

Shellfish Advisory Board Meeting
Thursday, Nov, 11 2020 6:30 PM
Zoom Meeting

Attended:, John Duane, Rebecca Taylor, Jake Puffer, Tom Siggia, Zack Dixon,
Damian Parkington

Absent: Chip Benton,

Others in attendance: Nancy Civetta, Helen Wilson, Caroline Lloyd, Dave Pike,
Gayle Skluzac, Jude Ahern,

Rebecca called the meeting to order at 6:37 pm

1. Minutes

**Tom Siggia made a motion to approve meeting minutes from Oct 8, 2020.
John Duane Seconded. Passed 4-0**

2. Plastics in Harbor Project - Update

Interns were not present to report

3. Recreational licenses - update

Nancy reported that some additional enforcement is needed

Issues are:

- fishing on wrong days
- taking petites
- closed areas

Basic idea is education first, then enforcement

Example: with educational talk an "s" is written on permit to indicate that the permit holder has already been spoken to. Then confiscation and citation according to the regulations.

Becca idea - YouTube educational video

4. Horse shoe crab letter (attachment 1)

Discussion of DMF decision not to consider a moratorium on Horseshoe Crab harvesting in Wellfleet:

- Barbara Brennessel reported that the Audubon surveys and her own observations (you can observe large numbers on nice days, and none on windy days) contradicts the DMF belief (trawl data) that there has been an increase in the species in recent years. She also reported that they are not spawning on full and new moons in Wellfleet.
- John Duane wondered how solid the science is
- make a town regulation instead of state?
- make a case that these crabs will be needed for medical research, not bait
- political solution rather than through Audubon or shellfishermen?
- letter from SAB?
- Align with Horseshoe Crab Conservation Association to be a more united front?
- send ideas to Mark Faherty (Audobon)

John will draft a letter to DMF on this topic outlining our opposition to their recent decision

5. Dredging incident

Nancy reported about the tugboat incident at the end of October

- the prop wash moved a bunch of sand onto the southern end of the grants closest to the pier.
- WSD will look during the upcoming tide to see if oysters/clams were buried or if topography was altered

6. Direct sales working group

Nancy reported that the Wellfleet Shellfishermen Association presented a letter to BOS to allow direct sales from Harvester to end user. Nancy thinks it will be very difficult.

Nancy spoke to DMF and FPP. They are very interested, but have to work within existing regulations (i.e., a market on the pier one day a week).

Discussion:

- do we need to write letter of support?
- there are no regs preventing this now, as long as harvester go through a dealer

- dealer pushback?
- reach out to WSA to gauge interest and give support?
- work with BOS, BOH, DMF, DPH
- next SAB meeting, Nancy will update us on logistics

7. Review of WSD FY 22 budget and vote

Save for Dec meeting, Town Administrator and WSD have not met on budget yet.

Next meeting December 9 at 6:30

Meeting adjourned at 8:06

Attachment 1

The Commonwealth of Massachusetts

Division of Marine Fisheries

251 Causeway Street, Suite 400, Boston, MA 02114 p: (617) 626-1520 | f: (617) 626-1509 www.mass.gov/marinefisheries _____

CHARLES D. BAKER Governor

TO: FROM: DATE: SUBJECT:

KARYN E. POLITO KATHLEEN A. THEOHARIDES Lt. Governor Secretary

MEMORANDUM

RONALD S. AMIDON Commissioner

DANIEL J. MCKIERNAN Director

Marine Fisheries Advisory Commission (MFAC)

Daniel J. McKiernan, Director

September 21, 2020

Decision on the Harvest of Horseshoe Crabs from Wellfleet Waters

A handwritten signature in black ink, reading "Daniel J. McLeary". The signature is fluid and cursive, with a long horizontal stroke at the end.

The town of Wellfleet, and other organizations within the town (e.g. Mass Audubon's Wellfleet Sanctuary, Wellfleet Shellfish Advisory Board), have historically requested that DMF implement a moratorium on the harvest of horseshoe crabs within Wellfleet Harbor. Former Director Paul Diodati denied such a petition from the town in 2012, and in the years since, there has been continued interest.

Most recently, in 2019, I met with Wellfleet town officials to informally discuss such a moratorium. A sizeable portion of Wellfleet Harbor is part of the National Seashore and is consequentially closed to horseshoe crab harvest under federal rules. Accordingly, I could see a potential enforcement and compliance rationale for enacting a broader closure. However, I wanted to hear from local interests regarding their view of the closure. After meeting with local officials, I tasked staff with reviewing what if any biological rationale exists to support a moratorium on harvest.

Over the course of the last year, DMF staff investigated this question. At this point in time, I have not seen sufficient biological evidence that supports a moratorium on harvest in this discrete area. Regional and state-wide trends show that abundance is increasing, potentially in response to management actions taken about a decade ago (e.g., lunar spawning closures). Crabs found in Wellfleet Harbor appear to be part of a regional complex of crabs specific to Eastern Cape Cod Bay, and given the generally low number of crabs harvested in Wellfleet Harbor, a prohibition on harvest in this area would provide little, if any, benefit to this population.

I have attached two memoranda that informed my decision on this subject. The first, is a recent memorandum from DMF biologist Derek Perry, our horseshoe crab specialist. This document details the current status and trends of horseshoe crabs in eastern Cape Cod Bay and Wellfleet Harbor. The second, is the October

3, 2012 memorandum from former Director Diodati to the MFAC regarding his decision to deny the town's petition for a closure.

September 21, 2020 Memorandum from Derek Perry October 3, 2020 Memorandum from Paul Diodati

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CHARLES D. BAKER Governor

TO: FROM: CC:

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KARYN E. POLITO KATHLEEN A. THEOHARIDES Lt. Governor Secretary

MEMORANDUM

Daniel J. McKiernan, Director Derek Perry, Invertebrate Biologist

RONALD S. AMIDON Commissioner

DANIEL J. MCKIERNAN Director

Michael Armstrong, Assistant Director

Robert Glenn, Assessment and Survey Program Manager Tracy Pugh, Invertebrate Fisheries Project Leader

September 21, 2020

Status of horseshoe crabs in Wellfleet Harbor and Cape Cod Bay

The town of Wellfleet and other organizations within the town (e.g. Mass Audubon's Wellfleet Sanctuary, Wellfleet Shellfish Advisory Board) have been steadfast in their desire for a horseshoe crab harvest moratorium even after the

town's request was turned down in 2012. This memo provides an update on relevant information and the status of horseshoe crabs in Wellfleet Harbor. All figures referenced herein are embedded in an appendix.

Introduction

The town of Wellfleet petitioned MADMF to close Wellfleet Harbor to the harvest of horseshoe crabs within the Harbor in May of 2012 citing concerns over local declines in crab abundance, uncertainty in abundance estimates, and the ecological role of horseshoe crabs as bioturbators and predators of bamboo worms. Former MADMF Director Paul Diodati did not grant this request citing the following reasons:

1. A lack of scientific evidence to support the claim that horseshoe crabs control bamboo worm populations and therefore enhance shellfish production;
2. A closure of Wellfleet Harbor could lead to a displacement in effort that could deplete other populations; and
3. A lack of data on current horseshoe crab abundance in Wellfleet Harbor, or an abundance threshold that would warrant opening or closing the harbor to harvest.

Other concerns raised by MADMF staff included: a lack of knowledge of the geographic range of horseshoe crabs found in Wellfleet Harbor; and concern that other towns would make similar closure requests without supporting data. Staff also stated that insufficient time had passed to determine if regulation changes made in 2010 (e.g. lunar closures, minimum legal size) had a positive impact on horseshoe crab abundance, and they believed more patrols and enforcement by Environmental Police in Wellfleet would be beneficial to enforce existing rules rather than create new regulations. MADMF offered to consider prohibiting crab harvest from discrete portions of the harbor that contain aquaculture grants to limit gear conflicts between aquaculturists and commercial horseshoe crab harvesters, and that MADMF would support and promote scientific research regarding the effect of horseshoe crabs on

bamboo worms. Director Diodati also extended the state-wide lunar closures to include the second half of April at the request of the people of Wellfleet.

Commercial Harvest Data

Spatially explicit commercial horseshoe crab harvest data are reported by fishermen to MADMF based on Shellfish Growing Areas (SGA). Wellfleet Harbor is made up of SGA CCB11, CCB12, CCB13, and CCB14 (Figure 1). Roughly only 8% of horseshoe crabs caught for bait in 2018 were harvested between Cape Cod Bay (including Wellfleet Harbor) and the Massachusetts-New Hampshire border (Figure 2). Most of the 2018 Massachusetts horseshoe crab bait landings came from Nantucket Sound (78.9%). Horseshoe crab landings from Wellfleet Harbor are confidential due to the limited number of fishermen reporting landings to these areas. Between 2010 and 2018, the number of permits reported to have fished these areas in any given year ranged between 0 and 2 with extremely low annual landings; the reported median annual harvest (2010-2018) was slightly above 400 crabs, which is the daily limit for a bait harvester. The number of crabs harvested from Wellfleet Harbor between 2010 and 2018 is similar or much less than other Cape Cod Bay embayments (Figure 3). The western shore of Wellfleet Harbor is closed to the harvest of horseshoe crabs because it falls within the border of the Cape Cod National Seashore (Figure 4). Most of the outer Cape is closed to the harvest of horseshoe crabs due to federal harvest closures at the Cape Cod National Seashore, and the Monomoy National Wildlife Refuge. Through Massachusetts regulations, only biomedical harvest is permitted in Pleasant Bay.

Fisheries Independent Data

Massachusetts fisheries independent horseshoe crab data come from two sources, the Massachusetts Horseshoe Crab Spawning Beach Survey, and the MADMF Trawl Survey conducted in May of each year. The spawning beach survey monitors the number of mature crabs that come onto the beach to spawn, whereas the trawl survey captures immature and mature crabs.

Mass Audubon's Wellfleet Sanctuary conducts spawning beach surveys at three sites within Wellfleet Harbor (Figure 5). The survey sites occur both within the boundaries of the Cape Cod National Seashore (Great Island) which has been closed to horseshoe crab harvest since 2000, and outside (Indian Neck and Sanctuary Beach) which is open to harvest. All three locations show an upward trend over the last three years in their respective time series, though numbers at the Great Island and Sanctuary Beach sites remain relatively low. Conversely,

Indian Neck data have varied without trend over time, with the second highest mean number of female crabs of its time series recorded in 2019. Despite Great Island being located in an area closed to harvest, it has the lowest abundance of crabs of the three sites in Wellfleet Harbor. Wellfleet spawning beach data for 2020 have not yet been submitted

The MADMF Trawl Survey does not tow within Wellfleet Harbor due to depth limitations, but the towable waters just outside of the harbor are among the areas most likely to encounter horseshoe crabs within Cape Cod Bay and Massachusetts Bay in the fall survey (Figure 6). Abundance in the Cape Cod Bay/Massachusetts Bay region has been increasing (Figure 7). The absence of crabs in many years of the spring survey is likely a function of crab behavior related to spawning activity. Adult crabs spawn in the spring and can usually be found in water too shallow for the survey to access. Male crabs spend more time in shallow water waiting for mating opportunities, so they are even less likely than females to be encountered in the spring survey.

Tagging information

There have been two recent horseshoe crab tagging efforts in Wellfleet Harbor, an acoustic telemetry study conducted by a graduate student at the University of Massachusetts-Amherst, and the U.S Fish and Wildlife Service's button tagging program. Both studies only tagged mature crabs. University of Massachusetts graduate student Michael Long, in cooperation with Mass Audubon's Wellfleet Sanctuary, conducted a telemetry study within Wellfleet Harbor from 2015 to 2017. This research showed that most

tagged crabs remain within the Bay for most of the year, before leaving in the winter (Figure 8). Exact locations for over-wintering crabs are unknown, as the receivers were removed from the water during the winter. Long's work showed that only 37% of crabs tagged in Wellfleet Harbor were detected in the Harbor the following year. The causes for this relatively low return rate could include emigration, natural or fishing mortality, and/or tag loss.

Volunteers participating in horseshoe crab spawning beach surveys are encouraged to look for and report tagged crabs. This increases the likelihood that tagged crabs will be observed at beaches where spawning surveys are conducted. Within Cape Cod Bay there are seven spawning beach survey sites,

three within Wellfleet Harbor, two within Barnstable Harbor, and two in Plymouth/Kingston/Duxbury Bay. The Mass Audubon's Wellfleet Sanctuary has been tagging horseshoe crabs with U.S. Fish and Wildlife service button tags since 2009. Nearly 500 crabs tagged within Wellfleet Harbor have been recaptured and reported with adequate recapture location information to be able to reasonably identify where the crabs were re-sighted (Figure 9). For crabs at large more than six months since release, slightly less than half of the recapture observations (48.4%) occurred within Wellfleet Harbor. More than 95% of recaptures occurred within Cape Cod Bay between Provincetown and Barnstable. About 1% were re-sighted along the backside of the Cape or in Nantucket Sound, and 1.5% were reported to be found in other states, one as far as Delaware.

Summary

Many of the reasons that MADMF did not close horseshoe crab harvest in Wellfleet Harbor after the 2012 petition are still valid today. While it has been shown that migratory shorebirds can greatly reduce the density of bamboo worms on tidal flats (Schneider and Harrington 1981), there has been no such work on the relationship between horseshoe crabs and bamboo worms. The relationships between the crabs, worms, and shellfish to each other, to the larger biological community, or to the physical properties of the tidal flats are still not clearly understood in this system.

Management actions taken in 2010 included enactment of lunar harvest closures to increase spawning opportunities. Male horseshoe crabs take nine years to reach sexual maturity, females take ten to eleven years. Male crabs that resulted from eggs laid during the first year of the lunar closure would have returned to the beach to spawn for the first time in 2019. The first female crabs from the 2010 year-class will likely return to beaches to spawn this year or next. The increase in abundance observed in the trawl survey that has occurred prior to increases in the spawning beach surveys could be due to the differences in life stages observed by each survey. The trawl survey catches both immature and mature crabs, whereas only mature crabs are encountered during the spawning survey. If the lunar closures are effective and the crabs are not harvested before they reach maturity, we will likely continue to see an increase in the number of spawning crabs in the coming years. While there are other possible reasons for the recent increases in abundance observed in the trawl and spawning beach surveys, including improving conditions resulting from climate change (for a species at the northern extent of its range), or other unknown reasons, the results of

the management actions taken in 2010 are likely still playing out. The fact that the spawning beach survey and the Spring and Fall Trawl Survey are all increasing gives greater confidence that regional abundance is increasing.

Our ability to monitor specific embayments to determine abundance thresholds and make embayment- specific management decisions is extremely limited, and movement data indicate that crabs are not limited to specific embayments but are regionally distributed. It seems more relevant to ensure that habitat is protected within each embayment utilized by the crabs. Based on acoustic and traditional tagging studies, it appears that crabs observed in Wellfleet Harbor move freely throughout Eastern Cape Cod Bay. Despite intensive re-sighting efforts within the Harbor, more tagged crabs are observed outside the Harbor than inside. This shows that crab populations are not specific to small embayments such as

3

Wellfleet Harbor, but may be specific to larger areas such as Cape Cod Bay. Though a few crabs were reported as recaptures in other states, this could be due to reporting error.

Displacement of harvest pressure from closed areas to open areas was cited as a concern in 2012. Landings within Wellfleet Harbor have been relatively modest, and well below or similar to other embayments in Cape Cod Bay. Less than 200 crabs have been harvested annually in four of the last ten years, but harvest has been episodic. Closing Wellfleet Harbor could lead to effort being displaced to other areas, though this concern is lessened by the fact that the crab population does not appear to be specific to Wellfleet and current harvest levels in Wellfleet are generally modest.

References

Schneider, D. C. and B. A. Harrington. 1981. Timing of shorebird migration in relation to prey depletion. *The Auk* 98: 801-811.

Attachment Appendix of Figures

4

Appendix of Figures

Marine Fisheries
Division of Marine Fisheries
SHELLFISH SANITATION AND MANAGEMENT

Massachusetts
Division of Marine Fisheries
SHELLFISH SANITATION AND MANAGEMENT

Crewing Area Code: CCBH
Area Name: WELFLEET HARBOR
Area Type(s): Estuary, Wellfleet

Shellfish Area Classification

Approved	Conditionally Restricted
Conditionally Approved	Prohibited
Restricted	

Produced: 01/17/2019

This area is in the Welfleet Harbor, an estuary along the coast of Cape Cod Bay. The area is classified as "Approved" for shellfish harvesting. The map shows the coastline of Cape Cod, Massachusetts, with various towns and water bodies labeled. The Welfleet Harbor is a large body of water in the center of the map. The Cape Cod Bay is to the south of the harbor. The map also shows various shellfish harvesting areas with different classifications: Approved (green vertical lines), Conditionally Restricted (orange diagonal lines), and Prohibited (red cross-hatch). The map includes labels for Welfleet Harbor, Cape Cod Bay, and various towns like WELFLEET, ORANGE, and CASTLETON. A scale bar indicates 0 to 1 mile. A small inset map shows the location of the area within Massachusetts.

Area of 5436

This area is in the Welfleet Harbor, an estuary along the coast of Cape Cod Bay. The area is classified as "Approved" for shellfish harvesting. The map shows the coastline of Cape Cod, Massachusetts, with various towns and water bodies labeled. The Welfleet Harbor is a large body of water in the center of the map. The Cape Cod Bay is to the south of the harbor. The map also shows various shellfish harvesting areas with different classifications: Approved (green vertical lines), Conditionally Restricted (orange diagonal lines), and Prohibited (red cross-hatch). The map includes labels for Welfleet Harbor, Cape Cod Bay, and various towns like WELFLEET, ORANGE, and CASTLETON. A scale bar indicates 0 to 1 mile. A small inset map shows the location of the area within Massachusetts.

Legend:

- Shoreland
- Shrubland
- Wetland/Other
- Water/Other
- Other Boundary
- Other Boundary/Other

Scale: 0 0.5 1 mile

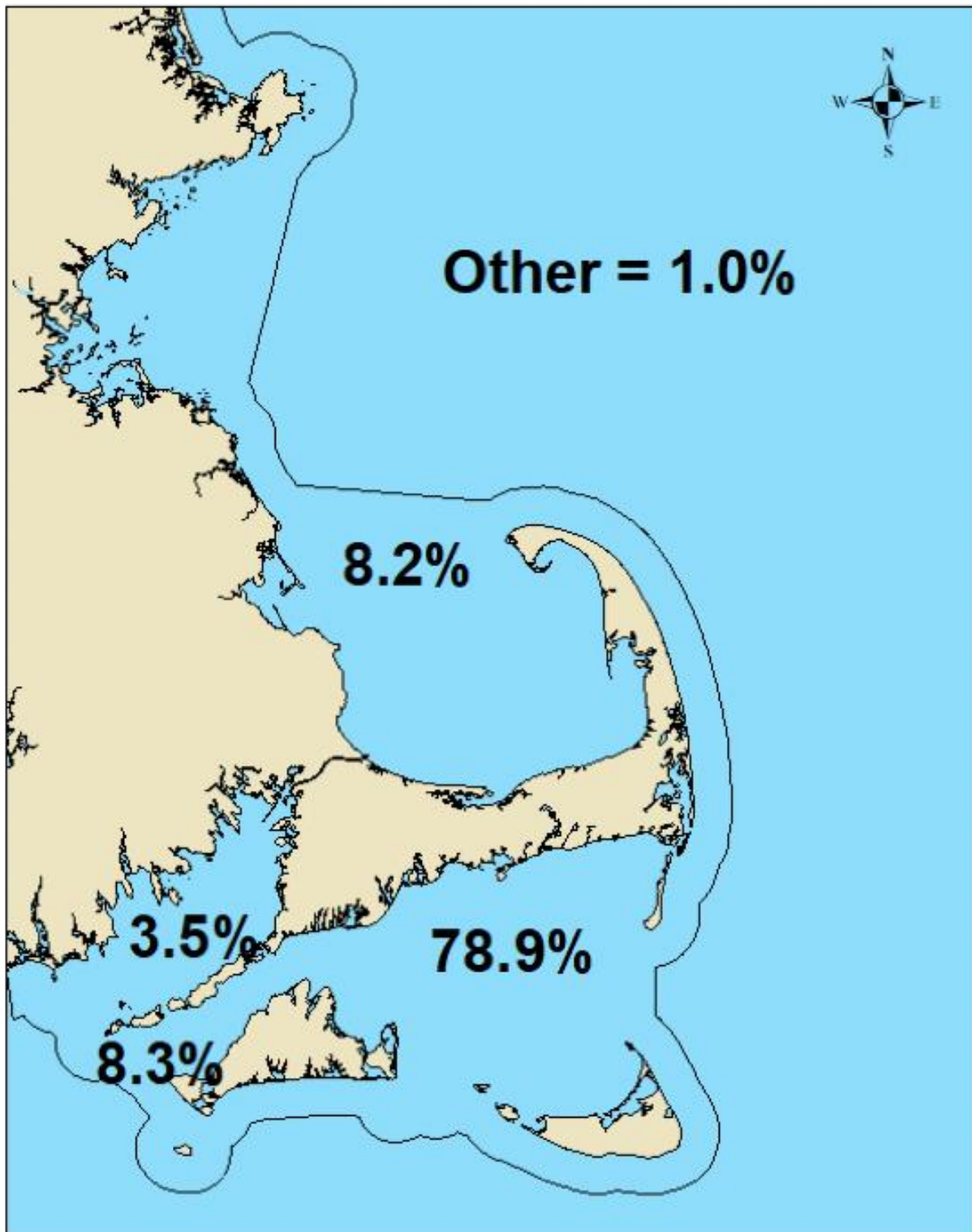
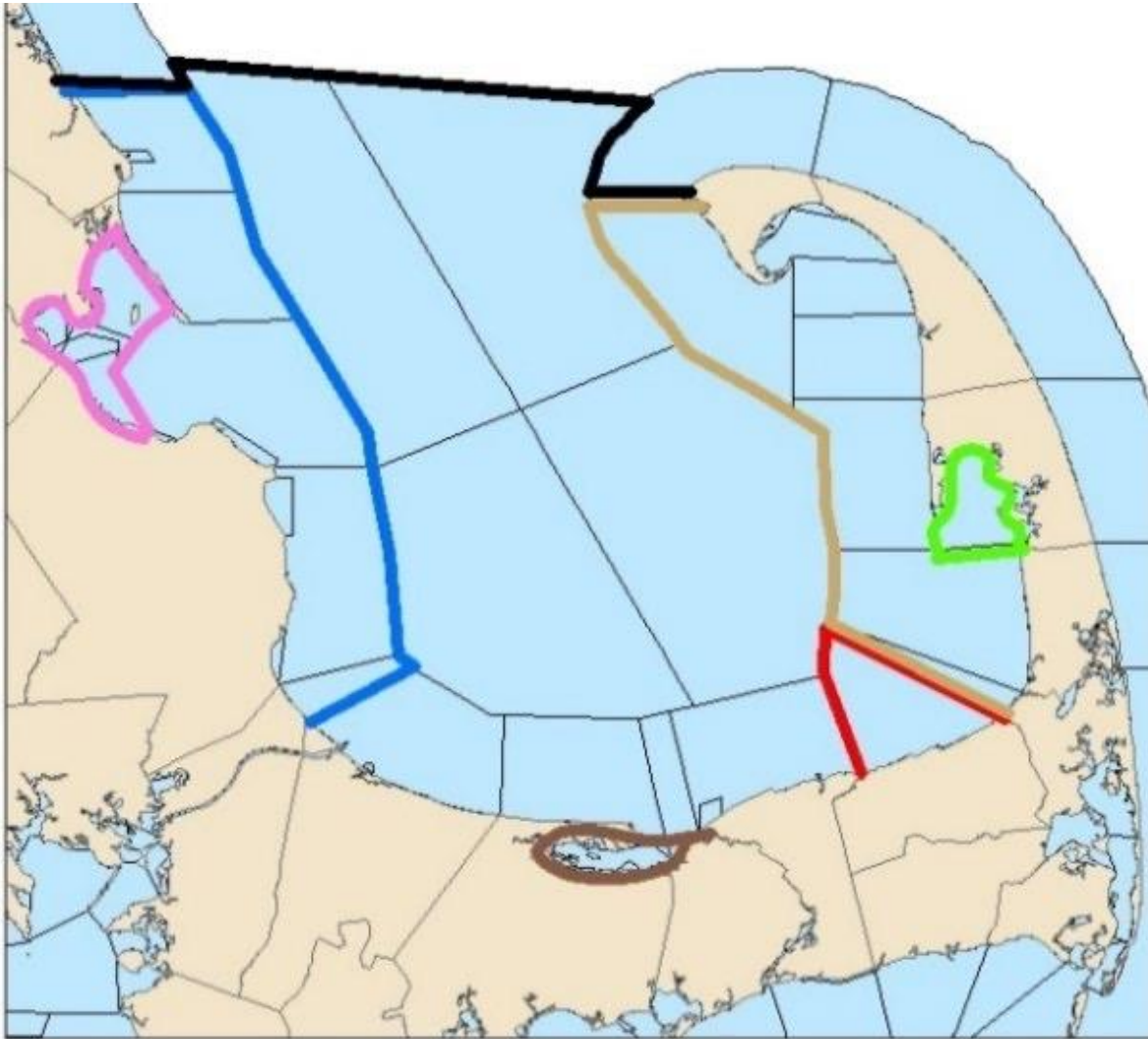


Figure 3. Map of Massachusetts SGAs color coded by region and bar chart of total horseshoe crab bait landings from these regions from 2010 to 2018. Regions not outlined in color are grouped in the “CCB other” category.

PKD = Plymouth-Kingston-Duxbury Bay. CCB 20 refers to SGA CCB 20 (Brewster). The black line represents the Cape Cod Bay border. Y-axis data labels omitted due to comply with confidentiality laws.



Number of Crabs Sold for Bait

Figure 4. Map of areas closed to horseshoe crab harvest for the bait fishery. The western shore of Wellfleet Harbor is within the Cape Cod National Seashore and is closed to the harvest of horseshoe crabs.

Horseshoe Crab Bait Fishery Closures

Effective May 1, 2007

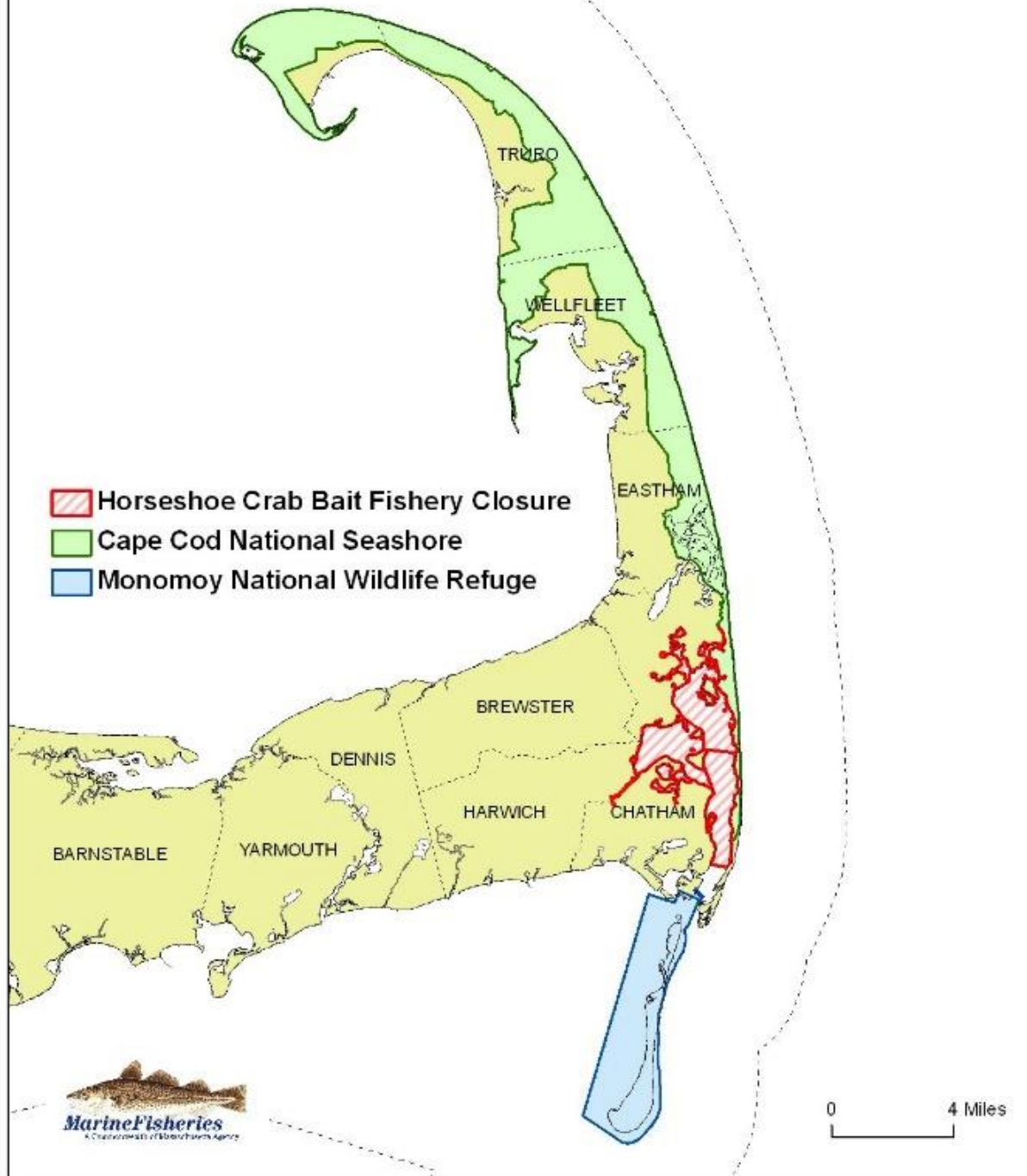
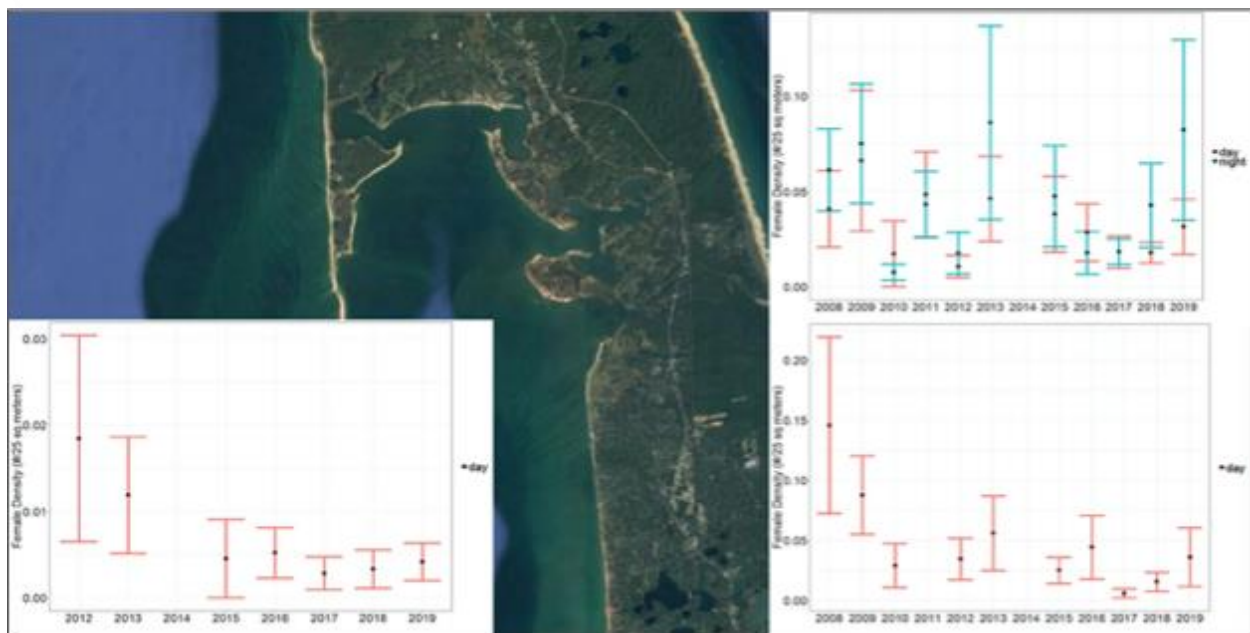


Figure 5. Location of spawning beach survey sites within Wellfleet Harbor and figures showing the mean number of female crabs at respective spawning beaches. * Error bars are 95% C.I. Great Island and Sanctuary Beach are only surveyed during the day, while day and night surveys are conducted at Indian Neck. Note that the survey was not conducted continuously at all stations. The 2014 survey used different methodology, so it is not included in these figures.



Great Island

Indian Neck

Sanctuary Beach

Figure 6. Location of catches of horseshoe crabs from the MADMF Fall Trawl Survey. Bubble size is representative of the number of crabs caught per tow.

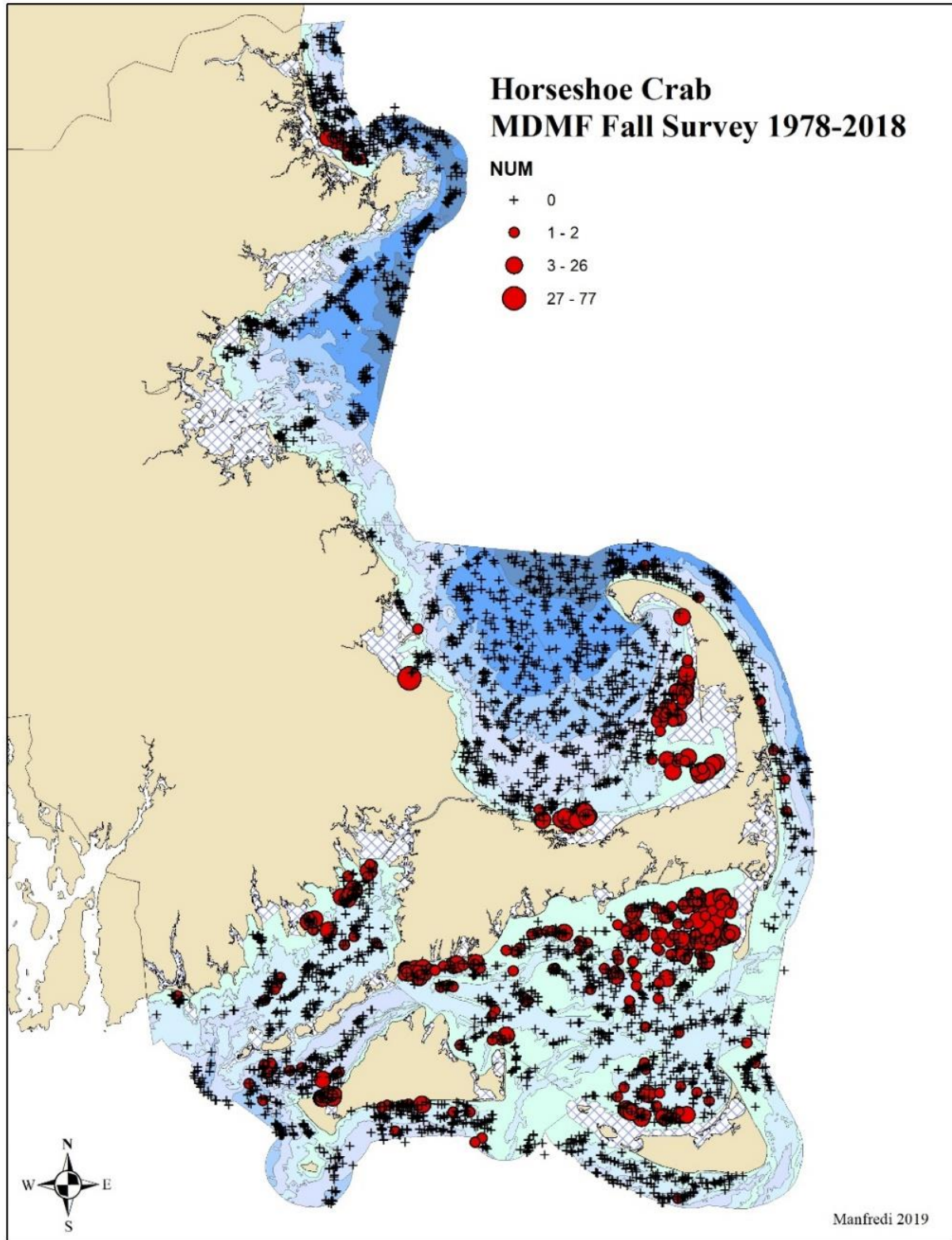


Figure 7. Bootstrapped mean number of horseshoe crabs per tow from the two shallowest depth strata (0-30', 30-60') of the MADM trawl survey in

the Gulf of Maine, 1982-2019. The red, dashed line is the time series median, blue line is a loess fit using family=symmetric and span=0.66. These settings provide a resistant fit to outliers at the end of the time-series. Blue shaded area is an approximate 95% confidence interval for the fit.

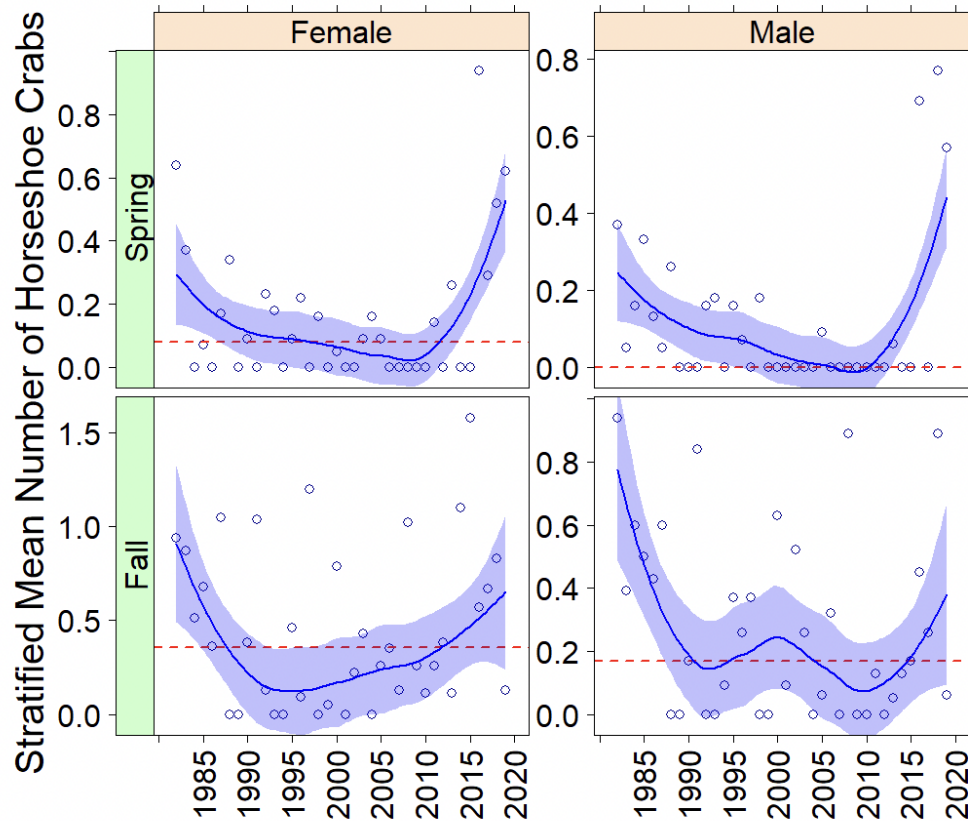
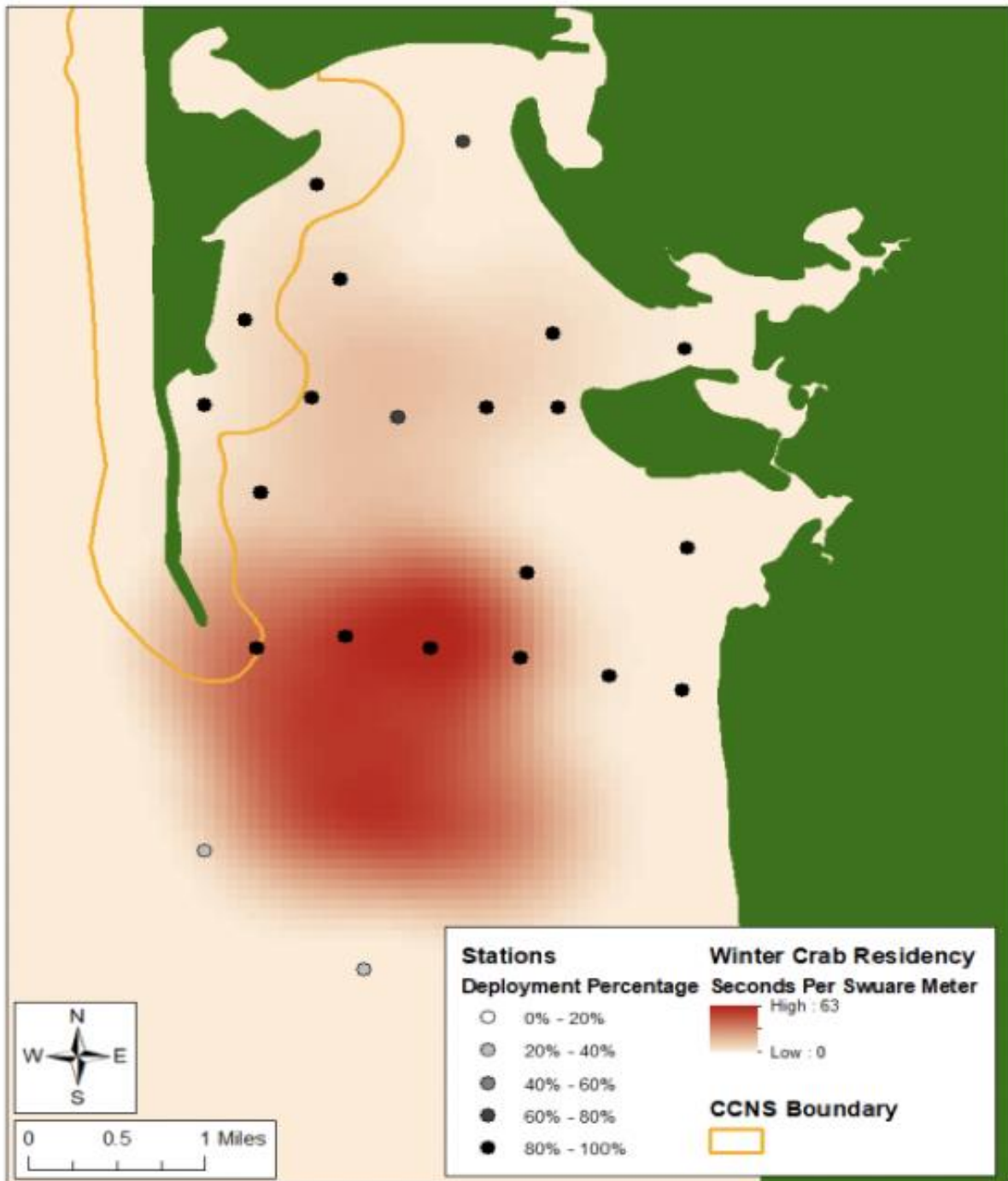
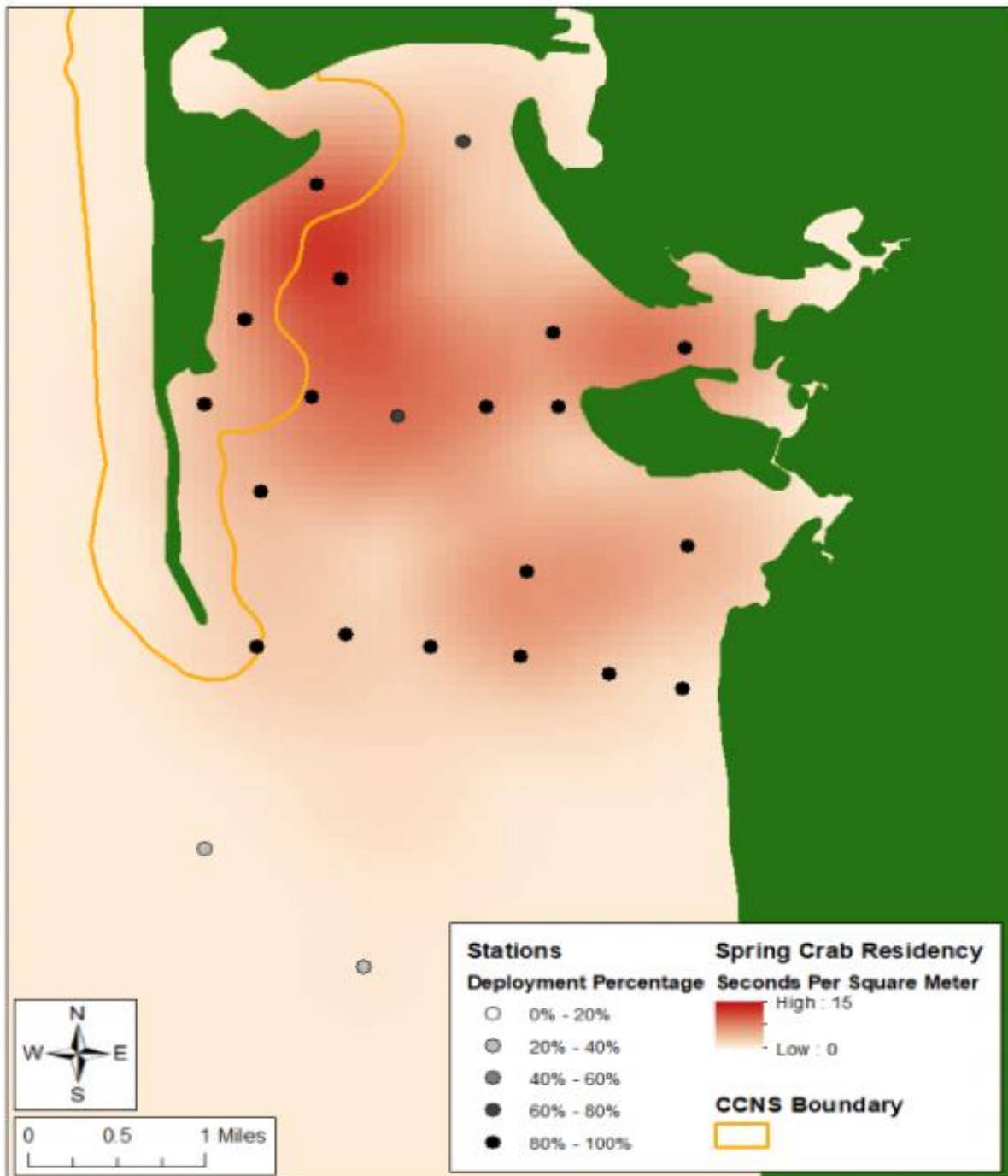


Figure 8. Seasonal residency figures from University of Massachusetts-Amherst student Michael Long graduate research using acoustic telemetry to study horseshoe crab movements in Wellfleet Harbor. Black dots are acoustic receiver locations. Grey dots are MADMF acoustic receiver locations. The red shaded area represents residency period, the amount of time tagged crabs spent in an area. Receivers were removed from the water during the winter. The winter figure is based on when crabs were last observed prior to haul-out, and first detected after re-deployment. Figure provided by M. Long.

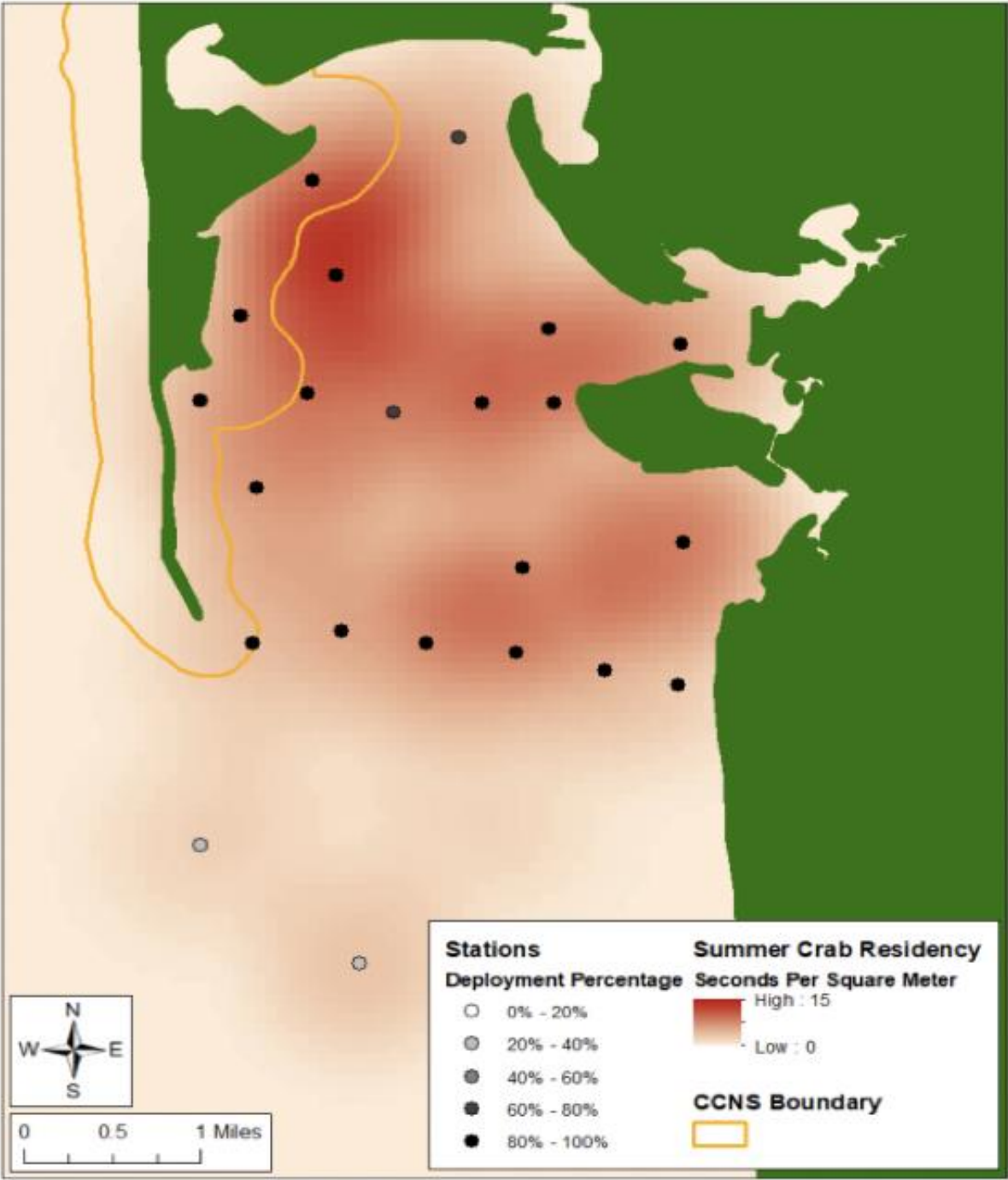
Wellfleet Harbor Horseshoe Crab Winter Residency



Wellfleet Harbor Horseshoe Crab Spring Residency



Wellfleet Harbor Horseshoe Crab Summer Residency



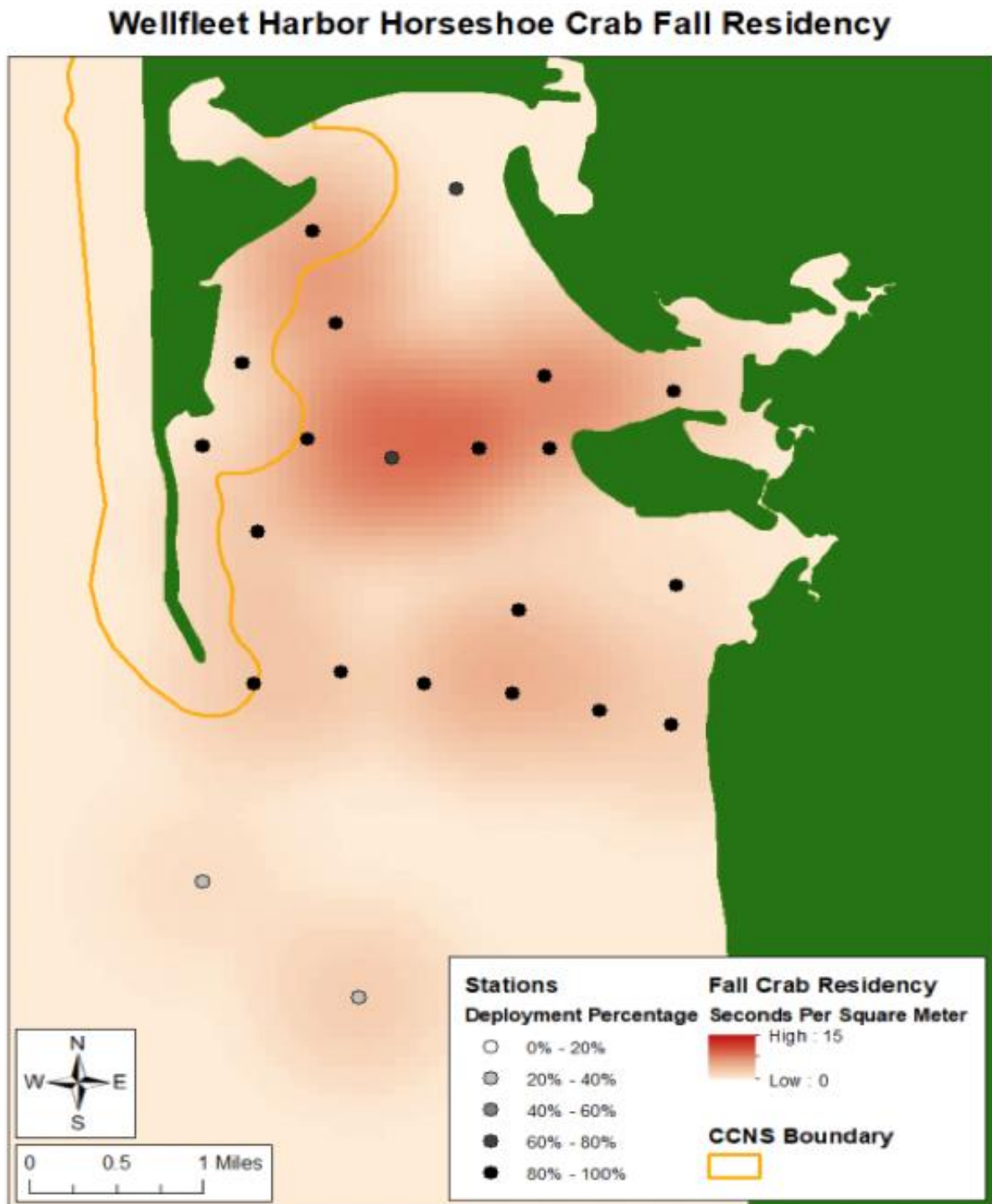


Figure 9. Percent of recaptures by town for 459 crabs tagged with USFWS button tags within Wellfleet Harbor at liberty for longer than 6 months and with sufficient recapture location information reported upon recapture. Recaptures of crabs in towns on two different water bodies are reported by town and water body (e.g. for Wellfleet: Wellfleet Harbor (48.4%) and

Cape Cod Bay (3.3%)). Not included in the figure are crabs reported to have moved out of state (CT-0.2%, NY-0.7%, NJ-0.2%, MD-0.2%, DE-0.2%).

