

COMMERCIAL AND RECREATIONAL USE ASSESSMENT REPORT – SEASIDE OF VIRGINIA'S EASTERN SHORE



©2014 Gordon Campbell / Al Abizade Photography



MAY 2015

Accomack-Northampton Planning District Commission

NOAA Grant # NA11NOS4190168

Grant Year 2012, Task 96



TABLE OF CONTENTS

Part I – Forward

Part II – Commercial Use Assessment Report

Part III – Recreational Use Assessment Report

PART I - FORWARD

The Eastern Shore of Virginia's undeveloped seaside environs are unmatched along the east coast, earning the United Nations Educational, Scientific, and Cultural Organization (UNESCO) World Biosphere Reserve designation. The 75-mile coastline includes thousands of acres of pristine salt marshes, vast tidal mudflats, shallow lagoons, and navigable tidal channels that support thriving seafood and recreational tourism industries, bound on the east by once partially-occupied, but now largely undeveloped, barrier islands.

A film documentary trilogy by the Barrier Islands Center in Machipongo was made specifically to document life on the barrier islands while there are still people alive who remember what it was like to live there, and to capture the legacies of dwindling numbers of bird decoy carvers and commercial fishermen. The films highlight the resolute spirit of those who make their livings by the natural bounty of the sea and its surrounds, and the strong family traditions and community ties they forge. These craftsmen and watermen have long been guides to visitors drawn to their humble seaside towns –and at one time barrier island villages - to hunt and fish in environments teeming with wildlife and waters abundant with trophy catches.

The Commercial and Recreational Use Assessment Reports document that legacy in a different way: by establishing a baseline data for commercial and recreational uses in the nearshore, inshore, and offshore zones off the Eastern Shore of Virginia. The commercial report utilizes data from the Virginia Marine Resources Commission (VMRC), the Greater Atlantic Regional Fisheries Office, and the Mid-Atlantic Regional Council on the Ocean (MARCO), supplemented by surveys of commercial fishermen. The recreation report analyzed and compiled existing recreational-use data, solicited key stakeholder information via a participatory Geographical Information Systems (GIS) workshop, and conducted aerial surveys during expected times of peak recreational use.

Some commercial fishing activities surely resemble those of the earliest seafood harvesters on the Shore: harvesting wild-grown clams and oysters; using nets to corral or hoist catches from the sea; or baiting and setting traps. Others employ sophisticated radar and sonar technology aboard large vessels that ply the ocean depths with ease. Gear type, species landings, water body, month/season, and landside infrastructure were some of the information sets gathered and examined in the Commercial Use Assessment Report (Part II of this compiled report) in an attempt to characterize general activity and isolate specific patterns that could provide insight into possible conflicts commercial fishermen encounter.

The commercial fishing data reflect widespread usage of the inshore and nearshore areas of the entire length of the Eastern Shore seaside, with concentrations at the northern end,

generally encompassing the Chincoteague Bay-Assateague Island area, and the southern seaside from about Cedar Island southward. Unlike the Communities at Sea maps, the measure for inshore and nearshore activity is based on pounds and value, with shellfish heavily weighting the view.

To supplement those data sets, VMRC permit holders were sent surveys seeking input about potential conflicts, and asking them to directly identify their geographic range of activity. Of 37 fishermen who responded to the survey, 12 said they experienced no conflicts at all. Those at the northern end of the Eastern Shore were more likely to report conflicts, which is also where there was a high concentration of commercial fishermen, both under state and federal permits. And sometimes the conflicts they reported were not ones that would have been picked up from other data, such as the range closures for rocket launches at Wallops Flight Facility.

What might have seemed a likely source of interference – recreational boaters and fishers – garnered only six of 37 complaints from commercial fishermen, but they seemed to be more of an issue for gill net fishermen who were more active on the seaside of the barrier islands.

That pattern is consistent with where the recreational activity was found during the recreational seaside assessment, which found the “shore use” – barrier island visitation – the top recreational use, with Assateague Island receiving three times as many observations as any other observed location on the seaside.

Data for the Recreational Use Assessment Report (Part III of this compiled report) was gathered through a 44-participant stakeholder workshop, utilizing participatory GIS to identify and map 22 distinct recreational and cultural uses. Aerial photographs produced specifically for this project provided supplementary data, particularly regarding which areas received the most use during peak times. Fourteen aerial surveys of the seaside during peak times of recreational use resulted in over 2,000 photographs of 10 different recreational use types.

In general, the majority of the recreational uses were observed along the barrier islands, at tidal inlets, and within navigable channels within the barrier island system. Use intensity tended to increase near ports, landings, and other water access points on the Seaside.

The most intensely used area was Assateague Island and the Chincoteague Inlet vicinity, which were reported and observed as being the most popular places for recreational use, including shore use, swimming, shore fishing, and surface water sports. The next most popular areas for various recreational uses are the tidal inlets, barrier islands, and navigable channels. Three ports, Chincoteague, Wachapreague, and Oyster predominantly provide the majority of access to the offshore ocean for various recreational uses. Recreational use is weather-dependent for most uses and there are many use-types which coincide with seasonal changes in availability of migratory wildlife and aquatic life.

The Seaside Special Area Management Planning (SAMP) team and MARCO have been investigating ways to better implement marine spatial planning on the Seaside and Mid-Atlantic Ocean off Virginia by assessing the wide array of uses in inshore and offshore areas. These efforts have identified the need to attain recreational and commercial use data to provide for appropriate marine spatial planning and in turn, reduce marine use conflicts, maximize use efficiency, and enhance environmental and economic productivity.

Taken together, these combined reports present a comprehensive data set for recreational use and commercial fishing and harvesting in the inshore, nearshore and offshore areas of the Eastern Shore seaside areas, and a baseline understanding of how humans use the ocean and its nearshore environs, and where those uses overlap to form areas of conflict or potential conflict.

PART II – COMMERCIAL USE ASSESSMENT

This Page Intentionally Left Blank





©2014 Gordon Campbell / At Altitude Photography

PHOTO COURTESY OF GORDON CAMPBELL, AT ALTITUDE PHOTOGRAPHY.
USED WITH PERMISSION.

Eastern Shore of Virginia Seaside Commercial Use Assessment Report

MAY, 2015

Prepared For:

Virginia Coastal Zone Management Program
Virginia Department of Environmental Quality
629 East Main Street
Richmond, Virginia 23218

PREPARED BY:

Accomack – Northampton Planning
District Commission
23372 Front Street
Accomac, Virginia 23301
(757) 787-2936

NOAA GRANT #NA12NOS4190168
GRANT YEAR 2012, TASK NUMBER 96



This project was funded by the Virginia Coastal Zone Management Program at the Department of Environmental Quality through Grant #NA11NOS4190122 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management Act of 1972, as amended.

Eastern Shore of Virginia
Seaside Commercial Use
Assessment Report

Prepared For:

Virginia Coastal Zone Management Program

Virginia Department of Environmental Quality

629 East Main Street

Richmond, Virginia 23218

PREPARED BY:

Accomack – Northampton Planning

District Commission

23372 Front Street

Accomac, Virginia 23301

(757) 787-2936

NOAA GRANT #NA12NOS4190168

GRANT YEAR 2012, TASK NUMBER 96



This project was funded by the Virginia Coastal Zone Management Program at the Department of Environmental Quality through Grant #NA11NOS4190122 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management Act of 1972, as amended.

Table of Contents

List of Figures.....	ii
List of Tables.....	iii
Executive Summary.....	iv
1.1 Relationship to Recreational Use Study.....	1
1.2 Study Area.....	2
Chapter 2: Methods.....	4
2.1 Literature and Data Search.....	4
LICENSING.....	4
COMMERCIAL LANDINGS.....	5
INFRASTRUCTURE FACILITIES.....	5
2.2 Identification of Commercial Fishing Areas.....	5
OCEAN PLANNING AND MARCO COMMUNITIES AT SEA.....	5
COMMERCIAL FISHERMEN SURVEYS.....	7
Chapter 3: Results & Discussion.....	7
3.1 Literature and Data Search.....	7
LICENSING.....	7
COMMERCIAL LANDINGS.....	8
INFRASTRUCTURE – BOAT RAMPS.....	14
INFRASTRUCTURE – AQUACULTURE.....	19
3.2 Where Fishing Occurs.....	19
COMMUNITIES AT SEA MAPS.....	19
COMMERCIAL FISHERMEN SURVEYS.....	30
VMRC RECORDS OF PUBLIC AND PRIVATE SHELLFISH GROUNDS.....	36
Chapter 4: Summary and Conclusions.....	43
4.1 Literature and Data Search: Permits, Infrastructure, and Landings.....	43
4.2 Methodology.....	43
4.3 Where Fishing Occurs.....	44
4.4 Recommendations.....	44
Appendix A: Engagement toolkit.....	46
Commercial Fishing Communities and Fishing Industry Reps: Outreach Toolkit.....	46
Appendix B: Summary of Eastern Shore fisherman responses to communities at sea maps.....	56

Appendix C – Commercial Fisherman Survey Letter and Survey Instrument.....	61
Appendix D: Commercial Fisheries Landings, Virginia Waters, 2010-2014	64
Appendix E: Summary of Commercial Fisherman Survey Responses	65

List of Figures

Figure 1: Study area boundary for the commercial and recreational use assessments	3
Figure 2: Regional Ocean Planning Bodies	6
Figure 3: Eastern Shore Commercial Fisheries Landings Taken from Virginia Waters	8
Figure 4: Eastern Shore Commercial Fisheries, Finfish vs. Shellfish	9
Figure 5: Eastern Shore Commercial Fisheries- Average Monthly Landings	9
Figure 6: Eastern Shore Commercial Fisheries Landings by Water Body	12
Figure 7: Northern Accomack County/Chincoteague Public Boat Ramps	16
Figure 8: Central/Southern Accomack County Public Boat Ramps	17
Figure 9: Northampton County Public Boat Ramps	18
Figure 10: Concentrations of commercial fishing activity, southern tip of Assateague Island.	20
Figure 11: Communities at Sea, Chincoteague Community: Primary Bottom Trawl (map is incorrectly labeled) Activity, Vessels Greater than 65', 2011-2013.	21
Figure 12: Communities at Sea, Chincoteague Community: Primary Gill Net Activity, 2011-2013.	22
Figure 13: Communities at Sea, Chincoteague Community: Primary Pots and Traps Activity, 2011-2013.....	23
Figure 14: Communities at Sea, Virginia Community: Primary Bottom Trawl Activity, Vessels Less than 65', 2011-2013.....	24
Figure 15: Communities at Sea, Virginia Community: Primary Bottom Trawl Activity, Vessels Greater than 65', 2011-2013.....	25
Figure 16: Communities at Sea, Virginia Community: Primary Dredge Activity, 2011-2013.....	26
Figure 17: Communities at Sea, Virginia Community: Primary Gill Net Activity, 2011-2013.	27
Figure 18: Communities at Sea, Virginia Community: Primary Lobster Activity, 2011-2013.	28
Figure 19: Communities at Sea, Virginia Community: Primary Pots and Traps Activity, 2011-2013.	29
Figure 20: Commercial Fishing Using Crab Pots on the Seaside of Virginia's Eastern Shore as Self-Reported by Survey Respondents.....	34
Figure 21: Commercial Fishing Using Fish Pots on the Seaside of Virginia's Eastern Shore as Self-Reported by Survey Respondents	35
Figure 22: Northern Accomack County Seaside Oyster Grounds	37
Figure 23: Mid-Accomack County Seaside Oyster Grounds	38
Figure 24: Southern Accomack County Seaside Oyster Grounds	39

Figure 25: Northern Northampton County Seaside Oyster Grounds	40
Figure 26: Southern Northampton County Seaside Oyster Grounds	41
Figure 27: Public Clamming Grounds in northern Accomack County	42

List of Tables

Table 1 VMRC Permits by Type for Seaside Waters Under Commonwealth of Virginia Jurisdiction, January 2015.....	7
Table 2 Eastern Shore Commercial Fisheries Landings by Water Body (2014)	10
Table 3 Eastern Shore Commercial Fisheries Landings by Water Body in Pounds	13
Table 4 Improved Seaside Boat Launches in Accomack and Northampton Counties.....	14
Table 5 Returned Surveys by Permit Type	31
Table 6 Commercial Fishing Conflicts Reported by VMRC Permit Type.....	32
Table 7 Reported Conflicts by Permit Holder Water Body.....	33



Photo: Wading clams near Chincoteague. Photo courtesy of Nancy Richards West. Used with permission. All rights reserved.

Executive Summary

A 2014 documentary, "Watermen," produced by the Barrier Islands Center in Machipongo, captured the experiences of watermen-and their families and communities - to preserve a legacy of generations of commercial fishing on the Eastern Shore of Virginia. This report documents that legacy in a different way: by identifying the geographic extent, intensity, and breadth of commercial fishing and other commercial harvesting in the ocean (nearshore and offshore) and the seaside waters between the mainland and barrier islands of Virginia's Eastern Shore (inshore). It is part of a larger ocean planning effort undertaken by the Seaside Special Area Management Planning (SAMP) team, which includes the Marine Resources Commission, the Accomack-Northampton Planning District Commission (A-NPDC), The Nature Conservancy, the Virginia Institute of Marine Science, and the Virginia Coastal Zone Management Program.

The report includes a baseline dataset for defining where commercial fishing occurs on the Seaside of Virginia's Eastern Shore, including data from the Virginia Marine Resources Commission (VMRC), the Greater Atlantic Regional Fisheries Office (GARFO), the Mid-Atlantic Regional Council on the Ocean (MARCO), and first-hand information obtained through interviews and surveys with local watermen.

The data document fishing grounds along the entire coastline – inshore, nearshore, and offshore - that are important not only to the livelihoods of more than 200 Eastern Shore watermen, but to both the Virginia and Mid-Atlantic commercial fisheries. Inshore areas and nearshore barrier islands show great intensity because of the variety of uses spanning nets, pots and traps, crab pots, and shellfish grounds.

MARCO's Communities at Sea maps were verified by both local watermen and itinerant fishermen in port at Chincoteague as being overall good representations of where fishing occurs, with a few notations made for further examination by the Communities at Sea mapping team.

VMRC landings data by water body proved valuable for examining the location and intensity of use for inshore areas, although confidentiality concerns precluding the examination of this data by month to determine whether uses might be more –or less - intense in any given season.

Thirty-seven surveys returned by VMRC permit holders provided first-hand information on conflicts and areas of gillnet and crab pot use. Conflicts with other commercial fishermen were cited ten times, and range closures for rocket launches at the NASA Wallops Flight Facility were mentioned nine times as sources of conflict. Also mentioned were recreational (seven times), environmental and governmental (four), and legislative/policy conflicts (three). Temporal patterns identified included summer months and regulatory requirements such as open and close of species seasons.

While this report includes a robust set of baseline data for commercial fishing along the coast of Virginia's Eastern Shore, the following recommendations would help supplement understanding of this work:

- Further investigation into commercial seaside fishing activities should consider vertical profiles of inshore areas and seasonal fishing patterns to provide a better understanding of conflicts.

- Conflicts with other commercial fishermen were cited ten times. There do not appear to be additional measures need to understand the nature of the conflicts, and no further study is recommended.
- Launch range closures were also cited ten times, sometimes with impassioned language about the financial difficulties incurred, especially when launches are delayed and there are multiple closures within a short span. As the Communities at Sea Maps indicate, areas subject to closures are important to fishermen beyond the Eastern Shore. Further investigation could provide more insight into the financial implications of range closures for Virginia fishermen.
- Additional planning efforts may be needed in areas where intense commercial and recreational uses were identified. Both studies identified intense uses in the vicinity of Chincoteague Inlet and its adjacent water bodies. A focused planning effort in this area or other similar intensely used areas should incorporate the broad array of stakeholders utilizing the area to develop more site-specific baseline datasets which could be used to assist with developing site-specific strategies for reducing ongoing use conflicts and enhancing existing uses.
- Environmental, governmental, and legislative/policy conflicts were few and diffuse. However, it is recommended that environmental, regulatory and policy activities continue to consider potential impacts upon commercial uses by engaging commercial users during any development process.



Photo: Unloading scallops at Chincoteague Fisheries Co-op.
Photo by Jessika Tripp. Used with permission. All rights reserved.

Chapter 1: Introduction

Fishing sustained humans on the Eastern Shore of Virginia long before Europeans established permanent settlements there. Powhatan Indian diets were based around food availability in five culturally-defined seasons, and during the early to mid-spring season of *cattapeuk*, Powhatans relied heavily on migrating fish and cultivated crops.¹ Abundant finfish and shellfish were harvested from adjacent water bodies of the Atlantic Ocean and Chesapeake Bay using nets and weirs to nourish communities that moved to follow the seasonal availability of food, with the added benefit of making their mobile communities less susceptible to disease.²

However, once European settlements gained a permanent foot-hold in the region, fishing took on a more prominent role, at first as a regular component of permanent settlers' diets, and eventually, as a mainstay in the regional economies. The "1928 Report of the Commission to Investigate and Survey the Seafood Industry of Virginia" found that approximately 100,000 persons' occupations depended in some way upon commercial fisheries, with more than 30,000 individuals entirely dependent the industry.³

Even so, fishing employment was barely noticeable within the context of statewide employment data, but it was significant to coastal counties. For example, in 1950, fishermen accounted for less than one percent of all statewide employment, but that same year, fishermen constituted 30 percent of all employment in Northampton County.

Employment is not the only measure of the importance of fishing to the Eastern Shore way of life. Regional cultural practices, rituals, victuals, and family traditions have absorbed seaside rhythms, and their inherent dangers, beauty, and bounty, romanticizing the profession, even as its numbers dwindle. A 2014 documentary, "Watermen," produced by the Barrier Islands Center in Machipongo, captured the experiences of watermen - and their families and communities - to preserve their legacy.

This report documents that legacy in a different way: by assembling existing data sources, and supplementing those with surveys of commercial fishermen conducted via U.S. mail, to provide baseline data of the geographic extent, intensity, and breadth of commercial fishing and other commercial harvesting in the ocean and the seaside waters between the mainland and barrier islands of Virginia's Eastern Shore.

1.1 Relationship to Recreational Use Study

The Accomack-Northampton Planning District Commission (A-NPDC) undertook a study of commercial fishing on the seaside of the Eastern Shore of Virginia as part of a larger ocean planning effort undertaken by the Seaside Special Area Management Planning (SAMP) team, which includes the Marine Resources Commission, A-NPDC, The Nature Conservancy, the Virginia Institute of Marine Science, and the Virginia Coastal Zone Management Program.

¹ Encyclopedia of Virginia, Virginia Foundation for the Humanities, www.encyclopediavirginia.org

² Ibid

³ Kirkley, James, "Virginia Commercial Fishing Industry: Its Economic Performance and Contributions," Virginia Institute of Marine Science, 1997.

The Recreational Use Assessment Report for Virginia's Eastern Shore seaside, published in May, 2014, can be viewed as a companion to this commercial use report. Both reports incorporated user self-reporting through participatory GIS, along with observations from other data sources to derive a baseline dataset. Rather than inferring potential conflicts by examining geographic overlap - the approach used in the recreational use study - the commercial use project directly surveyed commercial fishermen about conflicts they experience.

The project area for both reports covers the entire seaside of Virginia's Eastern Shore. This includes an approximately 75-mile coastline bound by the mainland of the Eastern Shore to the west, the state border with Maryland to the north, and the mouth of the Chesapeake Bay to the south (Figure 1).

Together, the two studies provide a comprehensive representation of the seaside commercial and recreational uses for the Eastern Shore of Virginia, and a framework for marine spatial planning policy discussions.

1.2 Study Area

Specifically, the western boundary includes the tidal portion of the creeks on the mainland, and the southern boundary is an east-west line crossing the third island from the south of the Chesapeake Bay Bridge-Tunnel, on the south side of the tunnel under the Chesapeake navigation channel. The eastern boundary of the project area is the 200 nautical mile offshore exclusive economic zone boundary (Figure 1).

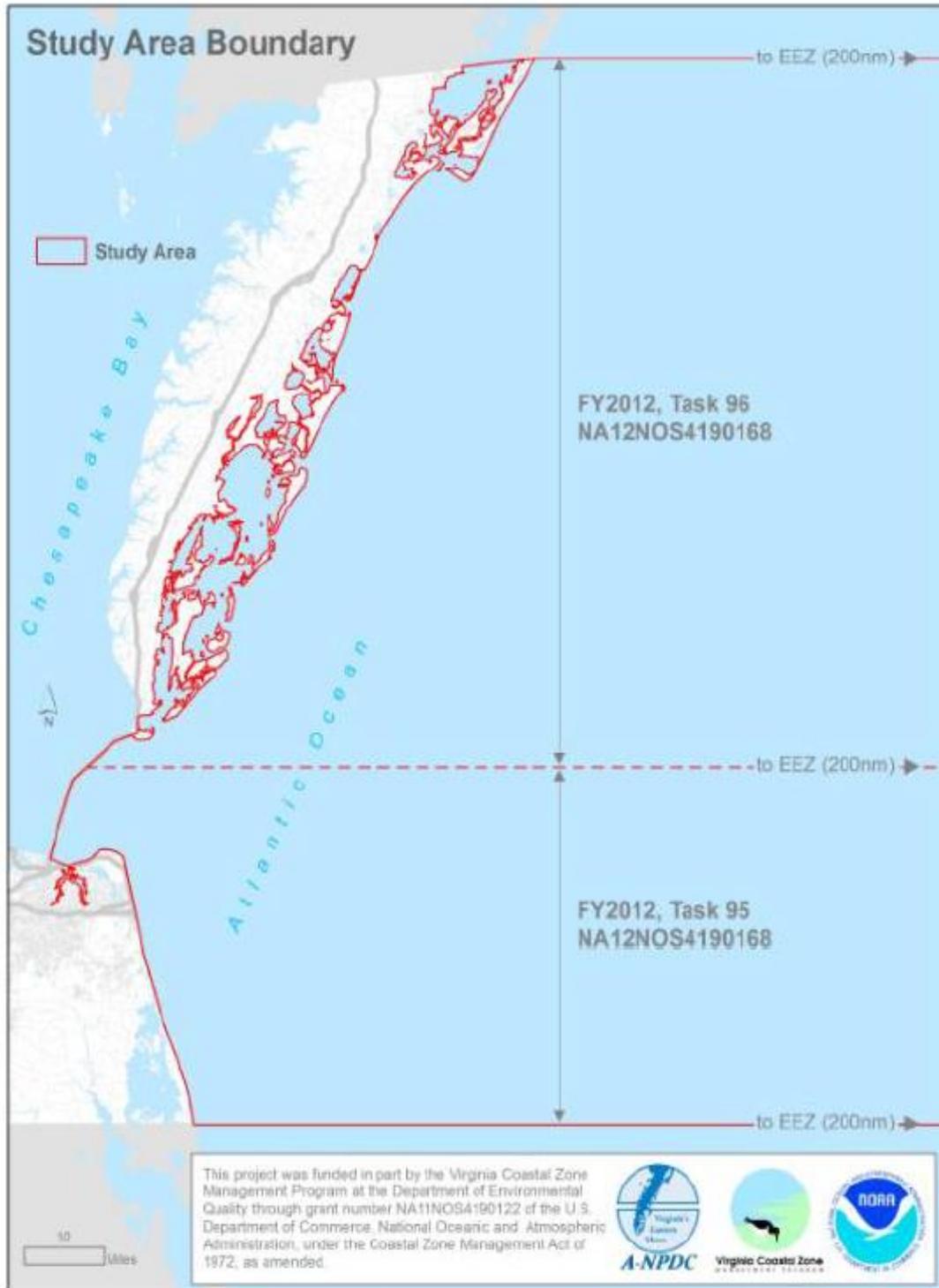
The seaside includes the longest expanse of coastal wilderness remaining on the Atlantic seaboard and is comprised of thousands of acres of pristine salt marshes, vast tidal mudflats, shallow lagoons, and navigable tidal channels that support thriving seafood and recreational tourism industries. These environments are bound on the east by a barrier island chain that is largely undeveloped.

The entire area between the seaside and the barrier islands, stretching from Fisherman Island, which lies, in part, beneath a bridge span of the Chesapeake Bay Bridge-Tunnel, northward to Assateague Island National Seashore, is designated by the United Nations Educational, Scientific and Cultural Organization (UNESCO) as a World Biosphere Reserve.



Photo: Commercial fishing vessel in Chincoteague. Photo by Jessika Tripp. Used with permission. All rights reserved.

FIGURE 1: STUDY AREA BOUNDARY FOR THE COMMERCIAL AND RECREATIONAL USE ASSESSMENTS, TASKS 95 AND 96 UNDER VCZM FY2012 GRANT NUMBER NA12NOS4190168.



Chapter 2: Methods

2.1 Literature and Data Search

The literature search focused on three types of data as indicators of commercial ocean activity: licensing, landings, and infrastructure facilities.

LICENSING

The Virginia Marine Resource Commission (VMRC) requires licenses for commercial activities in the Chesapeake Bay and Virginia's portion of the Territorial Sea (waters within three nautical miles of the coastline). Licenses are issued to work within specific bodies of water, and a request was made to VMRC for licenses issued for fishing or harvesting on the seaside of the Eastern Shore, including inshore (between the mainland and barrier islands) and nearshore (the ocean side of barrier islands) waters.

As the licensing agency for oyster grounds, VMRC maintains official documentation of public oyster grounds ("Baylor Grounds"), private oyster grounds leased from the Commonwealth, applications for private grounds, and documentation of public clamming grounds.

The public has access to a geographic representation of these locations through the VMRC's map viewer at <http://gis.mrc.virginia.gov/mapviewer>, along with locations of certain other VMRC permits and marine information.

Since VMRC issues saltwater commercial harvest permits by water body, and also records water body on landings, a records request was made to VMRC for commercial landings by water body by species.



©2014 Gordon Campbell / At Altitude Photography

Photo: Commercial crab fishermen on the seaside. Photo by Gordon Campbell, At Altitude Photography. Used with Permission. All rights reserved.

Similarly, the Greater Atlantic Regional Fisheries Office (GARFO), a division of the National Oceanic and Atmospheric Administration, manages all living marine resources in the exclusive economic zone (EEZ) of the Atlantic Ocean from Cape Hatteras to Maine, including issuing the multi-species permit required for commercial finfish landings taken from the EEZ. These data were downloaded from the GARFO website.

COMMERCIAL LANDINGS

Commercial landings refers to the weight and value of finfish and shellfish that are harvested. In Virginia, those data are reported to VRMC for Virginia waters, and to NOAA's National Marine Fisheries Service (NMFS) for federal waters. Requests were made to both VMRC and NOAA for commercial landings in Accomack and Northampton counties.

INFRASTRUCTURE FACILITIES

Accomack and Northampton counties, and the towns of Chincoteague and Wachapreague, along with Virginia Department of Inland Game and Fisheries and the Eastern Shore of Virginia National Wildlife Refuge provided information about launch facilities that are used for commercial fishing and harvesting. These data were obtained through a combination of online publications, e-mail, and phone interviews. Only the Eastern Shore of Virginia National Wildlife Refuge was able to provide information about commercial launches from its facilities.

2.2 Identification of Commercial Fishing Areas

OCEAN PLANNING AND MARCO COMMUNITIES AT SEA

Numerous uses compete for the same space out on the water – and above and below its surface. Competition comes from every sector: recreational, commercial, energy production, and research; encompassing everything from commercial fishing to sand mining to wind energy.

There have been systems in place for at least a century to plan for and allocate land resources: systems that evolved into data-driven frameworks for policy analysis. That same principle is now being comprehensively applied to the oceans through ocean planning work.

Ocean planning for the mid-Atlantic region began with the Mid-Atlantic Regional Council on the Ocean (MARCO), an organization formed to address the shared regional priorities identified in the Mid-Atlantic Ocean Governors' Agreement on Ocean Conservation, signed in 2009 by the governors of Virginia, Maryland, Delaware, New Jersey, and New York. In that document they agreed to make offshore renewable energy, habitat protection, water quality and climate adaptation the group's priorities.

The following year, President Obama issued an executive order establishing a national ocean policy to protect and restore the nation's oceans and coasts. The policy called for the formation of regional planning bodies (Figure 2) to coordinate ocean planning work among federal, state, and tribal bodies, and in conjunction with fishery management councils. Since the mid-Atlantic region already had a framework in place, MARCO is assisting the Mid-Atlantic Regional Planning Body, which was established in April 2013, with its ocean planning work.

One of the products of the ocean planning work was Communities at Sea maps, which were developed using a methodology developed by Dr. Kevin St. Martin of Rutgers University, working closely with fishermen and leading fisheries social scientists. To produce these maps, large volumes of commercial fishing data for 2011-2013 were extracted from vessel trip reports (VTR),

and synthesized into maps to represent not only where fishermen were fishing, but where their fishing efforts were concentrated as expressed by man-hours.

FIGURE 2: REGIONAL OCEAN PLANNING BODIES



Some shortcomings of the VTR data include inaccuracies due to multi-day trips, lack of seasonal indicators of activity, and missing activity from fishing for species that do not require federal permits, such as croaker. However, the roughly 100,000 trips recorded per year from Maine to North Carolina – about 40,000 from mid-Atlantic states – provided a robust data set from which to create the maps and begin to examine regional fishing patterns.

Separate maps were produced by port and gear type. Vessels were associated with a particular

port if the vessel landed at that port and either declared the port as his or her principal port, or the vessel landed in that port more than 50% of the time. The “rule of three” was used so that smaller ports used by fewer than three vessels, where an individual fisherman’s confidential data might have been compromised, were grouped into “all Virginia ports.”

To further protect confidentiality, data that were used in mapping were provided to the research team by the National Marine Fisheries Service free of any personal identifying information, such as the vessel name or the owner’s name.

Once produced, the Accomack-Northampton Planning District Commission (A-NPDC) took the Community at Sea maps out to commercial fishermen to verify their accuracy. The team at Rutgers University put together an outreach toolkit (Appendix A) to guide engagement with fishermen along the coast of the entire mid-Atlantic region. While A-NPDC staff did not use town-hall meeting format upon which the toolkit is predicated, A-NPDC used toolkit questions to guide discussions, sometimes individually and sometimes in small groups.

The initial map review was held in Newport News in July, 2014 at VMRC offices. Later, several methods were employed to solicit input.

- Local fishermen with GARFO permits were contacted via telephone. If they agreed to review the maps, a meeting was arranged at their convenience.
- A visit was made to the dock at the Chincoteague Fisheries Co-Op when vessels were in port off-loading their catch.

- Maps were taken to other meetings where fishermen would be present.

Errors, or areas flagged by fishermen as questionable, were reported back to the Rutgers University team for further investigation. A summary of Eastern Shore fishermen reactions to the MARCO maps can be found in Appendix B.

COMMERCIAL FISHERMEN SURVEYS

A-NPDC obtained a list of 210 VMRC commercial permit holders for waters off of the Eastern Shore of Virginia, along with permit types, and addresses. The list was for permits as of January 2015, and permit holders were sent maps and a survey asking them to indicate the geographic extent of their work areas and whether they encountered conflicts in their work. If they indicated there were conflicts, they were asked to report the types of conflicts and whether there could discern seasonal or other temporal patterns. The survey was part of a larger survey that also included question about offshore wind energy. (The entire survey can be viewed in Appendix C).

Survey responses were compiled and conflicts grouped into seven categories: No conflict, other commercial fishermen, Wallops Flight Facility, recreational, environmental, other governmental (military, park service, and leased oyster grounds), and legislative/policy (conditions tied permits, such as season starts or time of day limits). Maps provided by fishermen were geocoded to specific water bodies to create maps of their activity.

Chapter 3: Results & Discussion

3.1 Literature and Data Search

LICENSING

VMRC identified 210 current commercial permit holders as of January 2015, for seaside waters within three miles of the coastline of the Eastern Shore of Virginia. Permit types were crab pot; dredge, which are used for harvesting conch and a small number of horseshoe crabs; eel pot; fish pot; and gill net (Table 1).

TABLE 1: VMRC PERMITS BY TYPE FOR SEASIDE WATERS UNDER COMMONWEALTH OF VIRGINIA JURISDICTION, JANUARY 2015

**January 2015 VMRC permits by type
for seaside waters
under Commonwealth of Virginia jurisdiction**

Gear Type	Number of Permits
Crab Pot	116
Dredge	15
Eel Pot	4
Fish Pot	3
Gill Net	72
Total VMRC Permits	210

source: VMRC

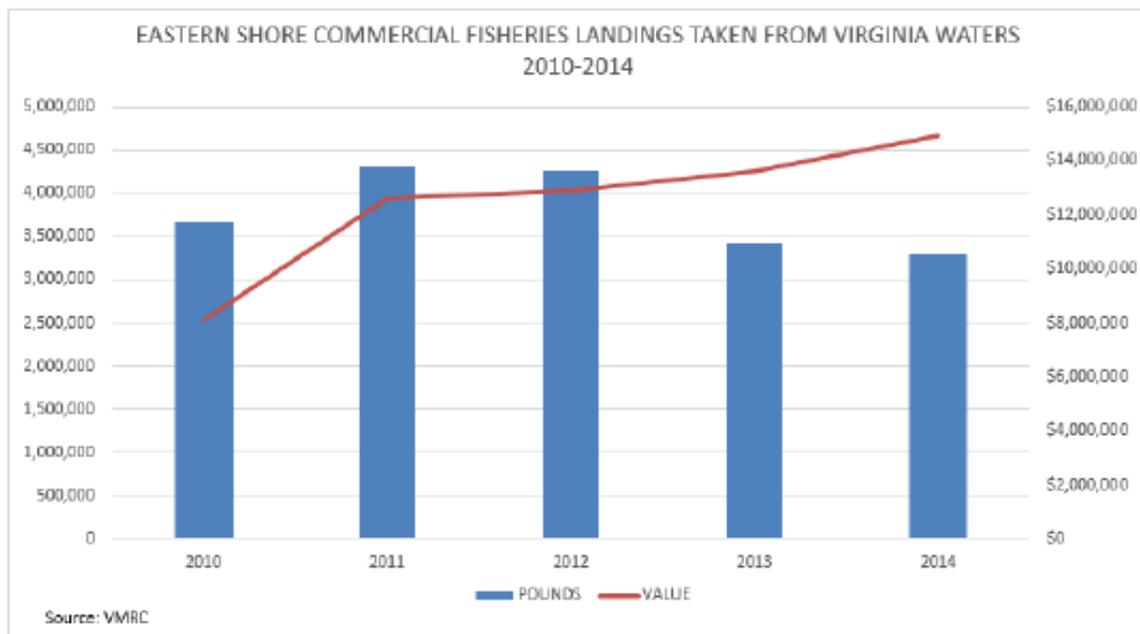
An online search of GARFO permits turned up 4,318 North Atlantic in November 2014. Unlike recreational users, who are likely to return home, or to their vacation rentals, after a day of ocean fishing, many commercial vessels that operate in the deep seas under GARFO permits remain at sea for extended periods, with a range that could encompass one state or the entire East Coast, making it hard to distinguish which of the vessels frequent offshore waters along Virginia's coast.

Sorting the data by principal port turned up 153 vessels with principal ports in Virginia; 32 of which are on the Eastern Shore, but some of these were charter captains, who were accounted for in the recreational use survey. Through phone calls to the contacts listed in the permits, 16 were confirmed to be commercial fishermen, another nine were confirmed to be charter captains, and it was undetermined whether the remaining seven were commercial fishermen or charter captains.

COMMERCIAL LANDINGS

Figure 3 summarizes Eastern Shore commercial fisheries landings from Virginia waters for the years 2010 – 2014 in both pounds and value. After an initial rise in pounds landed, from 3.6 million pounds in 2010 to 4.3 million pounds in 2011 and 2012, landings dropped below 2010 levels for 2013 and 2014, to 3.4 and 3.3 million pounds, respectively. However, the value of landings has seen a steady increase, from \$8.1 million in 2010 to \$15 million in 2014. (A complete table of landings by species and by year and by found in Appendix D.)

FIGURE 3: EASTERN SHORE COMMERCIAL FISHERIES LANDINGS TAKEN FROM VIRGINIA WATERS



By groups of species – finfish vs. shellfish – the overall trend in shellfish landings increased over the five-year period, while the overall trend in finfish landings was downward (Figure 4).

Landings varied by month, reflecting the seasonal fish migration patterns and/or restrictions placed on permit holders. Generally peak landings in terms of both value and pounds were seen in May through August, as illustrated by Figure 5. One exception is the month of December,

which was the third lowest landing month by pounds, but ranked sixth out of the twelve months in landings value, driven almost entirely by clam harvests.

December, however, is not an aberration: on the whole, 77 percent of the value of Eastern Shore landings are attributable to clams (\$11.6 million of \$16 million total landings). A distant second are blue crabs, at \$1.5 million, and oysters are third in landings value at just under \$1 million. Although 17 other species are landed in the two counties, nothing else comes close in value to clam, crabs, and oysters, and although more spot is landed annually than oysters (133,640 lbs. to 123,599, respectively), spot brought \$1.70 per pound in 2014, compared to \$8.01 per pound for oysters.

FIGURE 4: EASTERN SHORE COMMERCIAL FISHERIES, FINFISH VS. SHELLFISH

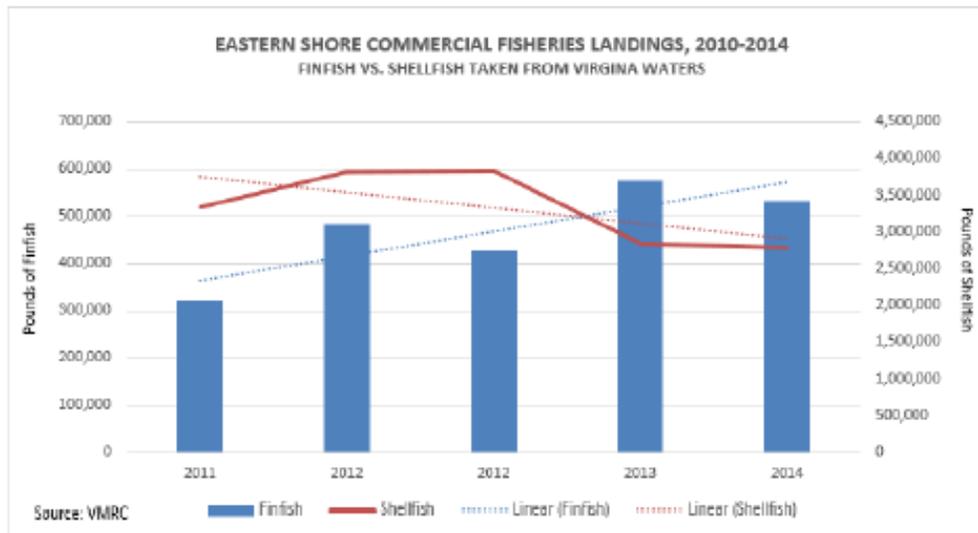


FIGURE 5: EASTERN SHORE COMMERCIAL FISHERIES- AVERAGE MONTHLY LANDINGS

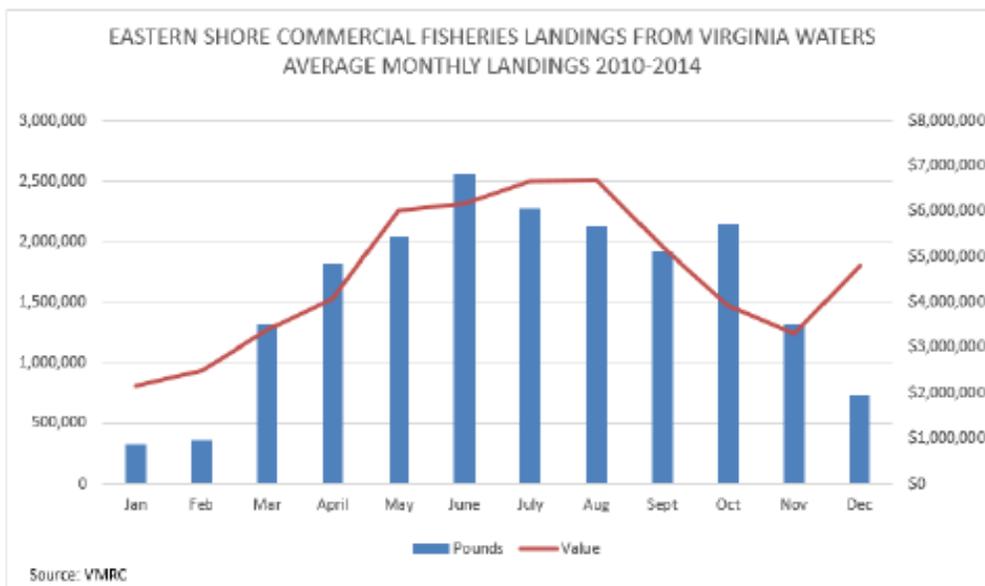


TABLE 2: EASTERN SHORE COMMERCIAL FISHERIES LANDINGS BY WATER BODY (2014)**Eastern Shore Commercial Fisheries Landings
by Water Body (2014)**

	POUNDS	VALUE
BOGUE BAY	23,491	\$53,820
BRADFORD BAY	37,208	\$61,575
BURTON BAY	57,053	\$82,703
CHINCOTEAGUE BAY	650,152	\$1,310,896
COBB BAY	11,483	\$66,795
GARGATHY BAY	4,737	\$25,895
HOG ISLAND BAY	498,534	\$4,310,718
KEGOTANK BAY	4,352	\$28,734
MAGOTHY BAY	133,562	\$800,976
METOMPKIN BAY	83,357	\$111,961
OYSTER BAY	21,763	\$49,266
SOUTH BAY	224,502	\$804,837
UNCLASSIFIED SEASIDE BAYS AND RIVERS	1,416,170	\$5,187,333
SWASH BAY	1,513	\$6,991
UPSHUR BAY	128,763	\$1,030,397
WATTS BAY	23,059	\$45,593
OTHER (ANNUAL AVG)	10,033.00	\$2,159
		\$14,980,648

Source: VMRC

VMRC also provided landings by water body (Table 2, Figure 6). Those data reinforced the predominance of the aquaculture industry. In 2014, Hog Island Bay accounted for more than a quarter of all seaside landings. Hog Island Bay. It happens to be northeast of Willis Wharf, home to both Cherrystone Aqua-Farms and H.M. Terry Company, both large, well-established aquaculture companies that grow out their clam and oysters in Hog Island Bay.

When examining trends within individual bays, some were more striking than others. For example, after reaching a peak of \$702,390 of "Other" species taken from Chincoteague Bay in 2012, the "other" yield dropped 41 percent to \$422,337 in 2013 and increased only slightly in 2014 (Table 3). The "Other" reporting category includes crabs, shellfish, and conch, which were reported together by VMRC to preserve data confidentiality. Data for Burton Bay showed a similar pattern.

Magothy Bay showed a 60 percent increase in shellfish landings when measured by harvest weight, and 800 percent when measured in value, an indicator of the growing shellfish aquaculture industry. Since 2010 four bottom leases totaling more than 600 acres were issued for oyster grounds Magothy Bay.

Commercial landings data for federal waters were not available at the level of detail needed to reflect Eastern Shore landings in time for inclusion in this report, but landings from federal waters do not appear to be as reliable as state landings for pointing to where commercial fishing

occurs. Federal landings do not point back to where the catch was taken – VTR data is the source of that information, and it is already captured in the Communities at Sea maps.

Furthermore, one fisherman interviewed for this report said fishermen who remain at sea for extended times, following fish as they follow preferred ocean temperatures, reported that landings were influenced by the availability of state quotas and commercial packers, in addition to the location of fish at any given time.

For example, one of the fishermen interviewed in December, 2014 was off-loading fish at the Chincoteague Fisheries Co-Op, before heading to North Carolina, where a small quota was open, to sell the rest of his harvest.



Photo: Commercial clamming in Hog Island Bay. Photo courtesy of Gordon Campbell, At Altitude Photography. Used with permission. All rights reserved.

FIGURE 6: EASTERN SHORE COMMERCIAL FISHERIES LANDINGS BY WATER BODY

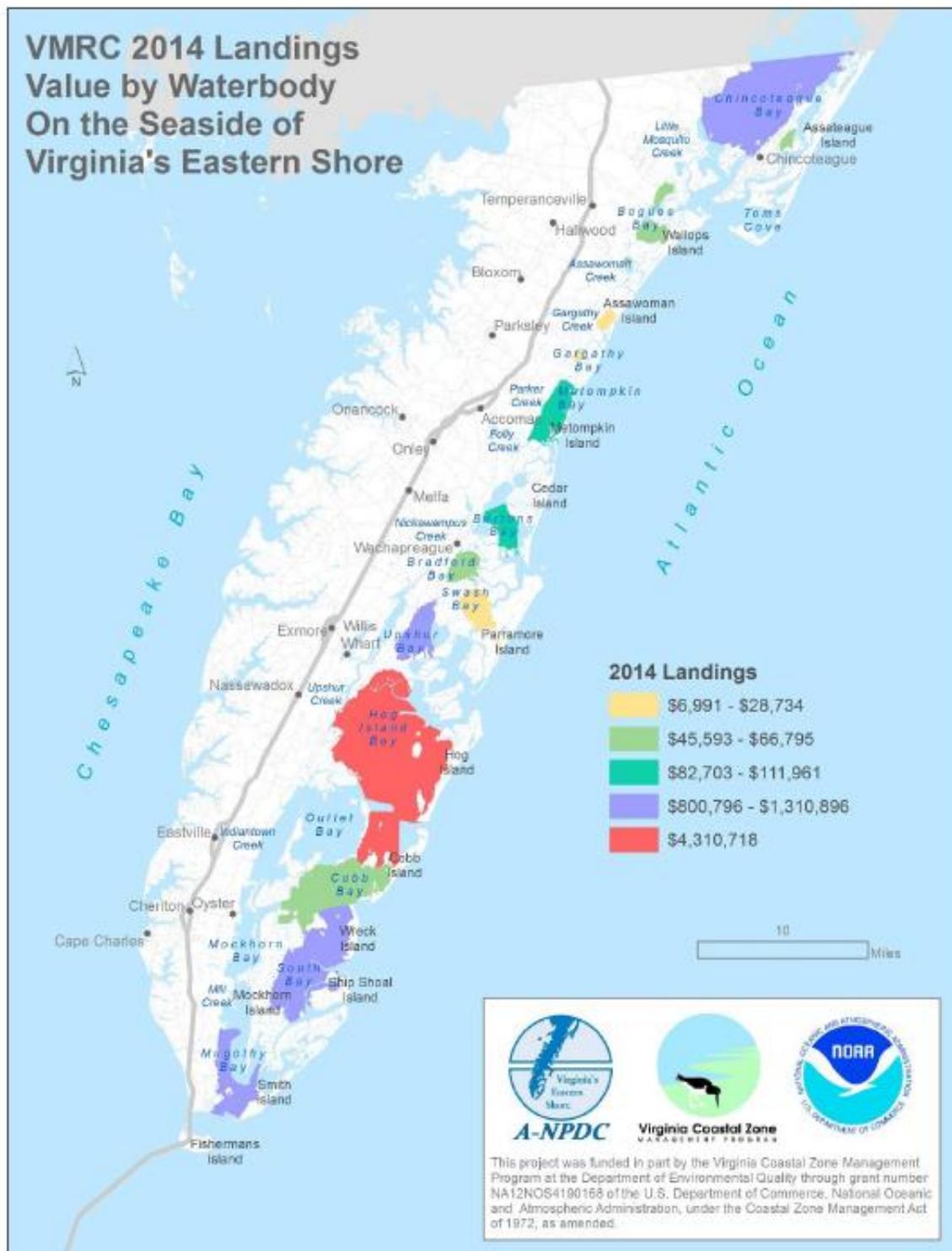


TABLE 3: EASTERN SHORE COMMERCIAL FISHERIES LANDINGS BY WATER BODY IN POUNDS

Eastern Shore Commercial Fisheries Landings by Water Body
Landings in Pounds, 2010-2014

	2010		2011		2012		2013		2014		Totals 2010-2014		GRAND TOTALS
	Finfish	Other	Finfish	Other									
BOGUE BAY	0	89,956	0	48,973	0	5,297	0	29,138	62	23,429	62	196,792	196,854
BRADFORD BAY	7,252	49,503	9,841	19,714	5,338	29,314	2,690	63,561	12,426	24,782	37,547	186,875	224,422
BURTON BAY	23,435	100,528	7,555	201,720	3,427	204,562	31,876	93,516	7,211	49,842	73,503	650,168	723,671
CHINCOTEAGUE BAY	93,854	608,059	211,399	694,335	162,050	720,390	210,468	422,337	224,983	425,168	903,361	2,930,268	3,833,030
CORB BAY	6,346	33,968	15,224	30,730	20,881	15,979	37,355	20,053	1,253	10,230	81,059	110,961	192,020
GARGATHY BAY	*	1,527	*	30,801	*	31,761	*	25,706	*	3,531	*	93,326	93,326
HOG ISLAND BAY	26,355	470,230	19,405	531,320	20,410	618,154	29,542	599,839	33,453	465,082	129,164	2,684,624	2,813,788
KEGOTANK BAY	*	*	*	*	*	*	*	*	*	*	*	*	*
MAGOTHY BAY	*	40,701	*	130,943	*	87,387	*	62,962	*	130,220	*	452,214	452,214
METOMPKIN BAY	7,940	26,606	2,134	90,782	1,830	77,740	2,718	47,256	16,775	66,582	31,396	308,966	340,362
OUTLET BAY	*	*	*	*	*	*	*	*	*	*	*	*	*
OYSTER BAY	*	*	*	*	*	*	*	*	*	*	*	*	*
SOUTH BAY	10,057	81,529	14,337	173,985	24,655	133,864	9,517	125,095	17,944	206,339	77,129	721,036	798,165
UNCLASSIFIED													
SEASIDE BAYS AND RIVERS	136,745	1,623,379	196,167	1,753,773	180,033	1,824,699	246,197	1,233,387	205,909	1,210,261	965,052	7,645,498	8,610,550
SWASH BAY	*	*	*	*	*	*	*	*	*	*	*	*	*
UPSHUR BAY	*	95,468	*	40,453	*	30,070	*	82,086	*	128,783	*	376,841	376,841
WATTS BAY	0	52,916	0	35,348	0	46,802	0	26,192	3,760	19,299	3,760	180,558	184,318
OTHER	7,483	10,134	7,232	40,543	7,927	9,212	5,549	8,935	8,992	23,183	37,183	92,006	129,189
GRAND TOTALS	320,066	3,344,483	483,314	3,823,425	427,156	3,835,281	575,912	2,840,062	532,768	2,786,931	2,339,216	16,630,132	18,969,348

*Due to confidentiality issues, data for this bay was combined with others and reported as "Other"

Source: VMRC

INFRASTRUCTURE – BOAT RAMPS

Both Northampton and Accomack counties offer free, public boat ramps. Some are specifically designated as commercial docks with improvements geared toward the needs of watermen, such as loading and unloading areas or running water. However, local officials report that all of their improved seaside launches, and some of the unimproved locations, are used by commercial fishermen. The public access sites are owned and maintained by the counties, except those in Chincoteague and Wachapreague, which are town facilities, and Wise Point and Red Bank, which are owned by the Eastern Shore of Virginia National Wildlife Refuge and the Virginia Department of Inland Game and Fisheries (DGIF), respectively. Although DGIF owns the Red Bank ramp, Northampton County provides maintenance at that location.

The Eastern Shore of Virginia Wildlife Refuge tracks commercial usage of its boat ramp. For the period of September 2013 through August 2014, officials reported more than 7,000 launches by commercial watermen.

A complete list of improved boat seaside boat launches in both counties can be found in Table 4, and their locations are noted in Figures 7, 8, and 9.

TABLE 4: IMPROVED SEASIDE BOAT LAUNCHES IN ACCOMACK AND NORTHAMPTON COUNTIES

Accomack County	Location	Features
Greenbackville	Off of Harbor Dr. (Rt. 3006)	Two concrete boat ramps with rental slips and parking.
Chincoteague Town Dock and Ramp	Main St. and Cropper (Behind American Legion)	Double concrete ramp, dock, paved parking for 17 trailers and 20 cars. Commercial bulkhead located further north at Robert Reed Park to accommodate trawlers after they offload at Chincoteague Fisheries Co-Op.
Chincoteague: East Side Ramp	East Side Road, between Turlington Ln. and Pointer Ln.	Double concrete launch with paved parking for 11 trailers and four vehicles.
Chincoteague: Veterans' Memorial Park	7472 Memorial Park Dr.	Single concrete ramp 11 paved trailer parking spaces and 22 vehicle spaces. Year-round rest rooms.
Curtis Merritt Harbor, a harbor of safe refuge	Curtis Merritt Harbor Dr.	Concrete boat ramp with paved parking for 39 boat trailers and 26 vehicles. Year-round bathrooms, cold-water outdoor showers mid-March to mid-November, and on-site harbor master. 96 boat slips, 25' to 50'; available by yearly lease, and a loading dock for larger vessels. Seasonal running water to boat-slips. 10-15 year waiting list for boating slip, although short-term sub-leases sometimes available through harbor master with priority to commercial uses.
Queen Sound	Off of Chincoteague Rd. (Off the Rt. 175 causeway between Wattsville and Chincoteague)	Concrete boat ramp with unimproved parking.
Old NASA Ferry Dock	End of Pierce Taylor Rd.	Limited use concrete boat ramp with limited

	(Rt. 730 near the village of Assawoman)	unimproved parking and picnic gazebo.
Kegotank	End of Kegotank Rd. (Rt. 681 near Modest Town)	Concrete boat ramp with unmarked parking.
Gargatha Landing	End of Gargatha Landing (Rt. 680 near Gargatha)	Concrete boat ramp with unimproved parking.
Parkers Creek	End of Fox Grove Rd. (Rt. 666 near the village of Pastoria)	Concrete boat ramp with limited unmarked parking.
Folly Creek	End of Folly Creek Rd. (Rt. 651 near the Village of Daugherty)	Concrete boat ramp with limited unmarked parking.
Town of Wachapreague	Atlantic Ave.	Free public launch next to Island House Restaurant. Town Marina also has a public launch; \$5 to launch or \$30 seasonal pass. Parking for free launch along Atlantic Ave. where legally permitted. Marina parking included in launch fee. Marina has slips for yearly or monthly lease (slips have water and electric), up to 44' vessel size.
Quinby Harbor	Off of Harbor Point Rd (Rt. 606)	Double concrete boat ramp with rental slips and parking. Fee for launches.
Northampton County	Location	Features
Willis Wharf	Route 603, Willis Wharf.	Two ramps with straight dock in the center. Ramp is used by commercial fishermen and aquaculture industry. Ample unmarked parking. County-appointed harbor committee oversees; part-time on-call harbor master.
Oyster	In the town of Oyster, at the end of Route 1802.	Two concrete ramps. Floating docks, plus one standard dock structure with 12 slips geared toward working watermen with seasonal water and electric. Appointed Harbor Committee and county maintenance employee serves as on-call harbor master.
Red Bank	At the end of Route 715.	Two boat ramps between l-shaped end docks, with straight dock in the center. Managed by Virginia Department of Inland Game and Fisheries; maintained by Northampton County.
Wise Point	Eastern Shore of Virginia National Wildlife Refuge	Managed by U.S. Fish and Wildlife Service. Two concrete boat ramps with parking for 41 trailers and 21 vehicles. Restrooms. Fee for launching. Commercial pass available.

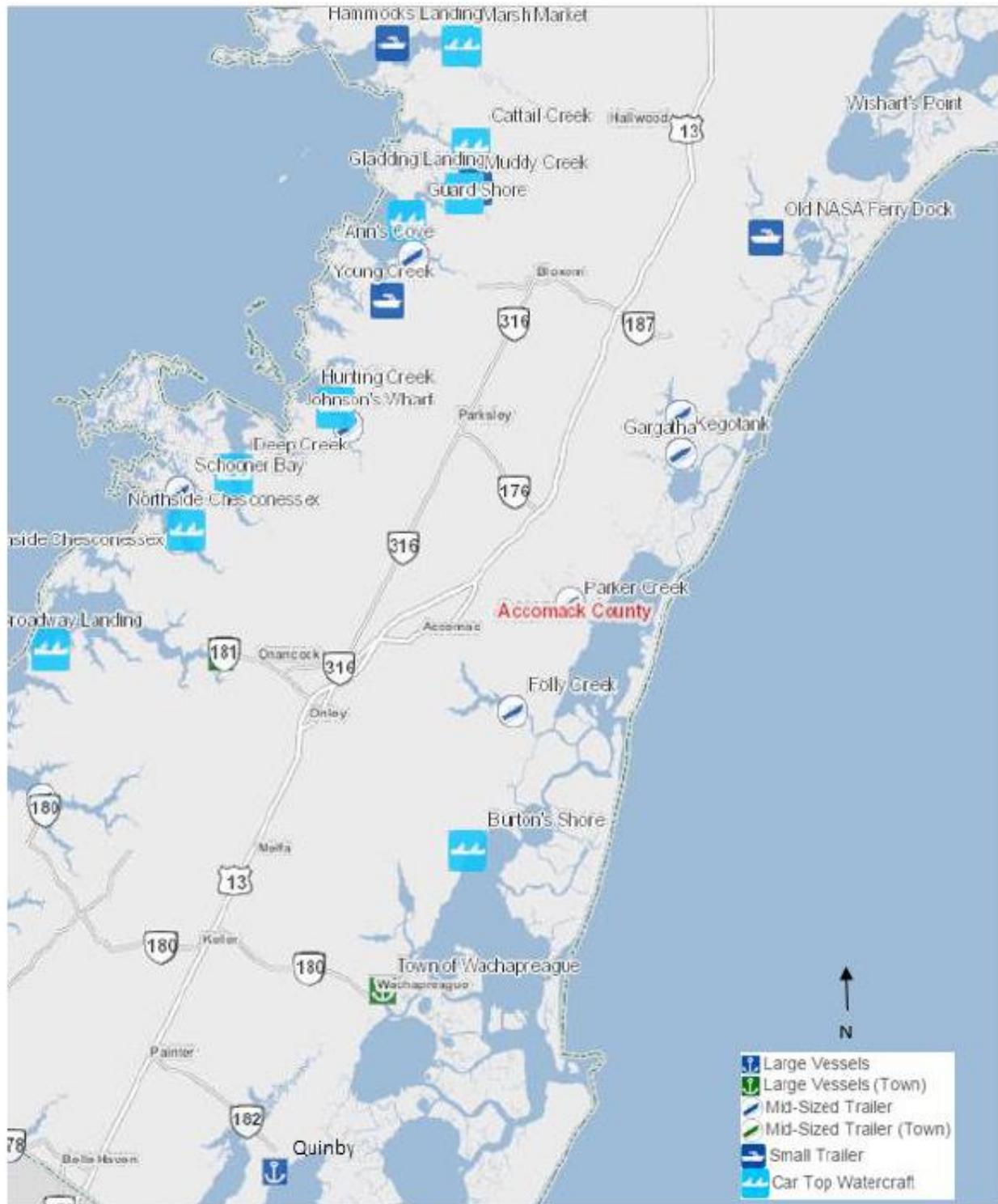
Sources: County and town web pages, phone interviews with harbor masters, U.S. Fish and Wildlife Services, and Virginia Department of Inland Game and Fisheries.

FIGURE 7: NORTHERN ACCOMACK COUNTY/CHINCOTEAGUE PUBLIC BOAT RAMPS



Source: Accomack County Online Mapping Service

FIGURE 8: CENTRAL/SOUTHERN ACCOMACK COUNTY PUBLIC BOAT RAMPS



Source: Accomack County Online Mapping Service

FIGURE 9: NORTHAMPTON COUNTY PUBLIC BOAT RAMPS



Source: VMRC Online Viewer, Northampton County

INFRASTRUCTURE – AQUACULTURE

The Eastern Shore's thriving aquaculture industry relies on land-based infrastructure for hatcheries, nurseries and packing plants. Major Eastern Shore producers include Ballard Fish and Oyster Company, also trading under the labels of Cherrystone Aqua Farms and Chincoteague Shellfish Farms, and H. M. Terry, under the label. The small town of Willis Wharf is the epicenter of this burgeoning industry, housing a clam and oyster hatchery and nursery shared between the two companies. Additional Cherrystone facilities can be found in Oyster and Chincoteague.



Photo: Oyster crew working seaside. Photo courtesy of Gordon Campbell, At Altitude Photography. Used with permission. All rights reserved.

3.2 Where Fishing Occurs

COMMUNITIES AT SEA MAPS

Communities at Sea maps were produced for Chincoteague for three gear types: pots and traps; gill net; and bottom trawl for vessels over 65' (incorrectly labeled "Groundfish"). Maps for six gear types were prepared for the Virginia Community: bottom trawl for vessels less than 65'; bottom trawl for vessels greater than 65'; dredge, gill net, lobster, and pots and traps. Activity levels are depicted in ranges from green for areas where the least fisher days are expended, to red, and then white, for the highest levels of activity. Contour lines shown within the fishing activity areas mark the zones within which 75 percent of the fishing activity for the displayed gear type occurs.

Overall, fishermen who reviewed the Communities at Sea maps agreed that the maps were good depictions of the fishing activity for which they had knowledge, but three items stood out for follow-up:

- The map titled "Primary Groundfish 65 Plus Activity" should be re-titled "Primary Bottom Trawl 65 Plus Activity."
- A small area on the Groundfish (Bottom Trawl) map – the one furthest east of Cape May – was noted by one captain as being too deep for trawlers, and he suspected it was a location fished by charter captains for swordfish. The area in question is circled in red in Figure 11.
- Additional areas for pots and traps, south and east of the offshore Virginia wind energy areas, and another parallel to and east of the existing pattern of pots and traps was noted by fishermen at a fishermen engagement meeting for the offshore wind energy area. Their proposed map additions can be seen in Appendix B.

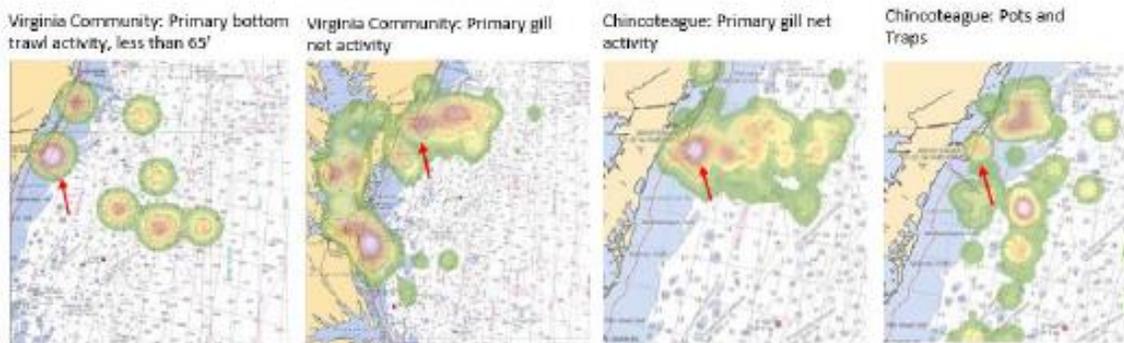
Some fishermen expressed concern as to whether the years for which VTR data was mapped were good representative years, and noted that some species did not require permits in federal waters. All comments were shared with the team at Rutgers University for follow-up, and can be seen in Appendix B.

Chincoteague Communities at Sea maps are shown in Figures 11-13. All other seaside ports had too few vessels to create independent maps for each without compromising confidential data. Those ports are included in the "Virginia Community" maps, which are shown in Figures 14-19, for the following gear types: bottom trawl vessels greater than 65 feet long; bottom trawl vessels less than 65 feet long; dredge; gill net; lobster; and pots and traps.

The southern tip of Assateague Island was a hot spot across several gear types. Virginia vessels of less than 65 feet showed a high concentration of fishing activity there. It was also an important spot for Chincoteague gill net and pots and traps fishermen, as well as for the Virginia pots and traps community. These areas are highlighted together in (Figure 10).

FIGURE 10: CONCENTRATIONS OF COMMERCIAL FISHING ACTIVITY AROUND THE SOUTHERN TIP OF ASSATEAGUE ISLAND.

Concentration of commercial fishing activity around the southern end of Assateague Island



Source: MARCO/Rutgers University Communities at Sea Maps

FIGURE 11: COMMUNITIES AT SEA, CHINCOTEAGUE COMMUNITY: PRIMARY BOTTOM TRAWL (MAP IS INCORRECTLY LABELED) ACTIVITY, VESSELS GREATER THAN 65', 2011-2013.

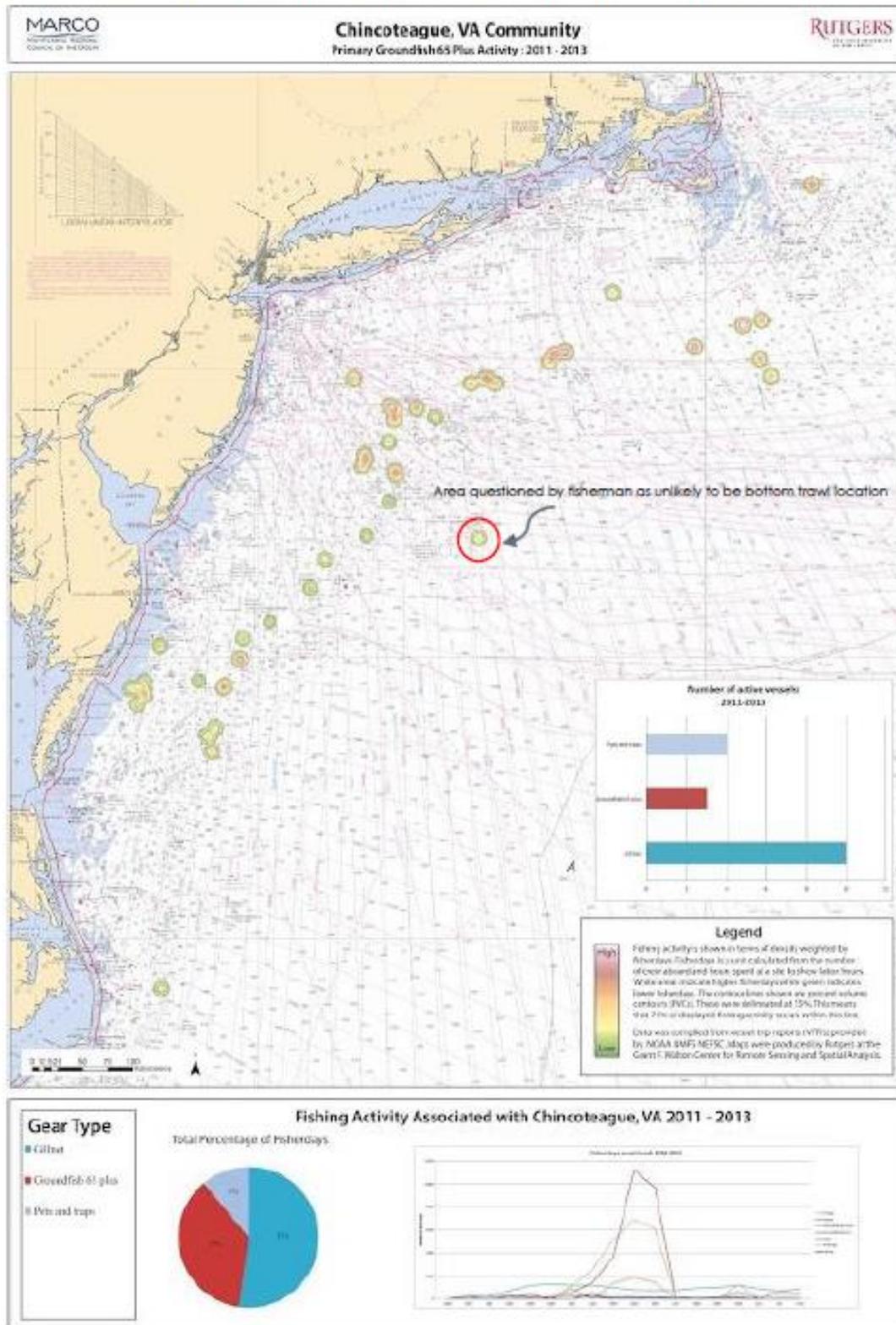


FIGURE 12: COMMUNITIES AT SEA, CHINCOTEAGUE COMMUNITY: PRIMARY GILL NET ACTIVITY, 2011-2013.

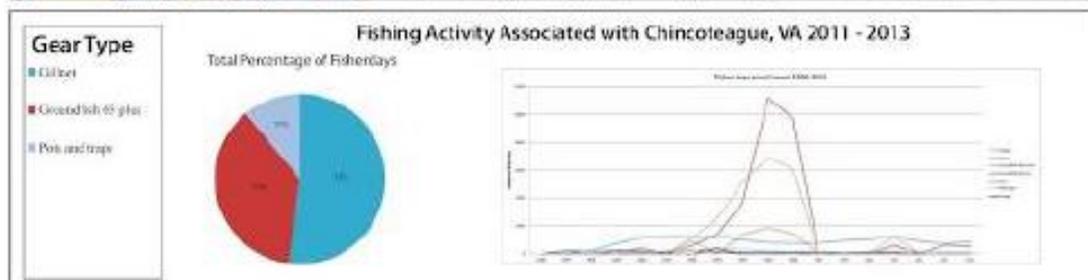
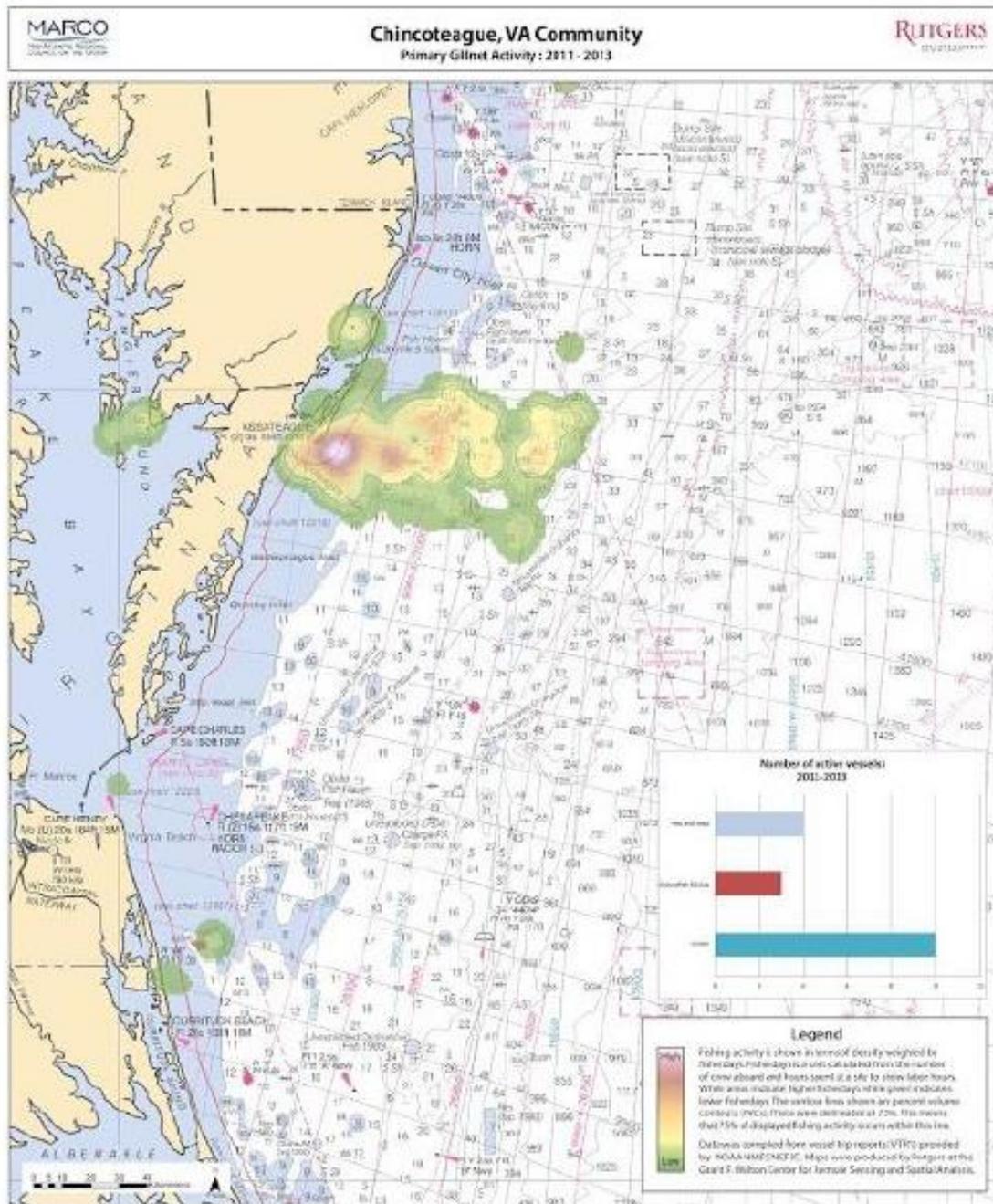


FIGURE 13: COMMUNITIES AT SEA, CHINCOTEAGUE COMMUNITY: PRIMARY POTS AND TRAPS ACTIVITY, 2011-2013.

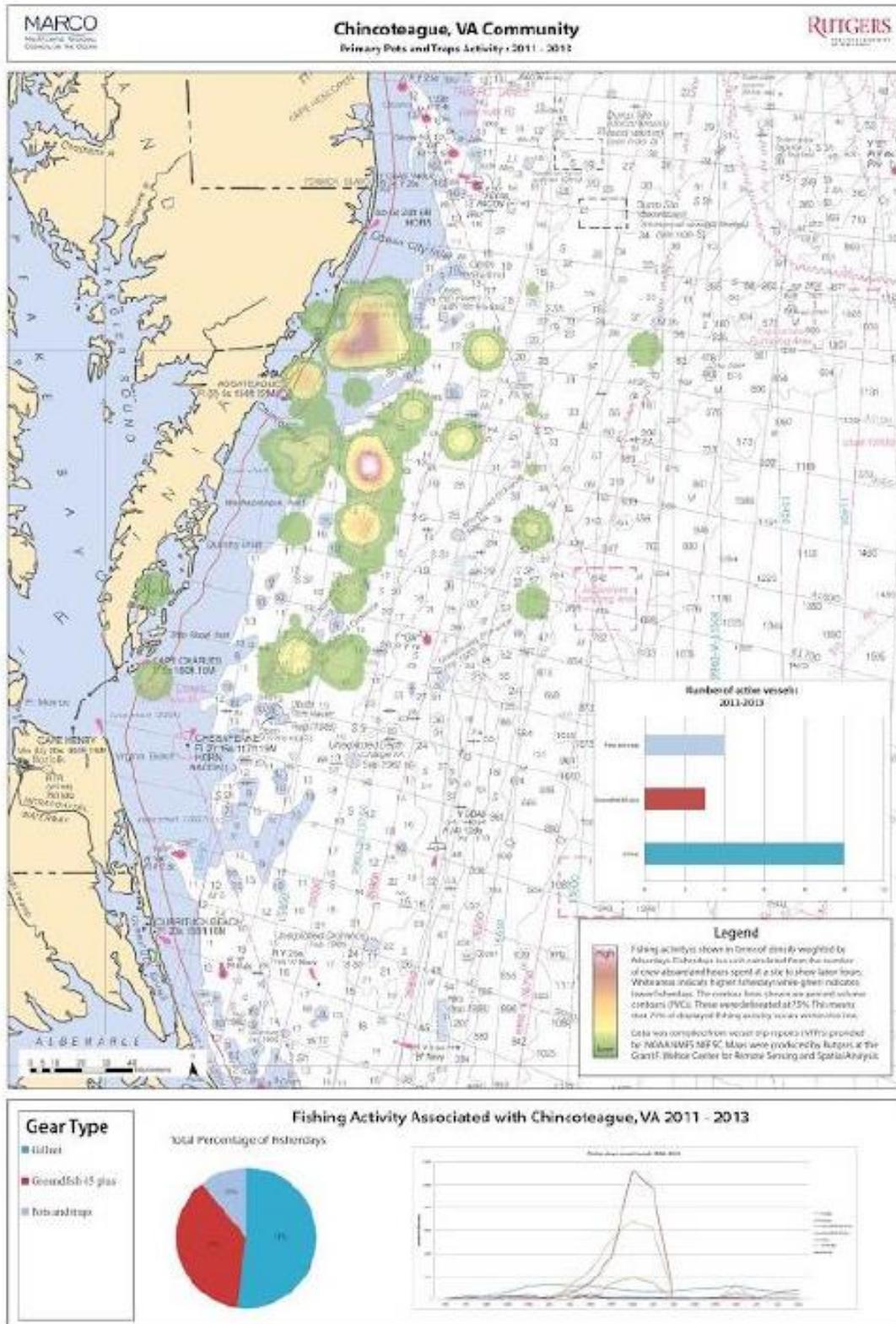


FIGURE 14: COMMUNITIES AT SEA, VIRGINIA COMMUNITY: PRIMARY BOTTOM TRAWL ACTIVITY, VESSELS LESS THAN 65', 2011-2013.

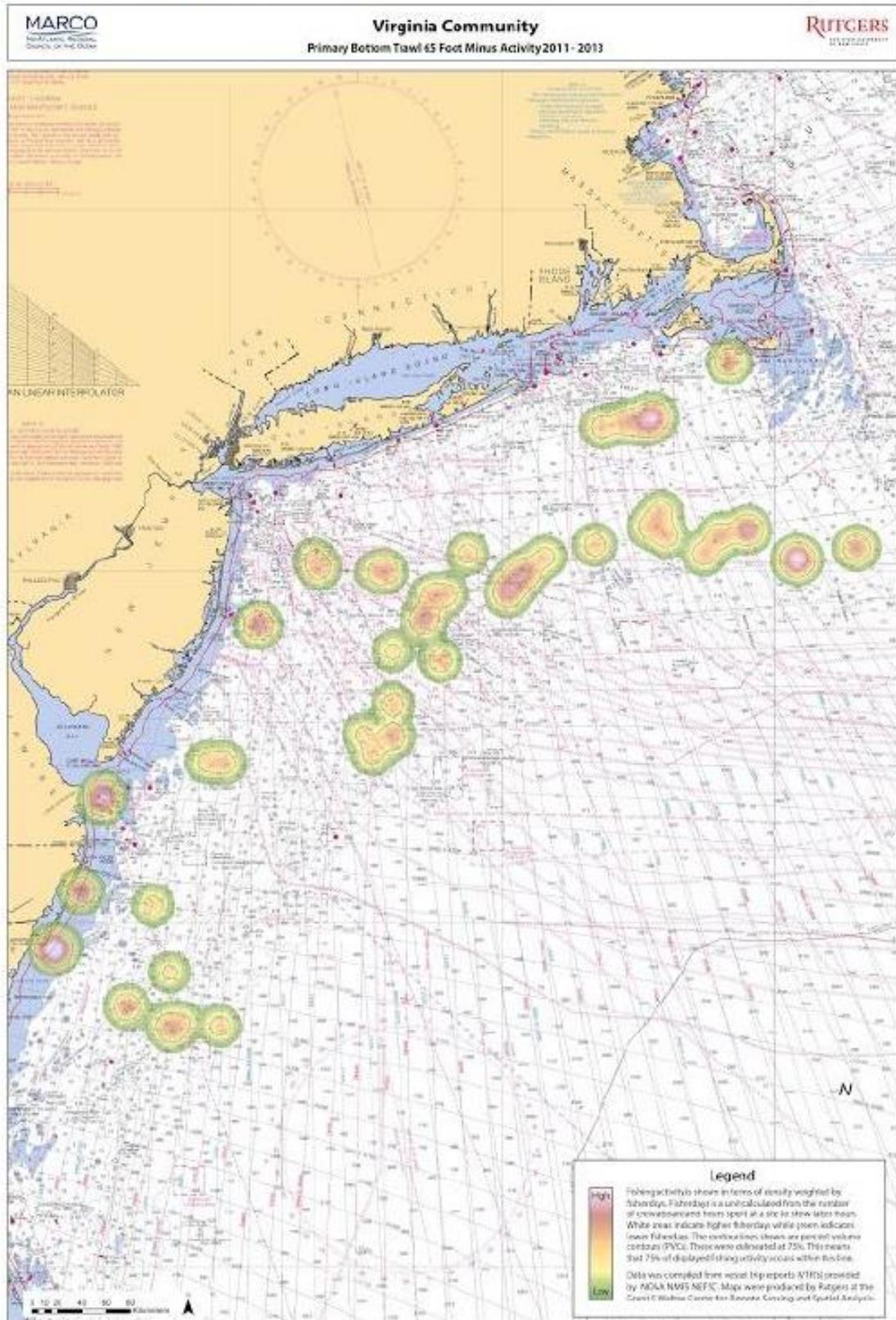


FIGURE 15: COMMUNITIES AT SEA, VIRGINIA COMMUNITY: PRIMARY BOTTOM TRAWL ACTIVITY, VESSELS GREATER THAN 65', 2011-2013.

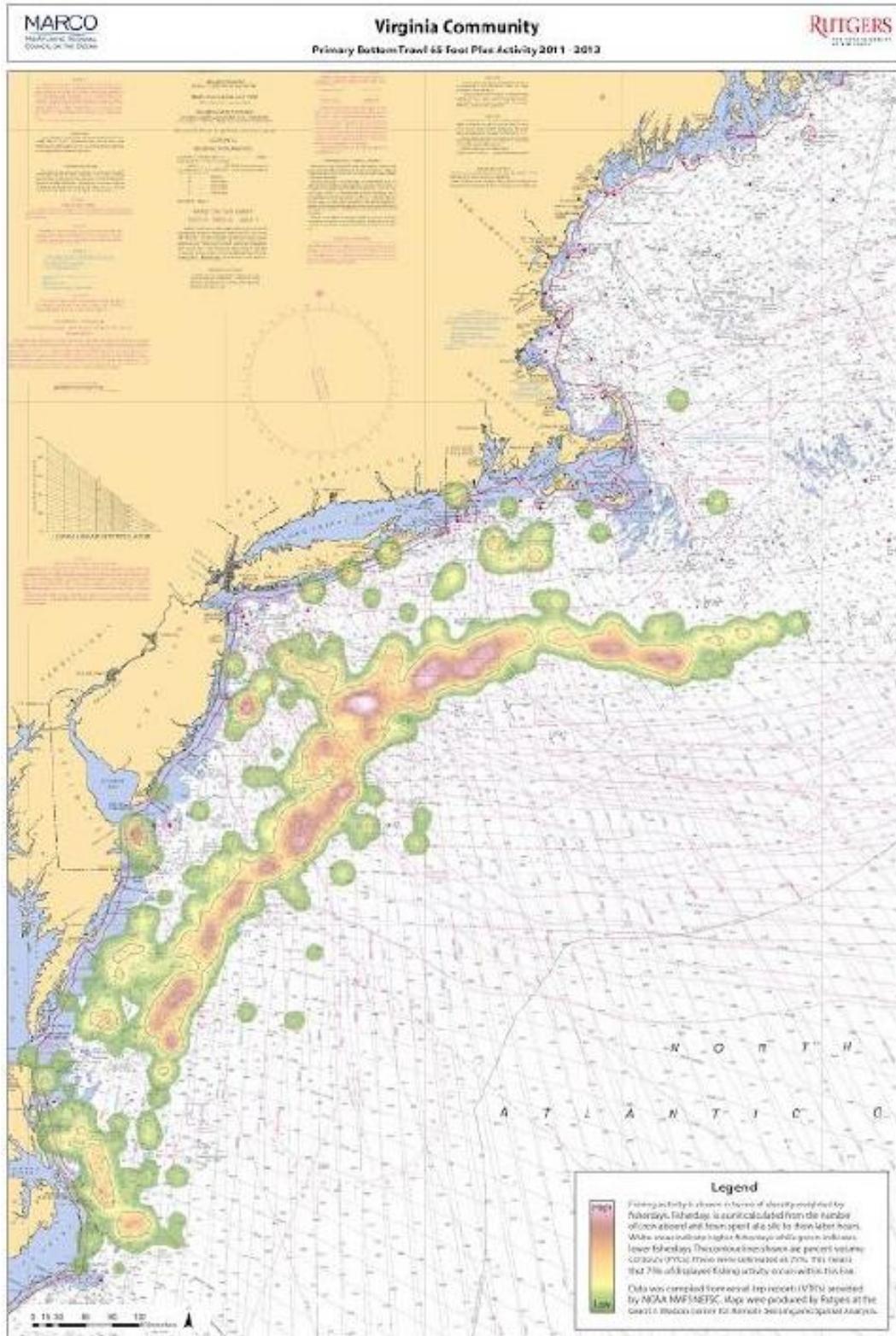


FIGURE 16: COMMUNITIES AT SEA, VIRGINIA COMMUNITY: PRIMARY DREDGE ACTIVITY, 2011-2013.

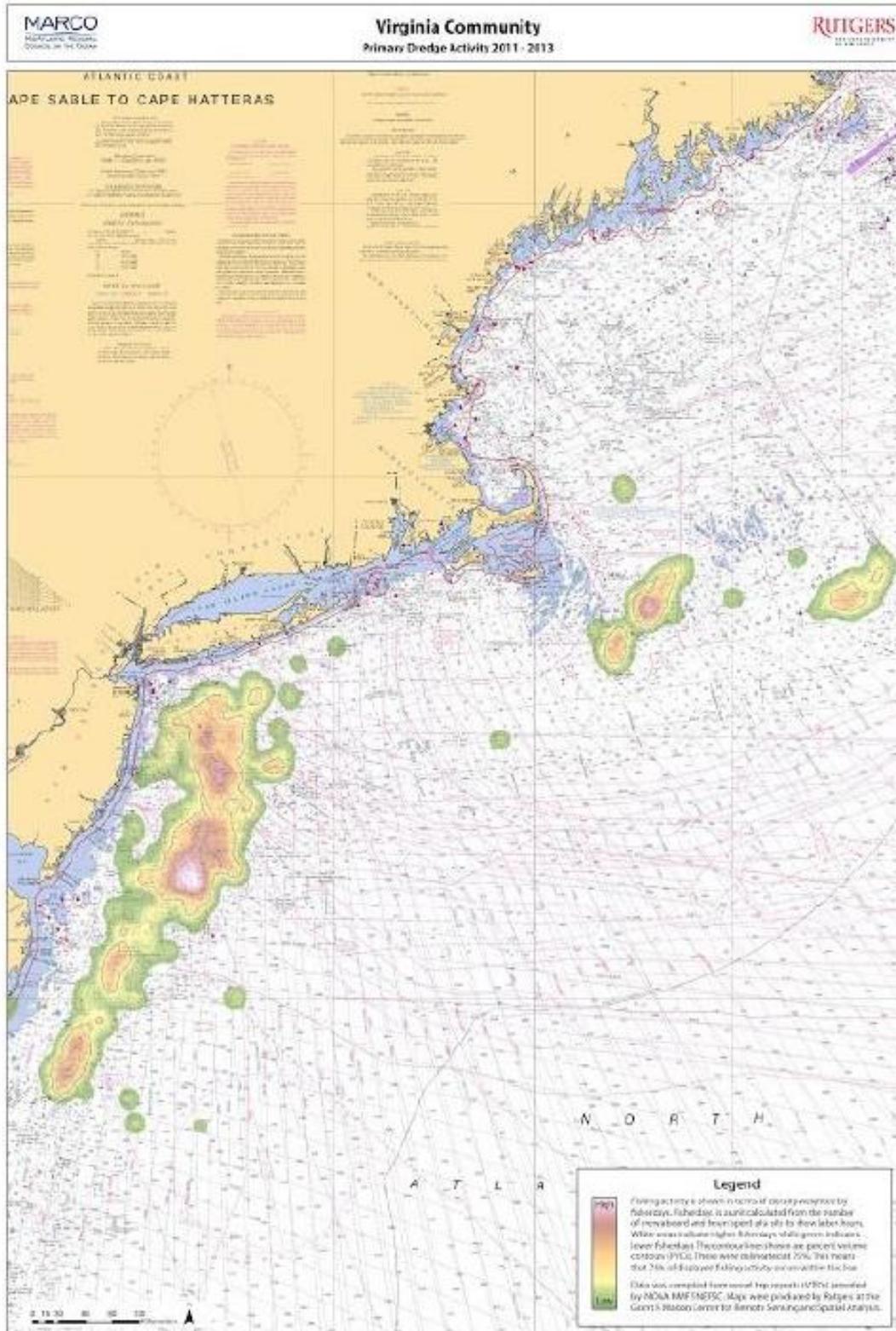


FIGURE 17: COMMUNITIES AT SEA, VIRGINIA COMMUNITY: PRIMARY GILL NET ACTIVITY, 2011-2013.

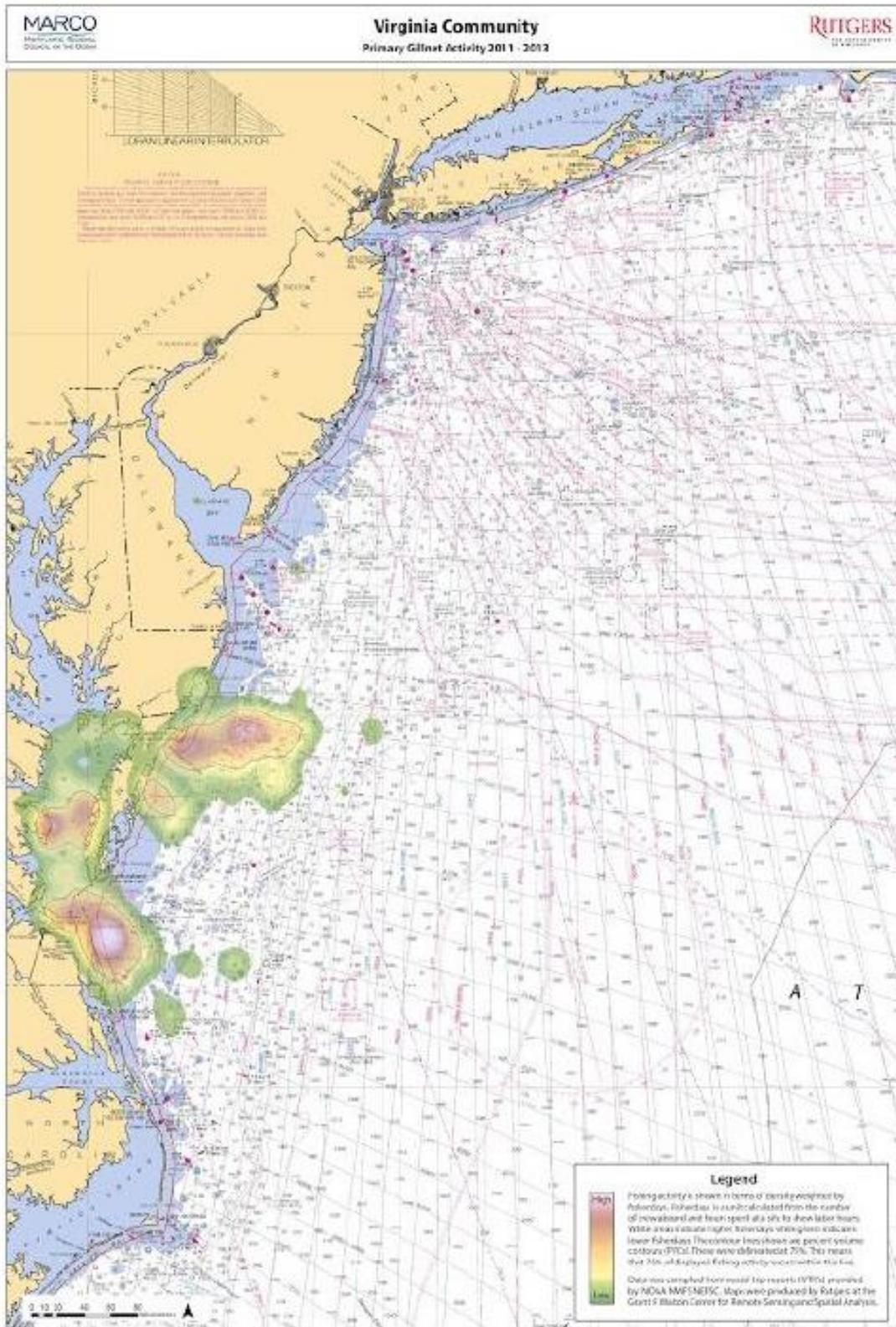


FIGURE 18: COMMUNITIES AT SEA, VIRGINIA COMMUNITY: PRIMARY LOBSTER ACTIVITY, 2011-2013.

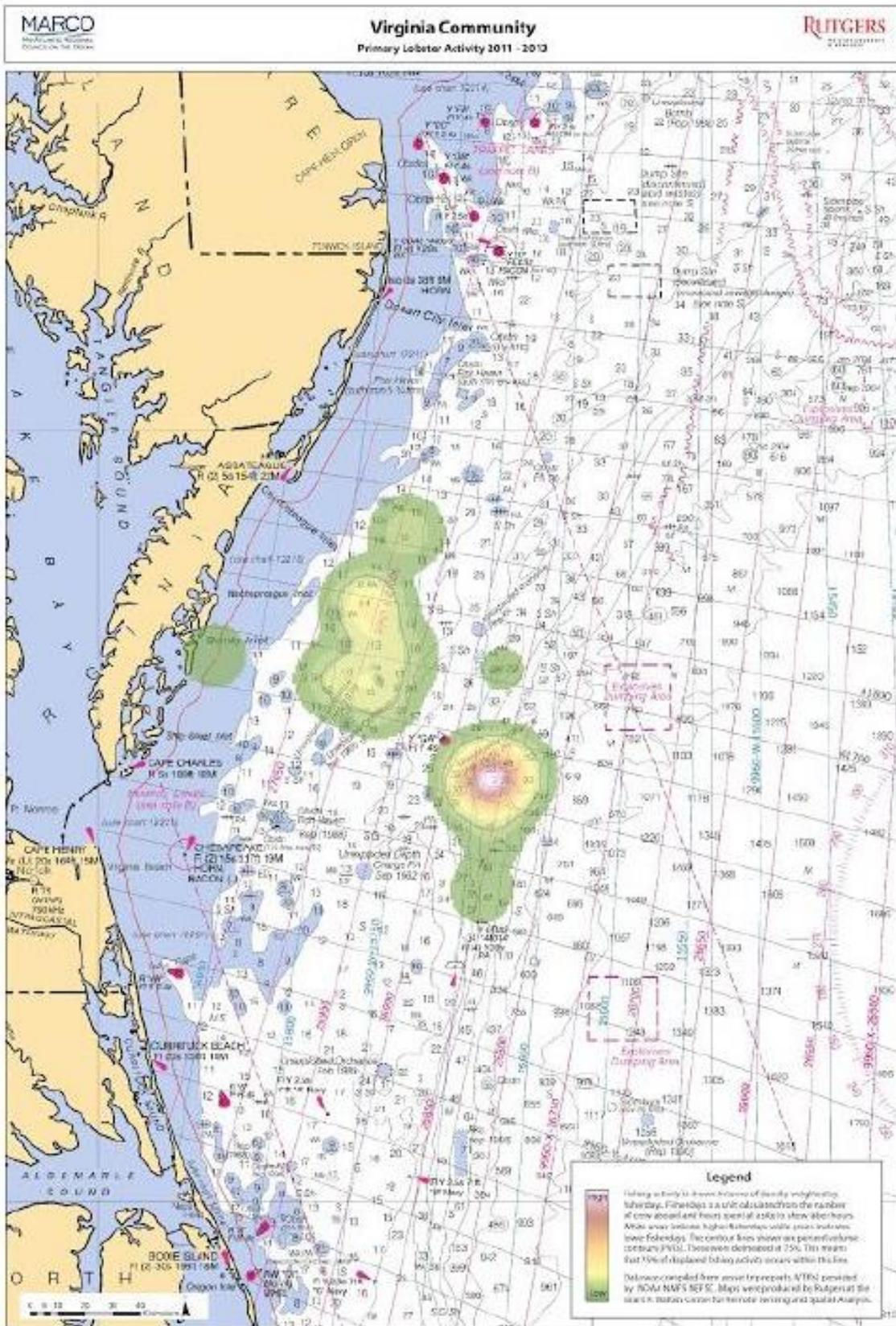
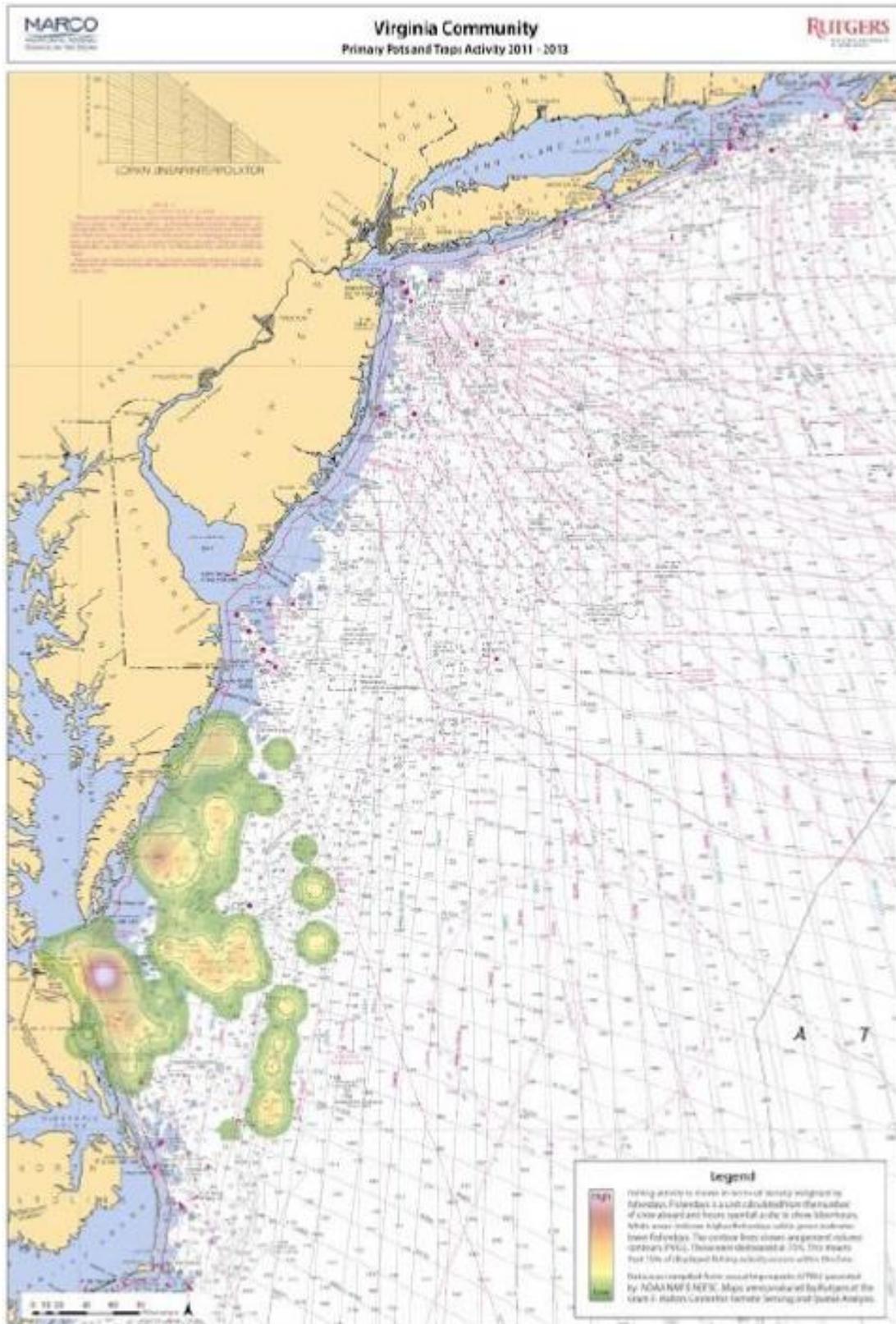


FIGURE 19: COMMUNITIES AT SEA, VIRGINIA COMMUNITY: PRIMARY POTS AND TRAPS ACTIVITY, 2011-2013.



The highest level of bottom trawl activity in the Virginia Community for vessels longer than 65 feet occurs in a range beginning about 60 miles offshore, and ending just before the shelf break, with secondary "hot spots" found at 15-foot contours closer to shore (Figure 15).

Chincoteague's corresponding Community at Sea map for bottom trawl vessels (erroneously labeled "Groundfish" in the map, as pointed out by one of the fishermen reviewers) (Figure 11) generally follows the same pattern, but with lighter activity, as would be expected with fewer vessels. Although there are several GARFO-licensed fishermen in the Chincoteague area, the Chincoteague activity likely also reflects non-local vessels off-loading at the Chincoteague Fisheries Co-Op.

Primary gill net activity for the Chincoteague Community extends approximately 50 miles east from Assateague Island (Figure 12). That area is also one of two important gill net fishing areas along the Eastern Shore for the Virginia Community (Figure 17). A second area is shown around the Wachapreague Inlet.

Primary areas of pots and traps activity for the Chincoteague Community (Figure 13) are clustered around the middle and southern end of Assateague Island, with other activity concentrations roughly 28 to 32 miles east of Metompkin Bay and Cedar Island in about 14 feet of water. These are also important Eastern Shore areas for the Virginia Community, with one additional location: an area with a north-south span well north of Wachapreague Inlet and well south of Quinby Inlet, and extending approximately 25 miles east (Figure 19).

Besides the concentration of effort discussed in Figure 10, Virginia bottom trawl vessels of less than 65 feet are shown fishing in lower concentrations approximately 50 miles east of the Quinby Inlet, and continuing east roughly 100 miles (Figure 14).

The map of primary dredge activity for the Virginia Community does not indicate any activity off the coast of the Eastern Shore of Virginia (Figure 16).

The largest amount of lobster activity is in the far southern edge of the study area, approximately 75 miles offshore (Figure 18). A small amount of lobster activity is shown near the Quinby Inlet, and a moderate amount of activity parallels the Shore from about Hog Island to Assateague Island, within depths of 9 to 18 feet.

COMMERCIAL FISHERMEN SURVEYS

Using a list of commercial fishing permits provided by VMRC in January, 2015, surveys were mailed to 210 commercial fishermen with permits to fish in water bodies along the coast of the Eastern Shore of Virginia. A total of 37 permits were returned, for a return rate of 17.6 percent. Table 5 provides a breakdown of returned surveys by type of permit.

Although it was not a scientifically-conducted survey, the information collected from fishermen provide insight into commercial fishing activity on the Eastern Shore. The overall return rate was 17.6 percent. Eighteen of 116 crab pot permit holders returned surveys (15.5 percent), and fifteen of 72 gill net permit holders (20.8 percent). Two of three fish pot permit holders responded; one of four eel pot permit holders returned surveys, and one of the 15 dredge permit holders responded.

TABLE 5: RETURNED SURVEYS BY PERMIT TYPE**Returned Surveys by Permit Type**

Gear Type	Number of Permits	Number of Returned Surveys	Sample Size (Percent of Permits)
Crab Pot	116	18	15.5%
Dredge	15	1	6.7%
Eel Pot	4	1	25.0%
Fish Pot	3	2	66.7%
Gill Net	72	15	20.8%
Total VMRC Permits	210	37	17.6%

Source: A-VPDC survey of commercial fishermen

Most respondents marked maps indicating where along the Eastern Shore they worked, and returned these maps with their surveys. On the whole, crab pot respondents tended to be more localized, and gill net respondents indicating a much larger range, with many reporting that their range extends the length of the Eastern Shore. Figures 20 and 21 reflect self-reported fishing areas captured by the participatory GIS process. Out of concern for data confidentiality, map of the two fish pot survey respondents' activity was not included in this report.

Both maps indicate fishermen are utilizing the entire shore, but there is not much overlap in intensity between the two maps, except the northern end around Chincoteague Bay-Chincoteague channel. Nor is there considerable intensity overlap between the fishermen's gill net map and the MARCO gill net map, except, again, around the Chincoteague Bay-Assateague Island area. Some of the fishermen hold both GARFO and Virginia permits, and some of their responses reflect the breadth of that experience. Similarly, Virginia license holders might also hold multiple permits – such as a crab pot permit holder who also harvests clams – and their responses include all their work, as reflected in comments such as kayakers ripping nets and exposing clams to bull fish, even though permits for clams were not one of the VMRC permit categories targeted for surveys.

Figure 20 shows an apparent gap in crab pot activity for Gargathy and Metompkin Bays. For Metompkin Bay, that is likely a result of not getting any survey returns from permit holders from that area, rather than a lack of activity (six surveys were mailed to crab pot permit holders for Metompkin Bay). VMRC landings data show both finfish and shellfish, with more shellfish than finfish. With landings valued at \$1.34 per pound, they were most likely crab landings, rather than oysters or clam, which typically fetch around \$8 per pound.

Two surveys were mailed to crab pot permit holders for Gargathy Bay. With landings at \$5.5 per pound, it appears that location is weighted heavily toward oysters and/or clams. Most of Gargathy Bay is comprised of Baylor (public oyster) grounds.

Table 6 summarizes types of conflicts reported by survey respondents by VMRC permit type. Thirty-seven survey respondents reported a total of 37 conflicts, with 12 fishermen reporting no conflicts in their work, and some reporting multiple conflicts. Of the conflicts reported, range closure for rocket launches at NASA's Wallops Flight Facility and interference by other commercial fishermen topped the list (each cited 10 times), followed by damage by those engaged in recreational pursuits (7 mentions). Environmental concerns and other governmental concerns were each cited by four survey respondents, and legislative and policy issues were mentioned by two.

Environmental considerations included pollution, protection of islands by The Nature Conservancy, and eel grass, which was reported by one waterman as clogging his boat motor. The Nature Conservancy's actions to protect natural resources, cited by two watermen, was seen as interfering with availability of oyster grounds. "Other governmental" conflicts incorporated two mentions of military exercises, one of leased oyster grounds, and one of a policy about harvesting horseshoe crabs at Assateague Island National Seashore. Legislative and policy issues were mentioned by two holders of crab pot licenses, and these respondents were concerned with requirements placed on permits.

Although they had fewer returned surveys than crab pot fishermen, gill net fishermen reported the most conflicts, with other commercial fishermen and Wallops Flight Facility seen as the most frequent sources of interference. Sources of commercial interference cited were other gill nets blocking access to shore, aquaculture, marine traffic, theft, and "crabbers."

Fishermen were also asked about considerations decision makers should take into account when making decisions about seaside and ocean waters. Experience working on the water, financial impact on watermen, fisheries and navigation data, and environmental concerns topped the list. All of their responses can be seen in Appendix E.

TABLE 6: COMMERCIAL FISHING CONFLICTS REPORTED BY VMRC PERMIT TYPE

Survey Responses to Question about Commercial Fishing Conflicts

(Responses Reported by VMRC Permit Type)

	Crab Pot	Gill Net	Fish Pot	Eels Pot	Dredge	Total
No Conflict Reported	8	2	1	1	0	12
Commercial	4	6	0	0	0	10
Wallops Flight Facility	2	7	1	0	0	10
Recreational	2	4	0	0	1	7
Environmental	2	2	0	0	0	4
Other Governmental*	2	2	0	0	0	4
Legislative/Policy	2	0	0	0	0	2
TOTALS	22	23	2	1	1	49

*Two reported military conflicts, one reported leased oyster grounds were a conflict, and one reported U.S. Park Service restrictions on hand harvesting harvest of horseshoe crab at Tom's Cove in Assateague National Seashore posed a conflict.

source: A-NPDC Survey of commercial fishermen

TABLE 7: REPORTED CONFLICTS BY PERMIT HOLDER WATER BODY

Reported Conflicts by Water Body Under Which VMRC Permits Were Issued*									
	Returned Surveys	No Conflict	Wallops Flight Fac.	Other Commercial	Recreational	Environmental	Other Governmental	Legislative/Policy	CONFLICTS BY WATER BODY
Burton Bay	1	-	1	1	1	-	-	-	3
Chincoteague Bay	13	5	1	5	1	1	-	2	10
Hog Island Bay	1	-	-	-	-	1	-	-	1
South Bay	1	-	-	-	-	1	-	-	1
Ocean/Offshore	10	2	8	2	3	-	2	-	15
Unclassified Seaside Bays and Rivers	6	3	-	2	1	1	1	-	5
No Assignend Water Body	5	2	-	-	1	-	1	-	2
TOTALS	37	12	10	10	7	4	4	2	37

*NOTE: does not necessarily reflect where permit holder reported working

source: A-NPDC survey of commercial fishermen



©2014 Gordon Campbell, At Altitude Photography

Photo: Harvesting oysters on the seaside at low tide. Photo by Gordon Campbell, At Altitude Photography. Photo used with permission. All rights reserved.

FIGURE 20: COMMERCIAL FISHING USING CRAB POTS ON THE SEASIDE OF VIRGINIA'S EASTERN SHORE AS SELF-REPORTED BY SURVEY RESPONDENTS

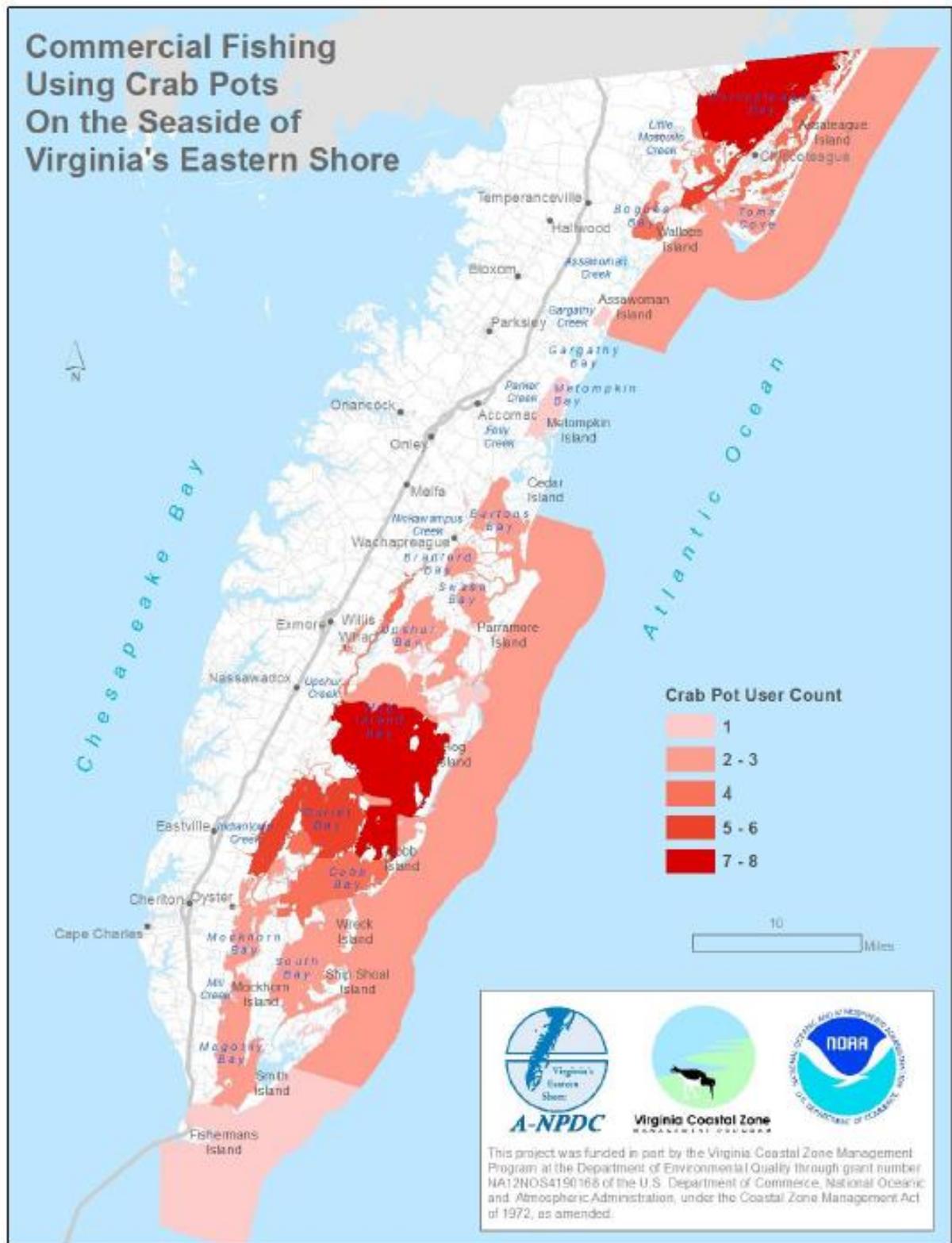
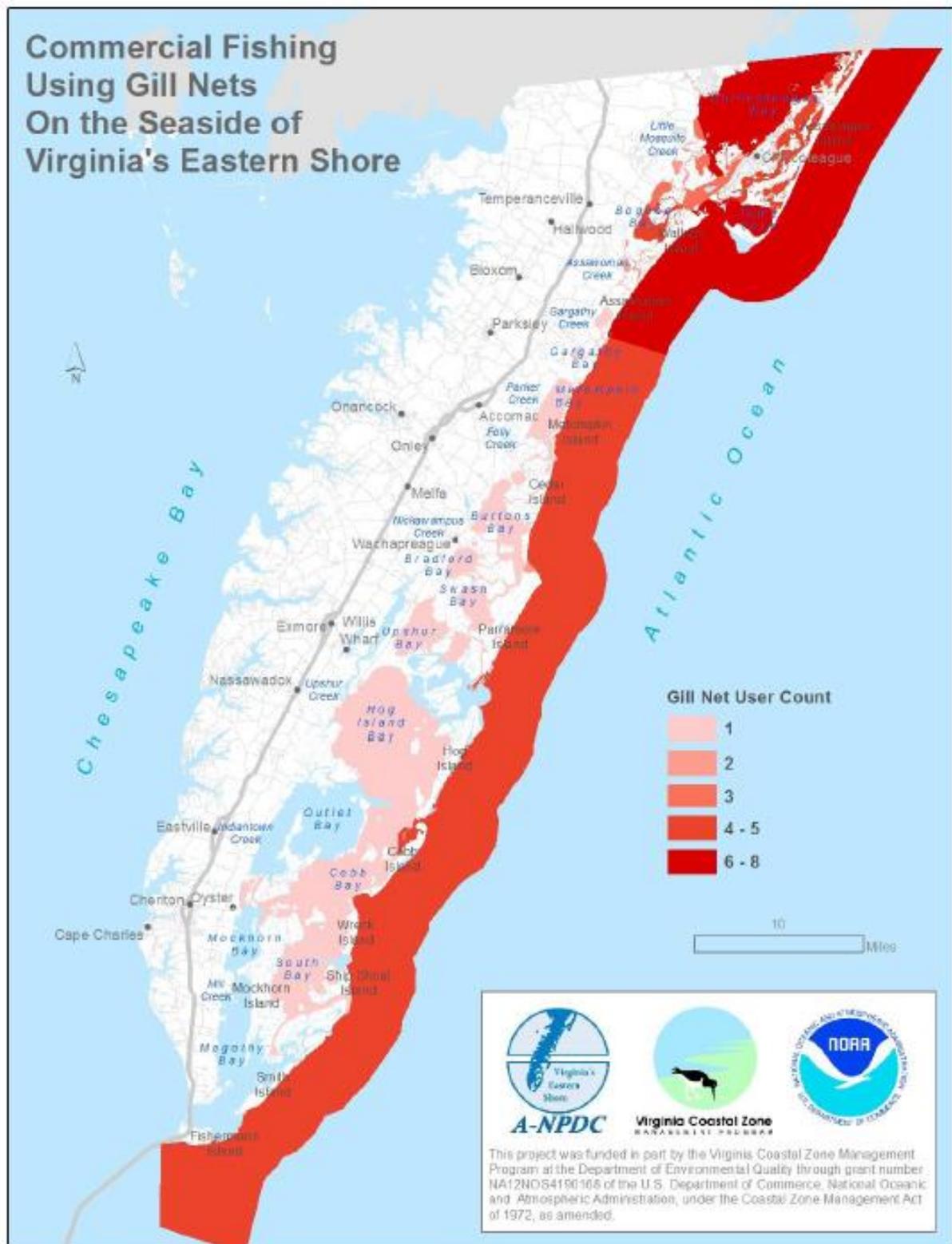


FIGURE 21: COMMERCIAL FISHING USING FISH POTS ON THE SEASIDE OF VIRGINIA'S EASTERN SHORE AS SELF-REPORTED BY SURVEY RESPONDENTS



As for the Wallops Flight Facility, one waterman summed it up this way: "We work year-round, both inshore and offshore," he said. "Wallop (sic) and any other need to consider the effects of closures. We are limited due to weather and can't afford to miss time due to closures."

Crab fishermen were more apt to report no conflicts (eight surveys), and four mentioned commercial conflicts. Beyond those, their sources of conflict were fairly evenly spread among the remaining categories, as shown in Table 6.

When the survey responses are grouped by the water body under which the permits were issued (Table 7), the ten survey respondents with permits to work in the ocean or offshore areas reported a total of 15 conflicts, and eight of those were closures for rocket launches. Of the 13 survey respondents working in Chincoteague Bay, five said they encountered no conflicts, but another five mentioned conflicts with other commercial fishermen. There are 36 crab pot licenses and 22 gill net permits issued for Chincoteague Bay, and some specifically mentioned the number of licenses or called out gill nets or crab pots as sources of tension.

When asked about patterns to the conflicts, three types of responses emerged: closings tied to Wallops launches (or attempted launches), seasonal conflicts as more people take to the water for commercial and recreational pursuits in the spring and summer, and those that are linked to permit requirements, such as opening and closing of seasons or time of day requirements.

By far, summer is the high mark, though conflicts were reported spring through December. "During spring flounder season," reported one Quinby fisherman, things are at their worst, when he experiences "cutting buoys on crab pots, (and) running over equipment."

A table of all responses can be found in Appendix E.

VMRC RECORDS OF PUBLIC AND PRIVATE SHELLFISH GROUNDS

The VMRC is charged with managing the Commonwealth's submerged bottoms, which fall into three categories: public shellfish grounds, privately leased bottom, and unassigned bottom.

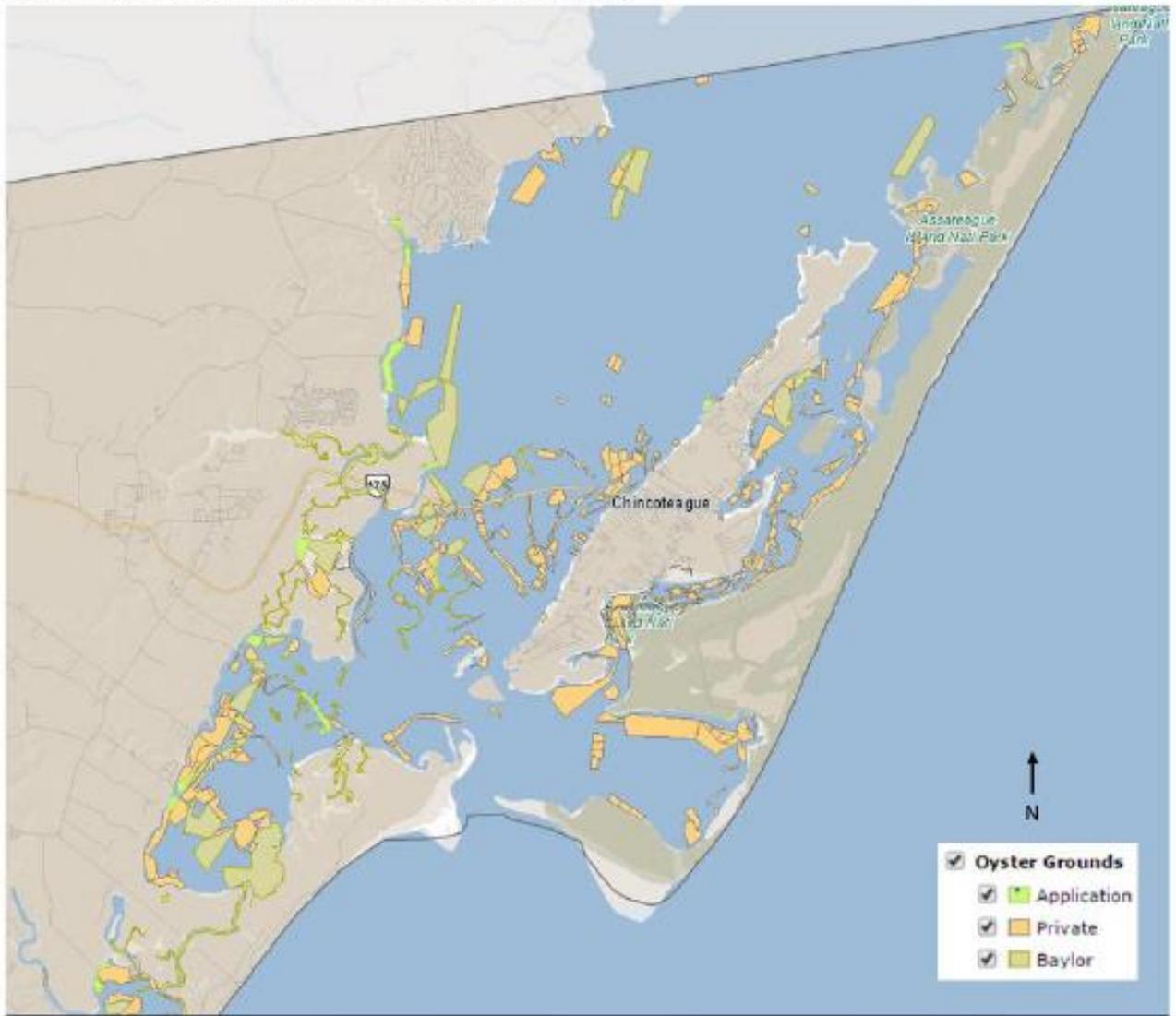
Public oyster beds are set aside for the public use in the Virginia Constitution and are managed through VMRC regulations. Commercial licenses are required for harvest of over one bushel of oysters or 250 clams, and both must be taken by hand or using ordinary tongs. Once bottoms are leased to private entities, they are managed by the leaseholders.

Figures 21 through 24 illustrate public oyster bed and leased bottoms as reported by VMRC. Leased bottom with pending applications are also shown. Figure 25 highlights public clamming grounds set aside by the VMRC.

Public and/or private shellfish grounds are found in almost every inshore water body along the entire Eastern Shore of Virginia. Some bays, such as Gargathy Bay (seen east of Parksley in Figure 23), are almost entirely set aside for public use. Hog Island Bay, on the other hand (the northern part of Figure 24), has considerable privately leased bottom, mostly leased to large aquaculture companies.

FIGURE 22: NORTHERN ACCOMACK COUNTY SEASIDE OYSTER GROUNDS

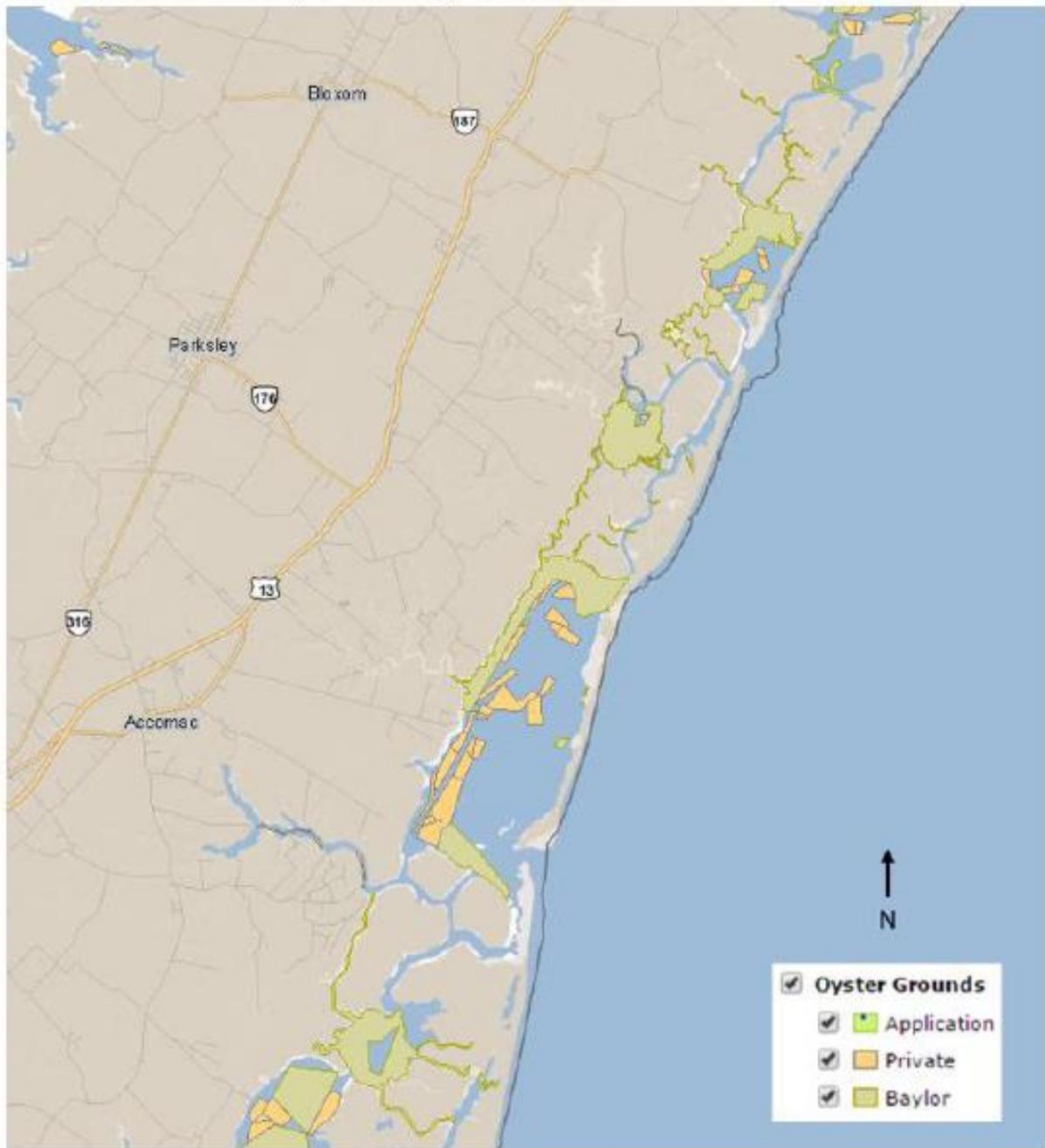
Northern Accomack County Seaside Oyster Grounds



Source: VMRC

FIGURE 23: MID-ACCOMACK COUNTY SEASIDE OYSTER GROUNDS

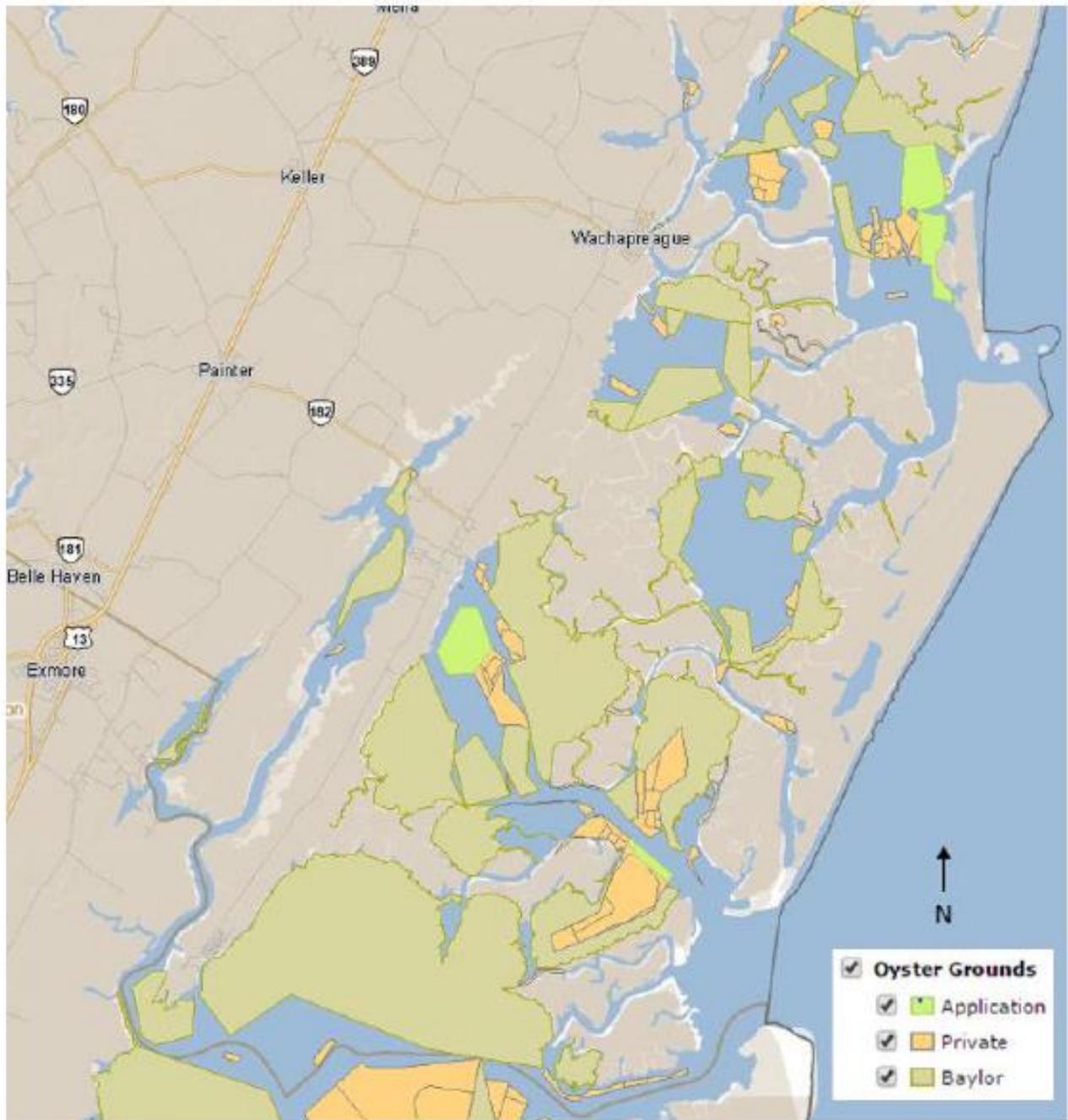
Mid-Accomack County Seaside Oyster Grounds



Source: VMRC

FIGURE 24: SOUTHERN ACCOMACK COUNTY SEASIDE OYSTER GROUNDS

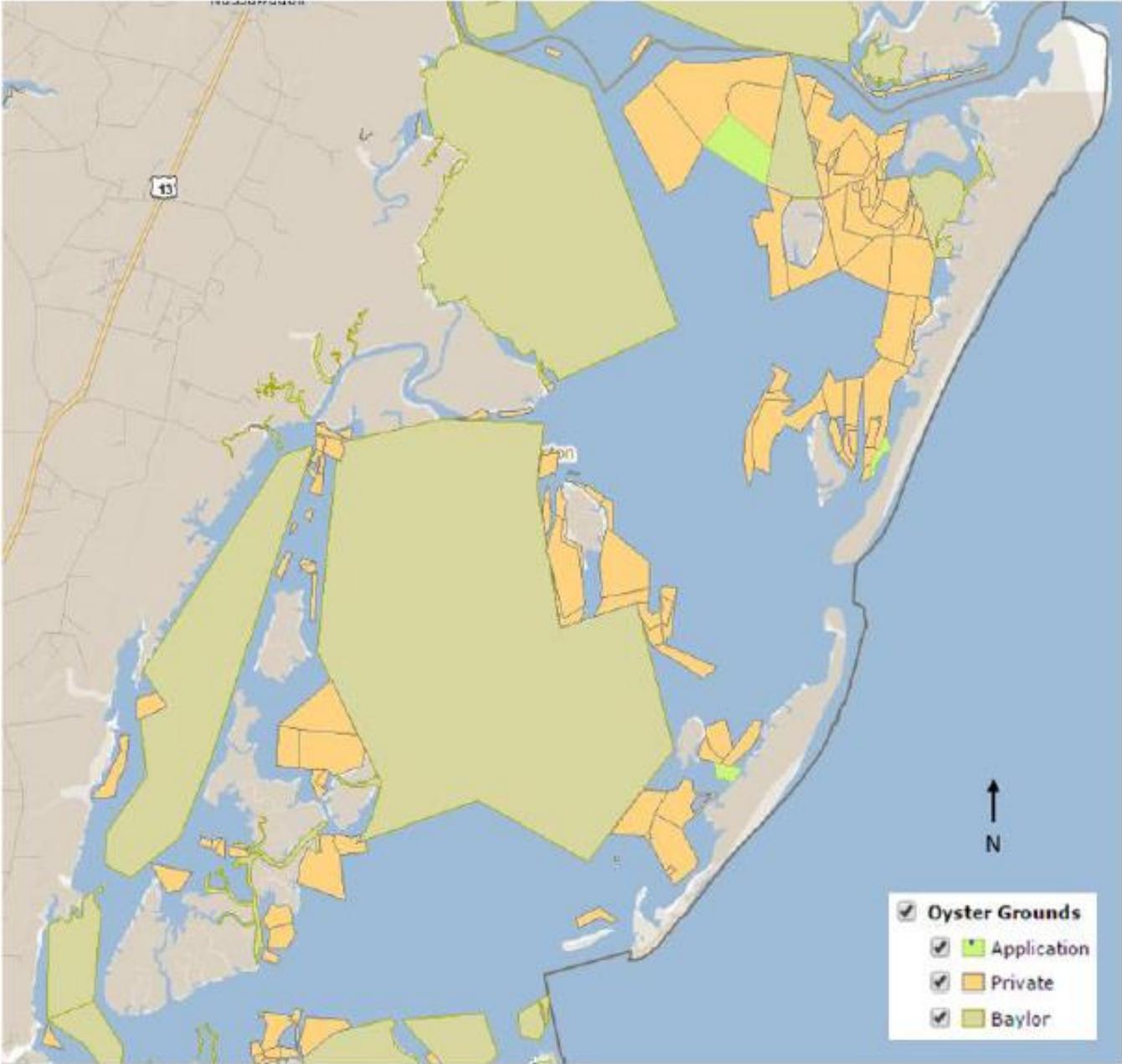
Southern Accomack County Seaside Oyster Grounds



Source: VMRC

FIGURE 25: NORTHERN NORTHAMPTON COUNTY SEASIDE OYSTER GROUNDS

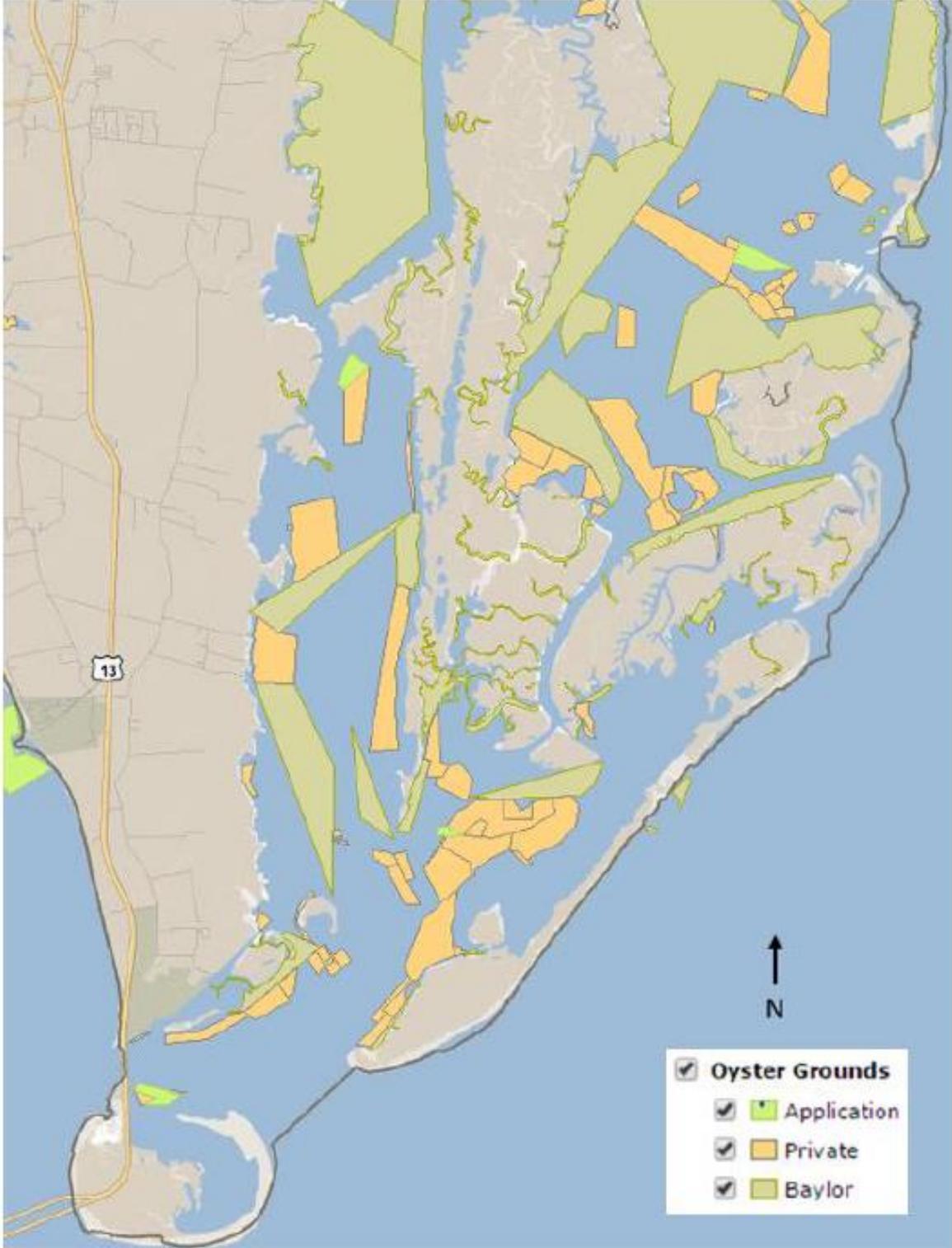
Northern Northampton County Oyster Grounds



Source: VMRC

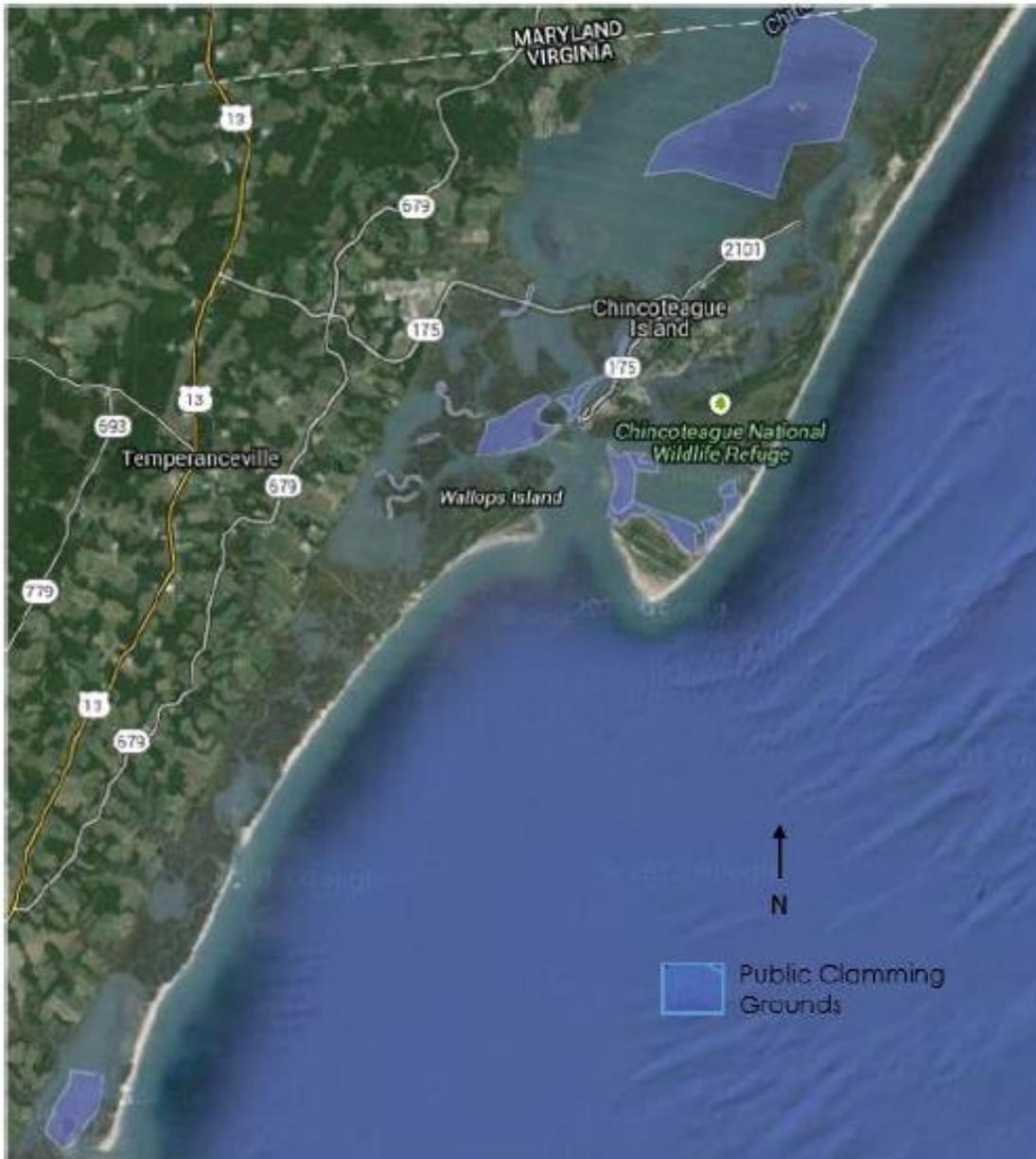
FIGURE 26: SOUTHERN NORTHAMPTON COUNTY SEASIDE OYSTER GROUNDS

Southern Northampton County Oyster Grounds



Source: VMRC

FIGURE 27: PUBLIC CLAMMING GROUNDS IN NORTHERN ACCOMACK COUNTY



Source: VMRC

Chapter 4: Summary and Conclusions

A-NPDC completed an assessment of commercial fishing uses of the seaside of Virginia's Eastern Shore, based largely on state commercial fisheries landings data, MARCO Communities at Sea maps, and surveys of commercial fishermen that yielded both near shore fishing locations through participatory GIS and information about conflicts they encounter in their work.

4.1 Literature and Data Search: Permits, Infrastructure, and Landings

Existing permit data provided indications about the types of fishing that were occurring off the Eastern Shore of Virginia, and some permits were issued for specific bodies of water. About half of the 210 permits were issued for the ocean, for unclassified seaside bays and rivers, or gave no indication of the water body on the permit. VMRC permit data proved most useful in obtaining contact information for mailing surveys to fishermen.

The nature of fishing activity in federal waters made the federal GARFO permits and landings data less valuable as indicators of fishing activity, but the permit data did provide contact information for contacting fishermen to review Communities at Sea maps.

Commercial landings data for Virginia waters –inside the three-nautical-mile boundary that delineates where Virginia waters end and federal waters begin- could be seen as a proxy for examining nearshore commercial activity. County-level landings data are available only through special request, and although VMRC was able to fill most of the request, confidentiality concerns limited their ability to provide some of the data that would have been helpful in evaluating potential conflicts, such as month-by-month landings within water bodies.

The anecdotal reporting by local officials of widespread use of improved boat locations for commercial fishing is another indication of commercial activity, but only one location was able to provide commercial counts. Although a few docks give preference to commercial users, at most landings commercial fishermen compete with recreational users for the same infrastructure.

4.2 Methodology

Fishermen were generally uninterested in the Communities at Sea maps. The few who were willing to review them did not see applications for the fishing community, and some (reviewers and those who did not want to review them) expressed fear that any information they provided would come back to harm them in the long run.

One important lesson is to remain flexible in approaching fishermen. There was no single approach that worked. Being open to what works for the fishermen was the key to getting participation: gathering in a local fisherman's oyster house; rolling out maps on the car hood behind a local convenience store; staking out the dock at the fisheries co-op; and carrying Communities at Sea maps to a meeting where fishermen were gathered for a different purpose were all methods used to get feedback.

The fishermen survey enjoyed a return rate of 17.6 percent. The survey itself was not designed as a scientific survey, but rather as an opportunity to supplement other data with first-hand knowledge, and supplied the only first-hand source of conflict information.

4.3 Where Fishing Occurs

As the Communities at Sea maps indicate, the seaside waters off of the Eastern Shore of Virginia are important fishing grounds for the entire Virginia commercial fishing community. Those maps, the VMRC shellfish maps, and the VMRC landings data provided by water body, coupled with the maps returned by fishermen indicating the primary nearshore areas in which they work, provide a comprehensive look at the locations and overall intensity of fishing activity.

MARCO Communities at Sea maps were seen by commercial fishermen as good overall representations of fishing locations and intensity. Possible improvements to future mapping efforts could include seasonal indicators of activity. One or more commercial activities in the same location might or might not be conflicts depending on when they are in the area, the vertical profile of the work, and how active the fishermen are on a day-to-day basis.

VMRC data pointed to near shore areas of importance. VMRC commercial fisheries landings by water body gave the best indication of concentrations of fishing in the bays between the mainland and the barrier islands, but confidentiality issues prevented some data from being reported for some individual bays. Likewise, data could only be broken out by finfish and "other," which included shellfish varieties, but no further breakdown by species, which prevented more detailed analysis within bays – for example, isolating oyster activity from crab pot activity. Like the Communities at Sea data, VMRC landings lacked detail about seasonal fishing patterns. The data also lacked information about the vertical profile of activity, and did not distinguish between active uses, such as oyster harvesting, and more passive uses, such as shellfish growing on the bottom land.

Without the ability to tease out the details, using the VMRC data as a surrogate for conflict potential could overstate –or understate - the potential for conflict within a given area. And as the fishermen themselves pointed out, some conflicts are not in the water at all, such as the closings for rocket launches, or legislative and policy issues.

Maps returned with the surveys, and VMRC maps of shellfish grounds, reinforced the high volumes of activities on some areas of the seaside, and certainly the concentration of activity at the north end of the Eastern Shore contributed to the number of conflicts emanating from that area. Chincoteague Bay fishermen reported ten conflicts, and five of those were with other commercial users. The ten ocean and offshore permit holders reported 14 conflicts: seven were with range closures for rocket launches – also in the northern part of the county – and two were with other commercial users.

4.4 Recommendations

The summary above pointed out a number of possible ways to improve knowledge about seaside commercial fishing and potential conflicts encountered by the industry.

- Further investigation into commercial seaside fishing activities should consider vertical profiles of inshore areas and seasonal fishing patterns to provide a better understanding of conflicts.
- Conflicts with other commercial fishermen were cited ten times. In reading comments associated with these conflicts, there do not appear to be additional measures need to understand the nature of the conflicts. No further study is recommended.
- Launch range closures were also cited ten times, sometimes with impassioned language about the financial difficulties incurred, especially when launches are delayed and there are multiple closures within a short span. As the Communities at Sea Maps indicate,

areas subject to closures are important to fishermen beyond the Eastern Shore. Further investigation could provide more insight into the financial implications of range closures for Virginia fishermen.

- Additional planning efforts may be needed in areas where intense commercial and recreational uses were identified. Both studies identified intense uses in the vicinity of Chincoteague Inlet and its adjacent water bodies. A focused planning effort in this area or other similar intensely used areas should incorporate the broad array of stakeholders utilizing the area to develop more site-specific baseline datasets which could be used to assist with developing site-specific strategies for reducing ongoing use conflicts and enhancing existing uses.
- Environmental conflicts were few and diffuse. However, it is recommended that environmental regulatory and policy activities continue to consider potential impacts upon commercial uses by engaging commercial users during any development process.
- Other governmental and legislative/policy issues were also few and scattered. No further study is of any of the conflicts is recommended, but it is clear from some the watermen's survey responses that they want ongoing engagement about legislative and policy development.



©2014 Gordon Campbell, J. N. Altitude Photography

Photo: Carefully tended oyster beds. Photo courtesy of Gordon Campbell, At Altitude Photography. Used with permission. All rights reserved.

Appendix A: Engagement toolkit Commercial Fishing Communities and Fishing Industry Reps: Outreach Toolkit

Protocol for Data/Map Validation Meetings with Fishermen (represented in VTR)

Format: One to several fishermen at a time to sit down to review and vet data.

Purpose:

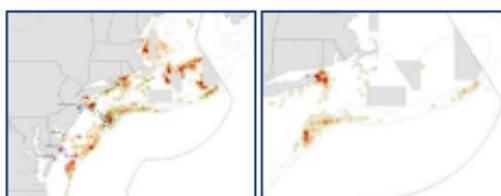
- Obtain feedback from fishing community members on accuracy, representativeness, format and utility of "communities at sea" maps.

1. Introduce the MARCO Project and Goals for the Meeting

- Discuss the MARCO project generally and within the context of ocean planning.
- Present this aspect of the MARCO project (i.e. documenting areas used by commercial fishermen).
- Make clear that there is a need to document areas at sea that fishing communities depend upon (yes, we need to document by sector/gear/fishery but, importantly, also by community).
- **[Slides, printouts, or go to portal online]** with examples of the many data layers in the portal... end with a map of ten minute squares.



- Discuss importance of mapping fishing areas by sector and gear...
- Note how they leave out who is fishing in these areas...
- No way to know which communities depend upon which areas...
- Then show an example of a **[fishing community maps as slide, print, or computer]**.



- This map was made using VTR data. It shows the primary trawl areas for all vessels (first map) and for vessels associated with Montauk (second map). The outline is a 75% volume contour.

Appendix A: Engagement Toolkit, Continued

- Based on the data we see in these maps, we are making a map series that depict fishing areas used by communities. Such maps (or as digital data) could be used in the following ways:
 - By managers to know which communities depend upon which areas (e.g. for area-based management, for impact analyses of other marine uses...).
 - By scientists (e.g. which fishing communities have which local knowledge of ecosystems? which communities might partner with scientists? which fishing practices are in which places...).
 - By fishing communities (e.g. advocating for maintaining access to particular fishing grounds, seeing which areas are under threat, demonstrating dependence...).
- Our primary interest is to get feedback from fishing community members concerning the map series. Before they are made public, we want to work with fishing communities to explore:
 - How fishing communities would like the data to be used (e.g. input into spatial management or ecosystem science).
 - How fishing communities would like to use the data themselves (e.g. advocacy).
 - Do fishing communities think the data is accurate? Complete?
 - How might we enhance the charts (e.g. in terms of color, other data on the charts).
 - How might we use the data to do analysis of change over time?

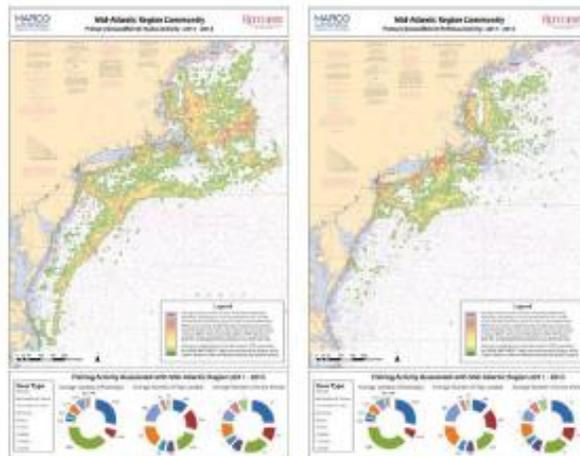
2. Get to Know the Attendees

- Because we can use this data to make maps at different scales, different gear groupings, and for different communities, we'd like to ask you a few questions to better match which maps to discuss with you... based on your interests and experiences...
- We are assuming that your primary experience has been commercial fishing... and that you are associated with the port of _____.
 - For how long? How many years?
 - Have you also fished from other ports?
 - In what capacity are you fishing now (e.g. owner, captain, mate, crew)?
 - What type of fishing (e.g. gear, vessel type, vessel size, targeted species)?
 - Given your experience, would you say that you have a good sense of where your peers in _____ go fishing (in general)?
 - Do you know which areas are important to _____?
- As you may have guessed by now, we are not interested in individual "hot spots", we are not interested in where any particular vessels go fishing... We are interested in the general areas which are important to your fishing fleets.

3. Introduce the Map Series (An Example)

- The map series can work at a variety of scales. One of our goals is to ask you what works and what doesn't at which scale...
- Let's first examine the general [region-wide maps] which DO NOT "zoom in" on community. They are similar to the ten-minute-square maps in terms of what they show.

Appendix A: Engagement Toolkit, Continued



- These maps show ground fishing areas (i.e. trawl gear) for the entire Northeast. The first map shows the fishing areas most frequented by large vessels. The second are fishing areas most frequented by small vessels.
- The actual variable is "fisherdays" which is a measure of labor time (i.e. how much time do fishermen spend in particular locations fishing?).
- We've also added some graphic summaries of other data relevant to the map...
- *This is not ready yet... Eventually we need one more level of map here... one that shows community areas for a variety of communities as PVCs for the region... (to show all the different communities and where they fish... including the host community).*
- As we noted, with this data we can "zoom in" to particular communities. Here is a **map showing those locations where _____ spends most of its time groundfishing** (using trawl gear).



- So, these are our current "templates" for the map series... but before we explore them in more depth, do you mind if we ask you a few questions?

Appendix A: Engagement Toolkit, Continued

4. Review Maps of [specific port]_'s Fishing Areas

- Let's look more closely at the fishing patterns of _____. We will start with maps which reflect the gear type you use (????).
- The **[first map is again for the entire region]** and not in particular...

SELECT Map of entire region...

Use data/map reflecting experience of attendee...

- This map shows fishing (the type you do) for the entire region. It shows where time is spent on this type of fishing in the Mid-Atlantic and beyond.
 - Do the areas you know appear on this map? Where are they?
 - Are these areas important to you? What other ports/communities?
 - Do you think the maps accurately show primary fishing areas?
 - If not... why not? What is incorrect or missing?
 - Do you think the secondary areas (beyond the outline in green) area also accurate?
 - Is there anything surprising about this map?
 - Would you like to see it widely available? Why or why not?
- There are also graphs and other supplementary data added to this map... Let's have a look.
 - Do these data seem correct to you?
 - If not, what is incorrect?
 - Is this data surprising? Useful?
- The **[second map is just _____ fishing]**, just vessels associated with Barnegat and that use gear like you... this is a map of where you and your peers spend most of your time fishing.

Appendix A: Engagement Toolkit, Continued

SELECT Map of just
_____ fishing...
Use data/map
reflecting
experience of
attendee...

- Questions...
 - Do you think the maps accurately show your community's primary fishing areas?
 - If not... why not? What is incorrect or missing?
 - Do you think the secondary areas (beyond the outline in green) area is also accurate?
 - Who else fishes in these areas? Are they mostly the areas of _____ vessels or other vessels too?
 - Is there anything surprising about this map?
 - Would you like to see it widely available? Why or why not?
- The graphs and other supplementary data added to this map are the same as on the region-wide map...
- Considering all maps, how could we enhance the readability of these maps? What would you like to see added or changed (in terms of color, background, data, graphs...)?

5. Discuss Change Over Time

- We could do this in a few different ways... for the next time... it could very important...
 - Simply map the pattern of fishing as it occurred at some point in the past (10 years ago? Some time just before an important change? A date the community members want to map/compare?).
 - Use change analysis techniques to map areas of significant change (positive and negative) and when change occurred. Then ask fishermen to explain.
- Looking at change, two scenarios...
 - Scenario 1: When the data shows little change:
 - The VTR data suggests little change in primary areas (show map from 2000). Do you agree? Why are patterns so stable?
 - Do you expect a change in primary fishing areas for in coming years?
 - Scenario 2: When the data show significant change:
 - The VTR data suggests significant change in primary fishing areas.

- **Appendix A: Engagement Toolkit, Continued**

- Were you fishing from here at that time? What explains the shift in primary area?
- Should a map of areas important to your community still include this historic area? Why?
- Do you expect a change in primary fishing areas in coming years?

- **6. Complete the Meeting**

- Your input is essential to this project...
- Would you be willing to continue to provide some help to this project?
 - Re-review data?
 - Provide periodic input or feedback formally or informally?
- Who else do you know that you think we could ask for feedback? Other people knowledgeable about the activities of this fishing community?
- Thanks very much for participating...

Appendix A: Engagement Toolkit, Continued

Talking Points about Data

Type and Processing of Data: There are several ways to develop data on commercial fishing activity – VTR, VMS, and using participatory mapping approaches. Each has strengths and weaknesses. Kevin St. Martin developed this particular method working closely with fishermen and leading fisheries social scientists. Although there are weaknesses to working with VTR data (inaccuracies due to multi-day trips and other factors, missing activity), we think that with the high volume of data points (roughly 100,000 trips recorded per year from Maine – North Carolina – about 40,000 from Mid-Atlantic states), a credible first iteration of maps to inform regional scale planning can be created, with help and advice from fishermen. In most cases VTR data will not be sufficient for informing fine scale decision making processes (e.g. exact placement of wind energy infrastructure, some fisheries management actions). We are interested in supporting opportunities to work with agency and industry partners to use other data types (e.g. VMS, chart plotter data) to create more comprehensive and integrated data products in the future.

The “Communities at Sea” method uses labor time rather than catch or value as a metric indicating areas of importance to the industry. **VTR data is integrated with permit data to define communities based on boat characteristics, fishing gear, and home ports.** The resulting maps have attributes that are useful for planning.

Community or Port Association: A vessel's trips are associated with a particular port

If the trip in question was landed in that port and

The vessel owner declared that port to be his/her principal port or

The vessel landed in the port more than 50% of the time.

The idea is to associate trips with particular ports when there is clear evidence that the vessel is a member of that ports' community. There are over 50 principal ports declared by vessel owners in the five Mid-Atlantic states identified in the VTR data from the past 15 years. However, over 80% of trips occur from New York and New Jersey, with the leading ports in terms of trips being Montauk, Point Pleasant, Barnegat, Cape May and Ocean City, MD.

Confidentiality: There are very strict confidentiality protocols established by NMFS. The data we are using was given to us stripped of any personal information (e.g. vessel names, IDs, owners, etc. etc.). We only have data grouped by “communities” (using the method above) and no longer have access to any individual vessel data... Furthermore, we will take extra steps to loop back to NMFS and industry for additional review before anything will go live on Portal.

Appendix A: Engagement Toolkit, Continued

Talking points about Regional Ocean Planning/MARCO

What is MARCO?

- The Mid-Atlantic Regional Council on the Ocean (MARCO) is a collaboration among the states of NY, NJ, DE, MD, and VA for managing ocean resources to improve their health and ensure the waters off the Mid-Atlantic continue to contribute to the region's quality of life and economic vitality. MARCO was formed in 2009 through a signed agreement by the governors of the five states to:
 1. Support the sustainable development of renewable offshore energy to make the Mid-Atlantic more self-reliant and economically stable
 2. Identify and protect important offshore habitats that are critical to sustaining seafood, tourism opportunities, and other job-creating benefits
 3. Prepare coastal communities for regional climate change impacts.
 4. Improve the region's water quality to sustain seafood, tourism and ocean health.
 5. Build capacity for regional ocean planning that will help maximize our Mid-Atlantic economy and our ocean's ecological health.

What is the Portal?

- The MARCO Mid-Atlantic Ocean Data Portal was developed in 2010 as an online mapping tool that consolidates available geo-spatial data, and enables state, federal, and local users to visualize and analyze ocean resource and human use information.
- This effort builds upon and complements other ocean planning activities in the region.

What features does the MARCO Mid-Atlantic Ocean Data Portal have?

- Web-based mapping viewer/data portal displaying the extent of information available about marine waters in the Mid-Atlantic;
- User-friendly interface design with interactive reporting features.

Why was the MARCO Mid-Atlantic Ocean Data Portal developed?

- To support MARCO's commitment to a comprehensive regional approach to ocean planning and management.
- The Portal also addresses the call of the U.S. National Ocean Policy (2010) for regional scale ocean planning supported by a robust ocean data and
- Information management system that includes a wide range of human use, environmental, socio-economic, and regulatory data.
- Assures that states and ocean stakeholders and users in the region have a role in identifying information for incorporation into the Portal and input to guide any future federal regional ocean planning efforts.

What are the objectives of the Mid-Atlantic Ocean Data Portal project?

Appendix A: Engagement Toolkit, Continued

- The overarching objective is to improve stakeholder and public knowledge about ocean uses and resources through:
 - Educating ocean managers, users, and key stakeholders about the Portal and the data being used to enhance the portal.
 - Identifying data needs and priorities for ongoing data collection and future research.
 - Including reporting and other features that can be used to enhance understanding about ocean resources, and inform ocean planning and management decisions.
 - Supporting MARCO's involvement in evolving federal regional offshore planning efforts.

How are stakeholders involved in the project?

- The *Mid-Atlantic Ocean Data Portal* is being enhanced through an inclusive and transparent stakeholder process using small and larger meetings, personal communication and web-based forums to:
 - obtain peer review of existing data;
 - collect and incorporate the best data available to fill gaps;
 - develop new data related to ocean uses;
 - improve functionality and usability of the Portal; and
 - develop metrics for success.
- This project will also improve the Portal's usability through interactive meetings, additional personal communications, and online tools that actively engage ocean users and key stakeholders, and encourage their participation throughout the planning process.

How will data obtained from stakeholders be used?

- Data will be integrated as digital layers in the system that can be visualized and overlaid with other data.

Appendix A: Engagement Toolkit, Continued

- Data and information identified through stakeholder input, and protocols for the display of the data will be vetted with the stakeholders before making them publicly available.

Who is the Project Team?

- **Tony MacDonald**, Director of the Monmouth University Urban Coast Institute is the principal investigator and project manager.
- **Jeanne Herb** from the Rutgers University, Edward J. Bloustein School is the Stakeholder Engagement Team lead. She is assisted by **Karen Lowrie** and **Matt Campo** of the Bloustein School and **Kevin St. Martin** of the Geography Dept. at Rutgers University
- **Jay Odell**, Mid-Atlantic Marine Director from The Nature Conservancy is the Technical Team lead, supported by **Rick Lathrop** from the Rutgers Center for Remote Sensing and Spatial Analysis and **Charles Steinback** from Ecotrust.
- A **Project Steering Committee** has been set up that includes MARCO Management Board Representative (NY,NJ, DE, MD and VA), and a representative from the National Oceanic and Atmospheric Administration.

Appendix B: Summary of Eastern Shore fisherman responses to communities at sea maps

Communities at Sea Map Review Session Newport News, 7/15/14 VMRC Office

VA Beach:

The pot/trap maps look really accurate, showing the area fished, and the hot spots shown really are the hot spots. May be missing some activity from fishermen not required to submit VTR but overall great. Agreement with the nearshore gillnet maps out of VB.

Gillnet maps look accurate for recent years but areas of historical importance not shown. In earlier days the effort extended further offshore, out to and beyond the light tower. Further described as an area straight (roughly East) from shore out to 13, even 15 miles, beyond the light tower. "We want to see that open again"

Both reviewers thought the comparison with the "Regional" (all ports combined) map was useful. They indicated the regional map "made sense" / "looked right" to them.

Chincoteague:

Reviewer's fishing activity was likely not shown in the Chincoteague gill net map. There were two issues – one, the filter of Chincoteague association may not be ideal and two, missing activity from fishermen who don't use VTR. He thought the Chincoteague map was fairly accurate – but incomplete. When we reviewed the Regional map (which includes his effort, Wachapreague associated effort, etc) – a very specific area of activity he indicated as missing was actually present. Reviewer indicated that effort extended E. of the lower yellow hotspot – in a line towards the unexploded ordnance mark on the NOAA chart. Images at end of this document are snips from the two maps to show this.

We had a pretty lengthy discussion regarding the infographics showing fisherdays by gear type for Chincoteague, re: the big spikes in 65+ and 65- bottom trawl. The fishermen indicated that before scallop fishery management changes there was a directed fishery for scallops using trawl gear.

Reviewer said he thought the Gillnet map for Chincoteague looked "pretty good". Follow up meetings with him and other lower eastern shore fishermen are needed.

Another fisherman dropped in towards the end of the meeting. He was very interested in the maps and had nothing negative to say about them as far as how they showed 2011-13 activity. He asked a lot of questions. He listened very closely to the description of the variable being mapped (being labor). He was initially skeptical, then nodded affirmatively.

We had a fairly long discussion about the need to incorporate information from earlier years. He said that this will show more activity on the shelf – as compared to current pattern with bands of effort inshore and along the break. He said we need to go back to at least 1998. He said we need to look at a period long enough to capture both a good croaker and a good Atlantic mackerel year. The reason being that these species are both caught in the same general areas on the shelf, but have very different temperature preferences (croaker can handle water temp as high as 96; mackerel more like 68F).

Appendix B Continued: Summary of Eastern Shore fisherman responses to communities at sea maps

Rick Robins offered to work with "Spot" to convene a VA Beach focused meeting with fishermen for us. Rick also submitted the following on a note card: "Newport News based scallop boats may land a preponderance of scallop trips in New Bedford MA, and also Cape May NJ, depending on the Access Area they are fishing, or if they are on an open area trip. Open area trips are increasingly landed in MA by Newport News based boats, due to the regulatory disincentives associated with the Days-At-Sea Demarcation Lines. VA scallop landings have declined 70% from 2009-2013 as a result. So, it may be informative to look at the maps in terms of where boats fish vs. home port, and not just exclusively look at port of landing.

Meade Amory: He was in relative agreement with the maps but indicated that to gain the full insight from the scallop dredge boats we should consider a later sharing of the maps. His opinion was to look at late summer, early fall when the fleet increases. Meade indicated a strong willingness to coordinate with Todd on the establishment of a meeting at Spot's.

Kim Huskey (VA Seafood Council)—While her input and review of the maps was not based on personal water-time, her input and willingness to coordinate with Todd will be an invaluable component to the development of the Virginia efforts with the industry. She shared a strong commitment to coordinate meetings and assist with the convening of representatives from the industry.

Take home: If we want to show important fishing areas in consideration of a dynamic, changing system, we need to consider that fishermen follow fish and fish follow temperature envelopes. The oceanographic conditions during the group of years we select for averaging fishing activity data matter.

Another take home: Clearly if we want to present a full picture of commercial fishing activity we need to use a participatory mapping approach with conch and black sea bass fishermen who don't use VTR. We knew that going in to this meeting. VTR maps are close but perhaps not close enough. Still unclear as to how big a problem this is also for gillnet, but I don't think it's an issue for any other gear types (except for menhaden).

Might want to use a supplemental/overlay approach, as opposed to trying to modify the Communities at Sea maps. We could probably create a spatial data product that includes shapes from a participatory approach in the same layer, but with distinctly different symbology. Menhaden (if Omega will share it) should be a standalone purse seine gear layer.

Final take home: Recommend placing a high priority on "unpacking" the "Other" gear category and definitely creating new maps for Charter and for Party/Headboat. A team meeting will be needed (following some initial exploration of the data by CRSSA), to consider a) how we define Communities and b) how we interpret fisherdays or a similar metric. I learned from Kevin that there is a variable in the data for how many customers are on board for each trip – this is great.

Follow ups (to be converted to specific time bound assignments):

- Loop back with the fishermen who were at this meeting to share some draft maps "change analysis" that support (possibly replace, but I think support) these maps, by utilizing more years of data.
- Follow up with specific offers of time to help with this.

Appendix B Continued: Summary of Eastern Shore fisherman responses to communities at sea maps

- Take a careful look at how community port associations are made for the scallop (dredge) trips. The focus could include making sure we aren't "losing" Newport News records solely based on rule changes that are behind more scallops from these vessels being landed in Cape May and New Bedford.
- Look at combining some or all of the VA ports, potentially creating a lower Eastern Shore cluster – Cape Charles north to Wachapreague or Chincoteague, a county delineation would seem appropriate for the Eastern Shore of Virginia
- Change all labels of Groundfish on the maps to Bottom Trawl. While this is VA comment driven change I think "Bottom Trawl" as a label will work as well or better than Groundfish in NJ, NY, MD and DE.
- Need to clarify next steps for new pGIS work to get at maps and potential roles for Monmouth Team and VA CZM.
- Monmouth team needs to produce draft maps for charter and party/headboat. ID a process to compare with previously created pGIS maps of same and decide on best approach for using both together or apart.
- Need to clarify next steps for pGIS work and potential roles for Monmouth Team and VA CZM.



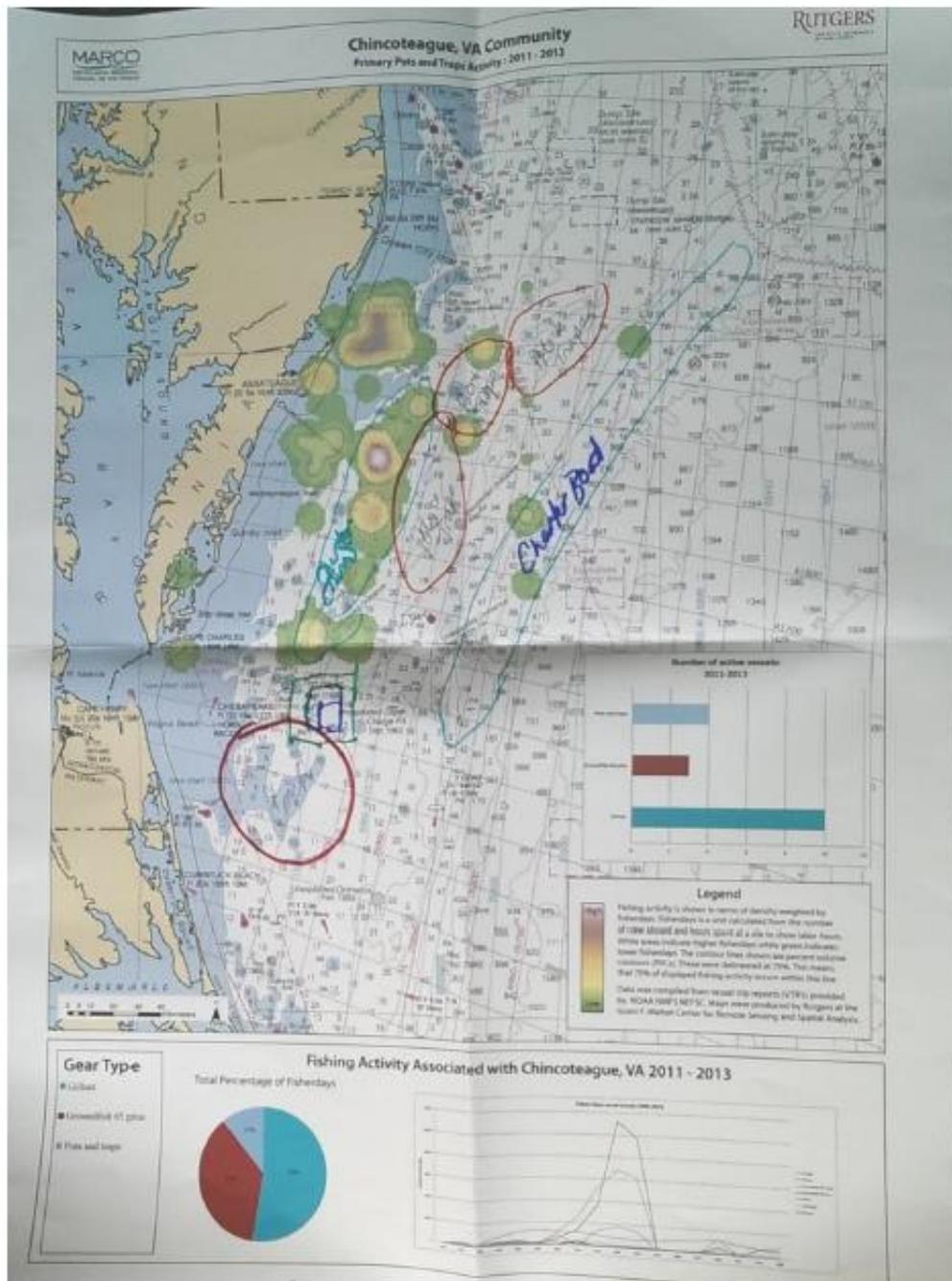
map snippets show Chincoteague and Regional Pot/Trap maps, respectively, to pin point the area that Tim was saying was missing (green blob extending to right of yellow blob on the Regional map).

Appendix B Continued: Summary of Eastern Shore fisherman responses to communities at sea maps

Communities at Sea Map Reviews

Map(s)	Review D	Location	Name of Review	Local/Itinerant	Comments
Virginia: Pots and Traps	11/4/2014	Oyster house of Don Miles in Oyster	Don Miles, Wayne Mears	Local	Depicts well the areas used for conch; pretty much stays the same year to year. Eager to talk about wind energy.
Virginia: Gill Net	12/4/2014	Behind Royal Farms	Glen Stevens	Local	No longer fishes in federal waters; only gill nets in state waters for rock fish in May. Croaker not pick up in time frame.
Chincoteague: Groundfish	12/19/2014	At the dock/Chincoteague Fisheries Co-Op	Joe Rose	Itinerant	Groundfish map valid; matches his knowledge except one outlier (farthest east of Cape May). Suspects it might be a swordfish location; it is deeper than he would
Chincoteague: Pots and Traps; Gill Net	12/19/2014	Dockside at Curtis Merritt Harbor	John Sherenlieb	Local	Pretty much everything is at <10 fathoms except monkfish, which can go to 30'. Interested in how any wind energy area off ocean city might affect his activity
Chincoteague: Groundfish	12/19/2014	At the dock/Chincoteague Fisheries Co-Op	Michael "Jimbo" Ireland	Itinerant	Valid for ground fish N. of Hudson Canyon; Fluke S. of Hudson Canyon. Gear type should be ground trawl S. of Hudson Canyon; only groundfish N. of Hudson Canyon. Concerns maps will result in further fishing restrictions; especially restrictions to recovered
Chincoteague: Groundfish	12/19/2014	At the dock/Chincoteague Fisheries Co-Op	Shaun Riggan	Itinerant	Groundfish map hits all the places he fishes in winter months, but true groundfish are closer in, and in warmer months would be taking to more northern ports. Maps shows busy shipping channels - that's good. They are dangerous. Hopes maps won't use to add more
Virginia: Gill Net; Pots and Traps	3/26/2015	VIMS, during wind energy meetings	Rick, Sandra Puchalski	Local	Reviewed; no comments.
Virginia Community: Pots and Traps, Gill	3/26/2015	VIMS, during wind energy meetings	Tim Wivel, Scott Wivell	Local	Reviewed all maps, validated gill nets and pots and traps. No omissions or error they could see.
Chincoteague: Pots and Traps; Gill Net	3/30/2015	Wind energy meeting in Chincoteague	Chris Walker, Danny Bowden, Joe Kelly, Ernie Bowden	Local	for pots and traps. Years 2011 and 2013 were bad years for fishing data; not really good representative years for Communities at Sea maps. Croaker fishing important to area; won't show up because federal permits not required

Appendix B Continued: Summary of Eastern Shore fisherman responses to communities at sea maps



Fishermen circled areas in red where they believed additional pots and traps activity was occurring.

Appendix C – Commercial Fisherman Survey Letter and Survey Instrument

January 23, 2015

«GreetingLine»

Big decisions are being made about how ocean waters are used. Wind energy, sand mining, and off-shore oil and gas drilling are just a few of the interests competing with fishing, shipping, military, and other traditional uses.

The Accomack-Northampton Planning District Commission wants to be sure that Eastern Shore fishers are well-represented in any deliberations about how the waters off Virginia's coast are used. Three projects we are working on give us the opportunity to be sure your voices are heard:

- The Mid-Atlantic Regional Council on the Ocean (MARCO) Communities at Sea data portal,
- The ocean commercial use assessment sponsored by NOAA and the Virginia Department of Environmental Quality, and
- A commercial wind energy area east of Virginia Beach that we would like to make sure you are aware of and involved in during the initial study and construction.

It will take about 3 times longer to read this letter than to do the survey (survey will take 2-4 minutes), but this letter explains why we are doing the survey, and why you should be involved. But if you prefer, skip the letter and go directly to the survey!

MARCO and Commercial Use Assessment

Your name was provided by the VMRC at the request of A-NPDC for a list of all commercial permit holders for fish pots, crab pots, eel pots, horseshoe dredge, or gill nets in seaside Commonwealth waters. **Would you please take a couple of minutes to answer a few questions on the enclosed survey?** Your answers to these questions will help inform the MARCO work and the commercial use assessment.

On the reverse side of the survey is a map. The map selected for you was based on the area indicated on your permit. **Please take a moment to shade, circle, or otherwise indicate the areas in which you work on the seaside.** If you fish or harvest in other areas, please use the map of the entire Eastern Shore to indicate those areas. There is no identifying information on the extra Eastern Shore map, and it will not be related back to your name in any way.

The mapped information will be digitized and aggregated for the report, and individual information will not be reported. We are interested in the picture that forms when all the data is put together, not in any one person's information. If we believe any information, after it is aggregated, would still compromise the confidentiality of a respondent, we simply will not use it.

PROJECTS ARE UNDERWAY THAT WILL INFORM DECISIONS AT THE STATE AND FEDERAL LEVEL ABOUT OCEAN USE. YOUR PARTICIPATION IN THE ATTACHED SURVEY IS REQUESTED TO HELP ENSURE EASTERN SHORE VOICES ARE PART OF THE DISCUSSION!

Appendix C, Continued: Commercial Fisherman Survey Letter and Survey Instrument

January 23, 2015

Page Two

The aggregated information will provide an indication of high activity areas, and combined with the recreational information, will depict areas with high potential for competition among different users of ocean-side waters off Virginia's Eastern Shore.

Wind Energy Areas

Regarding the wind energy area, the Department of Energy recently awarded a Virginia consortium \$47 million to construct two six-megawatt ocean-scale test turbines by 2017 in a research lease area just west of the larger wind energy area leased to Virginia Dominion Power in 2013. Lessons from this research project will be applied to the larger Dominion Virginia Power lease area, so if you are interested in either area, your participation at this point is important.

The Accomack-Northampton Planning District Commission has been retained to coordinate with Eastern Shore commercial and recreational fishers who might have a current or future interest in fishing within or around the leased research area, during which time management practices will be developed in collaboration with interested fishers.

As part of that work, A-NPDC will be working to ensure we have the best possible sources of data about where fishing occurs, using federal vessel trip reports and data collected for a 2014 Recreational Use Assessment Report generated by A-NPDC for NOAA and the Virginia Department of Environmental Quality under the Coastal Zone Management Program. We will ask commercial fishers, recreational charter captains, and recreational fishers who have chart plotter data if they would be willing to share that data under the strictest terms of confidentiality. Again, the research team is interested in the picture the data presents when aggregated, rather than any individual's data.

A map of the wind research area is included in the survey. **Please indicate your level of interest in this process by completing the related questions on the bottom half of the survey sheet.** If you would like more information about the wind energy research project, called VOWTAP, this Dominion link provides background and updates. <https://www.dom.com/wind>

Please use the self-addressed, stamped envelope to return the questionnaire and the extra map, if you marked it, to the ANPDC office by **February 6**. If you have any questions, please contact Connie Morrison at 757-787-2936, ext. 127.

Please keep this letter for your reference.

Thank you for your assistance.

Connie Morrison
Regional Planner
Accomack-Northampton Planning District Commission
757-787-2936, ext. 127

Appendix C, Continued: Commercial Fisherman Survey Letter and Survey Instrument

«Name», «fname», «street», «city», «state» «zip» «WATER_NAME»

COMMERCIAL FISHING SURVEY FOR OCEAN-SIDE WATERS OFF VIRGINIA'S EASTERN SHORE

Have other people or activities ever interfered with or impeded your work anywhere in the seaside waters? Y ___ N ___

Comments: _____

If so, are they conflicts with other commercial uses, recreational uses, or some other type of interference? _____

Please describe: _____

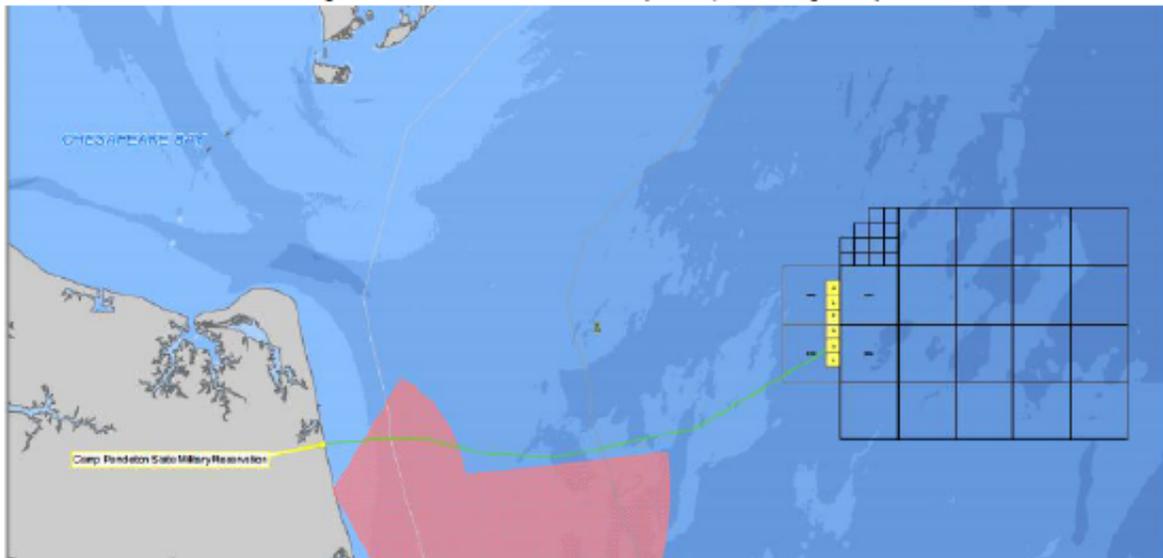
If they stem from recreation, which types of recreation uses cause conflicts or interference for your commercial work? _____

Are there any recurring patterns to the conflicts—whether time of day, seasonal, or some other pattern? If so, please describe. _____

Please describe commercial fishing/harvesting considerations that decision makers should take into account to when making decisions about seaside and ocean waters— whether near-shore or offshore. _____

VIRGINIA WIND ENERGY AREA

In Sept. 2013, Dominion Virginia Power won a \$1.6 million wind energy lease for an area 24 nautical miles east of Virginia Beach (see map below—the lease area is the large grid). A separate consortium—VOWTAP—has received approval for smaller research lease area for two six-megawatt test turbines just west of the larger wind energy lease (the southernmost white squares on the map), with a cable connecting the turbines, and one delivering generated power to the mainland. A-NPDC has been contracted to coordinate with Eastern Shore commercial and recreational fishers with a current or future interest in fishing within or around the leased area to help develop best management practices.



If you would like to receive information about this project and how it might affect fishing opportunities in and around the wind energy lease area, and/or participate in the development of fisher friendly practices in and around the wind energy area, please indicate below. Lessons from this research project will be applied to the larger Dominion Virginia Power lease area, so if you are interested in either area, your participation at this point is vital.

Phone: _____ (work, home, or mobile? Circle which) e-mail: _____

Is your mailing information above correct? Y ___ N ___ If not, please make corrections above.

I would be willing to attend a meeting to learn more Y ___ N ___ Best way to contact me is: phone ___ mail ___ email ___

I would be willing to share my fishing chart plotter data for research purposes if kept absolutely confidential. Y ___ N ___

Appendix D: Commercial Fisheries Landings, Virginia Waters, 2010-2014

Eastern Shore Commercial Fisheries Landings, Virginia Waters, 2010-2014

	2010		2011		2012		2013		2014	
	POUNDS	VALUE	POUNDS	VALUE	POUNDS	VALUE	POUNDS	VALUE	POUNDS	VALUE
BASS, STRIPED	0	\$0	0	\$0	0	\$0	44,190	\$174,422	26,766	\$102,445
BLOOD ARK, CLAM	1,202	\$5,759	1,828	\$27,799	1,323	\$28,109	1,721	\$31,234	1,850	\$29,258
BLUEFISH	6,015	\$3,567	7,138	\$3,596	9,905	\$8,923	22,876	\$18,164	9,674	\$6,867
CONCHS	25,417	\$21,981	72,653	\$115,271	104,166	\$178,450	53,046	\$68,910	38,980	\$61,544
CRAB, BLUE	2,032,593	\$1,864,140	2,489,052	\$2,028,555	2,423,202	\$1,960,654	1,529,463	\$1,954,391	1,176,638	\$1,474,659
CRAB, HORSESHOE	108,670	\$61,401	126,328	\$80,890	62,374	\$45,767	72,328	\$94,272	115,207	\$140,310
CROAKER, ATLANTIC	67,489	\$78,085	118,429	\$138,402	156,204	\$188,357	33,617	\$45,701	67,140	\$85,701
DRUM, BLACK	17,378	\$60,825	31,701	\$110,954	19,536	\$64,739	50,839	\$38,129	53,269	\$39,951
FISH, OTHER INDUSTRY	15,168	\$844	13,749	\$2,783	20,366	\$6,493	28,564	\$10,168	56,590	\$17,626
FLOUNDER, SUMMER	47,667	\$118,452	37,438	\$90,107	16,776	\$40,140	8,896	\$27,512	13,458	\$44,600
MENHADEN	6,465	\$194	3,242	\$259	24,522	\$1,605	54,718	\$3,966	45,977	\$3,400
MINNOW	84,660	\$80,353	81,414	\$85,621	85,736	\$90,429	41,824	\$49,081	68,303	\$78,109
OYSTERS, EASTERN	56,740	\$229,113	77,530	\$343,209	87,186	\$603,227	91,082	\$707,488	123,599	\$989,034
PUFFER, NORTHERN	4,155	\$21,826	5,090	\$26,810	1,571	\$4,511	2,800	\$11,230	8,011	\$32,170
QUAHOG	1,119,861	\$5,479,244	1,055,453	\$9,381,639	1,153,990	\$9,572,547	1,091,448	\$10,029,371	1,328,333	\$11,565,968
SEATROUT, GREY	908	\$1,372	446	\$646	2,255	\$3,617	3,182	\$5,481	2,029	\$3,785
SILVERSIDE, ATLANTIC	0	\$0	7,267	\$9,084	26,464	\$33,079	4,304	\$5,380	17,748	\$22,185
SPECIES OTHER	47,540	\$52,435	39,425	\$94,411	34,675	\$15,281	87,775	\$30,508	17,081	\$18,908
SPOT	22,580	\$23,687	138,322	\$146,195	31,710	\$52,359	192,119	\$292,414	133,640	\$227,329
WHITING, KING	41	\$32	228	\$143	427	\$808	773	\$1,413	262	\$421
TOTALS	3,664,550	\$8,103,312	4,306,739	\$12,626,374	4,262,387	\$12,899,094	3,416,165	\$13,599,234	3,304,555	\$14,944,888

Source: VMRC

Appendix E: Summary of Commercial Fisherman Survey Responses

PERMIT TYPE	WATER BODY	SOURCE OF CONFLICT	EXPLANATION	SEASONAL	CONSIDERATIONS DECISION MAKERS SHOULD TAKE INTO ACCOUNT
GILL NET	CHINCOTEAGUE BAY	COMMERCIAL ENVIRONMENTAL	COMMERCIAL USE FOR AQUACULTURE, POLLUTED WATER, CLOSED AREAS CAUSED BY BUILDING HOMES ON WETLANDS, SEPTIC, ETC.		CONSIDER THE ENVIRONMENTAL IMPACTS THAT THE PROJECT WILL HAVE ON WATER QUALITY AND BE CONSIDERATE OF PEAK FISHING/CRABBING TIME FOR OUR COMMERCIAL USE. I.E. SPRING, SUMMER & FALL.
CRAB POT	CHINCOTEAGUE BAY	COMMERCIAL	TOO MANY PEOPLE HOGGING LICENSES. TOO MANY GILL NETS		DECISION MAKERS NEED TO LAYOFF
CRAB POT	UNCLASS SEASIDE BAYS & RIVERS	COMMERCIAL	LOST 30 CRAB POTS TO DREDGE BOAT.	NO	HAVE DREDGE CO. PAY FOR POTS LOST
GILL NET	CHINCOTEAGUE BAY	COMMERCIAL	OTHER FISHERMEN	SEASONAL	
GILL NET	CHINCOTEAGUE BAY	COMMERCIAL	GILL NET BLOCKING MY FISHERY FROM LANDING ON SHORE	NONE	BOTTOM CONTOURS, HISTORY OF HOW OFTEN THAT AREA IS FISHED, HOW BIG OF A NAVAGATIONAL HAZARD WILL IT BE.
GILL NET	SOUTH BAY	ENVIRONMENTAL	ELL-GRASS. IT GETS IN OUR NETS AND MOTOR WHEELS AND STOPS THEM.	NONE	NONE
CRAB POT	CHINCOTEAGUE BAY	LEGISLATIVE/ POLICY	ALL THE NEEDLESS RULES & REGULATIONS PUT ON US BY THE COMMITTEE THAT MAKES THEM UP.	2.00PM TIME LIMIT, POTS ALLOWED, BUSHELS ALLOWED	THE PEOPLE WHO MAKE THE RULES SHOULD BE WATERMEN, NOT DR'S & LAWYERS. WINDMILLS WILL OT AFFECT MY CRABBING. I DON'T THINK.
CRAB POT	CHINCOTEAGUE BAY	LEGISLATIVE/ POLICY	INCREASED AMOUNT OF LEGISLATION ON JOB, CLIT BACKS ON POTS & QUOTAS		LONG TERM ACCESS TO THE AREA, GET CHANGE IN MIGRATORY PATTERN OF FISH & CRABS
GILL NET	OCEAN (E SHORE)	OTHER GOV, RECREATIONAL, COMMERCIAL	VIRGINIA BEACH. THE MILITARY WHICH IT WAS SHORT TERM. MARINE TRAFFIC. GEAR, CRAB POTS & GILL NETS, ETC.	USUALLY MIDDLE OF THE DAY	GEAR, CRAB POTS & GILL NETS, ETC.
CRAB POT	CHINCOTEAGUE BAY	NONE	NONE		
CRAB POT	UNCLASS SEASIDE BAYS & RIVERS	NONE			
CRAB POT	BURTON'S BAY	WALLOPS, RECREATIONAL, COMMERCIAL	NASA ROCKET LAUNCHES - STOP BOATERS THE DAY OF LAUNCH. NOT ABLE TO WORK THE DAY OF LAUNCHING. DRAGGER, SPORT FISHERMAN, CONCH POTTERS, ANY BOATERS INTERFERE.	WHEN LAUNCHING	POLUTING THE ENVIRONMENT. MAKING LAWS THAT NOT WORKING ANYMORE, PEOPLE MAKING DECISIONS THAT HAS NOT EXPERIENCE THE COMMERCIAL FISHERMAN WORK.
CRAB POT	CHINCOTEAGUE BAY	WALLOPS	NASA ROCKET LAUNCHES. CLOSED AREAS FOR COMMERCIAL USE AND RECREATIONAL USE.	ROCKET LAUNCHES	YOU CAN'T CLOSE AREA WHERE WE WORK & PLAY
FISH POT		WALLOPS	COMPLETE AREA CLOSURES COST SIGNIFICANT FINANCIAL DAMAGES		ONE GOOD WEATHER DAY CLOSURE CAN COST MILLIONS. AREA CLOSURES TOTALLY DAMAGE LOCAL ECONOMY. WORK WITH US, NOT AGAINST US. WRECK AND BOTTOM STRUCTURE MUST BE AVOIDED.
GILL NET	OCEAN (E SHORE)	WALLOPS	CLOSE AREAS FOR ROCKET LAUNCH		TO CONTACT COMMERCIAL FISHERMEN ABOUT AREAS THAT ARE NEEDED FOR THE FISHING INDUSTRY THAT CONTRIBUTE TO OUR INCOME, BEFORE USING THEM FOR OTHER MEANS
GILL NET	OCEAN (E SHORE)	WALLOPS	SELF-EXPLANATORY		CONCH POTTING & GILL NETTING
GILL NET	OCEAN (E SHORE) OFFSHORE	WALLOPS	NASA ROCKET LAUNCHES		I HAVE NO ISSUES WITH FIXED STRUCTURES BEING ERCTED.
GILL NET	EASTERN SHORE	WALLOPS	ALL SEASIDE		SHOULD KEEP AREAS SIZES TO A MINIMUM.

Appendix E Continued: Summary of Commercial Fishermen Survey Responses

PERMIT TYPE	WATER BODY	SOURCE OF CONFLICT	EXPLANATION	SEASONAL	CONSIDERATIONS DECISION MAKERS SHOULD TAKE INTO ACCOUNT
GILL NET	OFFSHORE EASTERN SHORE	WALLOPS	ALL SEASIDE		KEEP AREAS SMALL
GILL NET	OCEAN (E SHORE)	WALLOPS, OTHER GOV, RECREATIONAL	WALLOPS ISLAND ROCKETS AND CAMP PENDLETON EXERCISES. HOOK & LINE FISHERMAN IN VA. BEACH LOSING HOOKS IN NETS AND THEN DAMAGING THE NETS, FLAGS OR POLYBALLS IN RETALIATION WHEN THE ROCKFISH COME CLOSE TO THE BEACH IN THE SPRING	SPRING	IMPOSSIBLE TO MAKE A RECOMMENDATION WITH NO INFORMATION AS TO WHAT YOU ARE TALKING ABOUT. ACCESS, ACCESS, ACCESS, WE CAN'T CATCH FISH IF WE CAN'T WORK IN AN AREA. I BELIEVE EVERYONE HAS LEARNED TO WORK TOGETHER AND STAY OUT OF EACH OTHERS WAY TO A LARGE EXTENT THAT'S NOT TO SAY YOU DON'T SEE THE OCCASIONAL YAHOO (ON BOTH SIDES) THAT THINK THEY OWIN EVERYTHING AND EVERYBODY ELSE HAS THE GET OUT OF THEIR WAY, BUT AS A GENERAL RULE THATS A SOLUTION LOOKING FOR A PROBLEM
CRAB POT	HOG ISLAND BAY	ENVIRONMENTAL	NATURE CONSERVANCY TOOK PUBLIC OYSTER GOUNDS AND DELCARED THEM A SHELLFISH SANCTUARY KEEP OFF. THE NATURE CONSERVANCY WILL NOT PAY TAXES. PUTTING MORE TAX ON ME. THE NATURE CONSERVANCY IS DICTATING COUNTY POLICY.		I WANT WIND POWER ON THE BARRIER ISLANDS AND GAS DRILLING. WE NEED CHEAP ENERGY TO PROGRESS.
CRAB POT	UNCLASS SEASIDE BAYS & RIVERS CHINCOTEAGUE BAY	ENVIRONMENTAL	NATURE CONSERVANCY HAS TAKEN GROUNDS WE OYSTER ON.		
CRAB POT	CHINCOTEAGUE BAY	NONE			
CRAB POT	CHINCOTEAGUE BAY	NONE			
CRAB POT	OCEAN (E SHORE)	NONE	NONE	NONE	NONE
CRAB POT	UNCLASS SEASIDE BAYS & RIVERS	NONE			
CRAB POT	UNCLASS SEASIDE BAYS & RIVERS	NONE			THE DANGER TO OYSTER & CLAMS AQUACULTURE ALONG THE SHORE AND CRABBING IN THE WATERS OF THE BARRIER ISLANDS - POLLUTION FROM FUELS AND CHEMICALS AND SUCH ARE A BIG THREAT.
EEL POT		NONE			TIME OF THE YEAR, WEATHER
FISH POT		NONE			I HOPE IT DOESN'T MESS WITH THE FISH MIGRATION.
GILL NET	CHINCOTEAGUE BAY	NONE	NONE	NONE	NONE
GILL NET	OCEAN (E SHORE)	NONE	-	-	ANY KIND OF POLLUTION TO OUR WATER WAYS
DREDGE		RECREATIONAL	MATTER OF KAYAK PADDLES HITTING, RIPING NETS AND EXPOSE CLAMS TO BULLFISH	ANY HOURS - APRIL THROUGH DECEMBER	TO MAKING A OPPORTUNITY FOR KNOWLEDGE OF BAY AND OCEAN WATERS. WE ARE IN A SAILING BUSINESS AND NEED ALL THE HELP WE CAN GET BY A JOB.
GILL NET	CHINCOTEAGUE BAY	RECREATIONAL, COMMERCIAL	RECREATIONAL FISHERMAN AND CRABBERS.	SUMMER IS THE WORST	
CRAB POT	UNCLASS SEASIDE BAYS & RIVERS	RECREATIONAL, COMMERCIAL, OTHER GOV,	CUTTING BOUJYS ON CRAB POTS. RUNNING OVER EQUIPMENT; LEASED OYSTER GROUNDS	DURING SPRING FLOUNDER SEASON	NAVIGATION AND RESTRICTING WHEN OR WHERE YOU CAN TRAVEL
GILL NET	OCEAN (E SHORE)	RECREATIONAL, COMMERCIAL, WALLOPS	THEFT AND VANDALISM; WALLOPS CLOSING AREA FOR LAUNCH	SUMMER	WE WORK YEAR ROUND, BOTH INSHORE AND OFF SHORE. WALLOPS AND ANY OTHER NEED TO CONSIDER THE EFFECT OF CLOSURES. WE ARE LIMITED DUE TO WEATHER AND CAN'T AFFORD TO MISS TIME DUE TO CLOSURES

Appendix E Continued: Summary of Commercial Fishermen Survey Responses

PERMIT TYPE	WATER BODY	SOURCE OF CONFLICT	EXPLANATION	SEASONAL	CONSIDERATIONS DECISION MAKERS SHOULD TAKE INTO ACCOUNT
CRAB POT		OTHER GOV	US PARK SERVICE REQUIRES A PERMIT FOR WATERS WITHIN 1/2 MI OF ASSATEAGUE. PARK SERVICE WANTS TO BAN THE HAND HARVESTING OF HORSESHOE CRABS ABOVE THE MEAN LOW WATER MARK OF THE BODY OF WATER "TOM'S COVE " SAYING THAT WE ARE TRESPASSING. ONLY 15 HAND HARVESTER LICENSES IN THE STATE OF VIRGINIA.	THIS BAN IS SUPPOSED TO BEGIN THE YEAR 2015.	NO ONE OR ORGANIZATION SHOULD MAKE DECISIONS ON ANYTHING UNLESS THEY HAVE EITHER EXPERIENCED THE ACTIVITY 1ST HAND THEMSELVES OR GET MUCH MORE FACTS AND INPUT FROM THE WATERMAN THAT IS OUT IN THE FIELD EVERY DAY THEMSELVES. FULL-TIME WATERMAN NEED SOME BACKING, SOME HELP WHEN PARK SERVICE & FISH AND WILDLIFE TRIES TO INTERFERE WITH US MAKING AN HONEST LIVING.

*PART III – RECREATIONAL USE
ASSESSMENT*



RECREATIONAL USE ASSESSMENT REPORT – SEASIDE OF VIRGINIA'S EASTERN SHORE

MAY 2014

Accomack-Northampton Planning District Commission
NOAA Grant # NA11NOS4190122
Grant Year 2011, Task 96



This Page Intentionally Left Blank

Eastern Shore of Virginia Seaside Recreational Use Assessment Report

May, 2014

Prepared For:

Virginia Coastal Zone Management Program
Virginia Department of Environmental Quality
629 East Main Street
Richmond, Virginia 23218

Prepared By:

Accomack – Northampton Planning District Commission
23372 Front Street
Accomac, Virginia 23301
(757) 787-2936

NOAA Grant No. NA11NOS4190122

Grant Year 2011

Task 96



Virginia Coastal Zone
MANAGEMENT PROGRAM



This project was funded by the Virginia Coastal Zone Management Program at the Department of Environmental Quality through Grant #NA11NOS4190122 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management Act of 1972, as amended.

TABLE OF CONTENTS

1.0	Introduction	1
1.1	Project Boundaries & Setting	3
2.0	Methods	5
2.1	Literature & Data Search	5
2.2	Participatory GIS Workshop	6
2.2.1	Stakeholder Identification & Participation	7
2.2.2	Participatory GIS Process	8
2.2.1.1	Recreational Use Types	11
2.2.1.2	GIS Data Post-Processing	15
2.2.1.3	Post-Workshop Map Validation	16
2.3	Aerial Surveys	17
2.3.1	Flight Methodology & Schedule	17
2.3.1	Photography & GIS Processing	21
3.0	Results & Discussion	23
3.1	Literature & Data Search.....	23
3.2	Participatory GIS Workshop	24
3.3	Aerial Surveys	59
3.3.1	Recreational Uses by Flight Date	62
3.3.2	Recreational Uses by Location & Density	74
4.0	Summary & Conclusions	87

LIST OF FIGURES

Figure 1 - Map illustrating the study area boundary	4
Figure 2 - Table explaining the general and dominant use footprint types	10
Figure 3 - Table showing each boating for hire (charter) use type mapped during the participatory GIS workshop	12
Figure 4 - Table showing each recreational fishing & hunting use type mapped during the participatory GIS workshop	13
Figure 5 - Table showing each general recreational (non-consumptive) use type mapped during the participatory GIS workshop	14
Figure 6 - Table showing each cultural use type mapped during the participatory GIS workshop	15
Figure 7 - Map illustrating the flight paths of aerial surveys conducted during 2012.....	19
Figure 8 - Map illustrating the flight paths of aerial surveys conducted during 2013.....	20
Figure 9 - Map illustrating Charter Fishing - Small Vessel general and dominant use areas for the Virginia Atlantic Coast as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop	25
Figure 10 - Map illustrating Charter Fishing - Large Vessel general and dominant use areas for the Virginia Atlantic Coast as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop	26
Figure 11 - Map illustrating Charter Diving & Snorkeling general and dominant use areas for the Virginia Atlantic Coast as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop	27
Figure 12 - Map illustrating Charter Party Cruises general and dominant use areas for the Virginia Atlantic Coast as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop	28
Figure 13 - Map illustrating Charter Wildlife Viewing general and dominant use areas for the Virginia Atlantic Coast as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop.....	29
Figure 14 - Map illustrating Charter Scenic Viewing general and dominant use areas for the Virginia Atlantic Coast as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop	30

LIST OF FIGURES

Figure 15 - Map illustrating Charter Transport general and dominant use areas for the Eastern Shore of Virginia Seaside as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop	31
Figure 16 - Map illustrating Recreational Non-Motorized Vessel Fishing general and dominant use areas for the Virginia Atlantic Coast as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop.....	32
Figure 17 - Map illustrating Recreational Dive Fishing general and dominant use areas for the Virginia Atlantic Coast as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop	33
Figure 18 - Map illustrating Recreational Fishing from Motorized Vessels general and dominant use areas for the Virginia Atlantic Coast as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop.....	34
Figure 19 - Map illustrating Recreational Shore Fishing general and dominant use areas for the Virginia Atlantic Coast as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop	35
Figure 20 - Map illustrating Recreational Shore Fishing general and dominant use areas for the Eastern Shore of Virginia Seaside as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop	36
Figure 21 - Map illustrating Recreational Shellfish Harvesting general and dominant use areas for the Virginia Atlantic Coast as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop	37
Figure 22 - Map illustrating Recreational Shellfish Harvesting general and dominant use areas for the Eastern Shore of Virginia Seaside as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop.....	38
Figure 23 - Map illustrating Recreational Waterfowl Hunting general and dominant use areas for the Virginia Atlantic Coast as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop	39
Figure 24 - Map illustrating Recreational Waterfowl Hunting general and dominant use areas for the Eastern Shore of Virginia Seaside as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop.....	40

LIST OF FIGURES

Figure 25 - Map illustrating Motorized Boating general and dominant use areas for the Virginia Atlantic Coast as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop	41
Figure 26 - Map illustrating Paddling general and dominant use areas for the Virginia Atlantic Coast as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop	42
Figure 27 - Map illustrating Paddling general and dominant use areas for the Eastern Shore of Virginia Seaside as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop	43
Figure 28 - Map illustrating Sailing general and dominant use areas for the Virginia Atlantic Coast as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop	44
Figure 29 - Map illustrating Recreational Scuba/Snorkeling/Diving general and dominant use areas for the Virginia Atlantic Coast as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop	45
Figure 30 - Map illustrating Shore Use general and dominant use areas for the Virginia Atlantic Coast as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop	46
Figure 31 - Map illustrating Shore Use general and dominant use areas for the Eastern Shore of Virginia Seaside as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop	47
Figure 32 - Map illustrating Surface Water Sports general and dominant use areas for the Virginia Atlantic Coast as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop	48
Figure 33 - Map illustrating Surface Water Sports general and dominant use areas for the Eastern Shore of Virginia Seaside as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop	49
Figure 34 - Map illustrating Swimming general and dominant use areas for the Virginia Atlantic Coast as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop	50
Figure 35 - Map illustrating Historic and Cultural general and dominant areas for the Virginia Atlantic Coast as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop	51
Figure 36 - Map illustrating Scenic and Natural general and dominant areas for the Virginia Atlantic Coast as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop	52

LIST OF FIGURES

Figure 37 - Table summarizing recreational uses observed during the 2012 and 2013 aerial surveys	59
Figure 38 - Examples of photographs of each recreational use observed during the 2012 and 2013 aerial surveys	60
Figure 39 - Table summarizing recreational use counts observed during the 2012 and 2013 aerial surveys	62
Figure 40 - Maps showing Indeterminable Recreational Use observations occurring on weekdays and weekends	64
Figure 41 - Maps showing Recreational Fishing from Motorized Vessel observations occurring on weekdays and weekends	65
Figure 42 - Maps showing Recreational Shore Fishing observations occurring on weekdays and weekends	66
Figure 43 - Maps showing Motorized Boating observations occurring on weekdays and weekends	67
Figure 44 - Maps showing Paddling observations occurring on weekdays and weekends	68
Figure 45 - Maps showing Sailing observations occurring on weekdays and weekends	69
Figure 46 - Maps showing Shore Use observations occurring on weekdays and weekends	70
Figure 47 - Maps showing Surface Water Sport observations occurring on weekdays and weekends	71
Figure 48 - Maps showing Swimming observations occurring on weekdays and weekends	72
Figure 49 - Map illustrating a compilation of Indeterminable Use observations made during aerial surveys in 2012 and 2013	75
Figure 50 - Map illustrating a compilation of Recreational Fishing from Motorized Vessel observations made during aerial surveys in 2012 and 2013	76
Figure 51 - Map illustrating a compilation of Recreational Shore Fishing observations made during aerial surveys in 2012 and 2013	77
Figure 52 - Map illustrating a compilation of Motorized Boating observations made during aerial surveys in 2012 and 2013	78
Figure 53 - Map illustrating a compilation of Paddling observations made during aerial surveys in 2012 and 2013	79

LIST OF FIGURES

Figure 54 - Map illustrating a compilation of Sailing observations made during aerial surveys in 2012 and 2013	80
Figure 55 - Map illustrating a compilation of Shore Use observations made during aerial surveys in 2012 and 2013	81
Figure 56 - Map illustrating a compilation of Surface Water Sports observations made during aerial surveys in 2012 and 2013	82
Figure 57 - Map illustrating a compilation of Swimming observations made during aerial surveys in 2012 and 2013	83
Figure 58 - Table summarizing general and dominant recreational uses identified from historic datasets, the 2012 participatory GIS workshop, and 2012-2013 aerial surveys	89

APPENDICES

<u>Appendix A</u> - Participatory GIS Workshop Flyer & Sign-in Sheets.....	92
<u>Appendix B</u> - Participatory GIS Workshop Facilitator Notes for Mapped Uses.....	98
<u>Appendix C</u> - 2009 Recreational Use Observations on Barrier Islands, The Nature Conservancy	110
<u>Appendix D</u> - 2006 Recreational Use Observations on Barrier Islands, Virginia Eastern Shorekeeper.....	112
<u>Appendix E</u> - Recreational & Commercial Use Observations at Wise Point Boat Ramp, U.S. Fish & Wildlife Service	114
<u>Appendix F</u> - Aerial Survey Photograph Use Count Spreadsheet	121
<u>Appendix G</u> - Aerial Survey Flight Logs	148

ACKNOWLEDGEMENTS

This project would not have been possible without the invaluable assistance of the VA CZM Program GIS Coordinator, Nick Meade, who produced all of the maps in this report.

EXECUTIVE SUMMARY

The Eastern Shore of Virginia's Seaside provides a wide variety of unique opportunities for recreational enthusiasts to enjoy the unspoiled environments and rich natural resources of the tidal creeks, coastal lagoons, tidal salt marshes, and barrier islands as well as access to the Atlantic Ocean. Recreational activities have a rich history of being an anchor economy for the region. Recreational users share the Seaside with a multitude of other commercial, industrial, conservational, and educational users and it is therefore important to understand where recreational uses occur in order to be able to reduce conflicts with other use types and ensure there are adequate access points to allow for public recreation.

The Accomack-Northampton Planning District Commission (A-NPDC) has developed a baseline dataset for defining where recreational uses occur on the Seaside of Virginia's Eastern Shore. Recreational uses were assessed by using several different techniques including identifying existing data sources, soliciting observations and accounts of where recreational uses occur through a participatory mapping project, and performing a series of aerial surveys to directly observe where recreational uses occur during times of peak use.

The study identified a very limited amount of historic data for recreational use on the Seaside; however, the information that was identified strongly supported the findings of the participatory workshop and the aerial surveys. The participatory GIS workshop produced a series of 22 stakeholder-approved maps illustrating which areas are considered the most intensively-used areas on the Seaside. Fourteen aerial surveys of the Seaside during peak times of recreational use resulted in over 2,000 photographs of 10 different recreational-use types.

Correlation of the 3 different datasets, resulted in a comprehensive spatial understanding of where, when, and which recreational-use types were occurring on the Seaside. Most recreational uses occur within the barrier island system and there were relatively fewer that occurred in the offshore areas. The most-intensely used area was Assateague Island, which is was reported and observed as being the most popular place for shore use, swimming, shore fishing, and surface water sports. The next most popular areas for various recreational uses are the tidal inlets, barrier islands, and navigable channels. Three ports, Chincoteague, Wachapreague, and Oyster predominantly provide the majority of access to the offshore ocean for various recreational uses. Recreational use is weather-dependent for most uses and there are many use-types which coincide with seasonal changes in availability of migratory wildlife and aquatic life.

The resolution and comprehensive nature of the data and information produced by this study, if used in future marine spatial planning efforts has the potential to reduce marine-use conflicts and ensure that the most intensive and important recreational areas be preserved for public use for the foreseeable future.

1.0 INTRODUCTION

The Seaside of the Eastern Shore of Virginia has historically attracted people to its pristine and navigable natural environments to recreate. During the 19th century into the mid-20th century, the area's recreational uses were predominantly centered on recreational fishing and hunting. During these times, fishing and hunting were as much necessity as they were recreational. While some local residents fished and hunted for necessity, there was also a substantial for-hire industry with extremely popular hunting lodges on the barrier islands that were often frequented by presidents. As times changed in more recent years with the advent and increasing popularity of motor boats and with the establishment of roads to the beach at Assateague Island, recreational use trends have shifted from being predominantly fishing and hunting to shore use, fishing, and motor boating. Additionally, people are continuing to find new ways to enjoy the seaside as relatively new uses such as



kayaking and various water sports are gaining in popularity. Finally, the Eastern Shore of Virginia's rural character and unique pristine seaside environments are attracting more and more people who desire to recreate in such a unique setting.

The Seaside Special Area Management Planning (SAMP) team and the Mid-Atlantic Regional Council on the Ocean (MARCO) have been investigating ways to better implement marine spatial planning on the Seaside and Mid-Atlantic Ocean off Virginia by assessing the wide array of

uses in inshore and offshore areas. These efforts have identified the need to attain recreational-use data to provide for appropriate marine spatial planning and in turn,

1.0 INTRODUCTION

reduce marine-use conflicts, maximize use-efficiency, and enhance environmental and economic productivity.



As result, the Accomack-Northampton Planning District Commission (A-NPDC) conducted an assessment of recreational uses on the inshore and offshore areas of the Seaside of Virginia's Eastern Shore and adjacent ocean to produce a baseline dataset for use by the Seaside SAMP team and

MARCO. The assessment utilized three different surveying techniques including analyzing and compiling existing recreational-use data, solicitation of key stakeholder information via a participatory Geographical Information Systems (GIS) workshop, and aerial surveying during expected times of peak recreational use. Each technique provided detailed comprehensive information illustrating locations experiencing the greatest use for each of a variety of recreational uses.

Throughout the process, the A-NPDC worked closely with partnering agencies including the National Ocean and Atmospheric Administration Coastal Services Center (NOAA CSC), the Virginia Coastal Zone Management (VCZM) Program, and MARCO to determine recreational-use assessment categories and to develop assessment methodologies that will serve as the standard approach for other regions and states on the Mid-Atlantic coastline. The project's outcomes greatly enhanced understanding of the spatial extent of recreational uses in inshore and offshore Seaside environments, which in turn is expected to lead to improved marine spatial planning decisions, enhanced environmental and economic productivity, and reduction in marine-use conflicts.



1.0 INTRODUCTION



1.1 Project Boundaries & Setting

The project area discussed in this report covers the entire Seaside of Virginia's Eastern Shore. This includes an approximately 75-mile long stretch of coastline bound, the mainland of the Eastern Shore to the west, the state border with Maryland to the north, and the mouth of the Chesapeake Bay to the south. Specifically, the western boundary includes the tidal portion of the creeks on the mainland and the southern boundary was established as an east-west line crossing the third island from the south of the Chesapeake Bay Bridge Tunnel on the south side of the Baltimore Channel tunnel. The Seaside includes the longest expanse of coastal wilderness remaining on the Atlantic seaboard and is comprised of thousands of acres of pristine salt marshes, vast tidal mudflats, shallow lagoons, and navigable tidal channels that support thriving seafood and recreational tourism industries. These environments are bound by a barrier island chain to the east that is largely undeveloped. In addition, several Seaside towns and villages serve as ports for charter fishing activities in the offshore waters of the Mid-Atlantic coastal margin. The eastern boundary of the project area is the 200 nautical mile offshore exclusive economic zone boundary. See Figure 1 for a map of the project area.

The participatory GIS workshop and aerial surveys were conducted for the entire Atlantic Coast of Virginia and while this report only details the Eastern Shore portion, data and discussion of the southern portions are covered in a separate report through VCZM FY2012, Task 95.01. The data for all of Virginia's Atlantic Coast can also be viewed on VCZM's online data portal, the Virginia Coastal Geospatial and Educational Mapping System (Coastal GEMS) at www.coastalgems.org.

1.0 INTRODUCTION



Figure 1 - Map illustrating the study area boundary for the recreational use assessment. While the workshop and aerial surveys produced information for the entire Virginia Atlantic Coast, this report only addresses data for the Eastern Shore portion under a VCZM FY2012, Task 95 Grant Number NA12NOS4190168.

2.0 METHODS

2.1 Literature and Data Search

A-NPDC staff performed a comprehensive search for historical recreational data. Desired data included counts of observations of recreational uses and GIS data mapping recreational uses. The search was conducted by interviewing various agencies and stakeholder groups affiliated with the seaside on Virginia's Eastern Shore and performing literature searches.

Agencies and stakeholders contacted for interviews included:

- Assateague Coastkeeper;
- Counties of Accomack & Northampton;
- Eastern Shore of Virginia Tourism Commission;
- The Nature Conservancy;
- Towns of Chincoteague & Wachapreague;
- U.S. Fish & Wildlife Service;
 - Chincoteague & Eastern Shore of Virginia National Wildlife Refuges
- Virginia Department of Conservation and Recreation;
- Virginia Department of Environmental Quality;
- Virginia Department of Game and Inland Fisheries;
- Virginia Department of Transportation;
- Virginia Eastern Shorekeeper;
- Virginia Institute of Marine Sciences; and
- Virginia Marine Resources Commission.



Literature searches were performed at the Eastern Shore Public Library and on the internet.

Once relevant recreational data was identified, A-NPDC staff filtered the data to include data that was pertinent for the current study. The data is described in detail in Section 3.1.

2.0 METHODS

2.2 Participatory GIS Workshop

In order to know how, when and where recreational uses occur on the seaside of Virginia's Eastern Shore, it was determined that a participatory mapping approach would be the most effective way to better understand which areas are important recreational areas. The participatory GIS approach was determined to be ideal for recreational uses to be easily mapped and basic data to be added to an online portal which can be readily accessed for the use of stakeholders and the general public.

A-NPDC coordinated and hosted the 2-day workshop with assistance from VCZM, NOAA CSC, and MARCO partners on July 11 & 12, 2012 at the Eastern Shore Community College in Melfa, Virginia. Prior to the workshop, the NOAA CSC

held a participatory GIS facilitation training for the project planning team. Participants were instructed on the process and utilized computers and e-beam technology to map where recreational uses occur. This being the first time that a participatory GIS workshop



of this kind was conducted in Virginia, there the project team employed a flexible facilitation and coordination approach to the workshop that allowed for various refinements to the process as the workshop progressed.



The workshop outcomes were intended to support the VCZM Program's effort to develop a baseline dataset for recreational uses for Virginia's entire Atlantic Coast. As a member of MARCO, Virginia, through VCZM is collecting

2.0 METHODS

information on how the public uses the Atlantic coast of Virginia. These baseline data will inform planning efforts being undertaken by VCZM to help develop a Virginia Ocean Plan and to help VCZM and A-NPDC to develop the Seaside Special Area Management Plan. Collecting data on the variety of ways the Seaside Bays and Atlantic Ocean are used for recreation is anticipated to reduce use conflicts in coastal waters, maximizing efficiency, and enhancing environmental and economic productivity.

While the workshop captured information for the entire Virginia Atlantic Coast, only the information for the project area described in **Figure 1** are presented and discussed in this report. The areas south of the areas discussed in this report are covered under VCZM FY2012, Task 95, NA12NOS4190168 and all maps resulting from the workshop are available for viewing in greater detail on VCZM's online data portal, Coastal GEMS (www.coastalgems.org).

The project planning team, consisting of the A-NPDC, VCZM, NOAA CSC, and MARCO state representatives, developed the methods described in the following sections.

2.2.1 Stakeholder Identification & Participation

Identifying stakeholders with the most comprehensive knowledge and experiences was one of the most critical facets of the participatory GIS workshop planning effort. The project planning team leveraged its combined knowledge of local and regional personnel to engage a very diverse and broad reaching group of stakeholders. Invitations were extended to stakeholders who were known to have an extensive history of observing recreational uses within the field area. Special consideration was given to ensure that stakeholders for each of the 22 uses were well represented.

Invitations to the workshop were extended to over 110 stakeholders representing the following sectors:

- Federal Agencies (National Park Service employees and lifeguards, U.S. Fish and Wildlife Service, NASA, NOAA);
- State Agencies (VA Department of Game and Inland Fisheries, VMRC, VA Department of Environmental Quality, VA Department of Conservation and Recreation);
- Local Governments (Accomack and Northampton Counties and Seaside Towns)

2.0 METHODS

- Law Enforcement Agencies (VA Marine Police division of VMRC, VA Department of Game and Inland Fisheries Conservation Police Officers);
- Scientists and Researchers (VA Institute of Marine Science, University of VA, Marine Science Consortium);
- Non-Governmental Organizations (The Nature Conservancy, Virginia Eastern Shorekeeper, Assateague Coastkeeper, Eastern Shore Anglers Club, Surfrider Foundation, VA Aquarium);
- Harbor Masters and Marine Business Operators;
- Local Watermen (Aquaculture, Wild Harvesters, Commercial Fishermen, Charter Fishing Captains);
- Ecotourism Guides; and
- Knowledgeable Citizens.

In all, 44 stakeholders participated in the mapping process with 29 stakeholders participating on the first day of the workshop and 14 stakeholders participating on the second day. A comprehensive representation for the various sectors listed above and for the different uses was achieved. The workshop invitation flyer and sign-in sheets are included in Appendix A.

2.2.1 Participatory GIS Process



The participatory GIS process implemented during the current study was developed with the guidance of the NOAA CSC who had utilized the process in planning workshops nationwide. Participants were directed to draw on digital maps projected onto a wall using a stylus that emits signals to an adjacent reader which immediately adds the shape they draw to the map. This innovative method quickly and efficiently allows users to

2.0 METHODS

share their thoughts, compare notes and learn from others in the group.

On July 10, 2012, the day prior to the workshop, the NOAA CSC conducted a participatory GIS orientation and staff training for members of the project team, which consisted of staff from the A-NPDC, VCZM, and MARCO



state representatives from Maryland, Delaware, and New Jersey. The training was intended to provide a demonstration of the technology and mapping exercise and train staff on how to perform the various necessary roles during the mapping process.

Participants were invited to attend one of the two workshop dates and upon arrival to the workshop on their respective day, they were assigned to a breakout group based off their background knowledge and experience. The project team chose the participants for each group in a manner that provided the broadest range of backgrounds and experience levels were equally represented in each group. Each day three to four breakout groups were established with each group consisting of between six and nine participants. Following a morning introductory presentation that involved all participants, the breakout groups retreated to separate rooms where they remained with their group for the remainder of the workshop.

Each breakout group was led by three to five members of the project team who served various roles based on their expertise including group facilitator, GIS specialist, and note-taker. The facilitator facilitated the mapping process and led the group discussions. The GIS specialist coordinated all technology and assisted participants with technical aspects of the mapping process. The other members of the project team served as note-takers who captured details on group discussions and developments. One member of the project team served the role of "Runner", who coordinated efforts between each breakout group to ensure that each group was mapping uses using the same parameters. During the

2.0 METHODS

morning of the first workshop day, NOAA CSC staff served as facilitator and GIS specialist so the staff from the A-NPDC, VCZM, and MARCO states could observe the process prior to taking the lead during subsequent sessions. Each use type was mapped throughout the entire day, one use at a time.

The facilitator started the mapping process for each breakout group by defining the specific use to be mapped and what it includes and excludes. Participants were first instructed to draw polygons that represented footprints of general use and then, once complete, repeat the process for footprints of dominant use. The general and dominant-use footprints are described in detail in **Figure 2**.

Use Area Footprint Type	Purpose	Definition	Mapping Technique
General	To map the maximum footprint over which each use occurs.	Includes all areas in which the use is known to occur with some regularity, regardless of its frequency or intensity. This does not include areas where the use may have occurred once or twice or where it might conceivably occur now or in the future.	All input is captured and reflected in the final maps.
Dominant	To map those areas where the use most often occurs.	Includes all areas routinely used by most users most of the time. Examples could include: popular swimming beaches, regular fishing areas for charter boats, hot spots for whale watching, consistently good surfing beaches, etc.	Participants are asked to draw dominant use areas after reviewing the drafted general use footprints. Participants then suggest areas to be discussed by the group. The final product represents only those areas (polygons) agreed upon by the breakout group. Areas of disagreement are captured in the notes but not presented as the group product.

Figure 2 – Table explaining the general and dominant use footprint types.

2.0 METHODS

Group discussions during the mapping process would often lead to additional information being provided for uses regarding seasonal and temporal variations and special events. For some uses these details were able to be spatially documented, while for others it was recorded in the notes.

2.2.1.1 Recreational Use Types

A-NPDC and VCZM staff coordinated with staff from the NOAA Coastal Services Center to establish criteria for the mapping project including selection of recreation use types. The recreational use types were organized into three main

use groups:

- Boating for Hire (Charter) Uses;
- Recreational Fishing/Hunting Uses; and
- General Recreational Uses (Non-consumptive).



Additionally, historic and culturally-significant areas were also acknowledged by the project team as being very important areas. Participants were asked to identify and describe these areas within the study area to provide information that will assist with efforts to develop strategies for collecting more comprehensive cultural use information in the future.

Finally, during the two-day workshop, the definitions of the use types were refined by adding additional details as participants raised questions and offered new ideas that had yet to be considered during the workshop planning process. Additionally, since use footprints were defined using the relative and non-quantifying terms, "general" and "dominant", there were often occasions where participants would reach consensus on what these relative terms truly meant. Since the workshop involved multiple breakout groups working concurrently, it was critical that all participants and workshop facilitators were using the same parameters as they evolved. To resolve this issue, one member of the project team was designated as a "runner" whose role was to coordinate and

2.0 METHODS

communicate any changes or additions to the parameters amongst each breakout group. Summaries of notes related to processing or other items for each mapped use are included in Appendix B.

Figures 3 through 6 below describe the 22 different recreational and cultural uses included during the participatory GIS workshop, and the various ranges of mapping scales deemed to be appropriate by the project planning team.

Boating for Hire (Charter) Uses

Use Name	Definition	Appropriate Mapping Scale	
		Min	Max
Charter fishing - small vessel	Charter activity related to fishing led by charter vessels of lesser size (e.g. 6-pack boats)	1:250,000	1:500,000
Charter fishing - large vessel	Charter activity related to fishing led by charter vessels of greater size (e.g. head boats)	1:250,000	1:500,000
Charter diving/snorkeling	Charter activity related to recreational dive or snorkel charters	1:100,000	1:250,000
Charter party cruises	Charter activity for cruises	1:250,000	1:500,000
Charter wildlife viewing	Charter activity focused on wildlife viewing	1:250,000	1:500,000
Charter scenic viewing	Charter activity focused on scenic or natural area viewing, photography, historic perspective	1:250,000	1:500,000
Charter transport	Charter activity related to transport services, ferry boats, etc	1:250,000	1:500,000

Figure 3 - Table showing each boating for hire (charter) use type mapped during the participatory GIS workshop.

2.0 METHODS

Recreational Fishing/Hunting Uses

Use Name	Definition	Appropriate Mapping Scale	
		Min	Max
Recreational kayak & non-motorized vessel fishing	Any fishing activities from private non-motorized vessels	1:50,000	1:100,000
Recreational dive fishing	Recreational SCUBA and free-dive fishing	1:25,000	1:50,000
Recreational fishing from motorized vessels	Any fishing activities from private motorized vessels, including tournaments	1:250,000	1:500,000
Recreational shore fishing	Recreational fishing from beaches or piers	1:50,000	1:100,000
Recreational shellfish harvesting	Any take of clams or oysters	1:50,000	1:100,000
Recreational waterfowl hunting	Any take of waterfowl	1:50,000	1:100,000

Figure 4 – Table showing each recreational fishing & hunting use-type mapped during the participatory GIS workshop.

2.0 METHODS

General Recreational Uses – Non-consumptive

Use Name	Definition	Appropriate Mapping Scale	
		Min	Max
Motorized boating	Personal watercraft, outboard motors, private motorized vehicles	1:100,000	1:500,000
Paddling	Kayaking, canoeing, rowing, paddle-boarding, outrigger paddling	1:50,000	1:100,000
Sailing	Sailboats, overnight anchoring, races, regattas	1:250,000	1:500,000
Scuba/snorkeling/diving	Scuba diving, tethered diving, snorkeling, free diving	1:25,000	1:50,000
Shore Use	Barrier island visitation	1:25,000	1:50,000
Surface water sports	Surfing, wind-surfing, kite-surfing	1:25,000	1:50,000
Swimming	Short and long distance surface swimming any distance from shore	1:25,000	1:50,000

Figure 5 – Table showing each general recreational (non-consumptive) use type mapped during the participatory GIS workshop.

2.0 METHODS

Cultural Uses

Use Name	Definition	Appropriate Mapping Scale	
		Min	Max
Historic/cultural	Ocean areas or views with inherent cultural, traditional, archaeological, religious, spiritual, tribal or historic value	1:250,000	1:500,000
Scenic/natural views	Ocean areas or views that provide unique opportunities for photography, historic perspective, visual experience, etc.	1:250,000	1:500,000

Figure 6 – Table showing each cultural use type mapped during the participatory GIS workshop.

2.2.1.2 GIS Data Post-Processing

After the workshop, the GIS data from each breakout group were compiled, reviewed, and processed by NOAA CSC and VCZM staff to create over 100 unique data layers for each of the 22 use types. Notes from the workshop (see Appendix B) were reviewed and consulted to identify any observed data inconsistencies or gaps. Several follow-up actions were undertaken including soliciting datasets identified during the workshop and these data were acquired and integrated into the metadata.

Processing of the raw data included clipping all shapes to the study area. Once this was accomplished the data was cleaned and edited to fix obvious drawing errors and small unintended gaps, to replace shapes drawn as placeholders, and to follow all other participant instructions captured in the notes. Next, an analysis fishnet grid of one square nautical mile per grid cell was established. Data for each use type was merged, split into general and dominant use feature classes, and individually joined to the fishnet grid. Finally, a calculation for the number of breakout groups that mapped a use for any given grid cell was done, and threshold data analysis was performed to retain the entire general use footprint but remove the dominant use areas not mapped by a majority (50% or greater) of breakout groups.

2.0 METHODS



The final data layers for each use type represent cumulative averages of use information compiled by each of the five breakout groups. Information from each breakout group was weighted evenly. The project planning team established a set grid size for each use type that was

determined to be most appropriate for illustration purposes over which each use occurs.

2.2.1.3 Post-Workshop Map Validation

Once processed, participants were invited and encouraged to review and comment on the accuracy and completeness of the final maps for each mapped use type. Participants were directed to an online portal where the final data and maps could be viewed. Participants were then instructed to complete an evaluation form either indicating their approval, citing inaccuracies and making suggestions for edits to the data, or voicing their disapproval of the maps and scheduling a follow-up appointment with members of the project team.

All evaluations received expressed satisfaction of the data and maps as presented and there were not any suggested edits or expressions of disapproval.

There being no further edits needed, the data and maps were published on the VCZM Coastal GEMS (www.coastalgems.org). The data and maps will also be made available on the MARCO Mid-Atlantic Ocean Data Portal (www.midatlanticocean.org) in the near future, but were not included on the site at the date of this report.

2.0 METHODS

2.3 Aerial Surveys

In order to validate the recreational use maps produced during the participatory GIS workshop, the A-NPDC performed a series of aerial surveys over Virginia's Atlantic Coast during 2012 and 2013 that resulted in direct observations of recreational uses during known times of peak use.



Using geo-referenced digital photography during the flights, information was easily and quickly captured for the types and specific places where people were recreating. The survey photographs and GIS data were then processed to create density maps illustrating observed recreational use patterns during times of peak activity. The aerial survey criteria was developed in a manner that allowed for direct comparison to the maps created during the participatory GIS workshops. Specific details on the aerial survey process are described in the following sections.

2.3.1 Flight Methodology & Schedule

Low-level aerial surveys were conducted from a fixed-wing Cessna 182 aircraft, which is owned and operated by the Virginia Marine Resources Commission (VMRC), to capture recreational uses on the Seaside during times of peak use. The survey team consisted of a VMRC pilot and A-NPDC staff member who was responsible for photography and note-taking. The surveys were conducted following methodology utilized successfully in other similar studies around Florida (Ault et al., 2008 and Gorzelany; 1998, 2005, 2009).

Photographs were acquired using a Canon PowerShot S100 digital camera with georeferencing capability that provided spatial information for the plane was at the time the photograph was taken.

Flights occurred over an established flight path at a constant altitude and speed decided upon by A-NPDC staff and the pilot. Surveys occurred within three miles to the east of the barrier islands per VMRC policy and were two to four hours in duration depending on aircraft and pilot availability, weather conditions, times corresponding with peak usage and optimal visual observation conditions. Flights originated from the airport in Melfa,

2.0 METHODS

Virginia and covered the seaside from the Maryland/Virginia border on Assateague Island to the Virginia/North Carolina border. Discussion for this report solely focuses on the Eastern Shore portion from the border with Maryland to the north and third island from the south on the Chesapeake Bay Bridge Tunnel (CBBT). Figures 7 and 8 illustrate the flight paths of the aerial surveys conducted during 2012 and 2013.

Physical data were recorded on flight data logs including the pre-flight National Weather Service marine forecast, boating and weather conditions, wind speed and direction, air and water temperature, tide phase, and sea surface conditions. The flight data logs are included as Appendix G.

In 2012, eight flights were conducted resulting in 1,064 photographs. Four flights occurred on weekdays and four flights occurred on weekends. These flights occurred on the following dates:

- July 3 (Weekday – Tuesday)
- August 19 (Weekend – Sunday)
- August 23 (Weekday – Thursday)
- August 30 (Weekday – Thursday)
- September 1 (Weekend – Saturday)
- September 6 (Weekday – Thursday)
- September 9 (Weekend – Sunday)
- September 22 (Weekend – Saturday)

In 2013, six flights were conducted resulting in 1,035 photographs. Three flights occurred on weekdays and three flights occurred on weekends. These flights occurred on the following dates:

- July 6 (Weekend – Saturday)
- July 27 (Weekend – Saturday)
- September 5 (Weekday – Thursday)
- September 26 (Weekday – Thursday)
- September 28 (Weekend – Saturday)
- October 3 (Weekday – Thursday)

2.0 METHODS

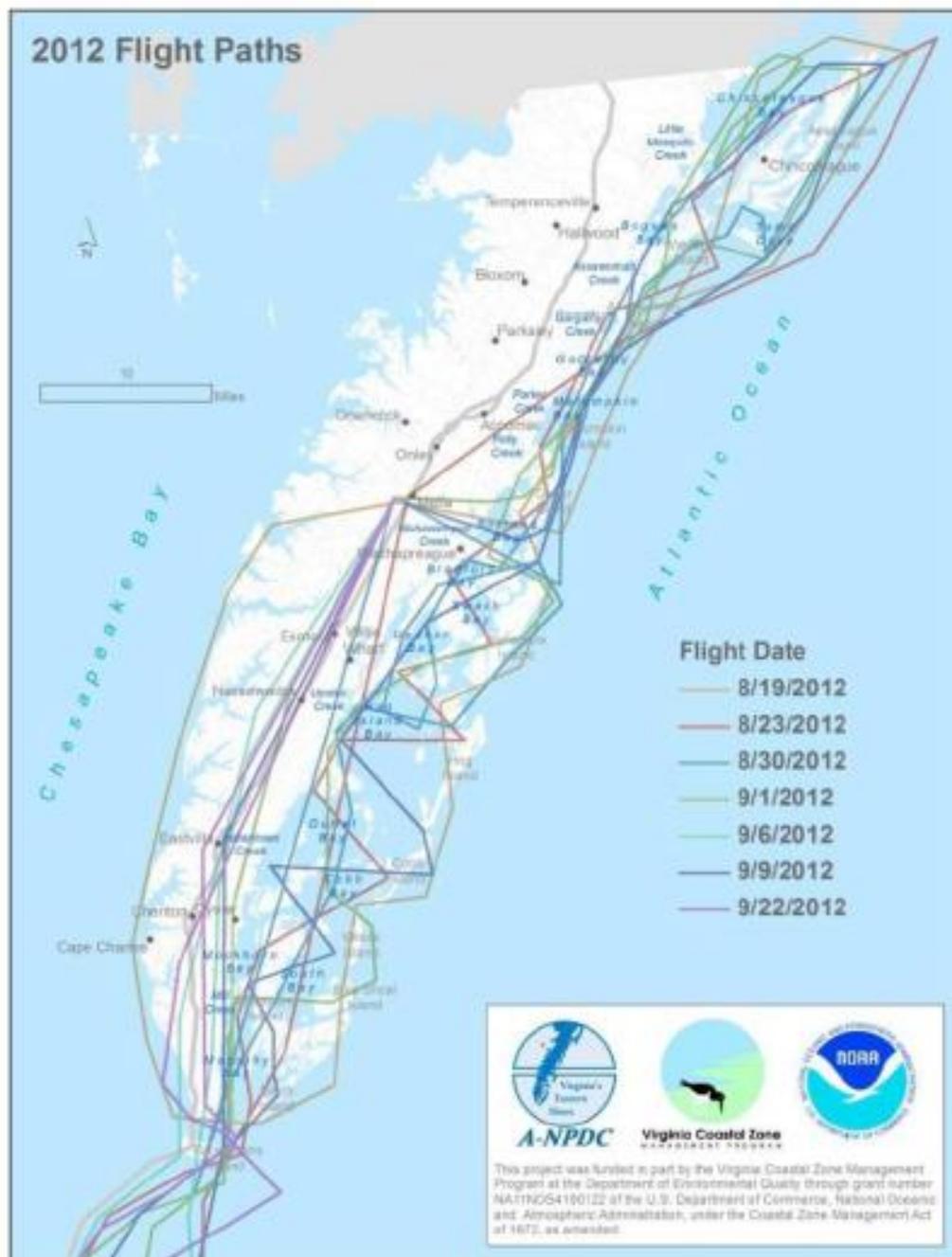


Figure 7 - Map illustrating the flight paths of aerial surveys conducted during 2012.

2.0 METHODS

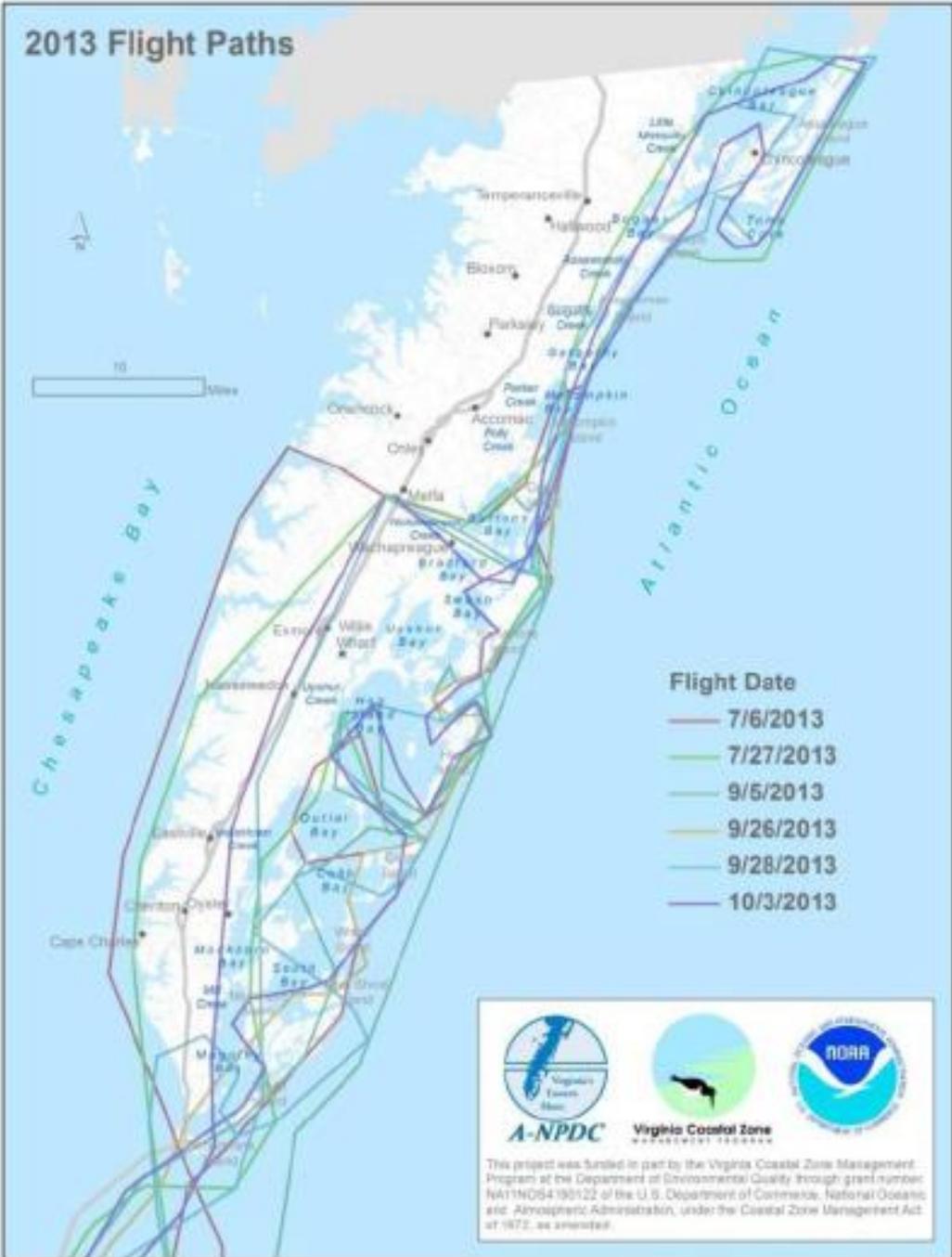


Figure 8 – Map illustrating the flight paths of aerial surveys conducted during 2013.

2.0 METHODS

2.3.2 Photograph & GIS Processing

Following the completion of each aerial survey, digital photographs and the accompanying spatial data were downloaded and incorporated into a GIS database. Once all surveys were completed, each of the 2,099 photographs, 693 of which were within the Eastern Shore survey area, were reviewed and processed into a GIS database and density use maps.

All photographs were georeferenced and captured the latitudinal and longitudinal position of the aircraft at the time the photograph was taken. ArcPhoto was used to upload the spatial data for each photograph into a GIS program where the locations of the photos were used as reference for creating feature class points for each individual recreational use observed. Some issues were experienced with the GPS on certain flights in the vicinity of the NASA-Wallops Flight Facility due to restrictions on GPS signal for security purposes. Additionally, two flight paths had to be altered due to airspace restrictions at the NASA-Wallops Flight Facility. The recreational use photographs where failure of the GPS signal occurred did not prove to be an issue as the knowledge and familiarity of the A-NPDC staff allowed for the locations of each observed use to be properly located in the GIS program.



To allow for comparison with the maps from the participatory GIS workshop, the recreational use type categories used mimicked those used during the workshop. Guidelines and criteria for counting the recreational uses were established prior to each photograph being meticulously reviewed and categorized by use(s) in a Microsoft Excel spreadsheet (see Appendix F). The guidelines used for determining the counts of recreational uses were as follows:

2.0 METHODS

- Only recreational uses were counted and distinguishable commercial uses were not counted;
- Any use observed outside of the field survey area was not included;
- Uses captured in multiple photographs were only counted once (i.e. sometimes as many as three photos were taken of the same subject);
- Uses that were clearly recreational and not commercial but the exact recreational use could not be determined due to inadequate photograph resolution were classified as an "Indeterminable Use";
- Vessels that were moored or tied to a dock were not counted;
- Vessels that were beached or anchored at a beach were counted as "Motorized Boating";
- Any vessel from which recreational fishing was observed received a count of "one" regardless of how many people were aboard the vessel;
- People standing or wading in waters greater than knee deep were counted as "Swimming";
- Best estimates were used for beaches with dense crowds where individual users were not easily counted;
- People standing or walking in waters less than knee deep were counted as "Shore Use";
- Distinguishing boating for hire (charter) uses from general recreational uses was not possible; therefore, the uses within the "Boating for Hire (Charter) Uses" category was not used; and
- Any vessels where as few as one fishing rod was visibly vertical and in use were counted as "Recreational Fishing".

Once the spreadsheet was populated with counts for each observed recreational use, the spreadsheet was merged with the GIS metadata. As each point class feature was created in GIS, it received a unique identification number to match it with the merged spreadsheet data. Once completed, density maps were created by averaging uses over a grid cell size of one square nautical mile. This was chosen to mimic the methods used in the creation of the maps from the participatory GIS workshop.

3.0 RESULTS & DISCUSSION

3.1 Literature and Data Search

The comprehensive search for historical recreational data did not result in the identification of any existing GIS data, nor were any existing datasets identified through the literature search.

Three datasets were identified that included counts of recreational uses within the project area. All existing data were created since 2006 indicating that the process of gathering data on recreational uses in the area began relatively recently. The three identified datasets are described in detail in the following sections.



2009 Nature Conservancy Recreational Use Counts

In 2009, the Nature Conservancy conducted a count of Red Knot populations on the barrier islands from Assateague Island south to Fishermans Island and including some locations within the coastal lagoons on April 25 and 30; May 14, 21, and 25; and on June 1. Additional recreational use counts were noted during the bird surveys. Recreational uses categories included the number of people on the beach, vehicles on the beach, boats adjacent to the beach, and surf fishermen. The recreational use component of these data is summarized in **Appendix C**.

The recreational data for the number of people on the beach, boats adjacent to the beach, and surf fishermen were within the range of the counts taken during the aerial surveys of the current study considering the period over which the observations were made. Additionally for these three recreational uses, the Nature Conservancy's data identified similar hotspots as the current study, especially for Assateague Island.

It is important to note that these data consider one recreational use type that was not included as a separate classification for the current study, recreational vehicular use on the beach. Extensive recreational vehicular use was observed on Assateague Island with 624 counts. Vehicles were also observed on Wallops, Assawoman, and Hog Islands.

3.0 RESULTS & DISCUSSION

Vehicular use accounted for 26% of all recreational use counts. For the current study, vehicular use was classified as “shore use” and was not assessed by itself.

2006 Virginia Eastern Shorekeeper Recreational Use Counts

In 2006, the Virginia Eastern Shorekeeper produced “*Patrol Summary -Observations and Reports of Human Activity on the Atlantic Barrier Islands on the Eastern Shore of Virginia*,” with funding from VCZM and NOAA. The study included random patrols from Gargathy Inlet south to Fishermans Island. Six patrols were conducted during the cold weather months (December-March) and 35 were conducted during the remainder of the year. Most patrols were conducted during Fridays and Saturdays than the remainder of the week. Most reported counts are anecdotal but numerical counts for cottages provided. The recreational use data is summarized in **Appendix D**

The data does offer insight into where these uses are occurring and this information is in general agreement with the findings of the current study.

2012 U.S. Fish & Wildlife Service Recreational & Commercial Use Counts

For several months in 2012, the U.S. Fish and Wildlife Service staff at the Eastern Shore of Virginia National Wildlife Refuge compiled recreational use data, which included both motorized and non-motorized boating, at the Wise Point boat ramp at the refuge in southern Northampton County. The recreational use and commercial data are summarized in **Appendix E**.

The current study does identify the Wise Point boat ramp as a critical access point for the seaside on the southern portion of the Eastern Shore. Since the recreational use counts do not distinguish between individual use types, further correlation with the current study is not possible.

3.2 Participatory GIS Workshop

As described in **Section 2.2**, the Participatory GIS Workshop solicited information from a variety of key stakeholders to produce a series of maps that illustrate where recreational use generally and predominantly occurs for 22 different recreational and cultural uses. The Participatory GIS Workshop maps are included as **Figures 9 through 36**. The maps have been validated by those who participated and additional stakeholders unable to attend. While the workshop covered the entire Virginia Atlantic Coast, the discussion below only addresses the Seaside of the Eastern Shore illustrated in **Figure 1**.

3.0 RESULTS & DISCUSSION



Figure 9 – Map illustrating Charter Fishing - Small Vessel general and dominant use areas for the Virginia Atlantic Coast as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop.

3.0 RESULTS & DISCUSSION



Figure 10 – Map illustrating Charter Fishing – Large Vessel general and dominant use areas for the Virginia Atlantic Coast as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop.

3.0 RESULTS & DISCUSSION

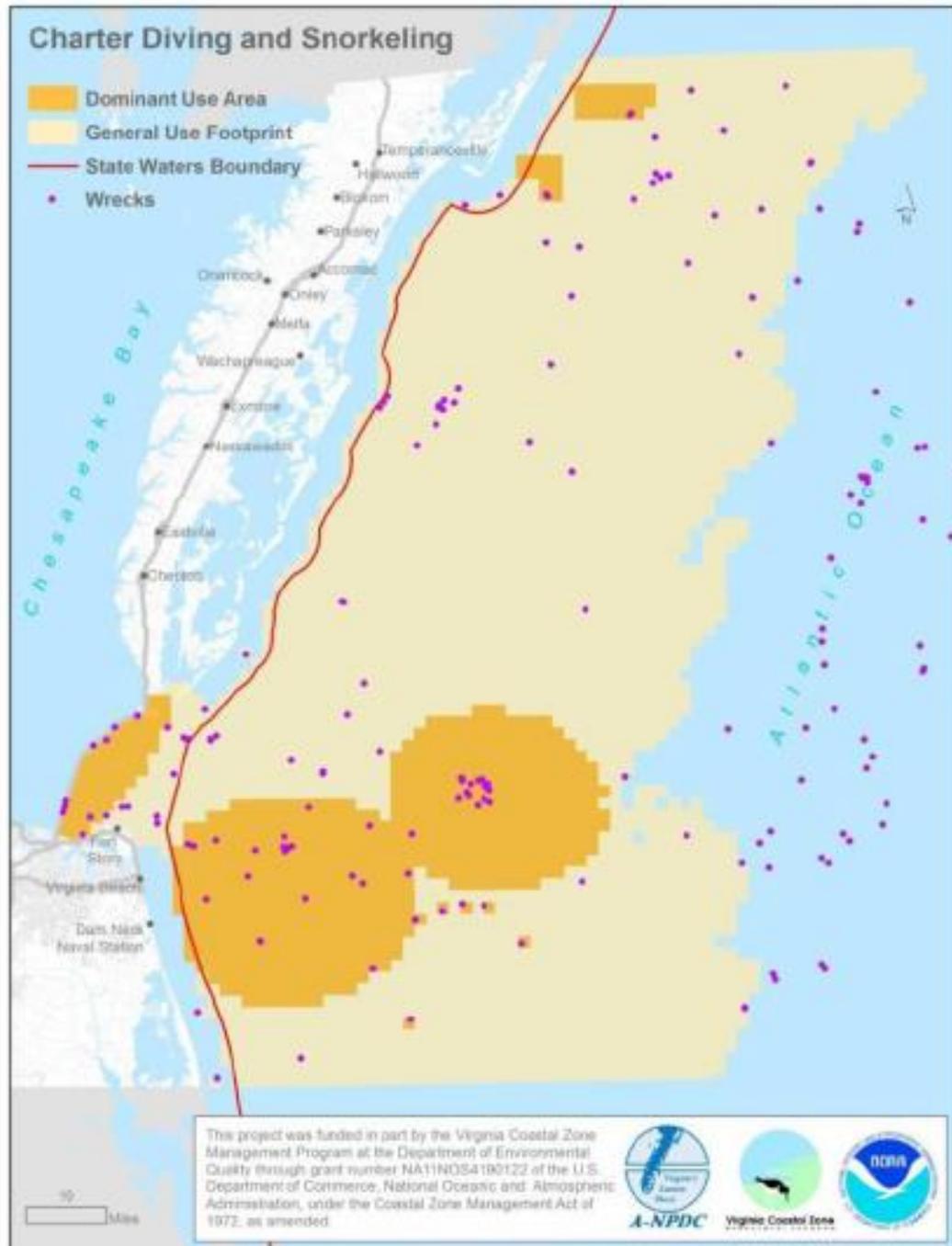


Figure 11 - Map illustrating Charter Diving & Snorkeling general and dominant use areas for the Virginia Atlantic Coast as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop.

3.0 RESULTS & DISCUSSION



Figure 12 - Map illustrating Charter Party Cruises general and dominant use areas for the Virginia Atlantic Coast as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop.

3.0 RESULTS & DISCUSSION



Figure 13 – Map illustrating Charter Wildlife Viewing general and dominant use areas for the Virginia Atlantic Coast as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop.

3.0 RESULTS & DISCUSSION



Figure 14 – Map illustrating Charter Scenic Viewing general and dominant use areas for the Virginia Atlantic Coast as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop.

3.0 RESULTS & DISCUSSION



Figure 16 – Map illustrating Recreational Non-Motorized Vessel Fishing general and dominant use areas for the Virginia Atlantic Coast as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop.

3.0 RESULTS & DISCUSSION

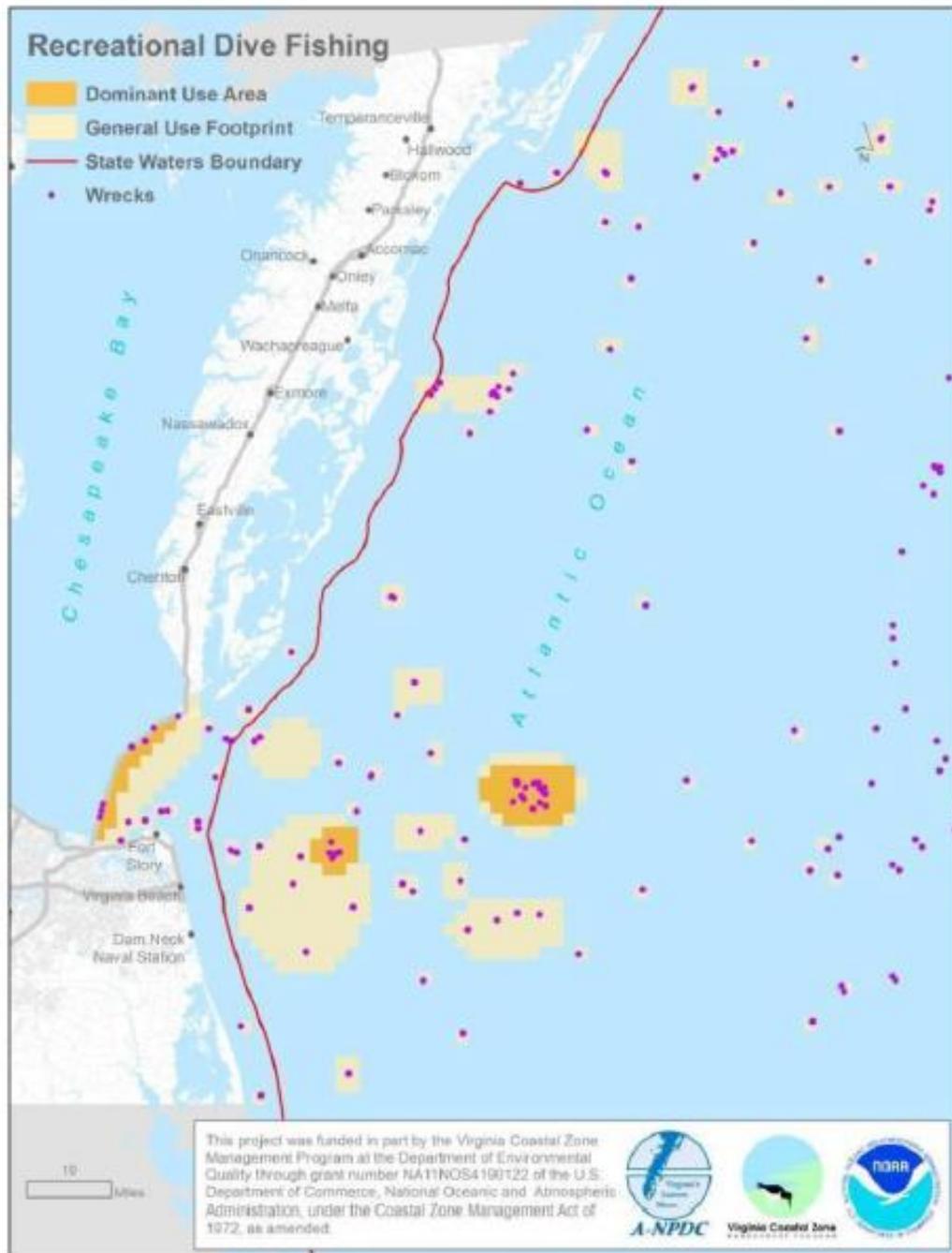


Figure 17 – Map illustrating Recreational Dive Fishing general and dominant use areas for the Virginia Atlantic Coast as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop.

3.0 RESULTS & DISCUSSION

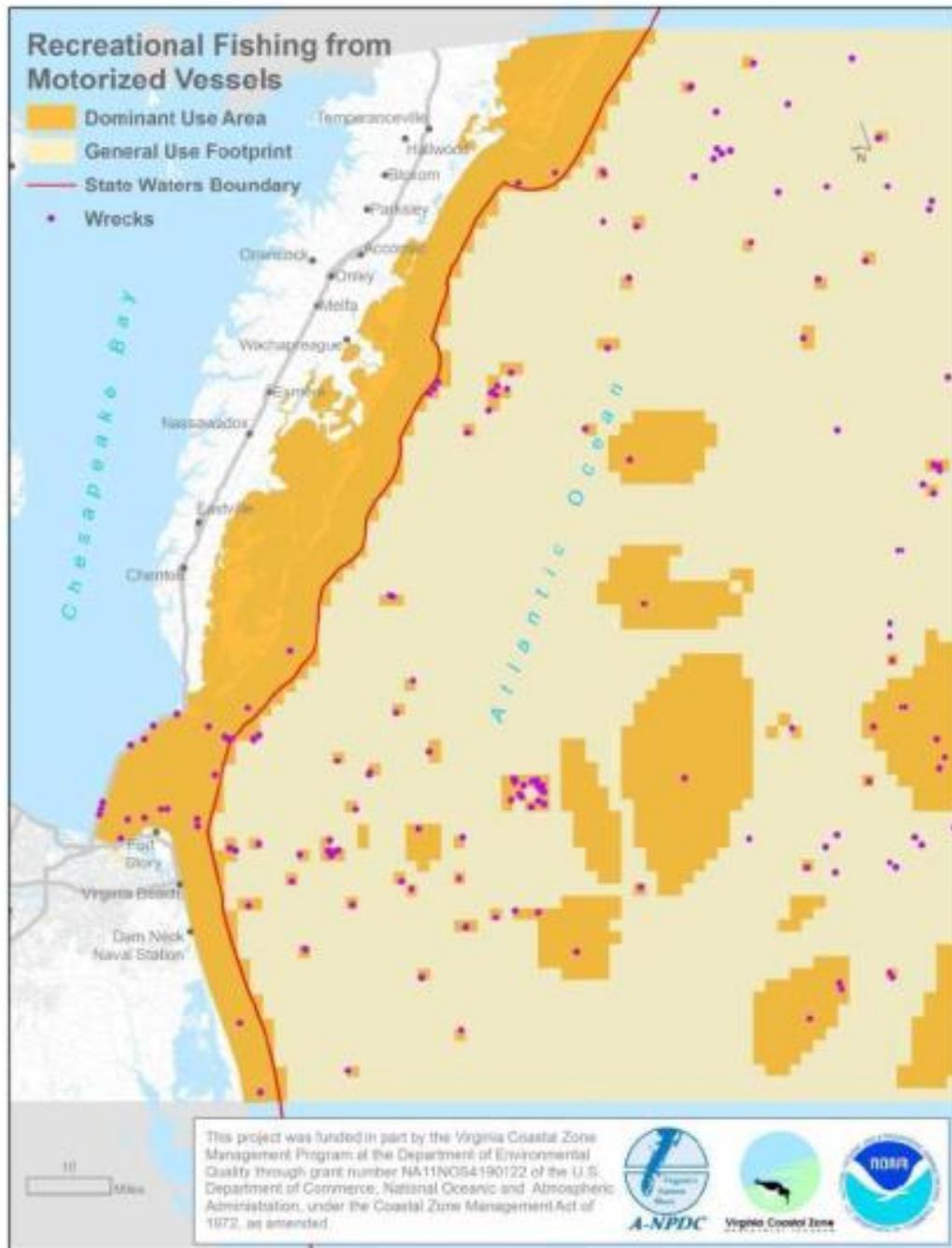


Figure 18 - Map illustrating Recreational Fishing from Motorized Vessels general and dominant use areas for the Virginia Atlantic Coast as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop.

3.0 RESULTS & DISCUSSION



Figure 19 - Map illustrating Recreational Shore Fishing general and dominant use areas for the Virginia Atlantic Coast as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop.

3.0 RESULTS & DISCUSSION

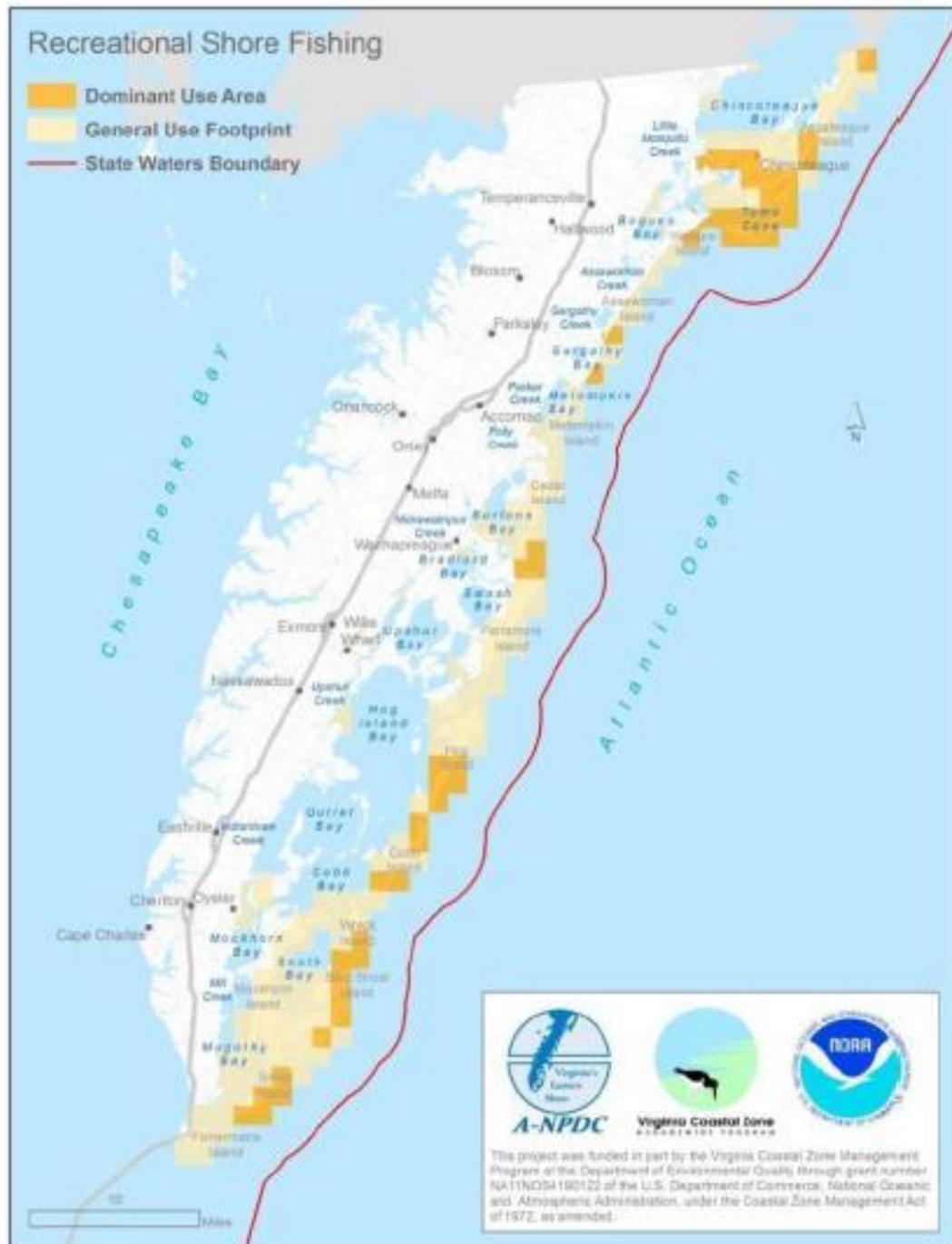


Figure 20 – Map illustrating Recreational Shore Fishing general and dominant use areas for the Eastern Shore of Virginia Seaside as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop.

3.0 RESULTS & DISCUSSION



Figure 21 – Map illustrating Recreational Shellfish Harvesting general and dominant use areas for the Virginia Atlantic Coast as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop.

3.0 RESULTS & DISCUSSION



Figure 22 - Map illustrating Recreational Shellfish Harvesting general and dominant use areas for the Eastern Shore of Virginia Seaside as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop.

3.0 RESULTS & DISCUSSION



Figure 23 - Map illustrating Recreational Waterfowl Hunting general and dominant use areas for the Virginia Atlantic Coast as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop.

3.0 RESULTS & DISCUSSION



Figure 25 – Map illustrating Motorized Boating general and dominant use areas for the Virginia Atlantic Coast as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop.

3.0 RESULTS & DISCUSSION



Figure 26 – Map illustrating Paddling general and dominant use areas for the Virginia Atlantic Coast as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop.

3.0 RESULTS & DISCUSSION

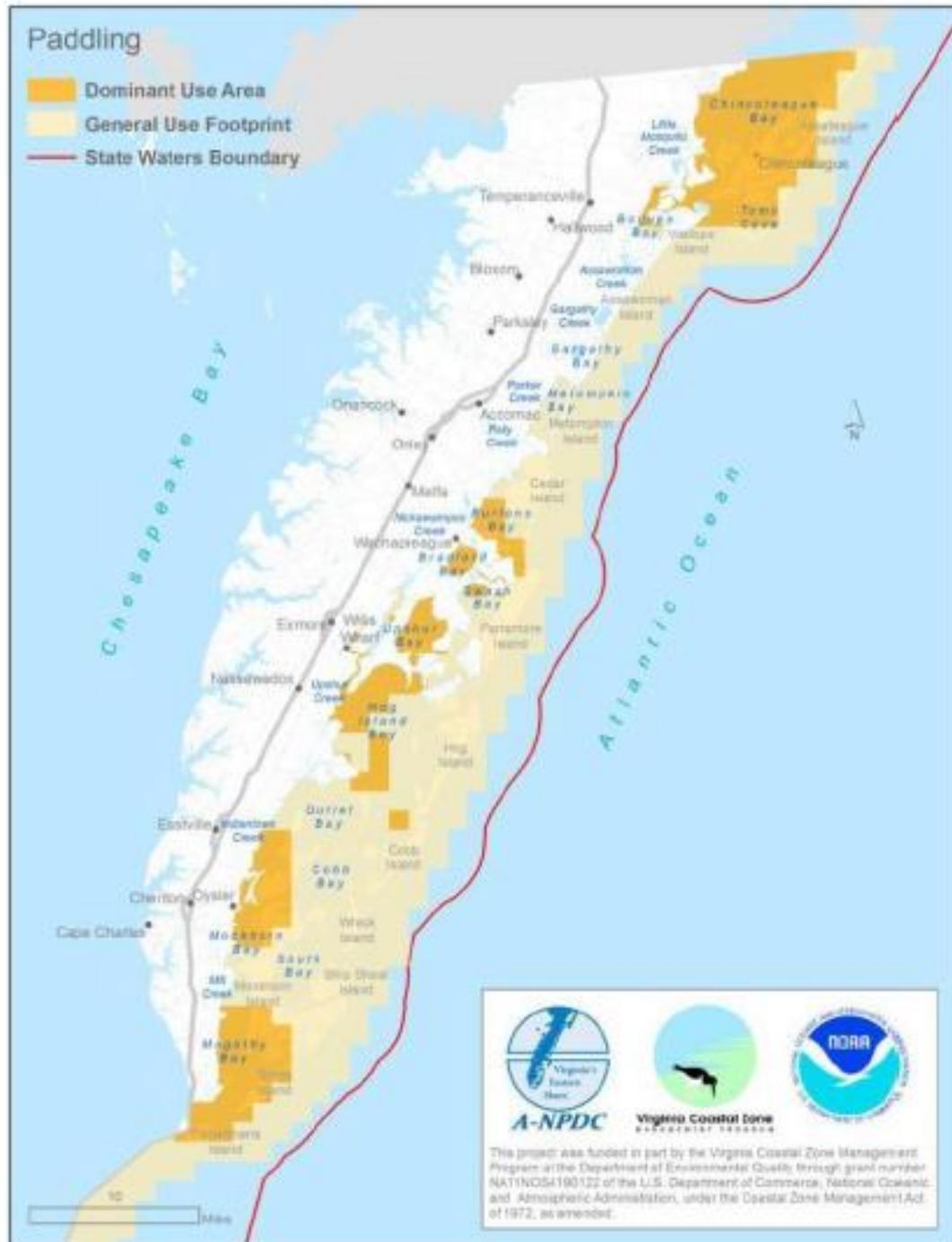


Figure 27 – Map illustrating Paddling general and dominant use areas for the Eastern Shore of Virginia Seaside as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop.

3.0 RESULTS & DISCUSSION



Figure 28 – Map illustrating Sailing general and dominant use areas for the Virginia Atlantic Coast as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop.

3.0 RESULTS & DISCUSSION

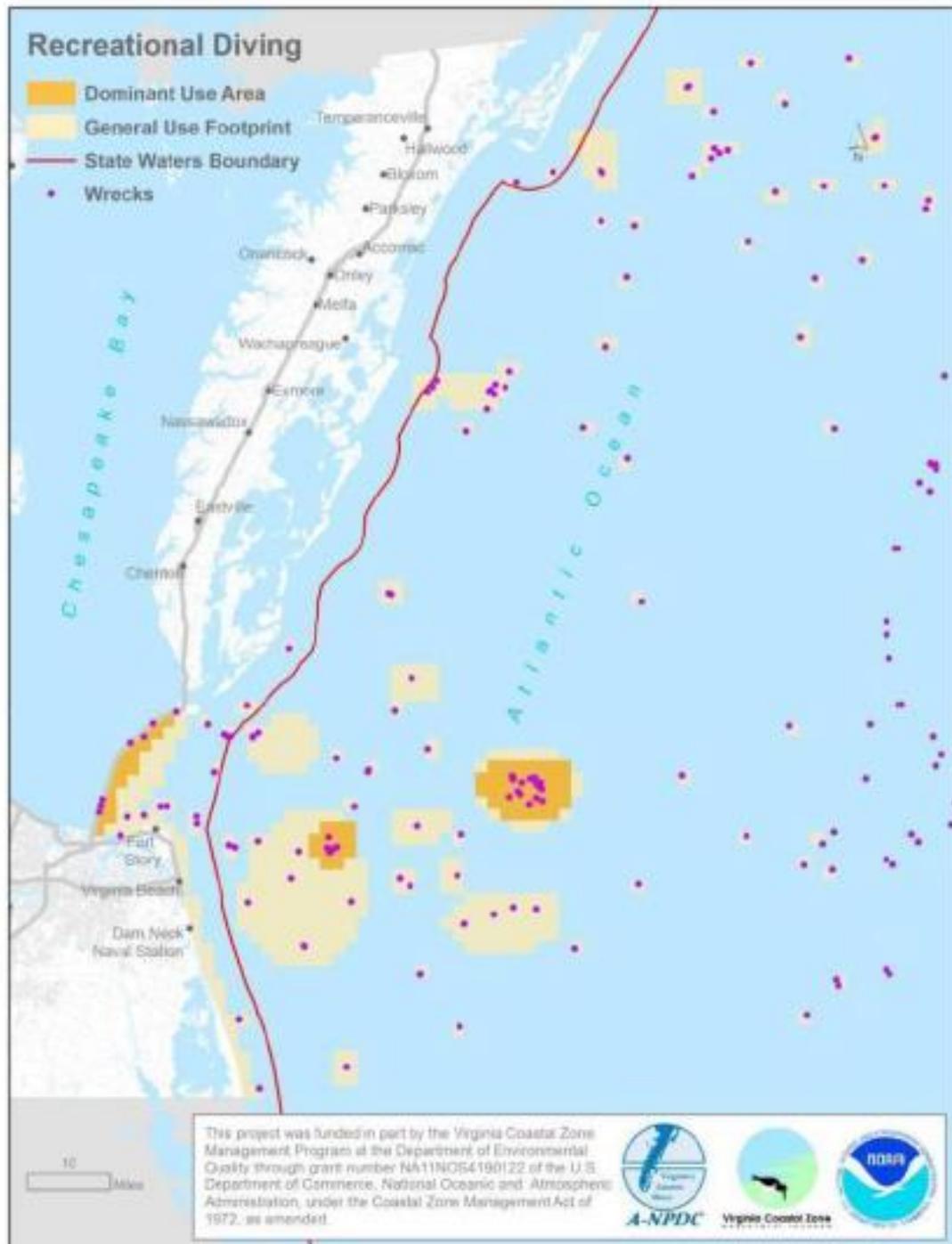


Figure 29 – Map illustrating Recreational Scuba/Snorkeling/Diving general and dominant use areas for the Virginia Atlantic Coast as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop.

3.0 RESULTS & DISCUSSION



Figure 30 - Map illustrating Shore Use general and dominant use areas for the Virginia Atlantic Coast as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop.

3.0 RESULTS & DISCUSSION



Figure 31 - Map illustrating Shore Use general and dominant use areas for the Eastern Shore of Virginia Seaside as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop.

3.0 RESULTS & DISCUSSION



Figure 32 – Map illustrating Surface Water Sports general and dominant use areas for the Virginia Atlantic Coast as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop.

3.0 RESULTS & DISCUSSION



Figure 33 – Map illustrating Surface Water Sports general and dominant use areas for the Eastern Shore of Virginia Seaside as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop.

3.0 RESULTS & DISCUSSION



Figure 34 – Map illustrating Swimming general and dominant use areas for the Virginia Atlantic Coast as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop.

3.0 RESULTS & DISCUSSION



Figure 35 - Map illustrating Historic and Cultural general and dominant areas for the Virginia Atlantic Coast as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop.

3.0 RESULTS & DISCUSSION



Figure 36 – Map illustrating Scenic and Natural general and dominant areas for the Virginia Atlantic Coast as described and validated by participants of the 2012 Recreational Use Participatory GIS Workshop.

3.0 RESULTS & DISCUSSION

Charter Fishing – Small Vessel (Figure 9) uses generally occur from shore out to the shelf break and slightly beyond. Stakeholders agreed that dominant-use areas for relatively smaller (6-pack) vessels are the areas within state waters, adjacent to wrecks and other fishing grounds, the offshore canyons, and the entire shelf-break area from approximately 100-500 fathom depth.

Stakeholders generally knew less about Charter Fishing – Large Vessel (Figure 10) use than small vessel charter fishing. The general use footprint extends from the shore out to the shelf-break and slightly beyond. Dominant-use areas were limited to the mouth of the Chesapeake Bay and Fishermans Island vicinity.



Use-information for Charter Diving and Snorkeling (Figure 11) indicated that the use generally occurs at the mouth of the Chesapeake Bay and east of state waters to a depth of approximately 150 feet. The dominant use areas include relatively shallow waters around the Chesapeake Bay Bridge Tunnel and offshore wrecks off the southern end of Assateague Island.

Charter Party Cruises (Figure 12) were reported to occasionally occur within the entire interior of the barrier islands and at the mouth of the Chesapeake Bay. Stakeholders were aware of charter party cruises occurring at specific locations and these areas were considered dominant-use areas. The dominant-use areas included the Chincoteague vicinity including Chincoteague Inlet, Toms Cove Hook at the southern end of Assateague Island, and southern Chincoteague Bay.

Stakeholders reported that Charter Wildlife Viewing (Figure 13) generally occurs at the mouth of the Chesapeake Bay and from shore to the shelf-break. Dominant-use areas were reported in the tidal creeks, lagoons, and inlets on the Seaside. Specifically, the most dominant-use areas include the Chincoteague Inlet vicinity, Metompkin Inlet/Folly Creek vicinity, the Wachapreague/Wachapreague Inlet vicinity, and the vast majority of the areas inside the barrier islands from Quinby/Quinby Inlet south to Fishermans Island. Stakeholders indicated that this use is highly seasonal and dependent on migrations times of aquatic species and wildlife.

3.0 RESULTS & DISCUSSION

Use-information for Charter Scenic Viewing (Figure 14) indicated that the use generally follows the trend of Charter Wildlife Viewing (described above) with occurs at the mouth of the Chesapeake Bay and from shore to approximately 5 miles east of the state water boundary. The dominant use areas include the Chincoteague Inlet/Chincoteague Bay vicinity, the Wachapreague/Wachapreague Inlet vicinity Broadwater Bay, marshes west of Hog Island, and the Oyster/Cobb Bay/Sand Shoal Inlet vicinity. Stakeholders indicated that this use is seasonal with most of the use occurring from Spring to late Fall.

There was relatively less known about Charter Transport (Figure 15) than other mapped uses with only two of five groups having any knowledge of this use.

Stakeholders reported general usage to occur occasionally along navigable routes to the barrier islands including Willis Wharf to Hog Island, Folly Creek to Cedar Island, and the Chincoteague/Chincoteague Bay vicinity. The most dominant use was reported to occur along a route from Chincoteague to a large sand mining operation off of Toms Cove Hook at the south end of Assateague Island.

Recreational Non-Motorized Vessel Fishing (Figure 16) was reported to occasionally occur within the entire interior of the barrier islands, the offshore area from the barrier islands approximately to the state water boundary, and at the mouth of the Chesapeake Bay. The dominant-use areas included the Chincoteague Inlet/Toms Cove Hook vicinity, and the Wise Point/Fishermans Inlet vicinity.

Stakeholders reported that Recreational Dive Fishing (Figure 17) generally occurs at the mouth of the Chesapeake Bay and adjacent to offshore wrecks. Dominant-use areas along the Seaside were only reported for the wrecks at the mouth of the Chesapeake Bay, areas adjacent to the Chesapeake Bay Bridge Tunnel, and a cluster of wrecks approximately 12 miles east of the mouth of the Chesapeake Bay.



3.0 RESULTS & DISCUSSION

One of the most widely-reported and popular uses in the study area was Recreational Fishing from Motorized Vessels (Figure 18). Stakeholders reported this use generally occurring over the entire study area. Dominant-use areas include the entire area inside of the barrier islands, mouth of the Chesapeake Bay, offshore area to the 3-mile state waters boundary, at offshore wrecks, and at the canyons and other fishing grounds at the shelf break. Stakeholders described the heaviest use to occur within 30 miles of ports and boat launches with use occurring seasonally.

Use-information for Recreational Shore Fishing (Figures 19 & 20) indicated that the use generally occurs along all of the Seaside barrier islands. The dominant use areas include the following islands: Assateague, north Wallops, Metompkin, south Cedar, Dawson Shoals, north Parramore, Hog, Cobb, Wreck, Ship Shoal, Myrtle, and Smith. Stakeholders



indicated that this use is seasonal with most of the use occurring from Spring to late Fall.

The extent to which Recreational Shellfish Harvesting (Figures 21 & 22) occurred was relatively

less understood than other mapped uses. Stakeholders reported general usage to occur on the interior of the barrier islands. The most dominant use was reported to occur within Baylor Grounds and shallow unassigned bottom areas that are suitable for shellfish growth.

Recreational Waterfowl Hunting (Figures 23 & 24) was reported to generally coincide with Recreational Shellfish Harvesting (described above), occurring within the entire inner barrier island system and approximately one-half mile offshore. The dominant-use areas were reported to be the entire inner barrier island system during open season.

Motorized Recreational Boating (Figure 25) was reported to be one of the more popular recreational activities on the Seaside with the use generally occurring from shore to approximately 10-15 miles offshore and at the mouth of the Chesapeake Bay. The use predominantly occurs in the tidal creeks, lagoons, and inlets within the barrier island system with additional dominant use areas including the areas approximately within 2 miles offshore and the areas adjacent to the Chesapeake Bay Bridge Tunnel and the

3.0 RESULTS & DISCUSSION

southern tip of the Eastern Shore peninsula. The use was reported as occurring seasonally with the peak use times coinciding with the Spring to late Fall months.

Stakeholders reported that Paddling (Figures 26 & 27) generally occurs along the entire interior of the barrier island system and at the mouth of the Chesapeake Bay with some use occurring offshore as far as one mile. Dominant-use



areas along the Seaside were reported for the entire Chincoteague vicinity, the Wachapreague/Wachapreague Inlet vicinity, the Quinby vicinity, Willis Wharf, Machipongo River, Red Bank, the Oyster vicinity, and the waters surrounding Wise Point. Paddling mostly coincides with the Seaside Water Trail and predominantly occurs seasonally from Spring to late Fall.

Use-information for Sailing (Figure 28) indicated that the use generally occurs from the Seaside barrier islands to the eastern boundary of the study area as there is dispersed transit throughout the study area. Additional general usage was reported for the navigable channels leading to the ocean from the ports of Chincoteague, Wachapreague, and Oyster. There were no dominant-use areas reported for the Seaside of the Eastern Shore.

Stakeholders reported that Recreational Diving (Figure 29) coincides with Charter Dive Fishing (described above) with the use generally occurring at the mouth of the Chesapeake Bay and adjacent to offshore wrecks. Dominant-use areas along the Seaside were only reported for the wrecks at the mouth of the Chesapeake Bay, areas adjacent to the Chesapeake Bay Bridge Tunnel, and a cluster of wrecks approximately 12 miles east of the mouth of the Chesapeake Bay.

Shore Use (Figures 30 & 31) was one of the most popular recreational activities reported for the Seaside with the use generally occurring along all beaches and marshes along the interior of the barrier island system. The most predominantly-used area was reported to be at Assateague Island, which is the only point on the barrier islands accessible by

3.0 RESULTS & DISCUSSION

vehicle. Other dominant-use areas included the areas adjacent to the following tidal inlets: Chincoteague, Gargatha, Metompkin, Wachapreague, Quinby, Machipongo, Sand Shoal, New, and Fishermans. The use was reported as occurring year-round with the peak use times coinciding with the Spring to late Fall months.

Use-information for Surface Water Sports (Figures 32 & 33) indicated that general-use areas exist at the Chincoteague Bay, various spots on the barrier islands and at the tidal inlets, various spots in the tidal creeks and lagoons, the southern tip of the Eastern Shore peninsula, and the Chesapeake Bay Bridge Tunnel. Since kite and wind surfing occasionally occur up to one mile offshore, some general use areas were mapped to this distance outside of various tidal inlets. There only dominant-use area reported for the Seaside of the Eastern Shore was at southern Assateague Island from the parking area to the southern end of the island. This area is a very popular location for surfing, body boarding, and various other surface water sports. Surfing was the only surface water sport to be reported as occurring year-round. All surface water sports were reported to peak during the warm weather months from Spring to late Fall.



Use-information for Swimming (Figure 34) generally coincided with Shore Use and Surface Water Sports (described above). The general-use areas mapped included the entire Seaside barrier island chain with some inland areas near harbors, landings, and boat ramps. The most dominant-use area

reported for the Seaside was for Assateague Island near the parking lots with other heavily-used areas at the beaches adjacent to following tidal inlets: Gargatha, Metompkin, Wachapreague, Sand Shoal, and Fishermans. The use was reported as occurring seasonally during the warm weather months from Spring to late Fall.

3.0 RESULTS & DISCUSSION

Historic and Cultural Areas (Figure 35) included areas with inherent cultural, traditional, archaeological, religious, spiritual, tribal or historic value. These areas were mapped as a preliminary attempt to identify specific areas that could be revisited and assessed in greater detail in the future. The general Historic



and Culture area footprint included the entire Seaside barrier island system. The most valuable areas included Assateague and Chincoteague Islands, north Cedar Island, south Hog Island at the former location of the village of Broadwater, south Cobb Island, north Smith Island, the Chesapeake Bay Bridge Tunnel, and Wise Point and various other landings on the southern mainland of the Seaside.

Scenic and Natural Areas (Figure 36) were mapped for the exact reason as Historic and Cultural Areas described above. The general Scenic and Natural area footprint included the entire Seaside barrier island system and the offshore viewshed from the barrier



islands. The most important areas included the entire Chincoteague vicinity, Bradford Bay, Upshur Bay, Willis Wharf, the Machipongo River, Mockhorn Bay, Wise Point, Fishermans Island, and the Chesapeake Bay Bridge Tunnel and its viewshed to the east.

3.0 RESULTS & DISCUSSION

3.3 Aerial Surveys

The recreational uses observed during the 2012 and 2013 aerial surveys for the following uses are summarized in the following table (Figure 37). All counts of observed recreational uses are summarized in Appendix F.

Recreational Use	Observed	Not Observed
Indeterminable Recreational Use	✓	
Charter Fishing		✓
Charter Diving/Snorkeling		✓
Charter Party Cruises		✓
Charter Wildlife Viewing		✓
Charter Scenic Viewing		✓
Charter Transport		✓
Recreational Kayak & Non-Motorized Vessel Fishing		✓
Recreational Dive Fishing		✓
Recreational Fishing from Motorized Vessels	✓	
Recreational Shore Fishing	✓	
Recreational Shellfish Harvesting		✓
Recreational Waterfowl Hunting		✓
Motorized Boating	✓	
Paddling	✓	
Sailing	✓	
Scuba/Snorkeling/Diving		✓
Shore Use	✓	
Surface Water Sports	✓	
Swimming	✓	

Figure 37 – Table summarizing recreational uses observed during the 2012 and 2013 aerial surveys.

As noted in Section 2.3.2, chartered uses were not counted since they could not easily be distinguished from non-chartered uses. Recreational Shellfish Harvesting and Scuba/Snorkeling/Diving are commonly-known uses on the Seaside during the warm-weather months, but these uses were not observed during the surveys. It was not

3.0 RESULTS & DISCUSSION

expected to encounter any Recreational Waterfowl Hunting since the peak use time is during colder-weather months and surveys were not conducted during these times.

Examples of photographs from each observed recreational use are included in Figure 38.



3.0 RESULTS & DISCUSSION



Paddling



Sailing



Shore Use



Surface Water Sports



Swimming

Figure 38 (Continued) - Examples of photographs of each recreational use observed during the 2012 and 2013 aerial surveys.

3.0 RESULTS & DISCUSSION

3.3.1 Recreational Uses by Flight Date

It is well understood that the majority of recreational use occurs on days when more people are not working and when weather conditions are optimal. The aerial surveys were carried out in a variety of meteorological conditions and during both weekdays and weekends to try to quantify these differences and their influence on recreational use. Figure 39 summarizes recreational uses by flight date. Flight logs containing specific details of the flights and meteorological condition notes are included in Appendix G.

Flight Date	Indeterminable Rec. Use	Rec. Fishing from Motorized Vessel	Recreational Shore Fishing	Motorized Boating	Padding	Sailing	Shore Use	Surface Water Sports	Swimming
7/3/12	3	9	3	75	4	0	748	43	296
*8/19/12	30	4	4	71	7	0	171	7	12
8/23/12	27	14	4	18	6	1	135	1	41
8/30/12	22	13	5	31	1	0	55	1	3
*9/1/12	39	32	2	144	14	0	415	5	37
9/6/12	0	3	0	0	0	0	0	0	0
*9/9/12	9	5	0	9	0	0	55	3	2
*9/22/12	4	10	0	2	1	1	0	0	0
*7/6/13	15	56	0	62	2	0	24	0	0
*7/27/13	38	34	0	100	0	2	88	0	0
9/5/13	10	28	0	19	0	0	1	0	0
9/26/13	5	4	0	0	0	2	0	0	0
*9/28/13	2	1	0	0	0	0	0	0	0
10/3/13	12	22	2	0	1	0	9	0	0
Totals	216	235	20	531	36	6	1,701	60	391

*= Flights occurring on weekends

Figure 39 - Table summarizing recreational use counts observed during the 2012 and 2013 aerial surveys.

3.0 RESULTS & DISCUSSION

The recreational use most observed during the aerial surveys was Shore Use (1,701) followed by Motorized Boating (531), Swimming (391), and Recreational Fishing from Motorized Vessel (235).

Indeterminable Recreational Use (216) ranked as the fifth most observed use indicating that there was a significant amount of photographs that were not of adequate resolution to distinguish use type. This is largely due to the fact that many photographs were taken at large distances from the use and while the digital camera had the capability to take high resolution from afar; it often could not bring the use into focus due to the speed of the aircraft.

The most observations for any use type during a single aerial survey occurred on July 3, 2012 when 748 Shore Users were observed. This day represented near ideal conditions for peak recreational use as it was a national holiday weekend with clear conditions and minimal winds. The majority of Shore Use and Swimming observations occurred at the Assateague Island National Seashore. The Assateague Island National Seashore is the only public beach on the Seaside that is accessible by automobile and as such, there are noticeable trends in the Shore Use and Swimming data. These uses occurring at the only public beach on the Seaside were observed in the greatest numbers mostly because they can be done by a greater portion of the population and they typically require less of an investment in time and money. Aside from Shore Use and Swimming, the other uses can require equipment that can be too costly for some, experience and free time which fewer people have.

The data in Figure 39 also show that weather conditions can have a significant impact on recreational use. This is especially true for the uses that occur in places that can only be accessed by vessel, such as Recreational Fishing from Motorized Vessel and Motorized Boating. While it was attempted to perform the aerial surveys during ideal conditions in order to capture peak use, there were surveys that occurred on days that would not be classified as "ideal" conditions. The survey on Thursday, September 5, 2013 resulted in a below average number of observations due to a moderate chance of daytime storms in the forecast and conditions worsening over the duration of the survey. Conversely, surveys occurring on days with zero to minimal chances of daytime storms and negligible winds were consistently the days when an above average number of observations occurred.

Figures 40 through 48 illustrate comparisons of recreational uses occurring on the weekends and weekdays during aerial surveys in 2012 and 2013.

3.0 RESULTS & DISCUSSION

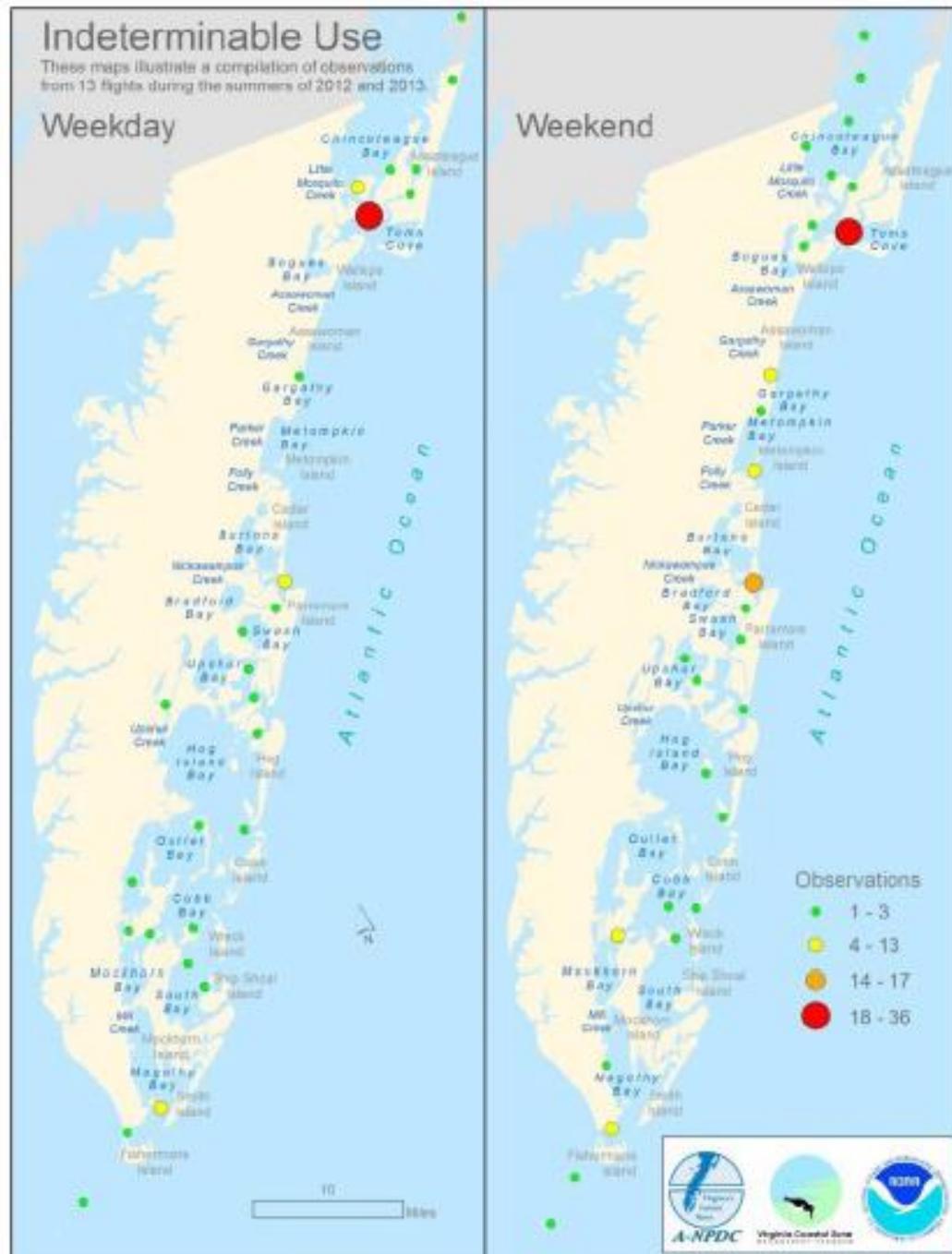


Figure 40 – Maps showing Indeterminable Recreational Use observations occurring on weekdays and weekends.

3.0 RESULTS & DISCUSSION

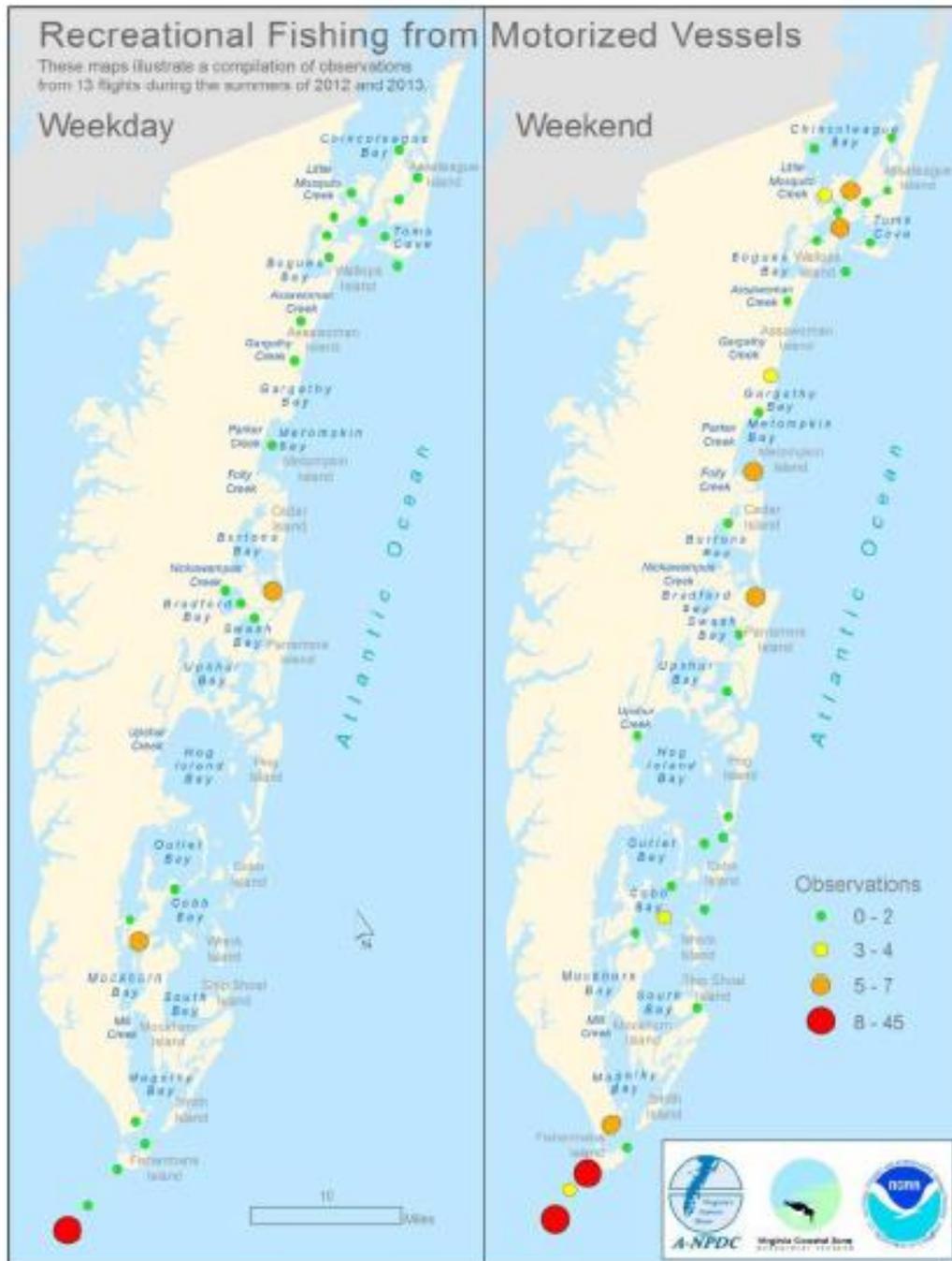


Figure 41 - Maps showing Recreational Fishing from Motorized Vessel observations occurring on weekdays and weekends.

3.0 RESULTS & DISCUSSION

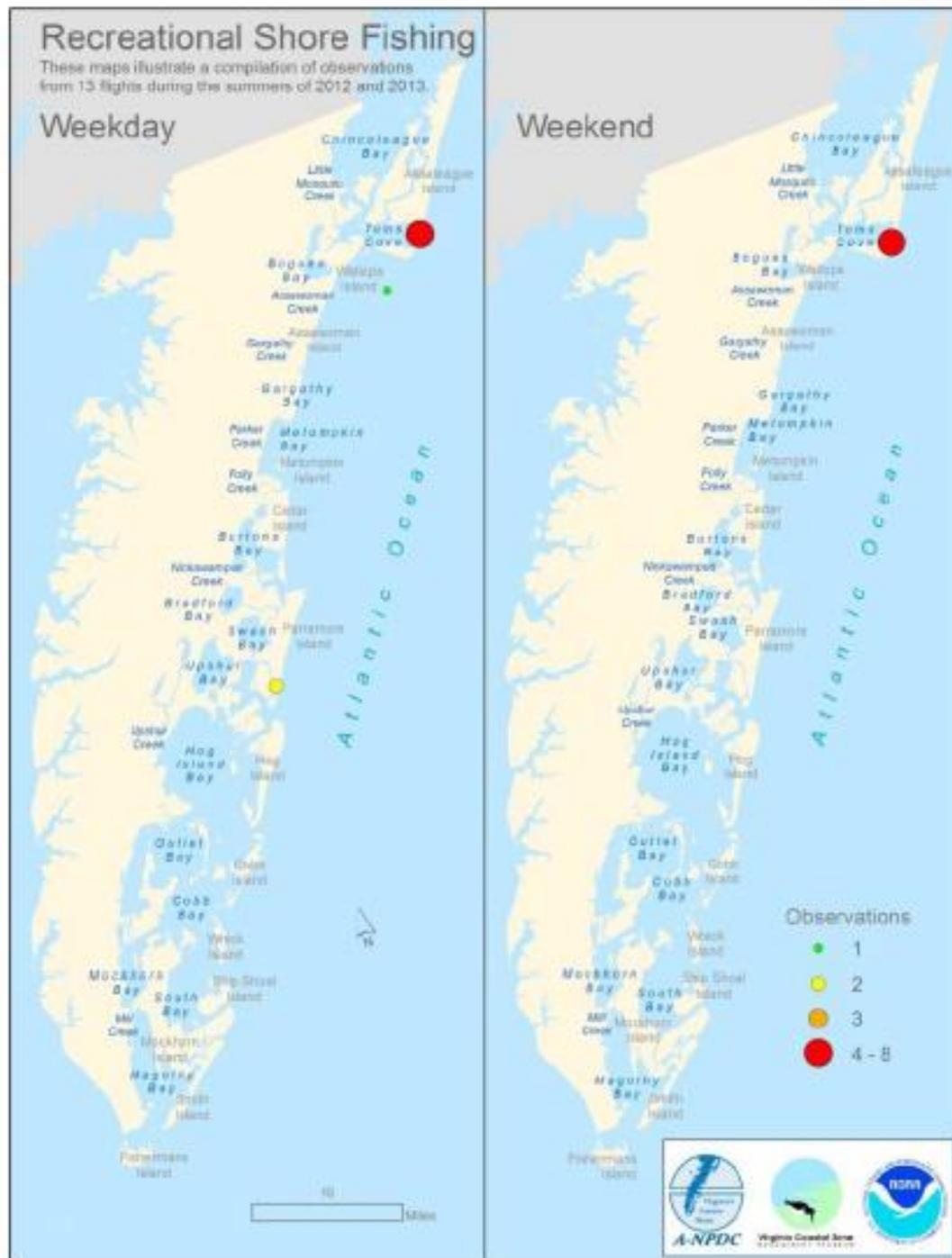


Figure 42 – Maps showing Recreational Shore Fishing observations occurring on weekdays and weekends.

3.0 RESULTS & DISCUSSION

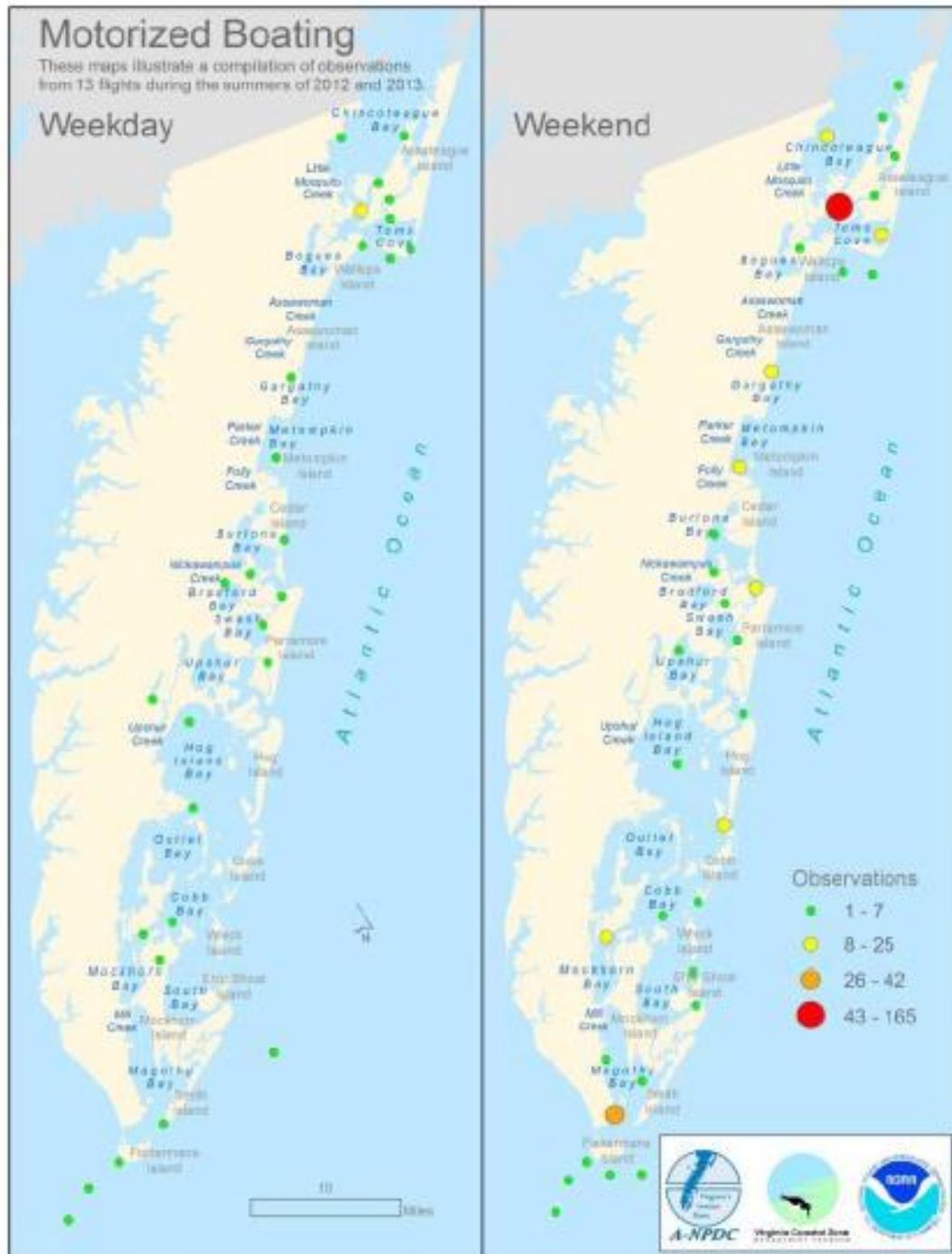


Figure 43 – Maps showing Motorized Boating observations occurring on weekdays and weekends.

3.0 RESULTS & DISCUSSION

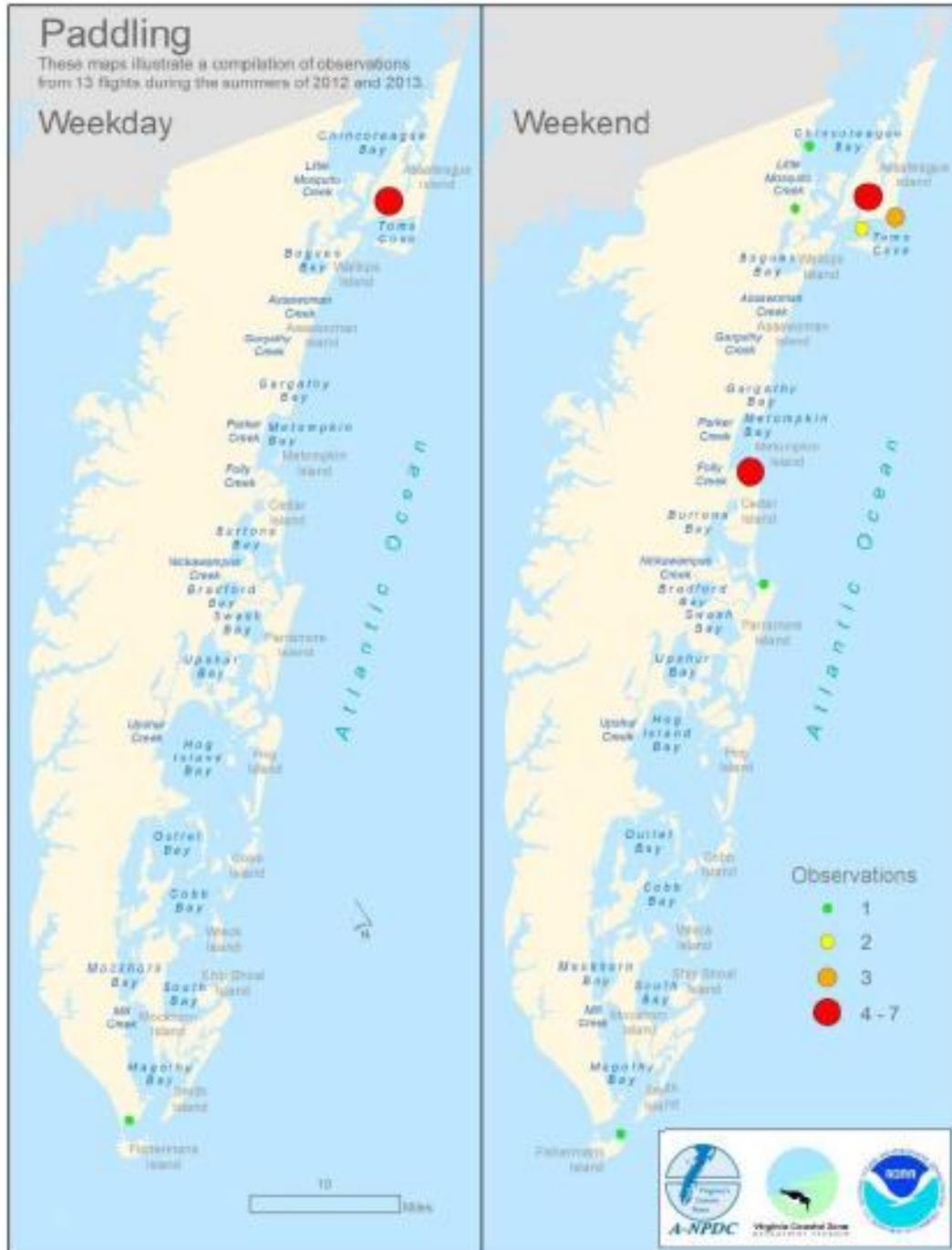


Figure 44 – Maps showing Padding observations occurring on weekdays and weekends.

3.0 RESULTS & DISCUSSION



Figure 45 – Maps showing Sailing observations occurring on weekdays and weekends.

3.0 RESULTS & DISCUSSION

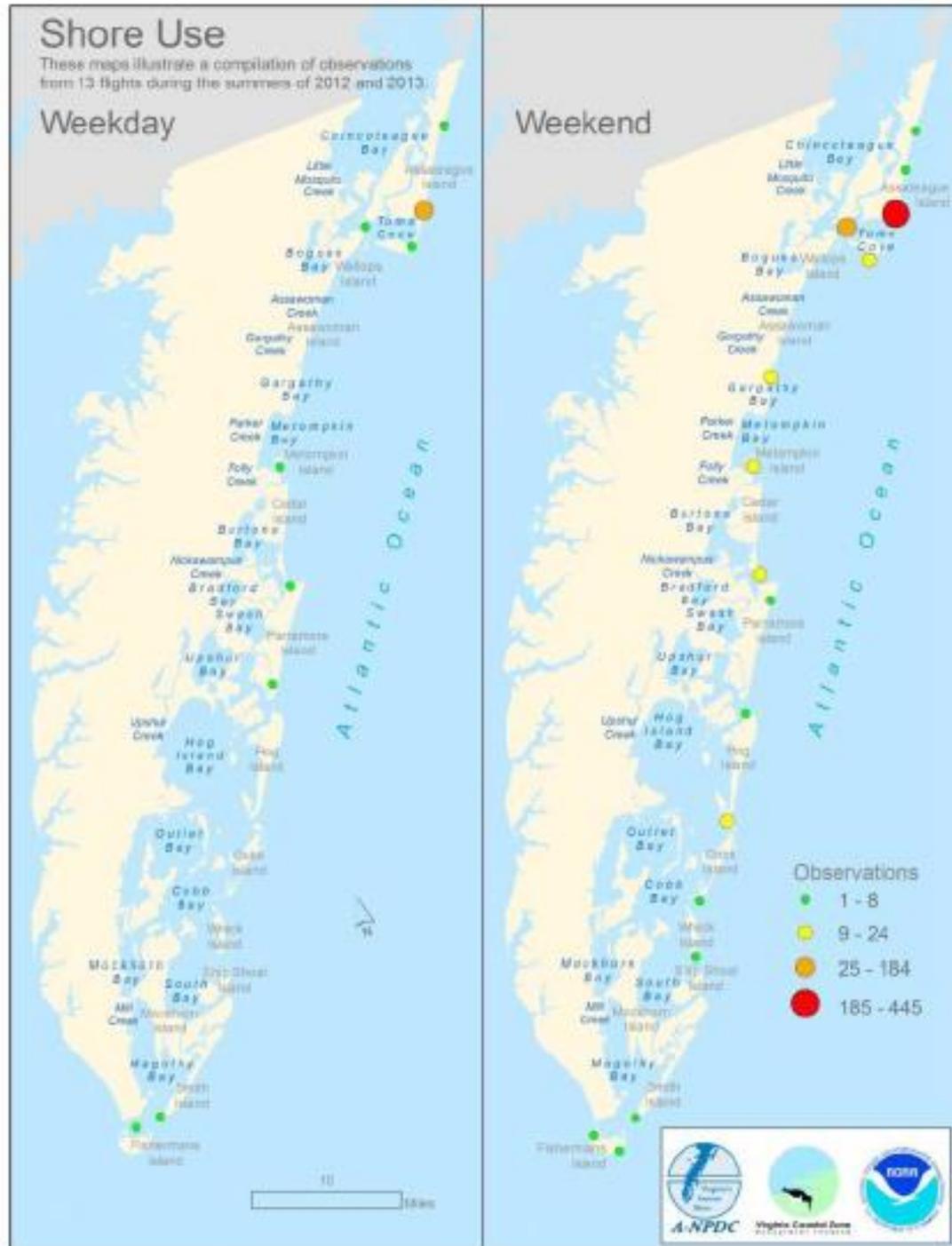


Figure 46 – Maps showing Shore Use observations occurring on weekdays and weekends.

3.0 RESULTS & DISCUSSION

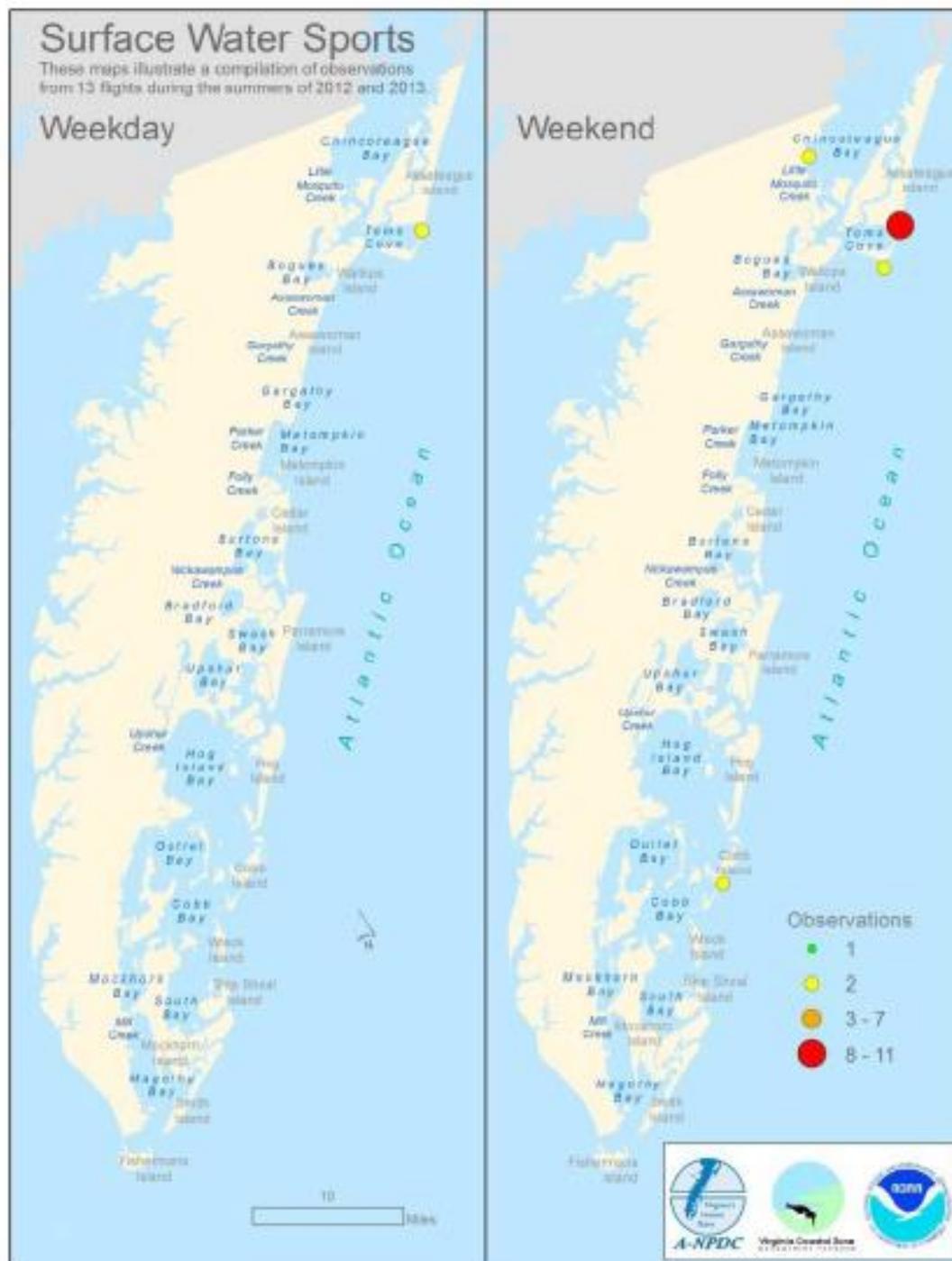


Figure 47 – Maps showing Surface Water Sport observations occurring on weekdays and weekends.

3.0 RESULTS & DISCUSSION

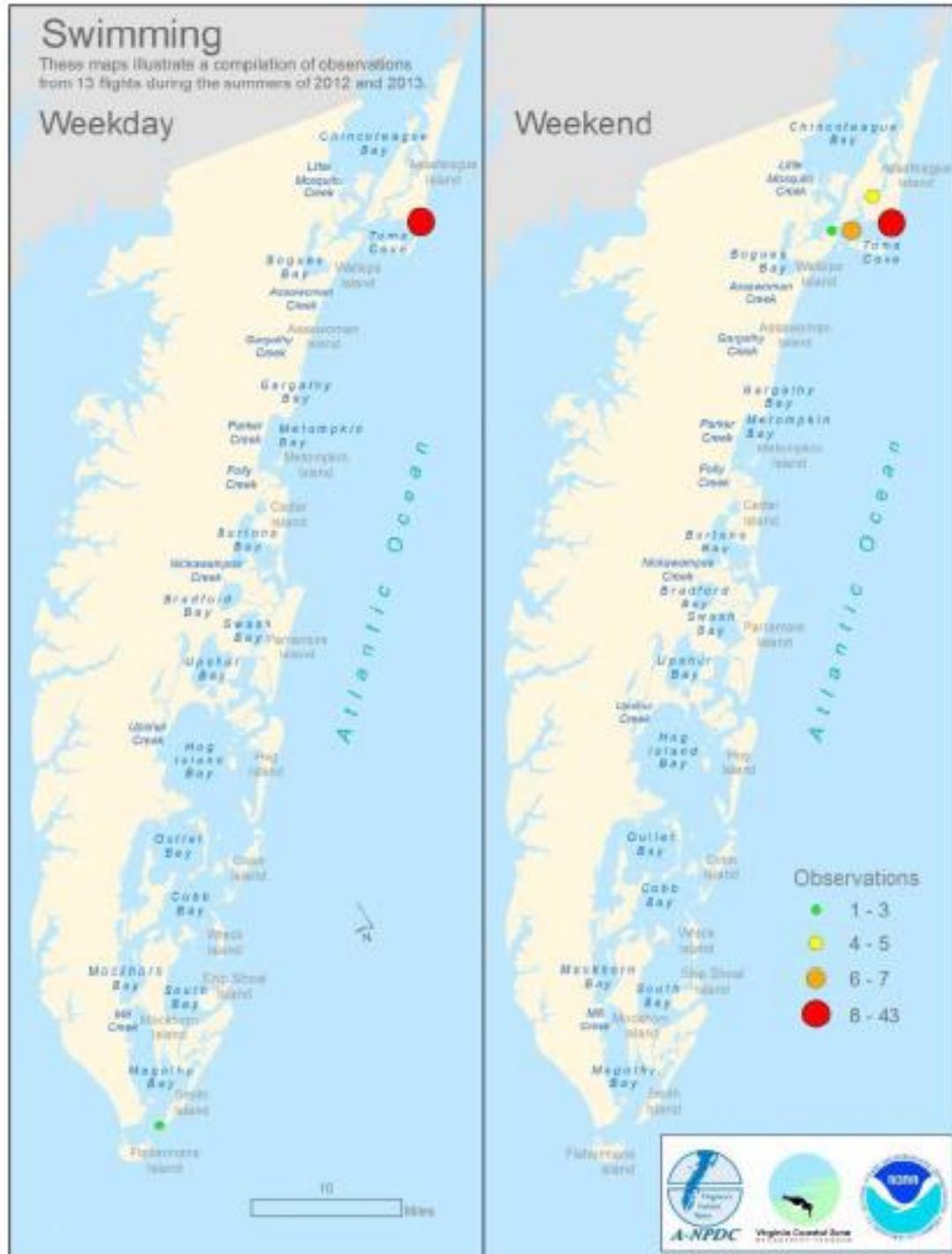


Figure 48 – Maps showing Swimming observations occurring on weekdays and weekends.

3.0 RESULTS & DISCUSSION

Indeterminable Recreational Uses (Figure 40) were encountered in relatively greater numbers on weekends as compared to weekdays. The most intense uses occurred in the Chincoteague Inlet/Assateague Island vicinity for both weekdays and weekends. Moderate-use areas were also encountered in more places on the weekends (5) than during weekdays (3).



Recreational Fishing from Motorized Vessels (Figure 41) was

found to be significantly more intense and widespread during the weekends as compared to weekdays. Weekend use increased sharply at the southern end of the field survey area.

Only 20 observations of Recreational Shore Fishing (Figures 39 and 42) were encountered and these basically occurred at the same intensity and at the same locations during the week and during the weekends. The most intense use occurred on Tom's Cove Hook at the southern end of Assateague Island.

Motorized Recreational Boating (Figure 43) was observed in similar locations on weekends as compared to weekdays. However, the intensity of this use at these locations increased drastically during weekends. This holds true especially for the Chincoteague Inlet vicinity and to a lesser extent near the other tidal inlets along the barrier islands.

Paddling was only observed on 36 occasions with slightly more occurring during weekends (Figures 39 and 44). The Chincoteague area experienced a significant increase in paddling on the weekends.

Sailing was only observed on 6 occasions making it difficult any use trends for weekday versus weekend (Figures 39 and 45).

3.0 RESULTS & DISCUSSION



Shore Use (Figure 46) was the most observed recreational use and there was a significant increase in both activity and the number of areas where the use was observed. Specifically, Shore Use was greatest on Assateague Island and Chincoteague Inlet where it increased from minimal/moderate during the week to moderate/heavy during weekends. Minimal Shore Use

was observed along several other barrier islands during the week, but this use became more intense and widespread during the weekends.

Surface Water Sports and Swimming (Figures 39, 47 and 48) were observed primarily on Assateague Island and in the Chincoteague Inlet/Bay vicinity. Activity was found to increase during weekends.

3.3.2 Recreational Uses by Location & Density

In addition to understanding when recreational uses occur on the Seaside as discussed in Section 3.3.1, it is equally important to know exactly where these uses occur. Figures 49 through 57 illustrate compilations of observations from all aerial surveys during 2012 and 2013. In general, the most active recreational areas observed were in the vicinity of Chincoteague and Assateague Islands and the mouth of the Chesapeake Bay/Fisherman Island vicinity at the southern end of the Delmarva Peninsula. Additional locations that were observed to receive an above average quantity of recreational use included the areas in the vicinity of Gargatha, Metompkin, Wachapreague, Quinby, Machipongo, and Sand Shoal Inlets.

3.0 RESULTS & DISCUSSION

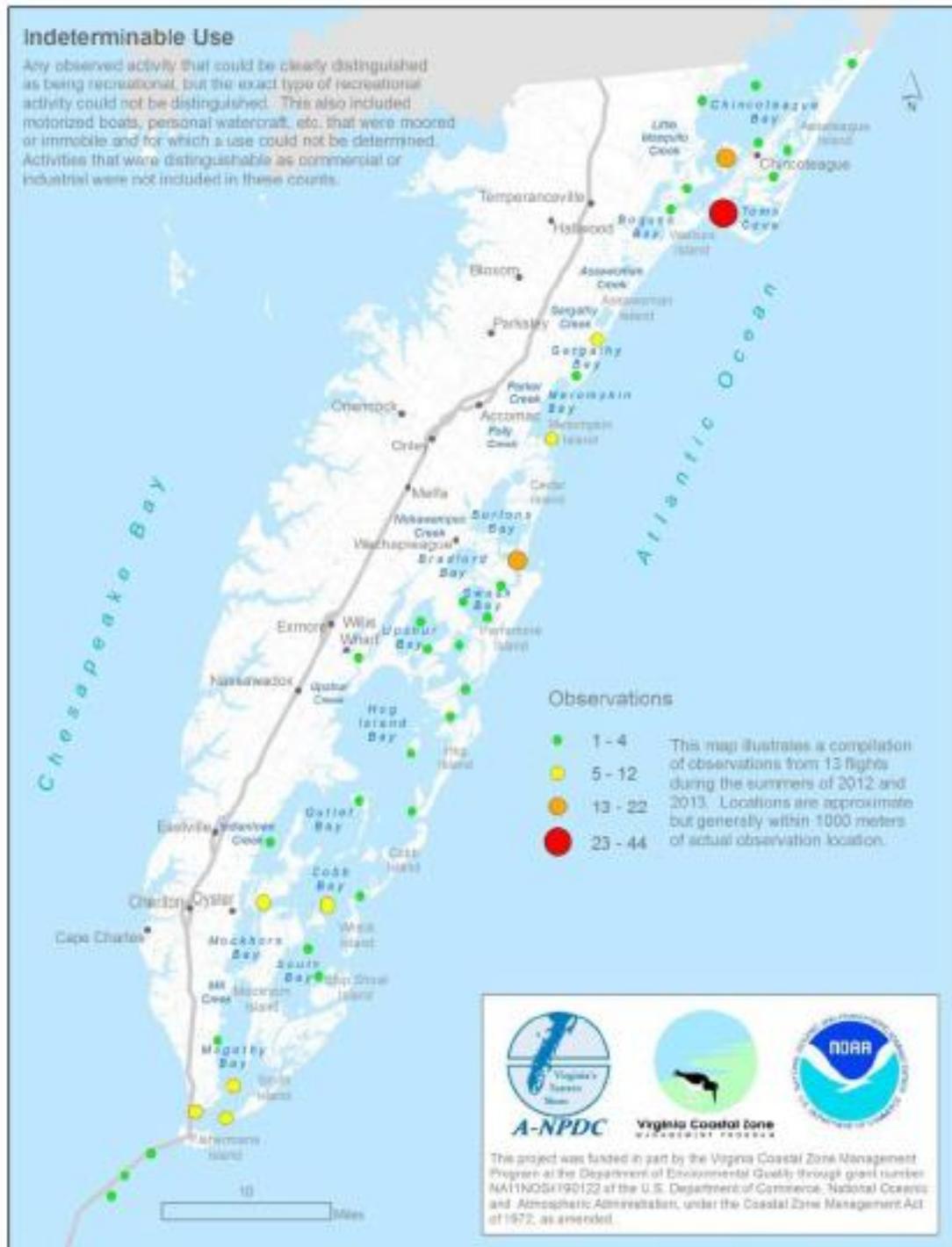


Figure 49 – Map illustrating a compilation of Indeterminable Use observations made during aerial surveys in 2012 and 2013.

3.0 RESULTS & DISCUSSION

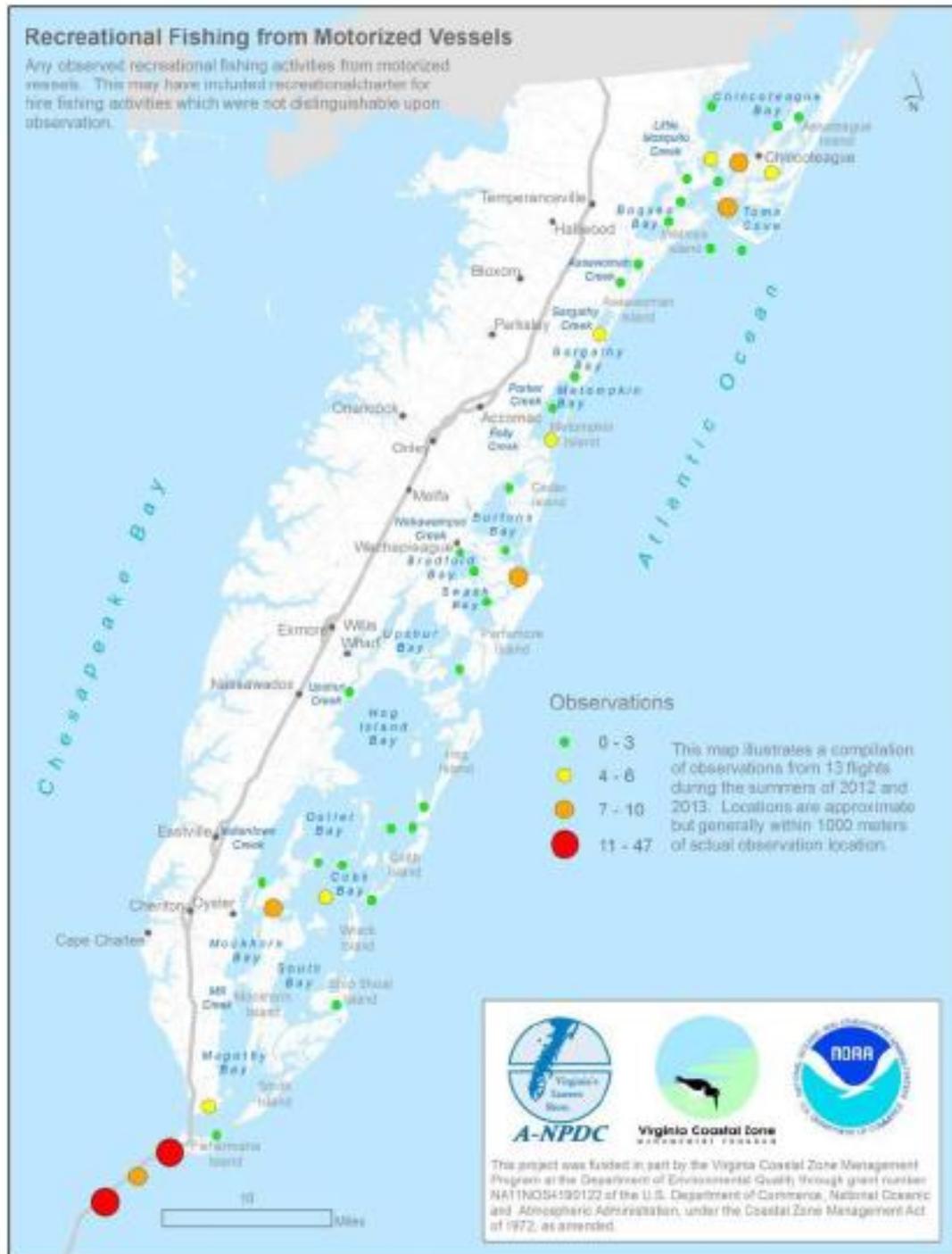


Figure 50 – Map illustrating a compilation of Recreational Fishing from Motorized Vessel observations made during aerial surveys in 2012 and 2013.

3.0 RESULTS & DISCUSSION



Figure 51 – Map illustrating a compilation of Recreational Shore Fishing observations made during aerial surveys in 2012 and 2013.

3.0 RESULTS & DISCUSSION

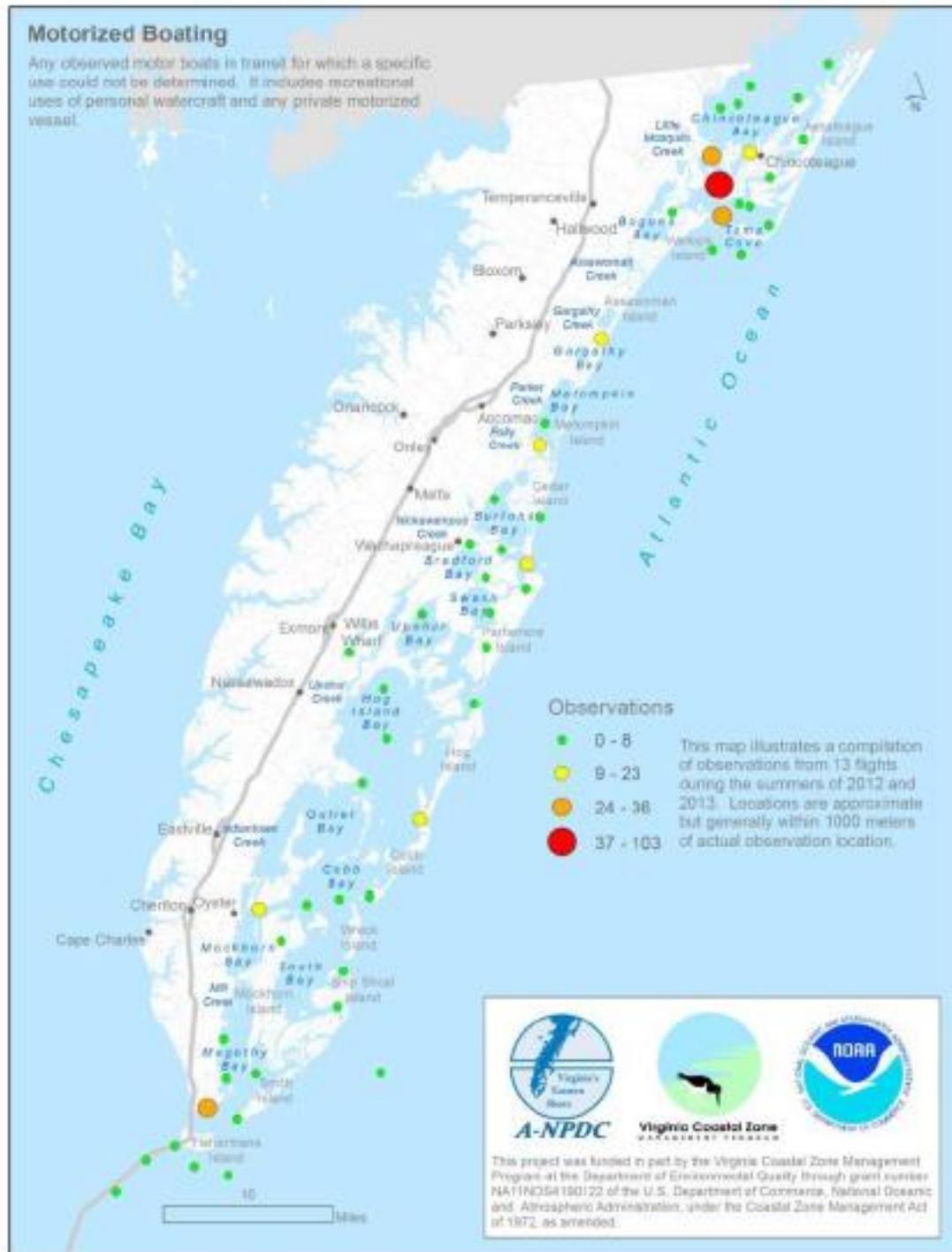


Figure 52 – Map illustrating a compilation of Motorized Boating observations made during aerial surveys in 2012 and 2013.

3.0 RESULTS & DISCUSSION

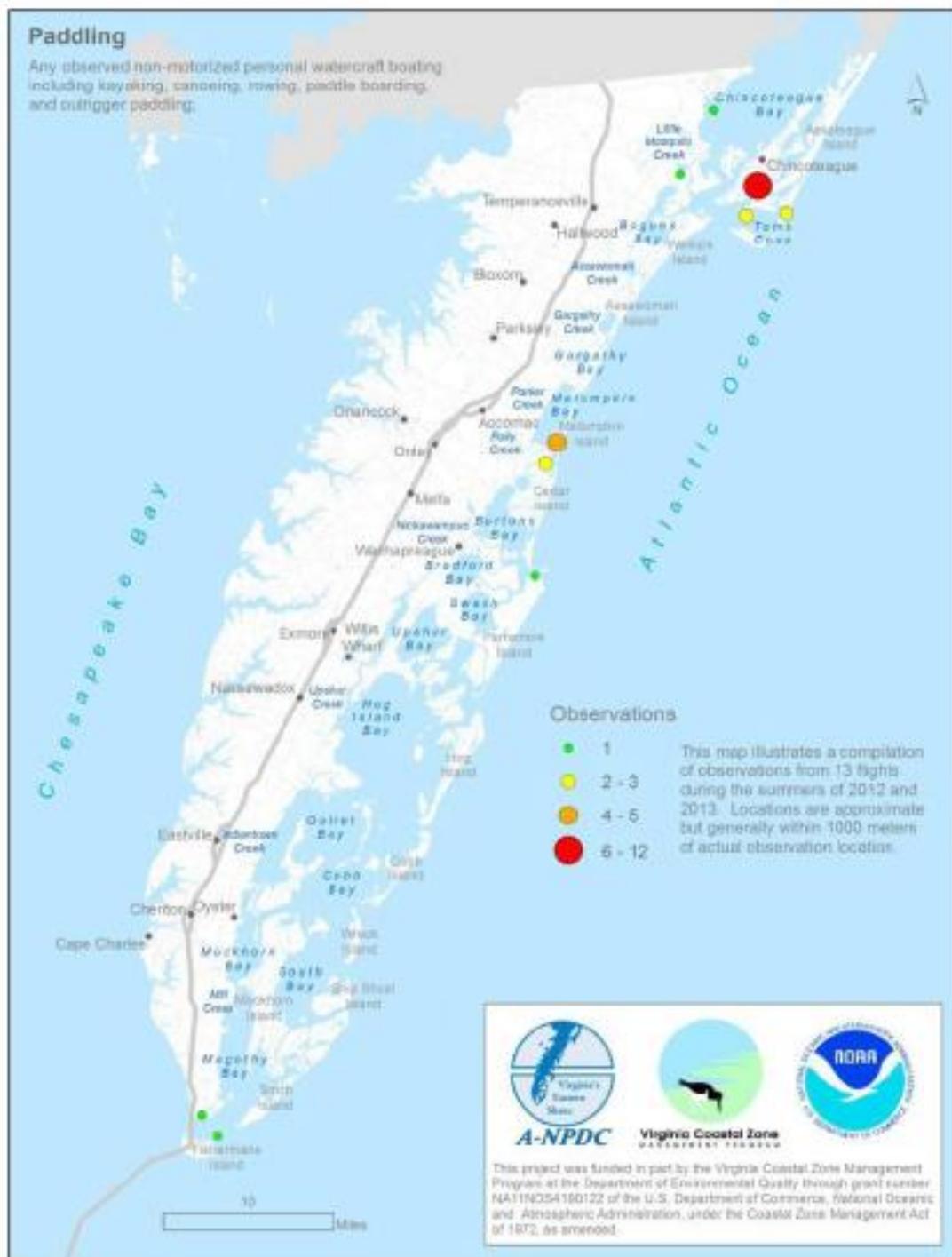


Figure 53 – Map illustrating a compilation of Paddling observations made during aerial surveys in 2012 and 2013.

3.0 RESULTS & DISCUSSION

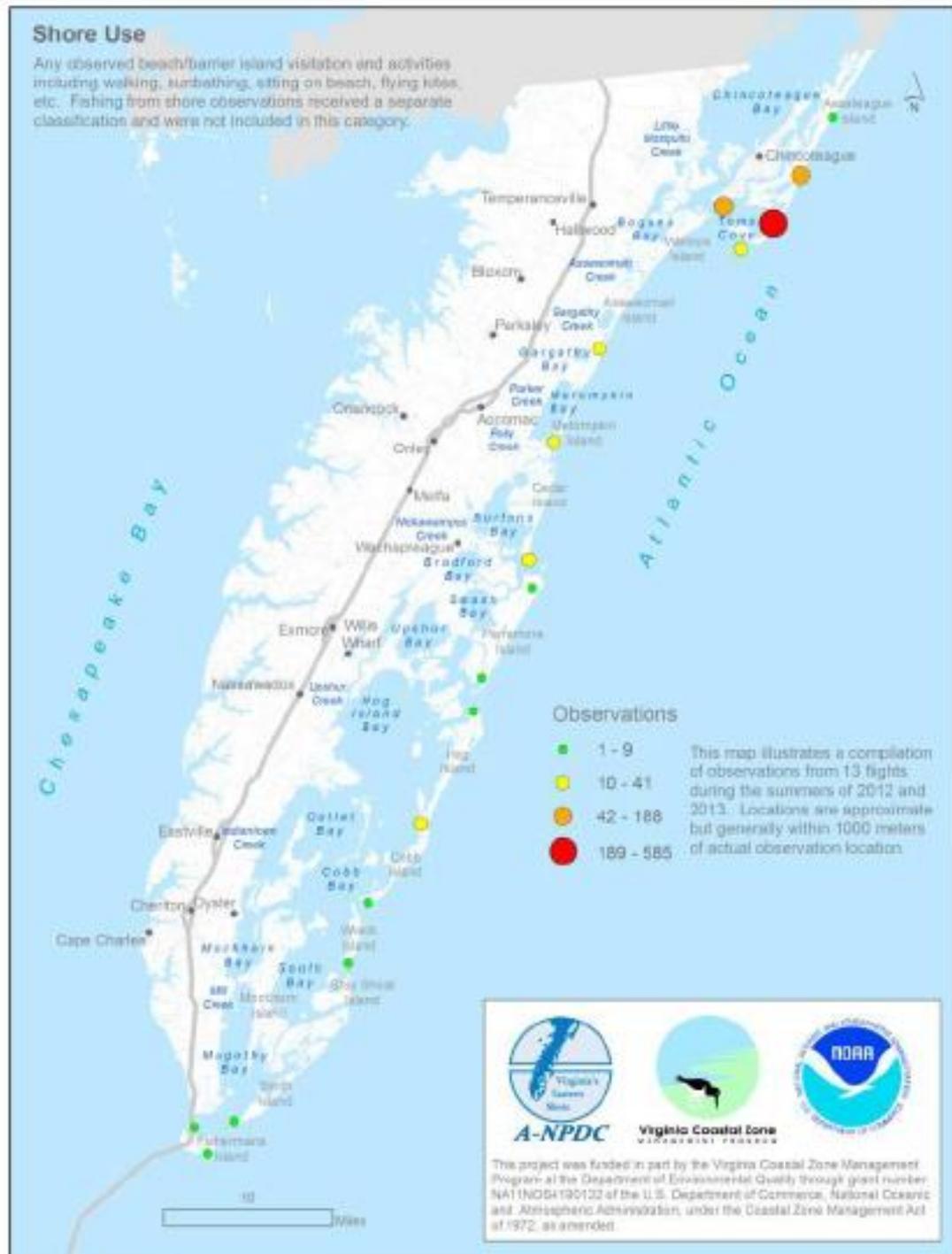


Figure 55 – Map illustrating a compilation of Shore Use observations made during aerial surveys in 2012 and 2013.

3.0 RESULTS & DISCUSSION

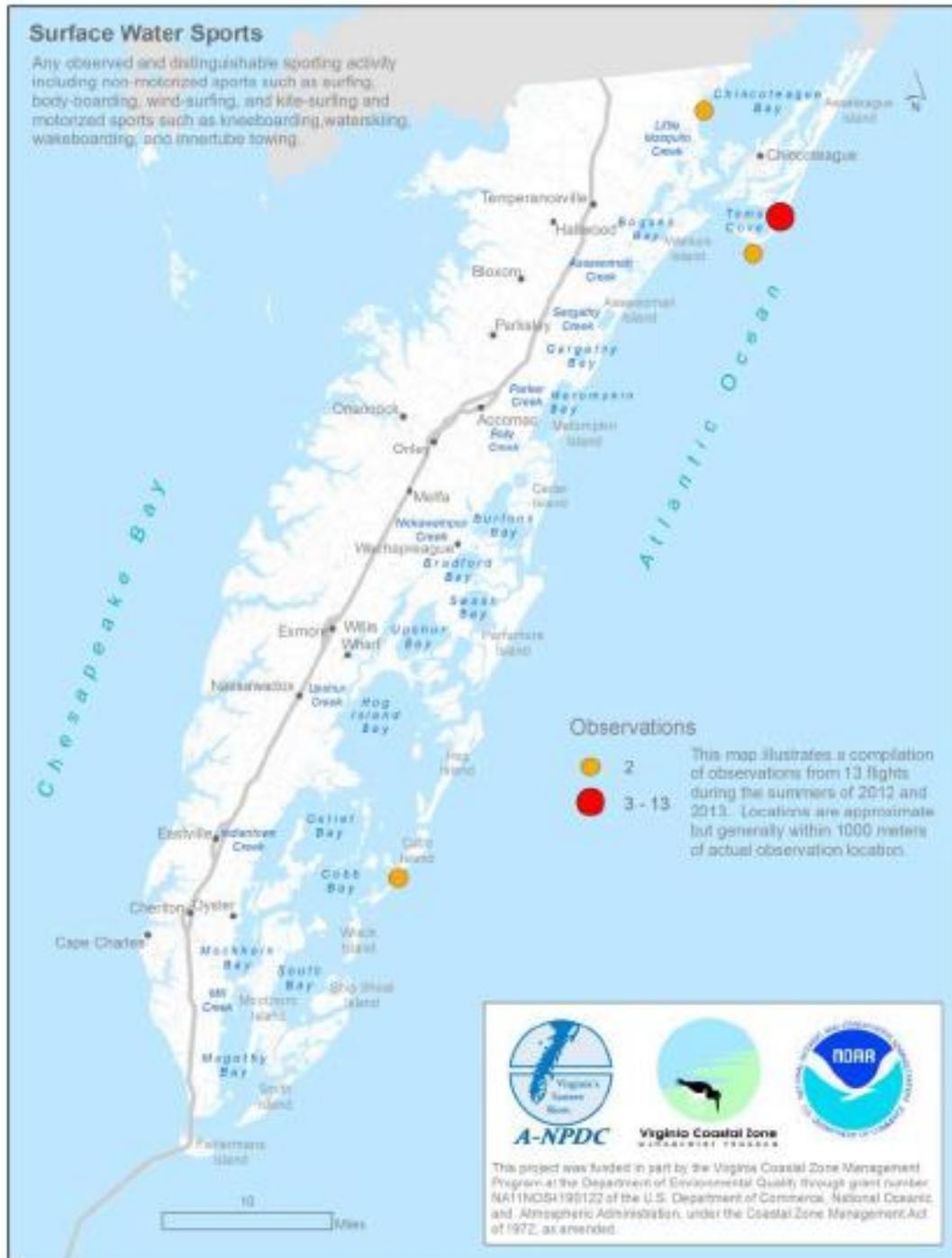


Figure 56 - Map illustrating a compilation of Surface Water Sports observations made during aerial surveys in 2012 and 2013.

3.0 RESULTS & DISCUSSION

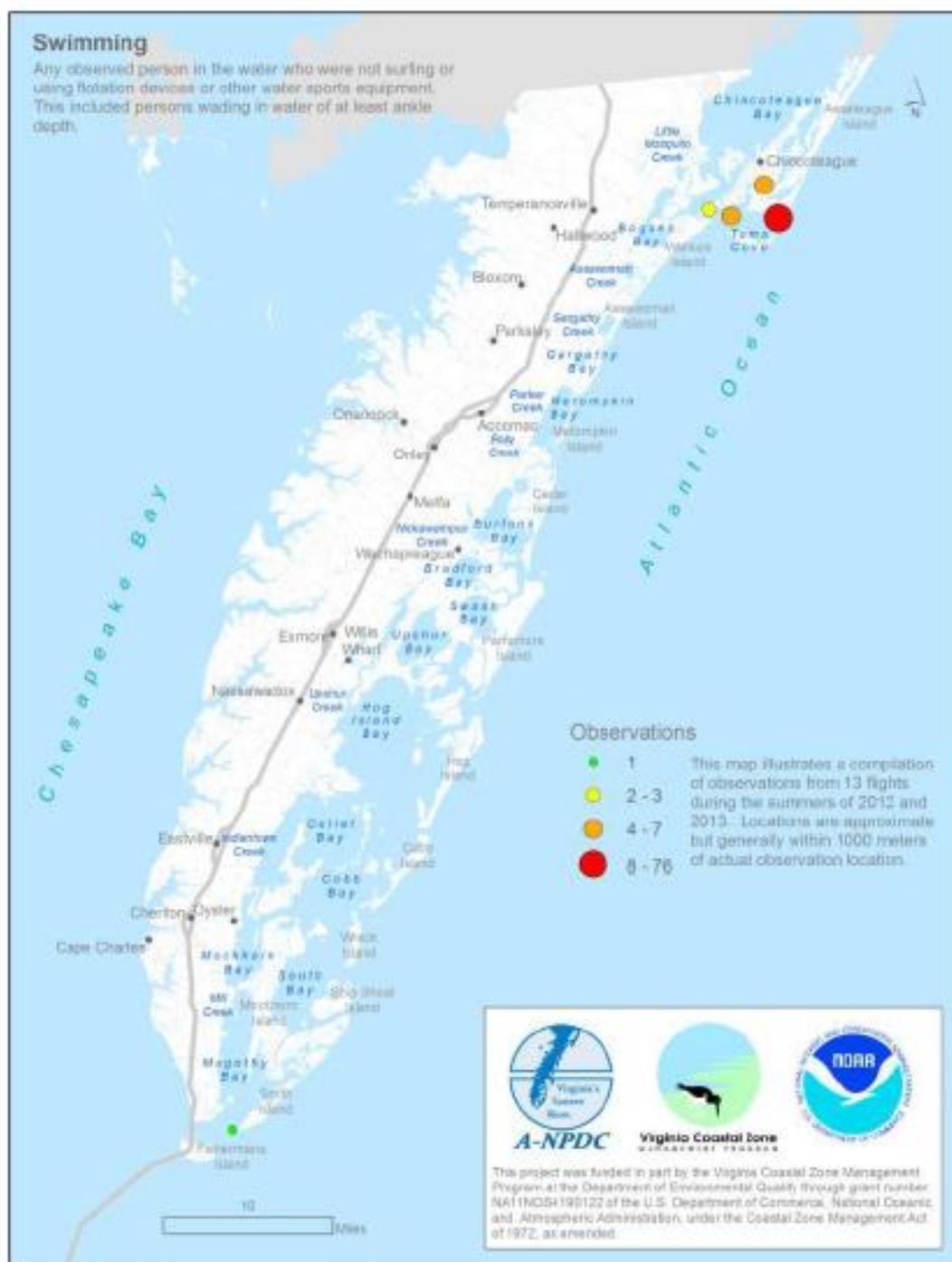


Figure 57 – Map illustrating a compilation of Swimming observations made during aerial surveys in 2012 and 2013.

3.0 RESULTS & DISCUSSION

While the indeterminable recreational uses (Figure 49) observed during the 2012 and 2013 aerial surveys do not allow for the discernment of where specific recreational uses are occurring, these observations do shed light on the trend of where general recreational



uses occur. The most active area for where these uses were observed was at Chincoteague Inlet with lesser concentrated areas in southern Chincoteague Bay and Wachapreague Inlet. There were relatively more uses observed in Accomack County than Northampton County. These uses were observed in more places across the entire Seaside than any other use.

Recreational Fishing from Motorized Vessels (Figure 50) was observed 235

times with the greatest concentration at the mouth of the Chesapeake Bay and adjacent to the Chesapeake Bay Bridge Tunnel. Other areas where concentrated use were observed include the Chincoteague and Assateague Island area, Wachapreague Inlet and around the vicinity of Mockhorn and Cobb Bay. Observations were relatively widespread across the entire Seaside compared to other uses. There is a definite correlation between where this use occurred and the navigability and ease of access of areas on the Seaside. Finally, it is important to note that while most of the observations were of smaller vessels, there were observations of vessels that were larger and may have involved charter (for hire) fishing activities. These different recreational uses were not distinguishable from each other from aerial photography alone.



Recreational Shore Fishing (Figure 51) in only 20 instances making it the second least observed use of the survey. Shore fishing was predominantly observed on Tom's Cove Hook at the southern end of Assateague Island

3.0 RESULTS & DISCUSSION

where this area can easily be accessed by off-road vehicles with a permit. Two instances of shore fishing were reported on Parramore Island.

Motorized Recreational Boating (Figure 52) was the second most-observed use during the aerial surveys with 531 observations. This use was prevalent across much of the study area with concentrated areas of use observed around Chincoteague including the inlet and southern Chincoteague Bay. Generally, the tidal inlets along the barrier islands received next most concentrated amount of use compared to the Chincoteague area. The most popular tidal inlets for motorized boating included Chincoteague, Gargatha, Metompkin, Wachapreague, Machipongo, and Fishermans. As was found for Recreational Fishing from Motorized Vessels, there was an observed correlation between the use and the navigability and ease of access of where the use was occurred.

Paddling was observed less frequently than the other uses with only 36 observations during the aerial surveys (Figure 53). The Assateague Channel on the eastern side of Chincoteague received the most use. Other areas receiving significant amounts of use included Toms Cove at southern end of Assateague Island and the Folly Creek/Metompkin Inlet area. The only other locations where this use was observed were at Wachapreague Inlet and in the Wise Point/Raccoon Island/Fishermans Island vicinity.

Sailing was only observed on 6 occasions making it the least-observed recreational use during the aerial surveys. There were no discernible trends in where sailing was observed although all uses did occur within waterways with excellent navigability. Sailing was observed at Chincoteague (Figure 54), Chincoteague Inlet, Wachapreague Inlet, in transit from Oyster Harbor, offshore of Cobb Island, and at the Chesapeake Bay Bridge Tunnel.

Recreational shore uses (Figure 55) occurred more than any other use with 1,701 counts; however, the uses were extremely confined to specific areas on the barrier islands and occurred in fewer places than most of the other observed recreational uses. The most



3.0 RESULTS & DISCUSSION

concentrated use occurred at the only public access point on the Seaside that is accessible by automobile, the Assateague Island National Seashore. The vast majority of use was observed at or adjacent to the parking lots at the southern end of Assateague Island with



relatively fewer uses observed within walking distance to the north and south of the parking lots. The next most significant use was observed at a tidal shoal in Chincoteague Inlet. This location is a popular destination for tourists and locals alike and several businesses on Chincoteague provide transport to this shoal during the summer months. Other barrier islands receiving relatively less but still significant use included the north end of Metompkin Island, the north of

Cedar Island, the south end of Cedar Island and Dawson Shoals, the south end of Hog Island, and the north end of Cobb Island. Finally, other locations where shore uses were observed include the north and south ends of Parramore Island, the north end of Hog Island, the south end of Cobb Island, the south end of Wreck Island, the south end of Smith Island, and at two locations on Fishermans Island.

Surface water sports were observed on 60 occasions at four locations on the Seaside (Figure 56). These uses were observed at the greatest concentration near the parking lots at the Assateague Island National Seashore. Other uses were observed at Toms Cove Hook at the south end of Assateague Island, in Chincoteague Bay near Captains Cove, and at Cobb Island. The vast majority of surface water sport use involved surfing and body boarding at Assateague Island.

Swimming was observed at locations that strongly correlate with Recreational Shore Use and Surface Water Sports (Figure 57). The most intense use was observed near the parking lots at the Assateague Island National Seashore. Swimming was observed to a lesser extent at the tidal shoal in Chincoteague Inlet and in Assateague Channel. One observation occurred at the south end of Smith Island.

4.0 SUMMARY & CONCLUSIONS

The A-NPDC completed a comprehensive assessment of recreational use on the Seaside of Virginia's Eastern Shore. Three datasets including a compilation of existing recreational-use data from various agencies, recreational-use maps from a participatory GIS workshop, and density maps from observations made during aerial surveys were used to assess which of 22 different and specific recreational uses was occurring where on the Seaside.

Literature & Data Search

Only three sources of data for recreational uses were identified within the region. One of the datasets only provided information for one specific landing, another produced a regional assessment but focused on shore uses only, and the other was a compilation of anecdotal accounts of recreational uses in the region. The limited information provided by the literature and data search indicates that the current study was a much-needed step towards comprehensively understanding recreational use trends on the Seaside.

Participatory GIS Workshop

Forty-four stakeholders provided critical information for general and dominant-use trends for 22 various recreational-use types. The participatory GIS workshop resulted in a series of maps which quantified use intensity into the relative-categories, general and dominant, and spatially illustrated where these uses occur. The maps did not provide information on which uses were the most widespread and which uses occur with the greatest intensity. The maps were reviewed and approved by the stakeholders who participated in the workshop as well as others who were unable to attend.

Aerial Surveys

Fourteen aerial surveys were conducted during peak times of recreational use over the barrier island system on the Seaside during 2012 and 2013. The aerial surveys were intended to provide supplemental information that attempted to validate the historic data and the workshop maps. As such, the aerial surveys made observations of the same recreational-use type categories utilized in the workshop. Only eight recreational-use types were encountered during the aerial surveys and an additional category, Indeterminable Recreational Use, was established to quantify uses that could not be distinguished by the survey methodology. The aerial surveys provided critical information that allowed for additional understanding regarding which use-type was most prominent and which areas received the greatest concentrations of people during peak use times. Other information inferred from the aerial survey data included that recreational use was

4.0 SUMMARY & CONCLUSIONS

much greater during the weekends compared to weekdays. In general, the majority of the recreational uses was observed along the barrier islands, at tidal inlets, and within navigable channels within the barrier island system. Use-intensity tended to increase near ports, landings, and other water-access points on the Seaside.

Correlation of Historic Data, Workshop Data, and Aerial Survey Data

The information identified in the literature and data search generally supported the findings from the participatory GIS workshop and aerial surveys. The historic data added nothing but supplemental information for the inshore areas, but did provide additional details on which recreational uses were occurring from Wise Point on the southern end of the peninsula.

The aerial survey data indicated that the most widespread use was Shore-Use. The greatest concentration of Shore Use occurred at Assateague Island, which accounted for nearly 3 times as many observations as any other use observed at any location on the Seaside. Motorized Boating, Swimming, and Recreational Fishing from Motorized Vessels were the next most encountered uses on the Seaside with the greatest concentrations of each generally occurring in the Chincoteague/Assateague vicinity and at the southern end of the peninsula and at the mouth of the Chesapeake Bay. In general, these areas received the greatest concentration of use with secondary locations occurring at Gargatha Inlet, Metompkin Inlet, Wachapreague Inlet, Machipongo Inlet, and Sand Shoal Inlet.

For the vast majority of recreational uses observed during the aerial surveys, they closely correlated with the dominant and general use spatial trends in the workshop maps. Only in one instance did the aerial survey observations not correlate with the workshop maps. The workshop maps did not illustrate the Folly Creek/Metompkin Inlet vicinity as a dominant-use area, but the aerial survey observations indicated that this was indeed one of the most-intensely used areas on the Seaside.

Figure 58 summarizes the general and dominant recreational use trends identified from historic datasets, the 2012 participatory GIS workshop, and 2012-2013 aerial surveys.

4.0 SUMMARY & CONCLUSIONS

Recreational Use	General Use Areas	Dominant Use Areas	Data Sources		
			Historic Data	pGIS Workshop	Aerial Surveys
Charter Fishing – Small Vessel	<u>Inshore</u> : creeks, lagoons, inlets; <u>Offshore</u> : islands to shelf break	<u>Inshore</u> : creeks, lagoons, inlets; <u>Offshore</u> : wrecks, bottom topography, shelf break		✓	
Charter Fishing – Large Vessel	<u>Inshore</u> : creeks, lagoons, inlets; <u>Offshore</u> : islands to shelf break	<u>Inshore</u> : mouth of Chesapeake Bay & southern tip		✓	
Charter Diving/Snorkeling	<u>Inshore</u> : southern tip; <u>Offshore</u> : 3 nm to 150 ft depth	<u>Offshore</u> : wrecks and adjacent areas <30 fathom depth		✓	
Charter Party Cruises	<u>Inshore</u> : creeks, lagoons, inlets; <u>Offshore</u> : state waters	<u>Inshore</u> : Chincoteague vicinity		✓	
Charter Wildlife Viewing	<u>Offshore</u> : islands to shelf break	<u>Inshore</u> : creeks, lagoons, inlets		✓	
Charter Scenic Viewing	<u>Inshore</u> : creeks, lagoons, inlets; <u>Offshore</u> : island to 5 miles east of state waters	<u>Inshore</u> : Chincoteague vicinity, Wachapreague channel, Quinby/Willis Wharf area, Hog Island, Oyster to Cobb Island		✓	
Charter Transport	<u>Inshore</u> : Chincoteague Bay, Gargatha landing to inlet, Quinby harbor to inlet;	<u>Inshore</u> : Chincoteague Inlet; <u>Offshore</u> : Chincoteague Inlet to vicinity 5 miles out to the east		✓	
Recreational Kayak & Non-Motorized Vessel Fishing	<u>Inshore</u> : creeks, lagoons, inlets; <u>Offshore</u> : state waters	<u>Inshore</u> : Chincoteague Inlet vicinity, Fishermans Inlet vicinity		✓	

4.0 SUMMARY & CONCLUSIONS

Recreational Use	General Use Areas	Dominant Use Areas	Data Sources		
			Historic Data	pGIS Workshop	Aerial Surveys
Recreational Dive Fishing	<u>Inshore</u> : Fishermans Island vicinity; <u>Offshore</u> : mouth of Chesapeake Bay, wrecks <30 fathom depths	<u>Inshore</u> : Chesapeake Bay Bridge Tunnel; <u>Offshore</u> : cluster of wrecks approx. 30 miles from mouth of Chesapeake Bay		✓	
Recreational Fishing from Motorized Vessels	Entire Study Area	<u>Inshore</u> : creeks, lagoons, inlets; <u>Offshore</u> : islands to 30 miles, near wrecks & canyons	✓	✓	✓
Recreational Shore Fishing	Within 100 yards from all shorelines and piers	Islands: Assateague, Chincoteague, Wallops, Metompkin, Cedar, Dawson Shoals, Parramore, Hog, Cobb, Wreck, Ship Shoal, Myrtle, Smith Other: Chincoteague Causeway		✓	✓
Recreational Shellfish Harvesting	<u>Inshore</u> : very limited areas near some inlets	<u>Inshore</u> : interior areas <4 ft depth		✓	
Recreational Waterfowl Hunting	<u>Offshore</u> : half-mile east of islands	<u>Inshore</u> : interior areas during open season		✓	
Motorized Boating	<u>Offshore</u> : 2 miles east of islands to 15 miles east of islands	<u>Inshore</u> : interior areas from spring to fall	✓	✓	✓
Paddling	<u>Inshore</u> : creeks, lagoons, inlets, Chesapeake Bay Bridge Tunnel; <u>Offshore</u> : islands to 1 miles	<u>Inshore</u> : along Seaside Water Trail, Chincoteague/Assateague vicinity, Folly Creek to Metompkin Inlet vicinity, Wise Point	✓	✓	✓

4.0 SUMMARY & CONCLUSIONS

Recreational Use	General Use Areas	Dominant Use Areas	Data Sources		
			Historic Data	pGIS Workshop	Aerial Surveys
Sailing	<i>Inshore</i> : navigable waterways & inlets, Chesapeake Bay Bridge Tunnel; <i>Offshore</i> : islands east to EEZ	None		✓	✓
Scuba/Snorkeling/Divi ng	<i>Inshore</i> : mouth of Chesapeake Bay; <i>Offshore</i> : wrecks and adjacent areas <30 fathom depth	<i>Inshore</i> : Chesapeake Bay Bridge Tunnel; <i>Offshore</i> : cluster of wrecks approx. 30 miles from mouth of Chesapeake Bay		✓	
Shore Use	Within 100 yards from all shorelines and piers	Islands: Assateague, Wallops, Metompkin, Cedar, Dawson Shoals, Parramore, Hog, Cobb, Wreck, Smith	✓	✓	✓
Surface Water Sports	<i>Inshore</i> : various creeks, lagoons, inlets & mouth of Chesapeake Bay; <i>Offshore</i> : to 1 mile east of islands	<i>Inshore</i> : Assateague Island		✓	✓
Swimming	<i>Inshore</i> : Within 100 yards from all shorelines and piers & Chincoteague, Folly Creek, Wachapreague, Red Bank, Oyster	Islands: south Assateague, north Metompkin, north & south Cedar, Dawson Shoals, south Cobb, north Wreck, south Smith		✓	✓

Figure 58 – Table summarizing general and dominant recreational uses identified from historic datasets, the 2012 participatory GIS workshop, and 2012-2013 aerial surveys.

APPENDICES

Appendix A

Participatory GIS Workshop Invitation Flyer & Sign-in Sheets

APPENDICES



Virginia's Atlantic Coast Recreational Use Mapping Project

How Do You Recreate on Virginia's Atlantic Coast and Seaside Bays of the Eastern Shore?

We'd like to know how, when and where you and others use these areas. We need your help to better understand which areas are important to your recreational activities so that they can be mapped and basic data can be added to an online portal that lets you view ocean resources and human uses in the Mid-Atlantic Ocean (www.midatlanticocean.org).

As a member of the Mid-Atlantic Regional Council on the Ocean (MARCO), Virginia, through its Coastal Zone Management (CZM) Program is collecting information on how the public uses the Atlantic coast of Virginia. These baseline data will inform planning efforts being undertaken by Virginia CZM to help develop a Virginia Ocean Plan and to help Virginia CZM and the Accomack-Norfolk Planning District Commission (A-NPDC) to develop the Seaside Special Area Management Plan. Collecting data on the variety of ways you use the Seaside Bays and Atlantic Ocean will help us plan for reducing use conflicts in our coastal waters, maximizing efficiency, and enhancing environmental and economic productivity.

State and federally managed waters of Virginia and the U.S. are used in many ways: commercial fishing, aquaculture, shipping, military exercises, sand mining, habitat for wildlife, and recreation.

With new and expanding coastal and ocean uses emerging such as energy production and increased shipping and considering Virginia's coastal population is increasing (from 5.6 million in 1980 to 5.1 million in 2010), the pressure is

What: Mapping Virginia's Atlantic coast recreational uses workshop

When: July 11 & 12, 2012

Participants will attend on just one day (9:30am - 4pm) & can choose which day they prefer. Lunch will be provided.

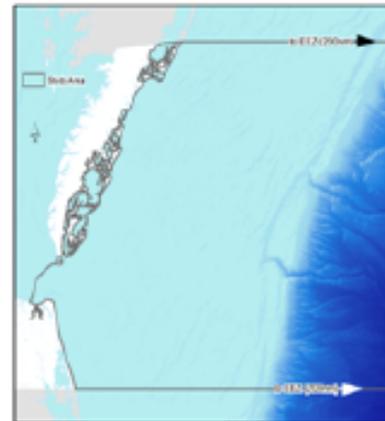
Where: Eastern Shore Community College, Melbs, VA

Who: Recreational & Charter

Fishermen; Boaters; Paddlers; Life Guards; Surfers; Divers; Wildlife Enthusiasts; Ecotourism Business Owners; Local, State, & Federal Government Representatives; Non-profit Organizations; Local Citizens

Why: To compile recreational use information for ocean planning efforts to reduce marine-use conflicts, maximize use efficiency, and enhance environmental & economic productivity

RSVP TO: jamih@erdc.state.va.us or 757.787.2936



mounting to ensure that there is space for both traditional and new uses and that conflicts are minimized.

Some mapped human use data exist, but Virginia currently has no recreational water use data for its Atlantic coast and Seaside Eastern Shore Bays. So basic data on how we use our coastal waters will be collected in a number of ways, including: inviting residents to share their knowledge about recreational uses at workshops using geographical information systems technology and using aerial photography to document uses at busy times.

APPENDICES



Virginia's Atlantic Coast Recreational Use Mapping Project

Participatory GIS Workshop

Participants in this workshop will use computers and "e-beam" technology to map coastal and ocean recreational activities – the first time this approach has been used in Virginia. But don't worry – no computer experience is necessary. Participants will be invited to attend for a full day – on either July 11, 2012 or July 12th – and to join a group of 5-10 other stakeholders to discuss and share their knowledge of different recreational uses (i.e. recreational and charter fishing, kayaking, boating, surfing, barrier island day use, etc.). Additional opportunities for stakeholders to share recreational use information may be offered as resources allow and to expand participation from the Virginia Beach area.

Participants will draw on digital maps projected onto a wall using a stylus that emits signals to an adjacent reader which immediately adds the shape they draw to the map. This innovative method quickly and efficiently allows users to share their thoughts, compare notes and learn from others in the group. The data and maps created will be shared with participants for their confirmation and approval before being shared publicly.

Why Participate?

The coast of Virginia is getting busier every day. There is a great deal of interest in developing offshore energy from wind, oil and gas. More and more ships are using the waterways. Residents continue to boat and fish. And all these uses will likely increase. This workshop provides an excellent opportunity to provide accurate information about how people are already using these areas and how they might want to use them in the future. As different government agencies start planning for how we could use these coastal and ocean waters, it's fundamental they begin with an understanding of how the waters are already being used. Making information on recreational uses available to governmental agencies will help ensure access for recreational activities into the future.

Recreational Use Categories To Be Mapped:

- **Boating for Hire (Charter) Uses**
 - Charter trips for fishing, diving & snorkeling, party cruises, wildlife & scenic viewing, & transport
- **Recreational Fishing Uses**
 - From motorized vessels from kayak & non-motorized vessels, dive fishing, from the shore
- **General Recreational Uses**
 - Motorized boating, paddling, sailing, scuba/snorkel/diving, shore use, water sports, swimming

Reserve Your Spot Today!

RSVP To:

Gart Smith, A-NPOC
757-757-2956 x114
gsmith@a-npoc.org

For more info contact:

Laura McKay, VCU
804-698-4523
Laura.McKay@vcu.edu

Gart Smith, A-NPOC
(Contact info above)

Todd Janesk, VCU
804-528-2853
tjanesk@vcu.edu



APPENDICES



VIRGINIA'S ATLANTIC COAST RECREATIONAL USE MAPPING WORKSHOP
July 11, 2012

Name	AFFILIATION
Jo Hansen	CICA
Bob Arzel	VCAC
Captain Walt	CICA + LIGHT TACKLE CHARTERS INC.
Will	USCG
Chris Brown	TNC
John Baggett	Port of Swains Island
Emmett Crawford	US NAVY
Daniel Jordan	Kiptopeke State Park
Forrest Glendon	Kiptopeke State Park
Andy Dornan	VA Marine Police
Nick Arbelotte	USCG SEA WATCH APPRAISAL
Anne Armstrong	Marine Science Consortium
Wes Birkford	VA Coastal Management
Kevin Haskell	VA Coastal Management
Peta Siff	Northampton County
Shane Wheaton	NASA
Tom Brockenberg	Accomack County
Curt Smith	A-NPDC
Alex Wiles	TNC
Barny Pruitt	TNC
Chris Turner	USACE

APPENDICES



VIRGINIA'S ATLANTIC COAST RECREATIONAL USE MAPPING WORKSHOP
July 12, 2012

Name	AFFILIATION
Curt Smith	A-NPDC
Jim Jenrette	Charter Captain
Neil Lim	NPS
LARRY ATKINSON	OPM
Gwen Lockhart	Virginia Aquarium
Russell VEEFLAND	ESV ANGLERS
Hank Pearson	VMAC
Bob Lefel	USFWS
Das Biliani	Wilmington
David Thomas	CBST Pilin/lt Charters
ANNE SMITH	VIMS
Art Schwarzschild	UVA VCR-LTER
CHRIS KENKNEY	CITY VB PAR
Dust Field	DEP-Natural Heritage

APPENDICES

Appendix B

Participatory GIS Workshop Facilitator Notes for Mapped Uses

APPENDICES

<u>Use Type</u>	<u>Processing Notes</u>	<u>Other Notes</u>	<u>Data Questions/Concerns</u>	<u>Suggestions</u>
Charter fishing – small vessel	The groups agreed that the general use footprint reached from shore out to the shelf break and slightly beyond. The dominant areas represent state waters, wrecks, other fishing grounds, the offshore canyons, and the entire shelf break area (100 – 500 fathoms).	There are many notes regarding species, pelagic vs. non-pelagic, specific grounds and depths, and seasonality.	<p>The general use footprint is very clear, although only 1 group extended it a little farther (~15 miles) beyond the actual shelf break than the others.</p> <p>The dominant use areas are pretty consistent although some groups drew large circles and others drew smaller areas or said to use the wrecks. As a result there are some small gaps in the south central part of the drawn area.</p>	<p>Confirm that charter operators would go ~15 miles beyond the shelf break for the general footprint.</p> <p>Create maps where the wreck / fishing ground names are labeled and share with charter operators to make sure these are the right spots for dominant use; might be easier in a live review setting due to the complexity of the use and the many data layers that influence the pattern (bathymetry, fishing grounds, wrecks, seasonality, etc.)</p>
Charter fishing – large vessel	The data from this use did not require much editing beyond cleaning basic drawing errors.	There are notes on species, pelagic vs. non-pelagic, and the difference between with 6-packs and head boats.	<p>The groups had less knowledge about head boat activity than 6-packs, and some of the groups either did not know beyond the CBBT or Virginia Beach area or said that it only happened in the southern part of the study area.</p> <p>The dominant use areas only cover the CBBT area and the light tower wrecks. 2 groups did draw dominant areas in the north and offshore (shelf break) but they did not overlap so the resulting threshold data has only the areas closest to Virginia Beach.</p>	<p>Create a review map showing the number of groups that drew a block as dominant so that charter operators can see the offshore and northern areas that dropped out during thresholding. It might end up being true that head boats are dominantly staying close to the population centers as some groups suggested.</p>

APPENDICES

<u>Use Type</u>	<u>Processing Notes</u>	<u>Other Notes</u>	<u>Data Questions/Concerns</u>	<u>Suggestions</u>
Charter diving / snorkeling	One group said to create a footprint from 3nm to 150 ft depth; another said it was the same as rec dive fishing (buffer the angler wrecks). The other two groups had limited information and only drew a couple of spots that they knew.	Not many notes. "Likely" that there is diving on every wreck out there but charter operators were not present to confirm. There is a tighter time frame for this (Spring-Summer) than Recreational SCUBA	General footprint may be overly generous. It was not clear based on the notes if the red group meant all of the area b/t 3nm and 150 feet or just the wrecks w/in that range. The dominant use areas seem to make sense although the areas drawn around the wreck clusters may be overly generous.	Confirm with charter operators the footprint is correct or that it is incorrect (they only visit the wrecks). Create a map that has wreck names labeled and share with charter operators to make sure these are the right spots for dominant use. Gwen Lockhart at the Virginia Aquarium has contact information for someone who could verify this use; Glockhart@virginiaaquarium.com 757-385-7575
Charter wildlife viewing	Most of the data processing was "cleaning" the drawn shapes. One group said to copy the Eastern Shores shapes from Charter scenic viewing.	There are a lot of notes on species, seasonality, and tide dependencies. There is a seasonal shift from dolphin viewing in summer to whale viewing in the winter. The Eastern Shores area is mostly concentrated on bird viewing.	None.	Confirm maps with charter operators. There was a suggestion in one group that the Aquarium viewing trips were not represented; contact Aquarium.

APPENDICES

<u>Use Type</u>	<u>Processing Notes</u>	<u>Other Notes</u>	<u>Data Questions/Concerns</u>	<u>Suggestions</u>
Charter scenic viewing	Most of the data processing was “cleaning” the drawn shapes and clipping as instructed. 2 groups had copied shapes from wildlife viewing (but not the offshore whale watching areas).	There is overlap w/ wildlife viewing in the Eastern Shores and the Party Cruise in Virginia Beach. Most of the activity occurs from spring to late fall. Fall colors and lighthouses are among the attractions.	None	Confirm maps with charter operators
Charter party cruises	Most of the data processing was “cleaning” the drawn shapes and clipping some specific spots. One group said to copy scenic viewing.	Limited notes. The dominant, known areas are a “booze cruise” from Rudee to Lynnhaven and Spider Cruises near Chincoteague. Spider Cruises does weddings and other party cruises.	None	Confirm maps with charter operators. Footprint (that was copied from scenic viewing) may be overly generous for the Eastern Shores not near Chincoteague
Charter transport	Only 2 of the 5 groups had knowledge of this use. Most of the data processing was “cleaning” the drawn shapes.	There was not a lot of knowledge of this use happening in the study area. There are a few routes out to some of the barrier islands that operate during the summer and there is a large sand mining operation south of Assateague that involves transport of workers	None	Confirm maps with charter operators

APPENDICES

<u>Use Type</u>	<u>Processing Notes</u>	<u>Other Notes</u>	<u>Data Questions/Concerns</u>	<u>Suggestions</u>
Recreational kayak and non-motorized vessel fishing	Most of the data processing was "cleaning" the drawn shapes and extending some specific spots.	3 of the 5 groups did not appear to know the entire study region. 1 group said it didn't happen near Chincoteague ("more of a big city activity") while other groups mapped that area as dominant. There are some notes on species.	None	Confirm maps with rec fisherman.
Recreational dive fishing	Most of the data processing was "cleaning" the drawn dominant shapes and buffering the points from the Chesapeake Angler Wrecks dataset by 100'. For most groups the depth cut-off was said to be 120', however 1 group said 30 fathoms so there are a few blocks in the footprint that are between 120-180'. It was mentioned by one group that fishing may take place in the water column above a wreck, so there is some wiggle room regarding the absolute depth of the wreck.	There are notes on species and areas. The most dominant areas are close to Virginia Beach. One group said the northern wrecks had better clarity.	None	Confirm maps with rec dive fisherman.

APPENDICES

<u>Use Type</u>	<u>Processing Notes</u>	<u>Other Notes</u>	<u>Data Questions/Concerns</u>	<u>Suggestions</u>
Recreational fishing from motorized vessels	2 of the groups said the footprint was the entire study area. Most of the data processing was "cleaning" the drawn dominant shapes. 1 group said to buffer the points from the VA Beach Anglers Club dataset by 100' and add them to the dominant layer.	There are a lot of notes on species and areas. There are closures at Wallops and by the Navy but they aren't on a regular schedule. Heaviest use w/in 30 miles of ports and boat launches, at inlets and bays, near submarine canyons, and in state waters.	Is the footprint equal to the entire area reasonable (especially the NE corner of the study region where the EEZ curves)? Or is what other groups said (~10 miles past the shelf break) more reasonable for rec fishing?	Confirm maps with rec fishermen; check on footprint. Gwen Lockhart at the Virginia Aquarium has contact information for someone who could verify this use; Glockhart@virginiaaquarium.com 757-385-7575
Recreational shore fishing	All data were clipped to 100 yards from shore and the piers. The unclipped datasets were checked to make sure that small areas that were drawn just outside the boundary or just offshore of an island were not lost. In most cases these areas were added in except where it appeared that the drawer was trying to capture an inland bay or river that wasn't supposed to be in the project boundary. There were a couple groups that said to exclude Wallops but others that said that it is used privately so it should remain in the footprint.	There are many notes on species and locations.	Wallops was cut from the drawn dominant areas, but the way that the analysis blocks line up the Oceanside of Wallops is calculated as dominant due to other nearby dominant areas. Should the block immediately near Wallops be cut from the dominant layer?	Confirm maps with shore fishermen.

APPENDICES

<u>Use Type</u>	<u>Processing Notes</u>	<u>Other Notes</u>	<u>Data Questions/Concerns</u>	<u>Suggestions</u>
Recreational shellfish harvesting	The drawn shapes were "cleaned" and shapes on the ocean-side of barrier islands were removed. A couple of groups suggested a depth cutoff (2 feet, 4 feet) but the bathymetry is not detailed enough to do this accurately and this did not cut much from the shore-side of the barrier islands. The Baylor grounds were assessed for clipping but those shapes are very small relative to the analysis blocks and would not have changed the final analysis.	There was not a lot of expertise for this use apart from saying that it happens throughout the barrier island system. There are seasons and health-based closures for the target species. Depth is the limiting factor for recreational harvesters. VIMS may develop a more detailed map on shellfishing but there is no timeline for this to happen.	There was some discussion/lack of knowledge on whether Lynnhaven should be included in the dominant layer. In the draft analysis it is only in the footprint.	Confirm maps with recreational harvesters.
Recreational waterfowl hunting	The drawn shapes were "cleaned" and the unclipped datasets were checked to make sure that small areas that were drawn just outside the boundary were not lost. 1 group footprint was extended out to ½ mile beyond barrier islands. 2 groups were copied from shellfish harvesting.	There are notes on specific species. The entire inner barrier island system is dominant during open season. There are regulations against getting off of a boat to hunt at privately-owned islands but these are often ignored. Fall and winter are the dominant seasons.	None	Confirm maps with recreational hunters.

APPENDICES

<u>Use Type</u>	<u>Processing Notes</u>	<u>Other Notes</u>	<u>Data Questions/Concerns</u>	<u>Suggestions</u>
Motorized boating	The drawn shapes were "cleaned" and areas were either extended or clipped to a certain distance from shore.	This is a dominant use from spring to fall. People typically don't go out beyond 10-15 miles if they aren't fishing.	None	Confirm maps with recreational boaters.
Paddling	The drawn shapes were "cleaned" and areas were either extended or clipped to a certain distance from shore. 1 group said to buffer the coastal waterway trail and add it to the dominant layer.	There were not a lot of notes for this use other than one mention of the waterway trail and that there is use year-round but the dominant use is from Memorial Day to Labor Day.	Should all of the waterway trail be dominant? Currently only parts of it included. There are also stretches where the trail goes outside of the project area but I'm not sure if this is because it goes through the inner marshes or if this is a shoreline accuracy issue. There is also an isolated dominant block by the southern tip of Rogue Island that doesn't really make sense. It should probably be joined to the other dominant blocks or removed.	Confirm maps with paddlers. Ask about waterway trail relative to other dominant spots.

APPENDICES

<u>Use Type</u>	<u>Processing Notes</u>	<u>Other Notes</u>	<u>Data Questions/Concerns</u>	<u>Suggestions</u>
Sailing	The drawn shapes were "cleaned" and areas were either extended to a certain distance from shore or clipped to remove areas that were too shallow. The footprint is the entire area as there is dispersed transit throughout the region.	There wasn't a lot of expertise for this use in most of the groups. There is far less sailing happening beyond the CBBT compared to within Chesapeake Bay. There is Catamaran and Hobie Cat usage near Virginia Beach. Catamarans can go to a shallower depth than regular sailboats. There is a race to Bermuda but the route wasn't known by participants.	None	Confirm maps with sailors; race route could be overlaid on final maps if it is a fixed route and determined to be important by the group.
SCUBA/snorkeling/diving	The drawn shapes were "cleaned" and some snorkeling areas were connected to shore. Groups either said to copy the recreational dive fishing layer or to buffer the Chesapeake Angler Wrecks data set (not including wrecks deeper than 30 fa). Drawn areas associated with specific wrecks were verified to be covering the wreck locations.	There are limited notes on depth and locations. This use is similar to recreational dive fishing (wrecks are focus) but also includes nearshore snorkeling near Virginia Beach.	None	Confirm maps with recreational divers and snorkelers.

APPENDICES

<u>Use Type</u>	<u>Processing Notes</u>	<u>Other Notes</u>	<u>Data Questions/Concerns</u>	<u>Suggestions</u>
Shore Use	<p>All data were clipped to 100 yards from shore and the piers. The unclipped datasets were checked to make sure that small areas that were drawn just outside the boundary or just offshore of an island were not lost. In most cases these areas were added in except where it appeared that the drawer was trying to capture an inland bay or river that wasn't supposed to be in the project boundary. 1 group said to copy shapes from swimming. A couple of spots (Wallops, Fishermans, privately owned) are either off limits or only legal with a permit and clipping areas were provided by some of the groups.</p>	<p>There are notes on activities, locations, and restrictions. Most of the use occurs at easy access spots around inlets. Dominant use is from Memorial Day to Labor Day. There are seasonal closures and permitted sites. Wallops is closed to the public but still used.</p>	<p>Wallops was cut from the drawn dominant areas, but the way that the analysis blocks line up the Oceanside of Wallops is calculated as dominant due to other nearby dominant areas. Should the block immediately near Wallops be cut from the dominant layer?</p> <p>There was some confusion regarding the use's definition because as written it didn't appear to include beach use. One group did not map anything south of Fisherman's Island due to this confusion but it does not appear to have affected the final data set.</p>	<p>Confirm maps with shore users.</p>

APPENDICES

<u>Use Type</u>	<u>Processing Notes</u>	<u>Other Notes</u>	<u>Data Questions/Concerns</u>	<u>Suggestions</u>
Swimming	All data were “cleaned” and clipped to 100 yards from shore. The unclipped datasets were checked to make sure that small areas that were drawn just outside the boundary or just offshore of an island were not lost. In most cases these areas were added in except where it appeared that the drawer was trying to capture an inland bay or river that wasn't supposed to be in the project boundary.	There are notes on seasonality and locations. Most people don't go deeper than standing depth. There is triathlon training near Virginia Beach. Dominant use is during summer. Use can depend on lifeguards, currents, and resort locations. There is some offshore swimming from charter boats but there is no consistent pattern associated with that activity.	None	Confirm maps with swimmers.
Surface water sports	There was minimal processing for this use beyond basic “cleaning.”	There are notes on seasonality, locations, and type of sport. Kite and windsurfing are pursued both inside the bays and up to 1 mile from land. There are designated surf spots along Virginia Beach but the entire area is used. Some surfing areas are reached by boat.	None	Confirm maps with surface water sports users.

APPENDICES

<u>Use Type</u>	<u>Processing Notes</u>	<u>Other Notes</u>	<u>Data Questions/Concerns</u>	<u>Suggestions</u>
Historic/ cultural	There was minimal processing for this use beyond basic "cleaning." Only 2 groups mapped this use using GIS; 1 other group collected written notes only.	There are many detailed notes documenting locations and activities. These notes will need to be analyzed and compiled into a cohesive document.	This use was planned as a mostly verbal activity but the participants were willing to map areas so there is a mix of GIS and written data. The GIS data was processed in the same manner as the other uses, but the project leaders will need to figure out the next steps on how to incorporate the written material and any other data sources.	None
Scenic/natural views	There was minimal processing for this use beyond basic "cleaning." Only 2 groups mapped this use. 1 group said to create footprint = to 15 miles (viewshed from land).	There are many detailed notes documenting locations and activities. These notes will need to be analyzed and compiled into a cohesive document.	This use was planned as a mostly verbal activity but the participants were willing to map areas so there is a mix of GIS and written data. The GIS data was processed in the same manner as the other uses, but the project leaders will need to figure out the next steps on how to incorporate the written material and any other data sources.	None

APPENDICES

Appendix C

2009 Recreational Use Observations on Barrier Islands, The Nature Conservancy Data

In 2009, the Nature Conservancy conducted a count of Red Knot populations on the barrier islands on April 25 and 30, May 14, 21, and 25, and on June 1. All recreational use counts are documented in the following table.

APPENDICES

LOCATION	# PEOPLE ON BEACH/ISLAND	# VEHICLES ON BEACH	# BOATS	# PEOPLE SURF FISHING
Assateague Island, VA	1,602	624	0	0
Pelican Island	3	0	1	0
Wallops Island	33	15	0	4
Assawoman Island	2	1	0	0
Metompkin Island	30	0	5	0
Cedar Sandbar	21	0	7	0
Dawson Shoals	8	0	2	0
Parramore Island	12	0	6	10
Chimney Pole Marsh	0	0	0	0
Hog Island	25	5	0	9
Cobb Island	16	0	1	8
Little Cobb Island	11	0	2	0
Wreck Island	0	0	0	0
Ship Shoal Island	0	0	0	0
Myrtle Island	10	0	1	7
Smith Island	12	0	4	0
Fisherman Island	0	0	0	0
TOTALS	1,785	645	29	38

APPENDICES

Appendix D

2006 Recreational Use Observations on Barrier Islands, Virginia Eastern Shorekeeper Data

The following table is a summary of recreational uses from "*Patrol Summary -Observations and Reports of Human Activity on the Atlantic Barrier Islands on the Eastern Shore of Virginia*" 2006, Virginia Eastern Shorekeeper, funded by the Virginia Coastal Zone Management Program through a grant from NOAA.

APPENDICES

LOCATION	People in posted areas	Unleashed dogs	Off road vehicles	All terrain vehicles	Surf fishing	Research activities	Cottages	Camping
Metompkin Island	x	x		x		x		
Cedar Island	x	x	x	x		x	6	x
Dawson Shoals	x	x			x	x		
Parramore Island		x		x	x	x	2	
Chimney Pole Marsh								
Hog Island		x		x		x	2	
Cobb Island	x	x			x	x	1	
Little Cobb Island	x					x		
Wreck Island	x	x		x	x	x		
Ship Shoal Island	x				x	x		
Myrtle Island						x		
Smith Island		x		x	x	x	1	
TOTALS**							12	

**Numbers appear where provided

APPENDICES

Appendix E

2012 Recreational and Commercial Use at Wise Point Ramp, Northampton County, U.S. Fish & Wildlife Service Data

For several months in 2012, the US Fish & Wildlife Service staff at the Eastern Shore of Virginia National Wildlife Refuge compiled recreational use data, including kayaks, at the Wise Point boat ramp in southern Northampton County. The following tables summarize the findings.

APPENDICES

WISE POINT BOAT RAMP	RECREATIONAL	COMMERCIAL
Tuesday, May 01, 2012	0	0
Wednesday, May 02, 2012	0	0
Thursday, May 03, 2012	5	2
Friday, May 04, 2012	21	6
Saturday, May 05, 2012	94	29
Sunday, May 06, 2012	16	4
Monday, May 07, 2012	10	0
Tuesday, May 08, 2012	0	0
Wednesday, May 09, 2012	0	0
Thursday, May 10, 2012	0	0
Friday, May 11, 2012	31	2
Saturday, May 12, 2012	95	14
Sunday, May 13, 2012	51	4
Monday, May 14, 2012	0	0
Tuesday, May 15, 2012	0	0
Wednesday, May 16, 2012	0	0
Thursday, May 17, 2012	29	7
Friday, May 18, 2012	14	0
Saturday, May 19, 2012	33	10
Sunday, May 20, 2012	13	7
Monday, May 21, 2012	0	0
Tuesday, May 22, 2012	0	0
Wednesday, May 23, 2012	0	
Thursday, May 24, 2012	0	
Friday, May 25, 2012	93	18
Saturday, May 26, 2012	131	10
Sunday, May 27, 2012	102	1
Monday, May 28, 2012	78	25
Tuesday, May 29, 2012	16	0
Wednesday, May 30, 2012	0	0
Thursday, May 31, 2012	22	0
May Total	854	139
Average	7.55	4.79
Friday, June 01, 2012	9	12
Saturday, June 02, 2012	36	3
Sunday, June 03, 2012	24	9

APPENDICES

Monday, June 04, 2012	17	11
Tuesday, June 05, 2012	4	3
Wednesday, June 06, 2012	12	15
Thursday, June 07, 2012	35	14
Friday, June 08, 2012	33	21
Saturday, June 09, 2012	41	1
Sunday, June 10, 2012	77	6
Monday, June 11, 2012	30	7
Tuesday, June 12, 2012	0	0
Wednesday, June 13, 2012	12	11
Thursday, June 14, 2012	2	11
Friday, June 15, 2012	19	14
Saturday, June 16, 2012	30	0
Sunday, June 17, 2012	20	3
Monday, June 18, 2012	23	16
Tuesday, June 19, 2012	20	20
Wednesday, June 20, 2012	20	10
Thursday, June 21, 2012	31	19
Friday, June 22, 2012	34	6
Saturday, June 23, 2012	76	18
Sunday, June 24, 2012	45	12
Monday, June 25, 2012	7	3
Tuesday, June 26, 2012	29	3
Wednesday, June 27, 2012	67	4
Thursday, June 28, 2012	27	7
Friday, June 29, 2012	38	12
Saturday, June 30, 2012	40	7
June Total	858	278
Average	28.60	9.27
Sunday, July 01, 2012	79	14
Monday, July 02, 2012	27	16
Tuesday, July 03, 2012	33	13
Wednesday, July 04, 2012	51	1
Thursday, July 05, 2012	65	7
Friday, July 06, 2012	75	3
Saturday, July 07, 2012	43	11
Sunday, July 08, 2012	9	0

APPENDICES

Monday, July 09, 2012	12	4
Tuesday, July 10, 2012	18	18
Wednesday, July 11, 2012	15	14
Thursday, July 12, 2012	6	12
Friday, July 13, 2012	62	18
Saturday, July 14, 2012	57	12
Sunday, July 15, 2012	39	4
Monday, July 16, 2012	25	7
Tuesday, July 17, 2012	29	9
Wednesday, July 18, 2012	23	11
Thursday, July 19, 2012	33	5
Friday, July 20, 2012	30	3
Saturday, July 21, 2012	114	5
Sunday, July 22, 2012	78	1
Monday, July 23, 2012	48	6
Tuesday, July 24, 2012	31	3
Wednesday, July 25, 2012	12	3
Thursday, July 26, 2012	46	5
Friday, July 27, 2012	86	3
Saturday, July 28, 2012	107	2
Sunday, July 29, 2012	69	4
Monday, July 30, 2012	24	3
Tuesday, July 31, 2012	41	20
July Total	1387	237
Average	44.74	7.65
Wednesday, August 01, 2012	23	10
Thursday, August 02, 2012	43	11
Friday, August 03, 2012	55	1
Saturday, August 04, 2012	121	6
Sunday, August 05, 2012	44	2
Monday, August 06, 2012	23	0
Tuesday, August 07, 2012	22	10
Wednesday, August 08, 2012	10	1
Thursday, August 09, 2012	26	0
Friday, August 10, 2012	710	8
Saturday, August 11, 2012	77	19
Sunday, August 12, 2012	23	1

APPENDICES

Monday, August 13, 2012	35	19
Tuesday, August 14, 2012	22	25
Wednesday, August 15, 2012	0	0
Thursday, August 16, 2012	44	23
Friday, August 17, 2012	57	26
Saturday, August 18, 2012	91	2
Sunday, August 19, 2012	39	5
Monday, August 20, 2012	17	1
Tuesday, August 21, 2012	33	2
Wednesday, August 22, 2012	33	33
Thursday, August 23, 2012	21	11
Friday, August 24, 2012	41	12
Saturday, August 25, 2012	26	8
Sunday, August 26, 2012	29	7
Monday, August 27, 2012	21	36
Tuesday, August 28, 2012	23	19
Wednesday, August 29, 2012	3	17
Thursday, August 30, 2012	19	19
Friday, August 31, 2012	14	25
August Total	1745	359
Average	56.29	11.58
Saturday, September 01, 2012	66	6
Sunday, September 02, 2012	41	5
Monday, September 03, 2012	27	0
Tuesday, September 04, 2012	20	3
Wednesday, September 05, 2012	9	5
Thursday, September 06, 2012	8	3
Friday, September 07, 2012	24	1
Saturday, September 08, 2012	56	9
Sunday, September 09, 2012	31	4
Monday, September 10, 2012	14	10
Tuesday, September 11, 2012	0	0
Wednesday, September 12, 2012	21	9
Thursday, September 13, 2012	10	1
Friday, September 14, 2012	29	17
Saturday, September 15, 2012	57	13
Sunday, September 16, 2012	55	12
Monday, September 17, 2012	19	25

APPENDICES

Tuesday, September 18, 2012	6	3
Wednesday, September 19, 2012	0	0
Thursday, September 20, 2012	16	2
Friday, September 21, 2012	32	4
Saturday, September 22, 2012	89	7
Sunday, September 23, 2012	47	0
Monday, September 24, 2012	7	2
Tuesday, September 25, 2012	0	0
Wednesday, September 26, 2012	18	18
Thursday, September 27, 2012	26	22
Friday, September 28, 2012	25	11
Saturday, September 29, 2012	29	7
Sunday, September 30, 2012	31	2
September Total	813	201
Average	27.1	6.7
Monday, October 01, 2012	0	0
Tuesday, October 02, 2012	0	0
Wednesday, October 03, 2012	13	3
Thursday, October 04, 2012	18	17
Friday, October 05, 2012	15	10
Saturday, October 06, 2012	48	6
Sunday, October 07, 2012	5	2
Monday, October 08, 2012	5	21
Tuesday, October 09, 2012	4	7
Wednesday, October 10, 2012	0	0
Thursday, October 11, 2012	0	0
Friday, October 12, 2012	11	11
Saturday, October 13, 2012	8	0
Sunday, October 14, 2012	24	0
Monday, October 15, 2012	0	0
Tuesday, October 16, 2012	0	0
Wednesday, October 17, 2012	10	11
Thursday, October 18, 2012	17	13
Friday, October 19, 2012	5	7
Saturday, October 20, 2012	53	1
Sunday, October 21, 2012	17	6
Monday, October 22, 2012	16	13
Tuesday, October 23, 2012	11	5

APPENDICES

Wednesday, October 24, 2012	0	0
Thursday, October 25, 2012	6	11
Friday, October 26, 2012	6	9
Saturday, October 27, 2012	0	0
Sunday, October 28, 2012	0	1
Monday, October 29, 2012	0	0
Tuesday, October 30, 2012	0	0
Wednesday, October 31, 2012	1	8
October Total	293	162
Average	9.4	5.2

APPENDICES

Appendix F

Aerial Survey Photograph Use Counts

APPENDICES

Photo ID	Flight Date	Indeterminate Recreational Use	Boating For Hire (Charter) Uses					Recreational Fishing Uses					General Recreational Uses - Non-Consumptive						
			Charter Fishing	Charter Diving/Snorkeling	Charter Party Cruises	Charter Wildlife Viewing	Charter Scenic Viewing	Charter Transport	Recr. Kayak & Non-Motorized Vessel Fishing	Rec. Dive Fishing	Rec. Fishing from Motorized Vessels	Rec. Shore Fishing	Rec. Shellfish Harvesting	Rec. Waterfowl Hunting	Motorized Boating	Paddling	Sailing	Scuba/Snorkeling/Diving	Shore Use
Seaside Rec Use Wkshp July 2012 029	7/3/12																220	21	34
Seaside Rec Use Wkshp July 2012 030	7/3/12													1			90	15	170
Seaside Rec Use Wkshp July 2012 031	7/3/12																162		44
Seaside Rec Use Wkshp July 2012 032	7/3/12																2		
Seaside Rec Use Wkshp July 2012 033	7/3/12												2					1	
Seaside Rec Use Wkshp Aug 2012 001	8/19/12												1	1					
Seaside Rec Use Wkshp Aug 2012 003	8/19/12									2			1						
Seaside Rec Use Wkshp Aug 2012 004	8/19/12									1									
Seaside Rec Use Wkshp Aug 2012 005	8/19/12	2																	
Seaside Rec Use Wkshp Aug 2012 010	8/19/12	1																	
Seaside Rec Use Wkshp Aug 2012 013	8/19/12	1																	
Seaside Rec Use Wkshp Aug 2012 015	8/19/12	1																	
Seaside Rec Use Wkshp Aug 2012 020	8/19/12																		
Seaside Rec Use Wkshp Aug 2012 022	8/19/12												20						
Seaside Rec Use Wkshp Aug 2012 024	8/19/12												7						
Seaside Rec Use Wkshp Aug 2012 025	8/19/12												8						
Seaside Rec Use Wkshp Aug 2012 026	8/19/12												2						
Seaside Rec Use Wkshp Aug 2012 027	8/19/12												1						
Seaside Rec Use Wkshp Aug 2012 028	8/19/12												4						
Seaside Rec Use Wkshp Aug 2012 032	8/19/12												3						
Seaside Rec Use Wkshp Aug 2012 033	8/19/12												1						
Seaside Rec Use Wkshp Aug 2012 034	8/19/12												2						
Seaside Rec Use Wkshp Aug 2012 035	8/19/12												2						
Seaside Rec Use Wkshp Aug 2012 038	8/19/12	1																	

APPENDICES

Photo ID	Flight Date	Indeterminate Recreational Use	Boating For Hire (Charter) Uses					Recreational Fishing Uses					General Recreational Uses - Non-Consumptive							
			Charter Fishing	Charter Diving/Snorkeling	Charter Party Cruises	Charter Wildlife Viewing	Charter Scenic Viewing	Charter Transport	Recr. Kayak & Non-Motorized Vessel Fishing	Rec. Dive Fishing	Rec. Fishing from Motorized Vessels	Rec. Shore Fishing	Rec. Shellfish Harvesting	Rec. Waterfowl Hunting	Motorized Boating	Paddling	Sailing	Scuba/Snorkeling/Diving	Shore Use	Surface Water Sports
Seaside Rec Use Wkshp Aug 2012 044	8/19/12																	2		
Seaside Rec Use Wkshp Aug 2012 046	8/19/12																	1		
Seaside Rec Use Wkshp Aug 2012 048	8/19/12																	2		
Seaside Rec Use Wkshp Aug 2012 049	8/19/12																	2		
Seaside Rec Use Wkshp Aug 2012 050	8/19/12																	2		
Seaside Rec Use Wkshp Aug 2012 052	8/19/12																	7		
Seaside Rec Use Wkshp Aug 2012 053	8/19/12																	33		1
Seaside Rec Use Wkshp Aug 2012 054	8/19/12												3					36	2	4
Seaside Rec Use Wkshp Aug 2012 055	8/19/12																	41	4	5
Seaside Rec Use Wkshp Aug 2012 056	8/19/12																	28	1	2
Seaside Rec Use Wkshp Aug 2012 057	8/19/12																	11		
Seaside Rec Use Wkshp Aug 2012 058	8/19/12										1							3		
Seaside Rec Use Wkshp Aug 2012 059	8/19/12												1							
Seaside Rec Use Wkshp Aug 2012 060	8/19/12												1							
Seaside Rec Use Wkshp Aug 2012 061	8/19/12																			
Seaside Rec Use Wkshp Aug 2012 062	8/19/12										1									
Seaside Rec Use Wkshp Aug 2012 063	8/19/12																			
Seaside Rec Use Wkshp Aug 2012 064	8/19/12	2																		
Seaside Rec Use Wkshp Aug 2012 066	8/19/12																			
Seaside Rec Use Wkshp Aug 2012 067	8/19/12	1																		
Seaside Rec Use Wkshp Aug 2012 068	8/19/12	1																		
Seaside Rec Use Wkshp Aug 2012 069	8/19/12	3																		
Seaside Rec Use Wkshp Aug 2012 073	8/19/12	2																		
Seaside Rec Use Wkshp Aug 2012 074	8/19/12																			

APPENDICES

Photo ID	Flight Date	Indeterminable Recreational Use	Boating For Hire (Charter) Uses					Recreational Fishing Uses						General Recreational Uses - Non-Consumptive						
			Charter Fishing	Charter Diving/Snorkeling	Charter Party Cruises	Charter Wildlife Viewing	Charter Scenic Viewing	Charter Transport	Recr. Kayak & Non-Motorized Vessel Fishing	Rec. Dive Fishing	Rec. Fishing from Motorized Vessels	Rec. Shore Fishing	Rec. Shellfish Harvesting	Rec. Waterfowl Hunting	Motorized Boating	Paddling	Sailing	Scuba/Snorkeling/Diving	Shore Use	Surface Water Sports
Seaside Rec Use Wkshp Aug 2012 078	8/19/12	1																		
Seaside Rec Use Wkshp Aug 2012 081	8/19/12													1						
Seaside Rec Use Wkshp Aug 2012 083	8/19/12	1																		
Seaside Rec Use Wkshp Aug 2012 084	8/19/12	1												1						
Seaside Rec Use Wkshp Aug 2012 098	8/19/12	1											1							
Seaside Rec Use Wkshp Aug 2012 100	8/19/12									1				1						
Seaside Rec Use Wkshp Aug 2012 101	8/19/12	1																		
Seaside Rec Use Wkshp Aug 2012 103	8/19/12	2																		
Seaside Rec Use Wkshp Aug 2012 105	8/19/12	2												2						
Seaside Rec Use Wkshp Aug 2012 107	8/19/12	1																		
Seaside Rec Use Wkshp Aug 2012 108	8/19/12	1												1						
Seaside Rec Use Wkshp Aug 2012 109	8/19/12	4																		
Seaside Rec Use Wkshp Aug 2012 110	8/19/12													1						
Seaside Rec Use Wkshp Aug 2012 111	8/19/12													1						
Seaside Rec Use Wkshp Aug 2012 113	8/19/12													2						
Seaside Rec Use Wkshp Aug 2012 117	8/19/12													1						
Seaside Rec Use Wkshp Aug 2012 118	8/19/12													1						
Seaside Rec Use Wkshp Aug 2012 061	8/23/12	1																		
Seaside Rec Use Wkshp Aug 2012 062	8/23/12	1																		
Seaside Rec Use Wkshp Aug 2012 063	8/23/12																			
Seaside Rec Use Wkshp Aug 2012 065	8/23/12										1									
Seaside Rec Use Wkshp Aug 2012 070	8/23/12										1									
Seaside Rec Use Wkshp Aug 2012 075	8/23/12																			
Seaside Rec Use Wkshp Aug 2012 076	8/23/12																			

APPENDICES

Photo ID	Flight Date	Indeterminable Recreational Use	Boating For Hire (Charter) Uses					Recreational Fishing Uses					General Recreational Uses - Non-Consumptive							
			Charter Fishing	Charter Diving/Snorkeling	Charter Party Cruises	Charter Wildlife Viewing	Charter Scenic Viewing	Charter Transport	Recr. Kayak & Non-Motorized Vessel Fishing	Rec. Dive Fishing	Rec. Fishing from Motorized Vessels	Rec. Shore Fishing	Rec. Shellfish Harvesting	Rec. Waterfowl Hunting	Motorized Boating	Paddling	Sailing	Scuba/Snorkeling/Diving	Shore Use	Surface Water Sports
Seaside Rec Use Wkshp Aug 2012 079	8/23/12	1																		
Seaside Rec Use Wkshp Aug 2012 080	8/23/12												1							
Seaside Rec Use Wkshp Aug 2012 083	8/23/12									1										
Seaside Rec Use Wkshp Aug 2012 084	8/23/12									1										
Seaside Rec Use Wkshp Aug 2012 085	8/23/12												1							
Seaside Rec Use Wkshp Aug 2012 086	8/23/12												1							
Seaside Rec Use Wkshp Aug 2012 089	8/23/12									1										
Seaside Rec Use Wkshp Aug 2012 090	8/23/12									1										
Seaside Rec Use Wkshp Aug 2012 092	8/23/12												1							
Seaside Rec Use Wkshp Aug 2012 093	8/23/12												1							
Seaside Rec Use Wkshp Aug 2012 094	8/23/12									1										
Seaside Rec Use Wkshp Aug 2012 097	8/23/12									1										
Seaside Rec Use Wkshp Aug 2012 098	8/23/12	3																		
Seaside Rec Use Wkshp Aug 2012 099	8/23/12	3																		
Seaside Rec Use Wkshp Aug 2012 100	8/23/12									1										
Seaside Rec Use Wkshp Aug 2012 103	8/23/12	1											1							
Seaside Rec Use Wkshp Aug 2012 104	8/23/12									1										
Seaside Rec Use Wkshp Aug 2012 106	8/23/12												1							
Seaside Rec Use Wkshp Aug 2012 107	8/23/12	3											1							
Seaside Rec Use Wkshp Aug 2012 108	8/23/12	10											1							
Seaside Rec Use Wkshp Aug 2012 110	8/23/12	1																		
Seaside Rec Use Wkshp Aug 2012 111	8/23/12	1											1					4		
Seaside Rec Use Wkshp Aug 2012 113	8/23/12									1										
Seaside Rec Use Wkshp Aug 2012 114	8/23/12														1					

APPENDICES

Photo ID	Flight Date	Indeterminable Recreational Use	Boating For Hire (Charter) Uses					Recreational Fishing Uses					General Recreational Uses - Non-Consumptive							
			Charter Fishing	Charter Diving/Snorkeling	Charter Party Cruises	Charter Wildlife Viewing	Charter Scenic Viewing	Charter Transport	Recr. Kayak & Non-Motorized Vessel Fishing	Rec. Dive Fishing	Rec. Fishing from Motorized Vessels	Rec. Shore Fishing	Rec. Shellfish Harvesting	Rec. Waterfowl Hunting	Motorized Boating	P addling	Sailing	Scuba/Snorkeling/Diving	Shore Use	Surface Water Sports
Seaside Rec Use Wkshp Aug 2012 116	8/23/12										1									
Seaside Rec Use Wkshp Aug 2012 117	8/23/12																	2		
Seaside Rec Use Wkshp Aug 2012 118	8/23/12																	3		
Seaside Rec Use Wkshp Aug 2012 119	8/23/12																	2		
Seaside Rec Use Wkshp Aug 2012 120	8/23/12																	13	4	
Seaside Rec Use Wkshp Aug 2012 121	8/23/12																	56	11	
Seaside Rec Use Wkshp Aug 2012 122	8/23/12																	30	20	
Seaside Rec Use Wkshp Aug 2012 123	8/23/12																	19	5	
Seaside Rec Use Wkshp Aug 2012 124	8/23/12																	3		
Seaside Rec Use Wkshp Aug 2012 125	8/23/12																	3	1	1
Seaside Rec Use Wkshp Aug 2012 126	8/23/12										1									
Seaside Rec Use Wkshp Aug 2012 128	8/23/12										2									
Seaside Rec Use Wkshp Aug 2012 130	8/23/12													1						
Seaside Rec Use Wkshp Aug 2012 133	8/23/12													1						
Seaside Rec Use Wkshp Aug 2012 134	8/23/12	1																		
Seaside Rec Use Wkshp Aug 2012 137	8/23/12									1										
Seaside Rec Use Wkshp Aug 2012 139	8/23/12													2						
Seaside Rec Use Wkshp Aug 2012 140	8/23/12													2						
Seaside Rec Use Wkshp Aug 2012 141	8/23/12													1						
Seaside Rec Use Wkshp Aug 2012 142	8/23/12													1	1					
Seaside Rec Use Wkshp Aug 2012 145	8/23/12									1										
Seaside Rec Use Wkshp Aug 2012 146	8/23/12	1																		
Seaside Rec Use Wkshp Aug 2012 147	8/23/12									1										
Seaside Rec Use Wkshp Aug 2012 0428	8/30/12	1																		

APPENDICES

Photo ID	Flight Date	Indeterminable Recreational Use	Boating For Hire (Charter) Uses					Recreational Fishing Uses					General Recreational Uses - Non-Consumptive							
			Charter Fishing	Charter Diving/Snorkeling	Charter Party Cruises	Charter Wildlife Viewing	Charter Scenic Viewing	Charter Transport	Recr. Kayak & Non-Motorized Vessel Fishing	Rec. Dive Fishing	Rec. Fishing from Motorized Vessels	Rec. Shore Fishing	Rec. Shellfish Harvesting	Rec. Waterfowl Hunting	Motorized Boating	Paddling	Sailing	Scuba/Snorkeling/Diving	Shore Use	Surface Water Sports
Seaside Rec Use Wkshp Aug 2012 0461	8/30/12																	1		
Seaside Rec Use Wkshp Aug 2012 0462	8/30/12																	1		
Seaside Rec Use Wkshp Aug 2012 0464	8/30/12																	6		
Seaside Rec Use Wkshp Aug 2012 0467	8/30/12																	13	1	1
Seaside Rec Use Wkshp Aug 2012 0468	8/30/12																	13		
Seaside Rec Use Wkshp Aug 2012 0469	8/30/12																	11		1
Seaside Rec Use Wkshp Aug 2012 0470	8/30/12																	2		
Seaside Rec Use Wkshp Aug 2012 0471	8/30/12											2								
Seaside Rec Use Wkshp Aug 2012 0472	8/30/12											2								
Seaside Rec Use Wkshp Aug 2012 0473	8/30/12											1						2		
Seaside Rec Use Wkshp Aug 2012 0474	8/30/12																	2		
Seaside Rec Use Wkshp Aug 2012 0477	8/30/12																	2		
Seaside Rec Use Wkshp Aug 2012 0479	8/30/12																	1		
Seaside Rec Use Wkshp Aug 2012 0480	8/30/12	1																		
Seaside Rec Use Wkshp Aug 2012 0482	8/30/12																	1		
Seaside Rec Use Wkshp Aug 2012 0483	8/30/12																	1		
Seaside Rec Use Wkshp Aug 2012 0486	8/30/12											1								
Seaside Rec Use Wkshp Aug 2012 0488	8/30/12	1																		
Seaside Rec Use Wkshp Aug 2012 0489	8/30/12	1																		
Seaside Rec Use Wkshp Aug 2012 0490	8/30/12											1								
Seaside Rec Use Wkshp Aug 2012 0491	8/30/12																	1		
Seaside Rec Use Wkshp Aug 2012 0493	8/30/12																	1		
Seaside Rec Use Wkshp Aug 2012 0495	8/30/12	1																		
Seaside Rec Use Wkshp Aug 2012 0496	8/30/12																	1		

APPENDICES

Photo ID	Flight Date	Indeterminable Recreational Use	Boating For Hire (Charter) Uses					Recreational Fishing Uses					General Recreational Uses - Non-Consumptive							
			Charter Fishing	Charter Diving/Snorkeling	Charter Party Cruises	Charter Wildlife Viewing	Charter Scenic Viewing	Charter Transport	Recr. Kayak & Non-Motorized Vessel Fishing	Rec. Dive Fishing	Rec. Fishing from Motorized Vessels	Rec. Shore Fishing	Rec. Shellfish Harvesting	Rec. Waterfowl Hunting	Motorized Boating	Paddling	Sailing	Scuba/Snorkeling/Diving	Shore Use	Surface Water Sports
Seaside Rec Use Wkshp Aug 2012 0504	8/30/12	1																		
Seaside Rec Use Wkshp Aug 2012 0506	8/30/12									1										
Seaside Rec Use Wkshp Aug 2012 0507	8/30/12									2										
Seaside Rec Use Wkshp Aug 2012 0508	8/30/12												1							
Seaside Rec Use Wkshp Aug 2012 0509	8/30/12									1			1							
Seaside Rec Use Wkshp Aug 2012 0510	8/30/12												1							
Seaside Rec Use Wkshp Aug 2012 0511	8/30/12	1																		
Seaside Rec Use Wkshp Aug 2012 0515	8/30/12												1							
Seaside Rec Use Wkshp Aug 2012 0518	8/30/12	1																		
Seaside Rec Use Wkshp Aug 2012 0520	8/30/12									1										
Seaside Rec Use Wkshp Aug 2012 0521	8/30/12													1						
Seaside Rec Use Wkshp Aug 2012 0522	8/30/12	1																		
Seaside Rec Use Wkshp Aug 2012 0524	8/30/12												1							
Seaside Rec Use Wkshp Aug 2012 0525	8/30/12	1																		
Seaside Rec Use Wkshp Aug 2012 0526	8/30/12	2																2		1
Seaside Rec Use Wkshp Aug 2012 0529	8/30/12	1																		
Seaside Rec Use Wkshp Aug 2012 0530	8/30/12	1																		
Seaside Rec Use Wkshp Aug 2012 0531	8/30/12	1																		
Seaside Rec Use Wkshp Aug 2012 0532	8/30/12												1							
Seaside Rec Use Wkshp Aug 2012 0533	8/30/12												2							
Seaside Rec Use Wkshp Sept 2012 0537	9/1/12									2										
Seaside Rec Use Wkshp Sept 2012 0538	9/1/12									1										
Seaside Rec Use Wkshp Sept 2012 0539	9/1/12												3					6		
Seaside Rec Use Wkshp Sept 2012 0540	9/1/12									1										

APPENDICES

Photo ID	Flight Date	Indeterminable Recreational Use	Boating For Hire (Charter) Uses					Recreational Fishing Uses					General Recreational Uses - Non-Consumptive							
			Charter Fishing	Charter Diving/Snorkeling	Charter Party Cruises	Charter Wildlife Viewing	Charter Scenic Viewing	Charter Transport	Recr. Kayak & Non-Motorized Vessel Fishing	Rec. Dive Fishing	Rec. Fishing from Motorized Vessels	Rec. Shore Fishing	Rec. Shellfish Harvesting	Rec. Waterfowl Hunting	Motorized Boating	Paddling	Sailing	Scuba/Snorkeling/Diving	Shore Use	Surface Water Sports
Seaside Rec Use Wkshp Sept 2012 0541	9/1/12	2																3		
Seaside Rec Use Wkshp Sept 2012 0542	9/1/12																	4		
Seaside Rec Use Wkshp Sept 2012 0543	9/1/12																	3		
Seaside Rec Use Wkshp Sept 2012 0544	9/1/12												1							
Seaside Rec Use Wkshp Sept 2012 0545	9/1/12												2							
Seaside Rec Use Wkshp Sept 2012 0546	9/1/12	1																		
Seaside Rec Use Wkshp Sept 2012 0547	9/1/12												1							
Seaside Rec Use Wkshp Sept 2012 0548	9/1/12	4															6			
Seaside Rec Use Wkshp Sept 2012 0550	9/1/12																		3	
Seaside Rec Use Wkshp Sept 2012 0551	9/1/12	1											2				4			
Seaside Rec Use Wkshp Sept 2012 0552	9/1/12									1										
Seaside Rec Use Wkshp Sept 2012 0553	9/1/12												1							
Seaside Rec Use Wkshp Sept 2012 0554	9/1/12												3							
Seaside Rec Use Wkshp Sept 2012 0556	9/1/12									1										
Seaside Rec Use Wkshp Sept 2012 0558	9/1/12	2																		3
Seaside Rec Use Wkshp Sept 2012 0559	9/1/12												5							
Seaside Rec Use Wkshp Sept 2012 0561	9/1/12												60				121		7	
Seaside Rec Use Wkshp Sept 2012 0566	9/1/12									1										
Seaside Rec Use Wkshp Sept 2012 0567	9/1/12												1							
Seaside Rec Use Wkshp Sept 2012 0569	9/1/12												1						3	
Seaside Rec Use Wkshp Sept 2012 0570	9/1/12												1	4						
Seaside Rec Use Wkshp Sept 2012 0571	9/1/12												1							3
Seaside Rec Use Wkshp Sept 2012 0574	9/1/12												1							
Seaside Rec Use Wkshp Sept 2012 0575	9/1/12									1			1	2						2

APPENDICES

Photo ID	Flight Date	Indeterminable Recreational Use	Boating For Hire (Charter) Uses					Recreational Fishing Uses					General Recreational Uses - Non-Consumptive							
			Charter Fishing	Charter Diving/Snorkeling	Charter Party Cruises	Charter Wildlife Viewing	Charter Scenic Viewing	Charter Transport	Recr. Kayak & Non-Motorized Vessel Fishing	Rec. Dive Fishing	Rec. Fishing from Motorized Vessels	Rec. Shore Fishing	Rec. Shellfish Harvesting	Rec. Waterfowl Hunting	Motorized Boating	Paddling	Sailing	Scuba/Snorkeling/Diving	Shore Use	Surface Water Sports
Seaside Rec Use Wkshp Sept 2012 0577	9/1/12									1				2						
Seaside Rec Use Wkshp Sept 2012 0578	9/1/12													1						
Seaside Rec Use Wkshp Sept 2012 0579	9/1/12													1						
Seaside Rec Use Wkshp Sept 2012 0580	9/1/12													2						
Seaside Rec Use Wkshp Sept 2012 0581	9/1/12	2												5						
Seaside Rec Use Wkshp Sept 2012 0582	9/1/12													2						
Seaside Rec Use Wkshp Sept 2012 0583	9/1/12	1												2						
Seaside Rec Use Wkshp Sept 2012 0584	9/1/12													1						
Seaside Rec Use Wkshp Sept 2012 0586	9/1/12									1										
Seaside Rec Use Wkshp Sept 2012 0587	9/1/12													1						
Seaside Rec Use Wkshp Sept 2012 0588	9/1/12									1										
Seaside Rec Use Wkshp Sept 2012 0590	9/1/12									2										
Seaside Rec Use Wkshp Sept 2012 0591	9/1/12	2																		
Seaside Rec Use Wkshp Sept 2012 0593	9/1/12	8												1						
Seaside Rec Use Wkshp Sept 2012 0594	9/1/12	1																		
Seaside Rec Use Wkshp Sept 2012 0595	9/1/12	1																		
Seaside Rec Use Wkshp Sept 2012 0596	9/1/12									1				1						
Seaside Rec Use Wkshp Sept 2012 0597	9/1/12	1												1						
Seaside Rec Use Wkshp Sept 2012 0598	9/1/12													2						
Seaside Rec Use Wkshp Sept 2012 0599	9/1/12													1						
Seaside Rec Use Wkshp Sept 2012 0600	9/1/12	1																		
Seaside Rec Use Wkshp Sept 2012 0601	9/1/12									1										
Seaside Rec Use Wkshp Sept 2012 0602	9/1/12													2						
Seaside Rec Use Wkshp Sept 2012 0603	9/1/12													1						

APPENDICES

Photo ID	Flight Date	Indeterminable Recreational Use	Boating For Hire (Charter) Uses					Recreational Fishing Uses					General Recreational Uses - Non-Consumptive							
			Charter Fishing	Charter Diving/Snorkeling	Charter Party Cruises	Charter Wildlife Viewing	Charter Scenic Viewing	Charter Transport	Recr. Kayak & Non-Motorized Vessel Fishing	Rec. Dive Fishing	Rec. Fishing from Motorized Vessels	Rec. Shore Fishing	Rec. Shellfish Harvesting	Rec. Waterfowl Hunting	Motorized Boating	Paddling	Sailing	Scuba/Snorkeling/Diving	Shore Use	Surface Water Sports
Seaside Rec Use Wkshp Sept 2012 0634	9/1/12																	27	3	13
Seaside Rec Use Wkshp Sept 2012 0635	9/1/12																	56		1
Seaside Rec Use Wkshp Sept 2012 0636	9/1/12																	50		
Seaside Rec Use Wkshp Sept 2012 0637	9/1/12																	51		
Seaside Rec Use Wkshp Sept 2012 0639	9/1/12										2							2		2
Seaside Rec Use Wkshp Sept 2012 0640	9/1/12																	2		
Seaside Rec Use Wkshp Sept 2012 0644	9/1/12																	12		
Seaside Rec Use Wkshp Sept 2012 0645	9/1/12																	1		
Seaside Rec Use Wkshp Sept 2012 0648	9/1/12																	4		
Seaside Rec Use Wkshp Sept 2012 0652	9/1/12									2										
Seaside Rec Use Wkshp Sept 2012 0653	9/1/12													1						
Seaside Rec Use Wkshp Sept 2012 0656	9/1/12	2												1						
Seaside Rec Use Wkshp Sept 2012 0657	9/1/12													6			10			
Seaside Rec Use Wkshp Sept 2012 0661	9/1/12													1	1					
Seaside Rec Use Wkshp Sept 2012 0662	9/1/12	1												1						
Seaside Rec Use Wkshp Sept 2012 0664	9/1/12													1						
Seaside Rec Use Wkshp Sept 2012 0665	9/1/12	1																		
Seaside Rec Use Wkshp Sept 2012 0666	9/1/12													1						
Seaside Rec Use Wkshp Sept 2012 0669	9/1/12	1																		
Seaside Rec Use Wkshp Sept 2012 0673	9/1/12										1									
Seaside Rec Use Wkshp Sept 2012 0676	9/1/12													1						
Seaside Rec Use Wkshp Sept 2012 0677	9/1/12	2																		
Seaside Rec Use Wkshp Sept 2012 0678	9/1/12													4			8			
Seaside Rec Use Wkshp Sept 2012 0679	9/1/12										1									

APPENDICES

Photo ID	Flight Date	Indeterminate Recreational Use	Boating For Hire (Charter) Uses					Recreational Fishing Uses					General Recreational Uses - Non-Consumptive							
			Charter Fishing	Charter Diving/Snorkeling	Charter Party Cruises	Charter Wildlife Viewing	Charter Scenic Viewing	Charter Transport	Recr. Kayak & Non-Motorized Vessel Fishing	Rec. Dive Fishing	Rec. Fishing from Motorized Vessels	Rec. Shore Fishing	Rec. Shellfish Harvesting	Rec. Waterfowl Hunting	Motorized Boating	Paddling	Sailing	Scuba/Snorkeling/Diving	Shore Use	Surface Water Sports
Seaside Rec Use Wkshp Sept 2012 0682	9/1/12									1										
Seaside Rec Use Wkshp Sept 2012 0683	9/1/12													1				1		
Seaside Rec Use Wkshp Sept 2012 0684	9/1/12																	2		
Seaside Rec Use Wkshp Sept 2012 0685	9/1/12									2										
Seaside Rec Use Wkshp Sept 2012 0688	9/1/12									2										
Seaside Rec Use Wkshp Sept 2012 0691	9/1/12													1						
Seaside Rec Use Wkshp Sept 2012 0692	9/1/12	1																		
Seaside Rec Use Wkshp Sept 2012 0693	9/1/12	1																		
Seaside Rec Use Wkshp Sept 2012 0694	9/1/12													1						
Seaside Rec Use Wkshp Sept 2012 0698	9/1/12													1						
Seaside Rec Use Wkshp Sept 2012 0699	9/1/12													1						
Seaside Rec Use Wkshp Sept 2012 0709	9/1/12													1						
Seaside Rec Use Wkshp Sept 2012 0833	9/6/12									1				0						
Seaside Rec Use Wkshp Sept 2012 0834	9/6/12									2				0						
Seaside Rec Use Wkshp Sept 2012 0910	9/9/12	1																		
Seaside Rec Use Wkshp Sept 2012 0912	9/9/12													1						
Seaside Rec Use Wkshp Sept 2012 0913	9/9/12									1										
Seaside Rec Use Wkshp Sept 2012 0914	9/9/12													1						
Seaside Rec Use Wkshp Sept 2012 0916	9/9/12	1																		
Seaside Rec Use Wkshp Sept 2012 0917	9/9/12													2						
Seaside Rec Use Wkshp Sept 2012 0919	9/9/12	1																		
Seaside Rec Use Wkshp Sept 2012 0920	9/9/12																	2		
Seaside Rec Use Wkshp Sept 2012 0922	9/9/12	1																		
Seaside Rec Use Wkshp Sept 2012 0923	9/9/12													1						

APPENDICES

Photo ID	Flight Date	Indeterminate Recreational Use	Boating For Hire (Charter) Uses					Recreational Fishing Uses					General Recreational Uses - Non-Consumptive							
			Charter Fishing	Charter Diving/Snorkeling	Charter Party Cruises	Charter Wildlife Viewing	Charter Scenic Viewing	Charter Transport	Recr. Kayak & Non-Motorized Vessel Fishing	Rec. Dive Fishing	Rec. Fishing from Motorized Vessels	Rec. Shore Fishing	Rec. Shellfish Harvesting	Rec. Waterfowl Hunting	Motorized Boating	Paddling	Sailing	Scuba/Snorkeling/Diving	Shore Use	Surface Water Sports
Seaside Rec Use Wkshp Sept 2012 0926	9/9/12													1						
Seaside Rec Use Wkshp Sept 2012 0928	9/9/12	2																		
Seaside Rec Use Wkshp Sept 2012 0930	9/9/12																	4		
Seaside Rec Use Wkshp Sept 2012 0931	9/9/12																	2		
Seaside Rec Use Wkshp Sept 2012 0932	9/9/12																	2		
Seaside Rec Use Wkshp Sept 2012 0933	9/9/12																	2		
Seaside Rec Use Wkshp Sept 2012 0934	9/9/12																	2		
Seaside Rec Use Wkshp Sept 2012 0935	9/9/12																	9	1	1
Seaside Rec Use Wkshp Sept 2012 0936	9/9/12																	7		1
Seaside Rec Use Wkshp Sept 2012 0937	9/9/12																	8		
Seaside Rec Use Wkshp Sept 2012 0938	9/9/12																	3		
Seaside Rec Use Wkshp Sept 2012 0939	9/9/12																	10		
Seaside Rec Use Wkshp Sept 2012 0941	9/9/12																	2		
Seaside Rec Use Wkshp Sept 2012 0942	9/9/12																	2		
Seaside Rec Use Wkshp Sept 2012 0944	9/9/12																		2	
Seaside Rec Use Wkshp Sept 2012 0949	9/9/12	1																		
Seaside Rec Use Wkshp Sept 2012 0950	9/9/12	1																		
Seaside Rec Use Wkshp Sept 2012 0951	9/9/12											1								
Seaside Rec Use Wkshp Sept 2012 0952	9/9/12											1								
Seaside Rec Use Wkshp Sept 2012 0953	9/9/12													1						
Seaside Rec Use Wkshp Sept 2012 0956	9/9/12													1						
Seaside Rec Use Wkshp Sept 2012 0957	9/9/12	1																		
Seaside Rec Use Wkshp Sept 2012 0958	9/9/12													1						
Seaside Rec Use Wkshp Sept 2012 0960	9/9/12										2									

APPENDICES

Photo ID	Flight Date	Indeterminable Recreational Use	Boating For Hire (Charter) Uses					Recreational Fishing Uses					General Recreational Uses - Non-Consumptive							
			Charter Fishing	Charter Diving/Snorkeling	Charter Party Cruises	Charter Wildlife Viewing	Charter Scenic Viewing	Charter Transport	Recr. Kayak & Non-Motorized Vessel Fishing	Rec. Dive Fishing	Rec. Fishing from Motorized Vessels	Rec. Shore Fishing	Rec. Shellfish Harvesting	Rec. Waterfowl Hunting	Motorized Boating	1 Paddling	Sailing	Scuba/Snorkeling/Diving	Shore Use	Surface Water Sports
Seaside Rec Use Wkshp Sept 2012 1062	9/22/12																			
Seaside Rec Use Wkshp Sept 2012 1063	9/22/12	1																		
Seaside Rec Use Wkshp Sept 2012 1064	9/22/12	1																		
Seaside Rec Use Wkshp Sept 2012 1066	9/22/12	1																		
Seaside Rec Use Wkshp Sept 2012 1067	9/22/12									1										
Seaside Rec Use Wkshp Sept 2012 1068	9/22/12	1																		
Seaside Rec Use Wkshp Sept 2012 1069	9/22/12									9				1	1					
Seaside Rec Use Wkshp Sept 2012 1187	9/22/12												1							
Seaside Rec Use Wkshp July 2013 001	7/6/13												1							
Seaside Rec Use Wkshp July 2013 003	7/6/13												1							
Seaside Rec Use Wkshp July 2013 004	7/6/13												1							
Seaside Rec Use Wkshp July 2013 006	7/6/13									1										
Seaside Rec Use Wkshp July 2013 008	7/6/13	4												2						
Seaside Rec Use Wkshp July 2013 011	7/6/13												3				2			
Seaside Rec Use Wkshp July 2013 012	7/6/13	2								2										
Seaside Rec Use Wkshp July 2013 015	7/6/13												2				8			
Seaside Rec Use Wkshp July 2013 017	7/6/13												1							
Seaside Rec Use Wkshp July 2013 018	7/6/13												1							
Seaside Rec Use Wkshp July 2013 027	7/6/13																1			
Seaside Rec Use Wkshp July 2013 028	7/6/13	1											2							
Seaside Rec Use Wkshp July 2013 029	7/6/13												1							
Seaside Rec Use Wkshp July 2013 035	7/6/13												1							
Seaside Rec Use Wkshp July 2013 036	7/6/13	1																		
Seaside Rec Use Wkshp July 2013 040	7/6/13												1							

APPENDICES

Photo ID	Flight Date	Indeterminable Recreational Use	Boating For Hire (Charter) Uses					Recreational Fishing Uses					General Recreational Uses - Non-Consumptive							
			Charter Fishing	Charter Diving/Snorkeling	Charter Party Cruises	Charter Wildlife Viewing	Charter Scenic Viewing	Charter Transport	Recr. Kayak & Non-Motorized Vessel Fishing	Rec. Dive Fishing	Rec. Fishing from Motorized Vessels	Rec. Shore Fishing	Rec. Shellfish Harvesting	Rec. Waterfowl Hunting	Motorized Boating	Paddling	Sailing	Scuba/Snorkeling/Diving	Shore Use	Surface Water Sports
Seaside Rec Use Wkshp July 2013 041	7/6/13																	4		
Seaside Rec Use Wkshp July 2013 042	7/6/13																	2		
Seaside Rec Use Wkshp July 2013 043	7/6/13												1							
Seaside Rec Use Wkshp July 2013 045	7/6/13									1										
Seaside Rec Use Wkshp July 2013 047	7/6/13													2						
Seaside Rec Use Wkshp July 2013 051	7/6/13													1						
Seaside Rec Use Wkshp July 2013 056	7/6/13													4				6		
Seaside Rec Use Wkshp July 2013 057	7/6/13													31						
Seaside Rec Use Wkshp July 2013 059	7/6/13	4																		
Seaside Rec Use Wkshp July 2013 060	7/6/13	1																		
Seaside Rec Use Wkshp July 2013 061	7/6/13									1										
Seaside Rec Use Wkshp July 2013 062	7/6/13									1										
Seaside Rec Use Wkshp July 2013 063	7/6/13									14										
Seaside Rec Use Wkshp July 2013 064	7/6/13									1										
Seaside Rec Use Wkshp July 2013 065	7/6/13									6										
Seaside Rec Use Wkshp July 2013 066	7/6/13									1										
Seaside Rec Use Wkshp July 2013 068	7/6/13									7										
Seaside Rec Use Wkshp July 2013 069	7/6/13									5										
Seaside Rec Use Wkshp July 2013 070	7/6/13									2										
Seaside Rec Use Wkshp July 2013 071	7/6/13									2										
Seaside Rec Use Wkshp July 2013 072	7/6/13									1				1						
Seaside Rec Use Wkshp July 2013 073	7/6/13													1						
Seaside Rec Use Wkshp July 2013 076	7/6/13									1										
Seaside Rec Use Wkshp July 2013 077	7/6/13									7										

APPENDICES

Photo ID	Flight Date	Indeterminable Recreational Use	Boating For Hire (Charter) Uses					Recreational Fishing Uses					General Recreational Uses - Non-Consumptive							
			Charter Fishing	Charter Diving/Snorkeling	Charter Party Cruises	Charter Wildlife Viewing	Charter Scenic Viewing	Charter Transport	Recr. Kayak & Non-Motorized Vessel Fishing	Rec. Dive Fishing	Rec. Fishing from Motorized Vessels	Rec. Shore Fishing	Rec. Shellfish Harvesting	Rec. Waterfowl Hunting	Motorized Boating	Paddling	Sailing	Scuba/Snorkeling/Diving	Shore Use	Surface Water Sports
Seaside Rec Use Wkshp July 2013 078	7/6/13									1				1						
Seaside Rec Use Wkshp July 2013 080	7/6/13	1								2										
Seaside Rec Use Wkshp July 2013 081	7/6/13													1						
Seaside Rec Use Wkshp July 2013 219	7/6/13													1						
Seaside Rec Use Wkshp July 2013 220	7/6/13													1						
Seaside Rec Use Wkshp July 2013 221	7/6/13													1						
Seaside Rec Use Wkshp July 2013 222	7/6/13																1			
Seaside Rec Use Wkshp July 2013 224	7/6/13	1																		
Seaside Rec Use Wkshp July 2013 225	7/6/13													1						
Seaside Rec Use Wkshp July 2013 001	7/27/13	5												2						
Seaside Rec Use Wkshp July 2013 002	7/27/13													3						
Seaside Rec Use Wkshp July 2013 005	7/27/13	3												2						
Seaside Rec Use Wkshp July 2013 006	7/27/13	1																		
Seaside Rec Use Wkshp July 2013 007	7/27/13													2				6		
Seaside Rec Use Wkshp July 2013 008	7/27/13									1										
Seaside Rec Use Wkshp July 2013 009	7/27/13													1						
Seaside Rec Use Wkshp July 2013 010	7/27/13	1																		
Seaside Rec Use Wkshp July 2013 012	7/27/13													1						
Seaside Rec Use Wkshp July 2013 013	7/27/13	1																		
Seaside Rec Use Wkshp July 2013 015	7/27/13									1										
Seaside Rec Use Wkshp July 2013 016	7/27/13													1						
Seaside Rec Use Wkshp July 2013 017	7/27/13													1						
Seaside Rec Use Wkshp July 2013 018	7/27/13	3												1						
Seaside Rec Use Wkshp July 2013 019	7/27/13									3										

APPENDICES

Photo ID	Flight Date	Indeterminable Recreational Use	Boating For Hire (Charter) Uses					Recreational Fishing Uses						General Recreational Uses - Non-Consumptive										
			Charter Fishing	Charter Diving/Snorkeling	Charter Party Cruises	Charter Wildlife Viewing	Charter Scenic Viewing	Charter Transport	Recr. Kayak & Non-Motorized Vessel Fishing	Rec. Dive Fishing	Rec. Fishing from Motorized Vessels	Rec. Shore Fishing	Rec. Shellfish Harvesting	Rec. Waterfowl Hunting	Motorized Boating	Paddling	Sailing	Scuba/Snorkeling/Diving	Shore Use	Surface Water Sports	Swimming			
Seaside Rec Use Wkshp July 2013 020	7/27/13																	10						
Seaside Rec Use Wkshp July 2013 023	7/27/13																		3					
Seaside Rec Use Wkshp July 2013 025	7/27/13																		1					
Seaside Rec Use Wkshp July 2013 026	7/27/13	2																						
Seaside Rec Use Wkshp July 2013 027	7/27/13	1																						
Seaside Rec Use Wkshp July 2013 028	7/27/13	2																						
Seaside Rec Use Wkshp July 2013 029	7/27/13	3																						
Seaside Rec Use Wkshp July 2013 031	7/27/13																							
Seaside Rec Use Wkshp July 2013 033	7/27/13																							
Seaside Rec Use Wkshp July 2013 034	7/27/13																							
Seaside Rec Use Wkshp July 2013 035	7/27/13																							
Seaside Rec Use Wkshp July 2013 037	7/27/13																							
Seaside Rec Use Wkshp July 2013 042	7/27/13	2																						
Seaside Rec Use Wkshp July 2013 045	7/27/13																							
Seaside Rec Use Wkshp July 2013 047	7/27/13	1																						
Seaside Rec Use Wkshp July 2013 050	7/27/13	1																						
Seaside Rec Use Wkshp July 2013 052	7/27/13																							
Seaside Rec Use Wkshp July 2013 053	7/27/13																							
Seaside Rec Use Wkshp July 2013 055	7/27/13																							
Seaside Rec Use Wkshp July 2013 058	7/27/13																							
Seaside Rec Use Wkshp July 2013 059	7/27/13																							
Seaside Rec Use Wkshp July 2013 060	7/27/13																							
Seaside Rec Use Wkshp July 2013 062	7/27/13																							
Seaside Rec Use Wkshp July 2013 064	7/27/13																							

APPENDICES

Photo ID	Flight Date	Indeterminable Recreational Use	Boating For Hire (Charter) Uses					Recreational Fishing Uses					General Recreational Uses - Non-Consumptive						
			Charter Fishing	Charter Diving/Snorkeling	Charter Party Cruises	Charter Wildlife Viewing	Charter Scenic Viewing	Charter Transport	Recr. Kayak & Non-Motorized Vessel Fishing	Rec. Dive Fishing	Rec. Fishing from Motorized Vessels	Rec. Shore Fishing	Rec. Shellfish Harvesting	Rec. Waterfowl Hunting	Motorized Boating	Paddling	Sailing	Scuba/Snorkeling/Diving	Shore Use
Seaside Rec Use Wkshp July 2013 065	7/27/13												3						
Seaside Rec Use Wkshp July 2013 066	7/27/13												6				25		
Seaside Rec Use Wkshp July 2013 067	7/27/13									1			1						
Seaside Rec Use Wkshp July 2013 068	7/27/13	1																	
Seaside Rec Use Wkshp July 2013 069	7/27/13												1						
Seaside Rec Use Wkshp July 2013 070	7/27/13												4				2		
Seaside Rec Use Wkshp July 2013 072	7/27/13									1									
Seaside Rec Use Wkshp July 2013 073	7/27/13												1						
Seaside Rec Use Wkshp July 2013 075	7/27/13												1						
Seaside Rec Use Wkshp July 2013 077	7/27/13	1											2						
Seaside Rec Use Wkshp July 2013 078	7/27/13	1								1									
Seaside Rec Use Wkshp July 2013 080	7/27/13												2						
Seaside Rec Use Wkshp July 2013 082	7/27/13												3				4		
Seaside Rec Use Wkshp July 2013 084	7/27/13												2						
Seaside Rec Use Wkshp July 2013 085	7/27/13												1						
Seaside Rec Use Wkshp July 2013 089	7/27/13									1			1						
Seaside Rec Use Wkshp July 2013 092	7/27/13	2																	
Seaside Rec Use Wkshp July 2013 096	7/27/13												1						
Seaside Rec Use Wkshp July 2013 101	7/27/13									1									
Seaside Rec Use Wkshp July 2013 103	7/27/13												1						
Seaside Rec Use Wkshp July 2013 104	7/27/13												2				5		
Seaside Rec Use Wkshp July 2013 106	7/27/13									1									
Seaside Rec Use Wkshp July 2013 107	7/27/13												2						
Seaside Rec Use Wkshp July 2013 108	7/27/13																7		

APPENDICES

Photo ID	Flight Date	Indeterminable Recreational Use	Boating For Hire (Charter) Uses					Recreational Fishing Uses					General Recreational Uses - Non-Consumptive							
			Charter Fishing	Charter Diving/Snorkeling	Charter Party Cruises	Charter Wildlife Viewing	Charter Scenic Viewing	Charter Transport	Recr. Kayak & Non-Motorized Vessel Fishing	Rec. Dive Fishing	Rec. Fishing from Motorized Vessels	Rec. Shore Fishing	Rec. Shellfish Harvesting	Rec. Waterfowl Hunting	Motorized Boating	P addling	Sailing	Scuba/Snorkeling/Diving	Shore Use	Surface Water Sports
Seaside Rec Use Wkshp July 2013 109	7/27/13																			
Seaside Rec Use Wkshp July 2013 113	7/27/13													1						
Seaside Rec Use Wkshp July 2013 115	7/27/13	1																		
Seaside Rec Use Wkshp July 2013 116	7/27/13													1						
Seaside Rec Use Wkshp July 2013 117	7/27/13													1						
Seaside Rec Use Wkshp July 2013 119	7/27/13									2				1						
Seaside Rec Use Wkshp July 2013 121	7/27/13									1										
Seaside Rec Use Wkshp July 2013 122	7/27/13	1																		
Seaside Rec Use Wkshp July 2013 125	7/27/13	1																		
Seaside Rec Use Wkshp July 2013 126	7/27/13									1					1					
Seaside Rec Use Wkshp July 2013 128	7/27/13													1						
Seaside Rec Use Wkshp July 2013 129	7/27/13													1						
Seaside Rec Use Wkshp July 2013 130	7/27/13													1						
Seaside Rec Use Wkshp July 2013 132	7/27/13													1						
Seaside Rec Use Wkshp July 2013 133	7/27/13													2						
Seaside Rec Use Wkshp July 2013 134	7/27/13													1						
Seaside Rec Use Wkshp July 2013 135	7/27/13													1						
Seaside Rec Use Wkshp July 2013 136	7/27/13													1						
Seaside Rec Use Wkshp July 2013 137	7/27/13													1						
Seaside Rec Use Wkshp July 2013 139	7/27/13													1						
Seaside Rec Use Wkshp July 2013 141	7/27/13									1										
Seaside Rec Use Wkshp July 2013 143	7/27/13													1						
Seaside Rec Use Wkshp July 2013 145	7/27/13									1										
Seaside Rec Use Wkshp July 2013 146	7/27/13	1																		

APPENDICES

Photo ID	Flight Date	Indeterminable Recreational Use	Boating For Hire (Charter) Uses					Recreational Fishing Uses					General Recreational Uses - Non-Consumptive							
			Charter Fishing	Charter Diving/Snorkeling	Charter Party Cruises	Charter Wildlife Viewing	Charter Scenic Viewing	Charter Transport	Recr. Kayak & Non-Motorized Vessel Fishing	Rec. Dive Fishing	Rec. Fishing from Motorized Vessels	Rec. Shore Fishing	Rec. Shellfish Harvesting	Rec. Waterfowl Hunting	Motorized Boating	Paddling	Sailing	Scuba/Snorkeling/Diving	Shore Use	Surface Water Sports
Seaside Rec Use Wkshp July 2013 147	7/27/13												1							
Seaside Rec Use Wkshp July 2013 148	7/27/13									3										
Seaside Rec Use Wkshp July 2013 149	7/27/13																	1		
Seaside Rec Use Wkshp July 2013 152	7/27/13	1																		
Seaside Rec Use Wkshp July 2013 153	7/27/13	1											1							
Seaside Rec Use Wkshp July 2013 154	7/27/13												1							
Seaside Rec Use Wkshp July 2013 156	7/27/13									1			2							
Seaside Rec Use Wkshp July 2013 157	7/27/13									2										
Seaside Rec Use Wkshp July 2013 158	7/27/13	1																		
Seaside Rec Use Wkshp July 2013 159	7/27/13												1							
Seaside Rec Use Wkshp July 2013 160	7/27/13									1			1							
Seaside Rec Use Wkshp July 2013 162	7/27/13									1										
Seaside Rec Use Wkshp July 2013 163	7/27/13									1										
Seaside Rec Use Wkshp July 2013 164	7/27/13									3			1							
Seaside Rec Use Wkshp Sept 2013 317	9/5/13												1							
Seaside Rec Use Wkshp Sept 2013 318	9/5/13												1							
Seaside Rec Use Wkshp Sept 2013 319	9/5/13	1																		
Seaside Rec Use Wkshp Sept 2013 321	9/5/13												1							
Seaside Rec Use Wkshp Sept 2013 322	9/5/13												1							
Seaside Rec Use Wkshp Sept 2013 323	9/5/13												1							
Seaside Rec Use Wkshp Sept 2013 327	9/5/13												1							
Seaside Rec Use Wkshp Sept 2013 328	9/5/13									1										
Seaside Rec Use Wkshp Sept 2013 329	9/5/13									1										
Seaside Rec Use Wkshp Sept 2013 330	9/5/13												1							

APPENDICES

Photo ID	Flight Date	Indeterminable Recreational Use	Boating For Hire (Charter) Uses					Recreational Fishing Uses					General Recreational Uses - Non-Consumptive							
			Charter Fishing	Charter Diving/Snorkeling	Charter Party Cruises	Charter Wildlife Viewing	Charter Scenic Viewing	Charter Transport	Recr. Kayak & Non-Motorized Vessel Fishing	Rec. Dive Fishing	Rec. Fishing from Motorized Vessels	Rec. Shore Fishing	Rec. Shellfish Harvesting	Rec. Waterfowl Hunting	Motorized Boating	Paddling	Sailing	Scuba/Snorkeling/Diving	Shore Use	Surface Water Sports
Seaside Rec Use Wkshp Sept 2013 331	9/5/13																	1		
Seaside Rec Use Wkshp Sept 2013 334	9/5/13									1										
Seaside Rec Use Wkshp Sept 2013 343	9/5/13									1										
Seaside Rec Use Wkshp Sept 2013 345	9/5/13												1							
Seaside Rec Use Wkshp Sept 2013 346	9/5/13												2							
Seaside Rec Use Wkshp Sept 2013 350	9/5/13	1																		
Seaside Rec Use Wkshp Sept 2013 351	9/5/13												2							
Seaside Rec Use Wkshp Sept 2013 362	9/5/13	3																		
Seaside Rec Use Wkshp Sept 2013 363	9/5/13									1										
Seaside Rec Use Wkshp Sept 2013 367	9/5/13												1							
Seaside Rec Use Wkshp Sept 2013 368	9/5/13									1										
Seaside Rec Use Wkshp Sept 2013 369	9/5/13	1																		
Seaside Rec Use Wkshp Sept 2013 371	9/5/13									1										
Seaside Rec Use Wkshp Sept 2013 372	9/5/13									1										
Seaside Rec Use Wkshp Sept 2013 375	9/5/13												1							
Seaside Rec Use Wkshp Sept 2013 376	9/5/13	1																		
Seaside Rec Use Wkshp Sept 2013 378	9/5/13												1							
Seaside Rec Use Wkshp Sept 2013 379	9/5/13									1										
Seaside Rec Use Wkshp Sept 2013 380	9/5/13									2			1							
Seaside Rec Use Wkshp Sept 2013 381	9/5/13									1										
Seaside Rec Use Wkshp Sept 2013 382	9/5/13									3			1							
Seaside Rec Use Wkshp Sept 2013 383	9/5/13									3										
Seaside Rec Use Wkshp Sept 2013 384	9/5/13	1																		
Seaside Rec Use Wkshp Sept 2013 385	9/5/13	1																		

APPENDICES

Photo ID	Flight Date	Indeterminable Recreational Use	Boating For Hire (Charter) Uses						Recreational Fishing Uses					General Recreational Uses - Non-Consumptive							
			Charter Fishing	Charter Diving/Snorkeling	Charter Party Cruises	Charter Wildlife Viewing	Charter Scenic Viewing	Charter Transport	Recr. Kayak & Non-Motorized Vessel Fishing	Rec. Dive Fishing	Rec. Fishing from Motorized Vessels	Rec. Shore Fishing	Rec. Shellfish Harvesting	Rec. Waterfowl Hunting	Motorized Boating	Paddling	Sailing	Scuba/Snorkeling/Diving	Shore Use	Surface Water Sports	Swimming
Seaside Rec Use Wkshp Sept 2013 386	9/5/13															1					
Seaside Rec Use Wkshp Sept 2013 388	9/5/13									1											
Seaside Rec Use Wkshp Sept 2013 389	9/5/13									1											
Seaside Rec Use Wkshp Sept 2013 391	9/5/13									2											
Seaside Rec Use Wkshp Sept 2013 393	9/5/13									1											
Seaside Rec Use Wkshp Sept 2013 395	9/5/13									1											
Seaside Rec Use Wkshp Sept 2013 396	9/5/13									1					1						
Seaside Rec Use Wkshp Sept 2013 397	9/5/13									1											
Seaside Rec Use Wkshp Sept 2013 490	9/5/13	1																			
Seaside Rec Use Wkshp Sept 2013 493	9/26/13	2																			
Seaside Rec Use Wkshp Sept 2013 494	9/26/13	1																			
Seaside Rec Use Wkshp Sept 2013 501	9/26/13															1					
Seaside Rec Use Wkshp Sept 2013 519	9/26/13	1																			
Seaside Rec Use Wkshp Sept 2013 522	9/26/13									1											
Seaside Rec Use Wkshp Sept 2013 524	9/26/13									1											
Seaside Rec Use Wkshp Sept 2013 534	9/26/13									1											
Seaside Rec Use Wkshp Sept 2013 538	9/26/13															1					
Seaside Rec Use Wkshp Sept 2013 539	9/26/13	1																			
Seaside Rec Use Wkshp Sept 2013 546	9/28/13									1											
Seaside Rec Use Wkshp Sept 2013 624	9/28/13	1																			
Seaside Rec Use Wkshp Sept 2013 629	9/28/13	1																			
Seaside Rec Use Wkshp Oct 2013 633	10/3/13																		4		
Seaside Rec Use Wkshp Oct 2013 639	10/3/13									1											
Seaside Rec Use Wkshp Oct 2013 640	10/3/13	1																			

APPENDICES

Photo ID	Flight Date	Indeterminable Recreational Use	Boating For Hire (Charter) Uses					Recreational Fishing Uses					General Recreational Uses - Non-Consumptive							
			Charter Fishing	Charter Diving/Snorkeling	Charter Party Cruises	Charter Wildlife Viewing	Charter Scenic Viewing	Charter Transport	Recr. Kayak & Non-Motorized Vessel Fishing	Rec. Dive Fishing	Rec. Fishing from Motorized Vessels	Rec. Shore Fishing	Rec. Shellfish Harvesting	Rec. Waterfowl Hunting	Motorized Boating	Paddling	Sailing	Scuba/Snorkeling/Diving	Shore Use	Surface Water Sports
Seaside Rec Use Wkshp Oct 2013 642	10/3/13								1											
Seaside Rec Use Wkshp Oct 2013 644	10/3/13								1											
Seaside Rec Use Wkshp Oct 2013 652	10/3/13										2									
Seaside Rec Use Wkshp Oct 2013 653	10/3/13																	2		
Seaside Rec Use Wkshp Oct 2013 654	10/3/13	1																		
Seaside Rec Use Wkshp Oct 2013 656	10/3/13	1																		
Seaside Rec Use Wkshp Oct 2013 668	10/3/13	1																		
Seaside Rec Use Wkshp Oct 2013 669	10/3/13																	1		
Seaside Rec Use Wkshp Oct 2013 671	10/3/13	1																		
Seaside Rec Use Wkshp Oct 2013 672	10/3/13	2																		
Seaside Rec Use Wkshp Oct 2013 682	10/3/13								1											
Seaside Rec Use Wkshp Oct 2013 683	10/3/13								1											
Seaside Rec Use Wkshp Oct 2013 684	10/3/13								2											
Seaside Rec Use Wkshp Oct 2013 686	10/3/13								2											
Seaside Rec Use Wkshp Oct 2013 687	10/3/13								4											
Seaside Rec Use Wkshp Oct 2013 688	10/3/13	1																		
Seaside Rec Use Wkshp Oct 2013 692	10/3/13								4											
Seaside Rec Use Wkshp Oct 2013 693	10/3/13								2											
Seaside Rec Use Wkshp Oct 2013 694	10/3/13								1					1						
Seaside Rec Use Wkshp Oct 2013 695	10/3/13	1																		
Seaside Rec Use Wkshp Oct 2013 697	10/3/13								1											
Seaside Rec Use Wkshp Oct 2013 744	10/3/13																	2		
Seaside Rec Use Wkshp Oct 2013 747	10/3/13	1																		
Seaside Rec Use Wkshp Oct 2013 749	10/3/13	1																		

APPENDICES

Photo ID	Flight Date	Indeterminate Recreational Use	Boating For Hire (Charter) Uses					Recreational Fishing Uses						General Recreational Uses - Non-Consumptive						
			Charter Fishing	Charter Diving/Snorkeling	Charter Party Cruises	Charter Wildlife Viewing	Charter Scenic Viewing	Charter Transport	Recr. Kayak & Non-Motorized Vessel Fishing	Rec. Dive Fishing	Rec. Fishing from Motorized Vessels	Rec. Shore Fishing	Rec. Shellfish Harvesting	Rec. Waterfowl Hunting	Motorized Boating	Paddling	Sailing	Scuba/Snorkeling/Diving	Shore Use	Surface Water Sports
Seaside Rec Use Wkshp Oct 2013 750	10/3/13									1										
Seaside Rec Use Wkshp Oct 2013 751	10/3/13	1																		
TOTAL		216	0	0	0	0	0	0	0	235	20	0	0	531	36	6	0	1701	60	391

APPENDICES

Appendix G Aerial Survey Flight Logs

APPENDICES



Virginia Coastal Zone
MANAGEMENT PROGRAM



Seaside Recreational-Use Survey Flight Log

Surveyors: Barbara Schuck Date: 8-19-12 Sunday
 Take-off: 9th a.m.
 Pilot: Sid Adams Land: 11:29 a.m.

WEATHER					
Air Temp:	<u>80s</u>	Heat Index:		Cloud Cover:	<u>Partly Cloudy</u>
				% Chance of Daytime Storms:	<u>10-30%</u>
Winds:	<u>SSE 10-15 mph</u>	<u>NE 3 mph</u>	<u>E 9-11</u>		<u>40%</u>
TIDES					
Chincoteague Channel (S end)		Great Machipongo Inlet		Smith Island USCG Station	
High:	<u>10:21 AM 9⁵⁶pm</u>	High:	<u>10:25 AM 10:14 a.m.</u>	High:	<u>10:26 AM 10:21 a.m.</u>
Low:	<u>4:29 AM 4:11 pm</u>	Low:	<u>4:51 AM 4:16 pm</u>	Low:	<u>5:07 AM 4:52 pm</u>
High:	<u>10:44 PM 10¹⁸pm</u>	High:	<u>11:07 PM 10³⁶pm</u>	High:	<u>10:49 PM 10²⁶pm</u>
Low:	<u>4:39 PM</u>	Low:	<u>4:41 PM 4:09 a.m.</u>	Low:	<u>5:17 PM</u>
Ches. Bay Bridge Tunnel (S end)		Virginia Beach		False Cape	
High:	<u>10:39 AM 10¹⁰am</u>	High:	<u>10:07 AM 9³⁶a.m.</u>	High:	<u>9:52 AM 9²¹am</u>
Low:	<u>4:24 AM 4:3 pm</u>	Low:	<u>4:57 AM 4:1 pm</u>	Low:	<u>5:47 AM 3:32 pm</u>
High:	<u>10:54 PM 10²⁸pm</u>	High:	<u>10:21 PM 9⁴⁵am</u>	High:	<u>10:06 PM 9³³am</u>
Low:	<u>4:43 PM</u>	Low:	<u>4:17 PM</u>	Low:	<u>4:07 PM</u>

NOTES

weather deteriorated throughout morning.

Completed flight over all ES seaside but turned back at CBBT because large T-storm approaching.

Most boat traffic at Queen's Head ramp.

Light use throughout. Maybe a few commercial clam boats but mostly recreational anglers.

a couple of kayakers

no surfers

Folks on Assateague beach

Very high tide - Most of marshes covered with salt water

APPENDICES



Virginia Coastal Zone
MANAGEMENT PROGRAM



Seaside Recreational-Use Survey Flight Log

Surveyors: *Barbara Schwanke*

Date: *8/23/12* *Thursday*

Take-off: *9:10*

Pilot:

Land: *11:50*

WEATHER			
Air Temp: <i>77</i>	Heat Index:	Cloud Cover: <i>partly</i>	% Chance of Daytime Storms: <i>20%</i>
Winds: <i>NNE 8-11 mph</i>		Hazy	
TIDES			
Chincoteague Channel (S end)		Great Machipongo Inlet	Smith Island USCG Station
High: <i>2:15 am</i>	High: <i>12:50 am</i>	High: <i>12:42 am</i>	
Low: <i>9:13 am</i>	Low: <i>7:05 am</i>	Low: <i>7:41 am</i>	
High: <i>2:51 pm</i>	High: <i>1:32 pm</i>	High: <i>1:19 pm</i>	
Low: <i>10:33 pm</i>	Low: <i>7:50 pm</i>	Low: <i>8:31 pm</i>	
Ches. Bay Bridge Tunnel		Virginia Beach	False Cape
High:	High: <i>12:11 am</i>	High:	
Low:	Low: <i>6:23 am</i>	Low: <i>6:13 am</i>	
High:	High: <i>12:50 pm</i>	High: <i>12:37 pm</i>	
Low:	Low: <i>7:11 pm</i>	Low: <i>7:01 pm</i>	
NOTES			
<i>Cloudy 77° 9:00 am</i>		<i>Car's fly over Lynnhaven -</i>	
<i>CBSA 2 birds</i>		<i>Walden Dr</i>	
<i>+ MLL II</i>		<i>Car's fly over ^{VARCI} peninsula</i>	
		<i>2 birds</i>	
		<i>1 bird on US beach (South)</i>	
		<i>Red flag up. VARCI</i>	

APPENDICES



Virginia Coastal Zone
MANAGEMENT PROGRAM



Seaside Recreational-Use Survey Flight Log

Surveyors: Barbara Lehman Date: 4/30/12 Thursday
 Take-off: 9:35 am
 Pilot: SID ADAMS Land: 11:40 am

WEATHER			
Air Temp: <u>80</u>	Heat Index: <u>✓</u>	Cloud Cover: <u>partly high cum</u>	% Chance of Daytime Storms: <u>0</u>
Winds: <u>2+</u>			
TIDES			
Chincoteague Channel (S end)	Great Machipongo Inlet	Smith Island USCG Station	
High: <u>8:08 pm</u>	High: <u>8:26 pm</u>	High: <u>7:44 am</u>	
Low: <u>1:56 am</u>	Low: <u>1:58 am</u>	Low: <u>2:39 pm</u>	
High: <u>7:39 am</u>	High: <u>7:57 am</u>	High: <u>8:13 pm</u>	
Low: <u>2:01 pm</u>	Low: <u>2:03 pm</u>	Low: <u>2:34 am</u>	
Ches. Bay Bridge Tunnel	Virginia Beach	Fales Cape	
High: <u>8:38 pm</u>	High: <u>7:50 pm</u>	High: <u>7:35 pm</u>	
Low: <u>1:56 am</u>	Low: <u>1:33 am</u>	Low: <u>1:13 am</u>	
High: <u>8:18 am</u>	High: <u>7:29 am</u>	High: <u>7:14 am</u>	
Low: <u>2:10 pm</u>	Low: <u>1:37 pm</u>	Low: <u>1:27 pm</u>	

NOTES
 left ACP - Cedar Island
 Oyster Creek 2 Commercial
 Oysters 1 Com " scattered
Clear - cum cloud
 10:15 Chincoteague Beach
 Wallops
 Cedar Point
 past Reed → back to Cedar
 up river to Neck
 Machipongo River
 Willis Island
 Hog Island bay to
 Dykes
 in a spot
 Wine Point
 Finkerman's Island back to North
 11:35 am
 over →

APPENDICES



VIRGINIA
DEPARTMENT OF TRANSPORTATION



Virginia Coastal Zone
MANAGEMENT PROGRAM



A-PPDC

M: 217-361
x2
18.5 mi
37 mi

Seaside Recreational-Use Survey Flight Log

Surveyors: Barbara Schwank Date: 9/1/12 Saturday Time: 12:30-4:30

Pilot: Syd Adams Take-off: 1:00 pm Land: 4:07 pm

WEATHER			
Air Temp: <u>86°</u>	Heat Index: <u>93</u>	Cloud Cover: <u>hazy light low cloud cover ceiling 5000 - light rain part of trip</u>	% Chance of Daytime Storms: <u>20</u>
Winds: <u>NW 8 mph</u>			
TIDES			
Chincoteague Channel (S end)	Great Machipongo Inlet	Smith Island USCG Station	
High: <u>9:33 pm</u>	High:	High:	
Low: <u>3:17 am</u>	Low: <u>3:19 am</u>	Low: <u>3:55 am</u>	
High: <u>9:12 am</u>	High: <u>9:28 am</u>	High: <u>9:15 am</u>	
Low: <u>3:33 pm</u>	Low: <u>3:35 pm</u>	Low: <u>4:11 pm</u>	
Ches. Bay Bridge Tunnel	Virginia Beach	False Cape	
High:	High:	High:	
Low: <u>3:19 am</u>	Low: <u>2:46 am</u>	Low: <u>2:36 am</u>	
High: <u>7:44 am</u>	High: <u>8:57 am</u>	High: <u>8:42 am</u>	
Low: <u>3:43 pm</u>	Low: <u>3:10 pm</u>	Low: <u>3:08 pm</u>	
NOTES			
<p>started north because of weather. Line near Wallops - get that first then south low over Cedar - 2 boats Lots of activity at Gangetha Tom cores ymcho! Chincoteague Channel munks Aired Chanco Bay (Tom's Cove to W. side of Chinc) northern Charles (1) Wachapreague Dawson Shoals Wachapreague Willis wharf Sp. in water bay Ranshan Bay Channel Cop Island So. oyster channel COST Lynnhom Inlet down south up CBZ</p>			

APPENDICES



Virginia Coastal Zone
MANAGEMENT PROGRAM



Seaside Recreational-Use Survey Flight Log

Surveyors: Barbara Schwede

Date: 9/6/12 Thursday

Pilot: Sid Adams

Take-off: 4:50

Land: 10:10 AM

WEATHER			
Air Temp: 84°	Heat Index: 88°	Cloud Cover: low	% Chance of Daytime Storms: 50%
Winds: SW 5 mph			
TIDES			
Chincoteague Channel (S end)		Great Machipongo Inlet	Smith Island USCG Station
High:		High:	12:20 AM
Low:		Low:	7:10 AM
High:		High:	12:49 PM
Low:		Low:	7:56 PM
Ches. Bay Bridge Tunnel		Virginia Beach	False Cape
High:	12:17 AM	High:	
Low:	6:19 AM	Low:	5:41 AM
High:	12:46 PM	High:	12:04 PM
Low:	7:10 PM	Low:	6:35 PM
NOTES			
<p>To: Virginia Beach only very bumpy cleared up as we went south</p> <p>CBDT 10:10 AM by Barbara Inlet (S shore only) VA Beach NE</p> <p>Ocean orders 20 to keep by any 3 miles.</p> <p>T-storms to Nuth at Wallops - got back to airport just before storm hit.</p>			

APPENDICES



Virginia Coastal Zone
MANAGEMENT PROGRAM



Seaside Recreational-Use Survey Flight Log

Surveyors: Barbara Schwend Date: 9-9-12 Sunday 9³⁰
 Pilot: Mark Aice Take-off: 9:45
 Land: 12:25

WEATHER

Air Temp: 21.0 Heat Index: Cloud Cover: low scud % Chance of Daytime Storms:
clear w/ sp

WINDS:

TIDES

Chincoteague Channel (S end)	Great Machipongo Inlet	Smith Island USCG Station
High: <u>2:45 am</u>	High: <u>3:03 am</u>	High: <u>2:50 am</u>
Low: <u>9:03 am</u>	Low: <u>9:05 am</u>	Low: <u>9:41 am</u>
High: <u>3:27 PM</u>	High: <u>3:45 pm</u>	High: <u>3:32 pm</u>
Low: <u>10:01 PM</u>	Low: <u>10:03 pm</u>	Low: <u>10:39 pm</u>
Ches. Bay Bridge Tunnel	Virginia Beach	False Cape
High: <u>2:46 am</u>	High: <u>2:23 am</u>	High: <u>2:08 am</u>
Low: <u>8:52 am</u>	Low: <u>8:21 am</u>	Low: <u>8:11 am</u>
High: <u>3:23 pm</u>	High: <u>2:57 pm</u>	High: <u>2:42 pm</u>
Low: <u>9:55 pm</u>	Low: <u>9:34 pm</u>	Low: <u>9:24 pm</u>

NOTES

Cedar Island/Wachapreague Inlet
N to Wallops (behind Island)
over Chincoteague Bay to MD line
S along Beach at Assateague + Wallops Is.
over Buzzards Inlet
Wachapreague
Quincy - out over Roanoke Is. to
Wells wharf
Oyster
Wise Point
CBBT
Lynnhaven
Ches Beach
Around Point Henry
South along VA Beach to
NC line + back

APPENDICES





~ 130 photos
Last flight for this

Seaside Recreational-Use Survey Flight Log

Surveyors: Barbara Schwenk Date: 9-22-12
 Pilot: Seo Adams Take-off: 10:05 am
 Land: 11:40

WEATHER			
Air Temp:	<u>74°</u>	Heat Index:	
Cloud Cover:	<u>0</u>	% Chance of Daytime Storms:	<u>0</u>
Winds:	<u>SW ~15 mph</u>		
TIDES			
Chincoteague Channel (S end)	Great Machipongo Inlet	Smith Island USCG Station	
High:	High:	High:	<u>1:23 am</u>
Low:	Low:	Low:	<u>8:26 am</u>
High:	High:	High:	<u>2:04 pm</u>
Low:	Low:	Low:	<u>9:22 pm</u>
Ches. Bay Bridge Tunnel	Virginia Beach	False Cape	
High:	High:	High:	<u>12:42 pm am</u>
Low:	Low:	Low:	<u>6:57 am</u>
High:	High:	High:	<u>1:23 pm</u>
Low:	Low:	Low:	<u>8:01 pm</u>
NOTES			
<u>Seven CBST</u>		<u>VABCH</u>	
		<u>clear</u>	
		<u>beautiful day but Windy & bumpy</u>	
<u>Lynnhaven Inlet</u>		<u>lots of fishing boats</u>	
		<u>some people on beach & some camps at False Cape on beach</u>	
		<u>Surfers - at VABCH + south</u>	
		<u>Hundreds of dolphins</u>	
		<u>Many kayakers</u>	
		<u>Lynnhaven Inlet esp. many - both motor boats + kayakers.</u>	

APPENDICES



Virginia Coastal Zone
MANAGEMENT PROGRAM



Seaside Recreational-Use Survey Flight Log

Surveyors: Susan Quinn Date: 6 July 2013
Pilot: Mark Hill Take-off: 10:55
Land: 12:55

WEATHER			
Air Temp:	88F	Heat Index:	
Winds:	260° @ 8kt/m	Cloud Cover:	Few
		% Chance of Daytime Storms:	<20%
TIDES			
Chincoteague Channel (S end)		Great Machipongo Inlet	
High:	7:26A	High:	7:52A
Low:	1:58A	Low:	2:07A
High:	7:56P	High:	8:22P
Low:	1:39P	Low:	1:48P
Ches. Bay Bridge Tunnel		Virginia Beach	
High:	7:52A	High:	7:16A
Low:	1:51A	Low:	1:34A
High:	8:10P	High:	7:32P
Low:	1:38P	Low:	1:05P
		Smith Island USCG Station	
		High:	7:39A
		Low:	2:40A
		High:	8:09P
		Low:	2:21P
		False Cape	
		High:	7:00A
		Low:	1:09A
		High:	7:21P
		Low:	12:57P

NOTES

Weather was clear, some scattered clouds
 Could not fly up to Chincoteague/Wallops
 Airspace was ^{low} ~~low~~
 ~10 surfers, ^{few} kayakers
 Pilot counted 286 recreational
 Most boats just outside CBBT
 Lots of sunbathers @ Virginia Beach
 Saw / photographed 2 parasails

APPENDICES



Virginia Coastal Zone
MANAGEMENT PROGRAM



Seaside Recreational-Use Survey Flight Log

Surveyors: *Bruce*

Date: *7/27*

Pilot: *Mark Hill*

Take-off: *1040*

Land: *1:00*

WEATHER

Air Temp: *86* Heat Index: Cloud Cover: *Few* % Chance of Daytime Storms:

Winds:

TIDES

Chincoteague Channel (S end)	Great Machipongo Inlet	Smith Island USCG Station
High: <i>12:00 AM</i>	High: <i>12:27 A</i>	High: <i>12:14 A</i>
Low: <i>6:21 AM</i>	Low: <i>6:40 A</i>	Low: <i>7:13 A</i>
High: <i>12:29 PM</i>	High: <i>12:57</i>	High: <i>12:41 P</i>
Low: <i>6:52 PM</i>	Low: <i>7:07</i>	Low: <i>7:40 P</i>
Ches. Bay Bridge Tunnel	Virginia Beach	False Cape
High:	High:	High:
Low:	Low:	Low:
High:	High:	High:
Low:	Low:	Low:

NOTES

Some scattered clouds, mostly clear but some cirrus
 We were able to fly up to Wallops/Chincoteague
 Spotted 2+(?) Kinglets, 3 parrots, numerous surfers & body surfers. Lots of recreational boats and today. Two low flying planes were skimming the beach of one of the islands (took some pics of the planes. Pilot counted ~124 birds)
 Lots of sunbathers on the beaches @ Virginia Beach, Assateague

APPENDICES



Virginia Coastal Zone
MANAGEMENT PROGRAM



Seaside Recreational-Use Survey Flight Log

Surveyors: *S. Simon*
Pilot: *Mark Hill*

Date: *5 Sept 13*
Take-off: *12:24 PM*
Land: *2:40 PM*

WEATHER

Air Temp: *75 F* Heat Index:

Cloud Cover: *Clear*

% Chance of Daytime Storms: *Low - Med (?)*

Winds: *@ 1000 FPM*

! Gorgeous Day

Got a bit windy towards the end of flight

TIDES *→ calm*

Chincoteague Channel (S end)

✓ Great Machipongo Inlet

✓ Smith Island USCG Station

High: ~~_____~~

High: *9:02 AM*

High: *8:49 AM*

Low: ~~_____~~

Low: *2:51 AM*

Low: *3:29 AM*

High: ~~_____~~

High: *9:25 PM*

High: *9:12 PM*

Low: ~~_____~~

Low: *3:04 PM*

Low: *3:37 PM*

✓ Ches. Bay Bridge Tunnel

✓ Virginia Beach

False Cape

High: *8:48 AM*

High: *8:13 AM*

High: _____

Low: *2:28 AM*

Low: *2:04 AM*

Low: _____

High: *9:01 PM*

High: *8:23 PM*

High: _____

Low: *2:47 PM*

Low: *2:18 PM*

Low: _____

NOTES *No Wallops today - Area was "hot"*

CG, and buoy tender

Saw lots of rays at the surface of the H₂O

Conrad boat c scuba diver

~ 2-3 parasails, sailboat

Some kayakers, not many people on the beaches today

APPENDICES



Virginia Coastal Zone
MANAGEMENT PROGRAM



Seaside Recreational-Use Survey Flight Log

Surveyors: *Susan Sim*

Date: *9/26/13*

Pilot: *Mark Hill*

Take-off: *3:30 PM*

Land:

WEATHER			
Air Temp: <i>70</i>	Heat Index:	Cloud Cover: <i>Scattered Clouds</i>	% Chance of Dry Ice Storm: <i>Weather report did not call for rain</i>
Winds:			
TIDES			
Chincoteague Channel (S end)	Great Machipongo Inlet	Smith Island USCG Station	
High:	High: <i>2:38A</i>	High: <i>1:31A</i>	
Low:	Low: <i>8:42A</i>	Low: <i>8:21A</i>	
High: <i>X</i>	High: <i>0:29P</i>	High: <i>2:06P</i>	
Low:	Low: <i>9:40P</i>	Low: <i>9:18P</i>	
Ches. Bay Bridge Tunnel	Virginia Beach	False Cape	
High:	High: <i>12:52A</i>	High:	
w:	Low: <i>6:54A</i>	Low:	
High:	High: <i>1:21PM</i>	High:	
Low:	Low: <i>8:04PM</i>	Low:	
NOTES: <i>Left from West Point, VA Middle Peninsula airport Flown to VNC border and headed N Got "jammed" in radar near Ocean. Had to stick near the beach as we headed N. Traced beach @ 500ft. Blue menhaden boat & 2 smaller boats in net circle. Busy air traffic control tracking today - Had to stick closer to the beach. Couldnt go near Wallops</i>			

APPENDICES



Virginia Coastal Zone
MANAGEMENT PROGRAM



Seaside Recreational-Use Survey Flight Log

Surveyors: *SSim*

Date: *9/28 (Saturday)*

Pilot: *Mark Hill*

Take-off: *10:30A*

Land: *1:27P*

Coveck 49

WEATHER

Air Temp: *22*

Heat Index:

Cloud Cover: *Bkn @ 2000 ft*

% Chance of Daytime Storms:

Winds:

TIDES

Chincoteague Channel (S end)

High: *3:13 AM*

Low: *9:35 AM*

High: *3:46 PM*

Low: *10:20 PM*

Great Machipongo Inlet

High: *3:38 A*

Low: *9:38 A*

High: *4:16 P*

Low: *10:34 P*

Smith Island USCG Station

High: *3:25 A*

Low: *10:11 A*

High: *4:03 P*

Low: *11:07 P*

Ches. Bay Bridge Tunnel

High:

Low:

High:

Low:

Virginia Beach

High: *2:52 A*

Low: *8:51 A*

High: *3:17 P*

Low: *9:59 P*

False Cape

High:

Low:

High:

Low:

NOTES

Lotsa white caps - possible small craft advisory
GPS stopped capturing just E of Day battery - Sev. pix taken at Wallops/Chincoteague S of GPS
Pix # 9666 jettied out at sea just S of Wallops
GPS still not working
Pix 9667 - GPS working again (barge & tow boat)
Starting to get windy @ 11:40 AM
Lots of sailboats just S of Sigambaren
Took a gally break @ Coveck Airport @ 12:10; took off again @ 12:27P
Pix taken @ 12:58 is the first low that I took earlier

APPENDICES



Virginia Coastal Zone
MANAGEMENT PROGRAM



Seaside Recreational-Use Survey Flight Log

Dolphins
370115
7603
48

Surveyors: _____ Date: 10/3/13

Pilot: *Mark Hill* Take-off: 11:25A

Land: 1:51P

Whales 365415 WD7600

Dolphin 365424 WD7558.63

2-3 juvs 363379 WD7551.86

Chance of Daytime Storms: _____

Winds: _____

Air Temp: _____ Heat Index: _____ Cloud Cover: _____

TIDES

Chincoteague Channel (S end)	Great Machipongo Inlet	Smith Island USCG Station
High: _____	High: <i>7:49A</i>	High: <i>7:36A</i>
Low: _____	Low: <i>1:34A</i>	Low: <i>2:07A</i>
High: _____	High: <i>8:11P</i>	High: <i>7:58P</i>
Low: _____	Low: <i>1:55P</i>	Low: <i>2:28P</i>
Ches. Bay Bridge Tunnel	Virginia Beach	False Cape
High: _____	High: <i>6:59A</i>	High: _____
Low: _____	Low: <i>12:45A</i>	Low: _____
High: _____	High: <i>7:12P</i>	High: _____
Low: _____	Low: <i>1:09P</i>	Low: _____

NOTES: *Heading straight N to Wallace, if you*
@ 9632 shot pic of boat that was empty & there was
a person on the beach - 5 dogs
Kayaker @ 3641.99 WD7554.87
#9602 3732.77 WD7548.62 GPS not working on
(coming up inland ~ 12 miles that pic.
3 of Acc
airport)