

# **Town and County of Nantucket Select Board • County Commissioners**

Jason Bridges, Chair  
Matt Fee  
Kristie L. Ferrantella  
Dawn E. Hill Holdgate  
Melissa Murphy



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Nantucket, Massachusetts 02554

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[www.nantucket-ma.gov](http://www.nantucket-ma.gov)

C. Elizabeth Gibson  
Town & County Manager

***AGENDA FOR THE MEETING OF THE  
SELECT BOARD  
APRIL 13, 2022 - 5:30 PM  
PSF COMMUNITY ROOM, 4 FAIRGROUNDS ROAD  
AND REMOTE PARTICIPATION VIA ZOOM WEBINAR  
NANTUCKET, MASSACHUSETTS***

***YOU TUBE LINK FOR VIEWING ONLY:***

<https://youtu.be/56-fk0n6A0Y>

***ZOOM WEBINAR REGISTRATION LINK TO VIRTUALLY ATTEND MEETING:***

[https://us06web.zoom.us/webinar/register/WN\\_v7vTzMXeTOyidiAA9qZ-IA](https://us06web.zoom.us/webinar/register/WN_v7vTzMXeTOyidiAA9qZ-IA)

***I. CALL TO ORDER***

***II. SELECT BOARD ACCEPTANCE OF AGENDA***

***III. ANNOUNCEMENTS***

1. The Select Board Meeting is Being Audio/Video Recorded.
2. Nantucket Lights: Request for Proclamation Declaring April 22-30, 2022 "International Dark Sky Week."
3. Town Offices will be Closed Monday, April 18, 2022 in Observance of Patriots' Day.
4. No Select Board Meeting on Wednesday, April 20, 2022.
5. Finance Committee-Sponsored 2022 Annual Town Meeting Public Information Session to be Held Tuesday, April 26, 2022 at 5:00 PM. To Join Zoom Meeting: <https://us06web.zoom.us/j/83965377829?pwd=U0drOVZhTitmZktDS040eERXbVRrUT09> (Meeting ID: 839 6537 7829; Passcode: 629931).
6. Select Board Announcements/Comments.

***IV. FOLLOW-UP ON COMMENTS FROM PRIOR SELECT BOARD MEETINGS***

***V. PUBLIC COMMENT\****

***VI. NEW BUSINESS\****

***VII. APPROVAL OF MINUTES AND WARRANTS***

1. Approval of Minutes of April 6, 2022 at 5:30 PM.
2. Approval of Treasury Warrants for April 13, 2022.

***VIII. CITIZEN/DEPARTMENTAL/COMMITTEE REQUESTS***

1. National Grid: Review of Plans for L1 Feeder Project.
2. Property Owner: Request for Approval and Execution of Estoppel Certificate Regarding Compliance of a Conservation Restriction Dated November 17, 2004 for Property Located at 21 Lincoln Avenue.
3. Request for Granting of Utility Easement to Nantucket Electric Company/National Grid for Underground Electric Distribution System Located In, Through, Under, Over, Across and Upon Parcels of Land Situated on the Northerly Side of Ticcoma Way and the Easterly Side of Waitt Drive, being Shown as Lot 88 through Lot 95, Inclusive, and Road Lot 80 (Waitt Drive), Pursuant to Vote on Article 81 of 2019 Annual Town Meeting.

***IX. PUBLIC HEARINGS***

1. Public Hearing to Consider a Utility Petition from Verizon New England Inc. and Nantucket Electric Company for Plan #MA2021-26 to Relocate Two Jointly Owned Poles (Pole 19/1 and Pole 19/2) on North Beach Street at Easton Street, and Associated Wires, Cables and Fixtures to Facilitate the Visibility of a Stop Sign.
2. Public Hearing to Consider Amending Town Regulations, as Part of Recodification Process.
3. Public Hearing to Consider Application for New Mobile Food Unit License for Sushi Sean 11:11 LLC dba Sushi Sean 11:11, Sean Durnin, Manager.
4. Public Hearing to Consider Application for Alteration of Premises of Annual Wine and Malt Beverages Restaurant License for Forty-Five Surfside Road, LLC dba 45 Surfside, Rebecca Moesinger, Manager, for Premises Located at 45 Surfside Road; Request for Determination that the Premises Licensed to Sell Alcoholic Beverages is Not Detrimental to the Activities of a School Pursuant to Section 16C of MGL Chapter 138.

***X. TOWN MANAGER'S REPORT***

1. Licensing: Update on Outdoor Dining and To-Go Alcohol Sales.
2. Discussion Regarding Dredging of "Ditches in Madaket" (Continued from March 16, 2022 Public Comments and March 23, 2022 Follow-up).
3. Natural Resources: 2021 Annual Water Quality Report.

***XI. SELECT BOARD'S REPORTS/COMMENT***

1. Committee Reports.

***XII. ADJOURNMENT***

***\*Identified on Agenda Protocol Sheet***

## **SELECT BOARD AGENDA PROTOCOL:**

**Roberts Rules:** The Select Board follows Roberts Rules of Order to govern its meetings as per the Town Code Charter.

**Public Comment:** Public Comment is to bring matters of public interest to the attention of the Board. The Board welcomes concise statements on matters that are within the purview of the Select Board. At the Board's discretion, matters raised under Public Comment may be directed to Town Administration or may be placed on a future agenda, allowing all viewpoints to be represented before the Board takes action, if any. Except in emergencies, the Board will not normally take any other action on Public Comment in its sole discretion.

To facilitate that any individual who wishes to provide Public Comment has the opportunity and to ensure the ability of the Board to conduct its business in an orderly fashion, the following rules and procedures are adopted consistent with state and federal free speech laws:

- The agenda for regular Select Board meetings will include a Public Comment period at the beginning of the meeting unless there is more urgent business for the Board to take up first. This time is reserved for speakers to address the Board on matters that are not related to any other Agenda item. If a speaker wishes to address the Board on a matter that is related to another Agenda item, the Chair will accept public comment when that Agenda item is reached during the meeting.
- All speakers are encouraged to present their remarks in a respectful manner.
- All remarks will be addressed through the Chair of the meeting.
- The Chair of the meeting may not interrupt speakers who have been recognized to speak, except that the Chair reserves the right to terminate speech which is not constitutionally protected because it constitutes true threats, incitement to imminent lawless conduct, comments that were found by a court of law to be defamatory, and/or sexually explicit comments made to appeal to prurient interests. Verbal comments may also be curtailed if they exceed three (3) minutes and to the extent they exceed the scope of the Board's authority.

*Disclaimer: Public Comment is not a time for debate or response to comments by the Board. Comments made during the Public Comment period do not reflect the views or positions of the Board. Because of constitutional free speech principles, the Board does not have authority to prevent all speech that may be upsetting and/or offensive made during the Public Comment period.*

**New Business:** For topics not reasonably anticipated by the Chair 48 hours in advance of the meeting may be brought up for discussion in accordance with the Open Meeting Law.

**Public Participation:** The Board welcomes valuable input from the public at appropriate times during the meeting with recognition from the Chair at his/her sole discretion. For appropriate agenda items, the Chair will introduce the item and take public input. Individual Board Members may have questions on the clarity of the information presented. The Board will hear any staff input and then deliberate on a course of action.

**Select Board Report and Comment:** Individual Board Members may have matters to bring to the attention of the Board during a meeting. If the matter contemplates action by the Board, Board Members will consult with the Chair and/or Town Manager in advance and provide any needed information by the Thursday before the meeting and/or schedule the matter for a future Board meeting. Otherwise, except in emergencies, the Board will not normally take action on Select Board Comment.

*Approved on February 17, 2021*



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## NANTUCKET LIGHTS

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March 25, 2022

Dear Select Board Members,

I am writing on behalf of Nantucket Lights (<https://nantucketlights.org>) to ask your support in helping to protect our dark skies by declaring April 22-30, 2022, to be International Dark Sky Week on Nantucket. I have enclosed sample proclamation language for your consideration and respectfully ask that you consider it at your next meeting.

International Dark Sky Week is a global initiative of the International Dark-Sky Association (<https://www.darksky.org>) to celebrate the night sky, raise awareness about light pollution, and promote the use of environmentally responsible outdoor lighting. This year, the dates for it are April 22-30.

A proclamation by the Select Board declaring those dates to be International Dark Sky Week on Nantucket would be a great way to show its support for preserving our dark skies. Several cities and towns have already adopted similar proclamations. The one adopted by the City of Reno, Nevada, is attached as an example.

For our part, we will be coordinating some awareness events that week in partnership with the Maria Mitchell Association. We would love to be able to point to a proclamation by the Select Board when we promote these events.

Thanks very much for considering this request.

Warm regards,

Gail Walker  
Founder and President  
Nantucket Lights

*The mission of Nantucket Lights is to preserve and protect Nantucket's nighttime environment and heritage of dark skies by raising awareness about light pollution on the island and advocating for environmentally responsible outdoor lighting.*



## PROCLAMATION

- WHEREAS,** the beauty of the natural night sky is a part of Nantucket's heritage and culture that should be protected and preserved; and
- WHEREAS,** the excessive use of artificial light at night, also known as light pollution, masks the beauty of the natural night sky and also has significant adverse impacts on our health and quality of life; and
- WHEREAS,** Nantucket is home to dozens of nocturnal as well as non-nocturnal wildlife species, plants, and insects that need a natural night environment to thrive; and
- WHEREAS,** Nantucket is home to the revered Observatories of the Maria Mitchell Association, whose astronomy research is hindered by light pollution; and
- WHEREAS,** light pollution wastes energy, a precious commodity on Nantucket; and
- WHEREAS,** the International Dark-Sky Association has created International Dark Sky Week to celebrate the night sky, raise awareness about light pollution, and promote the use of environmentally responsible outdoor lighting around the world.

**NOW, THEREFORE,** we, the Nantucket Select Board, hereby declare

April 22-30, 2022  
to be

## INTERNATIONAL DARK SKY WEEK on Nantucket

and call upon all residents to commit to increasing awareness and understanding of light pollution and the steps that each of us can take to protect and preserve our dark skies.

Approved this 13th day of April 2022.

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Jason Bridges, Chair  
Select Board, Town of Nantucket

Office of The Mayor  
City of Reno, Nevada  
Proclamation

- WHEREAS,** the aesthetic beauty and wonder of a natural night sky is a shared heritage of all humankind; and
- WHEREAS,** the experience of standing beneath a starry night sky inspires feelings of wonder and awe, and encourages a growing interest in science and nature, especially among young people and out-of-area visitors, within Reno, The Truckee Meadows, and environs; and
- WHEREAS,** light pollution has scientifically-established economic and environmental consequences, which result in significant impacts to the ecology and human health of all communities; and
- WHEREAS,** 80-percent of the world's population, including many people in Reno, lives under a dome of light pollution—excessive artificial lighting at night that disrupts natural darkness—and may never experience the visual wonder or ecological and health benefits of living under a dark sky; and
- WHEREAS,** light pollution represents a waste of natural resources amounting to roughly \$3 billion per year of wasted energy in the United States and contributes to diminished energy security; and
- WHEREAS,** the International Dark-Sky Association is the globally recognized authority on light pollution, and has created International Dark-Sky Week to raise awareness of light pollution, and provide free education, resources, and solutions to the public to encourage the protection of and enjoyment of dark skies and responsible outdoor lighting.

**NOW THEREFORE,** I, Hillary L. Schieve, Mayor of the City of Reno, Nevada, do hereby declare

April 22-30, 2022 as

**INTERNATIONAL DARK SKY WEEK**

In and for the City of Reno, asking each resident to join me in observing and pondering upon this important week, and raising awareness and support for protecting our precious dark skies resources.



ATTEST:

IN WITNESS WHEREOF, I have set my hand and caused the Seal of the city of Reno, Nevada, to be affixed this twenty second day of April, 2022.

A handwritten signature in blue ink, appearing to read "Hillary L. Schieve".

Hillary L. Schieve, Mayor  
City of Reno

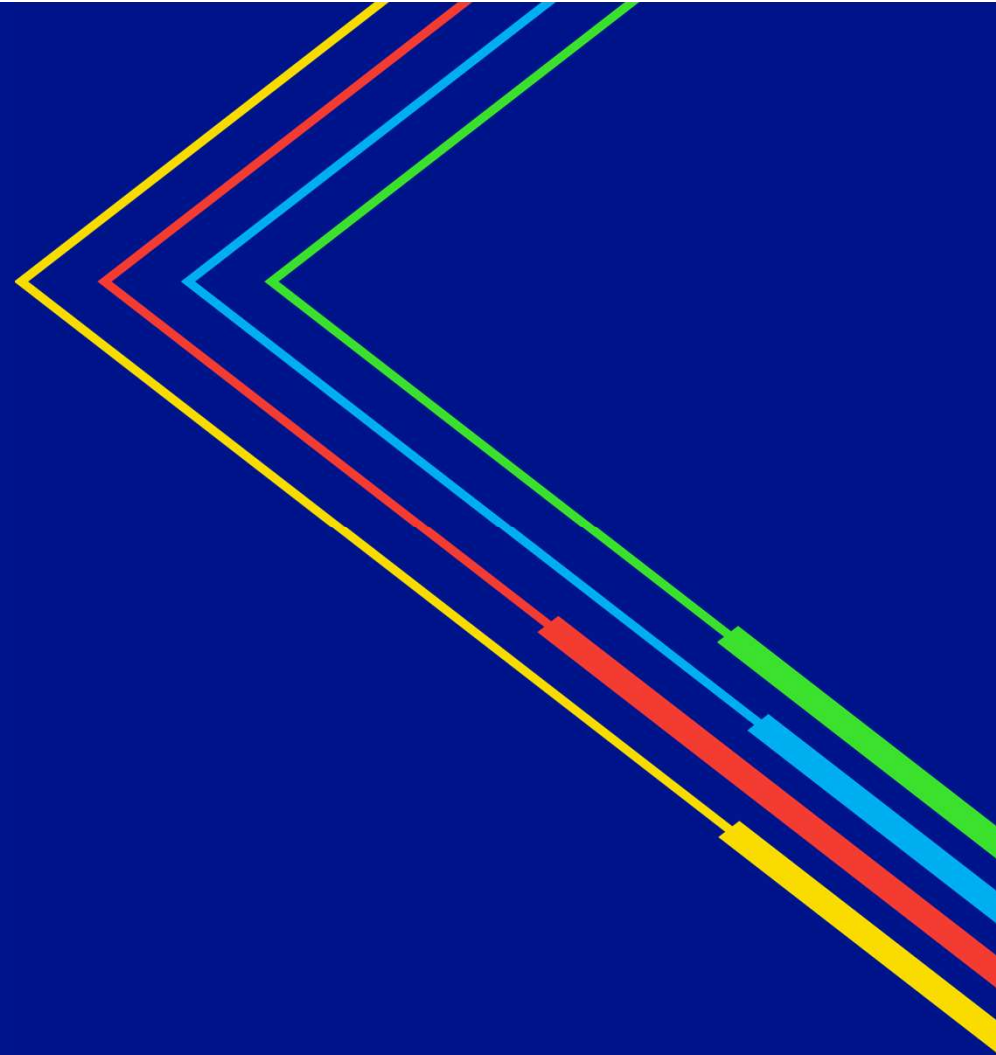
A handwritten signature in blue ink, appearing to read "Mikki Huntsman".

Mikki Huntsman, City Clerk  
City of Reno

# IslandReady: Design Plans for 101L1 Feeder Project

Nantucket, MA  
April 13, 2022

**nationalgrid**



# Introductions

## **National Grid Team**

William Ciocca, Community & Customer Management

Danielle Aretz, Stakeholder Management

Adam Wilding, Project Management

Joe Henry, Distribution Planning

Fabio Santos, Distribution Design

Steve Holdgate, Nantucket Operations

Josh Reynolds, Distribution Construction

Mike Masseur, Stakeholder Relations

# Agenda

1. Project History, Description & Need
2. L1 Scope Overview
3. Substation Scope
4. Street (Public Way) Scope
5. Proposed Schedule
6. Outreach

**National Grid** | Island Ready: 101L1 Feeder Project – Design Plans | April 13, 2022



# Project History, Description & Need

## Purpose

- Refeed existing downtown (Core) UG with 101L1 Feeder
- Create new loop system
- Create new feeder ties to L2 and L4
- Raise switchgears at substation to meet new flood mitigation requirements

## Benefits include:

- Improves switching ability
- Allows back feeds – creates redundancy
- Improvements to aging infrastructure (cable 1997)
- Minimizes outages in downtown (Core);
  - Contingency concerns: fused cabinet failure, L3 getaway failure, downtown flooding, etc.
- Provides additional backup capacity for L2 and L4

# L1 Scope Overview

## Civil Construction:

Install 1,600 linear feet of new duct bank (2-5" to 14-5" conduits), 12 new Manholes (5 in Substation), elevated metal platform for switchgears, 2 heavy duty pull-boxes, removal/demo of 3 concrete foundations (switchgears) and 5 Manholes (enlargements), and environmental protection and dewatering.

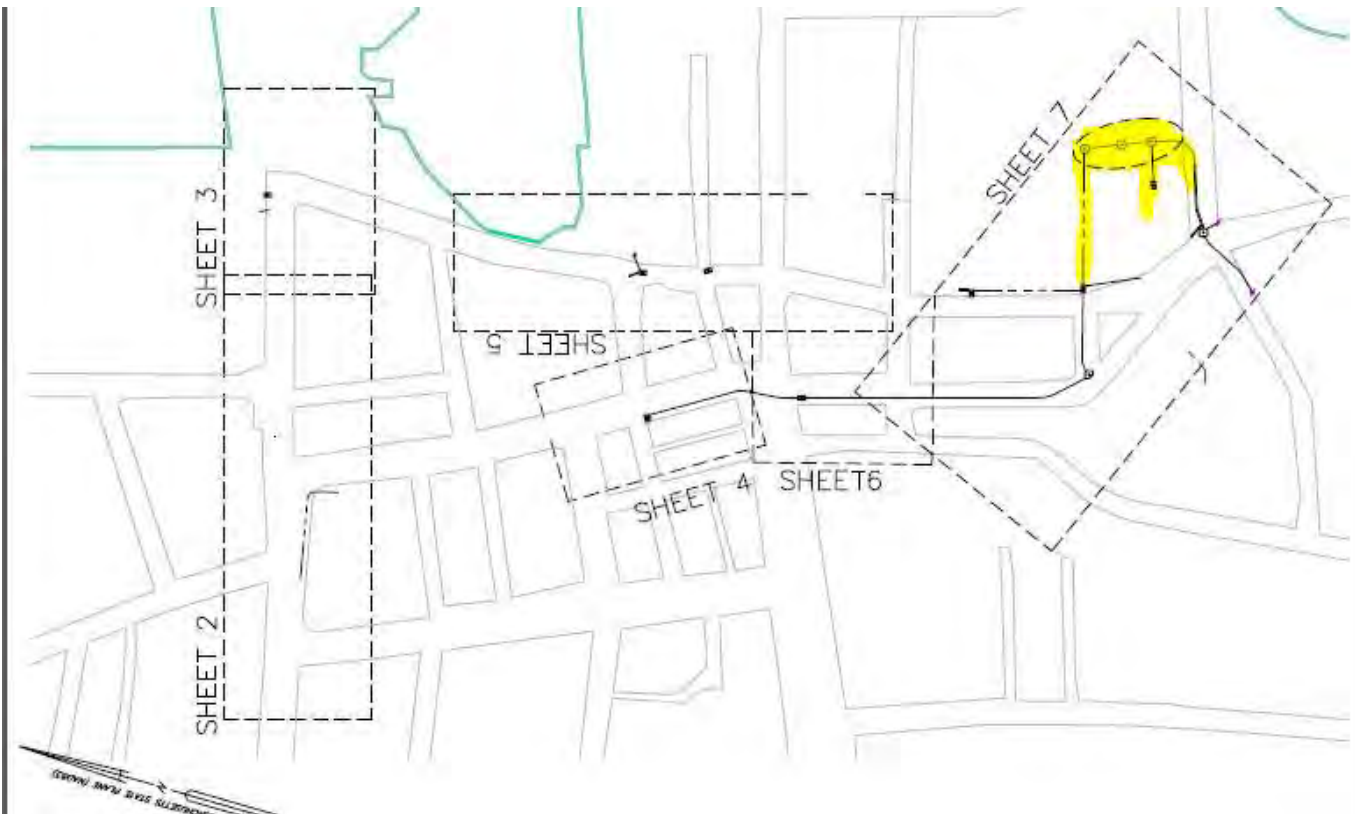
## Underground Line Construction:

5,000+ linear feet of Underground cabling (see Design breakdown for details)

## Overhead Line Construction:

3 pole replacements (Verizon), and misc. Overhead work (see Design breakdown for details)

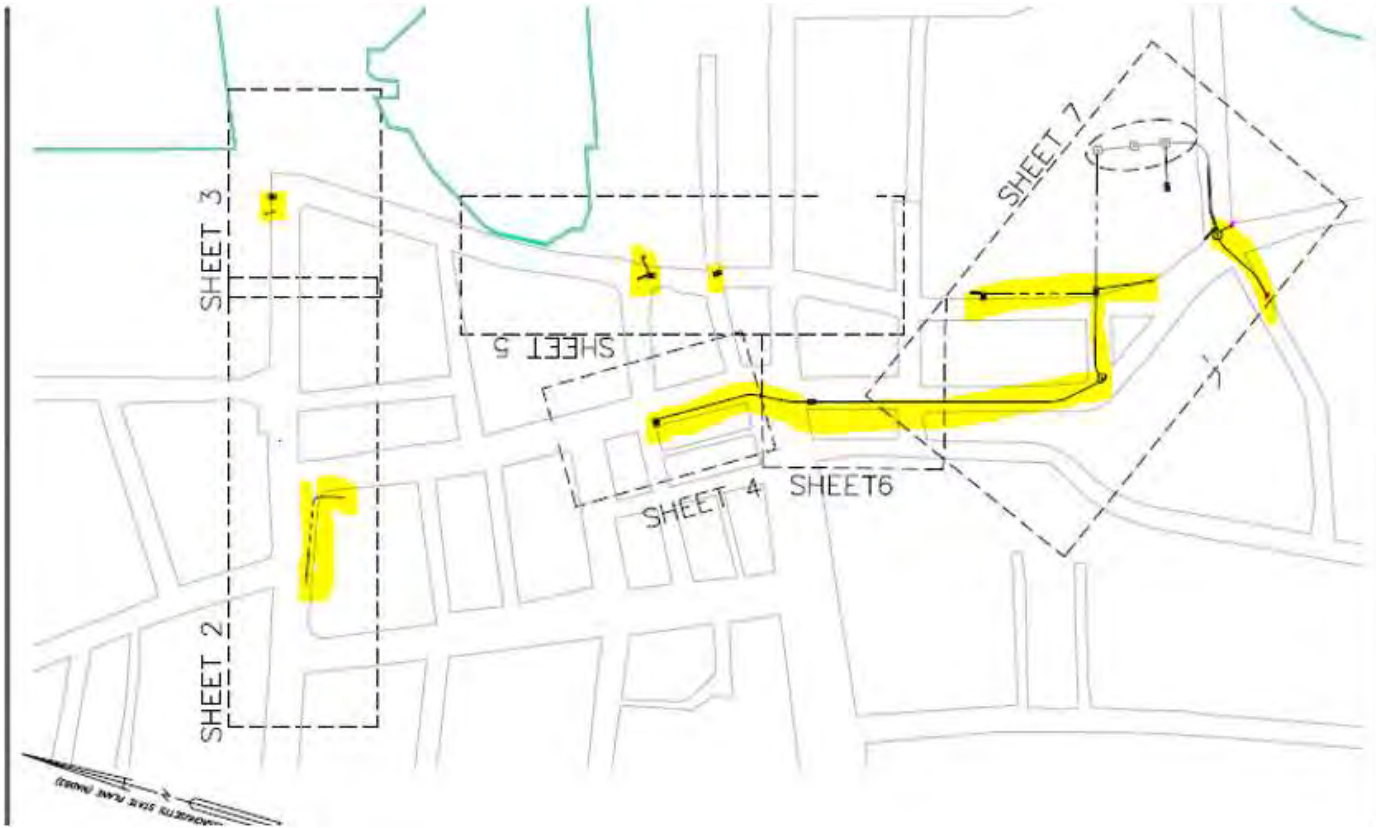
## Substation Scope



### Approvals:

- Planning Board – received January 13, 2020
- HDC – received January 21, 2020 (raised platform & fence), and March 10, 2020 (curbing & apron)
- Ch 91 – received DEP approval July 2, 2021
- Con Comm (applies to SS and Street work; OOC issued August 21, 2020 (plan to file extension by July 2023)

## Street (Public Way) Scope



### Approvals:

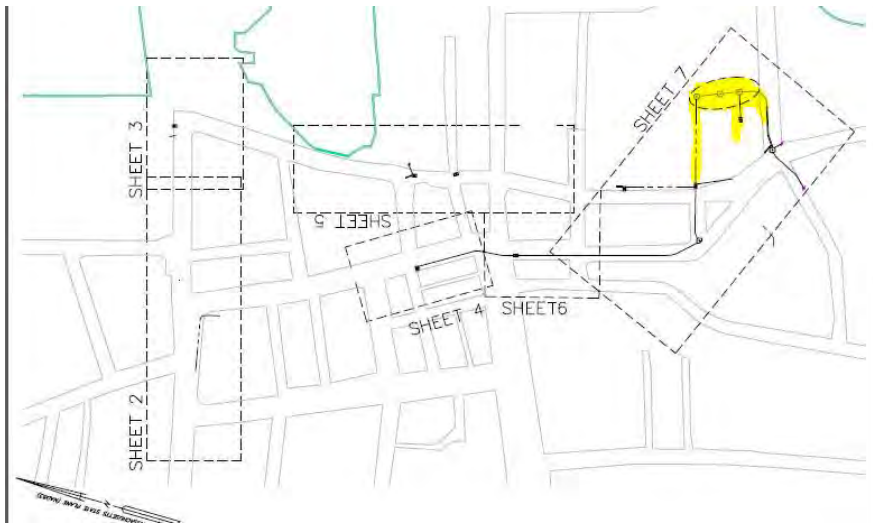
- Con Comm (applies to SS and Street work; OOC issued August 21, 2020 (plan to file extension by July 2023))
- Town Select Board – Grant of Location Petition

## Proposed Schedule

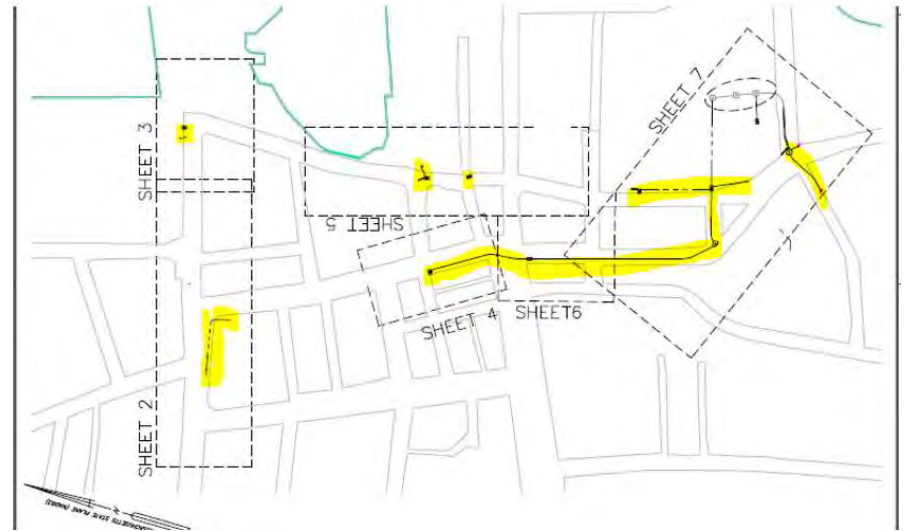
No impact to summer season (work to be completed on either side of summer)

Goal is to complete all work by end of 2023 CY (March – June, Oct – Dec)\*

### Substation work:



### Street (Public Way) work:

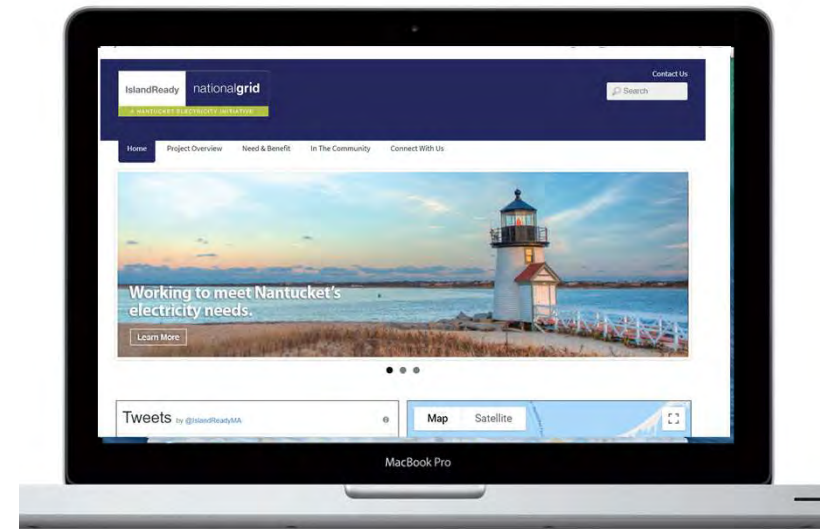


\*Pending contractor's schedule and Town's holiday and event schedule.

# Outreach

## Comprehensive Communications Plan

- Proactive outreach to project abutters and town officials re: project updates
- Partner with key business community organizations to serve as trusted communications channels (e.g., Downtown Business Associations)
- Door-to-door outreach, one-on-one meetings
- Public Information Sessions / Listening Sessions
- Maintain regular channels of communication (web, email, phone)
- Provide project updates via Inquirer and Mirror (editorial + paid ads)
- Participate in Nantucket events (e.g., Nantucket Island Fair)



## Connect With Us



[info@IslandReadyNantucket.com](mailto:info@IslandReadyNantucket.com)



508-257-5135 or 888-713-8448



[IslandReadyNantucket.com](http://IslandReadyNantucket.com)



[@IslandReadyMA](https://twitter.com/IslandReadyMA)

national**grid**



## Agenda Item Summary

|                      |                |
|----------------------|----------------|
| <b>Agenda Item #</b> | VIII. 2.       |
| <b>Date</b>          | April 13, 2021 |

### Staff

Ken Beaugrand, Real Estate Specialist.

### Subject

Approval and execution of the Estoppel Certificate certifying that the owners of the property located at 21 Lincoln Avenue are complying with the provisions of the Conservation Restriction held by the Town on this property.

### Executive Summary

The owners of the property hold title in a nominee trust and are conveying a beneficial interest in the Trust. In order to convey this interest, the owners of the property request the Town execute an Estoppel Certificate as the holder of the Conservation Restriction on the property at 21 Lincoln Avenue certifying that the owners are in compliance with the Conservation Restriction. The property was inspected by the Director of Natural Resources and the Coastal Resilience Coordinator on April 4, 2022 and found to be in compliance with the terms of the Conservation Restriction.

### Staff Recommendation

Approve and execute the Estoppel Certificate containing the certification that the property is in compliance with the Conservation Restriction.

### Background/Discussion

Town Counsel has reviewed and approved the documentation.

**Impact: Environmental** ☐ **Fiscal** ☒ **Community** ☒ **Other** ☐

Allows for the normal real estate sale process to proceed.

### Board/Commission Recommendation

N/A

### Public Outreach

N/A

### Connection to Existing Applicable Plan (i.e., Strategic Plan, Master Plan, etc.)

Master Plan

### Attachments

Estoppel Agreement, Conservation Restriction





## ESTOPPEL CERTIFICATE

The TOWN OF NANTUCKET, a body politic and corporate, acting by and through its Select Board, the Grantee of that certain Conservation Restriction dated November 17, 2004, registered with the Nantucket Registry District of the Land Court as Document No. 110242, (the "Restriction"), hereby certifies, in accordance with the provisions of Paragraph R of the Restriction, that Whitney A. Gifford and Garland Obrecht Alban, as Trustees of the 21 Lincoln Avenue Nominee Trust under Declaration of Trust dated September 17, 2012, registered with Nantucket Registry District as Document No. 138765, the current owners of that certain parcel of land, together with the buildings thereon, located in Nantucket, Massachusetts, now known and numbered as 21 Lincoln Avenue, shown on Land Court Plan No. 15978-A and as Lot 9 on Land Court Plan No. 8571-M, by virtue of Certificate of Title No. 24,472 filed with said Nantucket Registry District, are in compliance with all of the Grantor's obligations under the Restriction as of April \_\_\_\_, 2022

Executed and sealed on April \_\_\_\_, 2022.

TOWN OF NANTUCKET  
By its Select Board

\_\_\_\_\_  
Jason Bridges

\_\_\_\_\_  
Kristie L. Ferrantella

\_\_\_\_\_  
Matthew G. Fee

\_\_\_\_\_  
Dawn E. Hill Holdgate

\_\_\_\_\_  
Melissa K. Murphy

COMMONWEALTH OF MASSACHUSETTS

Nantucket, ss.

On this \_\_\_\_ day of April, 2022, before me, the undersigned notary public, personally appeared Jason Bridges, Kristie L. Ferrantella, Matthew G. Fee, Dawn E. Hill Holdgate and Melissa K. Murphy, members of the Town of Nantucket Select Board, personally known to me to be the persons whose names are signed on the preceding or attached document, and acknowledged to me that they each signed it voluntarily in their capacity as a member of the Town of Nantucket Select Board, for its stated purpose.

\_\_\_\_\_  
Notary Public  
My Commission Expires:

Document No. 110242

CONSERVATION  
RESTRICTION

*Nantucket Registry District*

DEC 31 2004

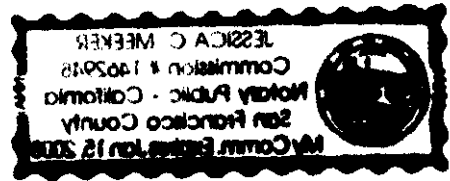
RECEIVED FOR REGISTRATION

8 O'CLOCK 15<sup>m</sup> A<sup>M</sup>

NOTED ON CERTIFICATE NO. 19199

IN REGISTRATION BOOK PAGE

ATTEST *Jane A. Kelley* ASST RECORDER



CONSERVATION RESTRICTION

to  
the Inhabitants of the Town of Nantucket,  
acting by and through its Board of Selectmen

With Trustee's Certificate

21 Lincoln Avenue, Nantucket

I, Sara M. Hendrickson, sole Trustee of Oversea Nominee Trust, under declaration of trust dated November 15, 1999, registered as Document No. 87244 at the Nantucket Registry District for the Land Court, having a mailing address of 3512 Clay Street, San Francisco, California 94118 (hereinafter "Grantor"), acting pursuant to Massachusetts General Laws chapter 184, sections 31, 32, and 33, as a gift grant to the Inhabitants of the Town of Nantucket, acting by and through its Board of Selectmen, having a mailing address of 16 Broad Street, Nantucket, Massachusetts 02554, its successors and permitted assigns (hereinafter "Grantee") in perpetuity and exclusively for conservation purposes, the following described Conservation Restriction and Easement (collectively hereinafter referred to as the "Conservation Restriction") on a portion of Grantor's land at 21 Lincoln Avenue, Nantucket, Massachusetts. Hereinafter the term "Grantor" shall mean the aforesaid Grantor, her successors and assigns and the Oversea Nominee Trust, and its successors in title and interest in the land subject to this Conservation Restriction.

Grantee is a governmental unit qualified under Section 170(h) of the Internal Revenue Code of 1986, as amended, and applicable regulations thereunder (hereinafter, the "Code"), and under M. G. L. c. 184, section 32 as an eligible donee to receive this Conservation Restriction.

Grantor is the owner of two parcels of land with a dwelling, garage, shed and beach steps constructed thereon, situated at 21 Lincoln Avenue, Nantucket Massachusetts, more particularly described on Exhibit A attached hereto, evidenced by Certificate of Title No. 19,199 at the Nantucket Registry District for the Land Court (hereinafter "Grantor's Land"). Grantor's Land abuts Nantucket Sound for approximately 87 feet, and contains a significant and steep coastal bank of about 70 feet (hereinafter, the "Bank"), a dune field extending from the bottom of the Bank about 304 feet (hereinafter "Restricted Dune Field"), and a natural coastal sand beach which extends about 100 feet from the edge of the Restricted Dune Field to the approximate mean low water line of Nantucket Sound (hereinafter "Restricted Beach"), as shown on the "Restriction Plan", drawn by Robert Emack, Surveyor, dated November 4, 2004, attached hereto as Exhibit B. Any and all accretions to the coastal beach and/or dune field shall be included in the lands subject to this Conservation Restriction, without the necessity of the execution and recording or registration of any further document,

however, any avulsions of or to the coastal beach and/or coastal dune fields shall not diminish the extent of the lands which are now, or in the future shall be or become, subject to the Conservation Restriction. The Restricted Beach includes the intertidal area (as it exists from time to time) and any lands lying landward between the intertidal area and the Restricted Dune Field.

The Restricted Dune Field and the Restricted Beach expressly exclude, and this Conservation Restriction specifically does not affect or apply to (i) that portion of Grantor's Land from Lincoln Avenue to the bottom of the Bank, and (ii) any and all structures and improvements now existing on Grantor's Land, including Grantor's dwelling, garage, shed and beach steps. The Restricted Dune Field, Restricted Beach, and that portion of Grantor's Land not subject to this Conservation Restriction are shown on the "Restriction Plan," drawn by Robert Emack, Surveyor, dated November 4, 2004, attached hereto as Exhibit B.

As used in this Conservation Restriction, the following terms shall be defined as follows:

"Bank" shall mean the seaward face or side of the elevated landform on the Premises, other than the Dune Area (defined below), which lies at the landward edge of the Dune Area, as the same would be defined as a "Coastal Bank" in 310 CMR 10.30, as amended from time to time (and/or the corresponding provisions of the Town of Nantucket Wetlands Bylaw and the regulations thereto) if the elevation of the Bank were based on the 100 year storm event flood plain;

"Dune Area" shall mean the area of natural hills, mounds and ridges of sediment landward of the coastal beach deposited by wind action or storm overwash. The Dune Area also means that area characterized by sediment deposited by artificial means and serving the purpose of storm damage prevention or flood control, as the same would be defined as "Coastal Dune" in 310 CMR 10.28, as amended from time to time (and/or the corresponding provisions of the Town of Nantucket Wetlands Bylaw and the regulations thereto) if the determination of the Dune Area were based on the 100 year storm event flood plain;

"Intertidal Areas" shall mean the land area upland of the mean low water line and seaward of the mean high water line, subject to tidal action;

"Mean High Water Line" shall mean the line where the arithmetic mean of the high water heights observed over a specific 19-year metonic cycle (the National Tidal Datum Epoch) meets the shore and shall be determined using hydrographic survey data of the National Ocean Survey of the U. S. Department of Commerce; and

"Mean Low Water Line" shall mean the line where the arithmetic mean of the low water heights observed over a specific 19-year metonic cycle (the National Tidal Datum Epoch) meets the shore and shall be determined using hydrographic survey data of the National Ocean Survey of the U. S. Department of Commerce.

A. Purpose. The Restricted Dune Field and Restricted Beach contain unique and outstanding qualities the protection of which in their predominantly natural and open condition will be of benefit to the general public. The Purpose of this Conservation Restriction is to assure that the Restricted Dune Field and Restricted Beach will be retained in perpetuity predominantly in their natural and open condition for conservation purposes including but not limited to recreational use (as limited and conditioned hereinbelow), to prevent any use of the Restricted Dune Field and Restricted Beach that will significantly impair or interfere with the conservation values (as expressed in the first paragraph of M.G.L. ch. 184, sec. 31) of the Restricted Dune Field and Restricted Beach, to impose certain obligations of beach conservation and management on Grantee, and to make the Restricted Beach accessible to the general public.

This Conservation Restriction is intended to protect the aforementioned natural and scenic resources of the Restricted Dune Field and Restricted Beach and of Nantucket Island by restricting the construction of dwellings, other structures and appurtenances thereto, limiting activities and uses in the Restricted Dune Field and Restricted Beach that are inconsistent with beach conservation and management, protecting natural vegetation and water quality, and encouraging wise stewardship of the Restricted Dune Field and Restricted Beach by Grantor and Grantee.

The conservation of the Restricted Dune Field and Restricted Beach will yield significant public benefit for the following reasons:

- (a) Conservation of the Restricted Dune Field and Restricted Beach will protect fragile coastal vegetation, natural habitat and water quality;
- (b) Conservation of the Restricted Dune Field and Restricted Beach will protect the picturesque public views of the beach, Dune Area and Bank in the "Steps Beach" area of Nantucket Town as seen from Nantucket Sound;
- (c) Granting public use of the Restricted Beach for passive, non-commercial recreational purposes will provide legal use and enjoyment of the beach and Nantucket Sound, which are significant natural resources for Nantucket's tourist-based economy;
- (d) Requiring beach conservation and management by Grantee will ensure that the Restricted Dune Field and Restricted Beach will be protected from misuse of the land, which is generally adjacent to other developed property; and

(e) The grant of a conservation restriction by Grantor to Grantee on the Restricted Dune Field and Restricted Beach will assist in preserving and maintaining the Restricted Dune Field and Restricted Beach and its open and scenic features for the benefit of the people of the Town and County of Nantucket, Commonwealth of Massachusetts, and the United States of America by assuring that the open space, natural and scenic features, and recreational qualities of the Restricted Dune Field and Restricted Beach will be retained and maintained forever substantially in their current condition for conservation purposes, by preventing any use or change of the Restricted Dune Field and Restricted Beach that will significantly impair or interfere with the aforesaid conservation values of the Restricted Dune Field and Restricted Beach, and by making an important natural resource legally accessible to the public.

(f) Conservation of the Restricted Dune Field and Restricted Beach through this Restriction serves to fulfill and is pursuant to the following governmental policies of the Town of Nantucket: (i) the Town's Resolution designated Article 71, approved at Town Meeting on April 10, 2002, that encourages property owners to preserve "gardens and open land . . . through public and private efforts, including the use of preservation restrictions where appropriate", and (ii) those provisions of the Town's approved Comprehensive Community Plan, dated November 1, 2000, which encourage the protection of open spaces, natural resources and public access to beaches.

(g) Ensuring public access to the Restricted Beach through this Restriction serves to fulfill the goals of and is pursuant to the Town's Open Beach Program.

(h) The protection of the Restricted Dune Field and the Restricted Beach through this Conservation Restriction will serve to prohibit development in sensitive resource areas that are not presently defined as coastal wetland resource areas under the Massachusetts Wetlands Protection Act (MGL Chap. 131, Section 40, 310 CMR 10:00) and do not lie within land subject to coastal storm flowage.

B. Prohibited Acts or Uses. Except for Grantor's reserved rights as set forth in paragraph C below, neither Grantor nor the successors or assigns of Grantor will perform or give permission to others to perform the following acts or uses on the Restricted Dune Field and Restricted Beach:

(a) Construction or placement of any building or structure, tennis court, swimming pool, satellite receiving dish, asphalt or concrete pavement, sign, billboard, or other advertising display, on-site sewage disposal system components, utility pole, tower, conduit or line or other temporary or permanent structure on, above or under the Restricted Dune Field and Restricted Beach, provided, however, that Grantee shall be permitted to erect temporary protective fences, signs and other devices when necessary to protect endangered and/or threatened species (such as nesting piping

plovers), consistent with applicable laws relating to the protection thereof, and Grantee shall remove such protective devices after the then present threat or danger to such protected specie has expired, and thereafter shall restore any disturbed area;

(b) Excavating, mining, dredging or removing from the Restricted Dune Field and Restricted Beach of soil, loam, peat, gravel, sand, rock or other mineral resource or natural deposit except as necessary for proper beach conservation or management and then only in a manner which does not impair the Purpose of this Conservation Restriction;

(c) Placing, filling, storing or dumping on the Restricted Dune Field and Restricted Beach of soil, ashes, refuse, trash, vehicle bodies or parts, rubbish, debris, junk, waste or other unsightly or offensive substance or material whatsoever or the installation of underground tanks;

(d) Cutting, removing or otherwise destroying trees, grasses, or other vegetation on the Restricted Dune Field and Restricted Beach except as necessary for proper beach conservation or management and then only in a manner which does not impair the Purpose of this Conservation Restriction;

(e) Activities detrimental to drainage, flood control, water conservation, water quality, erosion control, or beach conservation or management;

(f) Use of cars, trucks, all-terrain vehicles, and all other motor vehicles within the Restricted Dune Field and Restricted Beach, except for (1) emergency vehicles responding to a call, (2) vehicles necessary to carry out beach maintenance and preservation, (3) for the protection of threatened or endangered species, (4) vehicles necessary for law enforcement and for surveillance and inspections required hereunder, and (5) vehicles on the Restricted Beach from October 1 to May 15, unless mutually agreed by both parties, subject to reasonable controls as may be adopted by the Board of Selectmen or other governmental entity with competent jurisdiction, with at least fourteen (14) days prior notice to Grantor as provided in paragraph L herein of any meeting at which such controls are to be adopted;

(g) Any other use of or activity within the Restricted Dune Field and Restricted Beach that would materially impair significant conservation interests unless necessary for the protection of the conservation interests that are the subject of this Conservation Restriction;

(h) The division or subdivision of the Restricted Dune Field and Restricted Beach from each other and from the balance of Grantor's Land, such that the Restricted Dune Field and Restricted Beach will remain in unified ownership with the balance of Grantor's Land as a single parcel in perpetuity; and

(i) The conduct of commercial recreational activities in excess of the “de minimis” use standard set out and defined in Section 2031(c)(8)(B) of the Code.

C. Grantor’s Reserved Rights. The provisions of paragraph B notwithstanding, the following acts and uses by Grantor and the successors and assigns of Grantor shall not be prohibited by this Conservation Restriction or considered inconsistent with the intent of this grant:

(a) Continuation of all manner of lawful and permitted use and enjoyment of that portion of Grantor’s Land not affected by this Conservation Restriction, including without limitation occupancy, maintenance, repair, restoration, addition, demolition, replacement and construction of existing and future dwellings, garages, ancillary buildings, fences, beach steps, and other structures on the land and of driveways, walkways, paths, landscaping, gardens, and utility lines;

(b) Maintenance, repair, restoration, demolition, replacement and reconstruction of beach steps on the Bank and to the extent such steps may be located within the Restricted Dune Field;

(c) Limited clearing of shrubbery and other vegetation to the extent necessary for maintenance of the existing footpath from the bottom of the Bank across the Restricted Dune Field as shown on the Restriction Plan;

(d) Placing of fences that do not interfere with the Purpose of this Conservation Restriction, including installation and maintenance of dune fences in the Restricted Dune Field for proper beach conservation or management;

(e) Excavation and removal from the Restricted Dune Field and Restricted Beach of sand or other mineral resource or natural deposits as may be incidental to the excavation of a known archaeological site identified by and under the direction of a qualified organization such as the Massachusetts Historical Commission according to Mass. Regulations 950 CMR 70, or to the maintenance of good drainage, proper beach conservation or management practices or to other permissible use of the Restricted Dune Field and Restricted Beach;

(f) The use of the Restricted Dune Field and Restricted Beach by Grantor for the following recreational activities that do not exceed the “de minimis” use standard set out and defined in Section 2031(c)(8)(B) of the Code: sunbathing, swimming, picnicking, walking, fishing and other passive usual beach recreational activities conducted on foot;

(g) Selective planting of indigenous plants for proper beach conservation or

management; and

(h) Erection of signs no greater than twelve (12.0") inches square to identify the limits of public use set forth in paragraph E below.

All maintenance, repairs, restorations and uses of the Restricted Dune Field herein reserved to Grantor are subject to (1) compliance with all applicable laws; and (2) Grantor obtaining all required permits and/or approvals from any and all governmental bodies or authorities having jurisdiction over activities and work in or upon the Restricted Dune Field and the uses thereof and concerning the protection thereof.

D. Approval by Grantee for Otherwise Prohibited Acts or Uses. Grantor agrees to notify and obtain the prior written approval of Grantee in accordance with the provisions of paragraph K, in writing, before exercising any activity or use prohibited herein when, due to unforeseen or changed circumstances, such prohibited activity or use is deemed to be desirable by Grantor and Grantee, and such activity or use (1) does not violate the Purpose of this Conservation Restriction; and (2) either enhances or does not impair any significant conservation values within the Restricted Dune Field and Restricted Beach. Notwithstanding the foregoing, Grantor and Grantee have no right or power to agree to any activities or uses that would result in the termination of this Conservation Restriction or that could be construed as being prohibited under Section 170(h) of the Code governing "Qualified Conservation Contributions," or any regulations issued pursuant thereto.

E. Public Use. There is hereby granted to Grantee and to the public generally, in common with Grantor, a right and easement to use for passive purposes not in excess of the "de minimis" commercial use standard set out and defined in Section 2031(c)(8)(B) of the Code the Restricted Beach for sunbathing, swimming, picnicking, walking, fishing and passive usual beach recreational activities on foot, subject to restrictions set forth in paragraph F below, the Beach Management Plan defined in paragraph F, and subject to Grantor's rights set forth in paragraph H below. This Conservation Restriction does not grant to Grantee, to the public generally, nor to any other person any right to enter upon the Restricted Dune Field, except as follows: there is hereby granted to Grantee's authorized representatives and staff the right to enter the Restricted Dune Field at reasonable times and in a reasonable manner for the purpose of inspecting the same to determine compliance herewith, of enforcing this Conservation Restriction, and carrying out the obligations of Grantee set forth herein and in said Beach Management Plan. Nothing herein shall be deemed to grant to Grantee, to the public generally, nor to any other person any right to enter upon that portion of Grantor's Land not subject to the Conservation Restriction. Nothing herein, however, shall impair any pre-existing rights of the public.

F. Grantee's Obligation to Manage and Maintain. By acceptance of this Conservation Restriction, Grantee agrees at all times to manage and maintain the Restricted Dune Field and Restricted Beach as follows:

(a) The Restricted Dune Field shall be closed to the public. The Restricted Beach shall be closed to the public from 11:00 PM until sunrise of the following day, except as otherwise provided in the "Beach Management Plan" defined in subparagraph (d) below, and Grantee shall provide regular periodic night surveillance of the Restricted Dune Field and Restricted Beach to ensure compliance with the terms of this paragraph;

(b) Grantee shall provide an agent empowered by Grantee to enforce the rules and regulations established herein, including the legal ability to eject trespassers, which agent shall be readily accessible to Grantor at all reasonable times with reasonable dispatch to the Restricted Dune Field and Restricted Beach if requested by Grantor;

(c) Grantee shall provide regular trash collection of the Restricted Dune Field and Restricted Beach; and

(d) Grantee may adopt a "Beach Management Plan" for the purposes of regulating passive recreational use and enjoyment of the beaches of Nantucket and encouraging proper beach conservation and management, and which may not impose additional obligations on Grantor. Failure to adopt a Beach Management Plan shall not be a breach of Grantee's obligations herein; however, in the event Grantee proposes to adopt a Beach Management Plan, Grantee by and through its Board of Selectmen shall give at least fourteen (14) days prior notice to Grantor as provided in paragraph L herein of any meeting at which a Beach Management Plan is to be adopted. However, in no event shall the Grantee be responsible for repairs or restoration of the Restricted Beach or the Restricted Dune Field damaged or changed as a result of or caused by natural phenomena, such as avulsion, erosion, wave action, wind or other storm-related damage.

Grantee's failure to manage and maintain the Restricted Dune Field and Restricted Beach reasonably according to the terms of this paragraph, including the provisions of said Beach Management Plan, to the extent said Plan pertains to the Restricted Beach and/or the Restricted Dune Field, shall constitute a breach of this Conservation Restriction, and Grantor shall be entitled to enforce the terms of this paragraph, including the provisions of said Beach Management Plan by all rights and remedies available to Grantor pursuant to paragraphs G, H, I, and J below. In the event of any conflict between provisions of the Beach Management Plan and the terms of this Conservation Restriction, then the terms of this Conservation Restriction shall prevail.

G. Indemnity and Insurance. By acceptance of this Conservation Restriction, Grantee hereby indemnifies and holds harmless Grantor from any and all loss, cost,

claim, damage, and from and against any and all debts, demands, actions, causes of action, suits, sums of money (including all costs, expenses and reasonable attorney's fees), liabilities, and any and all other claims of every kind arising from the existence of this Conservation Restriction or the presence of Grantee, Grantee's authorized representatives and staff and the public upon Grantor's Land. Grantee and Grantor also acknowledge that any liability of Grantee and Grantor related to the rights and uses described in this Restriction may be covered by and limited under the provisions of the Massachusetts Recreational Use Statute, M.G.L. Chapter 21, Section 17C and its successor provisions. Grantee further agrees at all times to include Grantor's interest and name Grantor as an additional insured under Grantee's general liability insurance policy. Grantee shall deliver to Grantor, within ten (10) business days of Grantor's written request thereof, a certificate of such insurance coverage.

H. Breach. In the event that a breach of these restrictions by Grantor comes to the attention of Grantee, Grantee must notify Grantor in writing of such a breach. Grantor shall have ten (10) days after receipt of such notice to undertake actions that are reasonably calculated to correct swiftly the conditions constituting such a breach, provided, however, in the event that the breach reasonably cannot be cured within said ten (10) day period, the cure shall be completed within a reasonable time thereafter. If Grantor fails to take such corrective action, Grantee may at its discretion undertake such actions, including appropriate legal and equitable proceedings, as are reasonably necessary to effect the correction of each such breach; and the cost of each such correction, including the Grantee's reasonable expenses, court costs and legal fees shall be paid by Grantor, provided Grantor has been determined by final judgment of a court of competent jurisdiction to be responsible for the breach, or by mutual agreement of Grantor and Grantee.

In the event that a breach of the obligations of Grantee set forth herein, including but not limited to Grantee's obligations set forth in paragraph F, Grantor must notify Grantee in writing of such a breach. Grantee shall have fifteen (15) days after receipt of such notice to undertake actions that are reasonably calculated to correct swiftly the conditions constituting such a breach, provided, however, in the event that the breach reasonably cannot be cured within said fifteen (15) day period, the cure shall be completed within a reasonable time thereafter. If Grantee fails to take such corrective action and if Grantor in Grantor's sole discretion determines that other conservation values protected by this Conservation Restriction may be impaired by Grantee's failure to take such corrective action, then after five (5) days written notice to Grantee, Grantor at Grantor's sole discretion may seek specific performance of Grantee's obligations herein. The cost of each such suit for specific performance, including the Grantor's reasonable expenses, court costs and legal fees shall be paid by Grantee, provided Grantee has been determined by final judgment of a court of competent jurisdiction to be responsible for the breach, or by mutual agreement of Grantor and Grantee.

In the event that a court of competent jurisdiction finds such alleged breach has occurred and has not been cured and shall order Grantee to meet its obligations hereunder, and Grantee shall fail to comply with such order within the time specified by the court and such court issues a judgment of contempt and the condition giving rise to said breach remains uncorrected for ninety (90) days after issuance of such final judgment of contempt, after all appeals if any are taken, then Grantor may seek all injunctive and other equitable and legal remedies. In the event that Grantee does not prevail, and after all appeals (if any appeals are taken) have been exhausted and all appeal periods have expired, Grantee shall then be permitted to exercise its rights of assignment, as provided for in paragraph O herein below, and upon such assignment be relieved of all of its obligations hereunder. The cost of such legal action, including the reasonable expenses, court costs and legal fees, shall be paid by the losing party or by mutual agreement of Grantor and Grantee.

I. Acts Beyond Grantor's Control. Nothing contained in this Conservation Restriction shall be construed to entitle Grantee to bring any action against Grantor for any injury to or change in the Restricted Dune Field and Restricted Beach resulting from causes beyond Grantor's control, including, but not limited to, fire, flood, storm, earth movement, erosion, acts of others during use of the Restricted Beach or trespass on the Restricted Dune Field, or from any prudent action taken by Grantor under emergency conditions to prevent, abate or mitigate significant injury to the Restricted Dune Field and Restricted Beach resulting from such causes. Notwithstanding the immediately foregoing sentence of this paragraph I, Grantor solely shall be responsible for any and all violations and/or damages occurring or arising in or upon the Restricted Beach and/or the Restricted Dune Field when such violation and/or damage is caused, suffered, permitted or allowed by Grantor, and /or any one or more of Grantor's invitees, guests, employees, workers, servants, agents and/or independent contractors, including, but not limited to, payment of any and all fines, penalties, such violations and/or damages.

J. Legal Remedies of Grantor and Grantee. Except as provided in paragraph H, Grantor and Grantee reserve their rights to seek injunctive and other equitable and legal relief, which shall be in addition to, and not in limitation of, any other rights and remedies available to Grantor and Grantee. The cost of such legal action, including reasonable expenses, court costs and legal fees, shall be paid by the losing party or by mutual agreement of Grantor and Grantee. Grantee shall not be liable for monetary damages, except for those arising from its intentional wrongful acts meant and intended to inflict or cause harm or damages upon Grantor or Grantor's property, provided that in no event shall Grantee be subject to or liable for any punitive or exemplary damages.

K. Approval. Whenever approval by Grantee is required under the provisions of this Conservation Restriction, Grantor shall notify Grantee in writing not less than sixty (60) days prior to the date Grantor intends to undertake the activity in question; however, Grantee may waive or lessen the required period of time, provided said waiver is obtained in writing prior to the initiation of such activity. The notice shall describe the nature, scope, design, location, timetable and any other material aspect of the proposed activity in sufficient detail to permit Grantee to make an informed judgment as to its consistency with the Purpose of this Conservation Restriction. Where Grantee's approval is required, the office of the Board of Selectmen or Grantee's delegate on behalf of Grantee shall grant or withhold Grantee's approval in writing within thirty (30) days of the receipt of Grantor's written request therefor. Grantor's written request shall specifically recite the length of time provided by this Conservation Restriction for review and response by Grantee. Grantor shall not commence the contemplated activity until it is approved by Grantee's office of the Board of Selectmen or Grantee's delegate provided,, however, that failure of Grantee's office of the Board of Selectmen or Grantee's delegate to respond in writing within such thirty (30) days shall be deemed to constitute approval by Grantee of the request as submitted, so long as the request sets forth the provisions of this section relating to deemed approval after the passage of time, and so long as the request is not contrary to the express restrictions hereof, subject to the Grantor having obtained any and all regulatory permits and approvals from those governmental entities having regulatory jurisdiction over such activities.

L. Notice. Any notice, demand, request, consent, approval or communication that either party desires or is required to give to the other shall be in writing and either served personally or sent by first class mail or overnight delivery, postage prepaid, addressed as follows: to Grantor at 3512 Clay Street, San Francisco, California 94118 (with a copy to Philbrick and Avery LLP, P. O. Box 148; Nantucket, Massachusetts 02554) and to Grantee at the Board of Selectmen, 16 Broad Street, Nantucket, Massachusetts 02554 (with a copy to Deutsch Williams Brooks DeRensis & Holland, P.C., 99 Summer Street, Suite 1300, Boston, Massachusetts 02110-1235) or to such other address as either party from time to time shall designate by written notice to the other.

M. Proceeds from Extinguishment. Grantor and Grantee agree that the donation of this Conservation Restriction gives rise for the purposes of this paragraph M to a real property right, immediately vested in Grantee, with a fair market value that is at least equal to the proportionate value that this Conservation Restriction determined (which shall be the same value as stated in a third party appraisal to be obtained by Grantor) at the time of the gift bears to the value of Grantor's Land unrestricted at that time. If circumstances arise in the future such as render the Purpose of this Conservation Restriction impossible to accomplish, this Conservation Restriction

can only be terminated or extinguished, whether in whole or in part, by judicial proceedings in a court of competent jurisdiction in addition to the requirements of M. G. L. c. 184, section 32. If any change in conditions ever gives rise to extinguishment or other release of this Conservation Restriction under applicable law, then Grantee, on a subsequent sale, exchange or involuntary conversion of Grantor's Land or any portion thereof that includes all or a portion of the Restricted Dune Field and the Restricted Beach, after satisfaction of prior claims and net of any costs and expenses associated with such sale, shall be entitled to a portion of the proceeds equal to said proportionate value, subject, however, to any applicable law which expressly provides for a different disposition of proceeds.

Whenever all or any part of the Restricted Dune Field and Restricted Beach or any interest therein is taken in exercise of eminent domain by public, corporate, or other authority so as to abrogate the restrictions imposed by this Conservation Restriction, Grantor and Grantee shall cooperate in appropriate actions at the time of such taking to recover the full value of the taking and all incidental and direct damages resulting from the taking. All related expenses incurred by Grantor and Grantee in this action shall first be paid out of any recovered proceeds. The remaining recovered proceeds (including, for purposes of this subparagraph, proceeds from any lawful sale of the Grantor's Land unencumbered by the restrictions hereunder or any other property received in connection with an exchange or involuntary conversion of the Restricted Dune Field and Restricted Beach), minus any amount attributable to the value of improvements made after the date of this grant, shall be distributed between Grantor and Grantee in shares equal to such proportionate value (although if a less-than-fee interest is so taken, the proceeds shall be equitably allocated according to the nature of the interest taken).

All such proceeds received by Grantee shall be applied first to the payment of indebtedness, if any, in accordance with M.G.L. c. 44, section 63, and the balance of Grantee's share of the proceeds shall be used to advance conservation of Nantucket Island in a manner consistent with the conservation purposes set forth herein.

N. Severability. If any provision of this Conservation Restriction shall to any extent be held invalid, the remainder shall not be affected and shall remain in full force and effect.

O. Duration, Assignability and Limited Delegation. The burdens of this Conservation Restriction shall run with the Grantor's Land in perpetuity and shall be enforceable in perpetuity against Grantor and all successors and assigns of Grantor holding any interest in the Grantor's Land. Grantee is authorized to record or file any notices or instruments appropriate to assuring the perpetual enforceability of this Conservation Restriction. Grantor for herself and all her successors in title or interest to the Restricted Dune Field and Restricted Beach, agrees to execute any such instruments

upon request.

The benefits of this Conservation Restriction shall be in gross and assignable, but only to an entity or governmental unit or charitable corporation or trust, whose purposes expressly include conservation, willing, committed and able to enforce such restrictions, which entity shall also have purposes of open space conservation and which encompass the purposes set forth in this Conservation Restriction. Such entity or governmental unit or charitable corporation or trust must qualify under Section 170(h) of the Internal Revenue Code of 1986, as amended, and applicable regulations thereunder, and under M. G. L. c. 184, section 32 as an eligible donee to receive this Conservation Restriction directly. Any assignment of benefits by Grantee (or successor) must require the transferee to carry out the Purpose of this Conservation Restriction. See also paragraph T with respect to the order of assignability of Grantee's interest in this Conservation Restriction.

Grantor and Grantee herein agree that should Grantee (or any successor in interest to Grantee) come to own all or a portion of the fee interest subject to this Conservation Restriction: (i) Grantor and Grantee shall observe and be bound by the obligations and the restrictions imposed upon the Restricted Dune Field and Restricted Beach by this Conservation Restriction; (ii) this Conservation Restriction shall not be extinguished through the doctrine of merger in whole or in part in view of the public interest in its enforcement; and (iii) Grantee as promptly as practicable shall assign Grantee's interest in this Conservation Restriction of record to another Grantee in conformity with the requirements of this paragraph O. The instrument of assignment shall refer to the provisions of this subparagraph and shall contain confirmatory language suitable to reimpose this Conservation Restriction to the extent necessary to continue it in force.

Only upon prior written notice to Grantor, Grantee's Board of Selectmen may delegate approval and management authority under this Conservation Restriction to either the Nantucket Marine Department, the Nantucket Conservation Commission or their successor Town agencies. In any event, the Grantee's Board of Selectmen shall delegate inspection authority over the Restricted Dune Field to the Nantucket Conservation Commission, which shall report on its inspections to the Board of Selectmen or its delegate.

P. Effective Date. This Conservation Restriction shall be effective when Grantor and Grantee have executed it, the administrative approvals required by M. G. L. c. 184, section 32 have been obtained, and it has been registered in the Nantucket Registry District.

Q. Subsequent Transfers. Grantor shall: (1) incorporate the terms of this Conservation Restriction in any deed or other legal instrument which divests Grantor of

any interest in all or a portion of the Grantor's Land; and (2) make reference to this Conservation Restriction in any contract for the transfer of any interest in Grantor's Land.

R. Estoppel Certificates. Upon request by Grantor, Grantee shall within twenty (20) days execute and deliver to Grantor a document which certifies the status of Grantor's compliance with any obligation of Grantor contained in this Conservation Restriction and which otherwise evidences the status of this Conservation Restriction as may be reasonably requested by Grantor, including a so-called estoppel certificate in form suitable for registration with Nantucket Registry District and notation for the Certificate of Title then outstanding for the Grantor's Land.

S. Limitation of Grantor Liability. If an estoppel certificate has been delivered by Grantee and duly registered at the time of a transfer of interest in Grantor's Land, the transferee under such transfer shall not be liable for prior violations, and the transferor shall not be liable for subsequent violations.

T. Successor Grantee. In the event Grantee assigns the benefits of this Conservation Restriction, such assignment shall be made to the first (by order of listing) of the two below-named organizations which agrees to accept assignment, and which qualifies for assignment under the terms of this paragraph T and under paragraph O.

- (a) Nantucket Islands Land Bank, Nantucket, Massachusetts
- (b) Nantucket Conservation Foundation, Nantucket, Massachusetts

In the event that neither of the above name organizations agrees to accept, or all of the above named organizations fail to qualify for, assignment under the terms of this paragraph T and paragraph O, then this Conservation Restriction shall be assignable by Grantee in accordance with paragraph O.

U. Baseline Documentation. The specific scenic, open space, recreational and natural habitat values of Grantor's Land generally, and the Restricted Dune Field and Restricted Beach specifically, are documented in a report to be kept on file at the offices of Grantee's Board of Selectmen, which documentation the parties agree provides an accurate representation of the condition of Grantor's Land as of the effective date of this grant and which is intended to serve as an objective information baseline for monitoring compliance with the terms of this Conservation Restriction.

V. Restriction in Perpetuity. The provisions hereof shall inure to and be binding upon the heirs, executors, administrators, devisees, successors and assigns as the case may be of the parties hereto and shall be restrictions running with the Grantor's Land in perpetuity.

For Grantor's title, see Certificate of Title No. 19,199 at the Nantucket Registry District for the Land Court.

### TRUSTEE'S CERTIFICATE

#### Oversea Nominee Trust

By her signature hereto the undersigned, Sara M. Hendrickson, Trustee of the Oversea Nominee Trust established under Declaration of Trust dated November 15, 1999, registered as Document No. 87244 in the Nantucket Registry District (the "Trust") hereby certifies as follows:

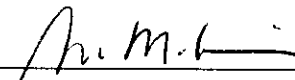
1. I am the sole Trustee of the Trust.
2. The Trust is in full force and effect and remains unmodified.
3. I am not the sole beneficiary of the Trust.

I, as the sole Trustee of the Trust, certify that when specifically authorized and directed by the beneficiaries of the Trust have the full right, power and authority to deal with any property owned or held by the Trust with the same force and effect as though such property were individually owned; the Trustee by instrument in writing signed by all the holders of beneficial interests under the Trust have been duly authorized and directed to grant this Conservation Restriction and to execute such other agreements, instruments and documents as the Trustee deems necessary in order to effectuate the grant and delivery of said Conservation Restriction; and no beneficiary is a minor, a corporation selling all or substantially all its Massachusetts assets, a personal representative of an estate subject to estate tax liens, or is now deceased or under any legal disability.

This Conservation Restriction being a gift, no documentary stamps are required.

The foregoing Conservation Restriction is hereby executed by the undersigned as a sealed instrument under Massachusetts law, as of this 17<sup>th</sup> day of November, 2004.

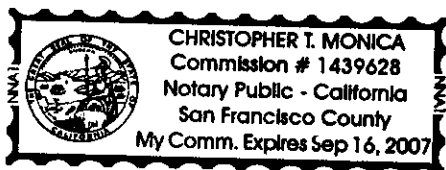
GRANTOR:  
OVERSEA NOMINEE TRUST

BY:   
Sara M. Hendrickson, Trustee

**STATE OF CALIFORNIA**

County of SAN FRANCISCO, ss.

On this 17 day of Nov, 2004, before me, the undersigned notary public, personally appeared the above-named Sara M. Hendrickson, (a) ~~personally known to me or~~ (b) proved to me through satisfactory evidence of identification, which were DRIVER LICENSE, to be the person whose name is signed on the foregoing instrument, and acknowledged to me that she signed it voluntarily, as Trustee, for its stated purpose.



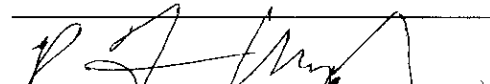
  
(Printed Name) CHRISTOPHER T. MONICA  
Notary Public  
My Commission Expires: 9-16-07

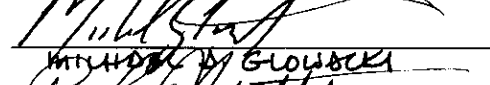
ACCEPTANCE BY THE BOARD OF SELECTMEN  
OF THE TOWN OF NANTUCKET

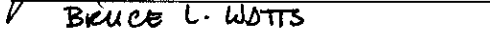
We, the undersigned, being a majority of the members of the Board of Selectmen of the Town of Nantucket, Massachusetts, hereby certify that at a meeting held on November 30, 2004, we voted to accept and approve the foregoing conservation restriction by Sara M. Hendrickson, Trustee, Oversea Nominee Trust, pursuant to Sections 2.1 and 3.3 of Chapter 289 of the Acts of 1996 and Section 32 of Chapter 184 of the Massachusetts General Laws, hereby accept the obligations of Grantee enumerated herein, and also certify that at said meeting we made a finding that the said conservation restriction serves conservation purposes and is in the public interest.

BOARD OF SELECTMEN  
TOWN OF NANTUCKET

  
TIMOTHY M. SOVERINO

  
ROBERT F. MURPHY

  
MICHAEL J. GLOSKE

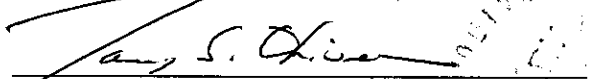
  
BRUCE L. WATTS

THE COMMONWEALTH OF MASSACHUSETTS

Nantucket County, ss

On this 30<sup>th</sup> day of November, 2004, before me, the undersigned notary public, personally appeared Timothy Soverino, Robert "Fin" Murphy, Bruce Watts, Michael Gloski

proved to me through satisfactory evidence of identification, which was ☐ photographic identification with signature issued by a federal or state governmental agency, ☐ oath or affirmation of a credible witness, ☒ personal knowledge of the undersigned, to be the people whose names are signed on the preceding document, and acknowledged to me that they signed it voluntarily for its stated purpose, as a majority of the members of the Board of Selectmen of the Town of Nantucket, Massachusetts.

  
Notary Public Nancy S. Oliver  
My commission expires: 9/1/06



## TOWN AND COUNTY OF NANTUCKET

Telephone (508) 228-7255

Fax (508) 228-7272

ACCEPTANCE OF GRANT OF EASEMENT

We, as a majority of the Board of Selectmen for the Town of Nantucket, hereby accept and approve the foregoing Conservation Restriction including a grant of easement for general public access over land identified as "Restricted Beach" as shown on a plan drawn by Emack Surveying, dated November 4, 2004, to be recorded with said Conservation Restriction and easement.

Date this 30<sup>th</sup> day of November, 2004.

TOWN OF NANTUCKET

By its Board of Selectmen:

*Timothy M. Soverino*  
 Timothy M. Soverino, Chairman

\_\_\_\_\_  
 Douglas L. Bennett

*Michael A. Glowacki*  
 Michael A. Glowacki

*Robert F. Murphy*  
 Robert F. Murphy

*Bruce L. Watts*  
 Bruce L. Watts

## COMMONWEALTH OF MASSACHUSETTS

Nantucket, ss.

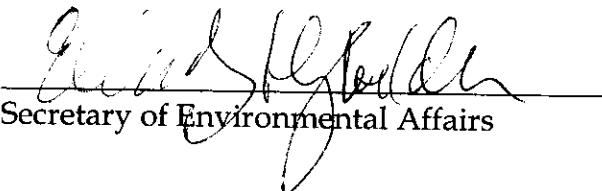
On this 30<sup>th</sup> day of November 2004, before me, the undersigned notary public, personally appeared Bruce L. Watts, Timothy M. Soverino, Robert F. Murphy, and Michael A. Glowacki, as they constitute a majority of the Nantucket Board of Selectmen, proved to me through satisfactory evidence of identification, which was personal knowledge, to be the persons whose names are signed on the preceding document, and acknowledge to me that each signed it voluntarily for its stated purpose, on behalf of the Town of Nantucket.

*Nancy S. Oliver*  
 Notary Public  
 My Commission Expires: 9/1/06

APPROVAL BY SECRETARY OF ENVIRONMENTAL AFFAIRS,  
COMMONWEALTH OF MASSACHUSETTS

The undersigned Secretary of the Environmental Affairs of the Commonwealth of Massachusetts hereby certifies that the foregoing Grant of Conservation Restriction by Sara M. Hendrickson, Trustee of Oversea Nominee Trust to the Inhabitants of the Town of Nantucket acting by and through its Board of Selectmen has been approved in the public interest pursuant to Massachusetts General Laws, chapter 184, section 32. Said approval is not to be construed as representing the existence or non-existence of any pre-existing rights of the public, if any, in and to the Grantor's Land, including its Restricted Dune Field and Restricted Beach, and any such pre-existing rights of the public, if any, are not affected by the granting of this Conservation Restriction.

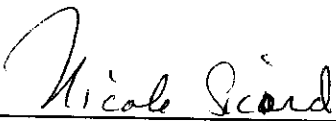
Dec. 23, 2004  
Date

  
Secretary of Environmental Affairs

COMMONWEALTH OF MASSACHUSETTS

County of Suffolk, ss.

On this 23rd day of December, 2004, before me, the undersigned notary public, personally appeared the above-named Sara M. Hendrickson, (a) personally known to me or (b) proved to me through satisfactory evidence of identification, which were personal knowledge & identity, to be the person whose name is signed on the foregoing instrument, and acknowledged to me that she signed it voluntarily, for its stated purpose.

  
(Printed Name)  
Notary Public  
My Commission Expires:

NICOLE SICARD  
Notary Public  
My Commission Expires December 31, 2004

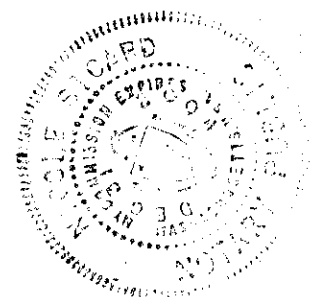


EXHIBIT AGRANTOR'S LAND

Sara M. Hendrickson, Trustee of Oversea Nominee Trust

That certain parcel of land, together with buildings and improvements erected thereon, located in the Town and County of Nantucket, Commonwealth of Massachusetts, now known and numbered as 21 Lincoln Avenue, bounded and described as follows:

Parcel One

Lot 9 on plan numbered 8751-M, drawn by Charles W. Hart & Associates, Inc., Surveyors, dated October 10, 1994, filed with Certificate of Title No. 16,224 at the Registry District of Nantucket County.

Parcel Two

|           |    |                                                                                                                                                                                                                        |
|-----------|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SOUTHERLY | by | Lincoln Avenue sixty-eight and 63/100 (68.63) feet;                                                                                                                                                                    |
| WESTERLY  | by | land now or formerly of Ruth C. N. Fitch measuring on the upland about five hundred twenty-two and 01/100 (522.01) feet and by said line protracted to low water mark or so far as private ownership may extend;       |
| NORTHERLY | by | Nantucket Sound; and                                                                                                                                                                                                   |
| EASTERLY  | by | land now or formerly of Nathaniel E. Lowell measuring on the upland about five hundred thirty-eight and 89/100 (538.89) feet, and by said line protracted to low water mark or so far as private ownership may extend. |

All of said boundaries, except the water lines, are determined by the Court to be located as shown on a plan drawn by J. H. Robinson, Surveyor, dated May 1935, as modified and approved by the Court, numbered 15978-A, filed with Certificate of Title No. 2202 at the Nantucket Registry District for the Land Court.

For title reference, see Certificate of Title No. 19,199 at the Nantucket Registry District for the Land Court.

**EXHIBIT B****RESTRICTION PLAN**

Sara M. Hendrickson, Trustee of Oversea Nominee Trust  
by Robert Emack, Surveyor  
dated November 4, 2004, follows on next page

CURRENT ZONING: R-1  
 MINIMUM LOT SIZE: 5,000 SF  
 MINIMUM FRONTAGE: 50 FT  
 FRONTYARD SETBACK: 10 FT  
 SIDE AND REAR SETBACK: 5 FT  
 ALLOWABLE G.C.R.: 30%

TOTAL LOT AREA TO MLW OCT 2004= 53,579 ± SF  
 AREA OF RESTRICTED BEACH= 7,895 ± SF  
 AREA OF RESTRICTED DUNE FIELD= 22,197 ± SF

NOTE: MEAN LOW WATER IS SHOWN AS PER NATIONAL  
 OCEAN SERVICE NANTUCKET TIDAL DATUM  
 PUBLISHED 04/21/2003

FOR PROPERTY LINE DETERMINATION THIS PLOT PLAN  
 RELIES ON CURRENT DEEDS AND PLANS OF RECORD,  
 VERIFIED BY FIELD MEASUREMENTS AS SHOWN HEREON.  
 THIS PLAN IS NOT REPRESENTED TO BE A TITLE  
 EXAMINATION OR A RECORDABLE SURVEY.

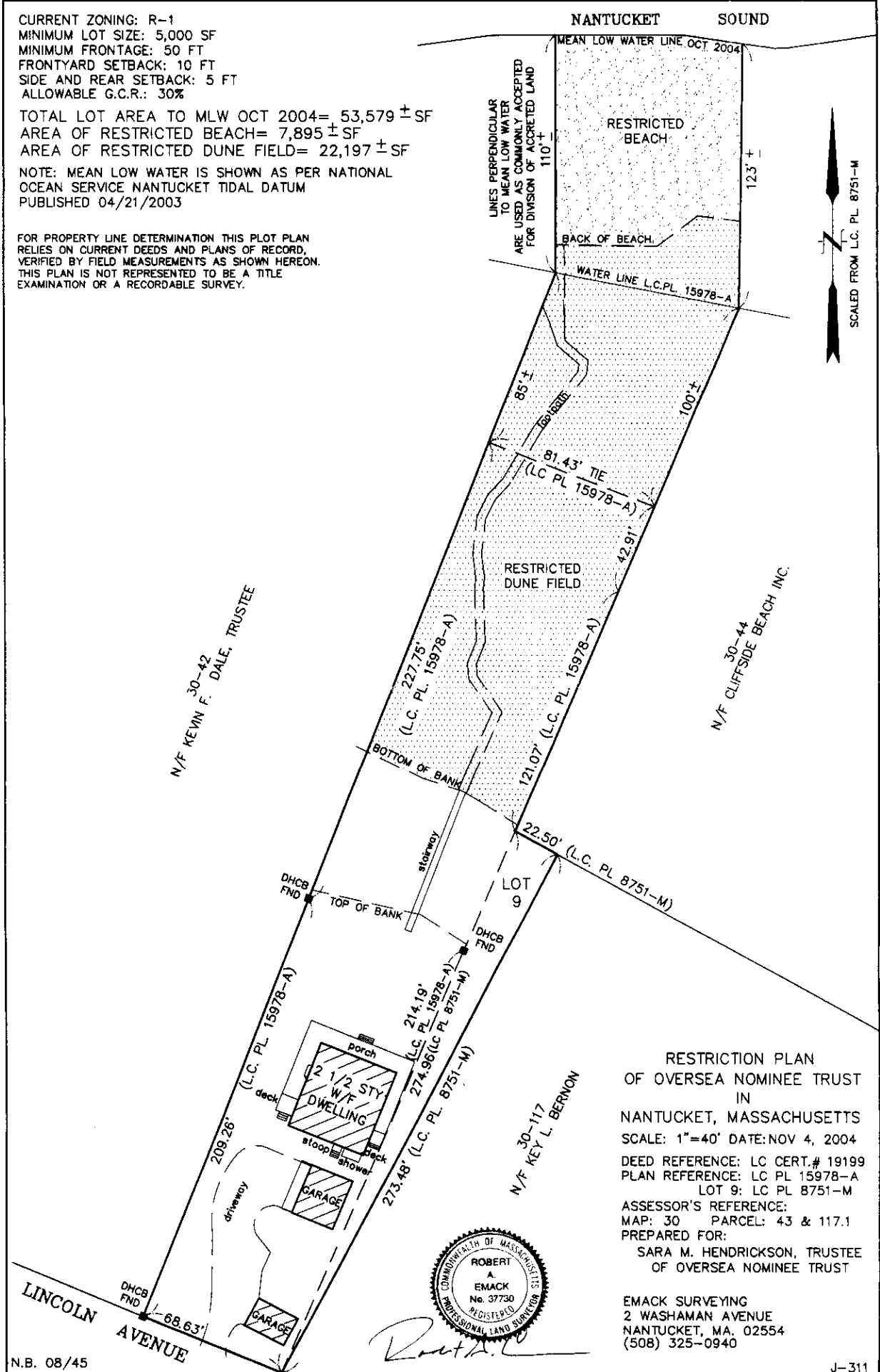


EXHIBIT C

CONSENT AND SUBORDINATION OF MORTGAGEE FIRST REPUBLIC BANK

To the Conservation Restriction  
follows on next page

CONSENT OF MORTGAGEE

FIRST REPUBLIC BANK, a Nevada corporation, being the holder of that certain mortgage granted to it by Sara M. Hendrickson, Trustee of Oversea Nominee Trust dated February 4, 2002, registered as Document No. 95831 at the Nantucket Registry District for the Land Court (the "Mortgage"), for consideration paid, hereby consents to the foregoing Conservation Restriction and agrees that the Mortgage shall be held subject and subordinate to and with the benefit of said Conservation Restriction.

In Witness Whereof, FIRST REPUBLIC BANK has caused its corporate seal to be hereto affixed and these presents to be signed in its name and on its behalf by

DOUGLAS S. WAGGENER its VICE PRESIDENT, hereunto duly authorized, this 18<sup>th</sup> day of NOVEMBER, 2004.

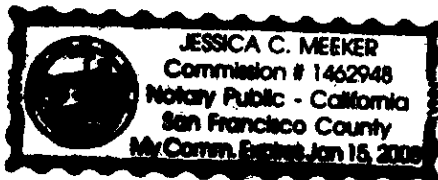
FIRST REPUBLIC BANK

BY: Douglas S. Waggener

STATE OF CALIFORNIA

County of San Francisco, ss.

On this 18th day of November, 2004, before me, the undersigned notary public, personally appeared the above-named Douglas Waggener (a) personally known to me or (b) ~~proved to me through satisfactory evidence of~~ identification, which were \_\_\_\_\_, to be the person whose name is signed on the foregoing instrument, and acknowledged to me that he signed it voluntarily, as Vice President of First Republic Bank, a Nevada corporation, for its stated purpose.



Jessica C. Meeker  
Notary Public  
Printed Name: Jessica C. Meeker  
My Commission Expires: Jan. 15, 2008



## Agenda Item Summary

|               |           |
|---------------|-----------|
| Agenda Item # | VIII. 3.  |
| Date          | 4/13/2022 |

### Staff

Erika D. Mooney, Operations Administrator

### Subject

Utility Easement with NGrid for Waitt Drive

### Executive Summary

In order to bring electric services into Waitt Drive, the Town is required to grant an easement to Nantucket Electric Company/National Grid. As granting easements is not allowed without a vote of town meeting, the Board executed a Grant of License with NGrid at its 7/25/2018 meeting. Town Meeting approved the granting of an easement as Article 81 of the 2019 Annual Town Meeting. Presented to you tonight is the final Grant of Easement to finalize the installation of utilities with NGrid.

### Staff Recommendation

Approve and execute the Grant of Easement.

### Background/Discussion

N/A

Impact: Environmental ☐ Fiscal ☐ Community ☐ Other ☐

N/A

### Board/Commission Recommendation

N/A

### Public Outreach

N/A

### Connection to Existing Applicable Plan (i.e., Strategic Plan, Master Plan, etc.)

N/A

### Attachments

Grant of Easement with Nantucket Electric Company/NGrid with easement plan.



## GRANT OF EASEMENT

**TOWN OF NANTUCKET**, a municipal corporation acting by and through its Select Board, and having an address of 16 Broad Street, Nantucket, Massachusetts 02554 (hereinafter referred to as the Grantor), for consideration of One (\$1.00) Dollar, grants to **NANTUCKET ELECTRIC COMPANY**, a Massachusetts corporation with its usual place of business at 40 Sylvan Road, Waltham, Massachusetts 02451 (hereinafter referred to as the Grantee) with quitclaim covenants, the non-exclusive perpetual right and easement to install, construct, reconstruct, repair, replace, add to, maintain and operate for the transmission of high and low voltage electric current and for the transmission of intelligence, an "UNDERGROUND ELECTRIC DISTRIBUTION SYSTEM" (hereinafter referred to as the "UNDERGROUND SYSTEM") located in Nantucket, Nantucket County, Massachusetts, consisting of lines of buried wires and cables and lines of wires and cables installed in underground conduits, together with all equipment and appurtenances thereto for the transmission of intelligence and the furnishing of electric service to the herein described premises, and without limiting the generality of the foregoing, but specifically including the following equipment; namely: bollards, handholes, junction boxes, transformers, padmount transformers and all housings, connectors, switches, conduits, cables and wires all located within the easement area of the hereinafter described property.

Said "UNDERGROUND SYSTEM" is located in, through, under, over, across and upon parcels of land situated on the northerly side of Ticcoma Way, and the easterly side of Waitt Drive, being more particularly shown as **Lot 88 through Lot 95, inclusive**, and including **Lot 80**, which is the private way named Waitt Drive, on a Plan of Land recorded with the Nantucket County Registry of Deeds as **Plan No. 2016-58**.

And further, said "UNDERGROUND SYSTEM" (locations of the electrical equipment and other facilities on the hereinbefore referred to premises of the Grantor) is approximately shown on a sketch entitled: "National Grid, URD Layout Plan; Waitt Drive Off Ticcoma Way Nantucket, MA; WR# 23860709; Scale: As Noted; Date: By: JLH; Rev:0," a reduced copy of said sketch is attached hereto as "Exhibit A" and recorded herewith, copies of which are in the possession of the Grantor and Grantee herein, but the final definitive locations of said "UNDERGROUND SYSTEM" shall become established by and upon the installation and erection thereof by the Grantee.

Also with the further perpetual right and easement from time to time to pass and repass over, across and upon said land of the Grantor as is reasonable and necessary in order to renew, replace, repair, remove, add to, maintain, operate, patrol and otherwise change said "UNDERGROUND SYSTEM" and each and every part thereof and to make such other excavation or excavations as may be reasonably necessary in the opinion and judgment of the Grantee, its successors and assigns, and to clear and keep cleared the portions and areas of the premises wherein the "UNDERGROUND SYSTEM" is located as shown on the sketch herein referred to, of such trees, shrubs, bushes, above ground and below ground structures, objects and surfaces, as may in the opinion and judgment of the Grantee interfere with the safe and efficient operation and maintenance of the "UNDERGROUND SYSTEM" and other related electrical equipment. However, said Grantee, its successors and assigns, will properly backfill said excavation or excavations and restore the surface of the land to as reasonably good condition as said surface was in immediately prior to the excavation or excavations thereof.

If said herein referred to locations as approximately shown on the sketch herein also referred to are unsuitable for the purposes of the Grantee or the Grantor, their respective successors and assigns, then said locations may, subject to prior written consent of the Grantee, which consent shall not be reasonably withheld, be changed to areas mutually satisfactory to both the Grantor and the Grantee herein; and further, said newly agreed to locations shall be indicated and shown on the sketch above referred to by proper amendment or amendments thereto. Any relocation so requested shall be at the sole cost and expense of the requesting party.

It is the intention of the Grantor to grant to the Grantee, its successors and assigns, all the rights and easements aforesaid and any and all additional and/or incidental rights needed to install, erect, maintain and operate within the Grantor's land an "UNDERGROUND SYSTEM" for the transmission of intelligence and for supplying electric service for the building, buildings or proposed buildings shown on the last herein referred to sketch or amended sketch.

It is agreed that said "UNDERGROUND SYSTEM" and all necessary appurtenances thereto, shall remain the property of the Grantee, its successors and assigns, and that the Grantee, its successors and assigns, shall pay all taxes assessed thereon.

The Grantor is authorized to grant this Easement pursuant to the vote of Article 81 of the 2019 Annual Town Meeting.

For Grantor's title, see Land Court Withdrawal from Registration dated September 20, 2012, and recorded with the Nantucket County Registry of Deeds in **Book 1348, Page 248**.

IN WITNESS WHEREOF, TOWN OF NANTUCKET acting by and through its Select Board, being Jason Bridges, Kristie L. Ferrantella, Matthew G. Fee, Dawn E. Hill Holdgate and Melissa K. Murphy, being thereto duly authorized this \_\_\_\_\_ day of \_\_\_\_\_, 2022.

TOWN OF NANTUCKET  
By and Through its Select Board

\_\_\_\_\_  
By: JASON BRIDGES

\_\_\_\_\_  
By: KRISTIE L. FERRANTELLA

\_\_\_\_\_  
By: MATTHEW G. FEE

\_\_\_\_\_  
By: DAWN E. HILL HOLDGATE

\_\_\_\_\_  
By: MELISSA K. MURPHY

Commonwealth of Massachusetts

County of \_\_\_\_\_ } ss.

On this the \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_, before me,  
Day Month Year

\_\_\_\_\_  
Name of Notary Public the undersigned Notary Public,

personally appeared JASON BRIDGES, KRISTIE L. FERRANTELLA, MATTHEW G. FEE,  
DAWN E. HILL HOLDGATE and MELISSA K. MURPHY, proved to me through satisfactory  
evidence of identity, which was/were

\_\_\_\_\_  
Description of Evidence of Identity

to be the persons whose names are signed on the preceding Grant of Easement, and  
acknowledged to me that they signed it voluntarily for its stated purpose as duly authorized  
members of the Select Board for the Town of Nantucket, MA.

\_\_\_\_\_  
Signature of Notary Public

\_\_\_\_\_  
Printed Name of Notary

My Commission Expires \_\_\_\_\_

Place Notary Seal and/or Any Stamp Above

04 NANTMA GEN

TOWN OF NANTUCKET

TO

NANTUCKET  
ELECTRIC COMPANY

GRANT OF EASEMENT

**AFTER RECORDING RETURN TO:**

LORI LOUGHLIN  
NATIONAL GRID  
1250 BRAYTON POINT RD  
SOMERSET, MA 02725

Approved By: \_\_\_\_\_

A

A

B

B

C

C

D

D

E

E

EASEMENT

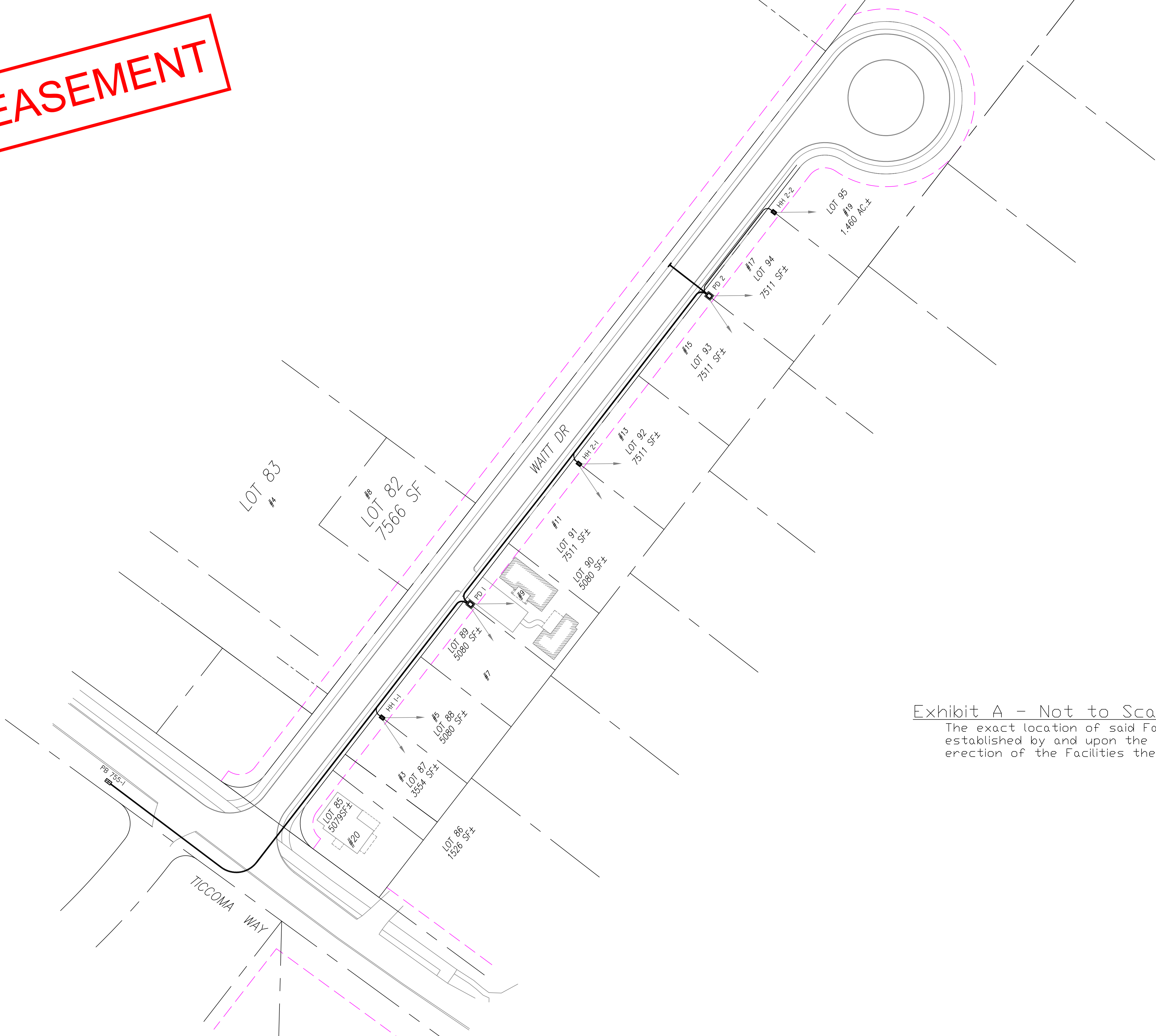
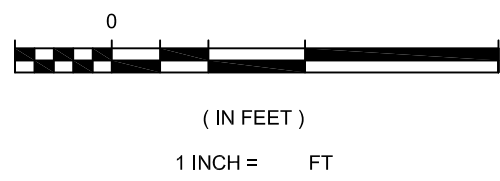


Exhibit A - Not to Scale  
The exact location of said Facilities to be established by and upon the installation and erection of the Facilities thereof.

LEGEND

- CONDUIT LENGTH BETWEEN STRUCTURES
- CONDUIT CONFIG
- SINGLE PHASE XFMR FOUNDATION
- SECONDARY HANDHOLE
- PULL BOX
- 3 PHASE XFMR FOUNDATION
- HEAVY DUTY HANDHOLE
- 2 WAY MANHOLE
- SWITCHGEAR MANHOLE
- 3 WAY MANHOLE
- 4 WAY MANHOLE
- EXISTING UTILITY POLE
- PROPOSED NEW POLE
- CONDUIT

GRAPHIC SCALE



WORK REQUEST NUMBER: 23860709

| REVISIONS |      |             |         |          |  |
|-----------|------|-------------|---------|----------|--|
| REV.      | DATE | DESCRIPTION | MADE BY | APP'D BY |  |
| 1         |      |             |         |          |  |
| 2         |      |             |         |          |  |
| 3         |      |             |         |          |  |
| 4         |      |             |         |          |  |
| 5         |      |             |         |          |  |
| 6         |      |             |         |          |  |
| 7         |      |             |         |          |  |
| 8         |      |             |         |          |  |

**nationalgrid**

URD LAYOUT PLAN

NOTE: ALL CONSTRUCTION TO BE PER LATEST NATIONAL GRID'S URD INSTALLATION & RESPONSIBILITY GUIDE (ELECTRIC SYSTEM BULLETINS)

**WAITT DR**  
OFF TICCOMA WAY  
NANTUCKET, MA  
**WR# 23860709**

SCALE: AS NOTED DATE: BY: M&R RV: AP: JLH REV: 0



## Agenda Item Summary

|               |            |
|---------------|------------|
| Agenda Item # | IX. 1.     |
| Date          | 04/13/2022 |

### Staff

Katie Cabral

### Subject

Verizon New England Inc & Nantucket Electric Company – North Beach Street

### Executive Summary

This petition proposes to relocate jointly owned poles and accompanying fittings on North Beach Street to facilitate visibility of a stop sign.

### Staff Recommendation

n/a

### Background/Discussion

n/a

Impact: Environmental ☐ Fiscal ☐ Community ☐ Other ☐

n/a

### Board/Commission Recommendation

n/a

### Public Outreach

Abutter notifications sent and 2 weeks of notices in I&M

### Connection to Existing Applicable Plan (i.e., Strategic Plan, Master Plan, etc.)

n/a

### Attachments

Departmental comments with petition



## UTILITY PETITIONS DEPARTMENTAL COMMENTS

APPLICANT: Verizon New England & National Grid  
TYPE: Petition for Joint or Identical Pole Locations  
SITE ADDRESS: North Beach Street (MA2021-26)  
HEARING DATE: April 13, 2022

---

### COMMENTS

NPD: No issues. -Deputy Gibson  
FIRE: No issues. -Chief Murphy  
PLANNING: No Issues. -Holly Backus  
DPW: No Issues. \*\*  
SEWER: No Issues. -David Gray  
WWCo: Call for mark out of mains and services in the area. -Mark Willett

**\*\*Contractor must obtain all required Town permits prior to the commencement of work, including but not limited to Street Opening and Street Blocking permits.**

Verizon - Rights of Way  
44 Old Townhouse Rd  
Yarmouth, MA 02664

December 27, 2021

Town of Nantucket  
Board of Selectmen  
16 Broad St  
Nantucket, MA 02554

Honorable Select Board,

Attached is a petition for Verizon New England Inc. and Nantucket Electric Company to relocate two poles in the public way at the intersection of North Beach St and Easton St, Nantucket, MA.

Would you kindly consider this petition and return the executed copies.

Yours truly,



Daryl Crossman  
Manager Rights of Way  
Verizon New England Inc.  
44 Old Townhouse Rd  
South Yarmouth, MA 02664  
(508) 398-5754 - Office  
[daryl.crossman@verizon.com](mailto:daryl.crossman@verizon.com) - Email

PETITION FOR JOINT OR IDENTICAL POLE LOCATIONS

12/27/2021

To the Town Select Board

in NANTUCKET, Massachusetts

**VERIZON NEW ENGLAND INC.** and **NANTUCKET ELECTRIC COMPANY D/B/A NATIONAL GRID** request permission to locate poles, wires, cables and fixtures including the necessary anchors, guys and other such sustaining and protecting fixtures to be owned and used in common by your petitioners, along and across the following public way or ways:

**North Beach St:**

**To relocated two (2) jointly owned poles at North Beach St and Easton St**

**NECESSITY – To facilitate visibility of a new stop sign.**

Wherefore they pray that after due notice and hearing as provided by law, they be granted joint or identical locations for and permission to erect and maintain poles, wires and cables, together with anchors, guys and other such sustaining and protecting fixtures as they may find necessary, said poles to be erected substantially in accordance with the plan filed herewith marked-VZ N.E. Inc. Plan No. **MA2021-26** Dated **October 11<sup>th</sup>, 2021**.

Also for permission to lay and maintain underground laterals, cables and wires in the above or intersecting public ways for the purpose of making connections with such poles and buildings as each of said petitioners may desire for distributing purposes.

Your petitioners agree that space shall be reserved and maintained for the limited purpose of attaching one-way low voltage fire and police signaling wires owned by the municipality or governmental entity for public safety purposes only.

VERIZON NEW ENGLAND INC.

By Daryl Crossman  
Daryl Crossman - Manager - Rights of Way

Dated this 27 day of Dec, 2021.

NANTUCKET ELECTRIC COMPANY D/B/A NATIONAL GRID

By \_\_\_\_\_  
Right of Way Representative

Dated this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

**ORDER FOR JOINT OR IDENTICAL POLE LOCATIONS**

By the Select Board of the Town of NANTUCKET, Massachusetts.

Notice having been given and a public hearing held, as provided by law,

IT IS HEREBY ORDERED:

that VERIZON NEW ENGLAND INC. and NANTUCKET ELECTRIC COMPANY D/B/A NATIONAL GRID, be, and they are hereby granted joint or identical locations for and permission to erect and maintain poles and their respective wires and cables to be placed thereon, together with anchors guys and other such sustaining and protecting fixtures as said Companies may deem necessary, in public way or ways hereinafter referred to, as requested in petition of said Companies dated the 27<sup>th</sup> day of December 2021.

**North Beach St:**

**To relocated two (2) jointly owned poles at North Beach St and Easton St**

**NECESSITY – To facilitate visibility of a new stop sign.**

All construction under this order shall be in accordance with the following conditions:

Poles shall be of sound timber, and reasonably straight and shall be set substantially at the points indicated upon the plan marked-VZ N. E. Inc. No. **MA2021-26** in a package Dated **October 11<sup>th</sup>, 2021** - filed with said petition.

The following are the public ways or parts of ways along which the poles above referred to may be erected, and the number of poles, which may be erected thereon under this order:

North Beach Rd

Pole relocation for visibility of a stop sign.

Also that permission be and hereby is granted to each of said Companies to lay and maintain underground laterals, cables and wires in the above or intersecting public ways for the purpose of making connections with such poles and buildings as each may desire for distributing purposes.

I hereby certify that the foregoing order was adopted at a meeting of the SELECT BOARD of Nantucket, Massachusetts held on the \_\_\_\_\_ day of \_\_\_\_\_ 20 \_\_\_\_.

---

Town Clerk

We hereby certify that on \_\_\_\_\_ 20\_\_ l, at \_\_\_\_\_ o'clock \_\_\_\_\_ m., at the \_\_\_\_\_ a public hearing was held on the petition of the VERIZON NEW ENGLAND INC. and NANTUCKET ELECTRIC COMPANY D/B/A NATIONAL GRID for permission to erect the poles, wires, cables, fixtures and connections described in the order herewith recorded, and that we mailed at least seven days before said hearing a written notice of the time and place of said hearing to each of the owners of real estate (as determined by the last preceding assessment for taxation) along the ways or parts of ways upon which the Companies are permitted to erect poles, wires, cables, fixtures and connections under said order. And that thereupon said order was duly adopted.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_  
Select Board of Nantucket, Massachusetts

#### CERTIFICATE

I hereby certify that the foregoing is a true copy of a joint location order and certificate of hearing with notice adopted by the SELECT BOARD for the Town of **NANTUCKET**, Massachusetts, on the \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_, and recorded with the records of location orders of said Town, Book \_\_\_\_\_, Page \_\_\_\_\_, this certified copy is made under the provisions of Chapter 166 of General Laws and any additions thereto or amendments thereof.

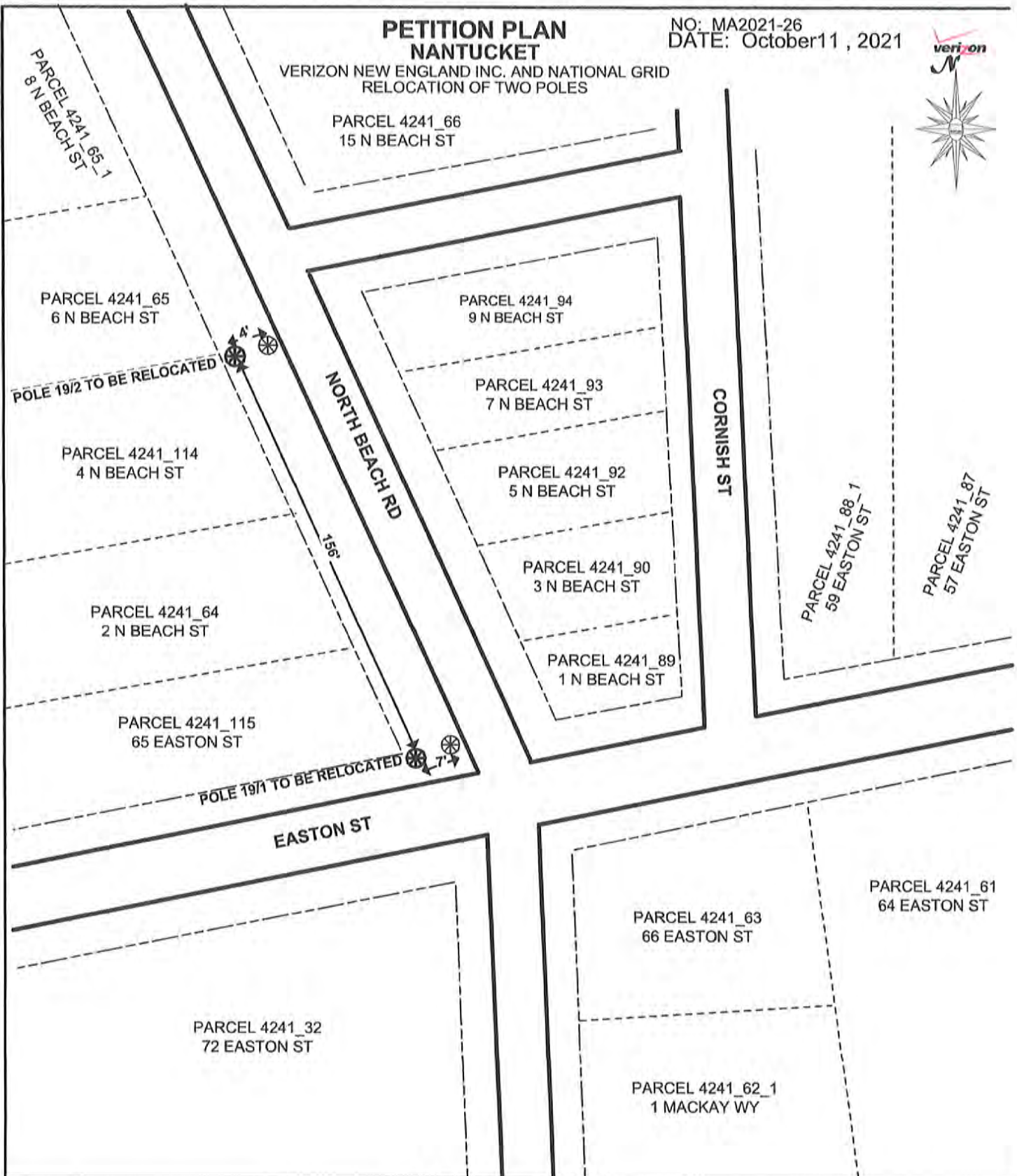
Attest:

\_\_\_\_\_  
Town Clerk

# PETITION PLAN NANTUCKET

VERIZON NEW ENGLAND INC. AND NATIONAL GRID  
RELOCATION OF TWO POLES

NO: MA2021-26  
DATE: October 11, 2021



## LEGEND



PROPOSED JOINTLY OWNED POLE



EXISTING JOINTLY OWNED POLE TO REMAIN

— EDGE OF PAVEMENT

- - - EDGE OF PROPERTY

— CENTER OF ROAD

ABUTTERS LIST

PARCEL ID: 4241\_89  
1 N BEACH ST

ONE NORTH BEACH ST LLC  
1 N BEACH ST  
NANTUCKET, MA 02554

---

PARCEL ID: 4241\_92  
5 N BEACH ST

OYSTER PROPERTIES LLC  
9 HELENA AVENUE  
LARCHMONT, NY 10538

---

PARCEL ID: 4241\_93  
7 N BEACH ST

CORT, JACK & JEANINE  
23 BITTERSWEET LANE  
WESTON, MA 02493

---

PARCEL ID: 4241\_94  
9 N BEACH ST

ROBINSON, THOMAS  
9 CLARK RD  
BROOKLINE, MA 02445

---

PARCEL ID: 4241\_66  
15 N BEACH ST

PIZZUTO, MARIA L TR  
1200 SOLDIERS FIELD RD STE 102  
BOSTON, MA 02133

---

PARCEL 4241\_64  
2 N BEACH ST

PETROCELLI, BRIGITTE L & NICHOLAS S  
560 HARLAND STREET, MILTON, MA 02186

---

PARCEL ID: 4241\_114  
4 N BEACH ST

202 VENTURES LLC  
2814 UNIVERSITY TER NW  
WASHINGTON, DC 20016

---

PARCEL ID: 4241\_65\_1  
6 N BEACH ST

KAIZER, PETER H & THEA K TR  
8 N BEACH ST  
NANTUCKET, MA 02554

---

PARCEL ID: 4241\_63  
66 EASTON ST

GOULET, JOHN E & KAREN B TRST  
32 STURBRIDGE RD  
WELLESLEY, MA 02481

---

PARCEL ID: 4241\_61  
64 EASTON ST

WHITE ELEPHANT HOTEL LLC  
75 PARK PLAZA STE 3  
BOSTON, MA 02116

---

PARCEL ID: 4241\_115  
65 EASTON ST

PHYLJAN LLC  
PO BOX 49334  
SARASOTA, FL 34230

---

PARCEL 4241\_32  
72 EASTON ST

NANTUCKET ISLAND RESORTS LLC  
C/O NEW ENGLAND DEVELOP-ACCTING  
DEPT  
75 PARK PLAZA #3, BOSTON, MA 02116

---



## Agenda Item Summary

|               |            |
|---------------|------------|
| Agenda Item # | IX. 2.     |
| Date          | 04/13/2022 |

### Staff

Katie Cabral

### Subject

Codification of Town Regulations

### Executive Summary

Town Administration has worked with General Code to codify all Town regulations into an organized and consistent format. Once approved, all regulations will be linked to the Town's website like the Town Code.

### Staff Recommendation

Approve. Sample adoption wording:

*The Select Board hereby adopts the Town of Nantucket Regulations as codified and renumbered and as set forth in the Chapter(s)/Article(s) noted in the highlighted Table of Contents of the Town Regulations, including the changes to the regulations set forth below. These regulations shall be considered the currently effective regulations of the (Board/Commission) for all intents and purposes.*

### Background/Discussion

n/a

Impact: Environmental ☐ Fiscal ☐ Community ☐ Other ☐

n/a

### Board/Commission Recommendation

n/a

### Public Outreach

Three weeks of notices in I&M.

### Connection to Existing Applicable Plan (i.e., Strategic Plan, Master Plan, etc.)

n/a



## Attachments

Table of Contents with sections to be adopted by the Select Board highlighted; list of changes made to regulations; updated regulations



# TABLE OF CONTENTS

## DIVISION 1 BYLAWS

See Separate Volume

## DIVISION 2 TOWN REGULATIONS

|      |                                                                               |       |
|------|-------------------------------------------------------------------------------|-------|
| 203. | Airport Regulations.....                                                      | 203:1 |
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## DISPOSITION LIST

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## Town of Nantucket Changes Made to Regulations During Codification Project

The following changes were made to various regulations during the course of the codification of the regulations at the direction of the Town following its review of the Manuscript and Editorial and Legal Analysis. The sections/subsections revised are noted in the codified regulations with the following history: **[Amended during codification]**

### Sample Adoption Wording

The following language or something similar could be used to confirm the regulations appearing in the Regulations Volume and to adopt the changes made:

*The Select Board hereby adopts the Town of Nantucket Regulations as codified and renumbered and as set forth in the Chapter(s)/Article(s) noted in the highlighted Table of Contents of the Town Regulations, including the changes to the regulations set forth below. These regulations shall be considered the currently effective regulations of the (Board/Commission) for all intents and purposes.*

### General Changes:

- All statutory references are cited in the following format: MGL c. \_\_\_, § \_\_\_.
- All references to the Town Code are cited in the following format: Chapter \_\_\_, [title], § \_\_\_\_, of the Code of the Town of Nantucket.
- All references to the “Board of Selectmen” are changed to “Select Board.”

### Chapter 207, Alcoholic Beverage Licensing and Regulation

1. Section 207-5B is amended as follows: *Upon receipt of an application for an original license, or in the case of a new manager, upon being advised of the new manager's identity, the Nantucket Police Department will conduct a background check of any proposed licensee or manager in accordance with Chapter 108, Civil Fingerprinting, of the Code of the Town of Nantucket, and such check will include a review of any existing criminal record. The licensing authority may reject any application where the licensee's or manager's criminal record indicates theft, unlawful sale, use or distribution of controlled substances, alcohol-related offenses, association with known felons or individuals involved in organized crime, a propensity for violence, or other behavior that, in the opinion of the licensing authority, puts the public at risk.*
2. Section 207-11C is amended as follows: *Applicants for a Nantucket temporary pouring license (a one-day license) must complete the required application form, pay [~~a \$20~~] an application fee established by the Board from time to time pursuant to MGL c. 40, § 22F, provide a valid insurance liability certificate and obtain all signature approvals before being considered for the granting of a one-day license.*
3. Section 207-14 is amended to delete the list of liquor license and application fees, replacing them with the following: **Application and licensing fees for annual and seasonal liquor licenses shall be set from time to time by the Board of Selectmen.**
4. Section 207-16D(9) is amended as follows: *Failure to comply with [~~section~~] 204 CMR 9.00 of the ABCC regulations or Chapter 54, Alcoholic Beverages, Article III, of the Code of the Town of Nantucket pertaining to retail sale of malt beverages in kegs.*
5. Section 207-16E(14) is amended to change “suspension of penalty” to “suspension or penalty” as follows: *Offense occurring while under suspension [~~of~~] or penalty.*

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**Chapter 216, Beaches**

1. In § 216-1D, the definition of “pond” is amended as follows: *POND – Any stagnant body of water without an outlet having a ~~[superficial]~~ **surficial** area of fewer than 10 acres, any great pond, or any like body of water with a small outlet, including but not limited to any body of water affected by tidal action, together with the surface area of such body of water and the soil and other matter under such body of water.*
2. Section 216-3D is amended as follows: *The fee for a beach event permit or commercial activity permit **shall be set from time to time by the Board of Selectmen.** ~~[is as follows: \$100 for events with an expected attendance of 16 to 75 people, and \$200 for events with an expected attendance of over 75 people.]~~*
3. Section 216-6C is amended as follows: *Except as may otherwise be allowed or permitted by law, no fireworks, explosive device or flare shall be ignited, lit, energized or fired anywhere in, on, over or upon any beach area designated by signage as a bird nesting area ~~[during the period such signs are in for]~~ **as directed by "Guidelines for Managing Recreational Activities in Piping Plover Breeding Habitat on the U.S. Atlantic Coast to Avoid Take Under Section 9 of the Endangered Species Act."** Please note that unauthorized fireworks are illegal in the Commonwealth of Massachusetts.*
4. Section 216-6D is amended as follows: *Except for vehicles engaged in actual necessary emergency response for the public safety or the security of the nation, ~~[all response for the public safety or the security of the nation,]~~ all two-, ~~[three,]~~ three-, or four-wheeled vehicles are prohibited from entering, operating, or being present within all posted nesting habitat in accordance with Section III, Paragraph 12 of the "Guidelines for Managing Recreational Activities in Piping Plover Breeding Habitat on the U.S. Atlantic Coast to Avoid Take Under Section 9 of the Endangered Species Act." Please note the Town of Nantucket's bylaw on use of all-terrain vehicles, Chapter 56, Regulation of Motor Vehicles on Beaches, § 56-6A, of the Code of the Town of Nantucket.*

**Chapter 220, Biodegradable Packaging**

Section 220-3B is amended as follows: *Reusable containers and recyclable paper or cardboard containers are allowable alternatives and vendors shall encourage the use of such containers ~~[but]~~ **by** allowing customers to bring their own containers or by providing reusable containers at no charge or for a reasonable fee.*

**Chapter 225, Boats and Boating**

1. Throughout this chapter, “Shellfish and Marine Department” is changed to “Marine Department.”
2. Section 225-1 is amended as follows: *These rules and regulations are in addition to the requirements of MGL c. 90B, § 9A, and 323 CMR 4.00, and are issued by the Board of Selectmen pursuant to the authority granted by ~~[Nantucket Code section 137-21, as adopted by Article 69 of the 1994 Annual Town Meeting]~~ **Chapter 137, Town Wharves and Waterways, § 137-18, of the Code of the Town of Nantucket.***
3. Section 225-2 is amended as follows: *In accordance with Chapter 137, Town Wharves and Waterways, ~~[of the Code of Nantucket § 137-21,]~~ **§ 137-18,** of the Code of the Town of Nantucket, no person shall engage in the business of renting to the public, for public operation, any personal watercraft, jet ski, surf jet or wet bike ~~[within the waters of the Commonwealth and within all coastal waters and inland bodies of water as lie within the limits of the Town of Nantucket]~~ **or any motorboat that uses an inboard motor powering a water jet pump or a propeller as its primary source of motive power and that is designed to be operated by a person sitting, standing or kneeling on the vessel rather than the conventional manner***

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*of sitting or standing inside a vessel within Nantucket waterways* without first having obtained a license to do so from the Town of Nantucket Board of Selectmen in compliance with ~~[s. 137-21]~~ **§ 137-18 of the Code of the Town of Nantucket**, in compliance with MGL c. 90B, § 9A and § 9B and 323 CMR 4.00, in compliance with all federal, state or local laws pertaining to their use, and in compliance with these rules and regulations.

4. Section 225-5 is amended as follows: *The annual license fee* ~~[is hereby established to be a minimum of \$200 times the number of personal watercraft to be rented at the licensed location]~~ **shall be set from time to time by the Board of Selectmen.**
5. Section 225-6E is amended as follows: No loading, unloading and storage of petroleum products intended for use in personal watercraft, jet skis, surf jets or wet bikes shall be undertaken by the licensee except in accordance with ~~[527 CMR 15.00]~~ **the Massachusetts Comprehensive Fire Safety Code (527 CMR 1.00)** and with guidelines issued by the Chief of the Fire Department of the Town.
6. Section 225-7 is amended as follows: In addition to any other remedy allowed by law for violations, any violation of any of the provisions of these rules or regulations or of ~~[s. 137-21 of the Code of Nantucket]~~ **§ 137-18 of Chapter 137, Town Wharves and Waterways, of the Code of the Town of Nantucket** shall be grounds for the Board of Selectmen, after a hearing, to suspend or revoke such license. If a violation occurs continuously over more than one calendar day, each day of violation shall constitute a separate violation. Any person may report observed violations or unsafe operating practices to the ~~[Shellfish and]~~ Marine Department, ~~[who]~~ **which** shall investigate such reports and determine whether to issue warnings or to institute proceedings before the Board of Selectmen for suspension or revocation of license.

**Chapter 256, Filming and Videotaping on Public Lands**

1. Section 256-1 is amended as follows: Any person proposing to occupy public property, a street or way for the purpose of any commercial film production where that occupancy has the risk of ~~[impeding]~~ **impeding** vehicular or pedestrian traffic, or impeding access to or for the customary enjoyment of such public property, street or way, must obtain a permit to do so from the Board of Selectmen or County Commissioners.
2. Section 256-3D(1) is amended as follows: A fee ~~[of \$1,000 per day]~~ **as set from time to time by the Board of Selectmen** (to be paid in advance) shall apply if the Board of Selectmen/County Commissioners determine the production to be "large-scale." This fee does not include the cost for use of Town employees (i.e., third-party police details for crowd control/traffic control). "Large scale" means any such production involving the use of more than 10 on-site production crew people.

**Chapter 260, Fishing and Shellfishing**

1. Section 260-2.1 is added as follows:

**§ 260-2.1. Scope and applicability.**

**The following regulations shall apply to scallop shanties constructed and used in the Town of Nantucket.**

2. Section 260-4.13 is amended as follows: Any unauthorized person who poaches or otherwise disturbs any shellfish in any amount or in any location shall be subject to criminal penalties and potential civil penalties. (See MGL c. 130. ~~[; and Section 11.6 Revocation of Shellfishing Permits.]~~)
3. Section 260-4.21 is amended as follows: Commercial catch reports. Holders of commercial shellfish permits shall submit a monthly catch report to the Shellfish Warden, on forms provided. It shall be the responsibility of the permit holder to ensure that he/she submits the required catch report no later than

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*the 15th day of the month following the month for which such report is being made (i.e., December 15, January 15, February 15, March 15, and April 15). Failure to submit a catch report shall be a violation of the Town of Nantucket regulations.*

4. Section 260-4.22B is amended in its entirety to read as follows: *Fees for annual permits (April 1 through March 30) shall be set from time to time by the Board of Selectmen.*
5. The “Season” column in the table in § 260-4.24 is amended to change “year-round” to “open year round.”
6. Section 260-4.25E is amended as follows: *Unnaturalized foreign-born persons. Commercial permits will not be issued to ~~those~~ unnaturalized foreign-born persons who have not resided on Nantucket for at least five years prior to making an application (MGL c 130, § 55).*
7. Section 260-4.27 is amended as follows: *For other than bay scallops, applications for commercial permits for quahogs, blue mussels, and conchs/whelk shall be filed with the Town of Nantucket or its designee on an annual basis and permits shall be valid for one year from date of approval.*
8. Section 260-4.29D is amended as follows: *Commercial bay scallop season and days. The Board of Selectmen shall allow the taking of bay scallops for commercial purposes from November 1 through March 31 on Monday through Friday only, with the exception of Christmas Day. When Christmas falls between Monday and Friday of any given year, scalloping shall be allowed the following Saturday. Any alteration to these dates shall be done in accordance ~~[to Ch.122, Section 122-9,]~~ with Chapter 122, Taking of Shellfish, § 122-8, of the Code of the Town of Nantucket. The Board of Selectmen may grant permission for the collection of scallop seed outside the commercial season for the purpose of moving seed.*
9. Section 260-4.34 is amended in its entirety to read as follows: *Commercial shellfishing permit fees shall be set from time to time by the Board of Selectmen.*
10. Section 260-4.38 is amended as follows: *The annual fee for an aquaculture license to be paid to the Town by each licensee shall be set from time to time by the Board of Selectmen, but in no event shall the fee be more than ~~[no less than]~~ \$25 per acre (or portion thereof) per licensee, as required by MGL c. 130, § 64. The fee shall be due no later than March 31 of any given year.*
11. Section 260-4.45 is amended as follows: *All individuals authorized by a licensed grant holder to work the grant in the absence of a licensed grant holder must be registered with the ~~[Shellfish Department]~~ Natural Resources Department or department designated by the Board of Selectmen. Licensees are responsible for the actions of all such employees or otherwise affiliated persons while they are working on the grant designated by their registration.*
12. Section 260-4.54 is amended as follows: *In the event of an extension being granted to a presently licensed area, the same level of effort per acre for the newly licensed area is required as described above. ~~[# Sections]~~*
13. Section 260-4.60 is amended as follows: *It shall be unlawful to use lethal means to control or exclude predators or other organisms from any area used for aquaculture. Nonlethal exclosures, including, but not limited to, nets, fences, bubble curtains and noise, may be used, if approved for a specific site and purpose. Invertebrate predators, pests and fouling organisms may be removed manually from an aquaculture site and disposed of in a lawful manner. ~~[(CMP 322, Section 13.7.2)]~~*
14. Section 260-4.66 is amended as follows: *All gear on licensed areas must be securely fastened to the bottom or removed. All unusable gear, including loose nets, twisted and damaged racks, loose envelopes, grow-out bags and fastening devices, must be removed from a licensed area and ~~[either]~~ disposed of properly.*
15. Original Sec. 5.38, Disturbance of grant by other than the licensee and (MGL Chapter 130; Section 57, Section 63 and Section 67), is repealed.

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16. Section 260-4.75 is amended as follows: *The applicants **for a permit to conduct scientific collection or shellfish propagation** shall provide a plan of the project, including all aspects of their backgrounds and intended management and operations of the project, to the Natural Resources Department, **Harbor and Shellfish** ~~[Harbor]~~ Advisory Board, and, if appropriate, the Board of Selectmen three months prior to the start of the project.*
17. Section 260-4.77 is amended to change “Shellfish Harbor Advisory Board” to “Harbor and Shellfish Advisory Board.”
18. In § 260-4.85, the “Poaching” row is amended to change “subject to criminal penalties and” to “subject to criminal penalties and **fin**es.”
19. In § 260-4.86, the following definitions are revised as indicated:
- PLANTED AREAS – Areas in which the ~~[Shellfish Department]~~ **Natural Resources Department or department designated by the Board of Selectmen** has planted shellfish for purposes of propagation or transplanting.*
- STATE COMMERCIAL PERMIT – Issued by DMF; allows an individual to take, land and sell (to a licensed dealer) shellfish and seaworms. A ~~[shellfish ID card]~~ **state commercial harvester license and shellfish transaction card** from the Division and Town permit are also required.*

**Chapter 272, Grills, Charcoal and Gas**

Chapter 272 is amended in its entirety to read as follows:

**§ 272-1. Prohibited fires.**

~~[This permit is valid for charcoal grill and gas grill fires only.]~~

Bonfires and wood fires are not permitted anywhere on Nantucket.

**§ 272-2. Beach restrictions.**

A. ~~[This permit cannot be used]~~ **Fires not meeting 527 CMR 1.00 are prohibited** on any of the public beaches or other beaches patrolled by lifeguards, within their boundaries or jurisdiction marked by signs. ~~[— while the lifeguards are on duty.]~~

B. Permitted fires on Tuckernuck are restricted to "Whale Point."

~~[This permit is only valid for one year from the date issued.]~~

~~The fee for this permit shall be \$5. Permits are free for persons over the age of 65 upon presentation of proof of age.~~

~~This permit is only valid when authorized by the signature of the officer on duty.~~

~~This permit must be in the possession of the authorized holder while using the permit and must be presentable upon the request of any officer of the police or fire department.~~

~~Holder of this permit must be at least 18 years of age.]~~

**§ 272-3. Violations and penalties.**

Failure to comply with the above-mentioned regulations ~~[will result in indefinite suspension of the permit and]~~ **may result in** possible court action under the General Laws of the Commonwealth of Massachusetts.

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**Chapter 316, Pedicabs**

1. Section 316-2H is amended as follows: Hours of operation shall not exceed the hours of 6:00 a.m. to 2:00 a.m. daily. Hours of operation for applicants less than 18 years of age will not ~~[exceed]~~ **extend past** 10:00 p.m. **daily**.
2. Section 316-2M is amended as follows: The ~~[total]~~ pedicab license fee ~~[is \$100 per year per pedicab]~~ **shall be set from time to time by the Board of Selectmen.**
3. Section 316-2R is amended as follows: The operating company will provide a shift supervisor during ~~[evening]~~ **the** hours **of 6:00 p.m. to 2:00 a.m.** and proof of radio contact upon request for juvenile-manned shifts.
4. Section 316-3G is amended as follows: The ~~[total]~~ pedicab operator fee ~~[is \$25 per year per operator]~~ **shall be set from time to time by the Board of Selectmen.**

**Chapter 349, Solid Waste**

1. In § 349-6, the definition of “recyclables” is amended as follows:

**RECYCLABLES — Materials designated for separation from other solid waste according to a list maintained in the Town offices and on the Town website, including certain types of paper, glass, metal, plastic and yard waste.**

~~[The following classes of materials:]~~

~~A. RECYCLABLE PAPER — All paper and paperboard products, excluding tissue paper, toweling, paper plates and cups and other low grade paper products which become unusable to paper mills as a result of normal intended use;~~

~~B. GLASS CONTAINERS — All glass bottles and jars (soda lime glass) but excluding glass light bulbs. Pyrex cookware, plate glass, drinking glasses, windows, windshields and ceramics;~~

~~C. METAL CONTAINERS — Aluminum, steel or bimetal beverage and food containers;~~

~~D. Scrap metal;~~

~~E. All number plastics (not including styrofoams set forth below) to include single resin plastics; all narrow neck plastic containers and any number plastics that do not apply to this category;~~

~~F. STYROFOAM — #6 EPS packing, foam bracing and peanuts, and foam trays and containers;~~

~~G. YARD WASTE — Grass clippings, weeds, garden materials, shrub trimmings and brush three inches or less in diameter (excluding diseased plants);~~

~~H. LEAVES — Deciduous and coniferous leaf deposition;~~

~~I. WHITE GOODS — Large appliances including refrigerators, freezers, dish washers, clothes washers and dryers, gas or electric ovens and ranges and hot water heaters;~~

~~J. WHOLE TIRES — Motor vehicle tires of all types; a shredded tire is a tire which has been cut, sliced or ground into four or more pieces such that the circular form of the tire has been eliminated; shredded tires may be landfilled;~~

~~K. Recyclable construction and land clearing debris.]~~

2. Section 349-7 is amended as follows: All material listed as hazardous wastes by the Massachusetts Department of Environmental Protection ~~[, including but not limited to surplus paint, used oil, oil filters, antifreeze, gasoline, automotive batteries, and both button cell and nickel-cadmium batteries,]~~ shall be separated from and not intermixed with any other wastes. These wastes shall only be accepted at the

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landfill or MRF on designated household hazardous waste collection days in accordance with 310 CMR 30.390 through 30.399. Hazardous waste generated by businesses or commercial operations or otherwise generated other than as part of residential household operations composed primarily of materials found in the wastes generated by consumers in their homes shall not be accepted at any time for collection or disposal by the Town of Nantucket. **Automotive and household batteries may be recycled during normal landfill hours.**

**Chapter 354, Streets and Sidewalks**

1. In § 354-3, the definition of “company” is amended as follows: *COMPANY – A natural gas pipeline company, petroleum or petroleum products pipeline company, public utility company, cable television company, and municipal utility company or department that supplies gas, electricity, telephone, communication or cable television services or private water companies within the [city or] Town [where such excavation is to be made].*
2. In § 354-3, the definition of “description of excavation location” is amended as follows: *DESCRIPTION OF EXCAVATION LOCATION – Such description shall include the name of the [city or] Town street, way, or route number where appropriate, the name of the streets at the nearest intersection to the excavation, the number of the buildings closest to the excavation or any other description, including landmarks, utility pole numbers or other information which will accurately define the location of the excavation.*
3. Section 354-4B is amended as follows: *An excavator license may be issued to an individual, company or corporation which can demonstrate to the Public Works Director possession of a working knowledge of excavation construction; can access the construction equipment necessary to professionally complete a street opening; possesses the required insurance indemnifying the Town of Nantucket from any and all liability which may arise from a street opening; has access to safety equipment as required by the Manual of Uniform Traffic Control Devices; has the ability to obtain the required performance bond; **and** has paid **the** [a \$200] annual street opening excavator license fee **as set from time to time by the Board of Selectmen.***
4. Section 354-13A(5)(c) is amended as follows: *That the applicant is aware of and has, with regard to the proposed trench excavation on private property or proposed excavation of a [city or] Town public way that forms the basis of the permit application, complied with the requirements of MGL c. 82, § 40 to § 40D, inclusive, and with the requirements set forth in these regulations.*

**Chapter 367, Taxicabs, Charter, Limousine and Tour Vehicles**

1. Section 367-1, Definitions, is amended to delete the definition of “unofficial waiting list.”
2. Section 367-2D is amended as follows: *License fee. The fee for a taxicab license shall be [~~\$300 annually~~] **set from time to time by the Board of Selectmen** for each motor vehicle authorized by the Selectmen to be operated under the regulations. There shall be a fee [~~of \$50~~] **in an amount set from time to time by the Board of Selectmen** for the transfer of a taxicab license from one vehicle to another during the current year of issuance after initial receipt.*
3. The first sentence of § 367-3A(4) is amended as follows: *At the Town's discretion, a temporary taxicab **operator's** license may be issued by the Town, provided that the applicant has provided all required information and meets all of the requirements for the issuance of a taxicab operator's license.*
4. Section 367-3B is amended as follows:
  - B. *Fee for taxicab operator's license.*

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- (1) **The fee for a taxicab operator's license shall be ~~[\$50]~~ set from time to time by the Board of Selectmen.** This fee is independent, and not reduced if a temporary taxicab operator's license is issued. Picture identification licenses shall not have to be renewed annually; however, a validation sticker shall be obtained yearly, clearly stating the expiration date of the taxicab operator's license. The fee for the validation sticker shall be ~~[\$25 per year]~~ **set from time to time by the Board of Selectmen.** If a taxicab operator's license is lost or in need of replacement, there shall be a replacement fee ~~[of \$25]~~ for the picture ID and ~~[a replacement fee of \$25]~~ for the validation sticker ~~[for a total replacement or new issue fee of \$50]~~ **in amounts set from time to time by the Board of Selectmen.**
- (2) ~~[Effective July 1, 2015, a]~~ **The fee for a temporary taxicab operator's license shall be ~~[\$75]~~ set from time to time by the Board of Selectmen** and shall be nonrefundable.
5. Section 367-4C(3) is amended as follows: ~~[A]~~ **No** taxicab operator shall operate or allow to be operated any motor vehicle under the regulations with a maximum seating capacity of **more than** 10 ~~[or more]~~ persons, including said taxicab operator.
6. Section 367-6A is amended to add the following sentence at the end thereof: **Subsequent violations may result in forfeiture of the vehicle license.**
7. The lead-in paragraph to § 367-9 is amended as follows: *In conjunction with monitoring available annual licenses in this section, the Town will codify and actively manage an official waiting list of applicant names based on order of submission by those interested in acquiring future charter, limousine and tour licenses. ~~[The unofficial waiting list(s) as of June 1, 2007 shall serve as the initial reference document such that applicants listed retain seniority unless and until such time any applicant requests removal from the list or declines to respond as necessary to the Town regarding remaining on the waiting list.]~~* An application fee may be set by the Board of Selectmen or its designee, payable at the time of application and at the time of written annual confirmation of interest by an established deadline for those on the waiting list(s).
8. Section 367-9G is amended as follows: Possession of license. The charter, limousine or tour **vehicle** license, or a photocopy certified by the Town Clerk, shall be displayed in the interior of the ~~[taxicab]~~ **charter, limousine or tour vehicle** in clear view of the passengers. Each vehicle licensed under these regulations shall, after payment of the fee and compliance with all application and licensing requirements, receive a vehicle decal from the Town Clerk, which shall be affixed to the licensed vehicle in accordance with these regulations.
9. Section 367-9H is amended to read in its entirety as follows: License fees. The fee for a charter vehicle license, limousine vehicle license, or tour vehicle license shall be set from time to time by the Board of Selectmen. There shall be a fee set by the Board of Selectmen for any transfer of license from one vehicle to another during the current year of issuance after initial receipt.
10. Section 367-9I(1) is amended as follows: No charter, limousine or tour vehicle license shall be issued by the Town Clerk until the applicant presents proof of registration and insurance appropriate for charter, limousine or tour vehicle operations and provided that such insurance and registration complies with the provisions of MGL c. 90. All applicants must present to the Town Clerk an original Massachusetts vehicle registration that clearly indicates the maximum passenger capacity of the vehicle being licensed. If the registration document does not indicate maximum passengers, then the applicant must provide the original motor vehicle title document issued by the Massachusetts Registrar of Motor Vehicles. The Town Clerk is prohibited from issuing any license to a vehicle that has a maximum carrying capacity of **more than** 10 passengers (which includes the driver). If the charter, limousine or tour vehicle business owner is allowed by the Board of Selectmen to operate more than one charter, limousine or tour vehicle, the business owner shall provide proof that each vehicle licensed complies with this section.

**Town of Nantucket**  
**Changes Made to Regulations During Codification Project**

11. Section 367-9J(4) is amended as follows: No charter or tour vehicle license may be transferred to a vehicle used as a taxicab within the Town, nor shall said charter or tour vehicle license be used in conjunction with a taxicab license issued to the same vehicle for a period of one year from the date of issue of the charter or tour vehicle license.
12. Section 367-10A is amended as follows: Charter, limousine and tour vehicle operator's license.
13. Section 367-10A(3) is amended as follows: At the Town's discretion, a temporary charter, limousine or tour vehicle operator's license may be issued by the Town, provided that the applicant has provided all required information and meets all of the requirements for the issuance of a charter, limousine or tour vehicle operator's license. The temporary charter, limousine or tour vehicle operator's license is only to be issued so that the applicant may operate a ~~[taxicab]~~ **charter, limousine or tour vehicle** during the pendency of the applicant's fingerprint record check, and in no case shall it be valid for a period exceeding 30 days. The holder of a temporary charter, limousine or tour vehicle operator's license shall be subject to all applicable sections of these regulations.
14. Section 367-10A(4) is amended as follows: Any temporary charter, limousine or tour vehicle operator's license issued shall automatically terminate upon the expiration of the thirty-day period or shall automatically terminate after five calendar days (Saturday, Sunday and holidays included) from the date upon which the applicant is notified that his/her record check has been completed, whichever occurs first. Notification may be by message to the ~~[taxicab]~~ company owner who is listed on the application, voice message to the applicant's listed phone number, or by any other reasonable means.
15. Section 367-10B is amended as follows:
  - B. Fee for licenses.
    - (1) The fee for a charter, limousine or tour vehicle operator's picture identification license shall be ~~[\$50]~~ set from time to time by the Board of Selectmen. Picture identification badges shall not have to be renewed annually; however, a validation sticker shall be obtained yearly, clearly stating the expiration date of the operator's license. The fee for the validation sticker shall be ~~[a fee of \$25 yearly]~~ **set from time to time by the Board of Selectmen.** If a picture identification license is lost or in need of replacement, there shall be a fee ~~[of \$25]~~ for the picture ID and ~~[a \$25 fee]~~ for the validation sticker **in amounts set from time to time by the Board of Selectmen.** ~~[for a total replacement or new issue fee of \$50.]~~
    - (2) ~~[Effective July 1, 2015, a]~~ The fee for a temporary charter, limousine or tour vehicle operator's license shall be ~~[\$75]~~ set from time to time by the Board of Selectmen and shall be nonrefundable.
16. Section 367-10C is amended as follows: Application for charter, limousine or tour vehicle operator's identification licenses. All applicants shall set forth, under the penalties of perjury, such uniform information as may be required of said applicant, in addition to the following information: name of applicant and the name of the license holder for whom the applicant will be working.
17. Section 367-11D(1), (2), (3) and (4) are amended as follows:
  - D. Owner/Operator dress code. The following is a minimum professional standard of dress for Charter, limousine or tour vehicle operators:
    - (1) Pants/Skirts: clean, no holes, rips or tears. Hems must be sewn. **Sweatpants are prohibited.**
    - (2) Shorts: clean, no holes, rips or tears. Length must be equivalent to "Bermuda Short" type. No fringed bottoms; hems must be sewn. **Athletic-type shorts are prohibited.**
    - (3) Shirts: clean, with long or short sleeves, **tucked neatly into pants if the shirt has tails. If a shirt has a square bottom, the shirt may be left out.** No T-shirts, halter tops. Sweatshirts may be worn only as an outer garment.

**Town of Nantucket**  
**Changes Made to Regulations During Codification Project**

- (4) Shoes: Sneakers, loafers or docksiders are acceptable with no holes or tears. Sandals may be worn if secured around ankle and heel.
18. Section 367-12 is amended as follows: The fee for [~~a one hour~~] rental of a charter, limousine or tour vehicle shall be [~~no less than \$35 per hour~~] set from time to time by the Board of Selectmen, with a hired minimum of one hour.
19. Section 367-13A is amended as follows: Fines. Any person, whether a charter, limousine or tour vehicle business owner or operator, found in violation of any provision of these regulations shall be punished by a fine of \$100 for each offense. This penalty may be enforced by the Nantucket Police Department by means of noncriminal disposition pursuant to Chapter 1, Article II, of the Code of the Town of Nantucket. If such person has incurred, and either plead guilty, chosen not to contest or been found guilty or "responsible" after hearing of more than three violations of these regulations during a calendar year, then the penalty for the fourth and any subsequent such offenses during that calendar year shall be \$300. Subsequent infractions may result in forfeiture of the vehicle license.

**Chapter 375, Traffic**

1. Throughout this chapter, "Massachusetts Highway Department" is changed to "Massachusetts Department of Transportation."
2. In § 375-1, Definitions, the following terms are amended as indicated:

*BUS* – Any motor vehicle designed for carrying more than [~~nine~~] **10** passengers and used for the transportation of persons or any motor vehicle operated upon a public way for the carriage of passengers for hire in such a manner as to afford a means of transportation similar to that afforded by a railway company by indiscriminately receiving and discharging passengers along the route on which the vehicle is operated or may be running, or for transporting passengers for hire as a business between fixed and regular termini, or transporting passengers for hire under a charter license, special service or school service permit issued by the Commonwealth of Massachusetts. When applicable, the term "bus" shall include a school bus.

~~COURTESY VAN – Any motor vehicle operated upon a public way which is designed for carrying passengers and used for the transportation of persons in such a manner as to afford a means of transportation to a single commercial venture at no cost, fee or charge. Any vehicle so used shall be operated solely for the benefit of a singular commercial venture whose principal business is not engaged in the transportation of persons for hire. And furthermore provided that such transportation is from a single pickup location and discharge of passengers is at the commercial venture for which the passenger is patronizing.~~

*PARKING* – The stopping or standing of a vehicle, whether occupied or not, except when paused [~~for traffic violation~~] in compliance with the law or directions of a police officer or official traffic control device.
3. Section 375-5B is amended as follows: No driver shall stand or park any vehicle where signs are posted restricting parking to certain days and/or times, on any day during the hours indicated, provided that the rules and regulations shall not apply to passenger vehicles stopped temporarily during the receiving or discharging of passengers.
4. Section 375-16A is amended to delete the specific parking fees, replacing the fees with text indicating that fees are set from time to time by the Board of Selectmen.
5. The last sentence of § 375-16E is amended as follows: Any of the above-mentioned misuse violations shall be punishable by a fine [~~of \$300~~] as set forth in Appendix J, Schedule of Fines, each day of violation being considered a separate offense.

**Town of Nantucket**  
**Changes Made to Regulations During Codification Project**

6. Section 375-21B is amended as follows: *Drive on right side of street. The driver of a vehicle shall not drive other than on the right half of the roadway, except on one-way streets, where signs have been erected to the contrary, or when overtaking and passing another vehicle **or when preparing for a left turn**. The driver of a slow-moving vehicle shall not drive other than as closely as possible to the right-hand edge or curb of the roadway, unless it is impracticable to travel on such side of a public way.*
7. Section 375-21F is amended as follows: *Driver to give way to overtaking vehicle. **Except when overtaking and passing on the right is permitted**, the driver of a vehicle, when about to be overtaken and passed by another vehicle approaching from the rear, shall give way to the right when practicable in favor of the overtaking vehicle, and shall not increase the speed of his/her vehicle until completely passed by the overtaking vehicle.*
8. Section 375-22C is amended as follows: *Commercial vehicles excluded. No commercial vehicle shall be operated on certain public ways or parts thereof. This restriction shall not apply to authorized emergency vehicles, as herein defined in § 375-1 of the rules and regulations, to passenger ~~or station wagon type motor~~ vehicles whose gross weight is less than 5,000 pounds and which are registered for commercial use, to vehicles using public ways for the making of deliveries or collections or for the purpose of reaching a regular storage place located on said public ways or parts thereof, nor to street repair vehicles of the Town. The list of public ways or parts thereof which have been designated as excluding commercial vehicles is included in Appendix H of the rules and regulations.*
9. Appendix J is amended to change the phrase “maximum noncriminal penalty” to “noncriminal penalty.”

Link for Town Regulations:

<https://www.nantucket-ma.gov/DocumentCenter/View/41628/Town-of-Nantucket-Regulations-PDF>



## Agenda Item Summary

|               |           |
|---------------|-----------|
| Agenda Item # | IX. 3.    |
| Date          | 4/13/2022 |

### Staff

Amy Baxter, Licensing Administrator

### Subject

Mobile Food Unit Application – Sushi Sean 11:11

### Executive Summary

Mobile Food Unit Application for Sushi Sean 11:11, LLC. Application and Menu attached.

### Conditions of MFU License:

- **Operation within 500 feet of a licensed food establishment is prohibited.**
- Mobile Food Unit Operators must place portable trash receptacles near the unit on a daily basis.
- All trash must be removed before leaving the area and properly disposed of at the end of the day.
- Mobile Food Unit must return to its approved Base of Operations daily.
- Mobile Food Units are Commercial Vehicles and all Commercial regulations apply.
- Any Mobile Food Units parked in timed spaces in the Downtown Parking District must obtain a Street Blocking Permit from Town Administration. No service allowed from the MFU – parking only to allow for catering service to downtown locations.

**Food Permit Plan:** Approved by Health Dept. Application approved to move forward with Licensing.

**Commercial Kitchen:** 19 Nobadeer Farm Road

**Property Owner Approvals for Service:** N/A No service locations approved at time of application.

Licensed MFU's may also use their units to cater private events on private property.

Any use of MFU for public event or on public property for a limited event requires additional one-day permit.

Any use of MFU on Private property location for service to the public requires property owner written approval and additional Zoning/Administration review/approval to be included on License.



### Staff Recommendation

There are no objections to this application. Health has approved the Food Service Plan and Commercial Kitchen base of operations.

Final inspections of the unit are required by Health and Fire before operation of the unit commences.

Any additional service locations not included in initial application must be approved by the property owner and submitted to Licensing. Any further requests for service on public property will be reported to the Select Board.

**No Mobile Food Unit Service allowed in the Downtown Historic/CORE District.**

### Background/Discussion

N/A

**Impact: Environmental** ☐ **Fiscal** ☐ **Community** ☐ **Other** ☐

N/A

### Board/Commission Recommendation

N/A

### Public Outreach

Public hearing advertised in newspaper for two weeks.

### Connection to Existing Applicable Plan (i.e., Strategic Plan, Master Plan, etc.)

N/A

### Attachments

MFU Application; Menu; Public Notice; Mobile Unit layout; Photos





Town & County of  
**NANTUCKET, MA**

LICENSING DEPARTMENT  
PSF, 4 Fairgrounds Road, M-F 8am-4pm  
508-325-4100 · [licensing@police.nantucket-ma.gov](mailto:licensing@police.nantucket-ma.gov)

## APPLICATION || **MOBILE FOOD UNIT**

### INCLUDE THE FOLLOWING WITH APPLICATION:

- ❖ FINGERPRINT FORM AND FEES (\$10 Town of Nantucket; \$30 Money Order Commonwealth of Mass)
- ❖ LOCATION AGREEMENTS (If Applicable) i.e. Cisco; Land Bank; Airport Commission
- ❖ HEALTH DEPARTMENT PLAN REVIEW
- ❖ SAMPLE MENU
- ❖ APPLICATION FEE: \$25
- ❖ PUBLIC NOTICE FEE: \$351.98 (Made Payable to The Inquirer and Mirror)

### UPON ISSUANCE OF FINAL LICENSE:

- ❖ VEHICLE REGISTRATION
- ❖ APPLICATION FOR LICENSE TO PEDDLE (\$62 Fee Made Payable to Commonwealth of Massachusetts)
- ❖ LICENSE FEE: \$300 (Made Payable to Town of Nantucket)

BUSINESS NAME: SUSHI SEAN 11:11

DBA: SUSHI SEAN 11:11

OWNER/OPERATOR: SEAN DURNIN

MOBILE#: 508-685-6123 E-MAIL: SUSHI SEAN 1111 @GMAIL.COM

MAILING ADDRESS: PO Box 2224, NANTUCKET, MASS 02534

COMMERCIAL KITCHEN LOCATION: 19 NOBADDER FARM R.D.

OVERNIGHT PARKING LOCATION: 5A CHUCK HOLLOW, NANTUCKET, MASS.

LOCATIONS: MOSTLY FOR PRIVATE EVENTS

PLANNED DATES OF OPERATION (i.e. Beginning March 1; Seasonal May – October, etc.):  
MAY 1ST — DECEMBER 31 -2022

Proposed Menu For MFU.

Sushi Sean 11:11 LLC

All items are prepared cold.

Sushi Rolls :

Tuna: avocado / cucumber.

Salmon: avocado/ scallions.

Yellowtail: seranos / cilantro .

Veggie Rolls: cucumber/ daikon / scallions .

California: crab stick / cucumber/ avocado .

Appetizers:

Spicy Tuna Nachos: spicy tuna, scallions, chips, spicy mayo.

Tuna poke bowl: cubed tuna, soy , sesame oil,  
scallions, seranos.

Seaweed salad.

Chilled tofu and pickled veggies.

MFU

arey  
water  
to sewer dept  
or  
Bureau of operations



# Food Establishment Permit Application

Application must be submitted at least 30 days before the planned opening date  
With the permit review fee of \$150.00

The Inspection fee will be either \$150 (< 50 Seats) \$250 (51-199 seats) or \$350.00 (> 200 seats)

| 1) Establishment Name: <u>SUSHI SEAN 11.11</u>                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                            |              |       |              |  |  |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-------|--------------|--|--|--|
| 2) Establishment Address: <u>19 NOBADER FARM Road, NANTUCKET, MASS</u>                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                            |              |       |              |  |  |  |
| 3) Establishment Mailing Address (if different): <u>PO Box 2224, NANTUCKET, MA 02554</u>                                                                                                                                                                                  |                                                                                                                                                                                                                                                                            |              |       |              |  |  |  |
| 4) Establishment Telephone No: <u>508-685-6123</u>                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                            |              |       |              |  |  |  |
| 5) Applicant Name & Title & email: <u>SEAN DURNIN, OWNER</u>                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                            |              |       |              |  |  |  |
| 6) Applicant Address: <u>5A CHUCK HOLLOW Tom NELSON, NANTUCKET, MASS.</u>                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                            |              |       |              |  |  |  |
| 7) Applicant Telephone No: <u>508-685-6123</u> 24 Hour Emergency No: <u>508-685-6123</u>                                                                                                                                                                                  |                                                                                                                                                                                                                                                                            |              |       |              |  |  |  |
| 8) Owner Name & Title (if different from applicant):                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                            |              |       |              |  |  |  |
| 9) Owner Address (if different from applicant):                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                            |              |       |              |  |  |  |
| 10) Establishment Owned By:<br><input type="checkbox"/> An association<br><input type="checkbox"/> A corporation<br><input type="checkbox"/> An individual<br><input type="checkbox"/> A partnership<br><input checked="" type="checkbox"/> Other legal entity <u>LLC</u> | 11) If a corporation or partnership, give name, title, and home address of officers or partner.<br><table border="1"> <thead> <tr> <th>Name</th> <th>Title</th> <th>Home Address</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table> | Name         | Title | Home Address |  |  |  |
| Name                                                                                                                                                                                                                                                                      | Title                                                                                                                                                                                                                                                                      | Home Address |       |              |  |  |  |
|                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                            |              |       |              |  |  |  |
| 12) Person Directly Responsible For Daily Operations (Owner, Person in Charge, Supervisor, Manager etc.)                                                                                                                                                                  |                                                                                                                                                                                                                                                                            |              |       |              |  |  |  |
| Name & Title:                                                                                                                                                                                                                                                             | <u>SEAN DURNIN, OWNER</u>                                                                                                                                                                                                                                                  |              |       |              |  |  |  |
| Address:                                                                                                                                                                                                                                                                  | <u>5A CHUCK HOLLOW, NANTUCKET, MASS.</u>                                                                                                                                                                                                                                   |              |       |              |  |  |  |
| Telephone No:                                                                                                                                                                                                                                                             | <u>508-685-6123</u> Fax: <u> </u>                                                                                                                                                                                                                                          |              |       |              |  |  |  |
| Emergency Telephone No:                                                                                                                                                                                                                                                   | <u>508-332-9198</u>                                                                                                                                                                                                                                                        |              |       |              |  |  |  |
| 13) District Or Regional Supervisor (if applicable)                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                            |              |       |              |  |  |  |
| Name & Title:                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                            |              |       |              |  |  |  |
| Address:                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                            |              |       |              |  |  |  |
| Telephone No:                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                            |              |       |              |  |  |  |

\* all in disclaimer

# Food Establishment Information

|                                                                                                                                                                                                      |                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| 14) Water Source: <u>TOWN</u><br>DEP Public Water Supply No: ( if applicable)                                                                                                                        |                                                                                                | 15) Sewage disposal: <u>TOWN</u>                                                                                                                                                                                                                                                                                                                                                                                               |  |
| 16) Days and Hours of Operation: <u>MON-FRI- 10:00AM-10:00PM</u>                                                                                                                                     |                                                                                                | 17) No. of Food Employees: <u>1</u>                                                                                                                                                                                                                                                                                                                                                                                            |  |
| 18) Name of Person In Charge Certified in Food Protection Management:<br><i>Required as of 10/1/2001 in accordance with 105 CMR 590.003 (A) Please attach copy of certificate</i> <u>SEAN JORJAN</u> |                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                |  |
| 19) Person Trained In Anti-Choking Procedures (if 25 seats or more): <input type="checkbox"/> Yes <input type="checkbox"/> No                                                                        |                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                |  |
| 20) Location: (check one)<br><input type="checkbox"/> Permanent Structure<br><input checked="" type="checkbox"/> Mobile                                                                              |                                                                                                | 22) Establishment Type (check all that apply)<br><input checked="" type="checkbox"/> Caterer<br><input type="checkbox"/> Food Delivery<br><input type="checkbox"/> Residential Kitchen for Retail Sale<br><input type="checkbox"/> Residential Kitchen for Bed and Breakfast Home<br><input type="checkbox"/> Residential Kitchen for Bed and Breakfast Establishments<br><input type="checkbox"/> Frozen Dessert Manufacturer |  |
| 21) Length Of Permit: (check one)<br><input checked="" type="checkbox"/> Annual<br><input type="checkbox"/> Seasonal/Dates:<br><input type="checkbox"/> Temporary/Dates/Time:                        |                                                                                                | Other (Describe) <u>MOBILE FOOD UNIT FOR PRIVATE PARTIES.</u>                                                                                                                                                                                                                                                                                                                                                                  |  |
| 23) Food Operations:<br>(check all that apply):                                                                                                                                                      |                                                                                                | Definitions: PHF - potentially hazardous food (time/temperature controls required)<br>Non-PHF - non-potentially hazardous food (no time/temperature controls required)<br>RTE - ready-to-eat foods (Ex. sandwiches, salads, muffins which need no further processing)                                                                                                                                                          |  |
| <input type="checkbox"/> Sale of Commercially Pre-Packaged Non-PHFs                                                                                                                                  | <input type="checkbox"/> PHF Cooked To Order                                                   | <input type="checkbox"/> Hot PHF Cooked and Cooled or Hot Held for More Than a Single Meal Service.                                                                                                                                                                                                                                                                                                                            |  |
| <input type="checkbox"/> Sale of Commercially Pre-Packaged PHFs                                                                                                                                      | <input type="checkbox"/> Preparation Of PHFs For Hot And Cold Holding For Single Meal Service. | <input type="checkbox"/> PHF and RTE Foods Prepared For Highly Susceptible Population Facility                                                                                                                                                                                                                                                                                                                                 |  |
| <input type="checkbox"/> Delivery of Packaged PHFs                                                                                                                                                   | <input type="checkbox"/> Sale Of Raw Animal Foods Intended to be Prepared by Consumer.         | <input type="checkbox"/> Vacuum Packaging/Cook Chill                                                                                                                                                                                                                                                                                                                                                                           |  |
| <input type="checkbox"/> Reheating of Commercially Processed Foods For Service Within 4 Hours.                                                                                                       | <input type="checkbox"/> Customer Self-Service                                                 | <input type="checkbox"/> Use Of Process Requiring A Variance And/OR HACCP Plan (including bare hand contact alternative, time as a public health control)                                                                                                                                                                                                                                                                      |  |
| <input type="checkbox"/> Customer Self-Service Of Non-PHF and Non-Perishable Foods Only.                                                                                                             | <input type="checkbox"/> Ice Manufactured and Packaged for Retail Sale                         | <input checked="" type="checkbox"/> Offers Raw Or Undercooked Food Of Animal Origin.                                                                                                                                                                                                                                                                                                                                           |  |
| <input type="checkbox"/> Preparation Of Non-PHFs                                                                                                                                                     | <input type="checkbox"/> Juice Manufactured and Packaged for Retail Sale                       | <input checked="" type="checkbox"/> Prepares Food/Single Meals for Catered Events or Institutional Food Service                                                                                                                                                                                                                                                                                                                |  |
| <input type="checkbox"/> Other (Describe)                                                                                                                                                            | <input type="checkbox"/> Offers RTE PHF in Bulk Quantities                                     | To be completed by the Board of Health<br>Total Permit Fee:<br>Payments due with application:                                                                                                                                                                                                                                                                                                                                  |  |
|                                                                                                                                                                                                      | <input type="checkbox"/> Retail Sale of Salvage, Out-of Date or Reconditioned Food             |                                                                                                                                                                                                                                                                                                                                                                                                                                |  |

I, the undersigned, attest to the accuracy of the information provided in this application and I affirm that the food establishment operation will comply with 105 CMR 590.000 and all other applicable law. I have been instructed by the board of health on how-to obtain copies of 105 CMR 590.000 and the federal Food Code.

24) Signature of Applicant: [Signature]

Pursuant to MGL Ch. 62C, sec. 49A, I certify under the penalties of perjury that I, to my best knowledge and belief, have filed all state tax returns and paid state taxes required under law.

25) Social Security Number or Federal ID: 081-90-0367

26) Signature of Individual or Corporate Name: \_\_\_\_\_





Superior Food Trucks  
 superiorfoodtrucks.com  
 sales@superiorfoodtrucks.com  
 800-794-9511

Sean Durnin 16' F59

DRAWN BY

SG

CHECKED

SG

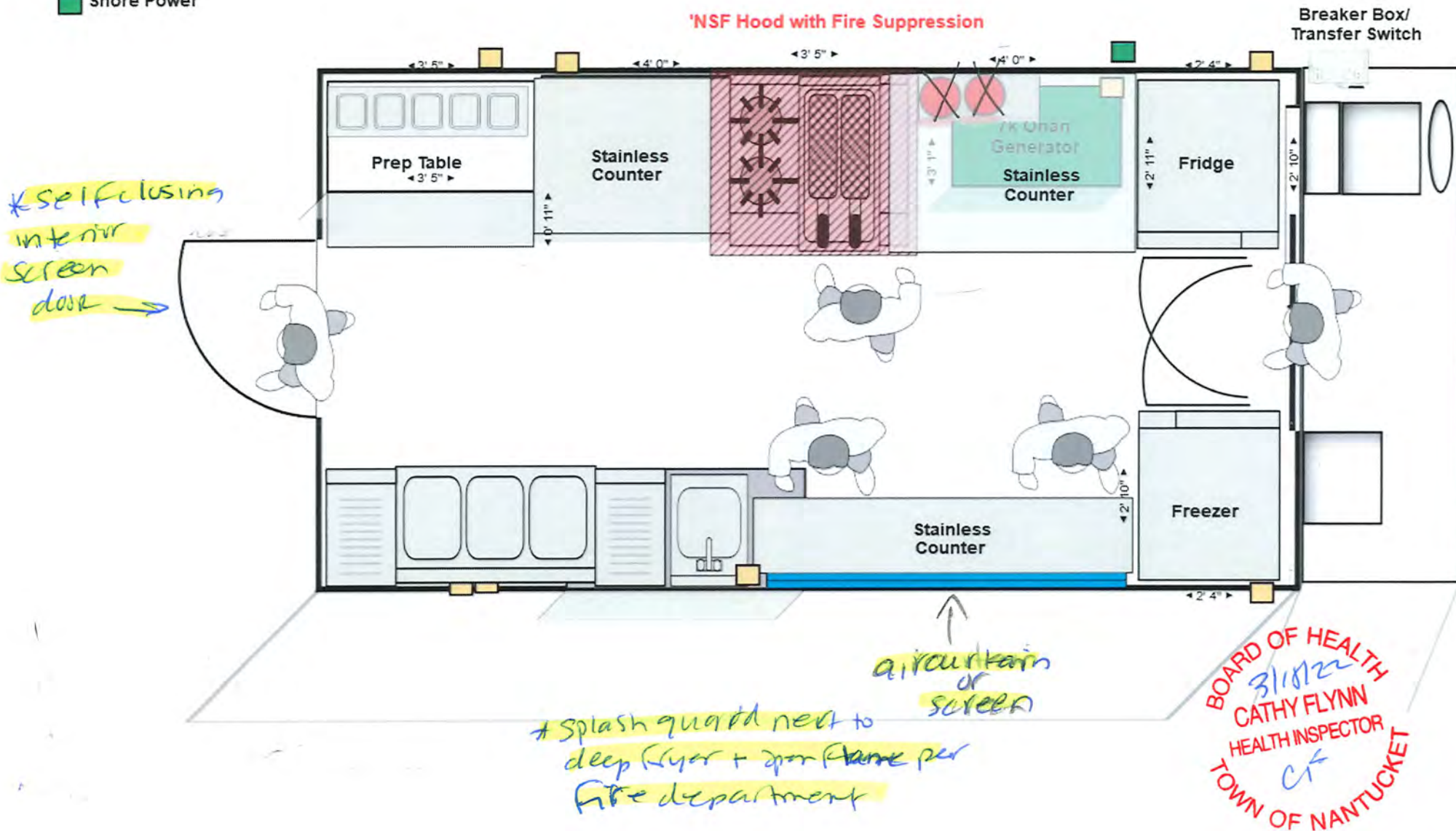
DATE

SCALE

SHEET NO.

1

- Outlet
- GFCI Outlet
- Shore Power



# PUBLIC NOTICE

Please be advised that the Select Board will hold a public hearing on Wednesday, April 13, 2022 at 5:30 PM to hear the application for a New Mobile Food Unit License for Sushi Sean 11:11 LLC, dba Sushi Sean 11:11, Sean Durnin, Manager. The hearing will be held in-person at the first floor Community Room of the Public Safety Facility, 4 Fairgrounds Road as well as via Zoom Webinar. Please see meeting posting for remote participation and viewing links. For further information, please email [TownManager@nantucket-ma.gov](mailto:TownManager@nantucket-ma.gov).



## Agenda Item Summary

|               |           |
|---------------|-----------|
| Agenda Item # | IX. 4.    |
| Date          | 4/13/2022 |

### Staff

Amy Baxter, Licensing Administrator

### Subject

Liquor License Alteration of Premises Application – **Forty-Five Surfside Road, LLC, DBA 45 Surfside, 45 Surfside Road, License #00222-RS-0762**

### Executive Summary

**Forty-Five Surfside Road, LLC** is applying for an Alteration of Premises for an **Annual Restaurant Wine and Malt Beverages** Liquor License for **DBA 45 Surfside** at **45 Surfside Road**.

The Applicant requests that Wine and Malt Beverages service be allowed on the pre-existing outdoor patio. There will be no overall increase in approved occupancy/seating capacity. The current license only allows for liquor service in the interior dining area.

### Staff Recommendation

Applicant has submitted required documentation as outlined below and is fully in compliance with all requirements of their Liquor and associated Licenses. 45 Surfside has not been cited for any violation of their Liquor License.

There is objection to this application from the Chief of Police as outlined below. The objection is consistent with previous requests in 2016, 2018 and 2019. 45 Surfside is located across from the Elementary School and not an appropriate location for a liquor license.

If an outdoor dining liquor license is approved by the Select Board, the following conditions are recommended:

- Patio area should be further sheltered from view from School and bike path.
- Alcohol service should be limited to seated food service and be served to patrons by staff – NOT self-service as it exists now. The area must be actively monitored by staff (not simply by looking out the window from the kitchen). See ABCC guidelines.
- Select Board may approve a seasonal license only for outdoor service with specific time frame noted on license (i.e. during months school is not in session).
- Select Board may also consider approval of Outdoor Dining extension for one year as approved by the State on April 1, 2022.



## Background/Discussion

Requirements for Alteration of Premises:

- ABCC Alteration of Premises Application
- Floor Plan for Licensed and Proposed Premises
- Supporting Financial Records
- Legal Right to Occupy
- Advertisement and Abutter Notification

### Application History for 45 Surfside:

1. The applicant first applied for an All Alcohol Beverages License in March of 2016. That request was denied and recommended to reapply for Beer and Wine only. Reasons for denial:
  - The intended service of alcoholic beverages outside the building would be inappropriate at this location, given its proximity to the bicycle/walking path and the public elementary school. And some Board members opposed an all-alcohol license for this business and location.
2. The applicant was ultimately issued a Beer and Wine license for Interior Service only in December of 2016.
3. The applicant applied for an Alteration of Premises to include the outdoor patio for liquor service in 2018 & 2019. Both requests were denied for the same reasons as highlighted above. The Police and Fire Chiefs expressed concern for any alcohol service at the location and in particular that a School Zone is not an appropriate location for service of alcohol especially during school hours.
4. In 2020 and 2021, 45 Surfside was allowed to expand its liquor service to outdoor premises in response to the COVID-19 State of Emergency Outdoor Dining allowances. This request is an application to continue outdoor service on a permanent basis.

### Comments and Consideration:

Pursuant to MGL c. 138, §23 and Ballarin v. Licensing Board of Boston, decisions of the Local Licensing Authority must be based on reasonable grounds; ABCC and courts prefer findings be based on the following:

- The appropriateness of a liquor license at a particular location
- The number of existing dispensaries in Town
- The views of the inhabitants of the locality in which a license is sought
- Traffic, noise, size (typically applies to a new location)
- The sort of operation that carries the license
- The reputation of the applicant

Impact: Environmental ☐ Fiscal ☐ Community ☐ Other ☐

N/A

### Board/Commission Recommendation

N/A



### Public Outreach

Public hearing advertised in newspaper for two weeks.

### Connection to Existing Applicable Plan (i.e., Strategic Plan, Master Plan, etc.)

N/A

### Attachments

ABCC Alteration of Premises Application and Supporting Documents; ABCC Outdoor Dining Guidelines and Patio Guidelines; 45 Surfside Liquor License; Public Notice; Photos of location; Determination Letter





*The Commonwealth of Massachusetts*  
*Alcoholic Beverages Control Commission*

☐ For Reconsideration

**LICENSING AUTHORITY CERTIFICATION**

Nantucket

City /Town

00222-RS-0762

ABCC License Number

**TRANSACTION TYPE (Please check all relevant transactions):**

The license applicant petitions the Licensing Authorities to approve the following transactions:

- |                                                                        |                                                                                                   |                                                                           |                                                                       |
|------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|-----------------------------------------------------------------------|
| <input type="checkbox"/> New License                                   | <input type="checkbox"/> Change of Location                                                       | <input type="checkbox"/> Change of Class (i.e. Annual / Seasonal)         | <input type="checkbox"/> Change Corporate Structure (i.e. Corp / LLC) |
| <input type="checkbox"/> Transfer of License                           | <input checked="" type="checkbox"/> Alteration of Licensed Premises                               | <input type="checkbox"/> Change of License Type (i.e. club / restaurant)  | <input type="checkbox"/> Pledge of Collateral (i.e. License/Stock)    |
| <input type="checkbox"/> Change of Manager                             | <input type="checkbox"/> Change Corporate Name                                                    | <input type="checkbox"/> Change of Category (i.e. All Alcohol/Wine, Malt) | <input type="checkbox"/> Management/Operating Agreement               |
| <input type="checkbox"/> Change of Officers/<br>Directors/LLC Managers | <input type="checkbox"/> Change of Ownership Interest<br>(LLC Members/ LLP Partners,<br>Trustees) | <input type="checkbox"/> Issuance/Transfer of Stock/New Stockholder       | <input type="checkbox"/> Change of Hours                              |
|                                                                        |                                                                                                   | <input type="checkbox"/> Other <input type="text"/>                       | <input type="checkbox"/> Change of DBA                                |

**APPLICANT INFORMATION**

|                                                          |                                               |                                                                  |                                                                                                        |
|----------------------------------------------------------|-----------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| Name of Licensee                                         | Forty-Five Surfside Road, LLC                 | DBA                                                              | 45 Surfside                                                                                            |
| Street Address                                           | 45 Surfside Road Nantucket, MA                |                                                                  | Zip Code 02554                                                                                         |
| Manager                                                  | Rebecca Moesinger                             |                                                                  | Granted under Special Legislation? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| \$12 Restaurant                                          | Annual                                        | Wines and Malt Beverages                                         | If Yes, Chapter <input type="text"/><br>of the Acts of (year) <input type="text"/>                     |
| <small>Type<br/>(i.e. restaurant, package store)</small> | <small>Class<br/>(Annual or Seasonal)</small> | <small>Category<br/>(i.e. Wines and Malts / All Alcohol)</small> |                                                                                                        |

**DESCRIPTION OF PREMISES** Complete description of the licensed premises

Two story building with cafe, kitchen, hallway, storage and restrooms on the first floor (2000sq. ft.), storage in basement (1450 sq. ft.)  
To include the deck on the front of the building, which has seating for five tables and the patio which is located beside the deck, with seating for 4 tables.

**LOCAL LICENSING AUTHORITY INFORMATION**

|                                                           |                                                                     |                     |                           |                      |                   |
|-----------------------------------------------------------|---------------------------------------------------------------------|---------------------|---------------------------|----------------------|-------------------|
| Application filed with the LLA:                           | Date                                                                | 03/16/2022          | Time                      | <input type="text"/> |                   |
| Advertised                                                | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | Date Published      | 03/31/22 & 04/07/22       | Publication          | Inquirer & Mirror |
| Abutters Notified:                                        | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | Date of Notice      | 03/16/22                  |                      |                   |
| Date APPROVED by LLA                                      | 04/13/2022                                                          | Decision of the LLA | Approves this Application |                      |                   |
| Additional remarks or conditions<br>(E.g. Days and hours) | <input type="text"/>                                                |                     |                           |                      |                   |
| For Transfers ONLY:                                       |                                                                     |                     |                           |                      |                   |
| Seller License Number:                                    | <input type="text"/>                                                | Seller Name:        | <input type="text"/>      |                      |                   |

The Local Licensing Authorities By:

Alcoholic Beverages Control Commission  
Ralph Sacramone  
Executive Director

NANTUCKET  
**45 SURFSIDE**  
bakery and café

March 3<sup>rd</sup>, 2022

RECEIVED  
MAR 16 2022  
BY: \_\_\_\_\_

Dear Mr. Chairman and Select Board Committee,

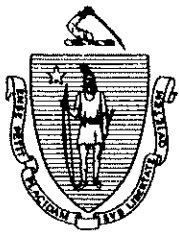
We would like to revisit the alteration of premise at 45 Surfside Café. We have used appropriate means to obstruct the view from all angles of the street and sidewalk. As a year-round restaurant open 363 days of the year it is absolutely imperative for us to make enough revenue in the Summer season to remain open and serving our local community the remaining 9 months of the year.

During the emergency order we were permitted to serve beer and wine outdoors along with many other of the restaurants on the island. That experience gave us insight to just how imperative it is to our business to be able to have full service both indoors and outdoors.

The alteration of premise would allow guests the ability to bring their drink to a table on the deck and patio. Operations would not be affected by the alterations. The proposed premise is in clear view from the inside of the restaurant.

Our goal is to offer guests the same experience outside and they do indoors at 45 Surfside.

Rebecca Moesinger  
45 Surfside Bakery and Café  
Owner



*The Commonwealth of Massachusetts*  
*Alcoholic Beverages Control Commission*  
95 Fourth Street, Suite 3, Chelsea, MA 02150-2358  
[www.mass.gov/abcc](http://www.mass.gov/abcc)

**AMENDMENT-Change or Alteration of Premises Information**

☐ **Change of Location**

- Payment Receipt
- Monetary Transmittal Form
- Chg of Location/Alteration of Premises Application
- Financial Statement
- Vote of the Entity
- Supporting financial records
- Legal Right to Occupy
- Floor Plan
- Abutter's Notification
- Advertisement

☒ **Alteration of Premises**

- Payment Receipt
- Monetary Transmittal Form
- Chg of Location/Alteration of Premises Application
- Financial Statement
- Vote of the Entity
- Supporting financial records
- Legal Right to Occupy
- Floor Plan
- Abutter's Notification
- Advertisement

**1. BUSINESS ENTITY INFORMATION**

Entity Name

Municipality

ABCC License Number

Forty Five Surfside Road, LLC

Nantucket

00222-RS-0762

Please provide a narrative overview of the transaction(s) being applied for. Attach additional pages, if necessary.

Alteration of premise at 45 Surfside Café.

**APPLICATION CONTACT**

The application contact is the person who should be contacted with any questions regarding this application.

Name

Title

Email

Phone

Rebecca Moesinger

Owner

rebecca@45surfside.com

617-980-4745

**2. ALTERATION OF PREMISES**

**2A. DESCRIPTION OF ALTERATIONS**

Please summarize the details of the alterations and highlight any specific changes from the last-approved premises.

Extend our beer and wine license premise to include the patio and deck.

**2B. PROPOSED DESCRIPTION OF PREMISES**

Please provide a complete description of the proposed premises, including the number of floors, number of rooms on each floor, any outdoor areas to be included in the licensed area, and total square footage. You must also submit a floor plan.

Deck and patio totalling 644 sq ft.

Total Sq. Footage

644

Seating Capacity

18

Occupancy Number

18

Number of Entrances

3

Number of Exits

3

Number of Floors

1

## AMENDMENT-Change or Alteration of Premises Information

### **3. CHANGE OF LOCATION**

#### **3A. PREMISES LOCATION**

Last-Approved Street Address

Proposed Street Address

#### **3B. DESCRIPTION OF PREMISES**

Please provide a complete description of the premises to be licensed, including the number of floors, number of rooms on each floor, any outdoor areas to be included in the licensed area, and total square footage. You must also submit a floor plan.

Total Sq. Footage

Seating Capacity

Occupancy Number

Number of Entrances

Number of Exits

Number of Floors

#### **3C. OCCUPANCY OF PREMISES**

Please complete all fields in this section. Please provide proof of legal occupancy of the premises. (E.g. Deed, lease, letter of intent)

Please indicate by what means the applicant has to occupy the premises

Own

Landlord Name

Rebecca Moesinger

Landlord Phone

617-828-3058

Landlord Email

rebecca@45surfside.com

Landlord Address

45 Surfside road, Nantucket MA 02554

Lease Beginning Date

Rent per Month

Lease Ending Date

Rent per Year

Will the Landlord receive revenue based on percentage of alcohol sales?

☐ Yes ☒ No

4. FINANCIAL DISCLOSURE

Associated Cost(s): (i.e. Costs associated with License Transaction including but not limited to: Property price, Business Assets, Renovations costs, Construction costs, Initial Start-up costs, Inventory costs, or specify other costs):

Associated Cost(s):

N/a only cost incurred will be application fees.

SOURCE OF CASH CONTRIBUTION

Please provide documentation of available funds. (E.g. Bank or other Financial institution Statements, Bank Letter, etc.)

| Name of Contributor | Amount of Contribution |
|---------------------|------------------------|
|                     |                        |
|                     |                        |
|                     |                        |
|                     |                        |
| Total               |                        |

SOURCE OF FINANCING

Please provide signed financing documentation.

| Name of Lender | Amount | Type of Financing | Is the lender a licensee pursuant to M.G.L. Ch. 138. |
|----------------|--------|-------------------|------------------------------------------------------|
|                |        |                   | <input type="radio"/> Yes <input type="radio"/> No   |
|                |        |                   | <input type="radio"/> Yes <input type="radio"/> No   |
|                |        |                   | <input type="radio"/> Yes <input type="radio"/> No   |
|                |        |                   | <input type="radio"/> Yes <input type="radio"/> No   |

## APPLICANT'S STATEMENT

I, Rebecca Moesinger the: ☒ sole proprietor; ☐ partner; ☐ corporate principal; ☐ LLC/LLP manager  
Authorized Signatory  
of Forty Five Surfside Road, LLC  
Name of the Entity/Corporation

hereby submit this application (hereinafter the "Application"), to the local licensing authority (the "LLA") and the Alcoholic Beverages Control Commission (the "ABCC" and together with the LLA collectively the "Licensing Authorities") for approval.

I do hereby declare under the pains and penalties of perjury that I have personal knowledge of the information submitted in the Application, and as such affirm that all statements and representations therein are true to the best of my knowledge and belief. I further submit the following to be true and accurate:

- (1) I understand that each representation in this Application is material to the Licensing Authorities' decision on the Application and that the Licensing Authorities will rely on each and every answer in the Application and accompanying documents in reaching its decision;
- (2) I state that the location and description of the proposed licensed premises are in compliance with state and local laws and regulations;
- (3) I understand that while the Application is pending, I must notify the Licensing Authorities of any change in the information submitted therein. I understand that failure to give such notice to the Licensing Authorities may result in disapproval of the Application;
- (4) I understand that upon approval of the Application, I must notify the Licensing Authorities of any change in the ownership as approved by the Licensing Authorities. I understand that failure to give such notice to the Licensing Authorities may result in sanctions including revocation of any license for which this Application is submitted;
- (5) I understand that the licensee will be bound by the statements and representations made in the Application, including, but not limited to the identity of persons with an ownership or financial interest in the license;
- (6) I understand that all statements and representations made become conditions of the license;
- (7) I understand that any physical alterations to or changes to the size of the area used for the sale, delivery, storage, or consumption of alcoholic beverages, must be reported to the Licensing Authorities and may require the prior approval of the Licensing Authorities;
- (8) I understand that the licensee's failure to operate the licensed premises in accordance with the statements and representations made in the Application may result in sanctions, including the revocation of any license for which the Application was submitted; and
- (9) I understand that any false statement or misrepresentation will constitute cause for disapproval of the Application or sanctions including revocation of any license for which this Application is submitted.
- (10) I confirm that the applicant corporation and each individual listed in the ownership section of the application is in good standing with the Massachusetts Department of Revenue and has complied with all laws of the Commonwealth relating to taxes, reporting of employees and contractors, and withholding and remitting of child support.

Signature:

Date: March 1st, 2022

Title:

Owner

## **ADDITIONAL INFORMATION**

Please utilize this space to provide any additional information that will support your application or to clarify any answers provided above.

We would like for guests to have a consistent experience whether they sit inside or outside. 45 Surfside's deck and patio is easily visible to the staff from the interior of the building.

**ENTITY VOTE**

The Board of Directors or LLC Managers of Forty Five Surfside Road, LLC  
Entity Name  
duly voted to apply to the Licensing Authority of Nantucket and the  
City/Town  
Commonwealth of Massachusetts Alcoholic Beverages Control Commission on April 13th, 2022  
Date of Meeting

For the following transactions (Check all that apply):

☒ Alteration of Licensed Premises

☐ Change of Location

☐ Other

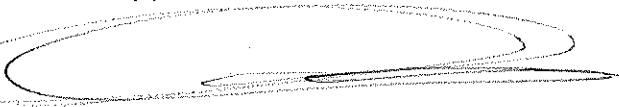
"VOTED: To authorize

Rebecca Moesinger

Name of Person

to sign the application submitted and to execute on the Entity's behalf, any necessary papers and do all things required to have the application granted."

A true copy attest,

  
Corporate Officer /LLC Manager Signature

Rebecca Moesinger  
(Print Name)

For Corporations ONLY

A true copy attest,

\_\_\_\_\_  
Corporation Clerk's Signature

\_\_\_\_\_  
(Print Name)

TOWN OF NANTUCKET

LIQUOR LICENSE

LIST OF PARTIES IN INTEREST IN THE MATTER OF THE PETITION OF:

PROPERTY OWNER Forty Five Surfside Rd LLC  
MAILING ADDRESS 45 Surfside Rd, Nantucket, MA 02554  
PROPERTY LOCATION 45 Surfside Rd  
ASSESSORS MAP/PARCEL 67-14.1  
SUBMITTED BY: Rebecca Mosingher

SEE ATTACHED PAGES

I certify that the foregoing is a list of persons who are owners of land whose property directly touches the proposed property and churches and schools within 500 feet of the property, all as they appear on the most recent applicable tax list.

March 16, 2022  
DATE

Mary Haley,  
Senior Clerk,  
Assessor's Office  
Digitally signed by Mary  
Haley, Senior Clerk,  
Assessor's Office  
Date: 2022.03.16 10:44:38  
-04'00'  
ASSESSOR'S OFFICE  
TOWN OF NANTUCKET

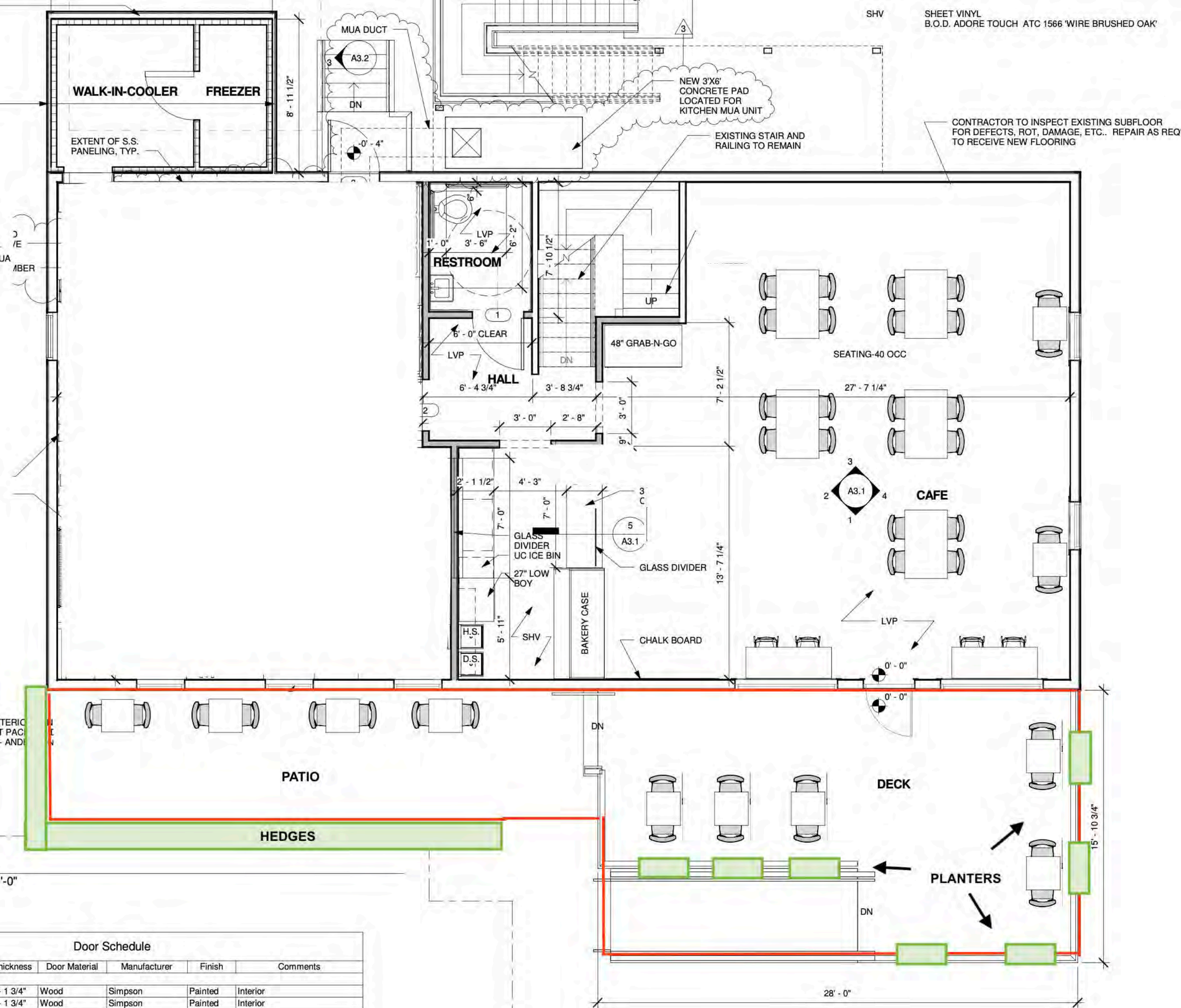
## Abutters Listing

| MBLU   | Lot | Lot Cut | Owner Full Name                    | Co-Owner Full Name          | Address Line 1       | City      | State | Zip   | Location       |
|--------|-----|---------|------------------------------------|-----------------------------|----------------------|-----------|-------|-------|----------------|
| 55     | 101 |         | NANTUCKET TOWN OF                  | C/O PARK & REC              | 16 BROAD ST          | NANTUCKET | MA    | 02554 | 30 SURFSIDE RD |
| 67     | 14  | 2       | KINNEY DAVID & JUMABAEV<br>YERZHAN | C/O KINNEY DAVID ETAL       | 7 BOYNTON LANE       | NANTUCKET | MA    | 02554 | 7 BOYNTON LN   |
| 67     | 15  | 2       | 36 SURFSIDE LLC                    |                             | 42 CHAUNCY ST APT 6C | BOSTON    | MA    | 02111 | 36 SURFSIDE RD |
| 67     | 664 |         | DOBYNS TANYA TR                    | DOBYNS FAMILY 2021 IRREV TR | 17 RAILROAD AVE      | DUXBURY   | MA    | 02332 | 3 BOYNTON LN   |
| 67     | 665 |         | DOBYNS PETER                       |                             | 22 DEPOT RD          | DUXBURY   | MA    | 02331 | 1 BOYNTON LN   |
| 67     | 844 |         | LEVIN MINDY                        |                             | 4 BARTLETT RD        | NANTUCKET | MA    | 02554 | 4 BARTLETT RD  |
| 67     | 990 |         | GLIDDEN RICHARD J TR               | TWO BARTLETT ROAD NOM TR    | 37 CENTER ST         | NANTUCKET | MA    | 02554 | 2R BARTLETT RD |
| Count: |     | 7       |                                    |                             |                      |           |       |       |                |

## **PUBLIC NOTICE**

Please be advised that the Select Board will hold a Public Hearing on Wednesday, April 13, 2022 at 5:30 PM to hear the application for an Alteration of Premises, for Forty-Five Surfside Road, LLC, dba 45 Surfside, located at 45 Surfside Road, Nantucket, MA 02554, Rebecca Moesinger, Manager. The hearing will be held in-person at the first floor Community Room of the Public Safety Facility, 4 Fairgrounds Road as well as via Zoom Webinar. Please see meeting posting for remote participation and viewing links. For further information, please email [TownManager@nantucket-ma.gov](mailto:TownManager@nantucket-ma.gov).

***SELECT BOARD***



SHEET VINYL  
B.O.D. ADORE TOUCH ATC 1566 'WIRE BRUSHED OAK'

WALK-IN-COOLER FREEZER

EXTENT OF S.S.  
PANELING, TYP.

MUA DUCT

A3.2

DN

NEW 3'X6'  
CONCRETE PAD  
LOCATED FOR  
KITCHEN MUA UNIT

EXISTING STAIR AND  
RAILING TO REMAIN

CONTRACTOR TO INSPECT EXISTING SUBFLOOR  
FOR DEFECTS, ROT, DAMAGE, ETC.. REPAIR AS REQ  
TO RECEIVE NEW FLOORING

RESTROOM

HALL

48" GRAB-N-GO

SEATING-40 OCC

CAFE

GLASS DIVIDER

CHALK BOARD

PATIO

HEDGES

DECK

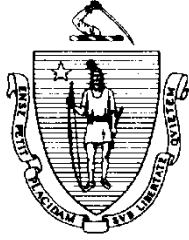
PLANTERS

Door Schedule

| Thickness | Door Material | Manufacturer | Finish  | Comments |
|-----------|---------------|--------------|---------|----------|
| 1 3/4"    | Wood          | Simpson      | Painted | Interior |
| 1 3/4"    | Wood          | Simpson      | Painted | Interior |
| 1 3/4"    | Wood          | Simpson      | Painted | Exterior |







***Commonwealth of Massachusetts  
Department of the State Treasurer  
Alcoholic Beverages Control Commission  
239 Causeway Street  
Boston, MA 02114***

**Deborah B. Goldberg**  
*Treasurer and Receiver General*

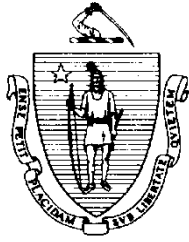
**Kim S. Gainsboro, Esq.**  
*Chairman*

**ALCOHOLIC BEVERAGES CONTROL COMMISSION ADVISORY REGARDING  
GUIDELINES FOR EXTENSION OF PREMISES TO PATIO AND OUTDOOR AREAS**

On July 28, 2015, at a public meeting, the Alcoholic Beverages Control Commission approved amendments to its "Guidelines for Extension of Premises to Patio and Outdoor Areas." These amended guidelines supersede the previously issued Guidelines from August 22, 1989. A copy of the amended Guidelines are attached to this Advisory.

As a reminder, all licensees must ensure that they are in compliance with the Laws of the Commonwealth of Massachusetts and that sale of alcoholic beverages take place only as authorized by applicable law. Questions concerning this Advisory can be directed to Ralph Sacramone, Executive Director of the Massachusetts Alcoholic Beverages Control Commission at (617) 727-3040 x 731.

(Issued August 6, 2015)



**Commonwealth of Massachusetts  
Department of the State Treasurer  
Alcoholic Beverages Control Commission  
239 Causeway Street  
Boston, MA 02114**

**Deborah B. Goldberg**  
*Treasurer and Receiver General*

**Kim S. Gainsboro, Esq.**  
*Chairman*

**GUIDELINES FOR EXTENSION OF PREMISES TO  
PATIO AND OUTDOOR AREAS**

1. Alcoholic beverages cannot be served outside of a licensed establishment unless and until an application to extend the licensed premises has been approved.
2. An application to extend the premises must describe the area in detail, including dimensions, seating capacity, and maximum occupancy.
3. The premises must be enclosed by a fence, rope, or other means to prevent access from a public walkway.
4. The outdoor area must be contiguous to the licensed premises with either (a) a clear view of the area from inside the premises, or, alternatively (b) the licensee may commit to providing management personnel dedicated to the area.
5. The applicant must have a lease or documents for the right to occupy the proposed area.
6. The licensing authorities should consider the type of neighborhood and the potential for noise in the environs.
7. Preferred are outdoor areas where alcohol is served to patrons who are seated at the tables and where food is also available.



***Commonwealth of Massachusetts  
Alcoholic Beverages Control Commission  
95 Fourth Street, Suite 3  
Chelsea, Massachusetts 02150***

**Jean M. Lorizio, Esq.**  
*Chairman*

**GUIDELINES FOR OUTDOOR ALCOHOLIC BEVERAGE SERVICE AREAS**

1. The licensure of outdoor alcoholic beverage service areas that are outside of the “suitable building” as provided in M.G.L. c. 138, §1, must follow the license application and approval process as provided in Chapter 138 for retail on-premises consumption licenses.
2. Local Licensing Authorities (“LLAs”) have discretion to apply reasonable conditions to the outdoor alcoholic beverage service areas, such as the requirement of food service and/or seated service.
3. All applications for outdoor alcoholic beverage service areas must include documentation demonstrating the right of the Licensee to occupy or permission to use the outdoor alcoholic beverage service area(s). This must include permission to transport alcoholic beverages over public property, if applicable, such as over public sidewalks.
4. Outdoor alcoholic beverage service areas should be contiguous to the licensed building premises with a clear and direct view of the outdoor area from inside the licensed building premises. Further, the Licensee must actively supervise the outside alcoholic beverage service area.
5. Outdoor alcoholic beverage service areas that are noncontiguous to the premises’ building are permitted. However, they must be in the immediate vicinity of, and within clear and direct view of, the existing licensed building premises. Licensees are reminded that their applications may be denied if, in the LLA’s or ABCC’s discretion, it is determined that any proposed noncontiguous outdoor alcoholic beverage service area is in an unsuitable location, such as being too far from the premises’ building or being in an unsafe location.

For noncontiguous outdoor alcoholic beverage service areas, the licensee must have an adequate number of employees that are physically present in the outdoor alcoholic beverage service area at all times when alcoholic beverages are being sold or consumed.

6. All outdoor alcoholic beverage service areas must be enclosed by a barrier, fence, or partition, sufficient for the licensee to maintain control of access to the area and to provide a safe environment for patrons.
7. The LLA should consider the type of neighborhood and the potential impact of noise in the environs before approving outdoor alcoholic beverage service areas.

Questions concerning this Advisory may be directed to Ralph Sacramone, Executive Director of the Massachusetts Alcoholic Beverages Control Commission at (617) 727- 3040 x 731.

(Issued April 7, 2022)

LICENSE #: 00222-RS-0762

LICENSE FEE: \$2,000.00

THE LICENSING BOARD *for the*  
TOWN OF NANTUCKET, MASSACHUSETTS  
HEREBY GRANTS AN  
**ANNUAL RETAIL RESTAURANT LICENSE**  
TO EXPOSE, KEEP FOR SALE, AND TO SELL  
**WINE AND MALT BEVERAGES**

**TO BE CONSUMED ON THE PREMISES**

**BUSINESS:** Forty-Five Surfside Road LLC

**DBA:** 45 Surfside

**PREMISES:** 45 Surfside Road  
Nantucket, MA 02554

**MANAGER:** Rebecca A. Moesinger

**ON PREMISES DESCRIBED AS:**

Two story building with café, kitchen, hallway, storage and restrooms on the first floor (2000 sq. ft.), storage in basement (1450 sq. ft.).

**No Alcohol Service or Consumption allowed on Outdoor Patio.**

**The hours during which alcoholic beverages may be sold:** In accordance with MGL Chapter 138 and amendments thereto with the local provision that patrons shall not be served alcoholic beverages before 8:00AM Monday through Saturday and 11:00AM on Sunday. **No alcohol service is permitted after 1:00AM** and patrons must be off the license premises and said **premises must be closed by 1:30AM**. Any restrictions apply

This license is granted and accepted upon the express condition that the licensee shall, in all respects, conform to all the provisions of the Liquor Control Act, Chapter 138 of the General Laws, as amended and any rules or regulations made thereunder by the licensing authorities.

IN TESTIMONY WHEREOF, the undersigned have hereunto affixed his official signature on this 1st day of December 2021.



Jason Bridges  
Chair, Select Board

**THIS LICENSE WILL EXPIRE DECEMBER 31, 2022**

*\*Unless earlier suspended, cancelled, or revoked*

**This License Shall Be Displayed On the Premises in a Conspicuous Place Where it May Be Easily Seen.**



Town & County of  
**NANTUCKET, MA**

At the Select Board meeting held Wednesday, April 13, 2022, the Board approved the application for an Alteration of Premises to include the outdoor patio for Forty-Five Surfside Road, LLC, dba 45 Surfside, Rebecca Moesinger, Manger, for the premises located at 45 Surfside Road, Nantucket, MA 02554. The Board determined that this Alteration of Premises to the Annual Wine and Malt Beverages liquor license is not detrimental to the educational activities of the Nantucket Elementary School, 30 Surfside Road, Nantucket, MA 02554; the Nantucket Elementary School is located within 500 feet of the licensed premises of 45 Surfside.

---

Jason Bridges, Chair

---

Dawn Hill Holdgate, Vice Chair

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Matt Fee

---

Kristie L. Ferrantella

---

Melissa Murphy

# OUTDOOR DINING UPDATE

## Outdoor Dining Next Steps

Report to the Select Board, April 13, 2022





## OUTDOOR DINING STATUS

✱ On April 1, 2022, the Governor signed Chapter 42 of the Acts of 2022 (the “Act”) into law. The Act includes extensions of pandemic-relief provisions related to restaurants.

- **Expanded Outdoor Table Service:**

- Section 27 of the Act extends the ability of cities and towns to approve requests for the expansion of outdoor table service until April 1, 2023.
- This section also extends a local licensing authority’s ability to approve, without further ABCC review or approval, changes in the description of a licensed premises for outdoor alcohol service until April 1, 2023. Any expansion or change approved under these provisions will automatically revert to its pre-pandemic status April 1, 2023.

- **Beer, Wine, and Cocktails to Go:**

- Sections 15 and 19 of the Act extends the ability of restaurants to sell beer, wine, and cocktails “to go” until April 1, 2023.



## WHAT DOES THIS MEAN FOR NANTUCKET RESTAURANTS?

✱ To move forward for 2022, the following steps are recommended:

### ● Restaurants with Public Property/Sidewalk Seating:

- Submit application by May 9 for Public Hearing review on May 18.
- Select Board to vote on Final Fee structure and application May 18.
- Applications for Public Property/Sidewalk Dining will be for 2022 only.
- No restaurants may increase their current approved occupancy with 2022 outdoor sidewalk dining permit.
- Full adherence to ABCC Patio and Outdoor Dining Guidelines required; including but not limited to containment of alcoholic beverage serving areas by a barrier, fence, or partition.



## WHAT DOES THIS MEAN FOR NANTUCKET RESTAURANTS?

✳ To move forward for 2022, the following steps are recommended:

- **Restaurants with Private Property Outdoor Extensions:**

- All private property extensions that were allowed due to Planning/Zoning State of Emergency Exceptions must apply for permanent Alteration of Premises to continue using space for food and beverage service. This includes exceptions for parking, tents, outdoor dining, etc.
- Private property spaces may apply for a single season extension on May 18 on the condition there are no Special Permits required and no increase in occupancy. Outdoor Space extensions are to allow for movement of interior dining to outdoor spaces for 2022 only.
- Permanent Alteration of Premises Applications are required for restaurants seeking to add outdoor spaces permanently to their License and increase occupancy for the establishment.

# SIDEWALK FEE RECOMMENDATION

|                                               |           |                                                                                                                                                                                                                                                                                                                                                                   |
|-----------------------------------------------|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| No Alcohol Service                            | \$500.00  | <ul style="list-style-type: none"> <li>*April 1 - Stroll</li> <li>*Common Victualler required (No-take-out only)</li> <li>*Must fit within storefront and NOT extend to abutters.</li> <li>*Maximum 3 tables (4-top max)</li> <li>*Removed for closures more than 3 consecutive days.</li> </ul>                                                                  |
| Beer & Wine License                           | \$750.00  | <ul style="list-style-type: none"> <li>*April 1 - Stroll</li> <li>*Common Victualler required (No-take-out only)</li> <li>*Must fit within storefront and NOT extend to abutters.</li> <li>*Maximum 3 tables or 12 seats</li> <li>*Removed for closures more than 3 consecutive days.</li> </ul>                                                                  |
| Beer & Wine License<br>++4 Tables (4-top max) | \$1000.00 | <ul style="list-style-type: none"> <li>*April 1 - Stroll</li> <li>*Common Victualler required (No-take-out only)</li> <li>*Must fit within storefront unless written approval received from Abutters.</li> <li>*Minimum 4 tables/16+ seats Maximum tbd based on storefront &amp; location</li> <li>*Removed for closures more than 3 consecutive days.</li> </ul> |
| All Alcohol License                           | \$1250.00 | <ul style="list-style-type: none"> <li>*April 1 - Stroll</li> <li>*Common Victualler required (No-take-out only)</li> <li>*Must fit within storefront and NOT extend to abutters.</li> <li>*Maximum 3 tables (4-top max)</li> <li>*Removed for closures more than 3 consecutive days.</li> </ul>                                                                  |
| All Alcohol License<br>++4 Tables (4-top max) | \$1500.00 | <ul style="list-style-type: none"> <li>*April 1 - Stroll</li> <li>*Common Victualler required (No-take-out only)</li> <li>*Must fit within storefront unless written approval received from Abutters.</li> <li>*Minimum 4 tables/16+ seats Maximum tbd based on storefront &amp; location</li> <li>*Removed for closures more than 3 consecutive days.</li> </ul> |

## ABCC GUIDELINES FOR OUTDOOR ALCOHOLIC BEVERAGE AREAS (Adopted April 7, 2022)

### \* GUIDELINES FOR OUTDOOR ALCOHOLIC BEVERAGE SERVICE AREAS

- \* 1. The licensure of outdoor alcoholic beverage service areas that are outside of the “suitable building” as provided in M.G.L. c. 138, §1, must follow the license application and approval process as provided in Chapter 138 for retail on-premises consumption licenses.
- \* 2. Local Licensing Authorities (“LLAs”) have discretion to apply reasonable conditions to the outdoor alcoholic beverage service areas, such as the requirement of food service and/or seated service.
- \* 3. All applications for outdoor alcoholic beverage service areas must include documentation demonstrating the right of the Licensee to occupy or permission to use the outdoor alcoholic beverage service area(s). This must include permission to transport alcoholic beverages over public property, if applicable, such as over public sidewalks.
- \* 4. Outdoor alcoholic beverage service areas should be contiguous to the licensed building premises with a clear and direct view of the outdoor area from inside the licensed building premises. Further, the Licensee must actively supervise the outside alcoholic beverage service area.
- \* 5. Outdoor alcoholic beverage service areas that are noncontiguous to the premises’ building are permitted. However, they must be in the immediate vicinity of, and within clear and direct view of, the existing licensed building premises. Licensees are reminded that their applications may be denied if, in the LLA’s or ABCC’s discretion, it is determined that any proposed noncontiguous outdoor alcoholic beverage service area is in an unsuitable location, such as being too far from the premises’ building or being in an unsafe location.
- \* For noncontiguous outdoor alcoholic beverage service areas, the licensee must have an adequate number of employees that are physically present in the outdoor alcoholic beverage service area at all times when alcoholic beverages are being sold or consumed.
- \* 6. All outdoor alcoholic beverage service areas must be enclosed by a barrier, fence, or partition, sufficient for the licensee to maintain control of access to the area and to provide a safe environment for patrons.
- \* 7. The LLA should consider the type of neighborhood and the potential impact of noise in the environs before approving outdoor alcoholic beverage service areas.

# PROPOSED SIDEWALK DINING LICENSE CONDITIONS AND AGREEMENT

✳ **Hours of Operation:** No outdoor sidewalk seating area shall be in use beyond 8am to 10pm daily.

✳ **Entertainment:** No Entertainment allowed on sidewalk seating areas.

✳ **Maintenance of Public Right of Way:** Restaurant owners are fully responsible for licensed area as follows:

- Food service personnel must constantly monitor the dining area for waste paper, garbage and other trash. Placement clips, cup holders and other such devices must be utilized to prevent blowing paper.
- A minimum of 48" but 60" preferred of sidewalk clearance must be maintained to always ensure ADA accessibility and a clear pedestrian path.

✳ **Sidewalk Dining Furniture and Accessories:**

- Outdoor seating areas must be easy to assemble on site and dismantle for storage or in case of emergency hazard situations.
- All outdoor furniture, plantings, and amenities will be of a high quality and add to the appearance and vibrancy of the public way. Areas that are determined to be in poor condition or of poor-quality materials that detract from the public way will be asked to upgrade or remove the outdoor dining area.

✳ **Proof of Consent by Third Parties:**

- Restaurants with proposed outdoor sidewalk seating on private property of third parties must submit proof of consent by the third party to for such use, such as a lease or other agreement.

✳ **Signage and Advertising Restrictions**

- While modest enhancement of outdoor seating areas is encouraged (e.g. with flower planters), signs and corporate logos (including that of the restaurant utilizing the outdoor dining space) may not be displayed in the outdoor seating area. No promotional signage or logos shall be allowed on any outdoor dining elements (umbrellas,enclosures, etc.).

✳ **Heaters:** Fire Department permit required for any proposed propane heating lamps

✳ **Liability:**

- Restaurants with outdoor seating on public property must provide certificate of liability insurance naming the Town of Nantucket as an additionally insured party in the amount of \$500,000/\$1 million providing coverage during the license period.
- Restaurants serving alcohol must provide proof that the Licensee's Liquor Liability Insurance policy covers the proposed outdoor seating area and that the Town is listed as additional insured.

**From:** [Libby Gibson](#)  
**To:** [Dawn Hill Holdgate](#); [Jason M. Bridges](#); [Kristie Ferrantella](#); [Matt Fee](#); [Melissa B. Murphy](#)  
**Cc:** [Erika Mooney](#); [Jeff Carlson](#); [Vincent Murphy](#); [Bob DeCosta](#)  
**Subject:** FW: Madaket Ditches - public comments at 3/16 SB Meeting  
**Date:** Friday, March 18, 2022 8:55:54 AM

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FYI

C. Elizabeth Gibson, ICMA-CM  
Town Manager  
Town of Nantucket  
(508) 228-7255

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**From:** Jeff Carlson  
**Sent:** Friday, March 18, 2022 8:01 AM  
**To:** Libby Gibson <LGibson@nantucket-ma.gov>; Vincent Murphy <vmurphy@nantucket-ma.gov>  
**Cc:** Gregg Tivnan <gtivnan@nantucket-ma.gov>; Chuck Larson <clarson@nantucket-ma.gov>; Thaïs Fournier <tfournier@nantucket-ma.gov>  
**Subject:** Re: Madaket Ditches - public comments at 3/16 SB Meeting

Hello everyone,

The Coastal Resilience Plan contains a recommendation for raising Madaket Road at First and Second Bridges (CRP Recommendation 3-1) to deal with coastal flooding risk at both locations that will be exacerbated and worsened as sea levels rise in coming decades. As part of the road raising strategy, there is also a recommendation to significantly resize the existing culverts to accommodate a greater flow of water over time. This could potentially also become a low bridge. Further design is needed. Whether a substantially larger culvert or bridge, we need to first understand the flow rates that will need to flow through the larger culvert/bridge at Madaket ditch. Once we know those flow rates and the increased flow rates over time as sea level rises, that will then serve as the guide to the dredging depth and volume that will need to flow through Madaket Ditch for the next several decades, with the appropriately sized culverts in place.

Not undertaking this action first may cause excess water to build on either Madaket Ditch side of the Long Pond side if undersized or excessive flow with channel and bank scouring if oversized. The culvert is the flow control mechanism that regulates the area and is the primary consideration before dredging between two large waterbodies.

Dredging should be coordinated as part of the road raising and culvert resizing plan, not ahead of culvert resizing.

There was a meeting held by the former DPW Director regarding resizing the culverts connecting Hither Creek to Long Pond (via the ditch) for more improved flow. The meeting was with DPW's contractors Fuss and O'Neil and reviewing the linked presentation. A follow up meeting was held via Zoom with all relevant permitting agencies like U.S. Fish and Wildlife, Mass DEP, NHESP, CZM and

impacted local landowners like the Nantucket Conservation Foundation. There were concerns raised due to protected fish and plant species that utilize the ditch and a need to permit the project in totality to avoid segmentation issues. Discussion included management of the constructed mosquito ditches that flow into the ditch and possible restoration in those areas.

Efforts from the Department of Public Works (DPW) including landfill capping and mining which has reduced the potential for nitrogen loading to the groundwater that ultimately flows into the watershed via Long Pond, Madaket Ditch, Hither Creek and ultimately Madaket Harbor. The Town's Annual Water Quality testing results confirmed that mining is helping to reduce the Nitrogen load to Long Pond as the pond is the only pond to meet its TMDL.

The presentation which discusses the dredging and resizing of culverts: <https://www.nantucket-ma.gov/DocumentCenter/View/24250/Madaket-Culverts-Evaluation---March-2019-Presentation>.

I will be in attendance at the 3/23 Select Board meeting to discuss this if needed. It is a project that significant progress is being made on but coordinating it with other efforts like the potential of sewers or other resiliency projects is critical and takes time for those aspects to be defined and properly integrated.

Thanks,

Jeff Carlson  
Natural Resources Director  
Town of Nantucket  
2 Bathing Beach Road  
Nantucket, MA 02554  
508-228-7230

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This email was scanned by Bitdefender



# 2021 Water Resource Report

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THAÏS M. FOURNIER

WATER RESOURCE SPECIALIST

NATURAL RESOURCES DEPARTMENT



Madaket Harbor



Nantucket Harbor

# THE HARBORS

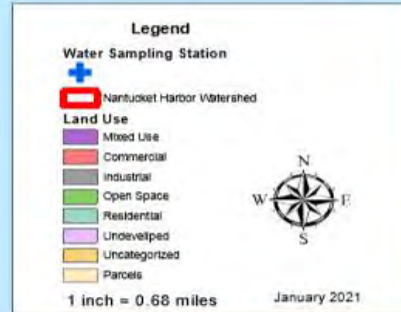
# Harbors: Present Status

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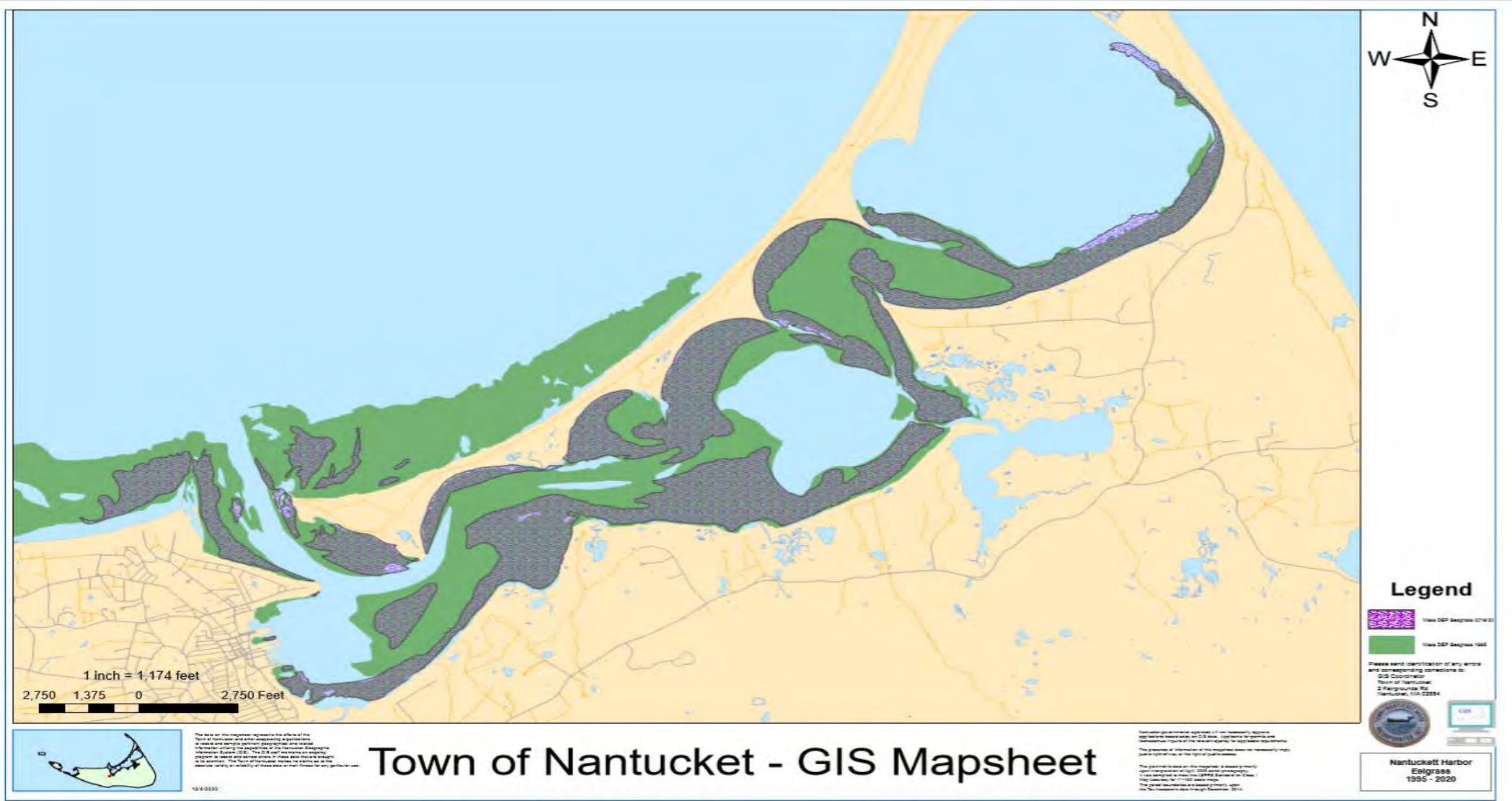


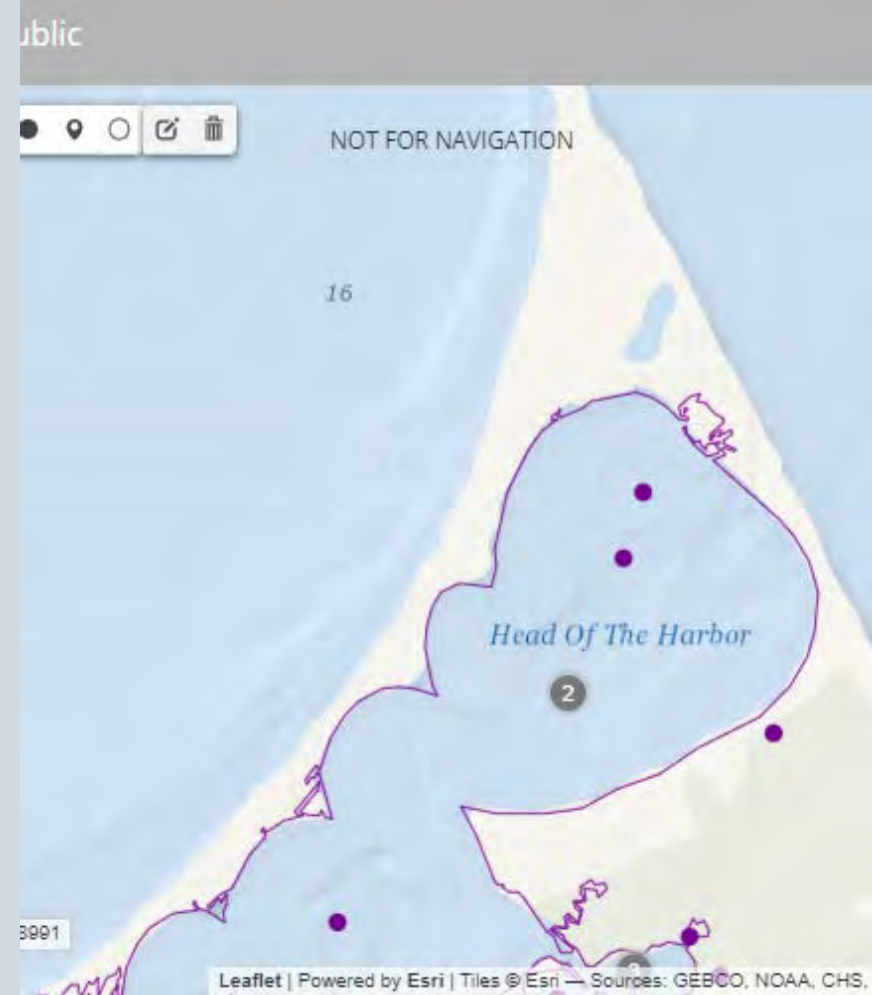
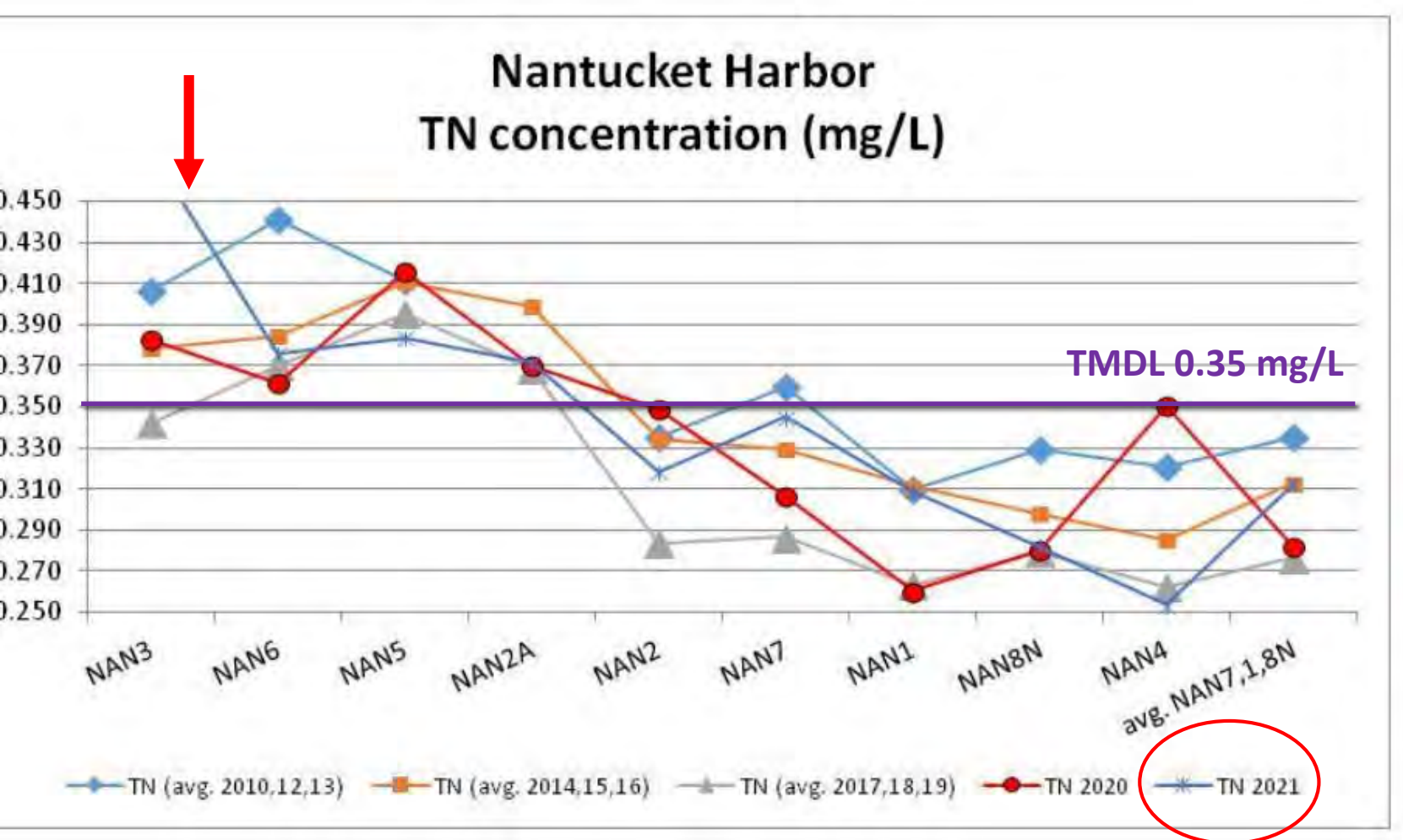
| Embayment        | TMDL                          | Status               | Trend     | Trophic Health Score  | Remedial Actions              |
|------------------|-------------------------------|----------------------|-----------|-----------------------|-------------------------------|
| Nantucket Harbor | 0.35mg/L<br>(0.36mg/L Polpis) | Approaching N target | Improving | High-moderate quality | New jetties, Planned sewerage |
| Madaket Harbor   | 0.45 mg/L                     | Approaching N target | Improving | High-moderate quality | Landfill remediation          |

# Nantucket Harbor Watershed



# Nantucket Eelgrass 1995 - 2020



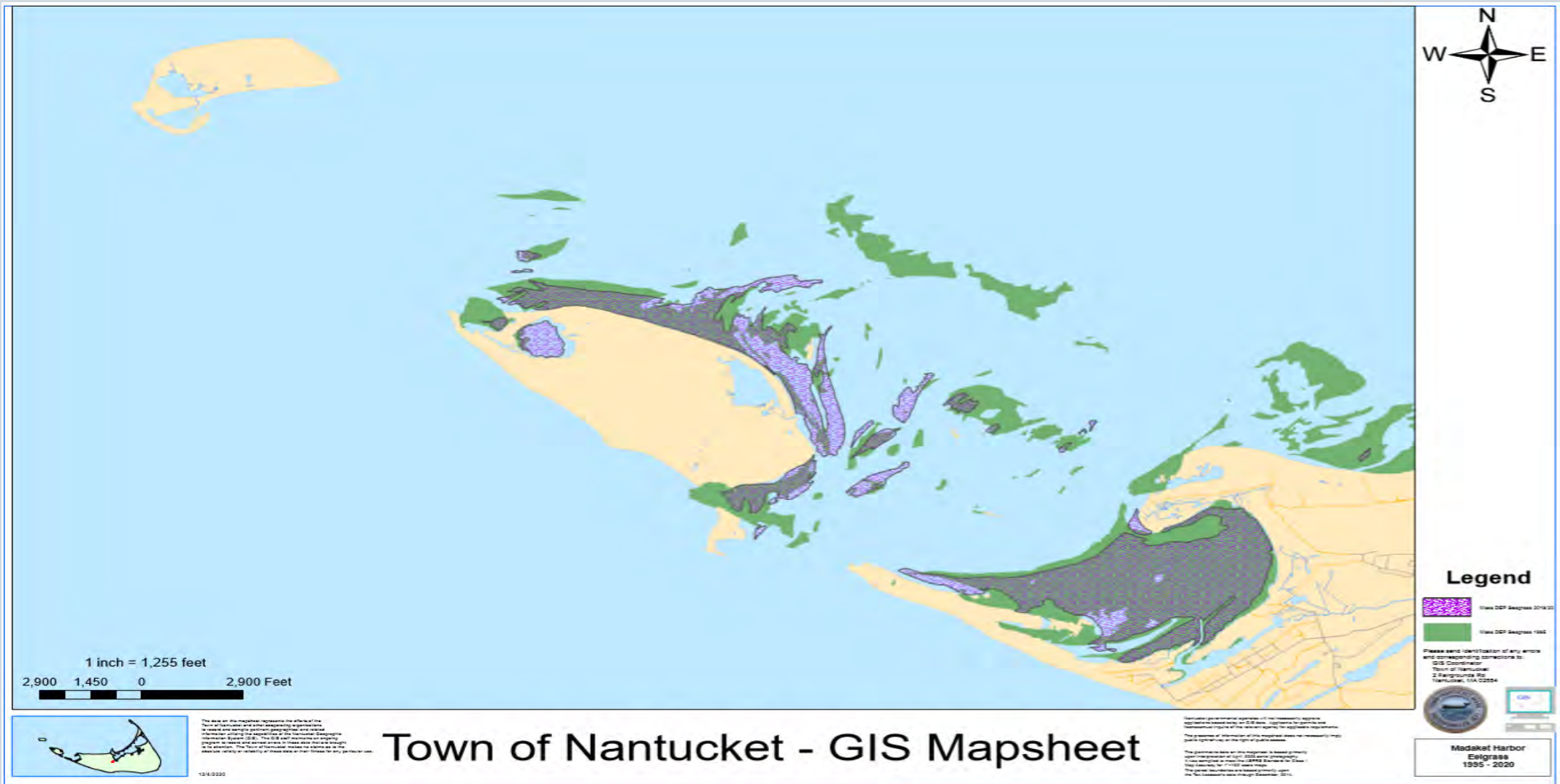


Nantucket Harbor: Total Nitrogen

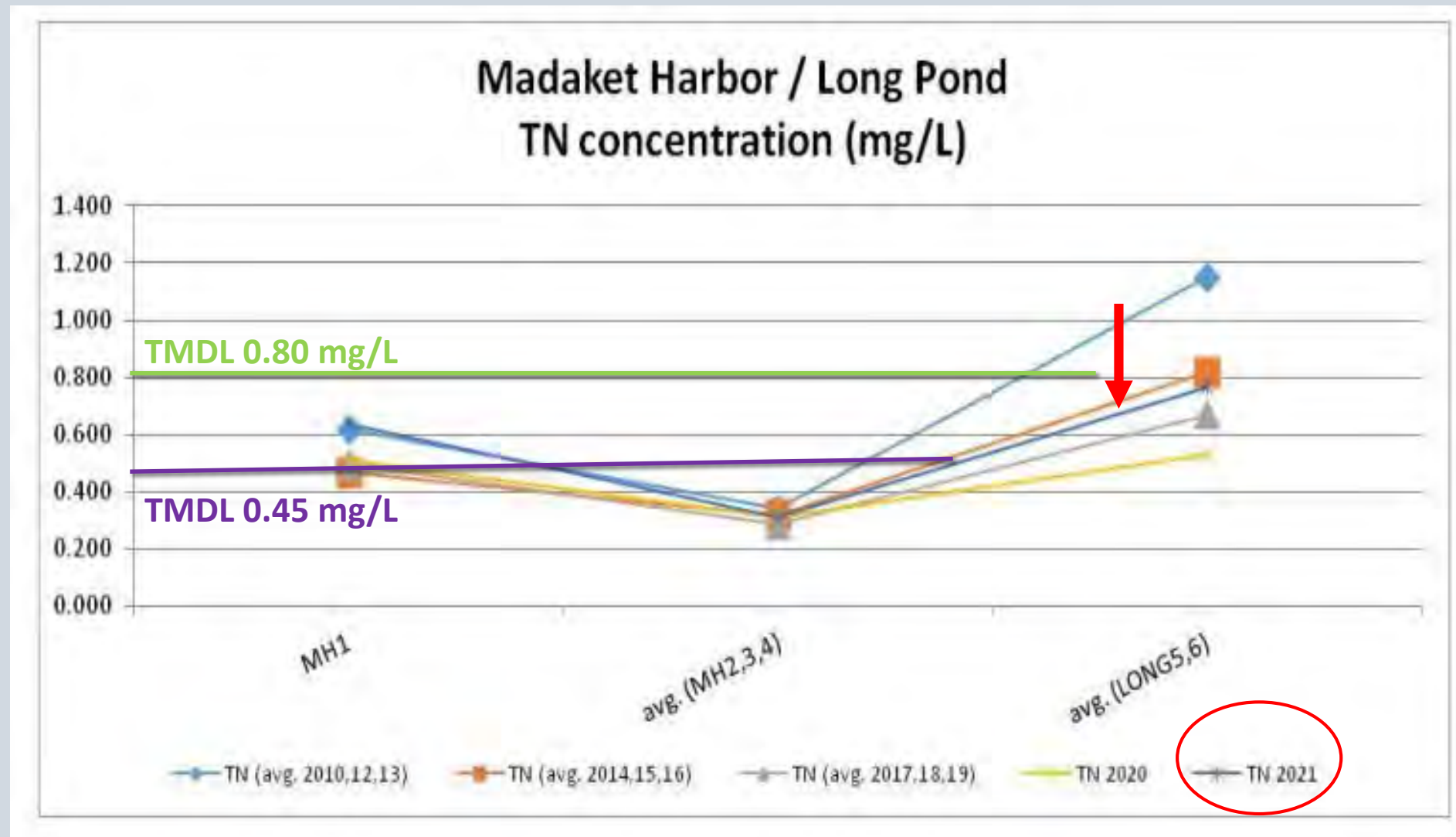
# Madaket Harbor Watershed



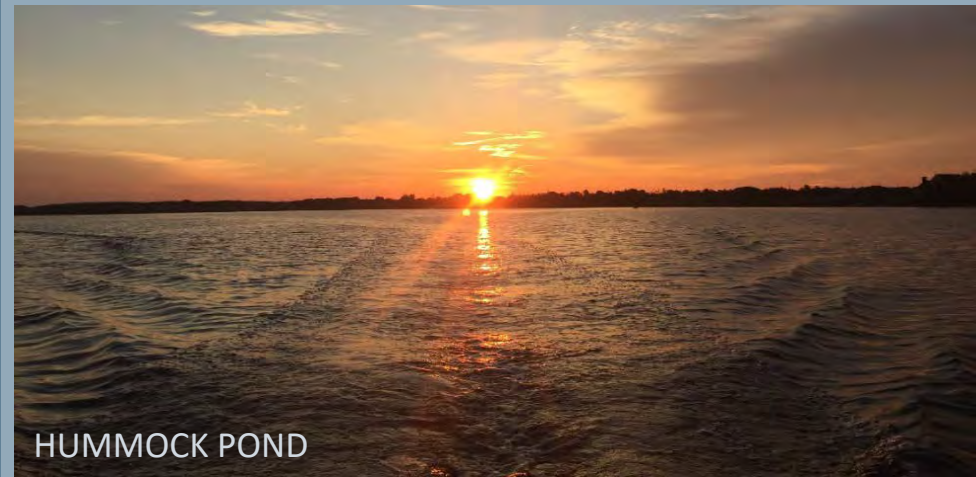
# Madaket Eelgrass 1995 - 2020



# Madaket Harbor/Long Pond: Total Nitrogen



# THE GREAT PONDS



# Nantucket Great Ponds



# Great Ponds: Present Status

|                                                                                    | Embayment       | TMDL                     | Status                 | Trend     | Trophic Health Score  | Remedial Actions                                       |
|------------------------------------------------------------------------------------|-----------------|--------------------------|------------------------|-----------|-----------------------|--------------------------------------------------------|
|    | Hummock Pond    | 0.50mg/L                 | Significantly impaired | Variable  | Moderate-fair quality | Pond openings                                          |
|    | Long Pond       | 0.80mg/L                 | Approaching N target   | Improving | Moderate quality      | Landfill remediation                                   |
|   | Miacomet Pond   | 0.60mg/L (not regulated) | Significantly impaired | Unchanged | Fair-poor quality     | Dredging/chemical treatment of nutrient laden sediment |
|  | Sesachacha Pond | 0.60mg/L                 | Moderate improvement   | Variable  | High-moderate quality | Pond openings, oyster restoration                      |

# Existing WQ Projects

---

- o TON HAB monitoring program
- o Adopt a Pond Program
- o Water Quality Analysis & Visualization (released 2021)
- o Hatchery Eelgrass Pilot project (with NLC)
- o Water Resource Management Plan draft completed
- o Update to Nantucket and Madaket Harbor Action Plan (FY 2022)
- o Integration with the Coastal Resiliency Plan and Hazard Mitigation Plan
- o Illicit Discharge Regulations (in process)

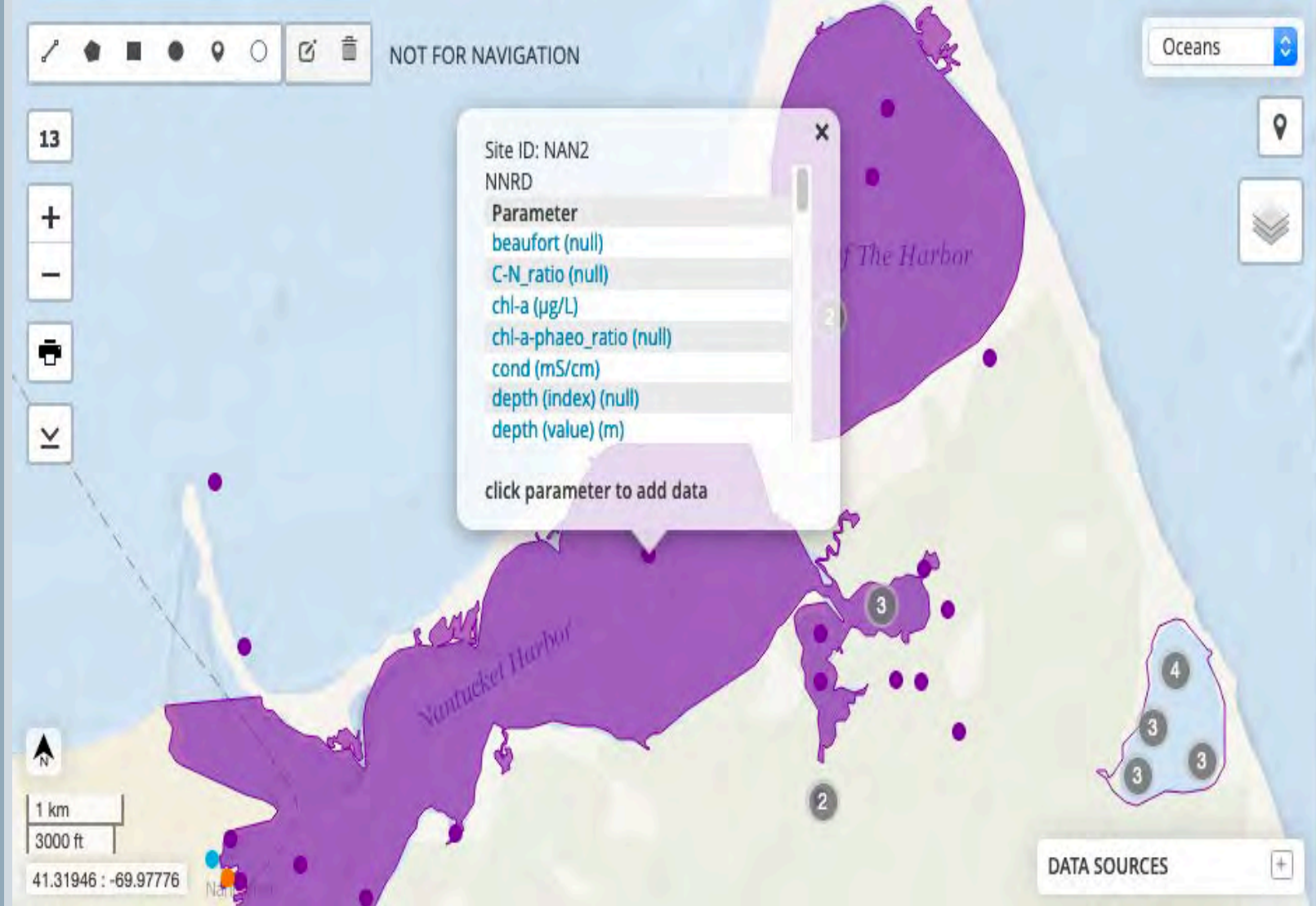


# New and Future WQ Projects

- o Nantucket Harbor Watershed Groundwater study with GHYC Foundation (included in FY '23 capital requests)
- o Dredging of Miacomet Pond (design included in FY '23 capital request)
- o Bioretention (bioswales)
- o Expand Adopt a Pond Program (WQ sampling)
- o Flow Cam to quickly identify and enumerate HABs and shellfish larvae
- o Placement of Sesachacha Pond Mats
- o Alum treatment at Head of Hummock Pond (NLC, NCF)



# Questions



<https://www.nantucket-ma.gov/718/Water-Quality>

[tfournier@nantucket-ma.gov](mailto:tfournier@nantucket-ma.gov)

# Extra Information

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The following slides are not meant to be presented but there to offer support with any questions asked.

# Regulatory Changes



## FDA National Shellfish Sanitation Program

- Locally administered by the MA Division of Marine Fisheries (MA DMF)
- Requires areas with more than 20 moorings to be classified as anything but Open
- These areas are not available for shellfishing
- Implemented in October 2020
- NRD is actively researching potential solutions for the restrictions

# Pond Management

## **In-pond management short-term goals:**

- - Control internal nutrient loading
- - Combat pond weeds/control cyanobacteria blooms
- - Decrease stormwater inputs

## **Long-term watershed management techniques:**

- - Investigate dredging/chemical treatments
- - Improve public access
- - Reduce nutrient input
  - Public education and outreach
  - Best Management Practices (BMPs)



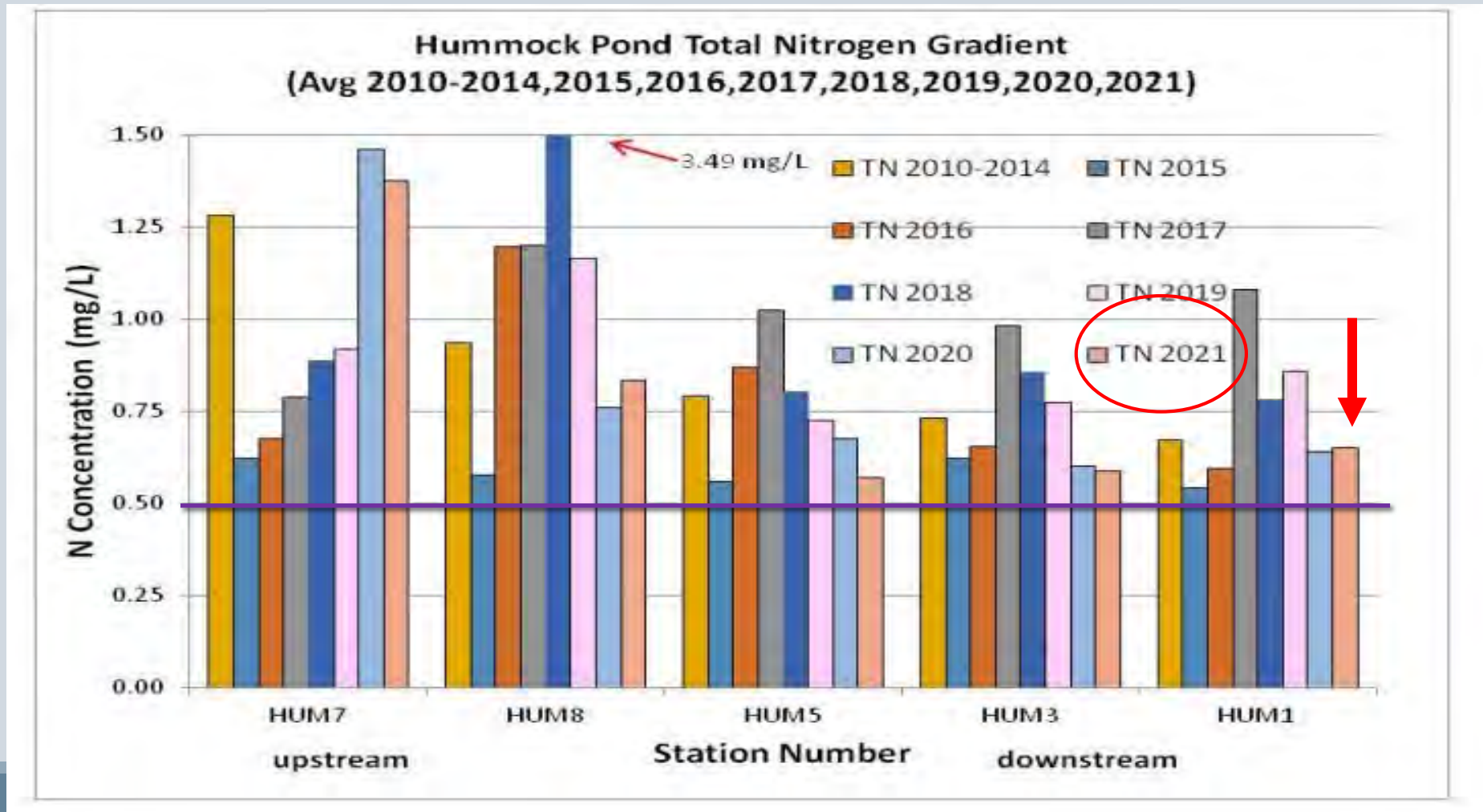
# Hatchery Eelgrass Pilot Project

## Eelgrass Seeding:

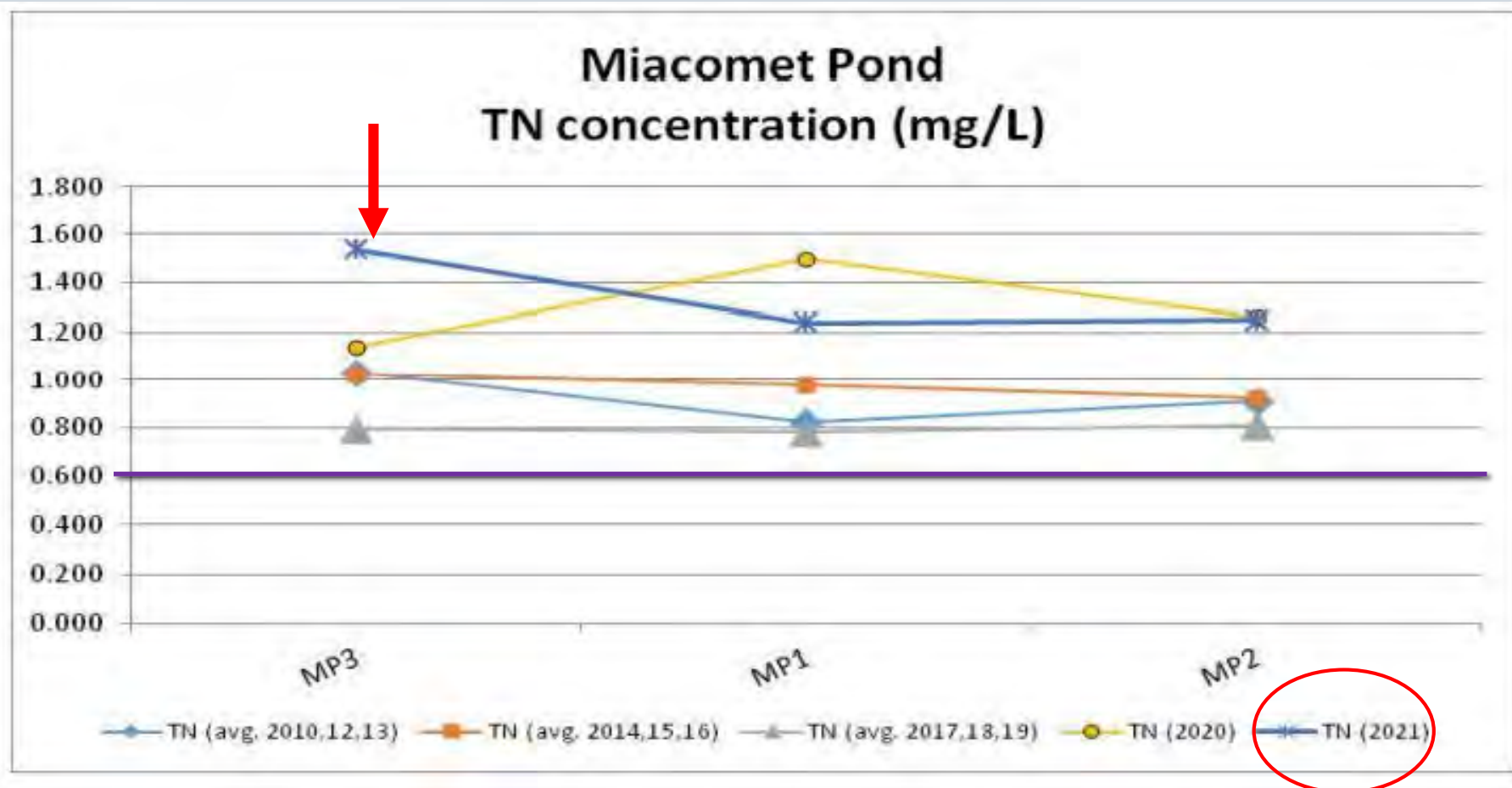
- - Broadcast Method
- - Rock approach
- - Floating Bag



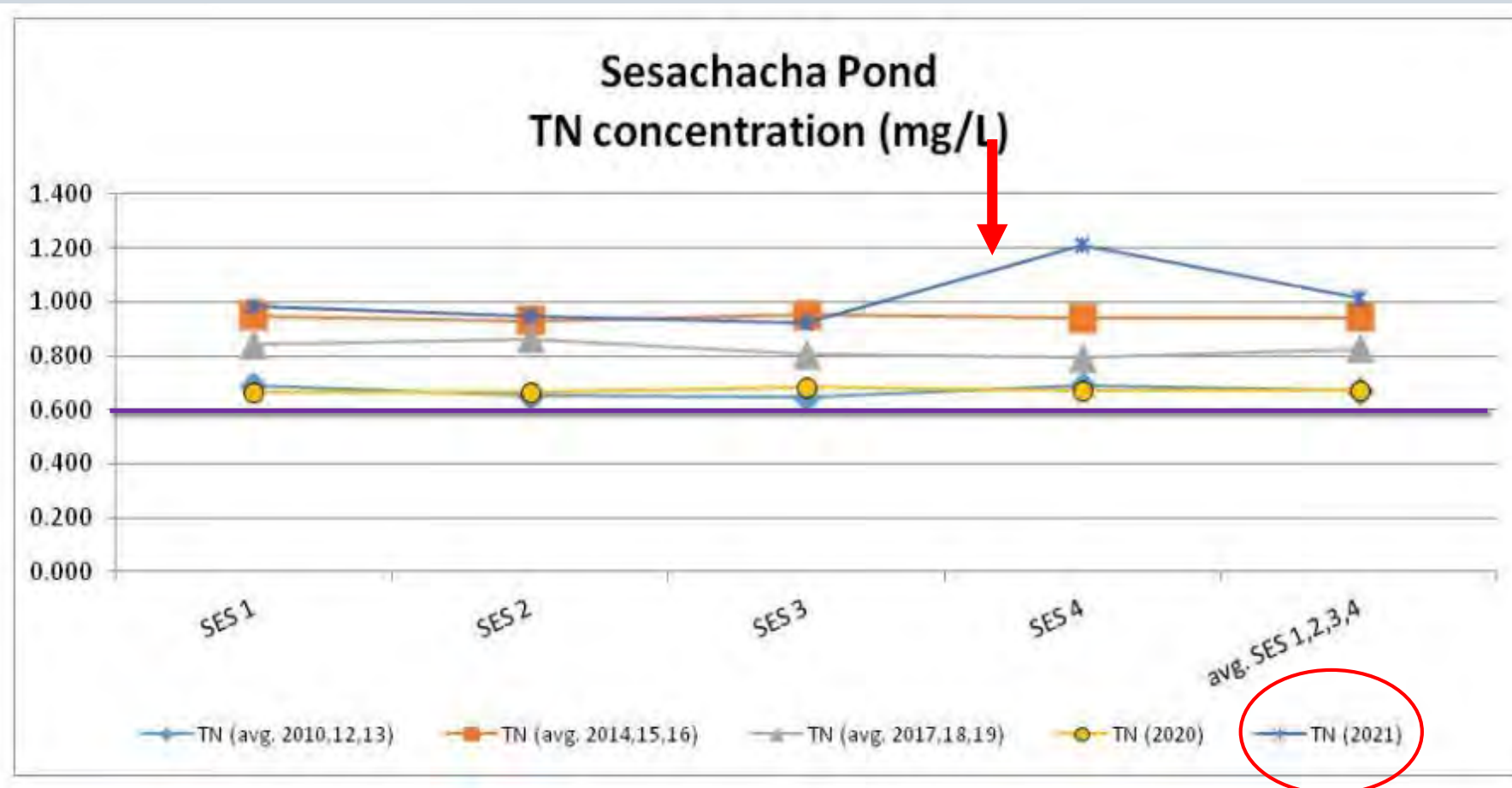
# Hummock Pond



# Miacomet Pond



# Sesachacha Pond



# TOWN OF NANTUCKET NATURAL RESOURCES DEPARTMENT

THAÏS M. FOURNIER, WATER RESOURCE SPECIALIST  
131 PLEASANT ST.  
NANTUCKET, MA 02554

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508-228-7200  
EXT 7604



## **2021 Executive Summary**

### **Water Quality Assessment of Nantucket's Harbors and Great Ponds**

#### **Abstract:**

The executive summary reviews the water quality monitoring results of the estuarine sampling undertaken through the ongoing Nantucket Island-Wide Water Quality Monitoring Program. The program is a multi-year collaboration between the Town of Nantucket (TON) Natural Resources Department and the Coastal Systems Program within the University of Massachusetts-Dartmouth, School for Marine Science and Technology.

The objectives of the monitoring program are:

1. To determine the present (2021) ecological health of each of the main salt ponds and estuaries within the Town of Nantucket,
2. To gauge (as historical data allows, 2010-2021) the decline or recovery of various salt ponds and embayments over the long-term (also part of TMDL compliance), and
3. To provide the foundation (and context) for development of potential alternatives for nutrient and resource management and quantitative measures of success.

#### **Introduction:**

As increasing numbers of people occupy coastal watersheds, the associated coastal waters receive increasing pollutant loads. Coastal embayments throughout the Commonwealth of Massachusetts are becoming nutrient enriched. The primary nutrient causing the increasing impairment of our coastal embayments is nitrogen, with its primary sources being wastewater disposal, and nonpoint source runoff that carries nitrogen (*e.g.*, fertilizers) from a range of other sources.

Nantucket proactively monitors the quality of its water systems to develop action plans to ensure public safety and strengthen the islands ecosystems. As in previous years, this annual Water Quality Technical Memorandum summarizes the water quality monitoring results of the estuarine sampling undertaken through the ongoing Nantucket Island-wide Water Quality Monitoring Program. Water sample collection and analysis has been performed according to specific protocols developed at the outset of the monitoring first started in 2010, such that year to year results would be cross comparable from one Nantucket estuary to another. The sampling program focuses on the summer/early fall months (June - September) as this time frame is typically representative of worst case water quality conditions and the basis for habitat management decisions.

The physical/environmental parameters measured in the estuaries during the 2021 sampling season included: total depth, Secchi depth (light penetration), temperature, conductivity/salinity, general weather (rain, cloudiness, etc.), wind force and direction, dissolved oxygen levels and observations of moorings, birds, shell fishing and unusual events (fish kills, algal blooms, etc.). Laboratory analyses of estuarine waters included: salinity, nitrate + nitrite, ammonium,

dissolved organic nitrogen, particulate organic carbon and nitrogen, chlorophyll-*a* and pheophytin-*a* and orthophosphate.

### **Trophic State of Nantucket Estuaries:**

The trophic state of an estuary is a quantitative indicator of its nutrient related ecological health and is based on key ecological metrics: concentrations of inorganic and organic Nitrogen, water clarity, lowest measured concentrations of dissolved oxygen, and Chlorophyll-*a* pigments (proxy for phytoplankton biomass/blooms). Nutrient related trophic health scales generally range from Oligotrophic (healthy-low nutrient) to Mesotrophic (showing some signs of deterioration of health due to nutrient enrichment) to Eutrophic (habitats significantly impaired and degraded, high levels of nutrients and organic matter and community shifts). The Trophic Health Index Score used here is a standard numerical scale based on criteria for open water embayments and uses the above mentioned measured parameters to create a habitat quality scale (Howes et al. 1999, <http://www.savebuzzardsbay.org>).

### **Results:**

**Table 1. Summary of present status and trends of water/habitat quality of estuaries of Nantucket based on the long-term water quality monitoring data reconciled against historic data and MEP nutrient threshold analyses undertaken for each system except Miacomet Pond. A TMDL for Hummock Pond has not yet been released by MassDEP. The trends in the table for Long Pond and Sesachacha Pond need to be interpreted as multi-year, since in 2021 these ponds showed a modest increase in water quality impairment.**

| Embayment        | TMDL                          | Status                 | Trend     | Trophic Health Score  | Remedial Actions                                                 |
|------------------|-------------------------------|------------------------|-----------|-----------------------|------------------------------------------------------------------|
| Nantucket Harbor | 0.35mg/L<br>(0.36mg/L Polpis) | Approaching N target   | Improving | High-moderate quality | New jetties, Planned sewerage                                    |
| Madaket Harbor   | 0.45 mg/L                     | Approaching N target   | Improving | High-moderate quality | Landfill remediation                                             |
| Hummock Pond     | 0.50mg/L                      | Significantly impaired | Variable  | Moderate-fair quality | Pond openings                                                    |
| Long Pond        | 0.80mg/L                      | Approaching N target   | Improving | Moderate quality      | Landfill remediation                                             |
| Miacomet Pond    | 0.60mg/L (not regulated)      | Significantly impaired | Unchanged | Fair-poor quality     | Potential dredging/chemical treatment of nutrient laden sediment |
| Sesachacha Pond  | 0.60mg/L                      | Moderate improvement   | Variable  | High-moderate quality | Pond openings                                                    |

## Conclusion:

The Town of Nantucket has been working for decades to protect and more recently restore its estuaries and their aquatic resources. Overall, the water quality trends in Nantucket's major estuaries have been positive over the past 5-10 years. Nantucket Harbor, Long Pond and Sesachacha Pond are showing improvements and are approaching their TMDL targets to meet restoration goals. Madaket Harbor is supporting high water and habitat quality. Hummock and Miacomet Ponds are experiencing water quality and habitat health issues.

At present and based on the 2010 - 2021 water quality database developed under the Island-wide unified water quality monitoring program, activities to lower nitrogen enrichment and its negative impacts to water and habitat quality have been planned and implementation is ongoing in four estuarine systems: Nantucket Harbor (raised jetties and planned sewerage), Madaket/Long Pond (lined landfill cells and future potential dredging), Sesachacha Pond (biannual openings), Hummock Pond (biannual openings). In addition, the TON's fertilizer application by-law should reduce nutrient inputs into Nantucket's embayments. As a result, it is anticipated that the efficacy of these management activities should be seen in the present and future water quality monitoring results.

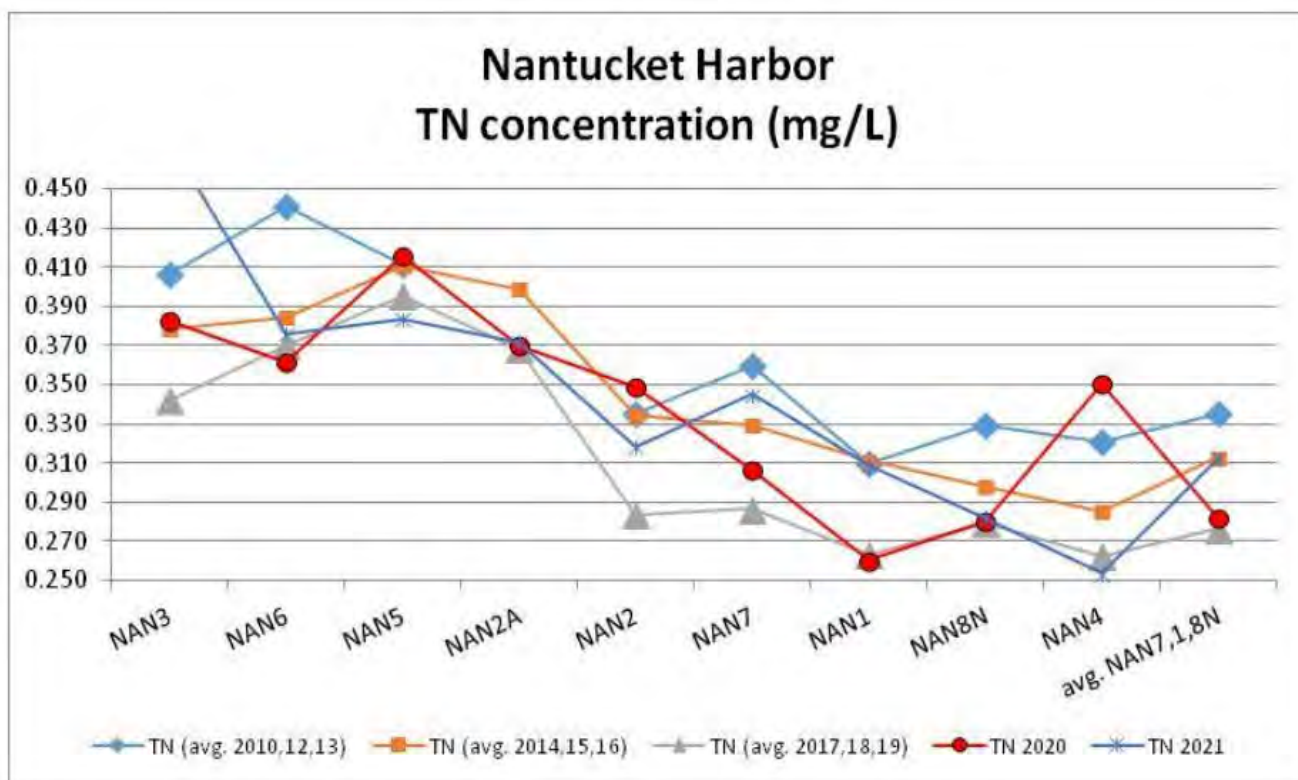


Figure 1. Temporal trends in Nantucket Total Nitrogen levels at all stations. Note that in all cases the 2017-2019 levels are lower than the earliest grouping with 2014-2016 being in the middle. TN levels have declined harbor-wide over the past 10 years due to nitrogen mitigation strategies implemented by the Town. 2020 data generally confirms the trend (with exception Nan-4), lower Harbor still showing TN decline, however 2021 shows increased TN mainly in the upper basin Nan-3.

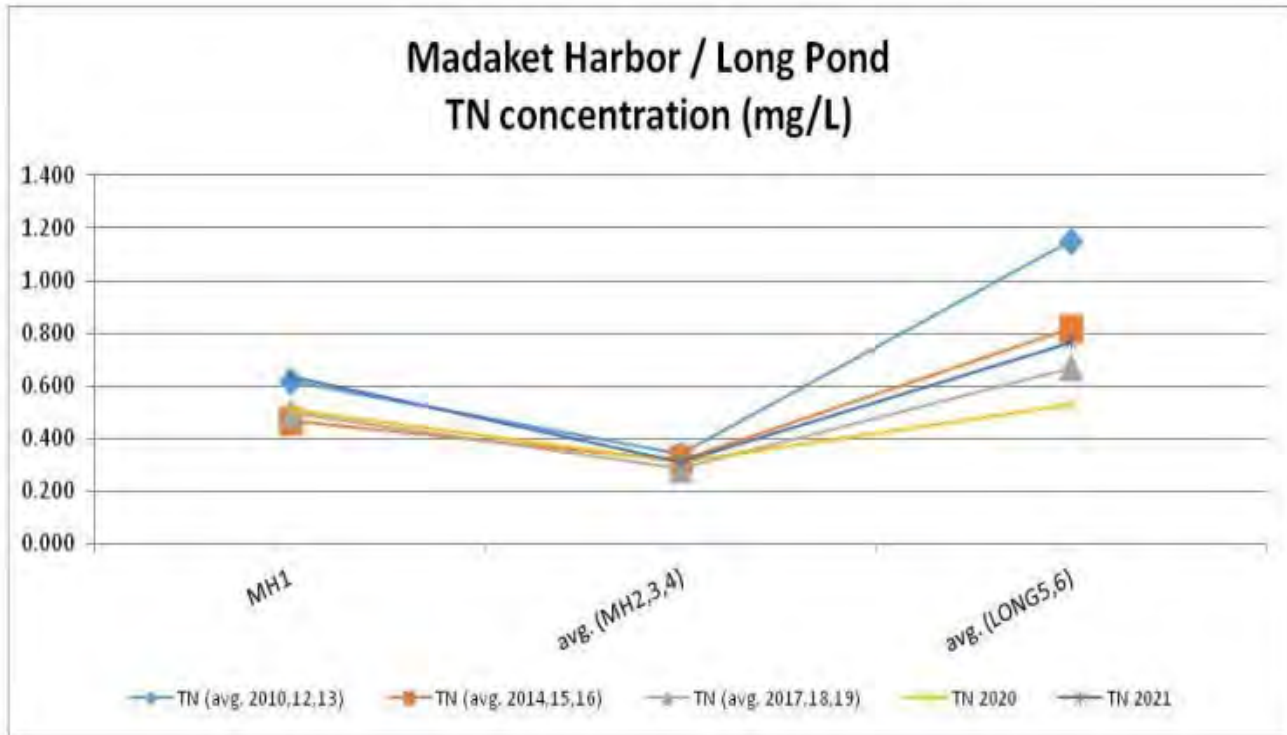


Figure 2. TN levels in Madaket Harbor main basin (MH-2,3-4), Hither Creek (MH-1) and Long Pond (stations Long 5 & 6) over the past decade. Long Pond shows reductions in TN from 2010,2012, 2013 to 2014-2016 to 2017-2020, however 2021 (0.766 mg TN/L) did show an increase from this trend.

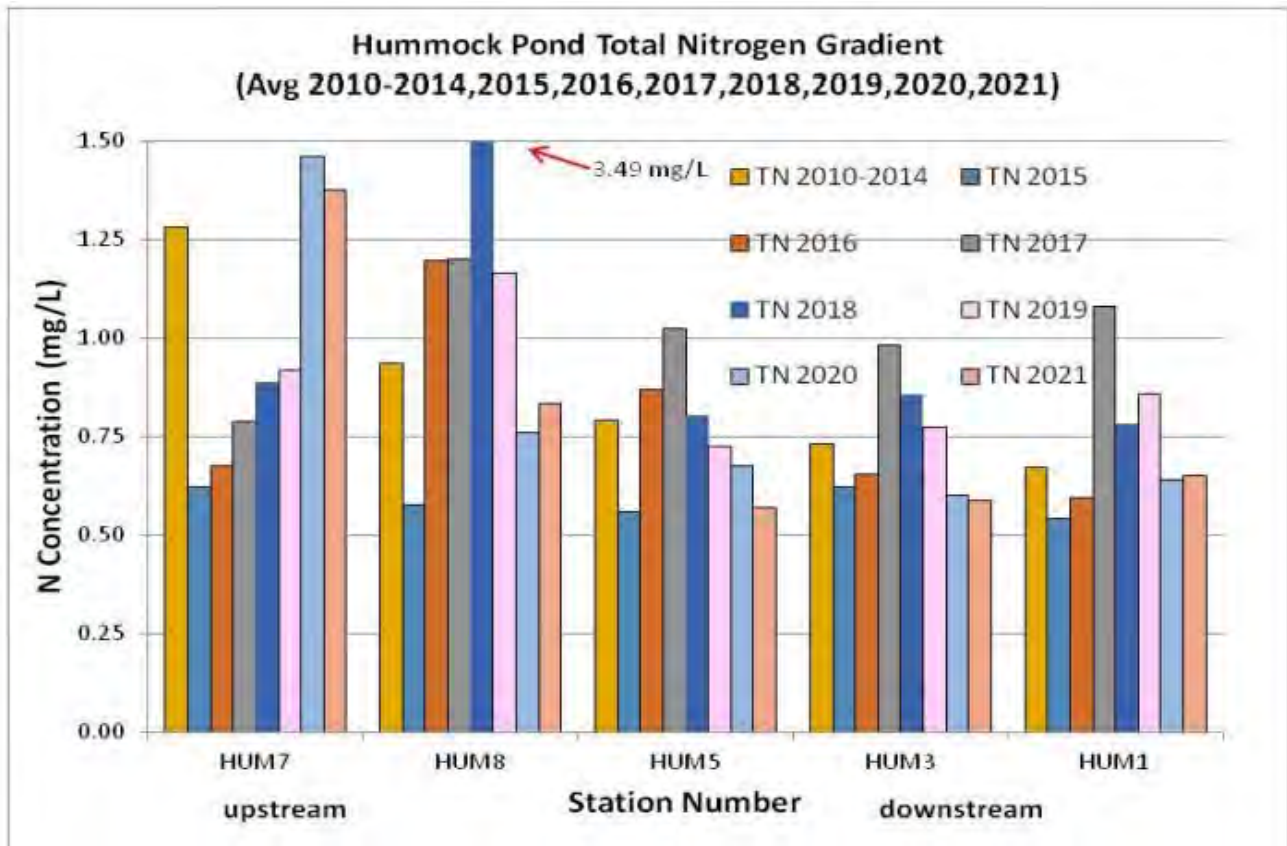


Figure 3. Summer average total nitrogen levels by station over time in Hummock Pond. The long opening in 2015 lowered TN levels (0.75 mg/L) well above the target level for high water quality. Lower TN in levels in 2020 and 2021 show water quality improvement in the lower basins maybe from longer opening duration.

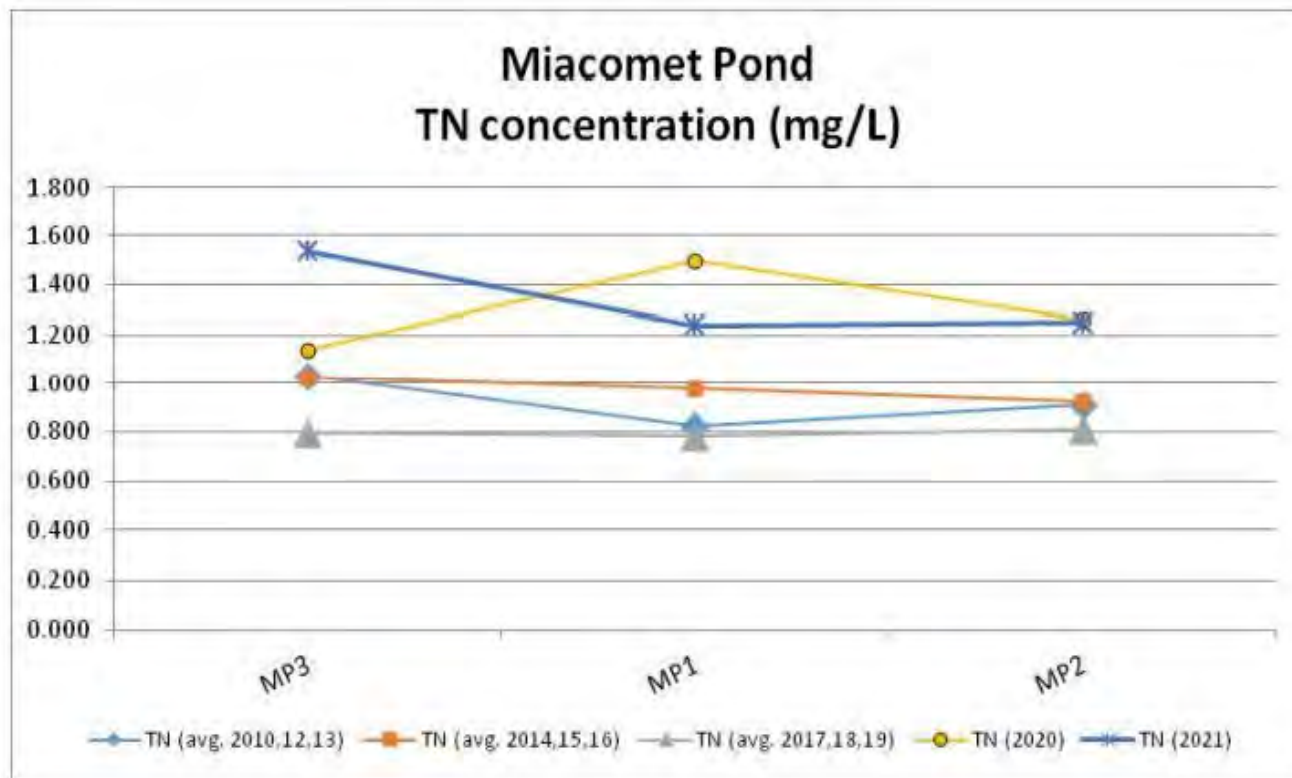


Figure 4. Summer average total nitrogen levels by station over time in freshwater Miacomet Pond. As a freshwater pond a regulatory TMDL target for nitrogen or phosphorus has yet to be established. Miacomet Pond remains a nutrient degraded system in 2021. Note that at all stations the TN level greatly exceeds the threshold for brackish and estuarine systems.

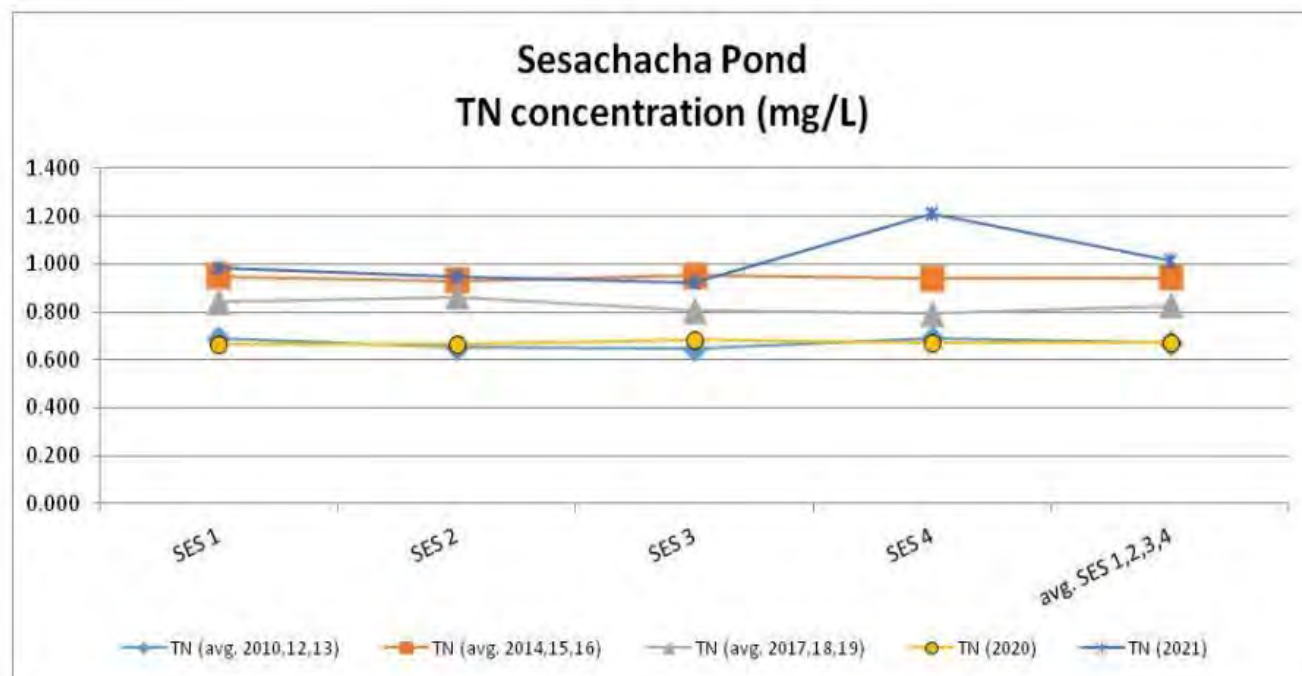


**Figure 5. Total nitrogen levels by station over time in Sesachacha Pond. Longer openings in 2010-2014 resulted in lower TN levels, recent opening attempts are again being more successful (2018), but TN levels remain above the target level. 2020 pond opening duration may have been longer than past years resulting in the lowest TN level on record, half of the MEP 2003 average. However, it appears lower exchange during the fall 2020 opening resulted in lower salinities and higher TN and pigments in 2021.**



## **Technical Memorandum**

# **DRAFT**

### **Water Quality Monitoring and Assessment of the Nantucket Island-Wide Estuaries and Salt Ponds Update 2021**

**To:**

**Town of Nantucket  
Marine and Natural Resources Department  
2 Bathing Beach Road  
Nantucket, MA 02554**

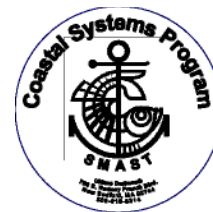
**From:**

**Brian Howes Ph.D. and Roland Samimy Ph.D.  
Coastal Systems Program  
School of Marine Science and Technology (SMAST)  
University of Massachusetts-Dartmouth  
706 South Rodney French Blvd.  
New Bedford, MA 02744**

**February 2022**



University of Massachusetts Dartmouth  
The School for Marine Science and Technology



# Executive Summary

## Water Quality Monitoring and Assessment of the Nantucket Island-Wide Estuaries and Salt Ponds

### Update 2021

As in previous years, this annual Technical Memorandum summarizes the water quality monitoring results of the estuarine sampling undertaken through the ongoing Nantucket Island-wide Water Quality Monitoring Program. The results presented are focused on summer time (June-September) sampling as a representation of worst case water quality conditions as that tends to be the driver for management and restoration. The program is a multi-year collaboration between the Town of Nantucket Natural Resources Department and the Coastal Systems Program within the University of Massachusetts-Dartmouth, School for Marine Science and Technology. Water sample collection and analysis has been undertaken according to specific protocols developed at the outset of the monitoring first started in 2010 such that year to year results would be cross comparable from one Nantucket estuary to another but also, so that Nantucket results would also be cross comparable to water quality data collected from other programs managed by the Coastal Systems Program (e.g. Cape Cod monitoring programs as well as Martha's Vineyard Island-wide monitoring program). The 2021 annual summary memo is focused specifically on the following: 1) Water Quality Results for Nantucket Harbor, Madaket Harbor, Long Pond, Hummock Pond, Miacomet Pond, Sesachacha Pond, Polpis Harbor Streams and Oyster Aquaculture Potential Sites and 2) Trophic State - Water Quality/Eutrophication Status and trends.

The goals of the monitoring program remain unchanged from previous years, primarily to:

1. determine the present (2021) ecological health of each of the main salt ponds and estuaries within the Town of Nantucket,
2. gauge (as historical data allows, 2010-2021) the decline or recovery of various salt ponds and embayments over the long-term (also part of TMDL compliance), and
3. provide the foundation (and context) for development of potential alternatives or refinements in implemented alternatives for nutrient and resource management and quantitative measures of success.

**Point (3) is critical for restoration planning should a system be found to be impaired or trending toward impairment, which requires targeted management actions for restoration or a system is improving due to Town actions which then should be improved/enhanced.**

As was the case in 2010, 2012 - 2020 sampling efforts, the 2021 sampling program focused on the summer/early fall months (June - September, few systems sampled in March, April, October, November but those results are not factored into the summer averages) as this time frame is typically representative of worst case water quality conditions and the basis for habitat management decisions. Samples collected in 2021 were obtained from the same sampling station locations and the same depths as in previous years to maximize cross comparability and to gauge temporal changes. It should be noted that the Town of Nantucket did undertake water quality monitoring in 2011, however, those samples were analyzed by a lab other than the Coastal Systems Analytical Facility at the UMASS School for Marine Science and Technology and data was presented in the report on the 2012 monitoring effort.

The Town of Nantucket has been working for decades to protect and more recently restore its estuaries and their aquatic resources. At present and based on the 2010 - 2021 water quality database developed under the Island-wide unified water quality monitoring program, activities to lower nitrogen enrichment and its negative impacts to water and habitat quality have been planned and implementation is ongoing in 4 estuarine systems: Nantucket Harbor (jetties and sewers), Madaket/Long Pond (landfill and possible dredging), Sesachacha Pond (openings), Hummock Pond (refined opening protocol). In addition, all of the Town's estuaries should benefit from the recent fertilizer application by-law. As a result, it is anticipated that the efficacy of these management activities should be seen in the on-going monitoring results.

Summer 2021 appears to have generally sustained high water quality for the Nantucket Harbor and Madaket Harbor systems, though some stations did show slight increases in total nitrogen and chlorophyll-a compared to 2020 conditions and their main tributary basins of Long Pond and West Polpis Harbor showed some decline compared to recent years. Hummock Pond water quality appears to continue to be poor in the upper portions of the system with high total nitrogen values and elevated chlorophyll-a concentrations, however, 2021 data indicates slightly lower or equal nutrient concentrations compared to 2020, but salinity levels have risen slightly in both years and similar system health was found as in 2020 and 2019 (possibly due to a similar opening efficacies). Generally, the decline in water quality started in 2016 which showed a decrease in overall water quality compared to system reset for the 2015 summer season. The reset was accomplished through a highly successful opening, which has not been fully repeated at that level since 2016, hence the decline in water quality over recent years until 2020 and 2021 which showed better openings and slight water quality improvement. The variations in TN levels results primarily from opening success. For instance, in spring 2017 the opening was only 1.5 days with high precipitation, although the spring opening in 2016 was comparable to the duration of the opening in 2015 (18 days and 15 days respectively). In contrast, Long Pond has shown steady declines in TN concentrations over historic levels through 2020 with variable parallel improvements in water and habitat quality, although the inter-annual reductions appear to be stabilizing, although in 2021 TN levels increased over 2020, possibly due to a decrease in the efficacy of the outlet from Long Pond to Hither Creek or a periodic environmental factor like high rainfall.

Miacomet Pond, which is now functionally a eutrophic freshwater pond, again in 2021 showed very poor water and habitat quality throughout. After a slight improvement in 2017, as seen in lower TN concentrations and lower total pigments (CHLA + Pheophytin), water quality worsened in 2018 and continued to show a nutrient degradation in 2019 - 2021. Miacomet Pond from 2014-2018 appeared to have phytoplankton production (e.g. chlorophyll-a) stimulated by both N and P inputs as pond salinities declined to present freshwater levels. The 2021 monitoring indicated that Miacomet Pond still has very high phytoplankton levels (40-88 ug/L) stimulated by both N and P as DIN/DIP ratios at certain stations exceed the Redfield Ratio. The longer term record indicates both N and P as key nutrients from 2014-2021, with nitrogen being the key

nutrient only in 2019. Miacomet Pond exceeds by several fold both known N and P levels needed to maintain a high quality aquatic system. Both TN and Total Pigment levels in the upper portions of Miacomet Pond were high compared to 2020.

Water Quality in Sesachacha Pond appears to be directly related to the efficacy of its seasonal openings. Water quality in 2010, 2012, 2013 was significantly improved over the levels observed previously in the MEP analysis (November 2006). The lower TN levels in Sesachacha Pond (2010-2013) versus historic levels documented by the MEP indicated significant improvement of pond resources. Since there was no major shift in nitrogen loading within the Sesachacha Pond watershed during that period of improvement, it is almost certain that the amount of tidal flushing during a given artificial breaching is driving the variability in the observed summer TN level. The rise in TN observed during the 2014 sampling suggests that a poor inlet opening may have occurred in spring 2014, as watershed loading was unchanged. Short openings in subsequent years (2015 {5 days}, 2016 {3 days}, 2017 {7 days}) suggests that inlet opening efficacy has a significant effect on pond water quality as TN concentrations from 2014 to 2017 have steadily increased to nearly the same level as when the MEP analysis was completed. Since a focused opening management plan has evolved over the past decade, TN levels have generally declined in recent years and averaged 0.784 mg TN/L over 2018 and 2019 field seasons (Table 4). In 2020, TN concentrations were even lower and chlorophyll levels appear to be as low observations in 2013. In 2020 there was a shift from spring to fall openings for Sesachacha Pond. In the subsequent summer 2021 the average TN concentrations were notably higher than 2017-2020, with a commensurate increase in total pigment levels. Although Sesachacha Pond is still above its N threshold the increased attention to pond openings through 2018 lowered TN from historic levels (1.2 mg N/L) to 0.7 mg N/L in 2020, which rose to 1.02 mg/L in 2021, a noticeable increase over the threshold TN level of <0.60 mg/L set by the MEP. Since a fall opening in 2020 did occur its impact would have been seen in the 2021 monitoring results, however, it seems likely the opening was not effective given the observed increase in TN and total pigment levels. This underscores that if opening can be maintained the threshold N level should be attainable for this estuary. The 2021 result underscores the importance of monitoring for the adaptive management of Sesachacha Pond by NRD.

**Trophic State of Nantucket Estuaries:** The Trophic State of an estuary is a quantitative indicator of its nutrient related ecological health and is based on key ecological metrics: concentrations of inorganic and organic Nitrogen, water clarity (Secchi Depth), lowest measured concentrations of Dissolved Oxygen (average of lowest 20% of summer measurements), and Chlorophyll-a pigments (surrogate for phytoplankton biomass/blooms). Nutrient related trophic health scales generally range from Oligotrophic (healthy-low nutrient) to Mesotrophic (showing some signs of deterioration of health due to nutrient enrichment) to Eutrophic (habitats significantly impaired and degraded, high levels of nutrients and organic matter and community shifts).

**Nantucket Harbor** (with Madaket Harbor) is presently supporting the highest water quality of Nantucket's estuaries. In 2018 and 2019, all of the Nantucket and Polpis Harbor monitoring stations were showing high water quality, slightly better than in 2017. However, in 2020 and 2021 there appears to have been a decline in Polpis Harbor West (Nan-5) possibly due to inflow from the headwater stream. Over the past 5 years, the main basin of Nantucket Harbor continues to support high quality waters, with only a periodic small decline in the uppermost basin, Wauwinet basin. Summer 2019 saw a slight decline in water quality that continued into 2020, but increased in 2021. Previous summers 2016-2018 generally showed similar high water quality in this basin as 2014 which also showed improved chlorophyll-a and TN levels versus prior years. Nutrient management activities associated with the Harbor (additional sewer hookups, jetty

improvement and oyster aquaculture) should result in even lower TN and chlorophyll levels and reduce the likelihood of large phytoplankton blooms in the future.

Polpis Harbor basins which after showing moderate impairment in 2010 and 2012 have been showing only low to no impairment in recent years, suggesting some improvement over historic conditions. Polpis Harbor showed 2018 & 2017 TN levels similar to 2010, 2012 and 2015, slightly higher than 2013 and 2014. However, Polpis Harbor West Basin showed elevated TN in 2020 and 2021 and a decline to moderate water quality, while the East Basin maintained its low TN and high water quality. This variation makes continued monitoring essential to clarify any trends in water quality and linkages to stream nitrogen discharges. While the overall Nantucket Harbor System is generally supporting high quality waters, the variability in the index in Wauwinet and Polpis basins should be monitored to ascertain their long-term health and to determine the effectiveness of restoration effort by the Town as it continues to move forward to meet the MassDEP TMDL for this system. Overall, Nantucket Harbor appears to be relatively stable from year to year with a continuing improvement into 2020 with high index scores and higher level metrics that support the contention that it is approaching its TMDL threshold, as is generally also the case for Polpis Harbor. In contrast, 2021 saw increasing TN and chlorophyll a in Wauwinet, without a clear cause, although in previous years a reduction in flow between Wauwinet and the lower basins was found to be an issue. Confirmation of this should be undertaken. The role of stream inputs to Polpis Harbor West on its recent water quality may suggest that some mitigation is needed. Planned sewerage within the Nantucket watershed should complete the restoration on nitrogen mitigated impairment within this estuarine system

**Madaket Harbor** main basin in 2021 continued to support a high level of nutrient related water quality, with High Quality waters at all sites over the past 5 years. It has been the more enclosed basins of Hither Creek and Long Pond with their reduced tidal flushing that have had water quality impairment associated with nitrogen enrichment.s. Over the 10+ years of monitoring, Hither Creek (Station 1), which receives discharge from Long Pond via Madaket Ditch, has consistently supported the poorest “health” status within the Madaket Estuary. Hither Creek is clearly nitrogen enriched and showing continuing impairment based on a variety of parameters, but has clearly improved since 2010 and has shown only moderately impaired water quality over the past 5 years, although 2021 showed a slight decline as did associated Long Pond. Over the past 10+ years the Trophic Index indicates that this basin has been improving gradually, going from fair-poor water quality and improving to moderate water quality since 2014 with the exception of 2017 and 2021 where TN levels rose, but stayed within the range that has developed over the past 4-5 years. The main basin of Madaket Harbor is showing relatively high water quality in each year but also shows a possible improvement from the 2010 to 2012 period and has been generally stable with high quality unimpaired waters in more recent samplings to 2018-2020.

**Long Pond** is a large tributary basin to Madaket Harbor, which receives tidal flow through the artificial connection of Madaket Ditch. Given the structure of the basin and its watershed, Long Pond operates semi-independently from Madaket Harbor. Long Pond’s Trophic Index scores for both monitoring stations (5 & 6) in the 10+ years of monitoring (2010, 2012-2020) clearly indicate poor nutrient related water quality. However, based upon the 2015-2020 results and the overall 10 year time-series, it appears that the Town’s management of the landfill, has reduced the nitrogen load from this source with the associated observed lowering of TN levels. However, 2021 saw a slight reversal of the long-term trend with moderate increases in TN levels. The water quality Index for 5 of the most recent 6 years is showing improvement at both Long Pond Stations and the receiving waters in Hither Creek in response to the lower TN levels. However, the basin remains moderately impaired. While continued monitoring will determine the final level of

improvement, it does appear that in general a reduction in N loading is occurring with beneficial effects. It should be noted that the lack of major change in the Health Index for Long Pond results in part from the relative coarseness of the Index, where sometimes large index score changes are required to change the Index value. However, there was a decline in trophic status in 2021. The analysis of key metrics (Chlorophyll-a, water clarity-Secchi and total nitrogen) individually do show improving water quality at stations 5 and 6 (particularly at Station 6 nearest the landfill) in 2012-2020 compared to 2010, particularly striking are the declining TN levels in 8 of the last 9 years. A recent Town supported benthic animal analysis parallels and underscores the water quality improvements.

**Sesachacha Pond** is a closed coastal salt pond that has its water quality managed by periodically breaching the barrier beach to open the basin to tidal exchange with the adjacent Atlantic Ocean waters. Sesachacha Pond was evaluated under the Massachusetts Estuaries Project (MEP) which recommended an additional mid-summertime opening (if logistically possible) as part of the pond management strategy to enhance flushing of the pond and improve water quality to reach the threshold without any need for infrastructure. The water quality monitoring program in 2010, 2012 and 2013 showed that the pond nitrogen levels were converging on the MEP Threshold (0.60 mg/L total nitrogen). Improved openings resulted in total nitrogen (TN) levels dropping significantly from historical levels in 2010 and 2012 with associated improvements in water clarity and the level of phytoplankton biomass as chlorophyll-a. However, with limited openings in 2014-2017, TN has risen and has returned to near historic levels (~0.9 mg/L), with an improvement in 2018 (0.752 mg N/L), and with continuing impaired conditions in 2019 but with a significant drop in 2020 (<0.68 mg N/L). It appears that these changes relate primarily to the quality of the pre-summer opening. Given the 2010-2013 period and recently when robust openings occurred, suggests that a solid opening program has the capability to improve water quality metrics pond-wide to levels near the TMDL nitrogen threshold. In 2020 the openings shifted from spring to fall in an attempt to make openings more manageable. The following summer 2021, TN levels rose sharply (1.016 mg N/L to near MEP levels) with the parallel occurrence of a large phytoplankton bloom. Whether or not the new opening plan is linked to the 2021 result will be tracked in the coming year.

Based upon the Index alone, changes in water quality in Sesachacha Pond over the 2010-2013 period were stabilized at a moderate level of impairment of this estuary, with more recent monitoring 2015-2017 seeing a trend toward poor water quality conditions. However, in 2020 water quality was less impaired than in the prior 10 years, but will likely show continued interannual variation (which it did in the 2021 decline), until an opening protocol can be perfected (which the Town is working on). It appears that like other periodically opened ponds, the quality of the opening (amount of water exchanged) controls the level of water quality in the following months. A closer examination of the opening protocol and the linkage to resultant water quality is needed for management of this system.

**Hummock Pond** is a closed coastal salt pond that is only periodically opened to the ocean to flush out nutrients and organic matter on the ebb tide and receive low nutrient saline waters on the flood tide. Creating sustained openings that are sufficient to allow exchange of tidal waters for more than 4-5 days has been difficult for this system due to its location on the coast and the large amount of sand migration in the coastal zone which can rapidly reseal the inlet.

The present non-tidal state and level of watershed nutrient inputs have resulted in moderate to poor nutrient related water quality throughout the pond, with poor water quality conditions the present norm (2005-2007, 2010, 2012, 2013, 2014, 2015). Unfortunately, in 2016 the pond appears to have had lower water quality in its upper and mid reaches than in previous years, although the lower basin did not show this inter-annual variation. Similarly, in 2017 and 2018 water quality declined even further throughout most of the estuary, including the lower basin. This resulted from the poor spring 2017 and 2018 openings. There is generally a small gradient in water quality with moderate to poor conditions near the ocean and poor conditions in the uppermost basins, but this collapsed to generally poor water quality throughout the system in 2017, 2018 and 2019. However, in 2020 and 2021, while still moderately impaired water quality was found, the Health Index showed the best water quality in all but the upper basin over the monitoring period. None-the-less, all of the metrics are consistent with a nutrient impaired basin in all years. Based upon the monitoring results it is clear that the nutrient related health of Hummock Pond is significantly related to the success of its periodic openings and that the pond is presently significantly impaired by nitrogen enrichment.

**Miacomet Pond** is a closed coastal salt/fresh pond that has not experienced significant tidal exchange for over a decade. The result has been a build-up of nutrients and organic matter resulting in a highly eutrophic system. As a result of the lack of tidal flow and continuous groundwater inputs, the pond is presently freshwater, with salinity levels in each of the past 8 years of monitoring of <0.5 PSU, reaching a low of 0.1 PSU, 2015-2017. The present non-tidal state and extent of watershed nutrient inputs has resulted in a decline in nutrient related water and habitat quality throughout the pond for both nitrogen and phosphorus, with poor water quality and habitat impairment the norm as again seen in 2020 and 2021. All of the metrics for Miacomet Pond are consistent with a highly nutrient impaired basin. However, as the freshening of this basin has become complete and sustained, it likely will have to be managed as a transitional freshwater system and will need to be reassessed as such. Since Miacomet Pond may have storm over-wash in the future due to climate change related storm intensification and sea level rise, it may be necessary for management to create both a nitrogen and a phosphorus budget for this system and to conduct short-term incubations to determine which nutrient is controlling pond health under present and varying salinity conditions. It is likely that regions of the pond may be sensitive to both nitrogen and phosphorus, such that overall both nutrients need to be monitored and considered for management of Miacomet Pond, although phosphorus management is clearly needed at this time. There is no evidence that Miacomet Pond will improve without management action(s).

Table ES-1. Summary of present status and trends of water/habitat quality of estuaries of Nantucket based on the long-term water quality monitoring data reconciled against historic data and MEP nutrient threshold analyses undertaken for each system except Miacomet Pond. A TMDL for Hummock Pond has not yet been released by MassDEP. The trends in the table for Long Pond and Sesachacha Pond need to be interpreted as multi-year, since in 2021 these ponds showed a modest increase in water quality impairment.

| Summary of Present Status and Trend of Water Quality in Nantucket's Estuaries |                |            |                        |           |                             |
|-------------------------------------------------------------------------------|----------------|------------|------------------------|-----------|-----------------------------|
| Estuary                                                                       | Type           | TMDL       | Status                 | Trend     | Remedial Actions            |
| Madaket Harbor                                                                | Marine         | In Place   | Approaching N Target   | Improving | Landfill Remediation        |
| Long Pond                                                                     | Brackish       | In Place   | Approaching N Target   | Improving | Landfill Remediation        |
| Nantucket Harbor - Polpis Harbor                                              | Marine         | In Place   | Approaching N Target   | Improving | New Jetties, Planned Sewers |
| Sesachacha Pond                                                               | Brackish       | In Place   | Moderate Improvement   | Variable  | Targeted opening            |
| Hummock Pond                                                                  | Brackish/Fresh | In Place?? | Significantly Impaired | Variable  | Targeted opening            |
| Miacomet Pond                                                                 | Fresh          | None       | Significantly Impaired | Unchanged | Unknown                     |

Overall, the water quality trends in Nantucket's major estuaries have been positive over the past 5-10 years. Nantucket Harbor, Long Pond and Sesachacha Pond are showing improvements and are approaching their TMDL targets to meet restoration goals. Madaket Harbor is supporting high water and habitat quality and is stable. Only Hummock and Miacomet Ponds are having significant ecological health issues. Hummock Pond has been very difficult to flush significantly with annual openings. As a result water quality is impaired and also the salinity is low, in 2014-2016 salinities in the lower basin (HUM-1,3,5) were 6-7 ppt. But in 2017 salinity dropped to <4 PSU due a low flushing opening. The salinity as increased slightly ~5 ppt from 2018-2020 with <4 PSU in the upper reaches (HUM-7 & 8). This is still low for maintaining Hummock Pond as a brackish water estuary. Historically levels have been ~8 PSU, so there is some concern about potential species changes, however salinity decline is relatively slow so there is still time to reset the salinity. Miacomet Pond provides evidence of the need to maintain salinity in Hummock Pond. Miacomet Pond has not been opened for more than a decade and the pond is now freshwater and has been for several years. Miacomet Pond is currently highly eutrophic and supports degraded water and habitat quality. Miacomet appears to need phosphorus management with periodic needs for nitrogen and phosphorus management in most years including 2020. Given the temporal record, it does not appear that Miacomet Pond will improve without implementation of management actions.

**Monitoring and Specific Results:** The Technical Memorandum on the 2021 Nantucket Water Quality Monitoring Program is organized consistent with previous SMAST water quality monitoring summaries (2010 and 2012 - 2018) but as in 2019 and 2020, the summary memo is now focused more on temporal trends while still allowing comparisons to data from the previous years of monitoring. However, the bulk of the prior data tables that were summarized in previous reports on the 2012 to 2018 field seasons are not repeated again here. Similarly, as in prior annual reports, the 2021 summary does not include an overview of the program or the summary of the sampling approach as these have not changed from previous years, instead they are included by reference. This tech memo does include the 2020 summary tables for quick comparison to 2021 results as well as synthesis of results in tabular and graphical form which includes all data collected under this program from its inception (2010 and 2012 - 2021). The 2021 summary is focused specifically on the following:

1. Results of Sampling: Summary of Water Quality Results

Nantucket Harbor

Madaket Harbor  
Long Pond  
Hummock Pond  
Miacomet Pond  
Sesachacha Pond  
Polpis Harbor Streams  
Oyster Aquaculture Potential Sites

2. Trophic State: Water Quality/Eutrophication Status
3. Recommendations for Future Monitoring (see last page of report)

As in previous years, the 2021 water quality monitoring of Nantucket's fresh and saltwater systems was focused on summer-time conditions, as the warmer months typically have the lowest water quality conditions, hence are the critical period for resource management. As in previous years (2010, 2012-2020), the 2021 approach utilized the same sample collection and analysis approach for assessing the water quality of each of the estuaries of Nantucket. This consistency is intended to maximize the value of the results by making the data perfectly cross-comparable to water quality monitoring data collected across the Island of Nantucket from previous years and to previous Massachusetts Estuaries Project results for Nantucket estuaries as well as more broadly to estuaries throughout the region (Cape Cod, Martha's Vineyard). In this manner, inter-ecosystem comparisons can be made to better assess system health/impairment and function and to formulate appropriate nutrient management strategies. This allows individual towns such as Nantucket to directly benefit from lessons learned throughout the wider region. It should be noted that in 2021 (as was the case in 2020 and 2019), compliance monitoring samples were collected from sentinel locations in Nantucket Harbor, Sesachacha Pond and Madaket Harbor as established under the Massachusetts Estuaries Project.

As in past years, UMD-SMAST Coastal Systems Program (CSP) scientists focused primarily on the analysis of samples collected from the field effort (led by Thaïs Fournier, Nantucket NRD) and the associated data analysis, and overall program coordination. The Nantucket Natural Resources Department staff primarily focused on coordination of field efforts, field sampling and data collection on physical parameters and water quality improvement efforts.

The goals of the monitoring program remain unchanged from previous years, primarily to:

1. determine the present (2021) ecological health of each of the main salt ponds and estuaries within the Town of Nantucket,
2. gauge (as historical data allows) the decline or recovery of various salt ponds and embayments over the long-term (also part of TMDL compliance), and
3. provide the foundation (and context) for development of potential alternatives for nutrient and resource management and provide quantitative measures of success.

This latter point (3) is critical for restoration planning should a system be found to be impaired or trending toward impairment, which requires targeted management actions for restoration.

As was the case in 2010, 2012-2020 sampling efforts, the 2021 sampling program focused on the summer/early fall months (June - September, a few samples collected in October and November for Sesachacha and Hummock Ponds were not included in the summer average concentration calculation). Additional monitoring of the openings of Sesachacha Pond and Hummock Pond were NOT continued in 2020 and 2021 as openings did not occur in spring but in fall after the monitoring season. However, a detailed plan for refining pond openings was developed for future implementation.

Water samples were collected from each of Nantucket's 6 estuarine systems (Figures 1-6) on multiple dates ("events") in 2021 following the schedule presented in Table 1. Samples were obtained from the same sampling station locations and the same depths as in previous years to maximize cross comparability and to gauge temporal changes. It should be noted that the Town of Nantucket did undertake water quality monitoring in 2011, however, those samples were analyzed by a lab other than the Coastal Systems Analytical Facility at the UMASS School for Marine Science and Technology. The 2011 water quality data were presented in tabular form in Appendix A in Annual Technical Memoranda of 2012 and 2013 and are not being reproduced again herein.

As in all previous years, the physical/environmental parameters measured in the estuaries during the 2021 sampling season included: total depth, Secchi depth (light penetration), temperature, conductivity/salinity (YSI meter), general weather (rain, cloudiness, etc.), wind force and direction, dissolved oxygen levels and observations of moorings, birds, shell fishing and unusual events (fish kills, algal blooms, etc.). Laboratory analyses of estuarine waters included: salinity, nitrate + nitrite, ammonium, dissolved organic nitrogen, particulate organic carbon and nitrogen, chlorophyll-a and pheophytin-a and orthophosphate. As initiated in the summer of 2015, the estuarine water quality monitoring undertaken in 2016-2021 included an additional 3 stream locations. During the summer 2016 season, stream station STA-3 was dropped due to no flow and a station STA-4a was added to clarify water quality conditions in the stream outflow associated with cranberry bogs up-gradient of STA-4. In 2017-2018 a fourth stream station was added (WPH outlet) to directly measure flow and nutrient load into Western basin of Polpis Harbor. In 2019, 2020 & 2021 stream sampling took place at 3 stations: STA-4, STA-6B and WPH outlet, however, these samplings were not paired with flow measurements to be able to calculate nutrient load to Polpis Harbor.

In 2020, 31 field duplicates (10% of the total number of samples collected {n=325}) were taken as part of the field sampling protocol for QA analysis. Data were compiled and reviewed by the laboratory for accuracy and evaluated to discern any possible artifacts caused by improper sampling technique, physical disturbance, etc. In addition, some samples were rerun to confirm initial results.

The Town of Nantucket has been working for decades to protect and more recently restore its nitrogen impaired estuaries and their aquatic resources. At present, activities to lower nitrogen enrichment and its negative impacts to water and habitat quality are ongoing in 4 estuarine systems: Nantucket Harbor (jetties and sewers), Madaket/Long Pond (landfill and possible dredging), Sesachacha Pond (openings), Hummock Pond (refined opening protocol). In addition, all of the Town's estuaries should benefit from the recent fertilizer application by-law. As a result, it is anticipated that the efficacy of these management activities should be seen in the on-going monitoring results.

Summer 2021 like 2020 and 2019, appears to have sustained high water quality for the Nantucket Harbor system as a whole, albeit with a couple stations showing inter-annual variability (2021 embayment wide TN average of 0.36 mg/L, 2020 = 0.34 mg/L, 2019 = 0.34

mg/L, 2018 = 0.31 mg/L, 2017 = 0.35 mg/L, 2016 = 0.35 mg/L, 2015 = 0.37 mg/L). Madaket Harbor is similar to Nantucket Harbor in that it generally supports high water quality and is flushed with high quality low nitrogen offshore waters. There is typically a gradual nitrogen gradient from Hither Creek (MH-1) into the main basin (MH-2 and MH-3) with lowest levels near the offshore boundary (MH-4). In 2021, as was also the case in 2020 only the levels in Hither Creek exceeded the TMDL target level (0.45 mg TN/L), which was also the case in 2019. However, there has been a reduction in TN levels, as 2 of the last 6 years met the TN threshold for Hither Creek. The Long Pond tributary embayment to Madaket Harbor remains moderately impaired but improved over the past decade as seen in the 2020 results, however, both TN and total pigment levels were noticeably elevated in 2021 (similar to 2017) which also impacted Hither Creek on ebbing tides. It appears that there was a large phytoplankton bloom in upper Long Pond in 2021 that had not occurred in the past 5 years. The 2021 bloom also effected Hither Creek which receives Long Pond water on the ebbing tides. However, overall it appears that the Town's management of the landfill, has generally reduced the nitrogen load from this source with the associated observed lowering of TN levels in Long Pond over the previous 6 years. The 2021 results raise the question of whether this is the result of inter-annual variation, possibly due to high rainfall, of a possible shift due to a possible change in tidal "flushing" of Long Pond, offsetting the watershed load reduction.

While still small, the water quality Index for Long Pond has been generally showing improvement 2015-2020 in response to the lower TN levels although the basin remains impaired. TN levels in 2015-2017 and 2018-2020 were almost half that of historical and 2010 measurements although they still show inter-annual variations as 2019 TN values were slightly higher (0.63 mg/L TN) compared to 2018 (0.59 mg/L TN) and 2020 TN levels were 0.502 – 0.55 mg N/L a marked improvement. In 2021 levels increased noticeably over 2020 conditions with TN concentration ranging from 0.710 - 0.822 mg/L. While continued monitoring will determine the final level of improvement as the system reaches a new equilibrium, it does appear that the reduction in N loading is occurring with beneficial effects. If TN levels stabilize at 2018-2020 levels, the TN - target in the TMDL may be achieved with steady N-load reduction as well as maintenance of effective flow out of Long Pond to Madaket Ditch and Hither Creek.

Long Pond has seen variable but modest improvements due to a general decline in estuary wide TN concentrations compared to historic levels (0.766 mg/L, 0.528 mg/L, 0.630 mg/L and 0.587 mg/L in 2021, 2020, 2019 and 2018, respectively), although, in 2021 TN levels increased possibly due to inter-annual variation or a change in flow. In contrast, Hummock Pond water quality appears to have remained generally poor. Overall water quality was highest in 2015 due to a successful pond opening (TN = 0.58 mg/L) but became poor again and has remained fair to poor (2021, 2020, 2019, 2018, 2017 and 2016 with embayment wide average TN levels remaining high at 0.80, 0.83, 0.88, 0.83, 1.01 and 0.80 mg/L, respectively). The variations in TN levels result primarily from opening success, for instance in spring 2017 the opening was only 1.5 days with high precipitation, although the spring opening in 2016 was comparable to the duration of the opening in 2015 (18 days and 15 days respectively). Miacomet Pond, which is now functionally a eutrophic freshwater pond, is eutrophic with 2021 chlorophyll pigment levels averaging 29.6 ug/L, TN = 1.34 mg/L (2020: 15.1 ug/L, TN = 1.30 mg/L, 2019: 23.9 ug/L, TN =

0.935 mg/L) and TP = 99 ug/L (2020: TP = 94 ug/L, 2019: TP = 127 ug/L) <sup>1</sup> (TP is more than 6 fold higher than in high quality freshwater systems). Water Quality in Sesachacha Pond (like Hummock Pond) appears to be directly related to the efficacy of its seasonal openings. Water quality in 2010, 2012, 2013 (mean TN = 0.671 mg/L, Chla = 5.5 ug/L) was significantly improved over the levels observed previously in the MEP analysis. The lower TN levels in Sesachacha Pond (2010-2013) versus historic levels documented by the MEP indicated improvement of pond resources most likely due to modified breaching of the pond as recommended by the MEP analysis. Since there was no major shift in nitrogen loading within the Sesachacha Pond watershed during that period of improvement, it is almost certain that the amount of tidal flushing during a given artificial breaching drives the variability in the observed summer TN level. The rise in TN observed during the 2014 sampling suggests that a limited inlet opening may have occurred in spring 2014, as it is unlikely a significant change in the watershed load occurred to drive the increase in TN from one summer to the next. Short openings in subsequent years (2015 {5 days}, 2016 {3 days}, 2017 {7 days}) suggests that inlet opening efficacy has a significant effect on pond water quality as TN concentrations from 2014 to 2017 have steadily increased to nearly the same level as when the MEP analysis was completed. In 2014-2017 water quality has declined (mean TN = 0.933 mg/L, Chla = 8.4 ug/L) and is again approaching MEP levels of enrichment. The amount of flushing with the openings is reflected in the significantly higher salinities in 2010-2013 versus 2014-2017, 17.9 PSU and 11.6 PSU, respectively. Higher salinities reflect greater exchange during open periods which is correlated with lower TN and total chlorophyll a levels. The 2018 and 2019 water quality analysis confirmed that the pond remains impaired but did show a mild improvement (TN = 0.752 and 0.840 mg/L and Chla = 13.9 and 8.9 ug/L, respectively) likely due to improved openings. The 2020 water quality analysis confirmed that the pond appears to be improving compared to previous years (TN = 0.673 and Chla = 3.4 ug/L) and is approaching the MEP Threshold of <0.60 mg/L TN. In 2021, there was a large increase in TN levels and a large phytoplankton bloom (total pigment levels averaged 18.8 ug/L), noticeably higher than in 2020 and nearly the same or higher than in 2016. System wide average TN concentration in 2021 rose to 1.03 mg/L, well above recent years and the <0.60 mg/L TN threshold set by the MEP. The shift from opening in spring to opening in fall in 2020 and 2021 might be associated with the 2021 shift to higher TN with associated blooms compared to the long-term trend. Whether the shift to fall openings or just the duration of openings in 2020 and 2021 are related to this decline in water quality in 2021, the salinity data supports the contention that tidal exchange prior to summers 2020 and 2021 were less than in prior years as the salinity was only ~7 PSU in these years versus >11 PSU in prior years.

The important role of the pond openings is further supported by the fact that average TN concentration in Sesachacha Pond was higher (1.00 mg/L TN) in 2016 which received a 3-day opening compared to average TN concentrations observed in 2017 (0.88 mg/L TN) given a 7-day opening. These results indicate that the level of water quality observed in Sesachacha Pond since 2014 does respond positively if sufficient flushing can be maintained. The effect of improved pond flushing is discussed in detail in the MEP Sesachacha Pond Nutrient Threshold Report submitted to the Town of Nantucket in 2006 and cannot be over emphasized.

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<sup>1</sup> Total Phosphorus levels in freshwater ponds/lakes on Cape Cod with high water and habitat quality general have TP <20 ug/L)

**Table 1.** Sampling Schedule for 2021 Nantucket Water Quality Monitoring Program. It should be noted that in some instance not all stations were sampled on all dates.

| MONTH               | SAMPLE DATES (summer 2021) |                |           |                 |               |              |                |              |
|---------------------|----------------------------|----------------|-----------|-----------------|---------------|--------------|----------------|--------------|
|                     | Nantucket Harbor           | Madaket Harbor | Long Pond | Sesachacha Pond | Miacomet Pond | Hummock Pond | Polpis Streams | Oyster Sites |
| January             |                            |                |           |                 |               |              |                |              |
| February            |                            |                |           |                 |               |              |                |              |
| March               |                            |                |           | 18,31           |               | 31           |                |              |
| April               |                            |                |           |                 |               | 20           |                |              |
| May                 |                            |                |           |                 |               |              |                |              |
| June                | 15                         | 2              | 1         | 3               | 10            | 1            | 17             | 15           |
| July                | 14                         | 1,28           | 15        | 20              | 20            | 15           | 21             | 28           |
| August              | 12                         | 25,30          | 24        | 11              | 11            | 24           | 5              | 12           |
| September           | 9                          | 14,27          | 1         | 30              | 30            | 1            | 13             | 9            |
| October             |                            |                |           | 21              |               | 21           |                |              |
| November            |                            |                |           | 15              |               | 15           |                |              |
| December            |                            |                |           |                 |               |              |                |              |
| <b>Total Events</b> | 4                          | 7              | 4         | 8               | 4             | 8            | 4              | 4            |

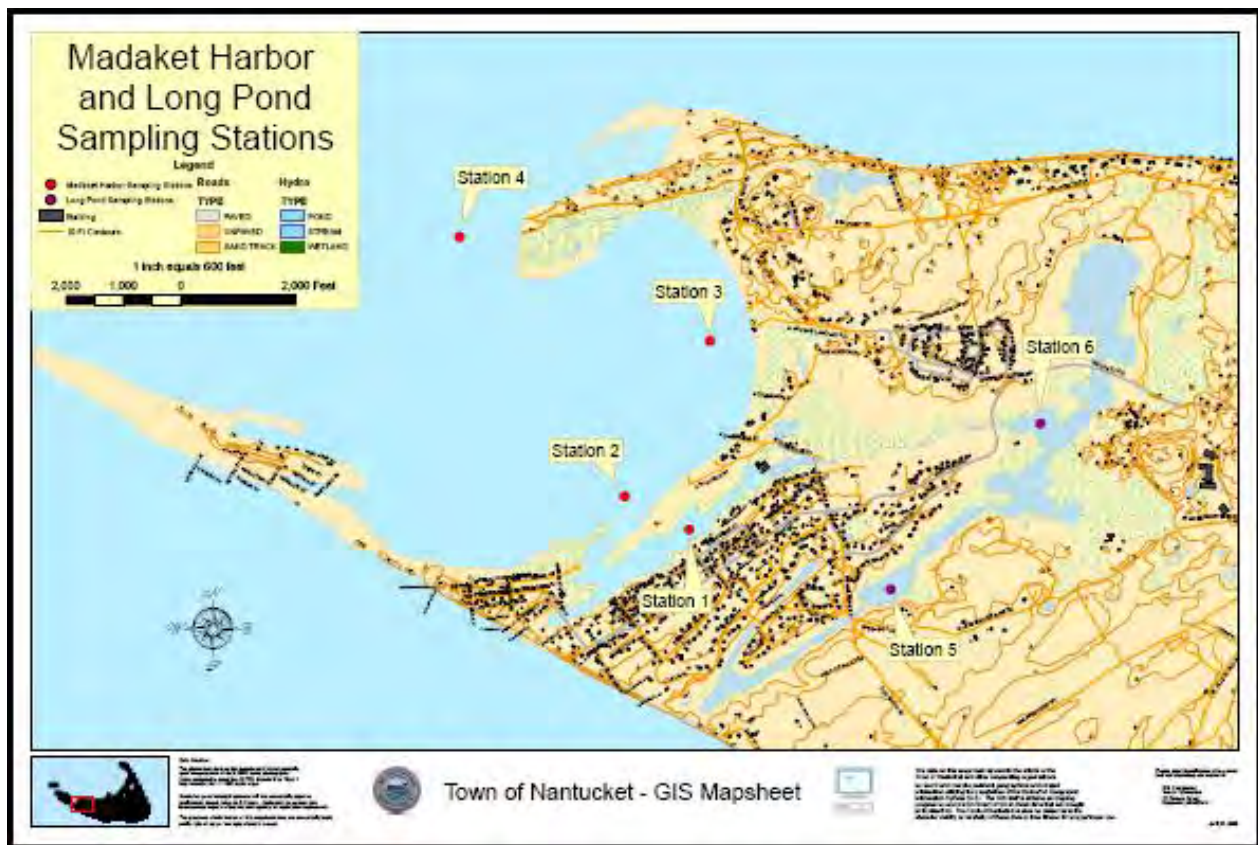


**Figure 1.** Madaket Harbor and Long Pond sampling stations 2010 and 2012- 2021.



**Figure 2.** Nantucket Harbor sampling stations 2021. Station NAN-8 (the cut) was only sampled in 2010 and location changed in 2011 - 2021. Nantucket Harbor and Polpis Harbor each have nitrogen thresholds in the MassDEP/USEPA TMDL for this system.

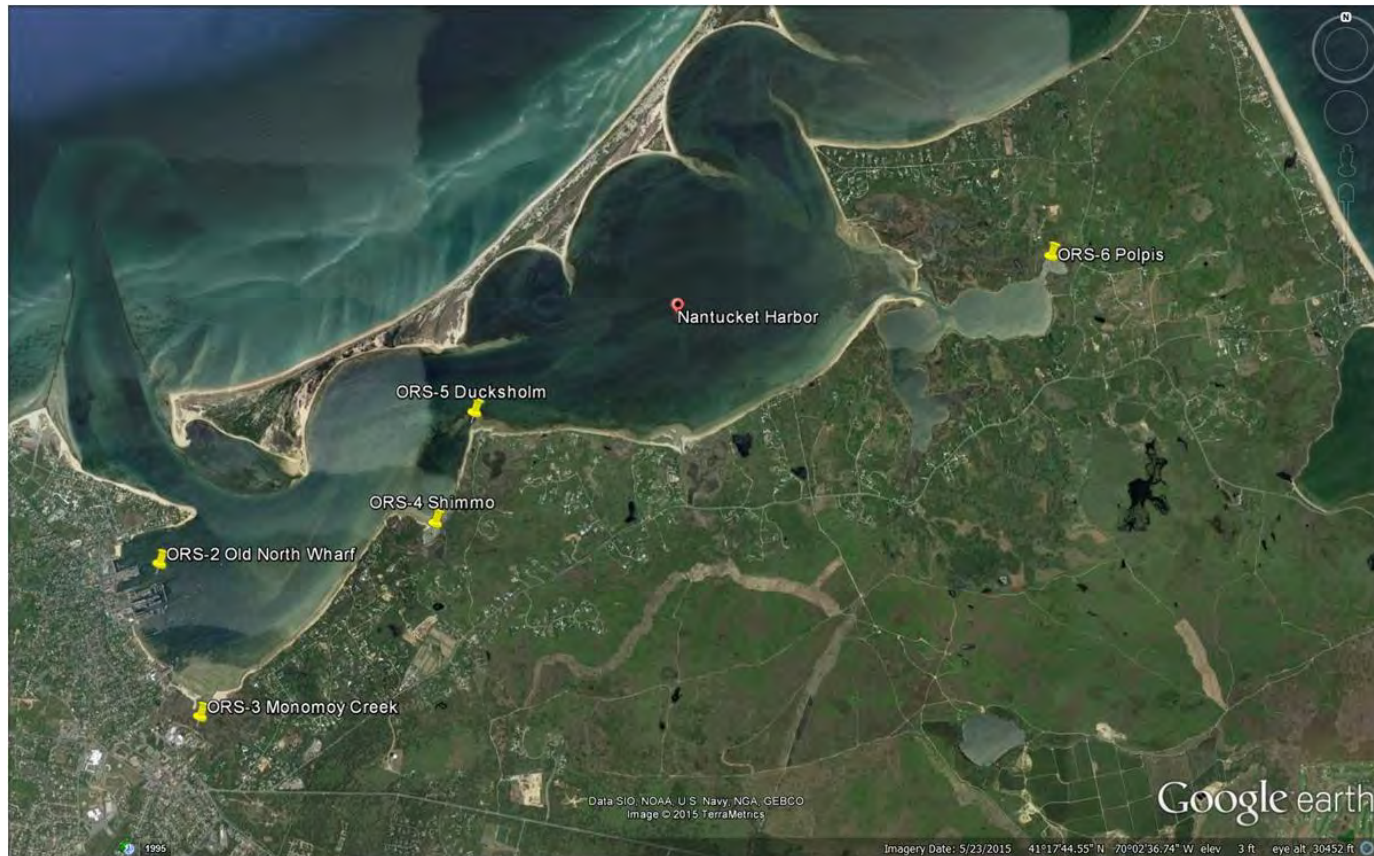


Figure 2a. Sampling locations associated with potential oyster aquaculture deployments in Nantucket Harbor (ORS-2,3,4,5,6) sampled in 2015. ORS-2,4,6 sampled in 2016, 2017, 2018, 2019, 2020 and 2021. Sites are associated with possible oyster aquaculture areas (yellow pins). ORS4 was the selected reef location and reef construction began in June 2017. Spat on shell was deployed in the Fall 2017.





**Figure 4.** Hummock Pond sampling stations 2010 and 2012- 2021. Station 7 is in Head of Hummock, a kettle pond connected by an artificial channel to the estuary with limited exchange from Station 7 to Station 8.



**Figure 5.** Miacomet Pond sampling stations 2010 and 2012- 2021. Miacomet Pond is currently functioning as a highly phosphorus enriched and impaired fresh pond.



**Figure 6.** Polpis Harbor Stream Sampling locations shown in yellow pins (ST-4, 4A, 6B) sampled in 2016-2017. WPH-outlet stream site sampled in 2017-2018. Sampling in 2019, 2020 and 2021 was of ST-4, 6B and WPH. Water samples from mid depth in water exiting culverts.



**Figure 6a.** Polpis Harbor Stream Sampling locations (ST-4, 4A, 6B and WPH-outlet) relative to estimated direction of flow as determined by the Town of Nantucket.

**Table 2a.** Summary of Water Quality Parameters, **2021** Nantucket Sampling Program. Values are Station Averages of all sampling events, June-September for sampling sites. Station NAN-2A is the MEP sentinel location for monitoring in Nantucket Harbor. NAN-2A is a new station that was first sampled in 2016 and is in a different location than NAN-2. It should be noted that in 2019 and 2018, TP was only evaluated at sites dominated by freshwater: Sesachacha Pond, Hummock Pond, Long Pond, Miacomet Pond and stream because of the low salinity values in those closed ponds and the possibility that the Miacomet system maybe phosphorous limited rather than nitrogen limited. Further study should investigate the possibility of P-limitation and TP paired with salinity should continue to be monitored during the summer 2022 field season.

| 2021                       |           | Secchi   | Secchi  | 20% Low | 20% Low |          | Avg.   | Avg.   | Avg.   | Avg.   | Avg.   | Avg.   | Avg.    | Avg.   | Avg.   | Avg.   | Avg.    | Avg.    | Chla/T-Pig | Avg.      | Avg.   |
|----------------------------|-----------|----------|---------|---------|---------|----------|--------|--------|--------|--------|--------|--------|---------|--------|--------|--------|---------|---------|------------|-----------|--------|
| Embayment                  |           | average  | Depth   | Field   | Field   | Salinity | PO4    | NH4    | Nox    | DIN    | DON    | TDN    | POC     | PON    | TON    | TN     | Chla    | Phaeo   | Ratio      | Total Pig | TP     |
|                            | Sample ID | (meters) | % of WC | Sat     | Sat     | (ppt)    | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L)  | (mg/L) | (mg/L) | (mg/L) | (ug/L)  | (ug/L)  |            | (ug/L)    | (mg/L) |
|                            |           |          |         | (mg/L)  | (% sat) |          |        |        |        |        |        |        |         |        |        |        |         |         |            |           |        |
| HUMMOCK POND               | HUM 7     | 0.8125   | 0.2245  | 4.4825  | 0.5375  | 8.8000   | 0.0998 | 0.2373 | 0.0723 | 0.3096 | 0.4802 | 0.7897 | 3.0035  | 0.6101 | 1.0670 | 1.3765 | 37.4474 | 17.0512 | 0.5479     | 54.4986   | 0.1983 |
| HUMMOCK POND               | HUM 8     | 0.6000   | 0.4643  | 7.4010  | 0.9213  | 9.8000   | 0.0223 | 0.0093 | 0.0028 | 0.0120 | 0.5191 | 0.5311 | 1.9493  | 0.3017 | 0.8208 | 0.8328 | 13.8026 | 11.5271 | 0.5354     | 25.3297   | 0.0733 |
| HUMMOCK POND               | HUM 5     | 1.1231   | 0.5493  | 6.6017  | 0.8296  | 7.8000   | 0.0148 | 0.0097 | 0.0090 | 0.0188 | 0.3575 | 0.3763 | 1.3204  | 0.1944 | 0.5520 | 0.5707 | 9.5922  | 8.8200  | 0.4700     | 18.4122   | 0.0680 |
| HUMMOCK POND               | HUM 3     | 1.0923   | 0.5703  | 7.7970  | 0.9812  | 6.8000   | 0.0150 | 0.0036 | 0.0041 | 0.0078 | 0.3901 | 0.3978 | 1.2207  | 0.1882 | 0.5783 | 0.5861 | 9.2176  | 5.3497  | 0.6080     | 14.5673   | 0.0515 |
| HUMMOCK POND               | HUM1      | 1.2423   | 0.4408  | 5.9699  | 0.7318  | 5.8000   | 0.0156 | 0.0065 | 0.0041 | 0.0106 | 0.4132 | 0.4238 | 1.5523  | 0.2278 | 0.6410 | 0.6515 | 8.3640  | 6.0692  | 0.5545     | 14.4333   | 0.0587 |
| LONG POND                  | LONG 6    | 0.9200   | 0.9200  | 3.5477  | 0.4829  | 11.8000  | 0.0802 | 0.0366 | 0.0116 | 0.0482 | 0.5223 | 0.5705 | 1.4047  | 0.2510 | 0.7733 | 0.8215 | 11.4487 | 9.9714  | 0.5271     | 21.4202   | 0.1772 |
| LONG POND                  | LONG 5    | 0.9750   | 0.8170  | 4.4832  | 0.4841  | 10.8000  | 0.2558 | 0.0192 | 0.0073 | 0.0265 | 0.3807 | 0.4072 | 1.8362  | 0.3025 | 0.6832 | 0.7097 | 12.8517 | 11.6397 | 0.6054     | 24.4913   | 0.3000 |
| MADAKET HARBOR             | MH1       | 1.7412   | 0.8394  | 4.6260  | 0.6608  | 12.8000  | 0.0336 | 0.0676 | 0.0183 | 0.0859 | 0.3350 | 0.4209 | 1.2951  | 0.2175 | 0.5525 | 0.6384 | 7.7961  | 6.3641  | 0.5278     | 14.1602   | ND     |
| MADAKET HARBOR             | MH2       | 1.8667   | 1.0000  | 5.6503  | 0.8094  | 13.8000  | 0.0144 | 0.0377 | 0.0072 | 0.0449 | 0.1866 | 0.2315 | 0.6790  | 0.0989 | 0.2856 | 0.3305 | 1.7671  | 2.2849  | 0.4442     | 4.0520    | ND     |
| MADAKET HARBOR             | MH3       | 2.4200   | 1.0000  | 5.5509  | 0.7801  | 14.8000  | 0.0108 | 0.0130 | 0.0031 | 0.0161 | 0.2048 | 0.2209 | 0.5599  | 0.0966 | 0.3014 | 0.3175 | 1.9218  | 2.0950  | 0.5003     | 4.0168    | ND     |
| MADAKET HARBOR             | MH4       | 2.8000   | 0.8875  | 5.8960  | 0.8211  | 15.8000  | 0.0137 | 0.0118 | 0.0036 | 0.0154 | 0.1796 | 0.1951 | 0.4038  | 0.0754 | 0.2550 | 0.2705 | 2.1685  | 1.4416  | 0.5693     | 3.6101    | ND     |
| MIACOMET POND              | MP3       | 0.5750   | 0.4555  | 5.6685  | 0.6689  | 18.8000  | 0.0478 | 0.1136 | 0.0262 | 0.1398 | 0.5855 | 0.7253 | 4.1582  | 0.8074 | 1.3928 | 1.5327 | 39.8316 | 48.4502 | 0.4344     | 88.2818   | 0.1914 |
| MIACOMET POND              | MP1       | 1.1222   | 0.7045  | 6.0622  | 0.6597  | 16.8000  | 0.0057 | 0.0566 | 0.0136 | 0.0702 | 0.6364 | 0.7066 | 2.3558  | 0.4003 | 1.1659 | 1.2362 | 21.7084 | 20.2836 | 0.4533     | 41.9920   | 0.0574 |
| MIACOMET POND              | MP2       | 1.4867   | 0.5261  | 6.8623  | 0.8156  | 17.8000  | 0.0053 | 0.0506 | 0.0267 | 0.0773 | 0.7069 | 0.7842 | 2.7933  | 0.4635 | 1.1703 | 1.2476 | 27.3618 | 13.5394 | 0.4822     | 40.9012   | 0.0491 |
| NANTUCKET HARBOR           | NAN1      | 3.2769   | 0.5993  | 5.3907  | 0.7613  | 19.8000  | 0.0168 | 0.0212 | 0.0058 | 0.0270 | 0.1913 | 0.2183 | 0.6701  | 0.0906 | 0.2820 | 0.3090 | 2.1678  | 1.9580  | 0.5922     | 4.1258    | ND     |
| NANTUCKET HARBOR           | NAN2      | 2.5538   | 0.6166  | 5.5987  | 0.8009  | 20.8000  | 0.0210 | 0.0183 | 0.0050 | 0.0233 | 0.2020 | 0.2252 | 0.5948  | 0.0929 | 0.2949 | 0.3182 | 4.3787  | 1.9144  | 0.7273     | 6.2931    | ND     |
| NANTUCKET HARBOR           | NAN2A     | 2.3625   | 0.4375  | 5.3362  | 0.7619  | 21.8000  | 0.0289 | 0.0167 | 0.0069 | 0.0236 | 0.2449 | 0.2685 | 0.7210  | 0.1030 | 0.3479 | 0.3715 | 5.0801  | 3.7090  | 0.5810     | 8.7891    | ND     |
| NANTUCKET HARBOR           | NAN3      | 2.0000   | 0.3323  | 5.5982  | 0.8010  | 22.8000  | 0.0256 | 0.0196 | 0.0042 | 0.0238 | 0.3112 | 0.3350 | 0.8196  | 0.1197 | 0.4500 | 0.4738 | 11.2895 | 4.1966  | 0.7560     | 15.4860   | ND     |
| NANTUCKET HARBOR           | NAN4      | 3.1857   | 0.6609  | 5.9633  | 0.8012  | 23.8000  | 0.0172 | 0.0338 | 0.0031 | 0.0369 | 0.1386 | 0.1754 | 0.6181  | 0.0780 | 0.2166 | 0.2534 | 3.8326  | 2.1801  | 0.7189     | 6.0128    | ND     |
| NANTUCKET HARBOR           | NAN5      | 1.8500   | 0.8893  | 4.9685  | 0.7153  | 24.8000  | 0.0203 | 0.0176 | 0.0051 | 0.0227 | 0.2176 | 0.2402 | 0.8458  | 0.1434 | 0.3610 | 0.3836 | 6.2183  | 2.9189  | 0.6792     | 9.1372    | ND     |
| NANTUCKET HARBOR           | NAN6      | 2.2925   | 0.9374  | 5.1745  | 0.7406  | 25.8000  | 0.0242 | 0.0197 | 0.0073 | 0.0270 | 0.2306 | 0.2576 | 0.8114  | 0.1186 | 0.3492 | 0.3762 | 4.8553  | 3.3121  | 0.6060     | 8.1674    | ND     |
| NANTUCKET HARBOR           | NAN7      | 1.9077   | 0.8898  | 5.7182  | 0.8142  | 26.8000  | 0.0188 | 0.0234 | 0.0073 | 0.0307 | 0.1667 | 0.1974 | 1.1317  | 0.1477 | 0.3143 | 0.3450 | 4.3054  | 2.4579  | 0.6435     | 6.7633    | ND     |
| NANTUCKET HARBOR           | NAN8N     | 1.4000   | 1.0000  | 5.3855  | 0.7701  | 27.8000  | 0.0156 | 0.0045 | 0.0005 | 0.0050 | 0.2123 | 0.2173 | 0.4885  | 0.0648 | 0.2771 | 0.2821 | 2.0968  | 1.2793  | 0.6608     | 3.3761    | ND     |
| Nantucket Hrb. Stream Site | ST4       | 0.3507   | 1.3333  | ND      | ND      | 28.8000  | 0.0338 | 0.0216 | 0.0015 | 0.0231 | 0.6175 | 0.6406 | 42.4021 | 1.9817 | 2.5992 | 2.6223 | ND      | ND      | ND         | ND        | 0.1970 |
| Nantucket Hrb. Stream Site | ST6B      | 0.4000   | 1.3333  | ND      | ND      | 29.8000  | 0.0350 | 0.0132 | 0.0025 | 0.0157 | 0.7231 | 0.7388 | 16.9379 | 0.8258 | 1.5489 | 1.5646 | ND      | ND      | ND         | ND        | 0.1781 |
| Nantucket Hrb. Stream Site | WPH       | ND       | ND      | ND      | ND      | 30.8000  | 0.0279 | 0.0562 | 0.0128 | 0.0689 | 0.9036 | 0.9725 | 1.3816  | 0.1392 | 1.0428 | 1.1118 | ND      | ND      | ND         | ND        | 0.0678 |
| SESACHACHA POND            | SESA 3    | 1.3115   | 0.3967  | 7.2162  | 0.8693  | 33.8000  | 0.2041 | 0.0425 | 0.0135 | 0.0560 | 0.5590 | 0.6150 | 2.2835  | 0.3066 | 0.8656 | 0.9216 | 8.3952  | 8.6953  | 0.5091     | 17.0904   | 0.2602 |
| SESACHACHA POND            | SESA 2    | 1.3227   | 0.2877  | 7.2249  | 0.8953  | 32.8000  | 0.1846 | 0.0221 | 0.0152 | 0.0373 | 0.5207 | 0.5580 | 1.8557  | 0.2713 | 0.9108 | 0.9480 | 7.8256  | 9.3507  | 0.5119     | 17.1763   | 0.2534 |
| SESACHACHA POND            | SESA 4    | 1.2214   | 0.3308  | 7.2608  | 0.9184  | 34.8000  | 0.2203 | 0.0362 | 0.0109 | 0.0471 | 0.5204 | 0.5347 | 5.1176  | 0.3103 | 1.1639 | 1.2111 | 9.2845  | 11.7226 | 0.4820     | 21.0071   | 0.3075 |
| SESACHACHA POND            | SESA 1    | 1.2750   | 0.2826  | 7.4207  | 0.9235  | 31.8000  | 0.2080 | 0.0400 | 0.0206 | 0.0605 | 0.5883 | 0.6489 | 2.4341  | 0.3336 | 0.9219 | 0.9825 | 8.5664  | 11.3657 | 0.4970     | 19.9321   | 0.2536 |
| OLD NORTH WHARF - Oyster   | ORS2      | 1.0750   | 1.0000  | 5.4269  | 0.7746  | 35.8000  | 0.0209 | 0.0128 | 0.0058 | 0.0186 | 0.2081 | 0.2267 | 0.5278  | 0.1072 | 0.3152 | 0.3338 | 3.0784  | 2.3164  | 0.6131     | 5.3948    | ND     |
| SHIMMO Oyster              | ORS4      | 1.4500   | 1.0000  | 4.0833  | 0.5877  | 36.8000  | 0.0164 | 0.0163 | 0.0050 | 0.0213 | 0.2150 | 0.2363 | 0.6533  | 0.1282 | 0.3432 | 0.3645 | 3.6882  | 3.1822  | 0.5656     | 6.8704    | ND     |
| POLPIS Oyster              | ORS6      | 1.0500   | 0.9792  | 4.9271  | 0.7142  | 37.8000  | 0.0254 | 0.0146 | 0.0042 | 0.0188 | 0.3292 | 0.3480 | 1.2009  | 0.1680 | 0.4972 | 0.5160 | 2.8226  | 3.3248  | 0.5451     | 6.1474    | ND     |

**Table 3a.** Summary of Stream Water Quality Parameters (ST4, ST6, WPH OUTLET {Polpis Harbor}) and stations associated with potential oyster aquaculture locations (ORS,2,4,6), **2021** Nantucket Sampling Program..

| Embayment        | Date      | Sample Id. | Salinity (ppt) | Avg. PO4 (uM) | Avg. TP (uM) | Avg. NH4 (uM) | Avg. Nox (uM) | Avg. DIN (uM) | Avg. DON (uM) | Avg. TDN (uM) | Avg. POC (uM) | Avg. PON (uM) | Avg. TON (uM) | Avg. TN (uM) | Avg. Chla (ug/L) | Avg. Phaeo (ug/L) | Chla/T-Pig Ratio | Avg. Total Pig (ug/L) |
|------------------|-----------|------------|----------------|---------------|--------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|--------------|------------------|-------------------|------------------|-----------------------|
| NANTUCKET STREAM | 6/17/2021 | ST4        | 0.00           | 1.31          | 2.11         | 1.05          | 0.03          | 1.08          | 61.80         | 62.88         | 60.88         | 2.97          | 64.78         | 65.85        | ND               | ND                | ND               | ND                    |
| NANTUCKET STREAM | 7/21/2021 | ST4        | 0.20           | 1.84          | 17.78        | 1.94          | 0.03          | 1.96          | 32.71         | 34.67         | ND            | ND            | ND            | ND           | ND               | ND                | ND               | ND                    |
| NANTUCKET STREAM | 8/5/2021  | ST4        | 0.10           | 0.62          | 3.89         | 1.04          | 0.03          | 1.06          | 53.99         | 55.05         | 4328.82       | 137.12        | 191.11        | 192.17       | ND               | ND                | ND               | ND                    |
| NANTUCKET STREAM | 9/13/2021 | ST4        | 0.10           | 0.60          | 1.64         | 2.14          | 0.36          | 2.50          | 27.92         | 30.42         | 72.12         | 7.35          | 35.26         | 37.77        | ND               | ND                | ND               | ND                    |
| NANTUCKET STREAM | 6/17/2021 | ST6B       | 0.00           | 1.21          | 3.35         | 1.09          | 0.09          | 1.18          | 41.28         | 42.46         | 300.71        | 10.30         | 51.57         | 52.75        | ND               | ND                | ND               | ND                    |
| NANTUCKET STREAM | 8/5/2021  | ST6B       | 0.00           | 0.74          | 12.25        | 1.71          | 0.30          | 2.01          | 23.44         | 25.46         | 3787.88       | 164.46        | 187.90        | 189.92       | ND               | ND                | ND               | ND                    |
| NANTUCKET STREAM | 9/13/2021 | ST6B       | 0.10           | 1.43          | 1.64         | 0.03          | 0.14          | 0.17          | 90.23         | 90.40         | 145.89        | 2.19          | 92.42         | 92.59        | ND               | ND                | ND               | ND                    |
| NANTUCKET STREAM | 7/21/2021 | WPH        | 13.30          | 0.96          | 2.53         | 6.37          | 1.19          | 7.57          | 41.90         | 49.47         | 187.00        | 18.51         | 60.41         | 67.98        | ND               | ND                | ND               | ND                    |
| NANTUCKET STREAM | 9/13/2021 | WPH        | 0.10           | 0.84          | 1.84         | 1.65          | 0.63          | 2.28          | 87.18         | 89.46         | 43.27         | 1.38          | 88.57         | 90.85        | ND               | ND                | ND               | ND                    |

| Sample ID | Secchi average (meters) | Secchi Depth % of WC | 20% Low Field DO Sat (mg/L) | 20% Low Field DO Sat (% sat) | Salinity (ppt) | Avg. PO4 (mg/L) | Avg. TP (mg/L) | Avg. NH4 (mg/L) | Avg. Nox (mg/L) | Avg. DIN (mg/L) | Avg. DON (mg/L) | Avg. TDN (mg/L) | Avg. POC (mg/L) | Avg. PON (mg/L) | Avg. TON (mg/L) | Avg. TN (mg/L) | Avg. Chla (ug/L) | Avg. Phaeo (ug/L) | Chla/T-Pig Ratio | Avg. Total Pig (ug/L) |
|-----------|-------------------------|----------------------|-----------------------------|------------------------------|----------------|-----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|----------------|------------------|-------------------|------------------|-----------------------|
| ORS2      | 1.00                    | 100%                 | 6.53                        | 93%                          | 32.10          | 0.012           | NS             | 0.012           | 0.006           | 0.018           | 0.254           | 0.272           | 0.668           | 0.087           | 0.341           | 0.359          | 2.48             | 0.63              | 80%              | 3.11                  |
| ORS2      | 0.50                    | 100%                 | 6.15                        | 81%                          | 31.90          | 0.021           | NS             | 0.013           | 0.003           | 0.016           | 0.149           | 0.165           | 0.545           | 0.084           | 0.233           | 0.249          | 5.16             | 5.24              | 50%              | 10.40                 |
| ORS2      | 1.90                    | 100%                 | 6.02                        | 84%                          | 32.10          | 0.026           | NS             | 0.014           | 0.003           | 0.017           | 0.162           | 0.179           | 0.494           | 0.073           | 0.235           | 0.252          | 2.35             | 1.58              | 60%              | 3.93                  |
| ORS2      | 0.90                    | 100%                 | 5.43                        | 77%                          | 31.90          | 0.025           | NS             | 0.012           | 0.011           | 0.023           | 0.268           | 0.291           | 0.404           | 0.185           | 0.453           | 0.476          | 2.33             | 1.81              | 56%              | 4.14                  |
| ORS4      | 1.20                    | 100%                 | 4.89                        | 65%                          | 32.80          | 0.010           | NS             | 0.015           | 0.006           | 0.021           | 0.139           | 0.160           | 0.627           | 0.087           | 0.226           | 0.247          | 1.35             | 0.54              | 71%              | 1.89                  |
| ORS4      | 1.20                    | 100%                 | 4.53                        | 64%                          | 31.30          | 0.019           | NS             | 0.006           | 0.005           | 0.011           | 0.205           | 0.216           | 0.838           | 0.158           | 0.363           | 0.374          | 9.19             | 8.07              | 53%              | 17.26                 |
| ORS4      | 1.40                    | 100%                 | 4.09                        | 57%                          | 31.40          | 0.016           | NS             | 0.012           | 0.005           | 0.017           | 0.262           | 0.278           | 0.600           | 0.095           | 0.357           | 0.374          | 2.56             | 1.52              | 63%              | 4.08                  |
| ORS4      | 2.00                    | 100%                 | 4.08                        | 59%                          | 31.40          | 0.021           | NS             | 0.032           | 0.005           | 0.037           | 0.254           | 0.291           | 0.548           | 0.173           | 0.427           | 0.464          | 1.66             | 2.60              | 39%              | 4.25                  |
| ORS6      | 1.10                    | 100%                 | 6.12                        | 89%                          | 32.40          | 0.015           | NS             | 0.019           | 0.005           | 0.025           | 0.202           | 0.226           | 0.698           | 0.082           | 0.284           | 0.309          | 1.33             | 0.73              | 64%              | 2.06                  |
| ORS6      | 1.10                    | 92%                  | 5.63                        | 78%                          | 31.70          | 0.029           | NS             | 0.026           | 0.004           | 0.030           | 0.307           | 0.337           | 0.742           | 0.136           | 0.442           | 0.472          | 4.05             | 8.74              | 32%              | 12.79                 |
| ORS6      | 1.20                    | 100%                 | 5.18                        | 71%                          | 31.80          | 0.023           | NS             | 0.013           | 0.002           | 0.015           | 0.192           | 0.207           | 2.658           | 0.305           | 0.496           | 0.511          | 2.86             | 2.25              | 56%              | 5.12                  |
| ORS6      | 0.80                    | 100%                 | 4.93                        | 71%                          | 31.10          | 0.035           | NS             | 0.000           | 0.006           | 0.006           | 0.616           | 0.623           | 0.706           | 0.150           | 0.766           | 0.772          | 3.05             | 1.57              | 66%              | 4.62                  |

**Table 2b.** Summary of Water Quality Parameters, **2020** Nantucket Sampling Program. Values are Station Averages of all sampling events, June-September for sampling sites. Station NAN-2A represents an MEP sentinel location for monitoring in Nantucket Harbor. NAN-2A is a new station that was first sampled in 2016 and is in a different location than NAN-2. It should be noted that in 2019 and 2018, TP was only evaluated at sites dominated by freshwater: Sesachacha Pond, Hummock Pond, Long Pond, Miacomet Pond and stream because of the low salinity values in those closed ponds and the possibility that the Miacomet system maybe phosphorous limited rather than nitrogen limited. Further study should investigate the possibility of P-limitation and TP paired with salinity should continue to be monitored during the summer 2021 field season.

|                            | 2020       | Secchi average | Secchi Depth | 20% Low Field DO | 20% Low Field DO |                | Avg. PO4 | Avg. NH4 | Avg. Nox | Avg. DIN | Avg. DON | Avg. TDN | Avg. POC | Avg. PON | Avg. TON | Avg. TN | Avg. Chla | Avg. Phaeo | Chla/T-Pig Ratio | Avg. Total Pig | Avg. TP |
|----------------------------|------------|----------------|--------------|------------------|------------------|----------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|---------|-----------|------------|------------------|----------------|---------|
| Embayment                  | Sample ID  | (meters)       | % of WC      | Sat (mg/L)       | Sat (% sat)      | Salinity (ppt) | (mg/L)   | (mg/L)   | (mg/L)   | (mg/L)   | (mg/L)   | (mg/L)   | (mg/L)   | (mg/L)   | (mg/L)   | (mg/L)  | (ug/L)    | (ug/L)     |                  | (ug/L)         | (mg/L)  |
| HUMMOCK POND               | HUM7       | 1.175          | 0.341        | 4.179            | 0.435            | 3.573          | 0.029    | 0.081    | 0.073    | 0.154    | 0.377    | 0.531    | 5.893    | 0.929    | 1.306    | 1.460   | 13.664    | 12.997     | 0.535            | 26.661         | 0.150   |
| HUMMOCK POND               | HUM8       | 1.006          | 0.686        | 6.237            | 0.728            | 3.900          | 0.015    | 0.006    | 0.002    | 0.008    | 0.369    | 0.378    | 2.756    | 0.380    | 0.749    | 0.758   | 7.227     | 4.512      | 0.577            | 11.739         | 0.097   |
| HUMMOCK POND               | HUM5       | 1.125          | 0.621        | 6.188            | 0.751            | 4.550          | 0.015    | 0.003    | 0.004    | 0.007    | 0.391    | 0.397    | 1.695    | 0.278    | 0.669    | 0.675   | 6.752     | 6.364      | 0.543            | 13.115         | 0.097   |
| HUMMOCK POND               | HUM3       | 1.240          | 0.670        | 7.179            | 0.866            | 5.442          | 0.017    | 0.005    | 0.003    | 0.008    | 0.375    | 0.383    | 1.280    | 0.216    | 0.591    | 0.599   | 4.454     | 3.943      | 0.537            | 8.398          | 0.085   |
| HUMMOCK POND               | HUM1       | 1.417          | 0.570        | 6.873            | 0.816            | 5.800          | 0.019    | 0.008    | 0.005    | 0.013    | 0.417    | 0.430    | 1.250    | 0.208    | 0.626    | 0.639   | 4.245     | 2.713      | 0.577            | 6.958          | 0.076   |
| LONG POND                  | LONG5      | 1.063          | 0.865        | 3.184            | 0.436            | 16.713         | 0.040    | 0.004    | 0.006    | 0.010    | 0.328    | 0.338    | 1.453    | 0.215    | 0.543    | 0.553   | 4.687     | 2.402      | 0.615            | 7.089          | 0.130   |
| LONG POND                  | LONG6      | 1.133          | 0.955        | 4.144            | 0.560            | 18.413         | 0.032    | 0.013    | 0.007    | 0.020    | 0.323    | 0.343    | 1.059    | 0.159    | 0.482    | 0.502   | 3.552     | 1.178      | 0.657            | 4.729          | 0.119   |
| MADAKET HARBOR             | MH1        | 1.625          | 0.929        | 4.418            | 0.631            | 29.064         | 0.021    | 0.029    | 0.005    | 0.034    | 0.330    | 0.365    | 0.796    | 0.144    | 0.475    | 0.509   | 6.936     | 1.310      | 0.799            | 8.246          | NS      |
| MADAKET HARBOR             | MH2        | 2.120          | 0.988        | 5.398            | 0.786            | 31.263         | 0.006    | 0.012    | 0.008    | 0.019    | 0.247    | 0.266    | 0.547    | 0.092    | 0.339    | 0.358   | 3.106     | 1.021      | 0.732            | 4.127          | NS      |
| MADAKET HARBOR             | MH3        | 2.342          | 1.000        | 5.159            | 0.706            | 31.633         | 0.010    | 0.007    | 0.003    | 0.011    | 0.194    | 0.204    | 0.580    | 0.091    | 0.284    | 0.295   | 2.676     | 1.205      | 0.671            | 3.882          | NS      |
| MADAKET HARBOR             | MH4        | 3.300          | 0.930        | 5.620            | 0.807            | 31.729         | 0.014    | 0.010    | 0.003    | 0.013    | 0.203    | 0.216    | 0.362    | 0.055    | 0.258    | 0.271   | 2.203     | 0.817      | 0.727            | 3.020          | NS      |
| MIACOMET POND              | MP3        | 1.167          | 0.781        | 2.073            | 0.240            | 0.100          | 0.041    | 0.240    | 0.038    | 0.277    | 0.496    | 0.774    | 2.002    | 0.367    | 0.864    | 1.141   | 11.925    | 7.800      | 0.576            | 19.725         | 0.127   |
| MIACOMET POND              | MP1        | 1.458          | 0.836        | 2.753            | 0.323            | 0.100          | 0.010    | 0.153    | 0.005    | 0.158    | 0.676    | 0.834    | 4.545    | 0.664    | 1.340    | 1.498   | 12.591    | 7.054      | 0.465            | 19.645         | 0.079   |
| MIACOMET POND              | MP2        | 1.713          | 0.593        | 5.046            | 0.606            | 0.100          | 0.004    | 0.106    | 0.005    | 0.111    | 0.510    | 0.621    | 3.541    | 0.637    | 1.147    | 1.258   | 20.775    | 3.554      | 0.613            | 24.329         | 0.077   |
| NANTUCKET HARBOR           | NAN3       | 2.478          | 0.420        | 4.916            | 0.701            | 31.838         | 0.024    | 0.009    | 0.003    | 0.012    | 0.269    | 0.281    | 0.635    | 0.102    | 0.371    | 0.383   | 4.599     | 0.817      | 0.826            | 5.416          | NS      |
| NANTUCKET HARBOR           | NAN6       | 2.370          | 0.864        | 4.764            | 0.697            | 31.621         | 0.024    | 0.016    | 0.003    | 0.019    | 0.245    | 0.264    | 0.642    | 0.097    | 0.343    | 0.362   | 3.346     | 0.999      | 0.774            | 4.345          | NS      |
| NANTUCKET HARBOR           | NAN5       | 1.675          | 0.925        | 3.943            | 0.573            | 31.263         | 0.021    | 0.012    | 0.002    | 0.015    | 0.236    | 0.251    | 1.083    | 0.165    | 0.401    | 0.416   | 5.577     | 2.185      | 0.786            | 7.762          | NS      |
| NANTUCKET HARBOR           | NAN2       | 2.650          | 0.552        | 4.847            | 0.726            | 31.838         | 0.021    | 0.012    | 0.004    | 0.016    | 0.252    | 0.268    | 0.493    | 0.081    | 0.333    | 0.349   | 4.069     | 1.167      | 0.767            | 5.236          | NS      |
| NANTUCKET HARBOR           | NAN2A      | 2.670          | 0.476        | 4.136            | 0.596            | 31.907         | 0.028    | 0.021    | 0.003    | 0.024    | 0.249    | 0.272    | 0.590    | 0.098    | 0.347    | 0.370   | 4.389     | 1.233      | 0.750            | 5.622          | NS      |
| NANTUCKET HARBOR           | NAN7       | 1.740          | 0.909        | 5.483            | 0.769            | 31.413         | 0.020    | 0.011    | 0.003    | 0.014    | 0.198    | 0.212    | 0.603    | 0.095    | 0.292    | 0.306   | 3.089     | 1.109      | 0.731            | 4.198          | NS      |
| NANTUCKET HARBOR           | NAN1       | 3.225          | 0.606        | 5.098            | 0.712            | 31.575         | 0.017    | 0.006    | 0.003    | 0.009    | 0.188    | 0.197    | 0.386    | 0.063    | 0.251    | 0.260   | 4.263     | 0.982      | 0.797            | 5.245          | NS      |
| NANTUCKET HARBOR           | NAN8N      | 1.275          | 1.000        | 5.751            | 0.783            | 31.275         | 0.013    | 0.004    | 0.002    | 0.006    | 0.189    | 0.195    | 0.508    | 0.085    | 0.274    | 0.280   | 3.192     | 1.319      | 0.730            | 4.511          | NS      |
| NANTUCKET HARBOR           | NAN4       | 3.167          | 0.657        | 5.648            | 0.769            | 31.600         | 0.016    | 0.005    | 0.003    | 0.009    | 0.269    | 0.277    | 0.466    | 0.073    | 0.342    | 0.351   | 3.599     | 0.787      | 0.831            | 4.386          | NS      |
| Nantucket Hrb. Stream Site | ST4        | ND             | ND           | ND               | ND               | 0.000          | 0.059    | 0.013    | 0.002    | 0.015    | 0.880    | 0.895    | 0.619    | 0.060    | 0.940    | 0.955   | NS        | NS         | NS               | NS             | 0.099   |
| Nantucket Hrb. Stream Site | ST6        | 0.100          | 0.333        | ND               | ND               | 0.100          | 0.016    | 0.016    | 0.007    | 0.023    | 0.226    | 0.249    | 5.522    | 0.243    | 0.470    | 0.493   | NS        | NS         | NS               | NS             | 0.215   |
| Nantucket Hrb. Stream Site | ST6B       | 0.250          | 0.625        | ND               | ND               | 0.050          | 0.118    | 0.013    | 0.005    | 0.017    | 0.608    | 0.625    | 7.854    | 0.397    | 1.005    | 1.022   | NS        | NS         | NS               | NS             | 0.606   |
| Nantucket Hrb. Stream Site | WPH Outlet | ND             | ND           | ND               | ND               | 0.100          | 0.055    | 0.016    | 0.003    | 0.019    | 0.929    | 0.948    | 1.827    | 0.159    | 1.087    | 1.106   | NS        | NS         | NS               | NS             | 0.102   |
| SESACHACHA POND            | SES3       | 1.579          | 0.480        | 6.668            | 0.847            | 6.858          | 0.158    | 0.002    | 0.005    | 0.007    | 0.463    | 0.470    | 1.793    | 0.216    | 0.679    | 0.686   | 2.803     | 0.768      | 0.702            | 3.571          | 0.214   |
| SESACHACHA POND            | SES2       | 1.686          | 0.347        | 5.673            | 0.714            | 6.863          | 0.158    | 0.003    | 0.005    | 0.009    | 0.449    | 0.457    | 1.709    | 0.207    | 0.656    | 0.664   | 3.801     | 1.349      | 0.709            | 5.150          | 0.210   |
| SESACHACHA POND            | SES4       | 1.313          | 0.357        | 6.279            | 0.788            | 6.875          | 0.158    | 0.002    | 0.003    | 0.005    | 0.468    | 0.473    | 1.629    | 0.201    | 0.669    | 0.674   | 3.034     | 0.898      | 0.746            | 3.932          | 0.216   |
| SESACHACHA POND            | SES1       | 1.640          | 0.303        | 6.218            | 0.783            | 6.871          | 0.155    | 0.004    | 0.012    | 0.016    | 0.442    | 0.458    | 1.707    | 0.209    | 0.651    | 0.667   | 3.945     | 0.953      | 0.605            | 4.898          | 0.211   |
| OLD NORTH WHARF - Oyster   | ORS2       | 1.200          | 1.000        | 4.966            | 0.723            | 31.650         | 0.019    | 0.018    | 0.005    | 0.023    | 0.228    | 0.251    | 0.470    | 0.072    | 0.300    | 0.323   | 2.730     | 0.701      | 0.814            | 3.431          | NS      |
| SHIMMO Oyster              | ORS4       | 0.850          | 1.000        | 2.898            | 0.419            | 31.000         | 0.017    | 0.029    | 0.008    | 0.037    | 0.254    | 0.291    | 0.558    | 0.099    | 0.353    | 0.389   | 5.153     | 4.221      | 0.615            | 9.374          | NS      |
| POLPIS Oyster              | ORS6       | 1.100          | 1.000        | 2.868            | 0.421            | 30.630         | 0.026    | 0.019    | 0.004    | 0.024    | 0.317    | 0.340    | 0.643    | 0.103    | 0.420    | 0.444   | 3.880     | 1.038      | 0.767            | 4.918          | NS      |

**Table 3b.** Summary of Stream Water Quality Parameters (ST4, ST6, WPH OUTLET {Polpis Harbor}) and stations associated with potential oyster aquaculture locations (ORS,2,4,6), **2020** Nantucket Sampling Program..

| Embayment        | Date      | Sample ID | Lab Salinity ppt | PO4 (mg/L) | TP (mg/L) | NH4 (mg/L) | NOx (mg/L) | DIN (mg/L) | DON (mg/L) | TDN (mg/L) | POC (mg/L) | PON (mg/L) | TON (mg/L) | TN (mg/L) | Avg. Chla (ug/L) | Avg. Phaeo (ug/L) | Avg. Total Pig (ug/L) |
|------------------|-----------|-----------|------------------|------------|-----------|------------|------------|------------|------------|------------|------------|------------|------------|-----------|------------------|-------------------|-----------------------|
| Nantucket Stream | 6/30/2020 | ST4       | 0.0              | 0.0590     | 0.0986    | 0.0131     | 0.0016     | 0.0147     | 0.8798     | 0.8945     | 0.6187     | 0.0605     | 0.9403     | 0.9550    | ND               | ND                | ND                    |
| Nantucket Stream | 9/2/2020  | ST6       | 0.1              | 0.0068     | NS        | 0.0102     | 0.0031     | 0.0133     | 0.1741     | 0.1874     | 3.6649     | 0.1786     | 0.3527     | 0.3660    | ND               | ND                | ND                    |
| Nantucket Stream | 8/11/2020 | ST6       | 0.1              | 0.0244     | 0.2153    | 0.0228     | 0.0099     | 0.0327     | 0.2787     | 0.3114     | 7.3781     | 0.3078     | 0.5865     | 0.6192    | ND               | ND                | ND                    |
| Nantucket Stream | 6/17/2020 | ST6B      | 0.1              | 0.1739     | 0.3036    | 0.0105     | 0.0060     | 0.0165     | 0.5903     | 0.6068     | 9.8370     | 0.4473     | 1.0375     | 1.0540    | ND               | ND                | ND                    |
| Nantucket Stream | 6/30/2020 | ST6B      | 0.0              | 0.0623     | 0.9084    | 0.0148     | 0.0037     | 0.0184     | 0.6256     | 0.6440     | 5.8710     | 0.3461     | 0.9717     | 0.9901    | ND               | ND                | ND                    |
| Nantucket Stream | 6/30/2020 | WPH       | 0.1              | 0.0549     | 0.1016    | 0.0159     | 0.0032     | 0.0191     | 0.9288     | 0.9479     | 1.8272     | 0.1585     | 1.0873     | 1.1064    | ND               | ND                | ND                    |

| Embayment        | Date      | Sample ID | Lab Salinity ppt | PO4 (mg/L) | TP (mg/L) | NH4 (mg/L) | NOx (mg/L) | DIN (mg/L) | DON (mg/L) | TDN (mg/L) | POC (mg/L) | PON (mg/L) | TON (mg/L) | TN (mg/L) | Avg. Chla (ug/L) | Avg. Phaeo (ug/L) | Avg. Total Pig (ug/L) |
|------------------|-----------|-----------|------------------|------------|-----------|------------|------------|------------|------------|------------|------------|------------|------------|-----------|------------------|-------------------|-----------------------|
| NANTUCKET HARBOR | 6/23/2020 | ORS2      | 31.6             | 0.0141     | NS        | 0.0260     | 0.0064     | 0.0324     | 0.2415     | 0.2739     | 0.5258     | 0.0919     | 0.3335     | 0.3658    | 4.224            | 0.355             | 4.579                 |
| NANTUCKET HARBOR | 7/9/2020  | ORS2      | 31.4             | 0.0213     | NS        | 0.0257     | 0.0079     | 0.0336     | 0.3201     | 0.3537     | 0.4384     | 0.0692     | 0.3893     | 0.4229    | 1.552            | 0.030             | 1.582                 |
| NANTUCKET HARBOR | 8/6/2020  | ORS2      | 31.8             | 0.0242     | NS        | 0.0196     | 0.0036     | 0.0231     | 0.2349     | 0.2580     | 0.4873     | 0.0801     | 0.3150     | 0.3381    | 3.331            | 1.234             | 4.565                 |
| NANTUCKET HARBOR | 9/25/2020 | ORS2      | 31.8             | 0.0154     | NS        | 0.0015     | 0.0020     | 0.0036     | 0.1156     | 0.1192     | 0.4271     | 0.0475     | 0.1631     | 0.1667    | 1.813            | 1.186             | 2.998                 |
| NANTUCKET HARBOR | 6/23/2020 | ORS4      | 31.1             | 0.0107     | NS        | 0.0212     | 0.0050     | 0.0261     | 0.2922     | 0.3184     | 0.4965     | 0.0933     | 0.3855     | 0.4117    | 3.324            | 1.202             | 4.526                 |
| NANTUCKET HARBOR | 7/8/2020  | ORS4      | 30.8             | 0.0157     | NS        | 0.0136     | 0.0156     | 0.0292     | 0.3696     | 0.3988     | 0.6264     | 0.1077     | 0.4773     | 0.5065    | 9.630            | 10.776            | 20.406                |
| NANTUCKET HARBOR | 8/6/2020  | ORS4      | 30.9             | 0.0226     | NS        | 0.0234     | 0.0042     | 0.0276     | 0.2386     | 0.2662     | 0.7130     | 0.1312     | 0.3698     | 0.3974    | 4.441            | 1.180             | 5.621                 |
| NANTUCKET HARBOR | 9/25/2020 | ORS4      | 31.2             | 0.0179     | NS        | 0.0568     | 0.0071     | 0.0639     | 0.1153     | 0.1793     | 0.3944     | 0.0620     | 0.1774     | 0.2413    | 3.217            | 3.728             | 6.945                 |
| NANTUCKET HARBOR | 6/23/2020 | ORS6      | 28.5             | 0.0253     | NS        | 0.0004     | 0.0093     | 0.0096     | 0.5241     | 0.5338     | 0.9684     | 0.1514     | 0.6755     | 0.6852    | 6.933            | 0.720             | 7.654                 |
| NANTUCKET HARBOR | 7/9/2020  | ORS6      | 30.7             | 0.0205     | NS        | 0.0094     | 0.0009     | 0.0103     | 0.2701     | 0.2804     | 0.5564     | 0.0905     | 0.3606     | 0.3709    | 2.504            | 1.837             | 4.341                 |
| NANTUCKET HARBOR | 7/9/2020  | ORS6      | NS               | NS         | NS        | NS         | NS         | NS         | NS         | NS         | NS         | NS         | NS         | NS        | NS               | NS                | NS                    |
| NANTUCKET HARBOR | 8/6/2020  | ORS6      | 31.4             | 0.0340     | NS        | 0.0286     | 0.0048     | 0.0333     | 0.3643     | 0.3976     | 0.6903     | 0.1181     | 0.4824     | 0.5157    | 3.682            | 0.972             | 4.654                 |
| NANTUCKET HARBOR | 9/25/2020 | ORS6      | 31.9             | 0.0229     | NS        | 0.0388     | 0.0020     | 0.0408     | 0.1081     | 0.1489     | 0.3556     | 0.0535     | 0.1616     | 0.2024    | 2.402            | 0.623             | 3.025                 |

## Status and Trends in Water Quality of Nantucket's Estuaries:

Based on the water quality data collected by the Nantucket Island-wide Monitoring program since 2010, it is now possible to conduct an initial trend analysis. While trends have been noted in previous reports, due to the now available 11 years of data, trends are becoming clearer and coming through the noise of inter-annual natural variations. For this analysis temporal trends are assessed in each of the 6 estuaries by combining data from 2010, 2012 and 2013; 2014, 2015 and 2016; 2017, 2018 and 2019. Results from 2021 and 2020 were compared to these three year groupings. Key water quality parameters were examined to determine if changes in estuarine health have occurred over the past decade.

Nantucket Harbor has had a number of nitrogen mitigations: a) raising the jetties, b) new sewerage, c) fertilizer by-law. From the time course of Total Nitrogen (TN) it is clear that the most recent 3 years of monitoring at each harbor station show lower TN levels than in the prior 2 three year groupings going back to 2010 with the 2014-2016 grouping showing intermediate levels and the 2017-2019 and 2020 generally showing the lowest TN levels (note 2020 is a single year so is more variable). **This indicates a lowering of TN harbor-wide over the past decade** (Figure 7). Similarly when examined by basin, again there is a consistent decline in TN and the rate of decline is consistent among the basins (Figure 8). This pattern is consistent with the Town's mitigation efforts, which may not have fully impinged upon Nantucket Harbor at this time. The exception to these trends in the 2021 TN levels was in Wauwinet (Nan-3), where TN levels were elevated. This may be inter-annual variation (rainfall) or due to a possible restriction in flow with the rest of the Harbor basins and should be tracked in coming years.

Phytoplankton biomass as total chlorophyll a pigments, shows a more variable pattern as the levels are controlled by a variety of factors in addition to nitrogen levels. Overall, chlorophyll levels within the main basin of Nantucket Harbor have been indicative of a low level of impairment (averaging <10 ug/L), with slightly higher levels in Polpis Harbor. However, it is clear that chlorophyll a has also declined from the early period (2010,2012,2013) to recent sampling, with 2020, 2019, 2017, 2016 and 2014 being relatively low (<6 ug/L). These modest summertime chlorophyll a levels throughout much of the Harbor are indicative of a high quality habitat (Figure 9). Trends in both chlorophyll a and TN are consistent with improving estuarine conditions, although the upper basin needs to be tracked. TN levels throughout the Harbor are approaching the TMDL targets for this system.

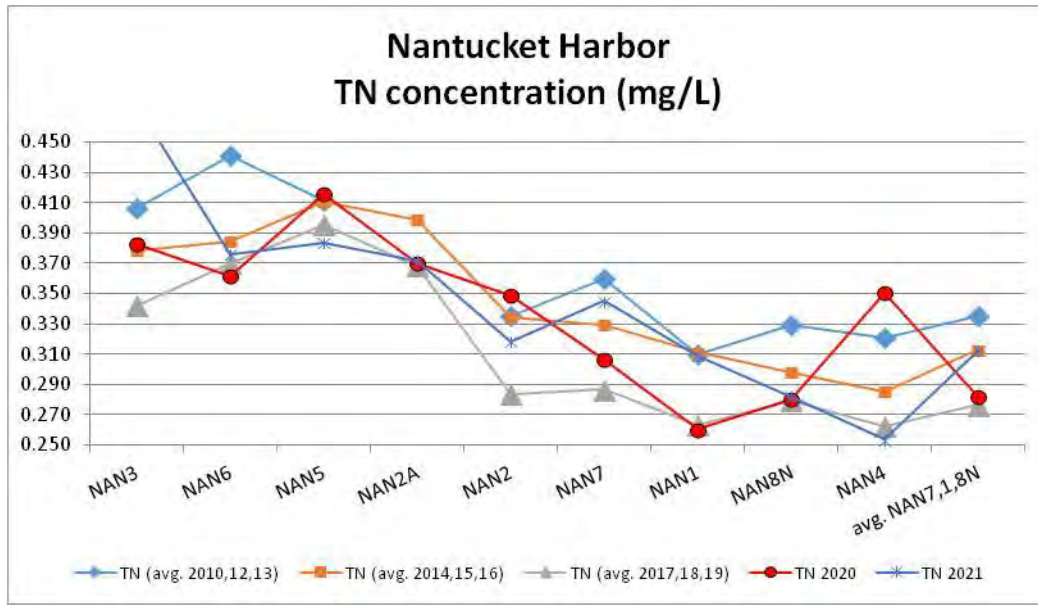


Figure 7. Temporal trends in Nantucket Total Nitrogen levels at all stations. Note that in all cases the 2017-2019 levels are lower than the earliest grouping (2010-2013) with 2014-2016 being in the middle. Clearly TN levels have declined harbor-wide over the past 10 years due to nitrogen mitigation strategies implemented by the Town. 2020 data generally confirms the trend (with exception Nan-4), lower Harbor still showing TN decline), however 2021 shows increased TN mainly in the upper basin Nan-3.

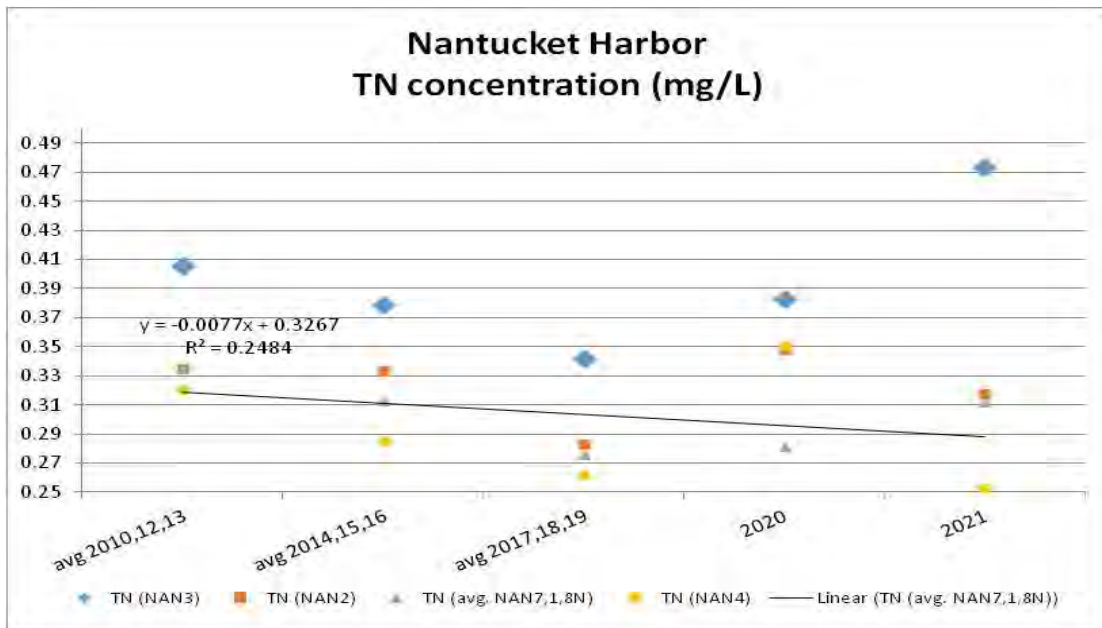
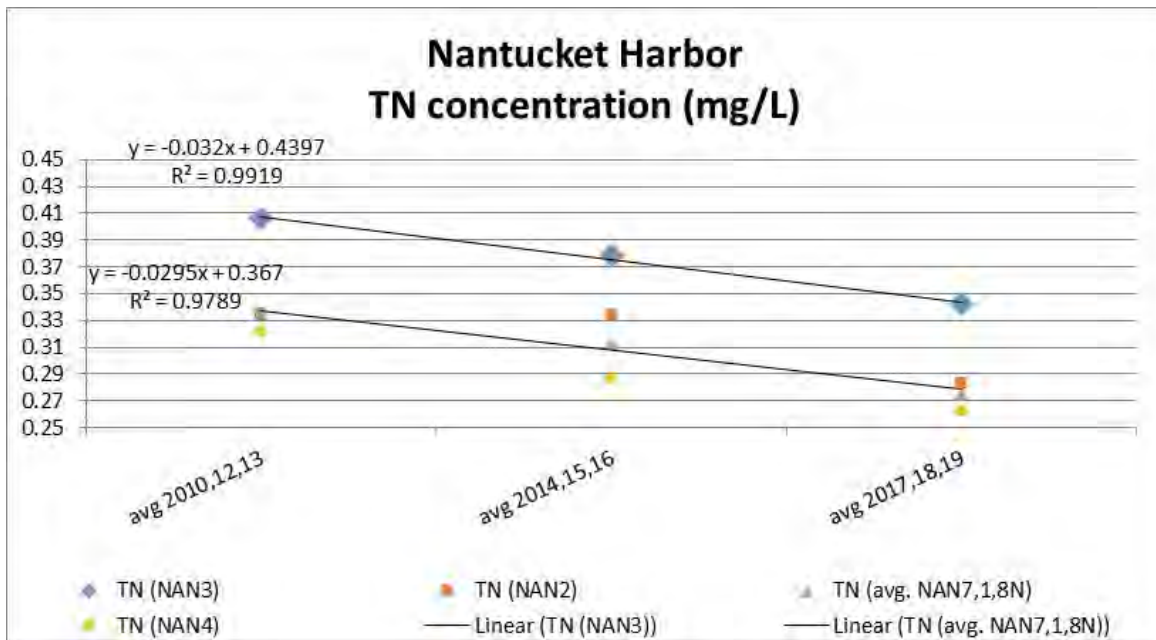


Figure 8. Temporal trends in Nantucket Total Nitrogen levels within the key basins. Years were combined as 2010, 2012 and 2013; 2014, 2015 and 2016; 2017, 2018 and 2019. 2020 is presented relative to the three year groupings in appears slightly above the trend but likely indicative of inter-annual variation, 2021 shows increased TN mainly in the upper basin Nan-3.

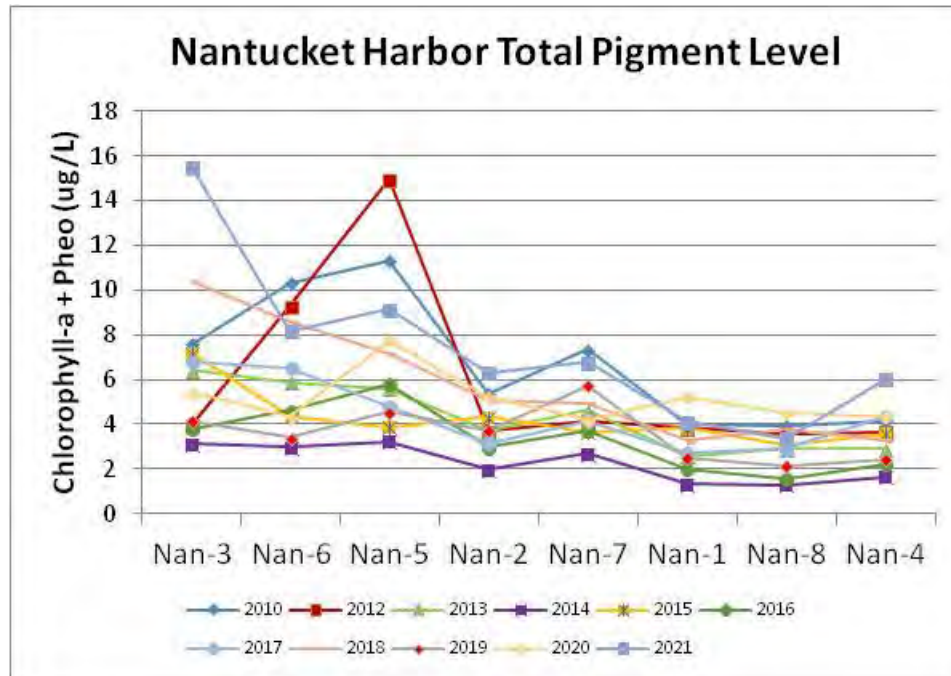


Figure 9. Average Chlorophyll-a concentrations by station in Nantucket Harbor. Stations Nan-5 and 6 are in Polpis Harbor the rest in the main basin. Note that 2019 levels were slightly lower in the upper basins (Nan-5 slightly lower in 2019 vs. 2020, 2018 and 2017, Nan-6 slightly lower in 2020 & 2019 vs. 2018 & 2017) and low and relatively constant throughout the Harbor. 2020 and previous 5 years indicated high water quality and Polpis Harbor periodically shows levels indicative of moderate impairment. In contrast, 2021 showed higher levels consistent with its higher N in 2021, the cause of these higher values needs to be evaluated.

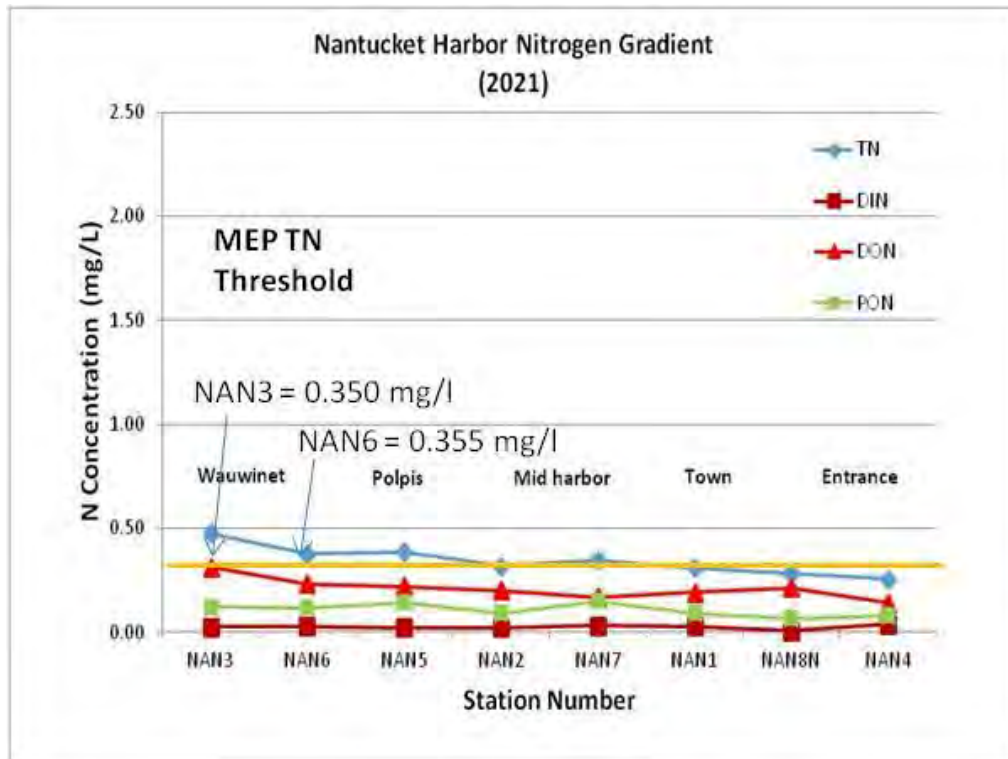


Figure 10. Components of Total Nitrogen pool in Nantucket Harbor waters by station (2020). At all stations TN is almost entirely in organic forms due to phytoplankton uptake of inorganic nitrogen entering from the watershed and recycled from the sediments and conversion to organic forms. Note that the TN levels remain very close to the MEP TN Threshold level codified in the present TMDL.

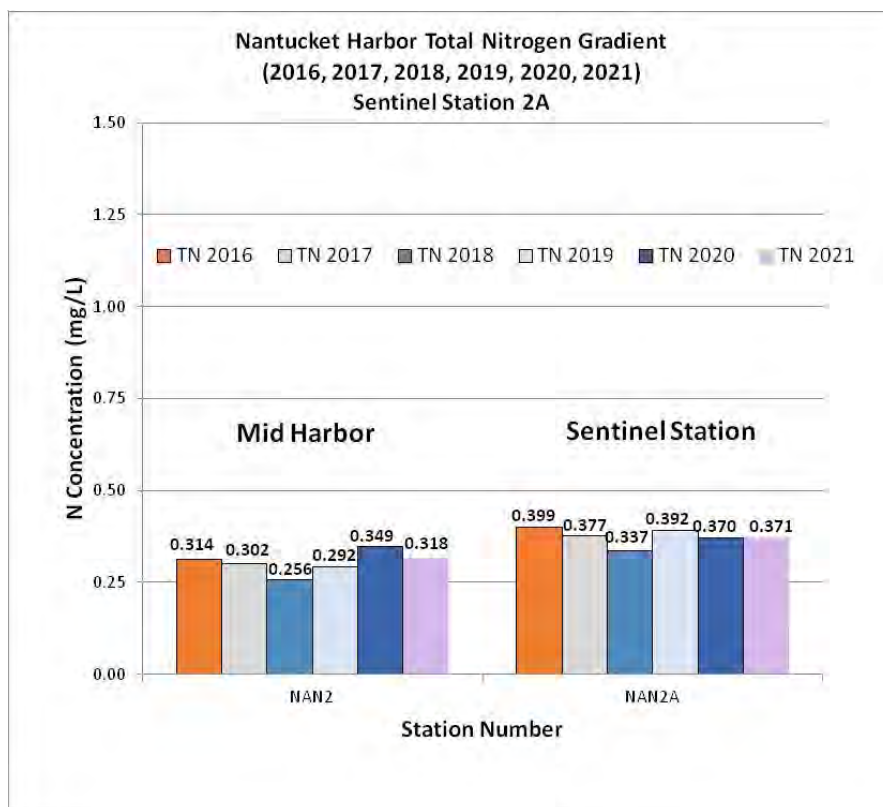


Figure 12. Total nitrogen levels at station 2 and 2A over time in Nantucket Harbor. Station 2A is a sentinel station in the head of the harbor established in 2016. The current 3 year average is 0.366 mg N/L close to the threshold of 0.350 mg N/L.

Table 3. TN levels by station and year in Nantucket Harbor for comparison to TMDL targets of 0.35 mg/L in Wauwinet (Stations 3 and 2A) and 0.355 mg/L in Polpis Harbor (Station 6). 2020 nearing threshold levels. Note that the 2021 rise in Wauwinet is counter to the long-term trend and the cause should be evaluated in future years, as to stochastic events or a possible shift in tidal flushing.

| Sub-Embayment              | Monitoring Station | Historical | s.d.  | 2010 | 2010            | 2012            | 2013            | 2014            | 2015            | 2016            | 2017            | 2018            | 2019            | 2020            | 2021            |
|----------------------------|--------------------|------------|-------|------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
|                            |                    | MEP        |       | Town | Mean TN         | Mean TN         | Mean TN         | Mean TN         | Mean TN         | Mean TN         | Mean TN         | Mean TN         | Mean TN         | Mean TN         | Mean TN         |
|                            |                    | Mean TN    |       | ID   |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |
|                            |                    | (mg/L)     |       |      | (mg/L)          | (mg/L)          | (mg/L)          | (mg/L)          | (mg/L)          | (mg/L)          | (mg/L)          | (mg/L)          | (mg/L)          | (mg/L)          | (mg/L)          |
| Head of the Harbor - Upper | 2                  | 0.408      | 0.188 | NA   | NS              | NS              | NS              | NS              | NS              | NS              | NS              | NS              | NS              | NS              | NS              |
| Head of the Harbor - Mid   | Town 3             | 0.401      | 0.115 | 3    | 0.392           | 0.411           | 0.415           | 0.345           | 0.436           | 0.355           | 0.366           | 0.325           | 0.336           | 0.383           | 0.474           |
| Head of the Harbor - Lwr   | 2A                 | 0.339      | 0.07  | 2A   | NS              | NS              | NS              | NS              | NS              | 0.415           | 0.377           | 0.337           | 0.392           | 0.370           | 0.372           |
| Pocomo Head                | 3                  | 0.335      | 0.081 | NA   | NS              | NS              | NS              | NS              | NS              | NS              | NS              | NS              | NS              | NS              |                 |
| Quaise Basin               | 3A+Town 2          | 0.336      | 0.112 | 2    | 0.297           | 0.364           | 0.345           | 0.314           | 0.374           | 0.314           | 0.302           | 0.256           | 0.292           | 0.349           | 0.318           |
| East Polpis Harbor         | 4+Town 6           | 0.362      | 0.105 | 6    | 0.438           | 0.484           | 0.401           | 0.378           | 0.404           | 0.371           | 0.405           | 0.327           | 0.378           | 0.362           | 0.376           |
| West Polpis Harbor         | 4A+Town 5          | 0.388      | 0.119 | 5    | 0.431           | 0.419           | 0.385           | 0.389           | 0.422           | 0.42            | 0.429           | 0.341           | 0.416           | 0.416           | 0.384           |
| Abrams Point               | 5                  | 0.335      | 0.06  | NA   | NS              | NS              | NS              | NS              | NS              | NS              | NS              | NS              | NS              | NS              |                 |
| Monomoy                    | 6                  | 0.297      | 0.086 | NA   | NS              | NS              | NS              | NS              | NS              | NS              | NS              | NS              | NS              | NS              |                 |
| Mooring Area               | 7+Town 1, 1A       | 0.326      | 0.106 | 1, 7 | 0.332,<br>0.377 | 0.335,<br>0.379 | 0.323,<br>0.323 | 0.294,<br>0.284 | 0.390,<br>0.330 | 0.304,<br>0.319 | 0.317,<br>0.333 | 0.212,<br>0.253 | 0.262,<br>0.274 | 0.260,<br>0.306 | 0.309,<br>0.345 |
| Nantucket Sound            | OS+Town 4          | 0.239      | 0.041 | 4    | 0.283           | 0.344[1]        | 0.3171          | 0.277           | 0.297           | 0.283           | 0.288           | 0.192           | 0.307           | 0.351           | 0.253           |

[1] It is almost certain that this does not represent the TN level in the inflow to Nantucket Harbor on the flood tide, but rather the 2012 data is influenced by mixing with TN enriched out-flowing waters. An attempt to control for this issue was implemented in the 2013 monitoring program. It should be noted that the 2019 concentration may also be high due to influence from out-flowing waters. Concentration at station 4 is very sensitive to timing of sampling.

**Madaket Harbor** is similar to Nantucket Harbor in that it generally supports high water quality and is flushed with high quality low nitrogen offshore waters. There is typically a gradual nitrogen gradient from Hither Creek (MH-1) into the main basin (MH-2 and MH-3) with lowest levels near the offshore boundary (MH-4). In 2021 only the levels in Hither Creek exceeded the TMDL target level (0.45 mg TN/L), which was also the case in 2020 & 2019 (Figure 11). However, there has been a reduction in TN levels, as 2 of the last 5 years met the TN threshold for Hither Creek. Similar to Nantucket Harbor, inorganic nitrogen levels are very low and represent only a minor fraction of the total N pool. This is due to the rapid uptake of this plant available form of nitrogen by phytoplankton and supports the contention that nitrogen is the key nutrient for managing phytoplankton blooms and maintaining clear waters. After uptake by phytoplankton the inorganic forms are converted to phytoplankton biomass, seen as PON, and can be released upon phytoplankton death and decay as DON.

There appears to be a trend towards lower TN levels at the Hither Creek Stations in recent years compared to 2010-2014 which may be related to changes in Long Pond (Figure 12 and see below). Phytoplankton biomass (as total chlorophyll a) follows the TN gradient from inshore to offshore quite well in each year (Figure 13). This is due to the mixing of higher nitrogen higher chlorophyll a waters discharging from Hither Creek with the lower nitrogen lower chlorophyll a waters of Madaket Harbor. The variable temporal decline in TN in recent years, therefore, may be resulting from lower TN discharges from Hither Creek which is significantly fed from outflowing waters from Long Pond and direct watershed inputs to Hither Creek itself. Examining Hither Creek in combination with Long Pond suggest that there may have been a slight decline in TN levels over the past decade, although the trend is not statistically significant. However, the large continuing decline in TN levels in Long Pond through 2020 is significant (Figures 14 and 15) and is likely due at least in part to modifications of the Town Landfill resulting in a lessening of nitrogen emanating from this source. At present the TN level in Long Pond is approaching the target in the TMDL for this basin, although 2021 departed from this trend, mainly at station Long 6 in the upper basin

Overall, there is a clear gradient in TN among the basins (as well as in Madaket Harbor, see above) with Long Pond supporting slightly higher TN than Hither Creek (MH-1) and the open water of Madaket showing the lowest TN. Long Pond shows reductions in TN from 2010, 2012, 2013 to 2014-2016 to 2017-2019 and again in 2020, only 2021 shows an increase from this trend, which needs to be evaluated in the coming season. Clearly TN levels have declined in Long Pond and possibly Hither Creek over the past 10 years. However, while 2017-2020 generally met the MEP threshold (0.8 mg N/L) 2021 was again above the threshold.

The effects of this lower TN can be seen in the generally lower chlorophyll a levels at station 6 in Long Pond adjacent the Landfill. Although variable, the values tend to be lower in recent years (even in 2021) and significantly lower than in 2003 when the Massachusetts Estuaries Project (MEP) found average summer chlorophyll a levels of >40 ug/L compared to >15 ug/L in summer 2019 and even in the high phytoplankton year of 2021 (total chlorophyll a pigment = 23 ug/L). Overall, the Nantucket Monitoring Program will continue to closely track improvements in Long Pond relative to its regulatory TMDL, but it seems at present that this estuarine basin has improved since the MEP and during the past decade of consistent monitoring.

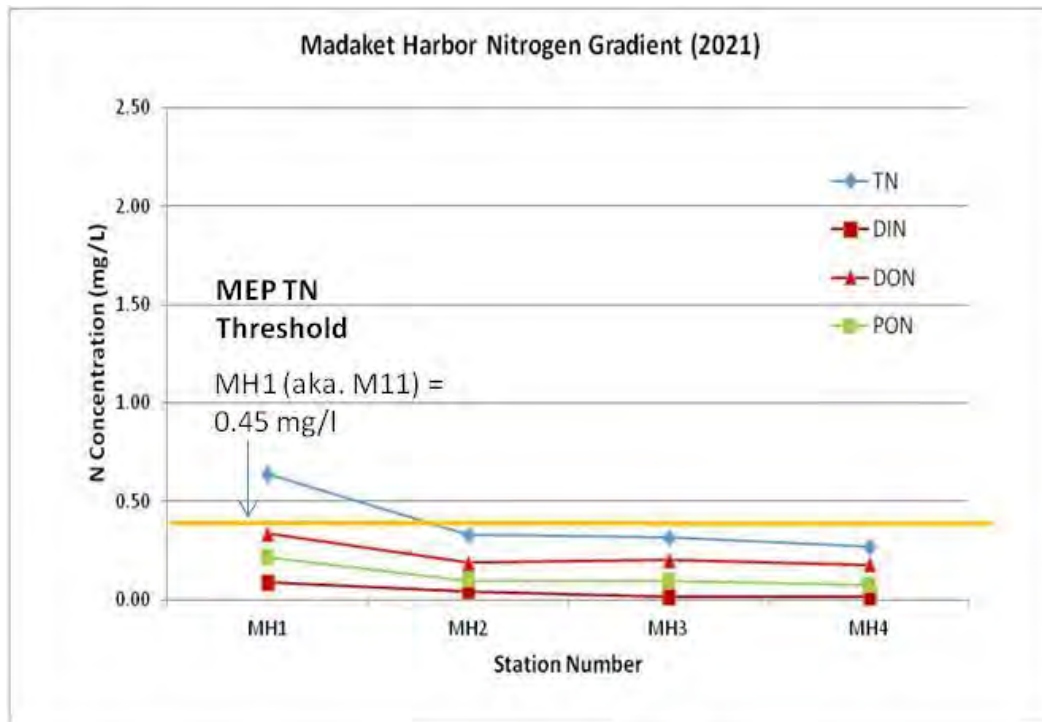


Figure 11. TN, dissolved inorganic nitrogen (DIN), dissolved organic nitrogen (DON) and particulate organic nitrogen at stations within Madaket Harbor 2020.

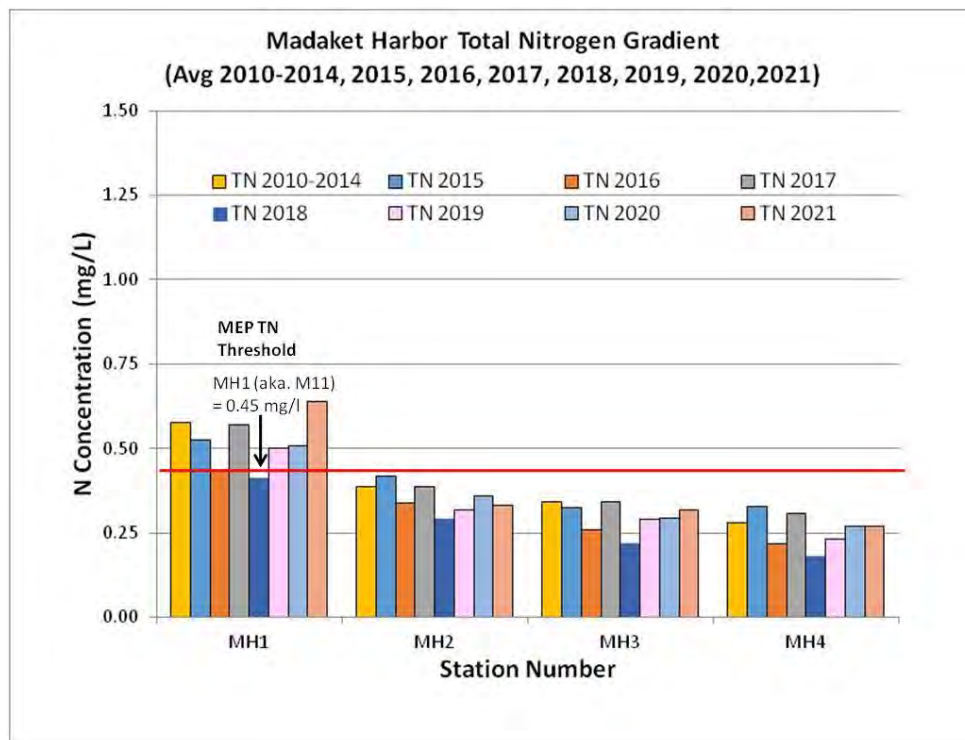


Figure 12. Total nitrogen levels by station over time in Madaket Harbor, horizontal line it TMDL TN level. 2021 data remains above threshold, but the threshold was met in 2 of the past 5 years (2016 & 2018) an improvement over the historic record.

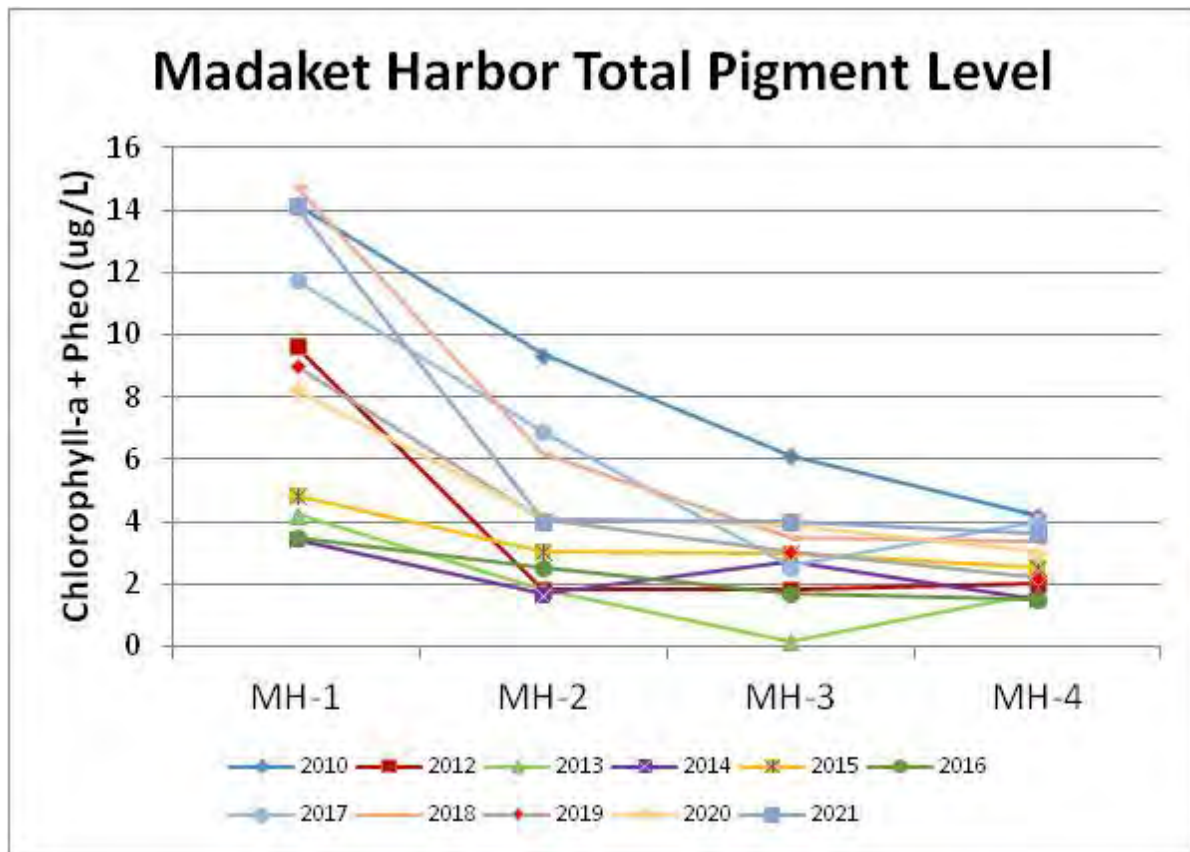


Figure 13. Average Total Chlorophyll-a concentrations by station in the well flushed Madaket Harbor system during the 2010-2021 summer sampling seasons. Stations MH-2,3,4 are in the main open basin and consistently show moderate to low chlorophyll a pigments after 2010, MH-1 is the MEP sentinel station in Hither Creek, which after blooms in 2017-2018 declined to <10 ug/L in 2019-2020, but again had high levels in 2021, presumably linked to Long Pond out-flowing waters.

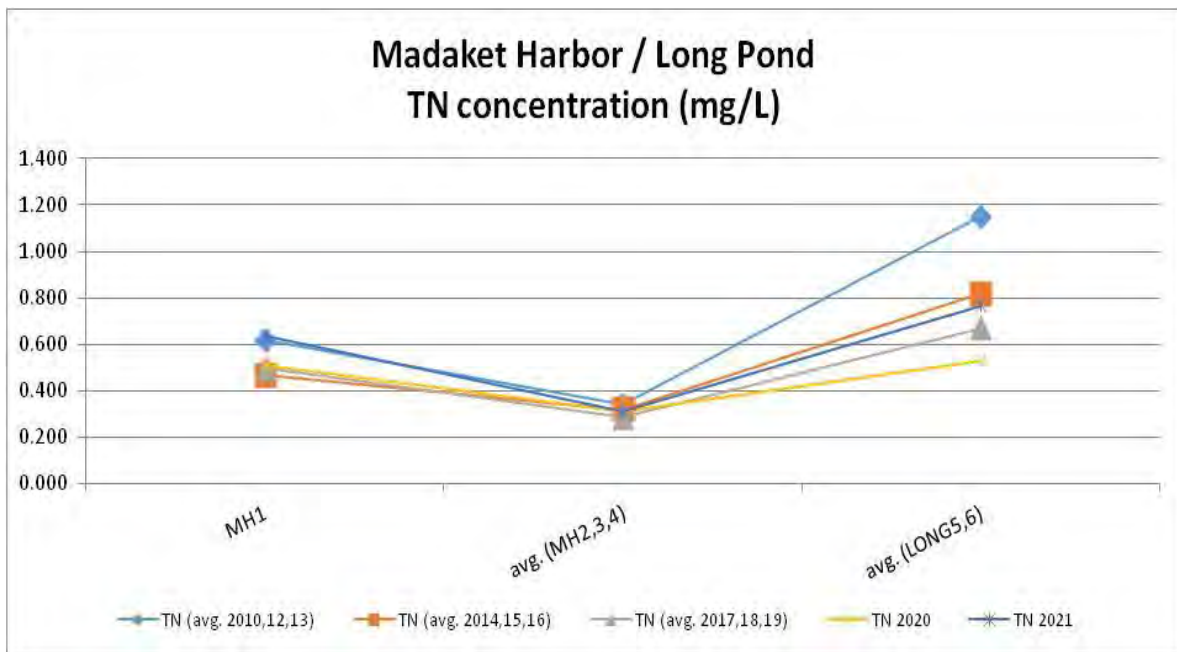


Figure 14. TN levels in Madaket Harbor main basin (MH-2,3-4), Hither Creek (MH-1) and Long Pond (stations Long 5 & 6) over the past decade. Note that for each group, Long Pond is slightly higher than Hither Creek (MH-1) and the open water shows the lowest TN. Long Pond shows reductions in TN from 2010,2012, 2013 to 2014-2016 to 2017-2019 and again in 2020 and 2021, but 2021 (0.766 mg TN/L) did show an increase from this trend, which needs to be evaluated in the coming season. Clearly TN levels have declined in Long Pond and possibly Hither Creek over the past 10 years. However, while 2017-2021 generally met the MEP threshold (0.8 mg N/L), 2021 was nearly at the threshold level.

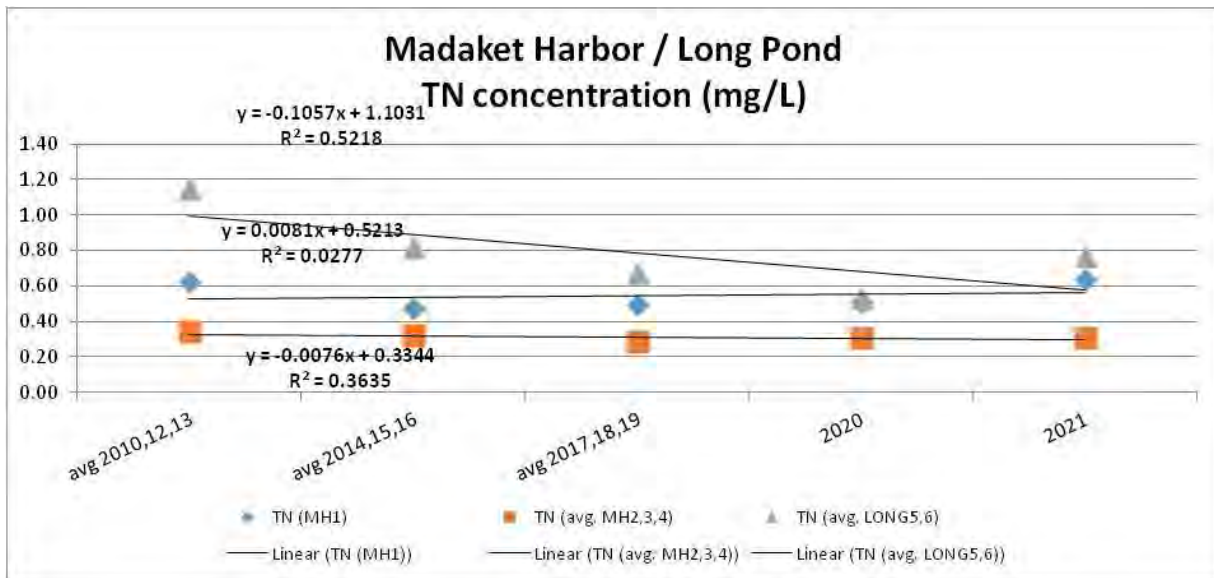


Figure 15. Change in TN level in Madaket Harbor main basin (MH-2,3-4), Hither Creek (MH-1) and Long Pond (stations Long 5 & 6) over the past decade. While TN levels have been stable in Madaket Harbor, Long Pond has seen a significant decline, such that 2017-2020 levels are approaching the TN level target in the TMDL for this estuary, likely linked to Town efforts to remediate the Town Landfill in the watershed to the upper basin. The cause of the 2021 increase is unclear, but may be due to stochastic events (rainfall) or a change in Long Pond outflow.

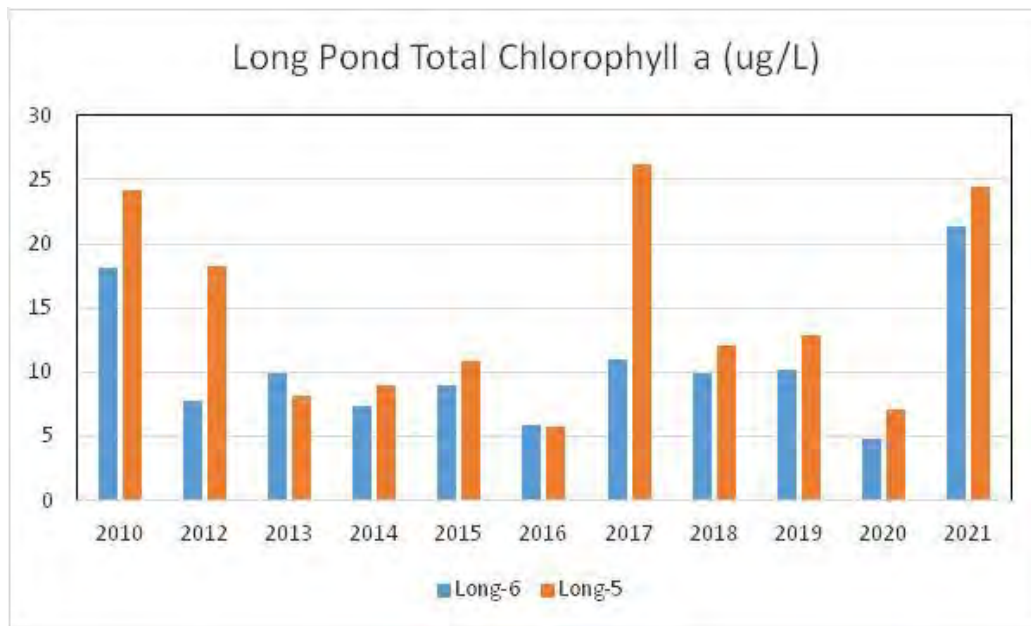


Figure 16. Average Total Pigment (Chlorophyll-a +Pheophytin) concentrations by station in the Long Pond portion of the Madaket Harbor system during the summer 2021 sampling season compared to 2010, 2012-2020 and 2021. Total Chlorophyll a pigment levels were slightly lower in 2020 compared to summers 2018-2019, but were the highest on record in 2021 consistent with the observed increase in TN.

**Sesachacha Pond** is a periodically opened salt water kettle pond that is managed by the Nantucket Natural Resources Department. Due to coastal processes it is not possible to maintain an open tidal inlet to this system or the other major coastal pond of Hummock Pond (brackish) and Miacomet Pond (once brackish now freshwater). Given the general lack of flushing of these ponds makes them particularly sensitive to nutrient inputs and the negative effects of eutrophication.

Sesachacha Pond has only a moderate level of watershed nitrogen inputs, but they have a magnified effect as the system only periodically receives tidal flushing (1-2 times/yr). Prior monitoring results have determined that successful openings (those of >5 days) have a positive effect on water and habitat quality. In fact, it appears that Sesachacha Pond can nearly achieve or even achieve its regulatory TMDL level for TN if openings can be prolonged. At present, Sesachacha Pond's total nitrogen levels (2020= 0.667 mg N/L) are above its TMDL target level at all stations (Figure 17). Although Sesachacha Pond remains above its TMDL target of 0.60 mg/L, the summer average TN levels have changed. While the openings 2010-2020 have not achieved the TMDL TN level, this salt pond has generally had higher water quality than historically (MEP). The baseline TN level for this pond found by the MEP was 1.197 mg TN/L, which supported degraded water quality and periodic chlorophyll a blooms of 100 ug/L. Since a focused opening management plan has evolved over the past decade, TN levels have generally declined and averaged 0.784 mg TN/L over 2018 and 2019 and even lower in the 2020 field season (Table 4). This underscores that even at present levels of success, openings play a critical role in lowering eutrophication in this estuary. However, in contrast to recent years, Sesachacha in 2021 supported much higher TN levels (1.016 mg TN/L) approaching MEP levels. The result was an increase in phytoplankton biomass as total chlorophyll a pigments (18.8 ug/L). These increases are likely related to pond flushing during openings, as the salinity of the pond in 2021 was only ~7 PSU compared to pre-2020 summers where it was typically >11 PSU.

Although the system is brackish due to its reduced salt water input, its nitrogen components are similar to the tidally flushed estuaries in that, entering dissolved inorganic N (DIN) is rapidly taken up by phytoplankton and converted to organic forms. The result is that almost all water column nitrogen can be found in growing or senescent phytoplankton (PON) or as dissolved organic nitrogen after release from senescent or decaying phytoplankton in the water column or after being deposited to the sediments (Figure 17). Sesachacha Pond waters do contrast with Nantucket and Madaket Harbor waters in the fraction of particulate organic nitrogen (PON) held in suspended phytoplankton, consistent with the elevated phytoplankton biomass indicated by the elevated total chlorophyll a levels in 2021 (see below).

The variation in pond openings can be seen in the variation in summer TN levels between years (Figure 18). The variation in TN causes large interannual variations in total chlorophyll a, but the elevated TN supports periodic blooms supporting the contention that the system is still eutrophic (Figure 19). Chlorophyll a levels >10ug/L typically indicate eutrophic conditions resulting from elevated nitrogen (which is also observed, Figure 17). However, as a variety of factors modify phytoplankton levels established by nitrogen inputs, the variation in

phytoplankton levels show more variation than the TN levels from year to year. However, the general pattern of openings to TN levels to overall water quality is clear.

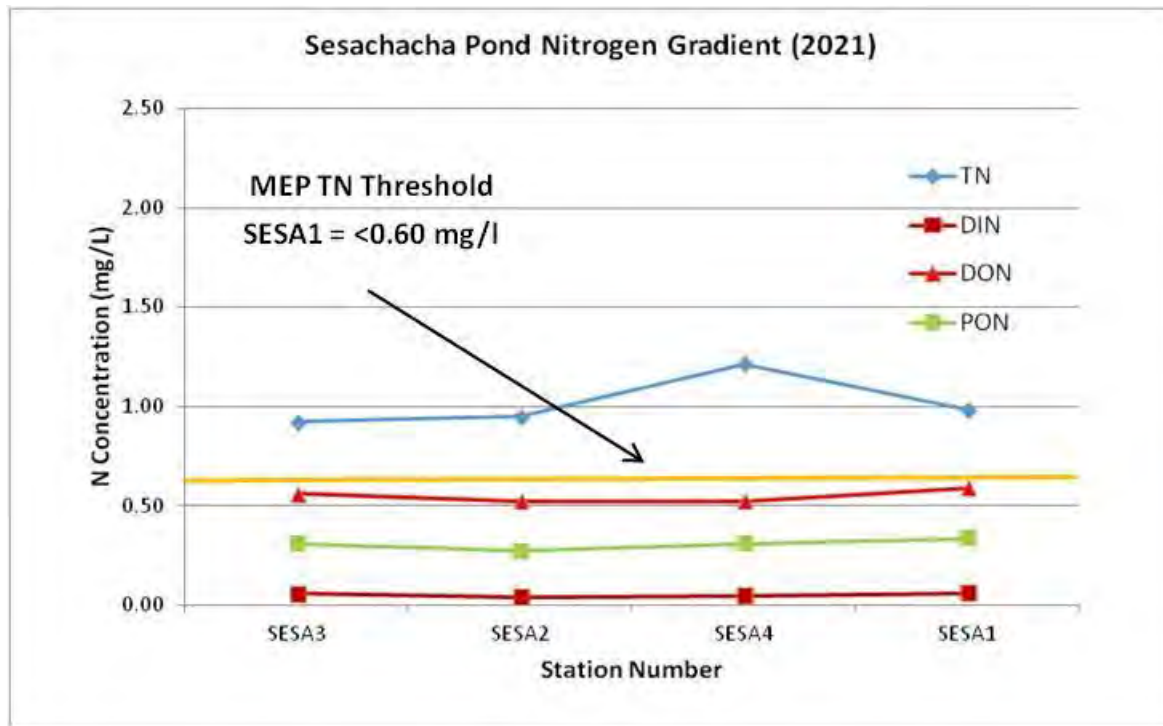


Figure 17. TN, dissolved inorganic nitrogen (DIN), dissolved organic nitrogen (DON) and particulate organic nitrogen at stations throughout Sesachacha Pond 2021. Note that at all stations the TN levels (average 1.016 mg N/L) are significantly above the regulatory TMDL and higher than prior years, indicating that this system is sensitive to its annual flushing regime which appears to have been less as seen in the low salinities of the pondwater.

Table 4. Summer average TN levels for Sesachacha Pond for comparison to its TMDL target of 0.60 mg/L. Note that while the openings 2010-2019 have not achieved the TMDL TN level, the salt pond has generally had higher water quality than historically (MEP). 2020 TN levels are approaching the threshold. Pond opening duration in 2020 maybe the driver of lower levels in 2020. Top value is concentration at Station 1. Value in ( ) is average concentration (Stations 1,2,3,4).

| Sampling Station Location | Historical     | s.d.  | 2010             | 2012             | 2013             | 2014             | 2015             | 2016            | 2017             | 2018             | 2019             | 2020             | 2021             |
|---------------------------|----------------|-------|------------------|------------------|------------------|------------------|------------------|-----------------|------------------|------------------|------------------|------------------|------------------|
|                           | MEP            |       | Mean TN          | Mean TN          | Mean TN          | Mean TN          | Mean TN          | Mean TN         | Mean TN          | Mean TN          | Mean TN          | Mean TN          | Mean TN          |
|                           | Mean TN (mg/L) |       | (mg/L)           | (mg/L)           | (mg/L)           | (mg/L)           | (mg/L)           | (mg/L)          | (mg/L)           | (mg/L)           | (mg/L)           | (mg/L)           | (mg/L)           |
| Sesachacha Pond           | 1.197          | 0.078 | 0.684<br>(0.704) | 0.678<br>(0.639) | 0.714<br>(0.669) | 0.919<br>(0.922) | 0.918<br>(0.904) | 1.01<br>(1.003) | 0.960<br>(0.884) | 0.734<br>(0.752) | 0.833<br>(0.845) | 0.667<br>(0.673) | 0.983<br>(1.016) |

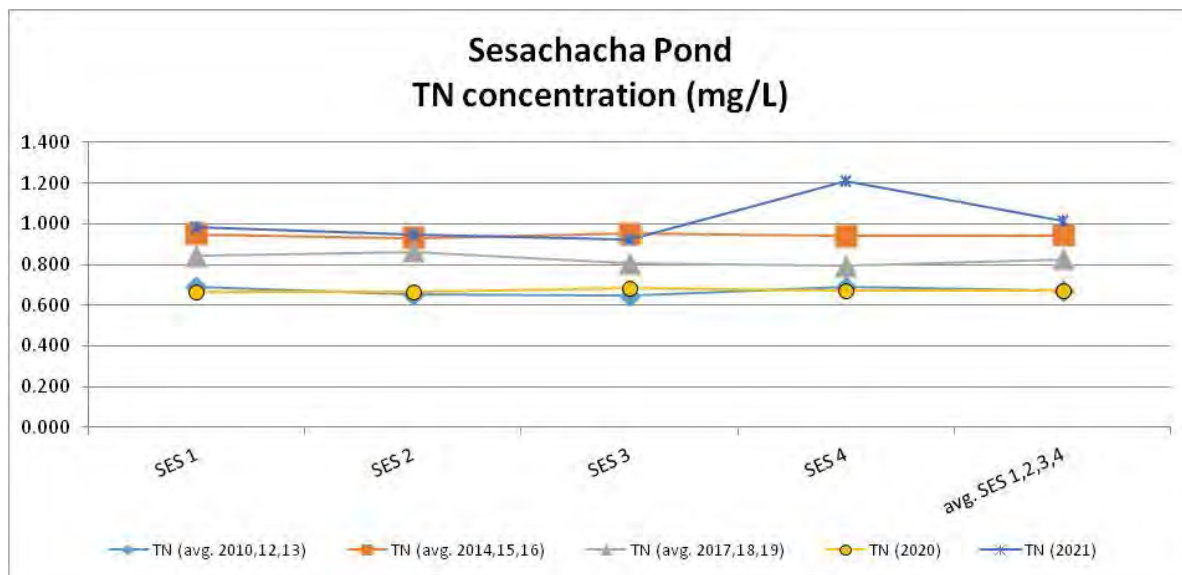
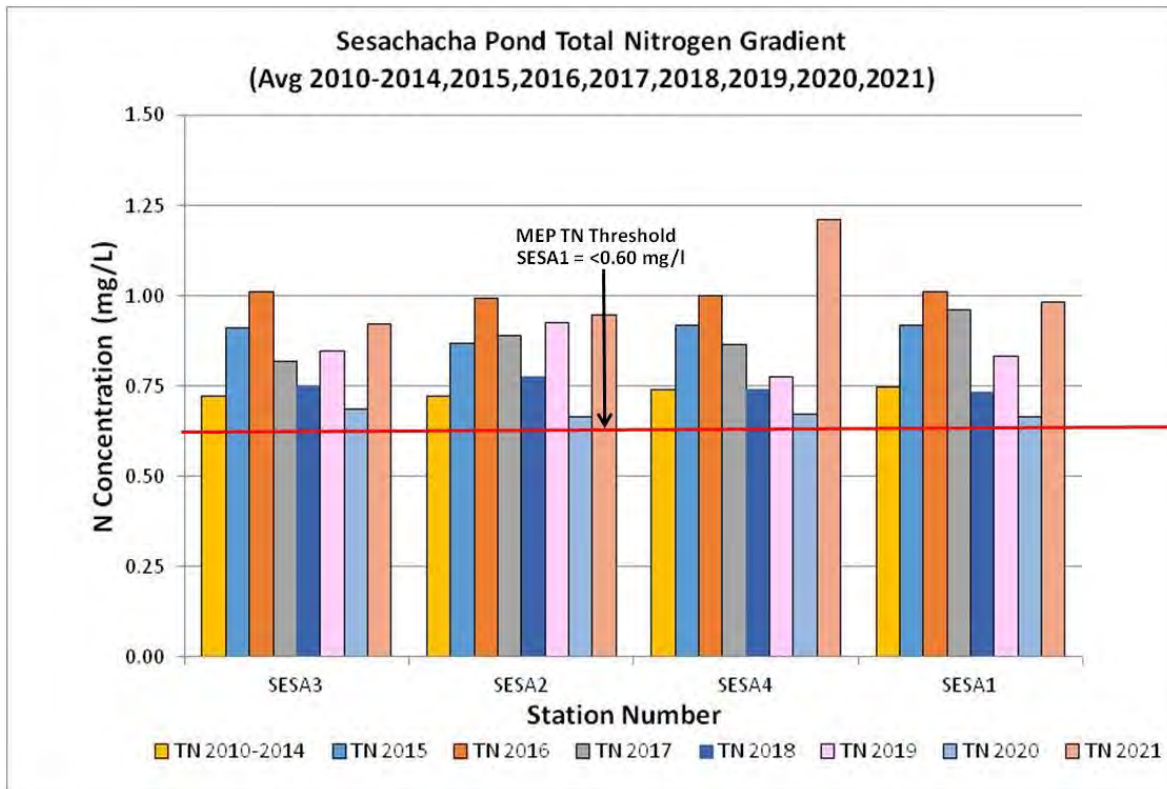


Figure 18a. Total nitrogen levels by station over time in Sesachacha Pond. Horizontal line in upper panel is TMDL TN level set by the MEP.

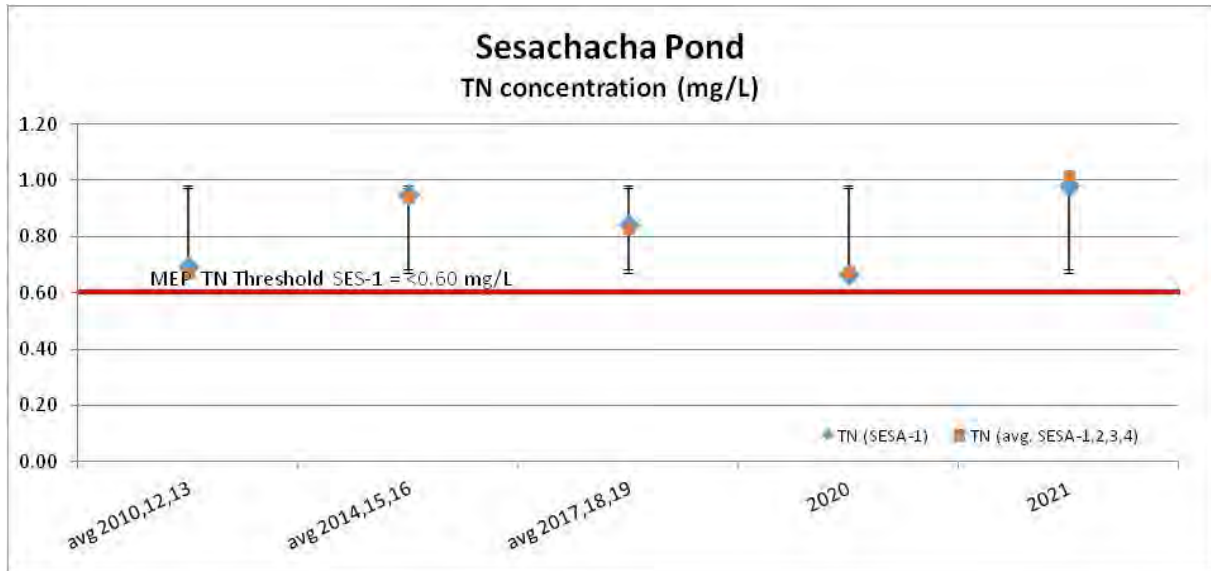


Figure 18b. Total nitrogen levels by station over time in Sesachacha Pond, horizontal line is TMDL TN level. Longer openings in 2010-2014 resulted in lower TN levels (<0.75 mg/L), recent opening attempts are again being more successful, but TN levels remain above the target level. 2020 pond opening duration may have been longer than past years resulting in the lowest TN level on record, half of the MEP 2003 average (Table 4). However, it appears lower exchange during the fall 2020 opening resulted in lower salinities and higher TN and pigments in 2021. Whether this is a single occurrence or will continue with fall openings will need to be evaluated in future.

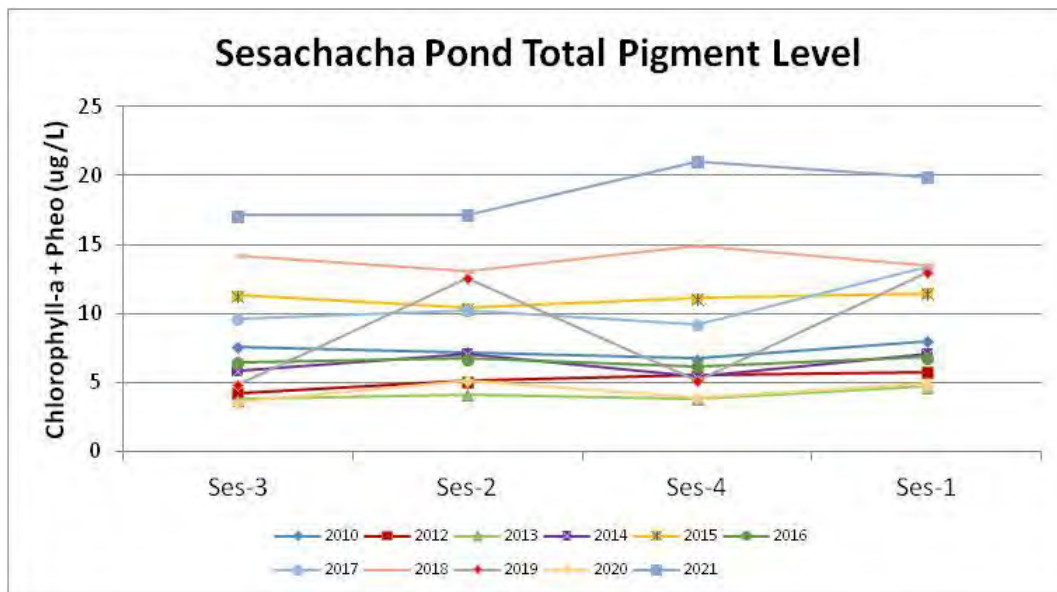


Figure 19. Average Total Pigment (Chlorophyll-a +Pheophytin) concentrations by station in the seasonally opened Sesachacha Pond system during the summer 2021 sampling season compared to 2010, 2012- 2020. Total chlorophyll a pigment levels in 2021 appeared stable

across stations at 17-21 ug/L indicative of moderate-significant impairment, consistent with the 2021 TN level.

**Hummock Pond** is a periodically opened drowned river valley pond that is managed by the Nantucket Natural Resources Department. Due to coastal processes it is not possible to maintain an open tidal inlet to this system or the other major coastal pond of Sesachacha Pond (brackish) and now freshwater, Miacomet Pond (once brackish). The general lack of flushing makes these ponds particularly sensitive to nutrient inputs and the negative effects of eutrophication. Managing openings of Hummock Pond has been particularly difficult due to longshore transport and the location of the opened inlet relative to dominant wind direction and storm flows. For this pond to be effectively opened analysis of weather and wave/wind direction needs to be monitored. The Town NRD and SMAST has developed a plan to establish this system for the periodically opened ponds program of Nantucket and are working jointly with the Martha's Vineyard Commission (who has the same problems) towards implementation. At present, we have variable openings that generally do not sufficiently lower pond TN levels before the inlet closes with resulting variable but continuing eutrophic conditions.

Hummock Pond has only a moderate level of watershed nitrogen inputs, but they have a magnified effect, as the system only periodically receives limited tidal flushing (at most 2 times/yr). At present, Hummock Pond's total nitrogen levels are well above its TMDL target level at all stations (Figure 20). This is true for the main drowned river valley basin and its tributary salt pond (Head of Hummock).

Although Hummock Pond remains above its TMDL target of 0.50 mg/L, the summer average TN levels have varied over time. While the openings 2010-2021 have not achieved the TMDL TN level, this salt pond has shown a range of water quality associated with the success of its tidal openings and sometimes storm over-wash of the barrier beach. Overall, the pond consistently has an increasing gradient in TN moving from near the barrier beach upgradient toward its headwaters (Figure 20). Head of Hummock does not have good exchange with the main basin and sometimes functions as a separate eutrophic basin with even higher TN levels.

Although the system is brackish due to its reduced salt water input, its nitrogen components are similar to the tidally flushed estuaries in that, entering dissolved inorganic N (DIN) is rapidly taken up by phytoplankton and converted to organic forms. The result is that almost all water column nitrogen can be found in growing or senescent phytoplankton (PON) or as dissolved organic nitrogen after release from senescent or decaying phytoplankton in the water column or after being deposited to the sediments (Figure 20). Hummock Pond waters are similar to Sesachacha Pond and contrast with Nantucket and Madaket Harbor waters in the large fraction of particulate organic nitrogen (PON) held in suspended phytoplankton. This is consistent with the elevated phytoplankton biomass indicated by the elevated total chlorophyll a levels in for example, 2019 (see below).

The baseline TN level for this pond, (2010-2014 monitoring) was generally lower than over the past 3-4 years, except for HUM-7 which has exceedingly elevated levels in the baseline period and compared to all other Hummock Pond stations (Figure 21). It appears that this recent period TN levels have been higher at most stations (HUM-1,3,8) and at some stations (HUM-7)

have been rising consistently from year to year from 2015 to 2019. It appears that after the successful opening prior to the 2015 field season, the tidal flushing significantly lowered TN throughout Hummock Pond and reset the system to new lower TN levels. However, following years were not as successful and the TN levels rose over time to their new much higher (than 2015) levels. Apparently, (a) even a single very successful opening can have a multiyear positive impact on Hummock Pond water quality and (b) it takes multiple years after a solid opening for the system to be again reset to higher TN levels. This underscores that even a modest improvement in openings of Hummock Pond can play a critical role in lowering eutrophication in this estuary.

The variation in pond openings can be seen in the variation in summer TN levels between years (Figure 21). The variation in TN causes large interannual variations in total chlorophyll a, but the elevated TN supports periodic blooms supporting the contention that the system is still eutrophic (Figure 20). Chlorophyll a levels >10ug/L typically indicate eutrophic conditions resulting from elevated nitrogen (which is also observed, Figure 22). Chlorophyll a levels in Hummock Pond are generally well above 10 ug/L exceeding 30 ug/L over some summers (2010, 2017-2020), matching the level of nitrogen enrichment throughout this estuary. However, as a variety of factors modify phytoplankton levels established by nitrogen inputs, the variation in phytoplankton levels show more variation than the TN levels from year to year. The general pattern of openings to TN levels to overall water quality is clear with the high TN levels in 2017-2019 (Figure 23) and highest chlorophyll a levels (Figure 22) and conversely the lowest TN levels in 2014-2016 and more moderate chlorophyll a levels. 2020 had intermediate chlorophyll levels consistent with its TN levels.

Overall, Hummock Pond remains eutrophic and is currently declining further. Unless nitrogen mitigations become possible, it appears that improvement to flushing is the primary mechanism for improving this pond's water quality and meeting its regulatory nitrogen TMDL. The positive news is that new approaches are being developed and the Nantucket Monitoring Program working with Nantucket NRD has demonstrated that periodic opening can make major improvements to the health of this estuarine system. Monitoring has revealed an additional potential threat to Hummock Pond habitats. In 2014-2016 salinities in the lower basin (HUM-1,3,5) were 6-7 ppt. But in 2017 salinity dropped to <4 PSU due a low flushing opening. The salinity has increased slightly ~5 PSU from 2018-2020 and <4 PSU in the upper reaches (HUM-7 & 8). This is still low for maintaining Hummock Pond as a brackish water estuary. Historically levels have been ~8 PSU, so there is some concern over species changes, however, salinity decline is relatively slow so there is still time to reset the salinity.

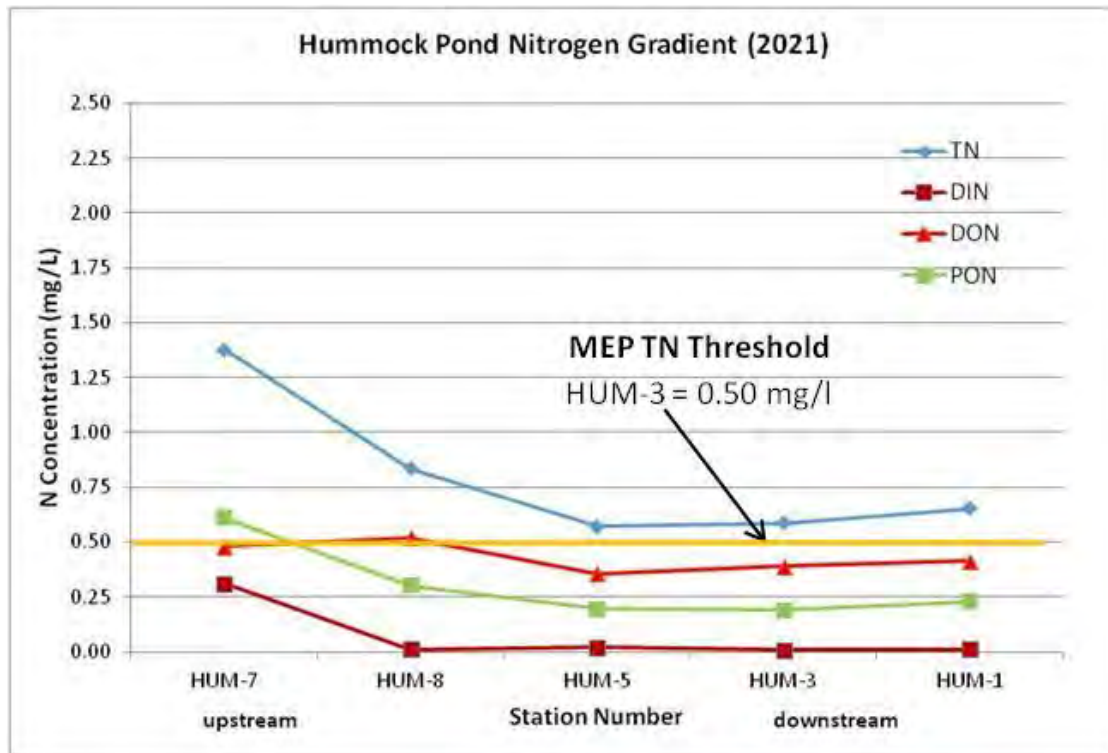


Figure 20. TN, dissolved inorganic nitrogen (DIN), dissolved organic nitrogen (DON) and particulate organic nitrogen at stations along the main axis of Hummock Pond, with HUM-7 being the tributary deeper basin at the head of the estuary. Note that at all stations the TN level greatly exceeds the regulatory TMDL (0.50 mg TN/L) and in 2021 the average of the lower stations Hum-1,3,5 was 0.638 mg N/L, indicating that this system remains nitrogen impaired.

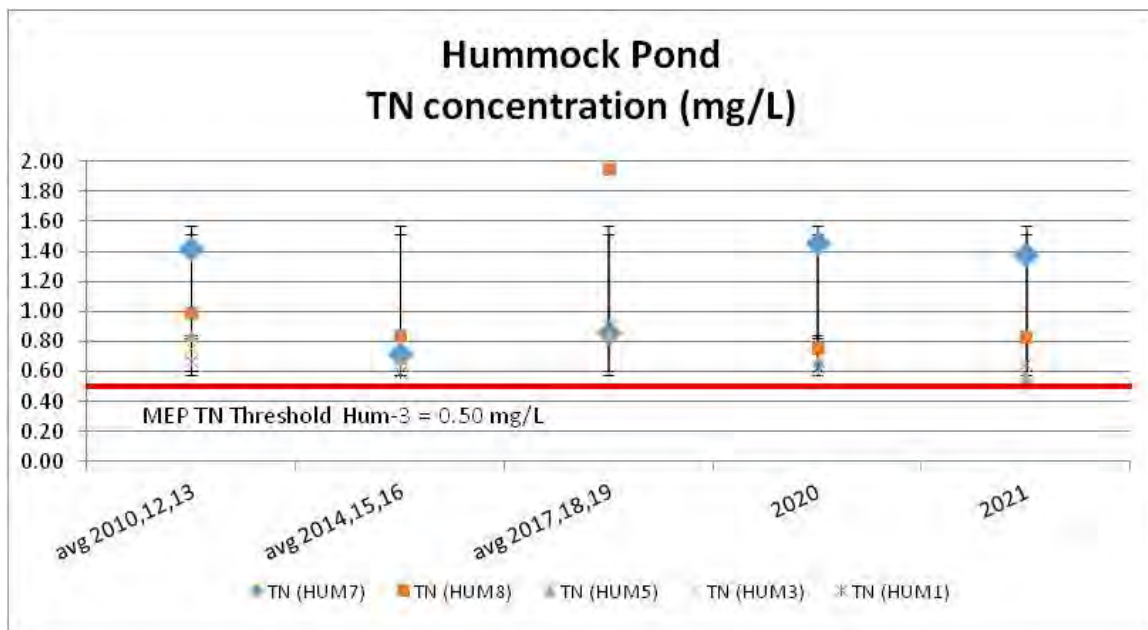
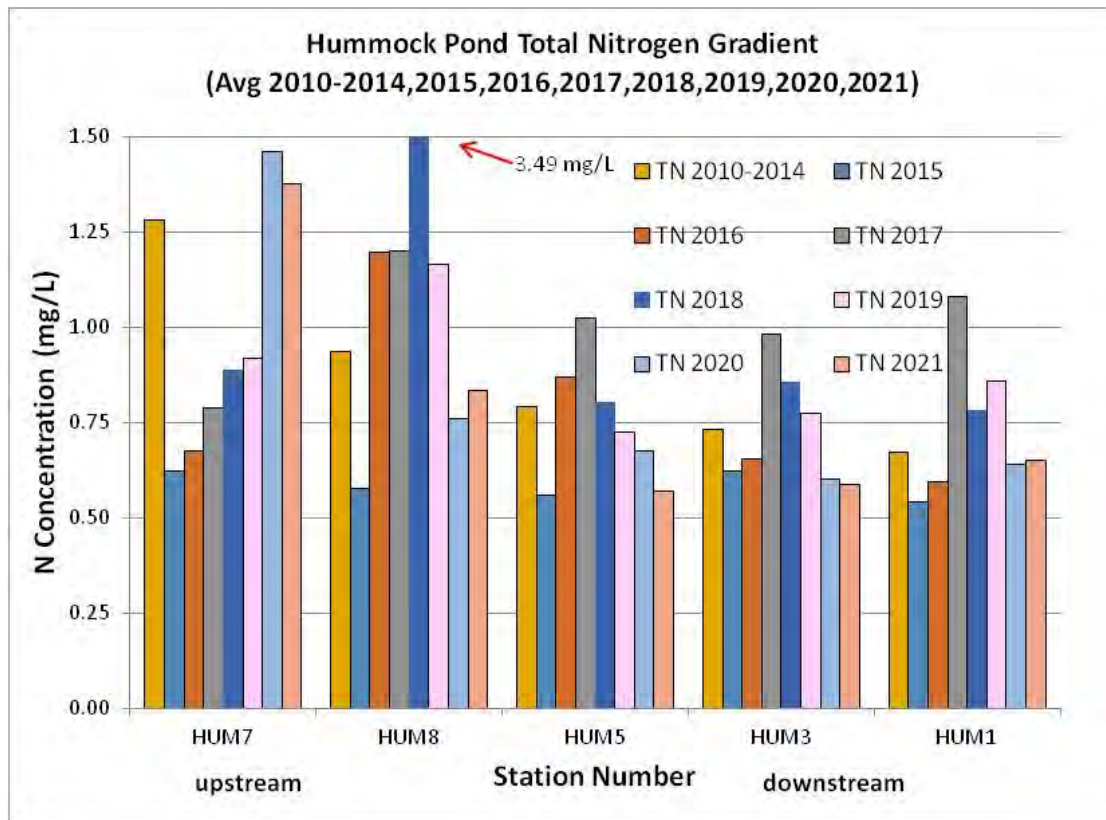


Figure 21. Summer average total nitrogen levels by station over time in Hummock Pond, horizontal line is the TMDL TN level (0.50 mg TN/L). The long opening in 2015 lowered TN levels (<0.65 mg/L), but recent opening attempts have been difficult and TN levels have risen >0.75 mg/L well above the target level for high water quality. Lower TN in levels in 2020 and 2021 show water quality improvement in the lower basins maybe from longer opening duration.

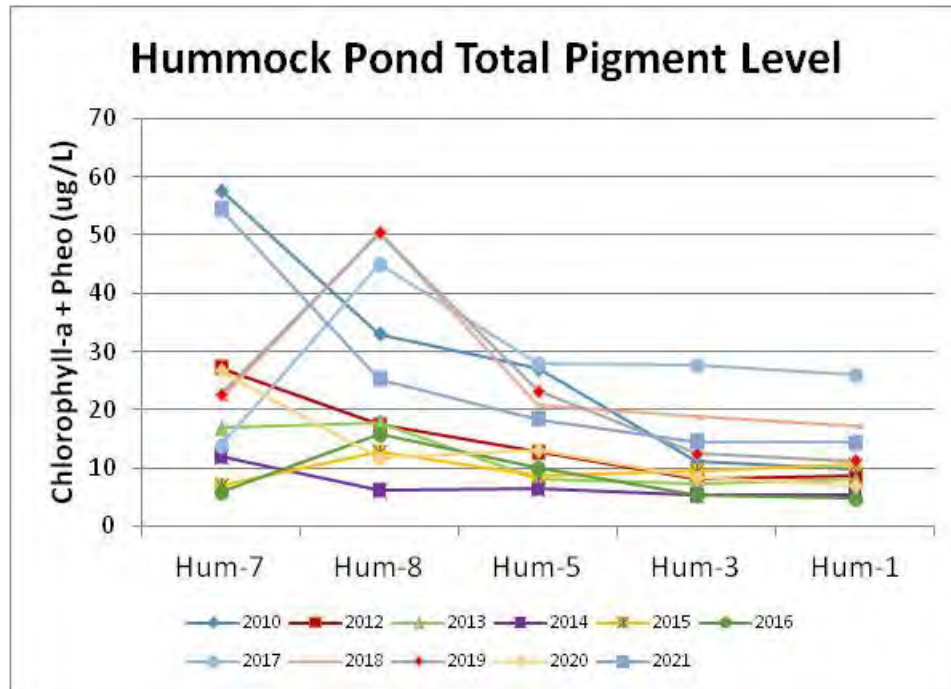


Figure 22. Average Total Pigment (Chlorophyll-a +Pheophytin) concentrations by station in the seasonally opened Hummock Pond system, during the summer 2021 sampling season compared to 2010, 2012-2020. Pigment levels in 2021 greater than 15 ug/L reflecting the level of nitrogen enrichment. The wetland area at HUM-7 had very high TN and a bloom in 2020.

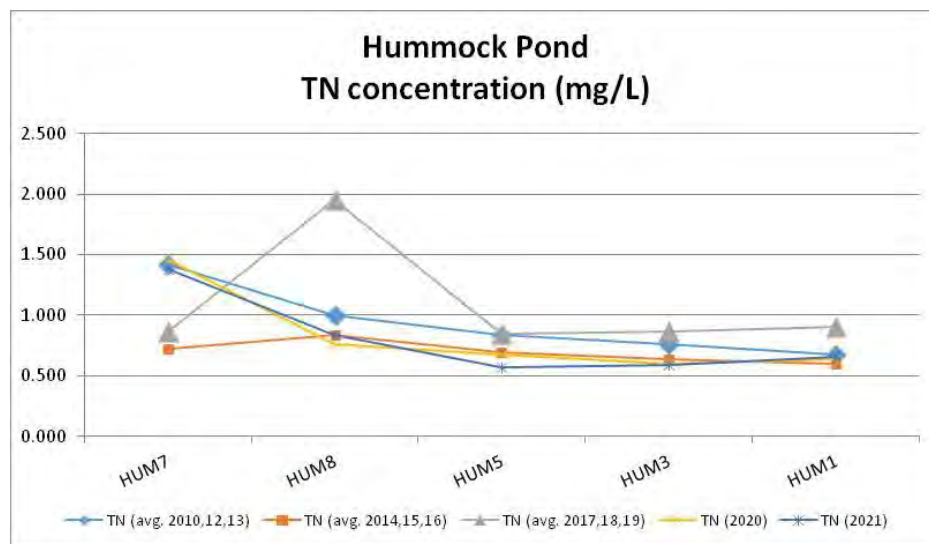


Figure 23. Change in TN level in Hummock Pond main basin (HUM-1,3,5,7) and the Head of Hummock basin (HUM-7) over the past decade grouped to reduce the variation to see if any trends existed. Note that the 2014-2016 (best openings) showed the highest water quality (lowest TN levels) throughout the pond, while the previous period and recent period had higher TN levels. 2020 results are generally higher than the 2014-2016 period which relate to effective pond openings.

Table 4. Summer average TN levels for Hummock Pond for comparison to its TMDL target of 0.50 mg/L. Note that while the openings have not achieved the TMDL TN level. However, the lower basins in 2020 and 2021 are again maintaining moderate N enrichments similar to 2014-2015. Pond openings prior to the summers 2020 and 2021 are the likely cause. The source of the very high TN levels at HUM-7 is unclear and should be evaluated to gauge if it results from a sill or localized tidal restriction.

| Hummock Pond Station ID's | 2021   | 2020   | 2019   | 2018   | 2017   | 2016   | 2015   | 2014   | 2013   | 2012   | 2010             | 2005/2007 |        |
|---------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------------------|-----------|--------|
|                           | TN     | TN     | TN     | TN     | TN     | TN     | TN     | TN     | TN     | TN     | TN               | TN        |        |
|                           | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L)           | (mg/L)    | (mg/L) |
|                           | Mean   | Mean   | Mean   | Mean   | Mean   | Mean   | Mean   | Mean   | Mean   | Mean   | Mean             | Mean      | S.D.   |
| HUM1                      | 0.652  | 0.639  | 0.857  | 0.781  | 1.078  | 0.594  | 0.539  | 0.651  | 0.769  | 0.666  | 0.616            | 0.751**   | 0.374  |
| HUM3                      | 0.586  | 0.599  | 0.774  | 0.856  | 0.980  | 0.654  | 0.622  | 0.643  | 0.827  | 0.863  | 0.589            | 0.630**   | 0.388  |
| HUM5                      | 0.571  | 0.675  | 0.724  | 0.804  | 1.024  | 0.868  | 0.558  | 0.653  | 0.881  | 0.871  | 0.766            | ND        | ND     |
| HUM7                      | 1.378  | 1.46   | 0.919  | 0.889  | 0.789  | 0.673  | 0.621  | 0.873  | 1.170  | 1.301  | 1.786            | 1.283**   | 0.969  |
| HUM8                      | 0.833  | 0.758  | 1.164  | 3.488  | 1.200  | 1.194  | 0.576  | 0.755  | 1.064  | 0.944  | 0.983            | ND        | ND     |
|                           |        |        |        |        |        |        |        |        |        |        | **2007 data only |           |        |

**Miacomet Pond** was a periodically opened salt water pond managed by the Nantucket Natural Resources Department (NRD). However, due to coastal processes it is not possible to maintain an open tidal inlet to this system or the other major coastal ponds of Sesachacha Pond (Brackish) and Hummock Pond (brackish). Although Miacomet Pond did have an illegal pond opening in 2018, that opening did not result in significant tidal exchange and had an insignificant effect on pond salinity. Due to its not experiencing any functional tidal exchange for well over a decade, Miacomet Pond is now functioning as a freshwater pond with freshwater salinities throughout. As a fresh pond, Miacomet is highly eutrophic with periodic needs for nitrogen and phosphorus management, with both N and P generally being key nutrients for management in most years including 2021 (Table 5).

Nitrogen levels in Miacomet Pond in 2021 and 2020 were exceedingly elevated,  $>1.1$  mg N/L, indicative of a highly eutrophic pond (Figure 24). In fact, 2020 & 2021 generally had the highest TN levels during the monitoring period, an increase over most prior years. Target thresholds for estuaries to maintain a high water and habitat quality are generally in the range of 0.35 – 0.50 mg N/L, less than half of Miacomet Pond (Figure 24). Although this pond is not opened by the Town and has not had any effective tidal exchange for over a decade, this salt pond has shown a range of TN levels from year to year the cause of which is being investigated. Overall the pond has an increasing level of TN moving from near the barrier beach toward its headwaters (Figure 24), a common pattern since nutrients tend to enter more into the headwaters than from the margins. Although the system is fresh due to its lack of salt water input, its nitrogen components are similar to the brackish water estuaries in that, entering dissolved inorganic N (DIN) is rapidly taken up by phytoplankton or algae and converted to organic forms. The result is that almost all watercolumn nitrogen can be found in growing or senescent phytoplankton (PON) or as dissolved organic nitrogen after release from senescent or decaying phytoplankton in the watercolumn or after being deposited to the sediments (Figure 24). Miacomet Pond waters are similar to Hummock and Sesachacha Pond in the large fraction of particulate organic nitrogen (PON) held in suspended phytoplankton. This is consistent with the elevated phytoplankton biomass indicated by the very high total chlorophyll a levels in 2021 (see below).

Since Miacomet Pond has not had any effective tidal exchange for over a decade the large variations that take place from year to year are a bit unclear (Figure 25). One explanation being investigated is associated with rainfall and groundwater recharge. In periods of high rainfall, groundwater levels increase and watershed discharge (carrying nitrogen as nitrate) increases, which would increase nitrogen levels in Miacomet Pond. The region has had variable recharge over the past decade with wet and drought periods.

As part of the monitoring effort, total phosphorus is measured. The inter-annual variation in key nutrient status can be seen in the N/P ratios in 2020 and 2021 (Table 5) where N or P can be the key management nutrient. However, levels of both are sufficient high that both need to be managed to improve water and habitat quality in Miacomet Pond. In 2019 total phosphorus levels were: at MP-3 in the innermost basin, 120 ug P/L (s.d.=82 ugP/L). At MP-2 in the mid basin, 69 ug P/L (s.d. = 30) and in the basin nearest the barrier beach, 60 ug P/L (s.d.=27 ug/L). In 2021, TP levels remained high (MP-3=191, MP-1=57, MP-2=49 ug P/L), several fold higher than the eco-region P concentration for Cape Cod ponds,  $<20$  ug P/L, which is used as a

restoration target for freshwater ponds. It appears based upon either TN or TP levels, Miacomet Pond is highly eutrophic and given the inter-annual variations, both need to be managed.

Phytoplankton biomass, as total chlorophyll a, also varies widely from year to year and generally exceeds the 10 ug/L level indicative of a nutrient enrich water body (Figure 26). Given the high nitrogen and phosphorus levels throughout Miacomet Pond and prior indications that both nutrients may periodically cause phytoplankton or algae blooms, at present management actions should focus on both nutrients. However, if phosphorus control is implemented, it is likely that the blooms would decline, since most freshwater systems have an overabundance of nitrogen (like Miacomet) but low phosphorus levels. This approach requires some simple feasibility study but may indicate a way forward for this eutrophic pond. Over the past decade Miacomet Pond has supported degraded water quality and poor habitat health, it's condition, though variable is not improving and 2020 & 2021 recorded the highest TN levels on record.

Table 5a - Nitrogen to phosphorous ratios from Miacomet Pond during the summer 2021 sampling season indicating that in 2021 the nutrient for managing eutrophication was primarily phosphorus as and TN/TP ratios at all stations were <16, the Redfield ratio, however DIN/DIP ratios at MP-1 and 2 were >16 indicating nitrogen is also a nutrient to be managed.

| <b>Station Id.</b> | <b>N/P</b>     | <b>PC/PN</b>       | <b>DIN/DIP</b>   | <b>TN/TP</b> |
|--------------------|----------------|--------------------|------------------|--------------|
| <b>(2021)</b>      | <b>organic</b> | <b>particulate</b> | <b>inorganic</b> | <b>total</b> |
| <b>MP-3</b>        | 23.9           | 5.8                | 10.9             | 21.2         |
| <b>MP-1</b>        | 43.8           | 6.8                | 30.4             | 47.9         |
| <b>MP-2</b>        | 60.2           | 7.0                | 29.4             | 56.8         |

Table 5b - Nitrogen to phosphorous ratios from Miacomet Pond during the summer 2020 sampling season indicating that in 2020 the nutrient for managing eutrophication was primarily nitrogen as TN/TP ratios at all stations were <16, the Redfield ratio, however DIN/DIP ratios at MP-1 and 2 were >16 indicating phosphorus may also need to be managed.

| <b>Station Id.</b> | <b>N/P</b>     | <b>PC/PN</b>       | <b>DIN/DIP</b>   | <b>TN/TP</b> |
|--------------------|----------------|--------------------|------------------|--------------|
| <b>(2020)</b>      | <b>organic</b> | <b>particulate</b> | <b>inorganic</b> | <b>total</b> |
| <b>MP-3</b>        | 21.8           | 6.4                | 11.6             | 2.5          |
| <b>MP-1</b>        | 41.3           | 8.4                | 46.3             | 4.2          |
| <b>MP-2</b>        | 37.2           | 6.2                | 48.0             | 9.8          |

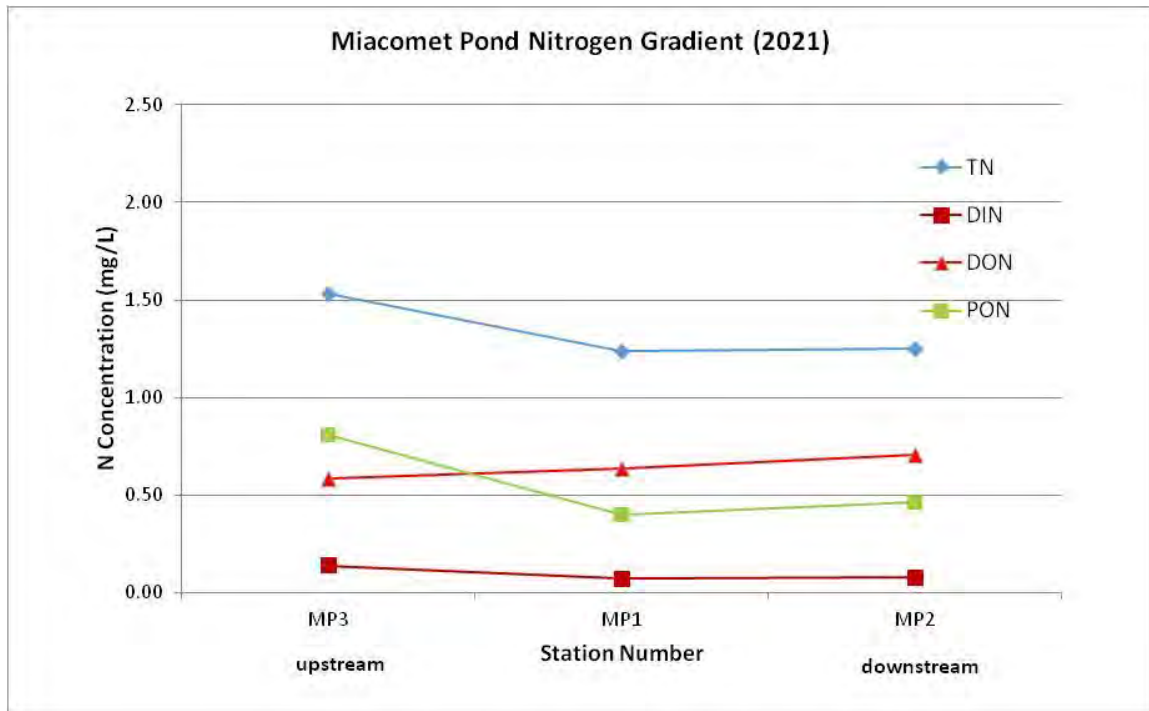


Figure 24. TN, dissolved inorganic nitrogen (DIN), dissolved organic nitrogen (DON) and particulate organic nitrogen in 2021, at stations along the main axis of Miacomet Pond, with MP2 in the basin nearest the barrier beach. Note that at all stations the TN level greatly exceeds the threshold for brackish and estuarine systems and MP-1 is higher than all other stations monitored in the program.

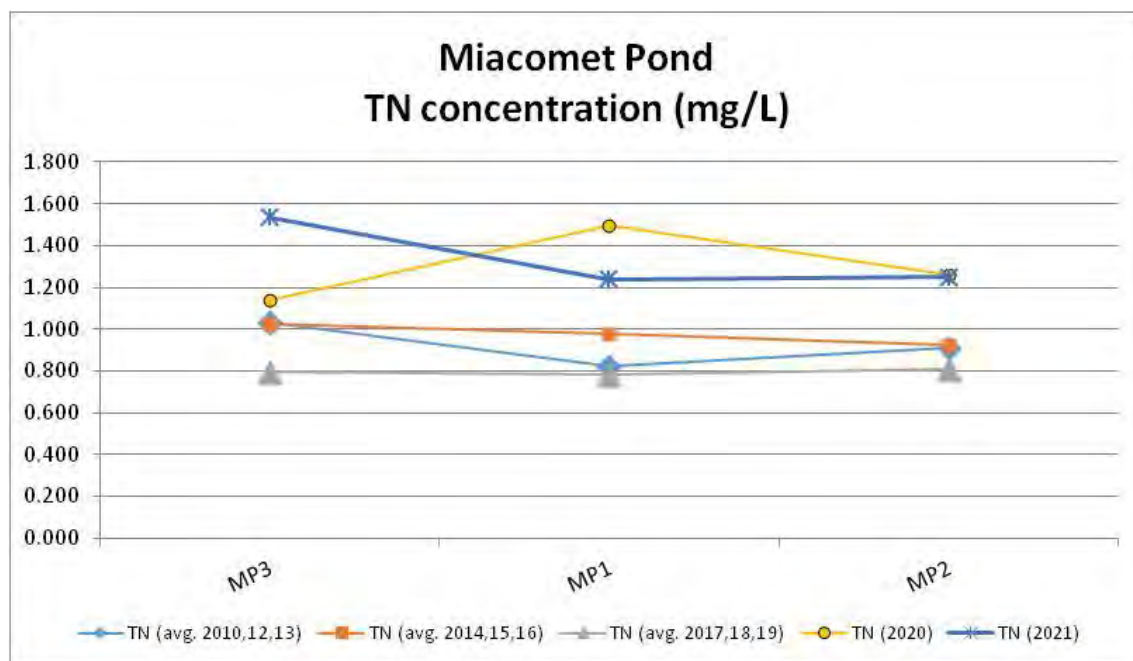
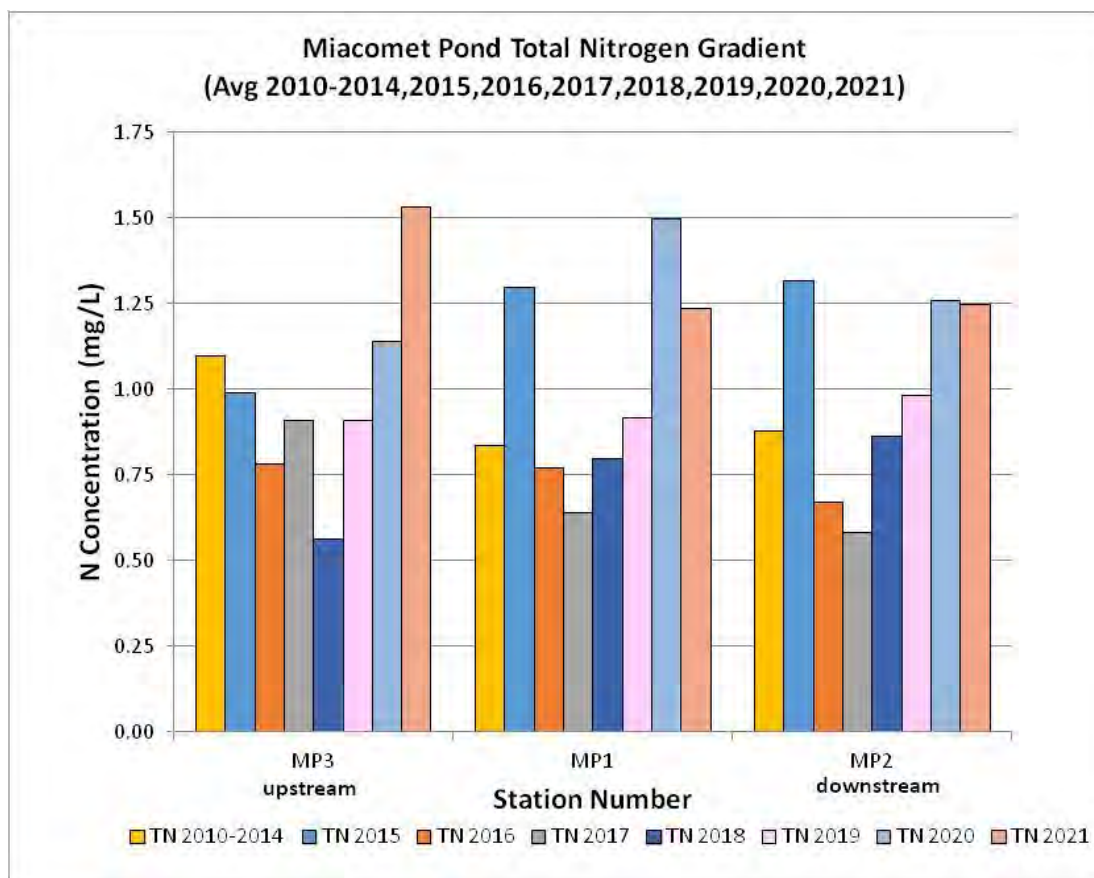


Figure 25a. Total nitrogen levels by station over time in Miacomet Pond.

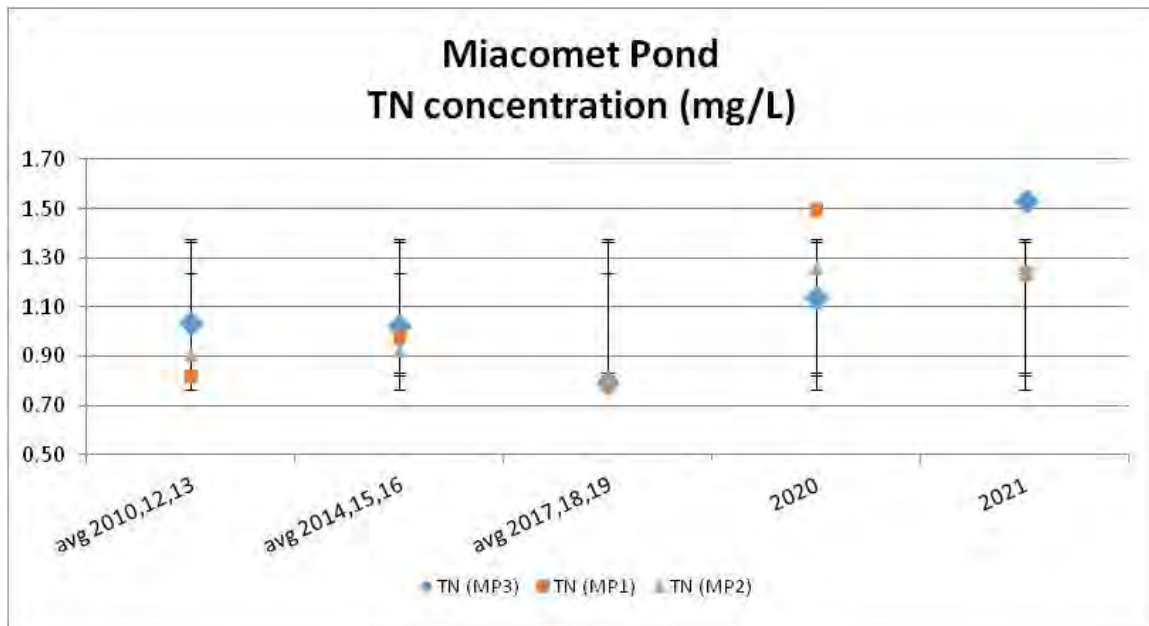


Figure 25b. Summer average total nitrogen levels by station over time in freshwater Miacomet Pond. As a freshwater pond a regulatory TMDL target for nitrogen or phosphorus has yet to be established. 2021 & 2020 recorded the highest TN for each station 2010-2021.

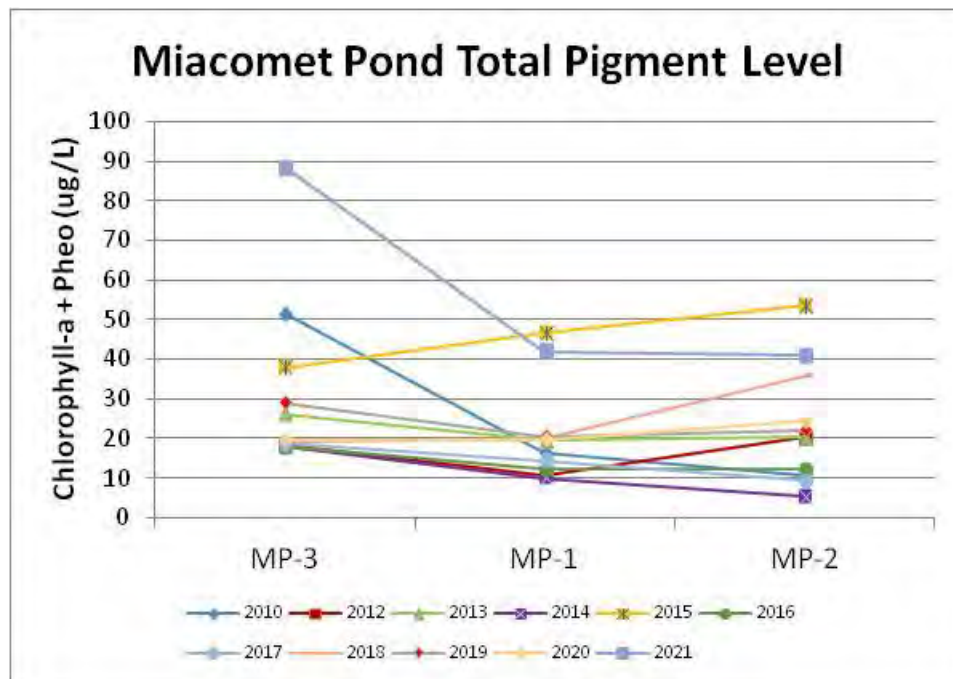


Figure 26. Average Total Pigment (Chlorophyll-a +Pheophytin) concentrations by station in the Miacomet Pond system during the summer 2021 sampling season compared to 2010, 2012-2020. Miacomet Pond is not opened to the Atlantic Ocean and now contains freshwater ( $\leq 0.2$  PSU). Total chlorophyll a pigment levels in 2021 were among the highest on record, consistent with the very high N and P levels and indicate continuing eutrophic conditions.

Table 6. Summer average TN levels for Miacomet Pond, 2010-2021. There is no TMDL for this system and it should be managed as a freshwater pond, likely through phosphorus management. This pond has not experienced significant tidal exchange for over a decade and salinity levels have been  $\leq 0.2$  PSU for more than a decade.

| Miacomet Pond Station ID's | 2021   | 2020   | 2019   | 2018   | 2017   | 2016   | 2015   | 2014   | 2013   | 2012   | 2010            | 2005/2007 |       |
|----------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-----------------|-----------|-------|
|                            | TN     | TN     | TN     | TN     | TN     | TN     | TN     | TN     | TN     | TN     | TN              | TN        |       |
|                            | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L)          | (mg/L)    |       |
|                            | Mean   | Mean   | Mean   | Mean   | Mean   | Mean   | Mean   | Mean   | Mean   | Mean   | Mean            | Mean      | S.D.  |
| MP1                        | 1.236  | 1.498  | 0.915  | 0.797  | 0.641  | 0.772  | 1.297  | 0.864  | 0.792  | 0.828  | 0.854           | 0.842*    | 0.191 |
| MP2                        | 1.248  | 1.258  | 0.983  | 0.863  | 0.584  | 0.669  | 1.318  | 0.784  | 1.036  | 0.880  | 0.811           | 0.855*    | 0.213 |
| MP3                        | 1.533  | 1.141  | 0.908  | 0.562  | 0.909  | 0.783  | 0.992  | 1.297  | 1.058  | 0.950  | 1.093           | 0.280*    | 0     |
|                            |        |        |        |        |        |        |        |        |        |        | *2005 data only |           |       |

**Trophic State of the Estuaries of Nantucket Island future:** The Trophic State of an estuary is a quantitative indicator of its nutrient related ecological health and is based on key ecological metrics: concentrations of inorganic and organic Nitrogen, water clarity (Secchi Depth), lowest measured concentrations of Dissolved Oxygen (average of lowest 20% of measurements), and Chlorophyll-a pigments (surrogate for phytoplankton biomass/blooms). Nutrient related trophic health scales generally range from Oligotrophic (healthy-low nutrient) to Mesotrophic (showing some signs of deterioration of health due to nutrient enrichment) to Eutrophic (habitats significantly impaired and degraded, high levels of nutrients and organic matter and community shifts). The Trophic Health Index Score used here is a standard numerical scale based on criteria for open water embayments and uses the above mentioned measured parameters to create a habitat quality scale (Howes et al. 1999, <http://www.savebuzzardsbay.org>). For the estuaries within the Town of Nantucket, a trophic index score was calculated for each sampling location for each year (2010 and 2012- 2021) using the summer monitoring results. The Index scores were calculated in 2 ways, one which included the low dissolved oxygen for each year in the index ("with DO", Table 6a) and one which excluded the oxygen metric ("without DO", Table 6b). The reason for this dual approach is that in some estuaries, such as those on Nantucket, there are only periodic depletions in bottom water dissolved oxygen, generally related to meteorological events acting on nutrient enriched basins. While these short-term depletions have important ecological consequences, they are difficult to capture in programs that sample 4 or 5 dates per summer. In these cases, inclusion of the oxygen can bias the Index upwards (i.e. higher quality) because of the greater probability of capturing high versus low oxygen events (i.e. missing periodic low oxygen events). This bias was found in the previous analysis of the 2010 dataset, as well as for other estuaries in southeastern Massachusetts. However, this is not always the case and there was no substantive "biasing high" between the "with DO" and "without DO" Index scores based on the 2013 and 2014 data and again in 2016 and 2017 and in recent data through 2020, none-the-less, the index analysis by both methods is presented for informational purposes herein (Tables 6a,6b). It should be noted that to the extent the bias does exist in a given year, it relates only to the oxygen data, the other water quality parameters do not change as rapidly as dissolved oxygen and therefore the sampling program adequately captures accurate concentrations of nutrient related metrics (DO changes by the hour). Further analysis of the *with DO* and *without DO* index values for all stations and monitoring years indicates that there is very little difference in the determined index value between the methods (RPD <10%; generally <5%). The exception was in Miacomet Pond and Head of Hummock Pond which have significant DO depletions in some years and therefore higher variability between the methods (RDP up to 20%). Given that inclusion of oxygen data did not generally change the bay health rank, the index calculated by including DO appears to be most appropriate based upon 10 years of data from Nantucket's systems, but both approaches are developed each year and presented herein.

For the present analysis the standard Index (with DO) was used for assessment and the Health Status was determined for each site based on the data collected during the

sampling events. The ranges of Index scores that fall within a particular Health Status determination are given below with the Index values and description for each monitoring station. Figures 27-31 show the distribution of Health Status throughout each estuary based on each of the 10+ years of monitoring (2010, 2012-2021). For the location maps, only the “with DO” index is shown as in 5 of the past 6 years the inclusion of DO made no substantive difference in the index value and in 2015 the difference was minor. Equally important there is only a few percent difference between the with and without DO indexes in the major systems of Nantucket and Madaket Harbor in all years including 2021, while the largest differences are in the most impaired systems but it does not change the assessment of their water quality impairment. Therefore, the Index maps shown for the “with DO” index making them directly comparable to other estuaries in the region with have assessments of Trophic Status. Numerical results in the tables are color coded in the figures for ease of interpretation. The colors of each triangle represent the Bay Health Index status of each site and follow the designation scheme below:

| <u>Color</u> | <u>Health Status</u> |
|--------------|----------------------|
| Blue         | High Quality         |
| Blue/Yellow  | High-Moderate        |
| Yellow       | Moderate             |
| Yellow/Red   | Moderate/Fair        |
| Red          | Fair/Poor            |

|               |       |             |
|---------------|-------|-------------|
| High          | >69   | Blue        |
| High-Moderate | 61-69 | Blue-Yellow |
| Moderate      | 39-61 | Yellow      |
| Moderate-Fair | 31-39 | Yellow-Red  |
| Fair-Poor     | <31   | Red         |

The integrated water quality scores, as represented by the Index were generally consistent among all 10+ years of monitoring. Although change at some sites was observed, change was gradual and large inter-annual shifts were typically related to major management actions. This relative stability is typical as nutrient related health does not generally change rapidly unless a significant alteration has occurred to the watershed nitrogen loading or to tidal flushing of a basin (e.g. Hummock Pond, Long Pond, Sesachacha Pond). However, 4 systems do appear to show a potential shift in nitrogen related health over the past 10 years with improvements in Hither Creek, Sesachacha Pond and Long Pond and slight improvements in Nantucket Harbor seem to be emerging (see below). However, Hummock Pond and Miacomet Pond are impaired and stable. Having the long-term monitoring results allows the Town to evaluate if year-to-year shifts in water quality status in individual basins are “real” or a response to periodic environmental events. Based upon the results it is possible to assess the nutrient related health of the basins within each of the 5 estuarine systems within the Nantucket Water Quality Monitoring Program. The following assessments rely

mainly on the Index "with DO" scores as it appears to most accurately represent current conditions:

### **Madaket Harbor**

Madaket Harbor main basin in 2021 continued to support a high level of nutrient related water quality as was observed over the prior 10 years. It has been the more enclosed basins of Hither Creek and Long Pond with their reduced tidal flushing that have shown nitrogen impairments. Water quality generally changes gradually, unless there has been a major change in loading or flushing. Within the Madaket Harbor/Long Pond watershed there has been a significant change in the nitrogen sourced at the Town Landfill. The Landfill has recently been undergoing management actions that reduce nitrogen loading to the groundwater, hence to upper Long Pond. It appears that the long-term gradual reduction in TN levels within the upper portions of this complex estuary is consistent with a lowering of watershed nitrogen loading. Over the 10+ years of monitoring, Hither Creek (Station 1), which receives discharge from Long Pond via Madaket Ditch, has consistently supported the poorest "health" status within the Madaket Estuary (Table 6a,b, Figure 29). Hither Creek is clearly nitrogen enriched and showing continuing impairment through 2021, based on a variety of parameters but has improved since 2010. The linkage between water quality in Hither Creek and Long Pond can be seen in the parallel improvements over the past 5 years versus prior 5 years of monitoring. Over the past 10 years the Index indicates that this basin has improved modestly, and is now generally supports moderate water quality TN level declined to pre-2017 levels in 2018 (0.41 mg/L) but went up slightly in 2019 (0.50 mg/L). It is expected that this variability will be reduced in coming years as the system reaches a new equilibrium with the new lower landfill TN loading rate, however, 2021 did not continue this trend with increased impairment in both Long Pond and Hither Creek as seen in both the TN levels and large phytoplankton bloom. In contrast, the main basin of Madaket Harbor continues to show relatively high water quality in each year but also shows a possible improvement from 2010 to 2012 and has been generally stable at high water quality in more recent samplings through 2021. It appears that Station 2, near the outlet to Hither Creek can receive low quality waters on the ebb tide from Hither Creek and that can modify water quality at this near shore location (e.g. 2010). But with improvements in the water quality in Hither Creek, its effect on water quality at Station 2 in near shore Madaket Harbor has been insufficient to affect the Harbor waters, which have maintained high quality status since 2012. The offshore sites (3 & 4) support high quality waters resulting from low nitrogen inputs and very high rates of water exchange. The 10 year positive trend in health index is at least partially the result of the reduced loading from the landfill to upper Long Pond and an improvement in the ebbing waters through Madaket Ditch (the exception being 2021). This trend is consistent with the upper basin of Long Pond being the source water for Madaket Ditch on the ebbing tides. In 2014-2018 the previously observed gradient in water quality metrics between the 2 Long Pond stations is recently only periodically detectable, lessening concern over a potential tidal restriction within Long Pond. However, slightly higher TN and CHLA levels observed in 2019 and 2021 in Long Pond indicate that the system does exhibit variability and careful management is still required. While a further analysis of the mechanism underlying

this periodic gradient would be useful, it is not needed at this time, tracking the phenomenon through the on-going monitoring program should be sufficient. If the improvement in Hither Creek becomes stabilized at the lower end of its range (0.8 – 0.6 mg/L) and 2018 was 0.59 mg N/L (2019 TN 0.50 mg/L at station MH1 and 0.639 mg/L in 2021), it is possible that the TMDL for Madaket Harbor may require somewhat less nitrogen load reduction, making the success of other nitrogen management actions (other than associated with the landfill and any needed septic system work in Madaket) more certain. However, at this point it is likely that additional nitrogen management will be required to meet the TMDL in Hither Creek as it remains of moderate quality, although it appears the reduced load discharging from Madaket Ditch in recent years needs to be stabilized to reduce TN levels. It should be noted that the “fair/poor” quality water designation in Long Pond relates primarily to Long Pond being not supportive of eelgrass. But the MEP and TMDL for Long Pond is based on infaunal animals living in the bottom sediments (i.e. not eelgrass) so the water quality index should not cause concern. However, additional analysis is required to determine if landfill activities will be sufficient to meet the TMDL for Long Pond particularly given the higher levels of TN in 2021(see below). Additional study to clarify the drivers of the improvement (controllable such as the landfill improvements or fertilizer management) will further assist in determining the magnitude of septic system management as posited through the MEP analysis. This further analytical effort is in progress in parallel with the Town’s actual and potential management actions.

## **Long Pond**

Long Pond is a large tributary basin to Madaket Harbor, which receives tidal flow through the artificial connection of Madaket Ditch. Given the structure of the basin and its watershed, Long Pond operates semi-independently from Madaket Harbor (Figure 29). Unlike Madaket Harbor which is marine, Long Pond is a brackish water system resulting from mixing of groundwater inflows and salt water entering through its restricted tidal channel (2018 and 2019 salinity = 16 PSU and in 2021 = 17 PSU). The stability of salinity levels in recent years support the contention that tidal flows through Madaket Ditch have been stable. Long Pond’s Bay Health scores for both stations (5 & 6) in the 10 years of monitoring (2010, 2012-2020) clearly indicate poor nutrient related water quality and this continues to be the case in 2020/2021. It is nearly certain that the water quality of Hither Creek is partially dependent on the nitrogen and organic matter load from Long Pond via Madaket Ditch on ebb tides. However, it should be noted that the TMDL targets restoration of sediment animal communities (infauna) which do not require the same high water quality as eelgrass.

Based upon the 2021 results and the 10+ year time-series, it appears that the Town’s management of the landfill, has reduced the nitrogen load from this source with the associated observed lowering of TN levels. This remains true even with the TN increase in 2021, as it did not rise to historic levels supporting the contention that it is transitory due to environmental events. That the lowering Long Pond TN levels is due to activities at the landfill is strengthened by the parallel timing of the landfill work and the lowering of TN in the adjacent waters, which are only a short groundwater travel time from the landfill. While still small, the water quality Index for Long Pond is starting to improve in

response to the lower TN levels although the basin remains impaired. TN levels in 2015-2017 and 2018-2021 were almost half that of historical and 2010 measurements although they still show inter-annual variations as 2019 TN values were slightly higher (0.63 mg/L TN) compared to 2018 (0.59 mg/L TN) and 2020 TN levels were 0.502 – 0.55 mg N/L a marked improvement, although levels were slightly higher in 2021, 0.639 mg N/L. While continued monitoring will determine the final level of improvement as the system reaches a new equilibrium, it does appear that the reduction in N loading is occurring with beneficial effects. If TN levels stabilize at 2018-2020 levels, the TN target in the TMDL may be achieved and in summer 2022 or 2023 a habitat and DO survey should be considered to evaluate the removal of Long Pond from the MassDEP list of impaired waters. It should be noted that the lack of major change in the Health Index for Long Pond results in part from the relative coarseness of the Index, where sometimes large index score changes are required to change the Index value. The analysis of key metrics (Chlorophyll-a, water clarity-Secchi and total nitrogen) individually do show improving water quality at stations 5 and 6 in 2012-2021 compared to 2010 and in the MEP threshold analysis (see analysis and figures above), however there was a slight decline at station 5 (fair-poor). This may just be attributable to inter-annual variability, possibly due to rainfall, and careful monitoring should continue.

## **Nantucket Harbor**

Nantucket Harbor with Madaket Harbor are presently supporting the highest water quality of Nantucket's estuaries. In 2020 and 2019, all of the Nantucket and Polpis Harbor stations were showing high water quality, slightly better than in 2017. However, in 2021 Polpis Harbor (west) and Wauwinet basin had only moderate water quality and the outer station of Wauwinet (NAN-2a) again had high to moderate water quality. These findings contrast with data collected over the previous 7 years, where the main basin of Nantucket Harbor has supported high quality waters, with only a periodic small level of decline in the uppermost basin, Wauwinet basin (Figure 27). Wauwinet basin (station 3) had the highest average total nitrogen values for the Harbor System in 2013 (0.415 mg/L) and 2015 (0.436 mg/L) consistent with its designation as the surrogate for the sentinel station for the main basin and its documented past eelgrass loss. It should be noted that in summer 2016, SMAST added station 2A and established it as the official TMDL sentinel station for which the nitrogen threshold was established (refer to Figure 2, TN 0.399 mg/L), along with station 3 in order to meet TMDL compliance monitoring criteria. Summer 2017 saw a slightly lower TN level at station NAN-2A (0.368 mg/L) and 2018 lower still (0.337 mg/L) but a slight increase in 2019 (0.392 mg/L), 2020 (0.383 mg N/L), but in 2021 (0.474 mg N/L). Summers 2016-2019 generally showed similar water quality in this basin as 2014 which showed improved chlorophyll-a and TN levels versus prior years. The main driver of the poorer 2015 and 2021 water quality was a phytoplankton bloom in the upper Harbor, which was relatively large for Nantucket Harbor but only moderate for more enriched estuaries in the region. While it is unclear if blooms will become more commonplace in the future, the levels in 2016 reflected more historic conditions and 2017/2018 again higher levels but lower in 2019. 2020 monitoring showed slightly elevated chlorophyll levels but still indicative of a productive

high quality system, but 2021 averaged ~16 ug/L chlorophyll pigments consistent with the TN level. However, other activities associated with the Harbor (additional sewer hookups, jetty improvement and oyster aquaculture) should result in even lower TN and chlorophyll levels and reduce the likelihood of phytoplankton blooms (>10 ug/L) in the future, but the frequency of blooms needs to be tracked as an additional key metric of water quality.

A similar pattern was seen in the enclosed sub-basins of Polpis Harbor (East and West) as in the main basins of Nantucket Harbor. Polpis Harbor basins which after showing moderate impairment in 2010 and 2012 have been showing only low to no impairment in recent years, suggesting some improvement over historic conditions. As in Wauwinet, Polpis Harbor showed 2020-2015 (except for 2017) TN levels similar to 2010, 2012 and 2015, slightly higher than 2013 and 2014. Over the past 5 of 6 years TN levels have been very stable in both East and West Polpis, except that in 2020 West Polpis had a phytoplankton bloom and subsequent low DO event and in 2021 again had a bloom which in both years lowered its Health Index Score to moderate impairment for the first time in 8 years. This variation makes continued monitoring essential to clarify any trends in water quality and linkages to stream nitrogen discharges. Polpis Harbor did not show a phytoplankton bloom in 2015 and supported only moderate-low phytoplankton biomass in 2015-2017, 2018 and 2019 (average <6 ug/L) and appears to have attained generally high water quality status from moderate status in 2010 and 2012. The 2020 and 2021 blooms in West Polpis raised the summer average to 8 ug/l compared to 4-6 ug/L in the main Harbor. While the cause is not certain, it may be related to the surface water discharge into the head of the west basin.

While the overall Nantucket Harbor System is generally supporting high quality waters, the variability in the index in Wauwinet and Polpis basins should be monitored to ascertain their long-term health and to determine the effectiveness of restoration effort by the Town as it continues to move forward to meet the MassDEP TMDL for this system. Overall, Nantucket Harbor appears to be relatively stable from year to year with a gradual slight improvement with high index scores and higher level metrics that support the contention that it is approaching its TMDL threshold. This is also partially the case for the Polpis Harbor basins, although the 2020 and 2021 water quality suggests that surface water inflows maybe important to this basin and may require a targeted load assessment.

### **Sesachacha Pond**

Sesachacha Pond is a closed coastal salt pond that has its water quality managed by periodically breaching the barrier beach to open the basin to tidal exchange with the adjacent Atlantic Ocean waters. This management action serves to flush out nutrients and organic matter on the ebb tides and receive low nitrogen saline waters on the flood tides. Sesachacha Pond was evaluated under the Massachusetts Estuaries Project and a nitrogen threshold (0.60 mg/L) was established for restoration of this system.

Additionally, the MEP analysis recommended an additional mid-summertime opening (if logistically possible) as part of the pond management strategy to enhance flushing of the pond and improve water quality to reach the threshold without any need for infrastructure. The water quality monitoring program in 2010, 2012 and 2013 showed that the pond nitrogen levels were converging on the 0.60 mg/L total nitrogen threshold established by the MEP. Total nitrogen (TN) levels dropped significantly from historical levels of 1.20 mg/L to ~0.68 mg/L in 2010 and 2012 and 0.67 mg/L in 2013, with associated improvements in the levels of water clarity and chlorophyll-a. However, with limited openings in 2014-2017, TN rose to near historic levels, ~0.9 mg/L. Re-evaluation by NRD using monitoring results has resulted in solid openings in recent years with an improvement in 2018 (0.752 mg N/L) and 2020 (0.673 mg N/L) with moderate restoration of overall water quality but with moderate continuing impaired conditions. In 2020 and 2021 the pond opening was shifted from spring to fall. During summer 2021 TN levels rose to 2014-2017 levels (1.016 mg N/L pond-wide) and there was a parallel bloom (19 ug/L) almost 5 times the 2020 level (4 ug/L). It is not clear at this point if these events are related to the temporal change in opening or some other factor, continued monitoring should yield the answer. All of the TN and chlorophyll results since 2010 support the contention that changes relate to the quality of the openings. Given the 2010-2013 period when robust openings occurred, it appears that a solid opening program continues to have the capability to improve the water quality metrics pond-wide to levels near the TMDL nitrogen threshold.

Based upon the Health Index alone, changes in water quality in Sesachacha Pond over the 2010-2013 period were stabilized at a moderate level of impairment of this estuary, with more recent monitoring 2015-2017 seeing a trend toward poor water quality conditions with a rebound in 2018 and 2020 where TN levels declined, until the significant decline in 2021 (Figure 28). In 2019, conditions did worsen slightly compared to 2018 but rebounded in 2020 until the decline return to 2017 conditions in 2021. Additional higher level assessment of Sesachacha Pond initiated based on the 2010 monitoring results was conducted and confirmed that the pond was improving by 2013, but was impaired in 2014 consistent with the monitoring results. 2020 showed the highest Health Index values in the 10 year record with low-moderate chlorophyll, unimpaired oxygen levels, and moderate clarity. It appears that like other periodically opened ponds, the quality of the opening (amount of water exchanged) controls the level of water quality in the following months. Fortunately, the data indicate that attaining pond openings of the quality of 2012 and 2013 (done under Town supervision) in the future may be sufficient to attain the TMDL for this system. In addition, the impaired but improved conditions in 2018 and 2020 and decline in 2021, all had high in TN (organic N component), did not show bottom water D.O. depletion, but had only moderate chlorophyll-a, which showed bloom levels in 2021. The overall results support the MEP threshold target of 0.60 mg N/L. Similarly, while TN was higher in 2019 than 2018 and 2020, DO depletions were not apparent (4.7 to 7.8 mg/L, 20% low DO values). A closer examination of the new opening protocol and the linkage to resultant water quality is needed for management of this system.

## Hummock Pond

Hummock Pond is a closed coastal salt pond that is only periodically opened to the ocean to flush out nutrients and organic matter on the ebb tide and receive low nutrient saline waters on the flood tide. Creating sustained openings that are sufficient to allow exchange of tidal waters for more than 4-5 days has been difficult for this system due to its location on the coast and the large amount of sand migration in the coastal zone which can rapidly reseal the inlet.

Hummock Pond is opened at a sufficient frequency to sustain salinity levels in the 4-8 PSU range, with only small inter-annual differences (2012 slightly higher than 2010). The pond continues to support a small but clear salinity gradient from Station 1 nearest the ocean to Station 7 in the uppermost basin (Head of Hummock). The present non-tidal state and watershed nutrient inputs have resulted in moderate to poor nutrient related water quality throughout the pond, with poor water quality conditions the present norm (2005-2007, 2010, 2012, 2013, 2014, 2015). Unfortunately, in 2016 the pond appears to have had lower water quality in its upper and mid reaches than in previous years, although the lower basin did not show this inter-annual variation. Similarly, in 2017 and 2018 water quality declined further throughout most of the estuary, including the lower basin. This resulted from the poor spring 2017 and 2018 opening which is reflected in the very low salinities throughout summer 2017 (3.5 PSU), 2018 (4.8 PSU) and even more so in 2019 (2.8-4.8 PSU). Fortunately, the 2020 and 2021 openings were moderately improved such that the salinity of the lower basin (HUM-1,3,5) again rose to 5.3 PSU in 2020 and 6.0 in 2021, but Hummock Pond is still slightly below its earlier salinity which is of concern for habitat stability. There is generally a small gradient in water quality with moderate to poor conditions near the ocean and poor conditions in the uppermost basins, but this collapsed to generally poor water quality throughout the system in 2017-2019 (Figure 31). However, with the slight improvement in salinity there was also a modest improvement in water quality in 2020 and 2021, with a rise in Index Score. The uppermost basin Head of Hummock, Station 7, is approaching fresh/brackish conditions (3.5-4.0 PSU in 2020 and 2021) and as a result is currently supporting mainly freshwater plant and animal habitats (note salinity was 2.8 PSU in 2019). This basin is particularly eutrophic with phytoplankton blooms periodically exceeding 70 ug/L, 26 ug/L in 2020 and 54 ug/L in 2021 (offshore waters are ~2 ug/L). It appears that the upper basin (Station 7), is supporting relatively stable salinities and phytoplankton biomass but with average higher chlorophyll a levels than the lower basins (16 ug/L). Head of Hummock appears to have been artificially connected to the adjacent estuary and is the recipient of much of the freshwater inflow. It continues to be one of the most highly eutrophic basins within the Town of Nantucket with oxygen depletions to 3 mg/L (1.36 mg/L DO in 2019). All of the metrics are consistent with a nutrient impaired basin in all years. It should be noted that the lower third of the Hummock Pond Estuary is currently supporting impaired benthic animal habitat even though conditions are the "best" in the overall impaired system.

Based upon the monitoring results it is clear that the nutrient related health of Hummock Pond is significantly related to the success of its periodic openings. The individual metrics and the Health Index for summer 2014 and 2015 appear to support that tidal flushing was improved as nutrient related health was highest in 2014 and 2015 and again in 2020 and 2021 of the years monitored. It also appears that the continued successful inlet openings from April 2014 into 2015, 2020 and 2021 have resulted in additional improvements in water quality, with 2015 showing the lowest TN levels in records back to 2005, although it is still above its threshold value to support high quality habitat. Unfortunately, this pattern was not seen in the 2016-2019 water quality data, which showed further decline in the upper and mid reaches, and even the lower basin. However, the rapid improvement in 2020 and 2021 suggests that water quality response is rapid to improved tidal flushing. The opening program and associated monitoring around the openings and during the summer will need to be used to set metrics for a “successful” opening, to produce a simplified assessment protocol for opening success and to document and further refine the opening protocol for the Town’s on-going program. To date this joint effort has shown the potential for significant benefits to Hummock Pond water quality and associated natural resources at low cost to the Town, but successful openings appear to be challenging and vary from year-to-year.

### **Miacomet Pond**

Miacomet Pond is a closed coastal salt pond that is rarely (over a decade ago) opened to the ocean to flush out nutrients and organic matter on the ebb tide and receive low nutrient saline waters on the flood tide. As a result of the lack of tidal flow and continuous groundwater inputs, the pond is presently freshwater, with salinity levels in each of the past 10 years of monitoring of <0.5 PSU, and only 0.1 – 0.2 in 2019-2021 and 0.1 PSU, 2015-2017. Clearly, Miacomet remains a completely fresh water dominated system. The present non-tidal state and extent of watershed nutrient inputs has resulted in a decline in nutrient related water quality throughout the pond for both nitrogen and phosphorus, with poor water quality and habitat impairment the present norm (Figure 30) and it remained that way in the summer of 2021. This can be seen, for example, in the high chlorophyll levels (2010: 12-50 ug/L; 2012: 10-20 ug/L; 2013: 20-26 ug/L; 2014: 23-70 ug/L; 2015: 38-53 ug/L) several times greater than the levels found in the high quality basins of Nantucket and Madaket Harbors with a maximum in 2018 (25 ug/L) following highs in 2017 and 2016 (mean = ~14 ug/L). Summer 2019 chlorophyll levels ranged between 11-16 ug/L but 2020 again rose to 20-24 ug/L levels and were even higher in 2021 with the main basin ~40 ug/L and upper reach, 88 ug/L. All of the metrics for Miacomet Pond are consistent with a highly nutrient impaired basin. As discussed in previous years, as the freshening of this basin has become complete and sustained, it likely will have to be managed as a transitional freshwater system and will need to be reassessed as such. As salt ponds freshen and become fresh ponds the nutrient causing eutrophication can shift to phosphorus from nitrogen or become both nitrogen and phosphorus (seasonally varying nutrient limitation). Since Miacomet Pond may have storm over-wash in the future due to climate change related storm intensification and sea level rise, it may be necessary for management to create both a

nitrogen and a phosphorus budget for this system and to conduct short-term incubations to determine which nutrient is controlling pond health under present and varying salinity conditions. None-the-less, phosphorus should be a part of pond management, with phosphorus limitation to phytoplankton growth throughout Miacomet Pond in 2016-2021. While nitrogen is also supporting eutrophication in this system, it is likely that phosphorus controls alone may create a significant improvement and should be evaluated as a cost-effective management action.

Another challenge in managing Miacomet Pond is that it will be difficult for the Pond to maintain itself as a purely freshwater system in the future as storm over-wash and rising sea level (as well as increasing storm intensity and frequency related to climate change) will tend to periodically cause seawater intrusion into its lower basin. An analysis of future conditions for Miacomet Pond as sea level rises may be in order at the point remediation is being considered. But at present the system is a highly nutrient impaired aquatic system with very poor water quality. It would be prudent for the Town to continue the development of a management plan that takes into account not only the nutrient related impairment of Miacomet Pond, but also accommodates the likely shifting between fresh and salt water over the long term.

### **Recommendations for Future Monitoring:**

Each year after review of a given years monitoring data and comparison to the long-term record, the Island-Wide Monitoring Program puts forward recommendations to the NRD for the on-going effort. As this is a long-term program many of the prior issues and additional data collection efforts have been addressed. In 2021, specific points are raised based on the long-term data and overall restoration effort :

- Salinity levels in Hummock Pond have slowly declined to <5.5 PSU in the lower basin (2018-2021) and <4 PSU in the upper reaches in 2020 and 2021. These levels are of concern as they may result in species changes. The 2020 and 2021 levels are an improvement over 2017, but need to be tracked closely with the openings, which appear to have been better in the last 2 years.
- Both N and P may be causing the highly eutrophic conditions in Miacomet Pond. It would be useful for management planning to determine their relative importance. Since P is much easier to control than N, the results might suggest targeted management of phosphorus to improve habitat health. It appears that Miacomet Pond will not improve without management action and is one of the most impaired systems in the region.
- Improving water quality in Nantucket Harbor and Long Pond (2017-2021) due to Town efforts should be noted, even with the inter-annual variation in recent years .
- A close examination of Sesachacha Pond opening protocol and improving water quality needs to be conducted, The shift from spring to fall openings needs to be evaluated in light of the large decline in Sesachacha Pond water quality in 2021.

- The role of Long Pond water quality changes on Hither Creek could benefit from a re-run of the MEP models and evaluation of the N source reduction associated with the landfill should continue.

Overall, the monitoring program is performing as designed and producing the needed high quality data for management and is still revealing new issues affecting the efficacy of management actions. Coordination between NRD and SMAST is at a high level due in no small part to the efforts of NRD Staff.

| EMBAYMENT  | 2021<br>Secchi<br>SCORE | Station Average 2021 (with DO) |              |              |                | (with DO)<br>2021<br>EUTRO<br>Index | Health Status |
|------------|-------------------------|--------------------------------|--------------|--------------|----------------|-------------------------------------|---------------|
|            |                         | Low20%<br>Oxsat<br>SCORE       | DIN<br>SCORE | TON<br>SCORE | T-Pig<br>SCORE |                                     |               |
| HUM7       | 18.8                    | 37.0                           | 0.0          | 0.0          | 0.0            | 11.2                                | Fair-Poor     |
| HUM8       | 0.0                     | 100.0                          | 100.0        | 0.0          | 0.0            | 40.0                                | Moderate      |
| HUM5       | 39.0                    | 90.0                           | 86.7         | 11.0         | 0.0            | 45.3                                | Moderate      |
| HUM3       | 37.2                    | 100.0                          | 100.0        | 4.8          | 0.0            | 48.4                                | Moderate      |
| HUM1       | 45.2                    | 74.2                           | 100.0        | 0.0          | 0.0            | 43.9                                | Moderate      |
| LONG6      | 26.6                    | 22.5                           | 46.5         | 0.0          | 0.0            | 19.1                                | Fair-Poor     |
| LONG5      | 30.2                    | 22.5                           | 71.5         | 0.0          | 0.0            | 24.8                                | Fair-Poor     |
| HC1        | #N/A                    | #N/A                           | #N/A         | #N/A         | #N/A           |                                     |               |
| HC2        | #N/A                    | #N/A                           | #N/A         | #N/A         | #N/A           |                                     |               |
| HC3        | #N/A                    | #N/A                           | #N/A         | #N/A         | #N/A           |                                     |               |
| MH1        | 66.2                    | 61.8                           | 21.2         | 10.8         | 0.0            | 32.0                                | Moderate-Fair |
| MH2        | 70.5                    | 87.0                           | 49.3         | 97.4         | 75.1           | 75.9                                | High          |
| MH3        | 86.7                    | 82.4                           | 94.2         | 90.4         | 75.7           | 85.8                                | High          |
| MH4        | 95.7                    | 88.5                           | 97.0         | 100.0        | 84.6           | 93.2                                | High          |
| MP3        | 0.0                     | 63.6                           | 0.0          | 0.0          | 0.0            | 12.7                                | Fair-Poor     |
| MP1        | 38.9                    | 61.8                           | 30.1         | 0.0          | 0.0            | 26.2                                | Fair-Poor     |
| MP2        | 56.4                    | 88.5                           | 26.0         | 0.0          | 0.0            | 34.2                                | Moderate-Fair |
| NAN1       | 100.0                   | 79.2                           | 71.5         | 99.1         | 73.4           | 84.6                                | High          |
| NAN2       | 90.0                    | 85.5                           | 78.4         | 93.2         | 38.5           | 77.1                                | High          |
| NAN2A      | 85.2                    | 79.2                           | 76.6         | 71.5         | 10.7           | 64.6                                | High-Moderate |
| NAN3       | 74.8                    | 85.5                           | 76.6         | 37.8         | 0.0            | 54.9                                | Moderate      |
| NAN4       | 100.0                   | 85.5                           | 57.8         | 100.0        | 42.3           | 77.1                                | High          |
| NAN5       | 70.0                    | 72.5                           | 78.4         | 66.7         | 7.5            | 59.0                                | Moderate      |
| NAN6       | 83.3                    | 75.9                           | 71.5         | 71.0         | 16.8           | 63.7                                | High          |
| NAN7       | 71.9                    | 87.0                           | 65.5         | 84.8         | 32.5           | 68.3                                | High          |
| NAN8N      | 52.6                    | 80.8                           | 100.0        | 100.0        | 90.1           | 84.7                                | High          |
| ST4        | ND                      | ND                             | 78.4         | 0.0          | ND             |                                     |               |
| ST6        | ND                      |                                |              |              |                |                                     |               |
| ST6B       | ND                      | ND                             | 94.2         | 0.0          | ND             |                                     |               |
| WPH OUTLET | ND                      | ND                             | 30.7         | 0.0          | ND             |                                     |               |
| SESA3      | 48.6                    | 95.8                           | 39.8         | 0.0          | 0.0            | 36.8                                | Moderate-Fair |
| SESA2      | 49.1                    | 100.0                          | 57.8         | 0.0          | 0.0            | 41.4                                | Moderate      |
| SESA4      | 44.2                    | 100.0                          | 47.4         | 0.0          | 0.0            | 38.3                                | Moderate      |
| SESA1      | 46.8                    | 100.0                          | 36.1         | 0.0          | 0.0            | 36.6                                | Moderate-Fair |
| ORS2       | 36.2                    | 80.8                           | 86.7         | 84.5         | 51.3           | 67.9                                | High-Moderate |
| ORS4       | 54.8                    | 47.9                           | 82.4         | 73.3         | 31.2           | 57.9                                | Moderate      |
| ORS6       | 34.8                    | 70.8                           | 86.7         | 24.7         | 40.4           | 51.5                                | Moderate      |

Table 6a. 2021 Trophic Health Index Scores and status for water quality monitoring stations in Nantucket estuaries based upon open water embayment (not salt marsh) habitat quality scales. Index calculated with Dissolved Oxygen data (described in Howes et. al., 1999 at [www.savebuzzardsbay.org](http://www.savebuzzardsbay.org))

|          |            | Station Average 2021 (with DO) |      |      |       | Station Average 2021 (with DO) |        |       |        | Station Average 2021 (with DO) |       |       |       | With DO       |               | No DO         |               | With DO     | No DO       |
|----------|------------|--------------------------------|------|------|-------|--------------------------------|--------|-------|--------|--------------------------------|-------|-------|-------|---------------|---------------|---------------|---------------|-------------|-------------|
| Salinity | EMBAYMENT  |                                | 2021 | %Sat |       |                                |        | 2021  | Low20% |                                |       |       |       | 2021          | Health Status | EUTRO         | Health Status | 2021        | 2021        |
| ppt      | YR         | Secchi m                       | DO   | DIN  | TON   | T-Pig                          | Secchi | Oxsat | DIN    | TON                            | T-Pig | EUTRO | Index |               | EUTRO         | Index         |               | Colors      | Colors      |
|          |            | All                            | 20%  | ppm  | ppm   | ug/L                           | SCORE  | SCORE | SCORE  | SCORE                          | SCORE |       |       |               |               |               |               |             |             |
| 3.60     | HUM7       | 2021                           | 0.81 | 54%  | 0.310 | 1.067                          | 54.50  | 18.8  | 37.0   | 0.0                            | 0.0   | 0.0   | 11.2  | Fair-Poor     | 4.7           | Fair-Poor     | Red           | Red         | Red         |
| 4.05     | HUM8       | 2021                           | 0.60 | 92%  | 0.012 | 0.821                          | 25.33  | 0.0   | 100.0  | 100.0                          | 0.0   | 0.0   | 40.0  | Moderate      | 25.0          | Fair-Poor     | Yellow        | Red         | Red         |
| 5.03     | HUM5       | 2021                           | 1.12 | 83%  | 0.019 | 0.552                          | 18.41  | 39.0  | 90.0   | 86.7                           | 11.0  | 0.0   | 45.3  | Moderate      | 34.2          | Moderate-Fair | Yellow        | Yellow-Red  | Yellow-Red  |
| 6.14     | HUM3       | 2021                           | 1.09 | 98%  | 0.008 | 0.578                          | 14.57  | 37.2  | 100.0  | 100.0                          | 4.8   | 0.0   | 48.4  | Moderate      | 35.5          | Moderate-Fair | Yellow        | Yellow-Red  | Yellow-Red  |
| 6.82     | HUM1       | 2021                           | 1.24 | 73%  | 0.011 | 0.641                          | 14.43  | 45.2  | 74.2   | 100.0                          | 0.0   | 0.0   | 43.9  | Moderate      | 36.3          | Moderate-Fair | Yellow        | Yellow-Red  | Yellow-Red  |
| 17.74    | LONG6      | 2021                           | 0.92 | 48%  | 0.048 | 0.773                          | 21.42  | 26.6  | 22.5   | 46.5                           | 0.0   | 0.0   | 19.1  | Fair-Poor     | 18.3          | Fair-Poor     | Red           | Red         | Red         |
| 16.20    | LONG5      | 2021                           | 0.98 | 48%  | 0.027 | 0.683                          | 24.49  | 30.2  | 22.5   | 71.5                           | 0.0   | 0.0   | 24.8  | Fair-Poor     | 25.4          | Fair-Poor     | Red           | Red         | Red         |
|          | HC1        | 2021                           |      |      |       |                                | #N/A   | #N/A  | #N/A   | #N/A                           | #N/A  |       |       |               |               |               |               |             |             |
|          | HC2        | 2021                           |      |      |       |                                | #N/A   | #N/A  | #N/A   | #N/A                           | #N/A  |       |       |               |               |               |               |             |             |
|          | HC3        | 2021                           |      |      |       |                                | #N/A   | #N/A  | #N/A   | #N/A                           | #N/A  |       |       |               |               |               |               |             |             |
| 22.61    | MH1        | 2021                           | 1.74 | 66%  | 0.086 | 0.553                          | 14.16  | 66.2  | 61.8   | 21.2                           | 10.8  | 0.0   | 32.0  | Moderate-Fair | 24.5          | Fair-Poor     | Yellow-Red    | Red         | Red         |
| 21.88    | MH2        | 2021                           | 1.87 | 81%  | 0.045 | 0.286                          | 4.05   | 70.5  | 87.0   | 49.3                           | 97.4  | 75.1  | 75.9  | High          | 73.1          | Fair-Poor     | Blue          | Blue        | Blue        |
| 23.57    | MH3        | 2021                           | 2.42 | 78%  | 0.016 | 0.301                          | 4.02   | 86.7  | 82.4   | 94.2                           | 90.4  | 75.7  | 85.8  | High          | 86.7          | High          | Blue          | Blue        | Blue        |
| 23.86    | MH4        | 2021                           | 2.80 | 82%  | 0.015 | 0.255                          | 3.61   | 95.7  | 88.5   | 97.0                           | 100.0 | 84.6  | 93.2  | High          | 94.3          | High          | Blue          | Blue        | Blue        |
| 0.10     | MP3        | 2021                           | 0.58 | 67%  | 0.140 | 1.393                          | 88.28  | 0.0   | 63.6   | 0.0                            | 0.0   | 0.0   | 12.7  | Fair-Poor     | 0.0           | Fair-Poor     | Red           | Red         | Red         |
| 0.10     | MP1        | 2021                           | 1.12 | 66%  | 0.070 | 1.166                          | 41.99  | 38.9  | 61.8   | 30.1                           | 0.0   | 0.0   | 26.2  | Fair-Poor     | 17.3          | Fair-Poor     | Red           | Red         | Red         |
| 0.11     | MP2        | 2021                           | 1.49 | 82%  | 0.077 | 1.170                          | 40.90  | 56.4  | 88.5   | 26.0                           | 0.0   | 0.0   | 34.2  | Moderate-Fair | 20.6          | Fair-Poor     | Yellow-Red    | Red         | Red         |
| 32.13    | NAN1       | 2021                           | 3.28 | 76%  | 0.027 | 0.282                          | 4.13   | 100.0 | 79.2   | 71.5                           | 99.1  | 73.4  | 84.6  | High          | 86.0          | High          | Blue          | Blue        | Blue        |
| 32.23    | NAN2       | 2021                           | 2.55 | 80%  | 0.023 | 0.295                          | 6.29   | 90.0  | 85.5   | 78.4                           | 93.2  | 38.5  | 77.1  | High          | 75.0          | High          | Blue          | Blue        | Blue        |
| 32.01    | NAN2A      | 2021                           | 2.36 | 76%  | 0.024 | 0.348                          | 8.79   | 85.2  | 79.2   | 76.6                           | 71.5  | 10.7  | 64.6  | High-Moderate | 61.0          | High-Moderate | Blue          | Blue-Yellow | Blue-Yellow |
| 32.39    | NAN3       | 2021                           | 2.00 | 80%  | 0.024 | 0.450                          | 15.49  | 74.8  | 85.5   | 76.6                           | 37.8  | 0.0   | 54.9  | Moderate      | 47.3          | Moderate      | Yellow        | Yellow      | Yellow      |
| 32.19    | NAN4       | 2021                           | 3.19 | 80%  | 0.037 | 0.217                          | 6.01   | 100.0 | 85.5   | 57.8                           | 100.0 | 42.3  | 77.1  | High          | 75.0          | High          | Blue          | Blue        | Blue        |
| 31.99    | NAN5       | 2021                           | 1.85 | 72%  | 0.023 | 0.361                          | 9.14   | 70.0  | 72.5   | 78.4                           | 66.7  | 7.5   | 59.0  | Moderate      | 55.6          | Moderate      | Yellow        | Yellow      | Yellow      |
| 31.87    | NAN6       | 2021                           | 2.29 | 74%  | 0.027 | 0.349                          | 8.17   | 83.3  | 75.9   | 71.5                           | 71.0  | 16.8  | 63.7  | High          | 60.6          | High-Moderate | Blue          | Blue-Yellow | Blue-Yellow |
| 32.07    | NAN7       | 2021                           | 1.91 | 81%  | 0.031 | 0.314                          | 6.76   | 71.9  | 87.0   | 65.5                           | 84.8  | 32.5  | 68.3  | High          | 63.7          | High-Moderate | Blue          | Blue-Yellow | Blue-Yellow |
| 32.00    | NAN8N      | 2021                           | 1.40 | 77%  | 0.005 | 0.277                          | 3.38   | 52.6  | 80.8   | 100.0                          | 100.0 | 90.1  | 84.7  | High          | 85.7          | High          | Blue          | Blue        | Blue        |
| 0.10     | ST4        | 2021                           | 0.35 | ND   | 0.023 | 2.599                          | ND     | ND    | ND     | 78.4                           | 0.0   | ND    |       |               |               |               |               |             |             |
|          | ST6        | 2021                           |      |      |       |                                | ND     | ND    |        |                                |       |       |       |               |               |               |               |             |             |
| 0.03     | ST6B       | 2021                           | 0.40 | ND   | 0.016 | 1.549                          | ND     | ND    | ND     | 94.2                           | 0.0   | ND    |       |               |               |               |               |             |             |
| 6.70     | WPH OUTLET | 2021                           | ND   | ND   | 0.069 | 1.043                          | ND     | ND    | ND     | 30.7                           | 0.0   | ND    |       |               |               |               |               |             |             |
| 7.09     | SESA3      | 2021                           | 1.31 | 87%  | 0.056 | 0.866                          | 17.09  | 48.6  | 95.8   | 39.8                           | 0.0   | 0.0   | 36.8  | Moderate-Fair | 22.1          | Fair-Poor     | Yellow-Red    | Red         | Red         |
| 7.09     | SESA2      | 2021                           | 1.32 | 90%  | 0.037 | 0.911                          | 17.18  | 49.1  | 100.0  | 57.8                           | 0.0   | 0.0   | 41.4  | Moderate      | 26.7          | Fair-Poor     | Yellow        | Red         | Red         |
| 7.08     | SESA4      | 2021                           | 1.22 | 92%  | 0.047 | 1.164                          | 21.01  | 44.2  | 100.0  | 47.4                           | 0.0   | 0.0   | 38.3  | Moderate      | 22.9          | Fair-Poor     | Yellow        | Red         | Red         |
| 7.09     | SESA1      | 2021                           | 1.28 | 92%  | 0.061 | 0.922                          | 19.93  | 46.8  | 100.0  | 36.1                           | 0.0   | 0.0   | 36.6  | Moderate-Fair | 20.7          | Fair-Poor     | Yellow-Red    | Red         | Red         |
| 32.00    | ORS2       | 2021                           | 1.08 | 77%  | 0.019 | 0.315                          | 5.39   | 36.2  | 80.8   | 86.7                           | 84.5  | 51.3  | 67.9  | High-Moderate | 64.7          | High-Moderate | Blue-Yellow   | Blue-Yellow | Blue-Yellow |
| 31.73    | ORS4       | 2021                           | 1.45 | 59%  | 0.021 | 0.343                          | 6.87   | 54.8  | 47.9   | 82.4                           | 73.3  | 31.2  | 57.9  | Moderate      | 60.4          | Moderate      | Yellow        | Yellow      | Yellow      |
| 31.75    | ORS6       | 2021                           | 1.05 | 71%  | 0.019 | 0.497                          | 6.15   | 34.8  | 70.8   | 86.7                           | 24.7  | 40.4  | 51.5  | Moderate      | 46.6          | Moderate      | Yellow        | Yellow      | Yellow      |
| 32.50    | HOH SANDE  | 2021                           | 1.80 |      | 0.063 | 0.336                          | 22.11  |       |        |                                |       |       |       |               |               |               |               |             |             |

Table 6b. 2021 Trophic Health Index Scores and status for water quality monitoring stations in Nantucket estuaries based upon open water embayment (not salt marsh) habitat quality scales. Index calculated with and without Dissolved Oxygen data.

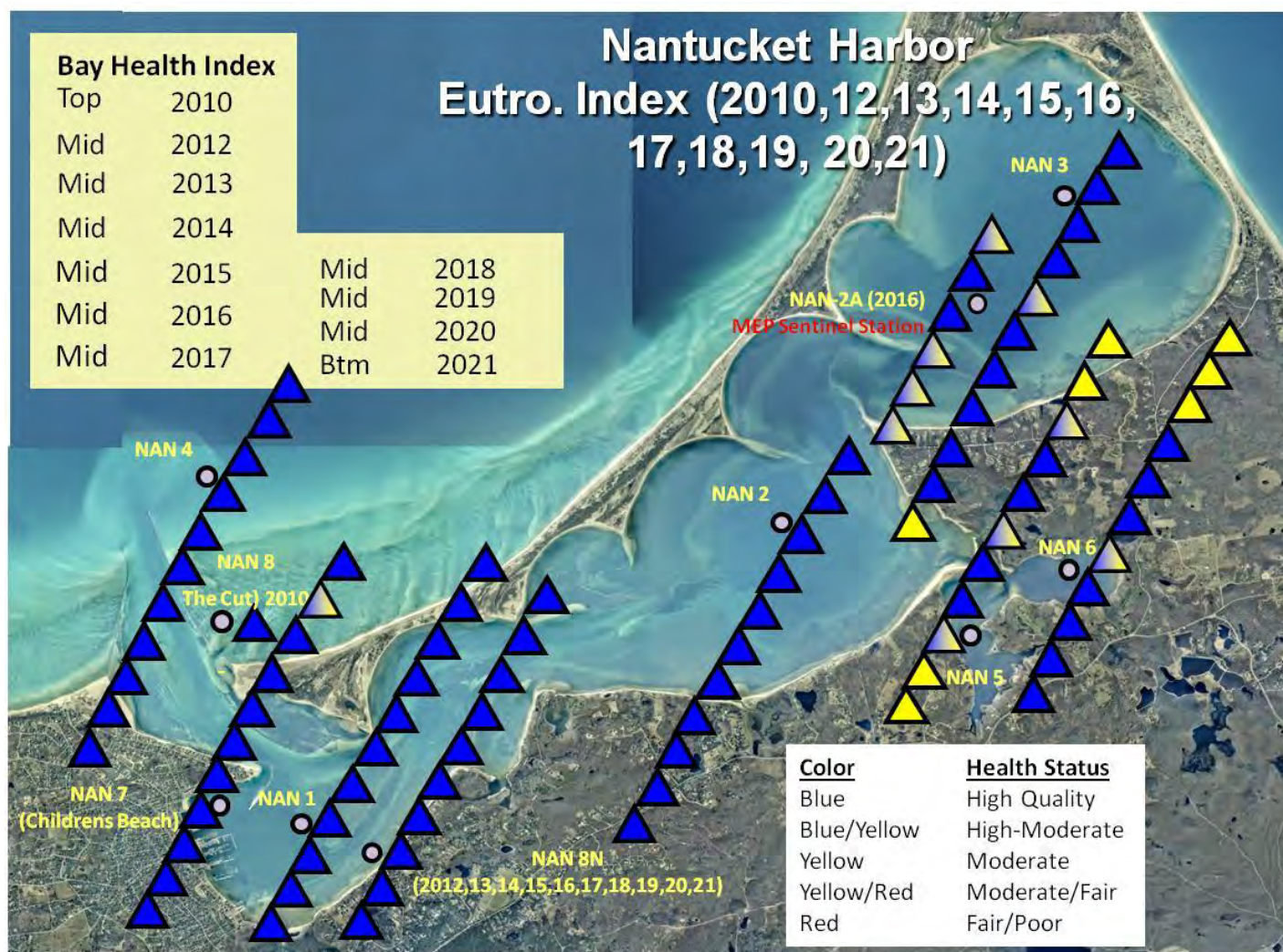


Figure 27. Nantucket Harbor Eutrophication Index 2010 (top triangle) and 2020 (bottom triangle). Index was calculated with dissolved oxygen. Colors indicate High (Blue), Moderate (Yellow), Fair/Poor (Red) nutrient related water quality. Station Nan-2A MEP Sentinel Station.

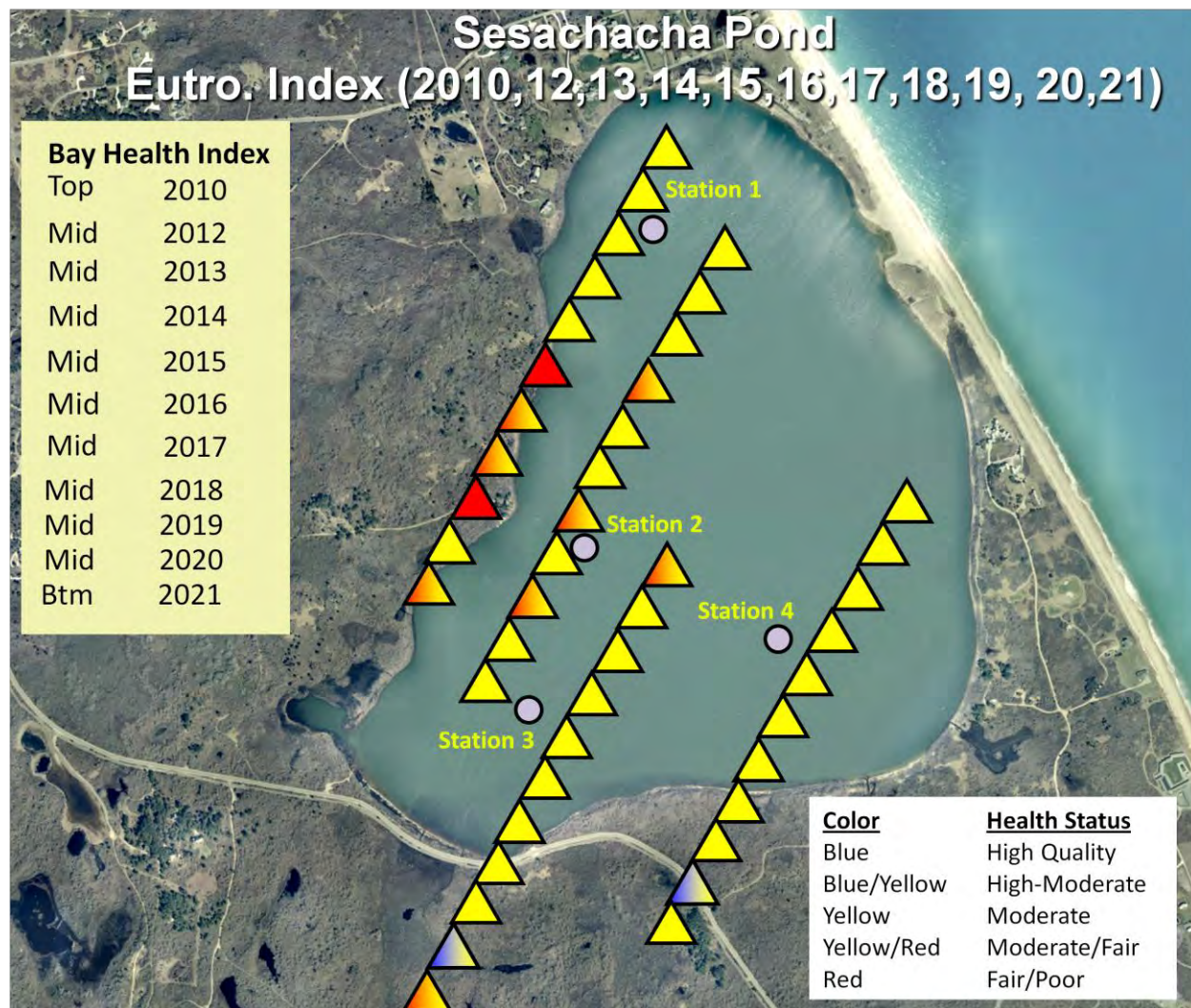


**Figure 28.** Sesachacha Pond Eutrophication Index 2010 (top triangle) and 2021 (bottom triangle). Index was calculated with dissolved oxygen. Colors indicate High (Blue), Moderate (Yellow), Fair/Poor (Red) nutrient related water quality.

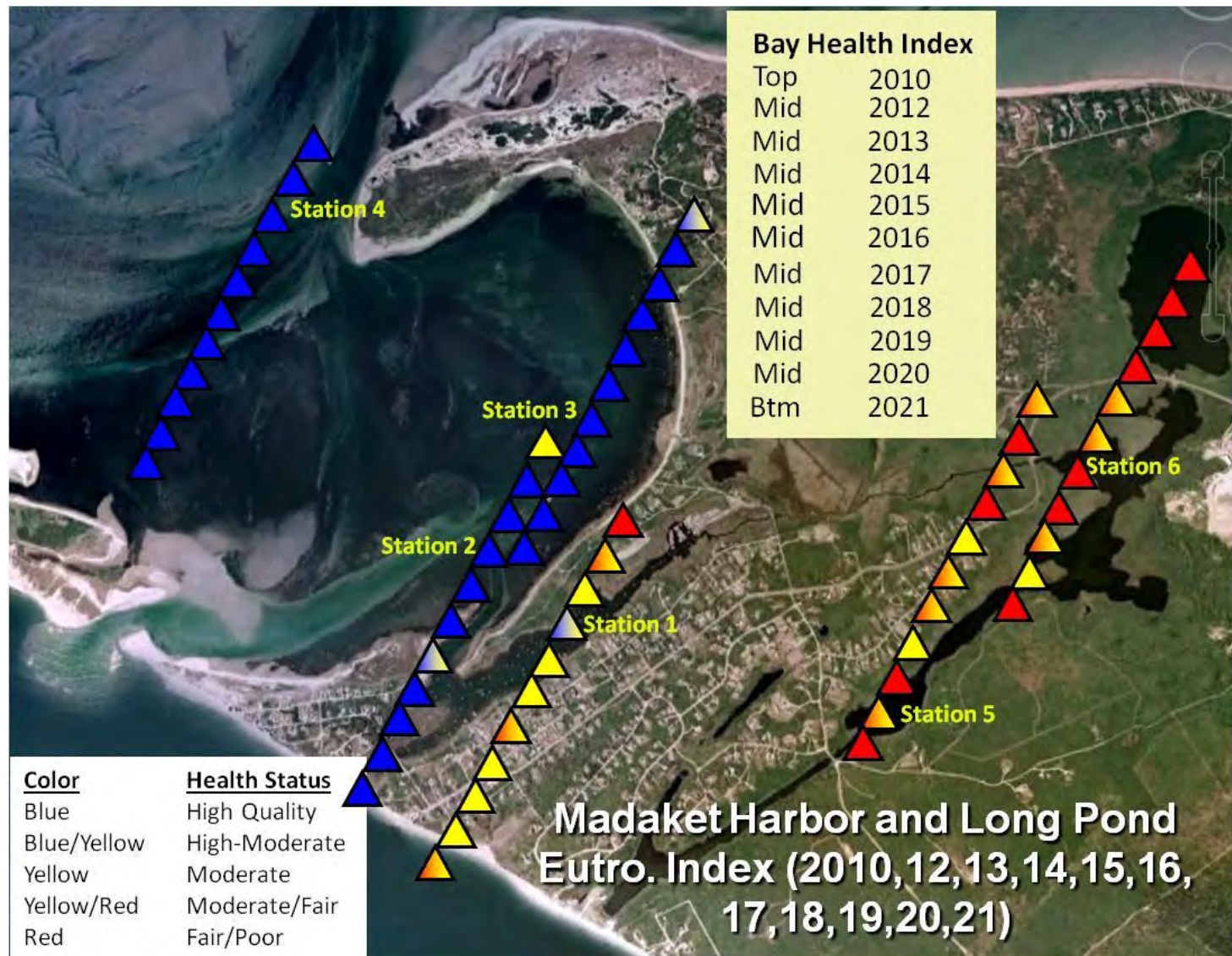
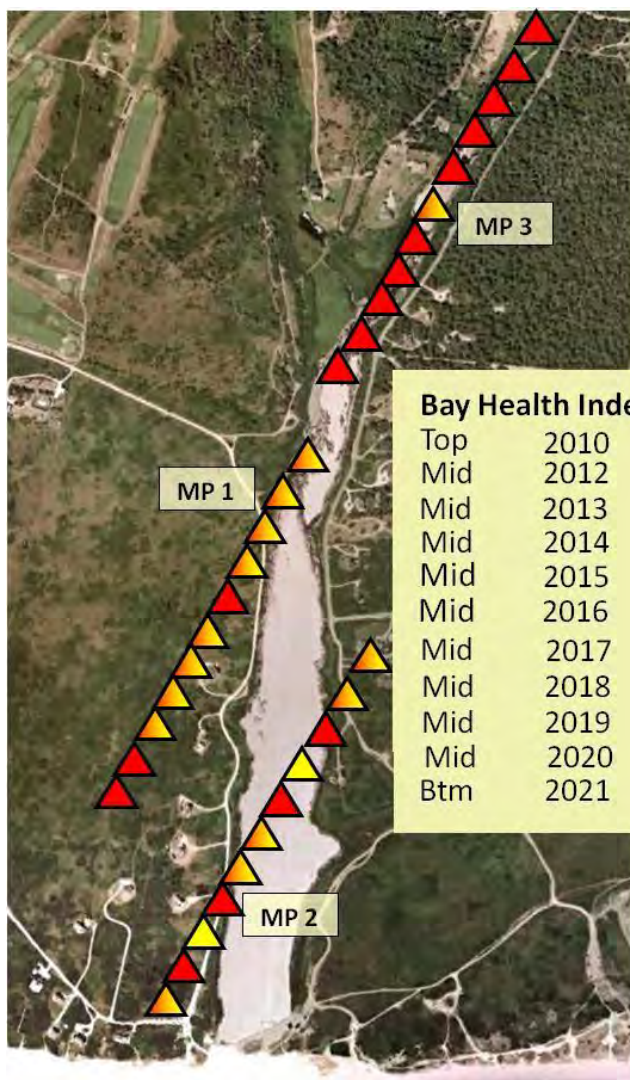


**Figure 29.** Madaket Harbor Eutrophication Index 2010 (top triangle) and 2021 (bottom triangle). Index was calculated with dissolved oxygen. Colors indicate High (Blue), Moderate (Yellow), Fair/Poor (Red) nutrient related water quality.



## Miacomet Pond Eutrophication Index (2010,12,13,14,15, 16,17,18,19,20,21)

| Color       | Health Status |
|-------------|---------------|
| Blue        | High Quality  |
| Blue/Yellow | High-Moderate |
| Yellow      | Moderate      |
| Yellow/Red  | Moderate/Fair |
| Red         | Fair/Poor     |

Figure 30. Miacomet Pond Eutrophication Index 2010 (top triangle) and 2021 (bottom triangle). Index was calculated with dissolved oxygen. Colors indicate High (Blue), Moderate (Yellow), Fair/Poor (Red) nutrient related water quality.

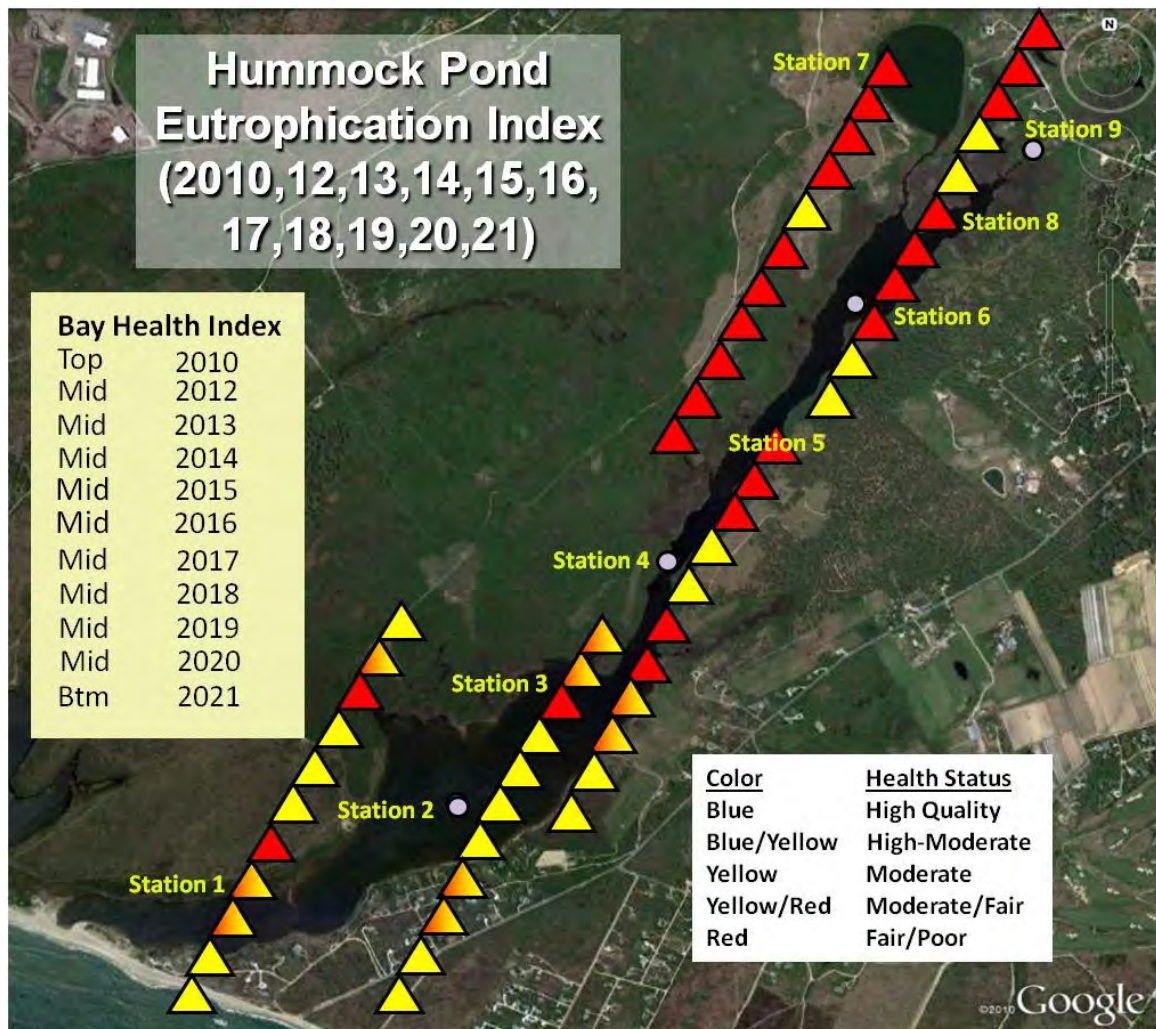


Figure 31. Hummock Pond Eutrophication Index 2010 (top triangle) and 2021 (bottom triangle). Index was calculated with dissolved oxygen. Colors indicate High (Blue), Moderate (Yellow), Fair/Poor (Red) nutrient related water quality.