Vessel Traffic Analysis for Port Access Route Study: Seacoast of New Jersey including the offshore approaches to the Delaware Bay, Delaware (NJ PARS)

Analysis conducted by the USCG Navigation Center (NAVCEN) in Alexandria, VA

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Introduction and Background

This traffic analysis examines data from the years 2017-2019 to identify trends and unique or significant variations of vessel transits and characteristics in consideration of the Port Access Route Study: Seacoast of New Jersey Including Offshore Approaches to the Delaware Bay. The study area for this traffic analysis is the same as the study area defined in the Federal Register, Agency Docket Number USCG-2020-0172 and shown in Figure 1. The ACPARS proposed fairways, proposed anchorages, and wind lease and planning areas are also shown in this figure.

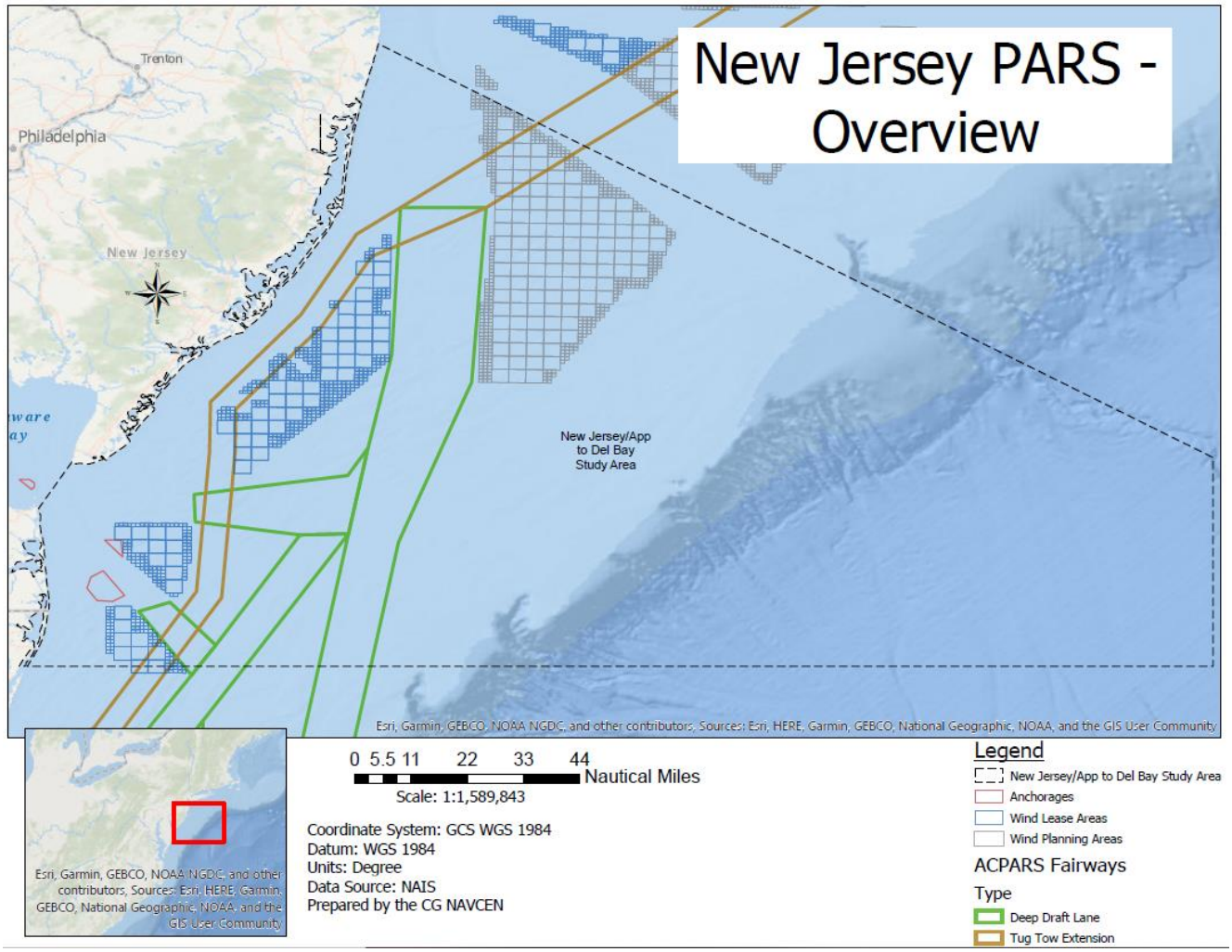

Figure 1: NJ PARS Overview

Materials and Data

Nationwide Automated Identification System (NAIS) Data

Traffic data from 01 January 2017 to 31 December 2019 is from NAIS collected and provided by the United States Coast Guard (USCG). All dimensions are originally reported in meters, subsequently draft and length dimensions have been converted to feet for use in this report.

Column Header	User-Defined?	Explanatory Information
MSG_TYPE	No	Identifies AIS unit as either Class A or Class B
MMSI	No	Maritime Mobile Service Identity, unique identifier for the ship, can change over time
IMO_NUMBER	Yes	International Maritime Organization Number, remains the same for the vessel's life, Not used in this report.
CALL_SIGN	Yes	Not used
LAT_AVG	No	Aggregate of latitude reports for 2.5 min on either side of time in PERIOD field.
LONG_AVG	No	Aggregate of longitude reports for 2.5 min on either side of time in PERIOD field.
PERIOD	No	Date/Time Stamp of AIS transmission.
SPEED_KNOTS	No	Speed of vessel at time of transmission
COG_DEG	No	Course over ground of vessel at time of transmission
HEADING_DEG	No	True heading of vessel at time of transmission if fitted with gyro compass
SHIP_AND_CARGO_TYPE	Yes	A numerical value between 10 and 99, delineating the vessel's service
DRAUGHT	Yes	Vessel Draft
DIM_BOW	Yes	"Bow Dimension" Distance from transceiver antenna to bow. Used to calculate Length
DIM_STERN	Yes	"Stern Dimension" Distance from transceiver antenna to stern. Used to calculate Length
DIM_PORT	Yes	"Port Dimension" Distance from transceiver antenna to port side. Used to calculate beam.
DIM_STARBOARD	Yes	"Starboard Dimension" Distance from transceiver antenna to starboard side. Used to calculate beam.
DESTINATION	Yes	

Table 1: AIS Data Overview

AIS data fields include fields that are both user-defined and non-user defined as indicated in Table 1. User defined data can be prone to error and missing inputs. Additionally, while AIS accepts user inputs of ship types 1-99, for this analysis, these ship types have been aggregated into 10 categories, shown in Table 2.

AIS Ship Type Code	Vessel Group
70-79	Cargo
30	Fishing
0/ Null	Not Available
1-20, 23-29, 33-34, 38-51, 53-59, 90-99	Others
60-69	Passenger
36,37	Pleasure Craft / Sailing
35	Military
80-89	Tanker
31-32, 52	Tug / Tow

Table 2: AIS Ship Types to Vessel Groups

The group "Not Available" categorizes vessels in which either the type was not recorded by NAIS correctly or the user defined a ship type that is invalid, or unrecognized. The group "Others" includes ships transmitting ship type "Other" (90-99) and various other specified ship types such as dredging, diving, and law enforcement vessels.

AIS traffic data does not capture all vessels that operate in the study area. Federal and international carriage regulations stipulate only certain vessels are required to send and/or receive AIS signals. This includes, but is not limited to: vessels of 65 feet or greater, towing vessels of 26 feet or greater, vessels certificated for 150 or more passengers, dredging vessels near a channel, fishing vessels, and vessels over 300 gross tons on an international voyage. A full description of applicability and general United States requirements can be found in 33 CFR 164.46.

Despite these limitations, AIS traffic data provides a satisfactory representation of the traffic in the study area. Deep draft and large vessels are required to broadcast an AIS signal; the counts of these vessels as well as their geographic locations are assumed to be accurate. The transit patterns for vessels that are not required to broadcast on AIS, such as small recreational vessels, are apparent even if these vessels are undercounted in the data set. This is based on the assumption that since a portion of the population of vessels not required by law to carry AIS voluntarily comply, these vessels provide a representative sample of the whole population. Overall, since not all vessels are required to broadcast on AIS, the population of all vessels in the study area is presumed greater than what is shown in this report.

Software

Track lines were constructed in the International Lighthouse Association's Risk Assessment (IALA) Software, IWRAP. Track line data extracted from IWRAP were used to create charts in Microsoft Excel, which are found in this study. Traffic densities and passage line diagrams were created using ArcGIS.

Methodology

Traffic Composition Analysis

The traffic composition section provides counts of vessel tracks anywhere in the study area. AIS transmission data was imported to IWRAP and used to construct and enumerate these tracks. In this report, a trip or track is defined as a continual passage through the study area which starts when the vessel enters the area and ends when either it exits the study area or remains stationary for greater than one hour.

This section includes counts of all tracks by vessel type in an area over a given year. This means that if a ship transits in the area multiple times, each transit is counted as a track. For example, if the container ship CGALLTHEWAY transits near the New Jersey shore, moors for greater than one hour while discharging cargo, after cargo discharge leaves the berth and anchors for greater than one hour, and finally weighs anchor and transits out of the study area, three tracks are tallied under the type "Cargo." The first is for the entrance transit, the second for the transit to anchorage, and the third is for the exit transit.

In addition to these track counts, unique vessel counts are also provided. This metric informs the study to differentiate total tracks and vessels responsible for those tracks. This tally indicates the number of unique vessels by type. In respect to the unique vessel counts, CGALLTHEWAY is counted only once under "Cargo," regardless of the number of transits it makes in the study area. These counts provide a broad overview of the vessels present in the study area.

Passage Line Analysis

While transit counts give a broad idea of traffic composition over the total study area, they dilute the information because the study area is very large. A passage line analysis allows for more specific study of the major routes present. This is accomplished by counting the transits across a gate placed in the areas with the highest traffic density. A transit is counted every time a vessel crosses a passage line then enumerated and reported by vessel type. In some instances where the traffic patterns varied notably between years monthly breakdowns are provided.

Passage lines were placed in areas that appeared to have a high traffic volume or because of their special geographic interest. Entrances and exits to inlets were of particular interest because of the likelihood of many vessel transits in these areas. Additionally, passage lines were also placed across the width of the traffic lanes approaching New York. Passage line Number 2 (Delaware Bay Entrance Pilot Area) accounts for the traffic approaching or exiting the Delaware Bay from any of the traffic lanes.

Figure 1 depicts the locations of passsage lines used in this analysis along with traffic density of all vessels from 2018 to 2019 combined. Traffic density is shown on a blue, yellow, red scale with blue as lowest denisty and red as highest. Passage lines are purple. Table 3 provides the name and number used to refer to each passage line throughout the study.

Continuing the previous example, in the passage line analysis conducted for New Jersey PARS, the CGALLTHEWAY is counted every time it crosses each passage lines. If that vessel crosses the Delaware Bay Pilot Area passage line and also crosses the Fishing Area West passage line in the same trip, two crossings are counted under "Cargo," one for each passage line. Passage lines marked 17a and 17b are a single passage line where Vessel crossings were analyzed in two directions North to South (17a) and South to North (17b). This was done to observe the flow of traffic into the Hudson South Wind Planning Area.

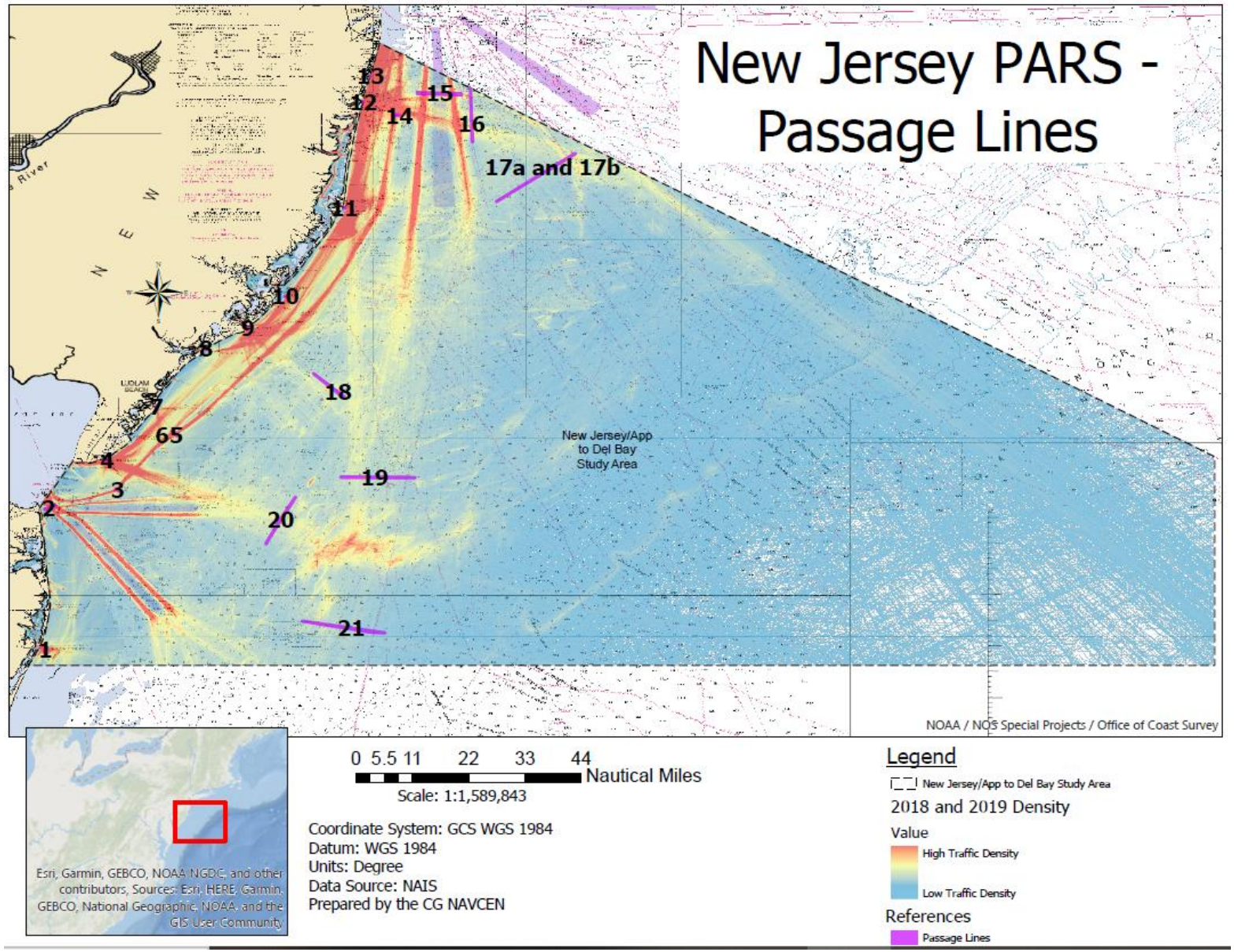

Figure 2: Passage Line Analysis Outline

Note: All passage lines are displayed above, some are smaller than others. The number labels are approximately centered on each passage line.

Number	Name
1	Ocean City Inlet
2	Delaware Bay Entrance Pilot Area
3	Two-Way Traffic Lane - South East of Cape May
4	Cape May Inlet
5	Informal Traffic Lane NJ to NY North of Cape May, South Split
6	Informal Traffic Lane NJ to NY North of Cape May, North Split
7	Townsends Inlet
8	Great Egg Harbor Inlet
9	Absecon Inlet
10	Little Egg Inlet
11	Barnegat Inlet
12	Manasquan Inlet
13	Shark River Inlet
14	Informal Traffic Lane NJ to NY Near Manasquan
15	Barnegat to Ambrose and Ambrose to Barnegat
16	Entering Hudson South Wind Planning Area
17a	Tug Tow Extension (ACPARS Proposed Fairway) in Hudson South Wind Planning Area (South to North)
17b	Tug Tow Extension (ACPARS Proposed Fairway) in Hudson South Wind Planning Area (North to South)
18	Ocean Wind and Atlantic Shores Boundary (Wind Lease Areas)
19	Fishing Area North
20	Fishing Area West
21	Fishing Area South

Table 3: Passage Line Key

Comparing Traffic Composition and Passage Line Analyses

The traffic composition figures (under the "Analysis" section titled "Traffic Composition Analysis") examine the study area as a whole, while the passage line analysis examines subsets of the area that are of particular interest. Passage line analysis subsets do not together encompass the entire study area. Therefore, the sum of the number of transits recorded in the passage line analysis will not equal the total number of transits in the traffic composition section. For example, in the passage line analysis section, if across all passage lines there are a total of 200 Pleasure Craft vessel transits in 2018, there will be more than 200 transits recorded in the traffic composition section for this vessel type. Although each analysis is informative, each should be considered separately since it is not expected that the traffic shown in the passage line analysis will reflect all traffic in the study area.

Transits Within an Area of Interest

Transits were tallied by vessel type that transited into the purple box shown in Figure 3 and labelled as "Lease Area Boundary Box." This area was drawn to examine traffic in the vicinity of wind lease blocks that are adjacent but leased by different developers.

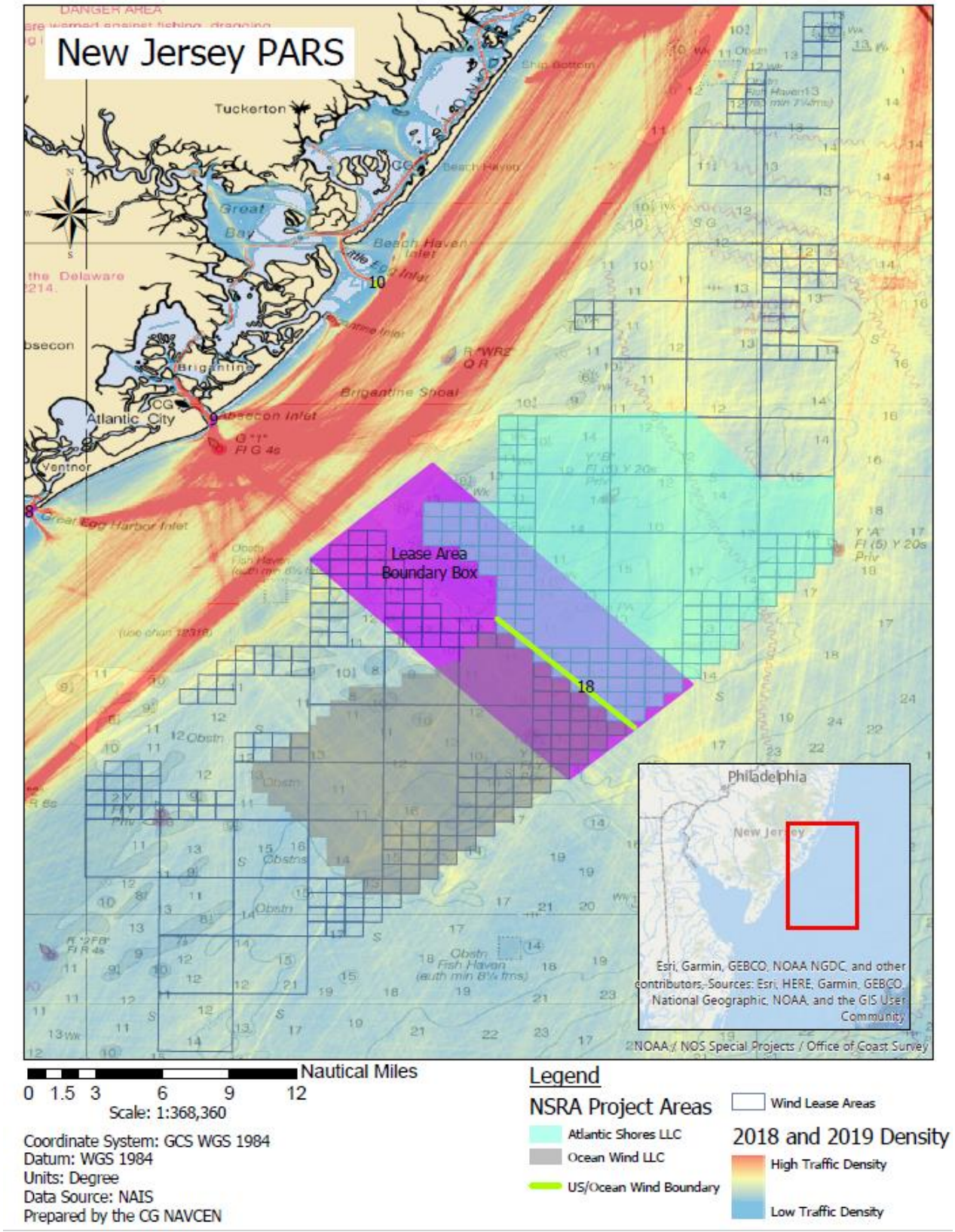

Figure 3: Lease Area Boundary Box

Vessel Length and Draft Distributions

The vessel length distributions report the sizes of vessels that transited the study area. These distributions show the count of the number of transits recorded by vessels of particular lengths. The vessel length from every track line is counted, so a vessel that visits the study area multiple times is counted each time. Vessel draft distributions are constructed in the same manner, using draft as the metric.

Traffic Densities

The charts in the traffic density section were created using ArcMap's line density function. The same data used in the traffic composition section were used to create track lines, and subsequently used to construct density plots. The density graphics show all vessel traffic for the key listed attribute over the course of a year. For example, the All Vessels density shows the conglomerate of the track lines of all the vessel groups combined, while the Cargo Ship density shows only the track lines associated with cargo ships. Densities are calculated by enumerating the length of transits per square mile ($\frac{\text{Miles transited(year)}}{mile^2}$)and are represented on a blue, yellow, red scale where blue represents low density and red represents high density. These calculations are carried out independently for each traffic density, thus each density is shown on a different scale that best represents the data in each case.

Proposed Anchorages Analysis

The notice of inquiry "Anchorage Grounds; Delaware Bay and Atlantic Ocean, Delaware (USCG-2019-0822)" proposes three new anchorages; two outside and one inside Delaware Bay. "Addendum 1 to this Traffic Analysis for the NJ PARS – NJ PARS Anchorage Analysis" is an examination of the traffic near the two proposed anchorages that fall within the study area for this PARS. This addendum provides general information about the historical vessel traffic near the proposed anchorages and vessels presumed to be anchoring near the entrance to the Delaware Bay and is included as a reference to this analysis.

Vessel Monitoring System (VMS) Data Analysis

A supplemental analysis of fishing vessel data was conducted using VMS data provided by National Oceanic and Atmospheric Administration (NOAA) Fisheries. The sharing and use of these data satisfies the criteria of section 1881a(b)(1)(H) of the Magnuson-Stevens Fisheries Management and Conservation Act. The results of this analysis are included in "Addendum 2 to the Traffic Analysis for the NJ PARS – NJ PARS VMS Data Analysis."

Tug/Tow Additional Analysis

An additional analysis of tug/tow vessel traffic across an area spanning along the coast between the Chesapeake and Delaware Bays was completed and included in "Addendum 3 to the Traffic Analysis for the NJ PARS – Tug/Tow Coastwise Traffic Analysis."

Results

Results for this analysis are maintained by NAVCEN in Word, Excel, PDF, ArcMap and IWRAP documents. For more information, please contact NAVCEN:

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Analysis

Traffic Composition Analysis

The Number of Vessel Transits and Unique Vessels by Vessel Type indicate how many transits each vessel type made in the study area over the identified year. These charts (Figure 4-Figure 6) show a count of the number of unique vessels in the identified year by type. For example, in 2017, 1553 unique Cargo vessels conducted 7543 total transits in the study area as depicted in Figure 4.

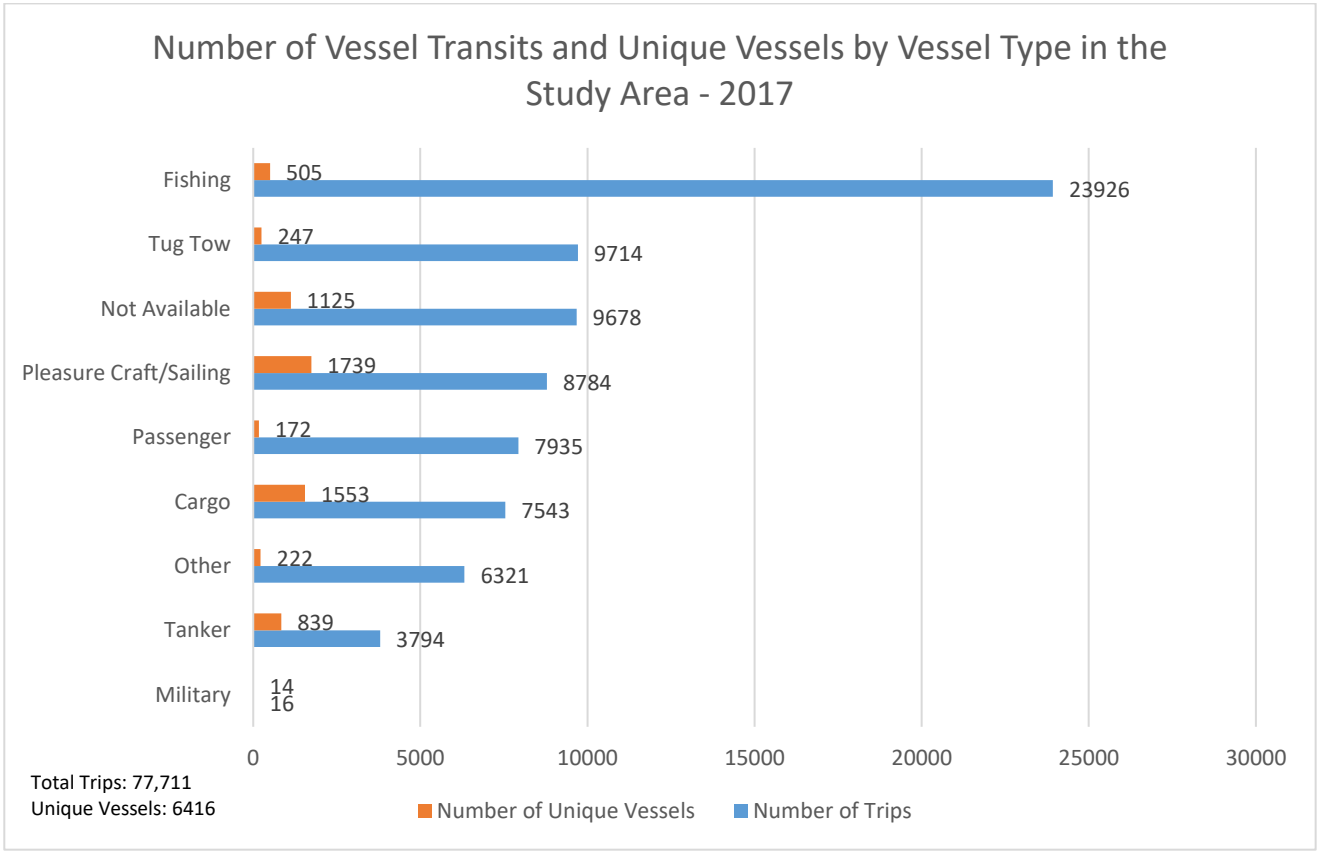


Figure 4: Number of Vessel Transits and Unique Vessels by Vessel Type in the Study Area, 2017

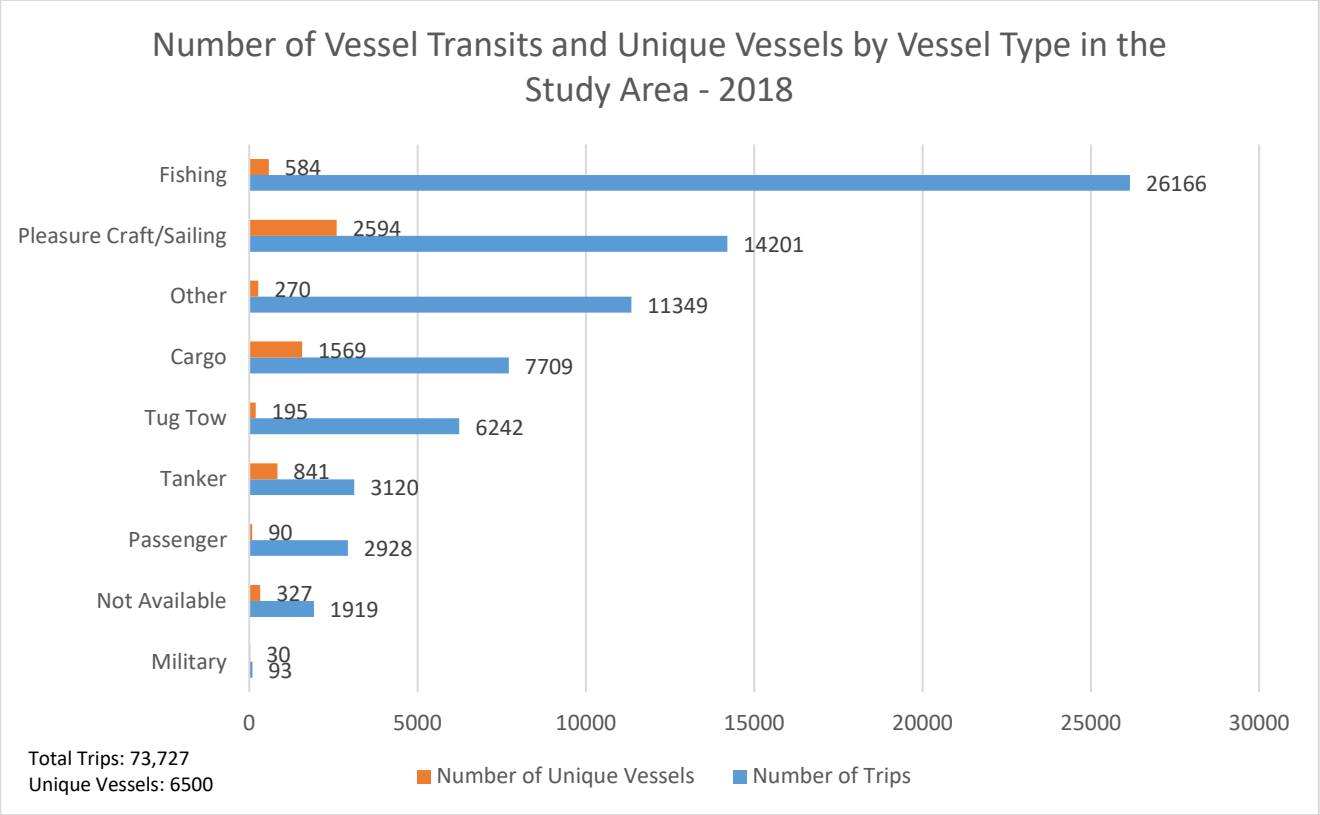


Figure 5: Number of Vessel Transits and Unique Vessel by Vessel Type in the Study Area, 2018

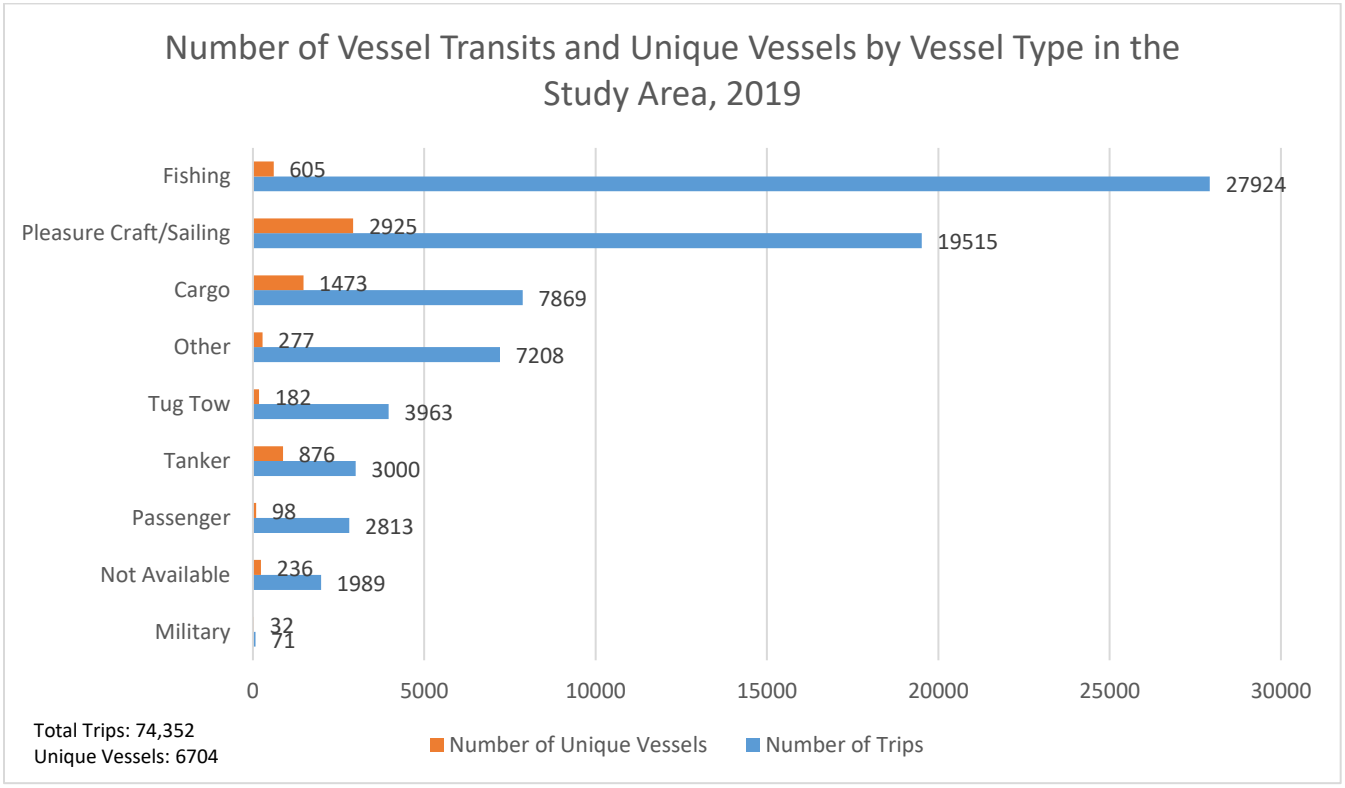


Figure 6: Number of Vessel Transits and Unique Vessels by Vessel Type in the Study Area, 2019

Information in in Figure 7 and Figure 8 is the same information shown in Figure 4-Figure 6. However, these charts allow a direct comparison of total trips and unique vessels counted between the three years of data. For example, in Figure 7, the number of trips counted for cargo vessels in 2017, 2018, and 2019 remained consistent with a range of 326 trips.

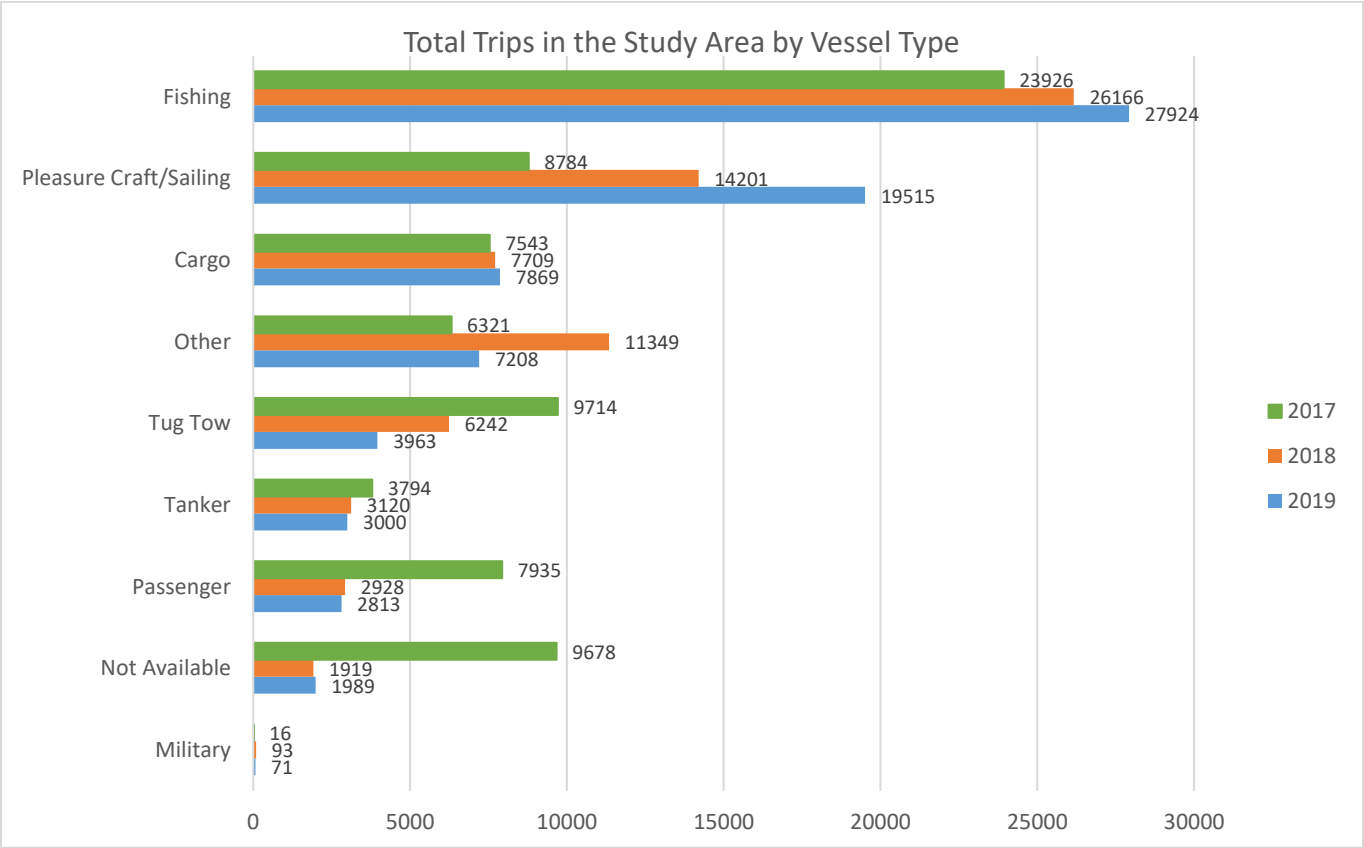


Figure 7: Total Trips in the Study Area by Vessel Type, 2017-2019

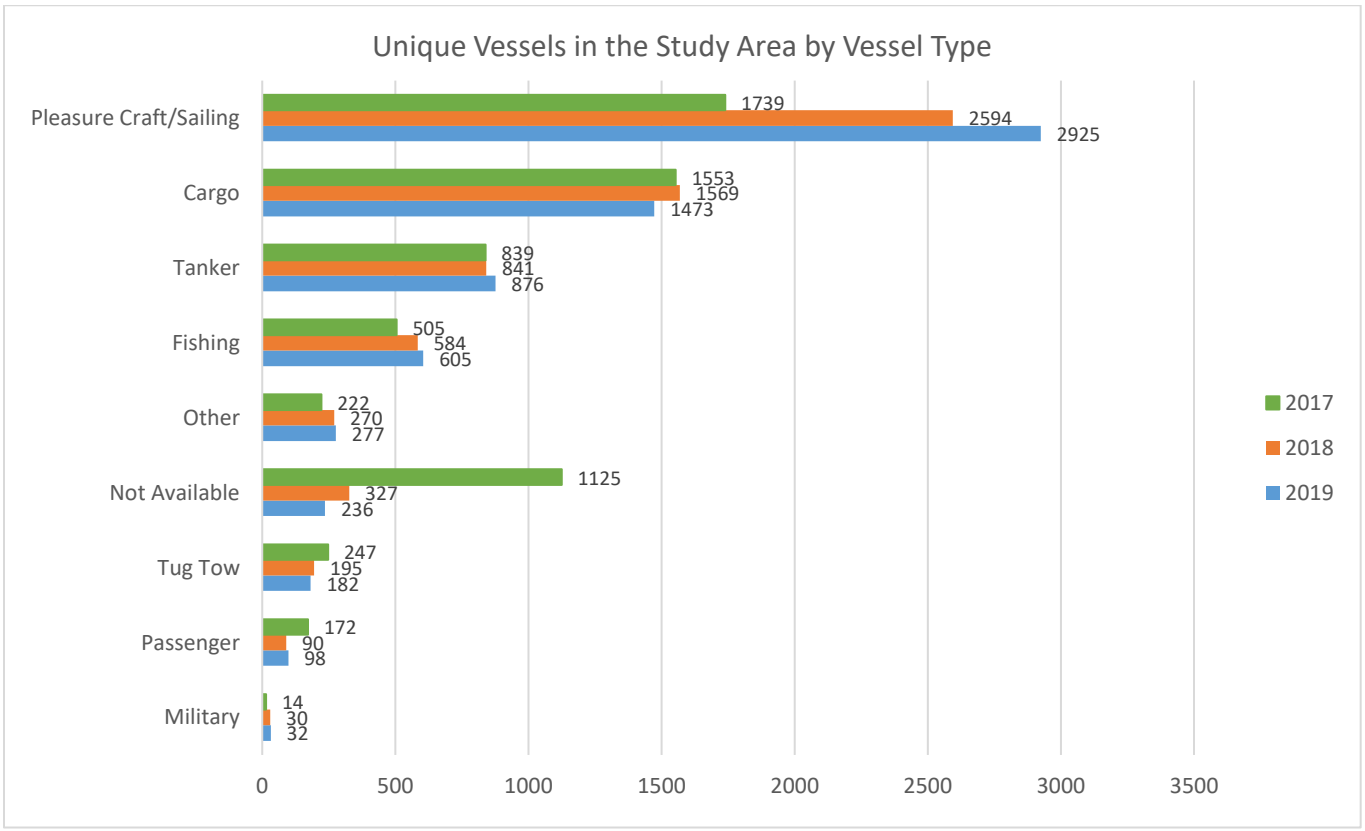
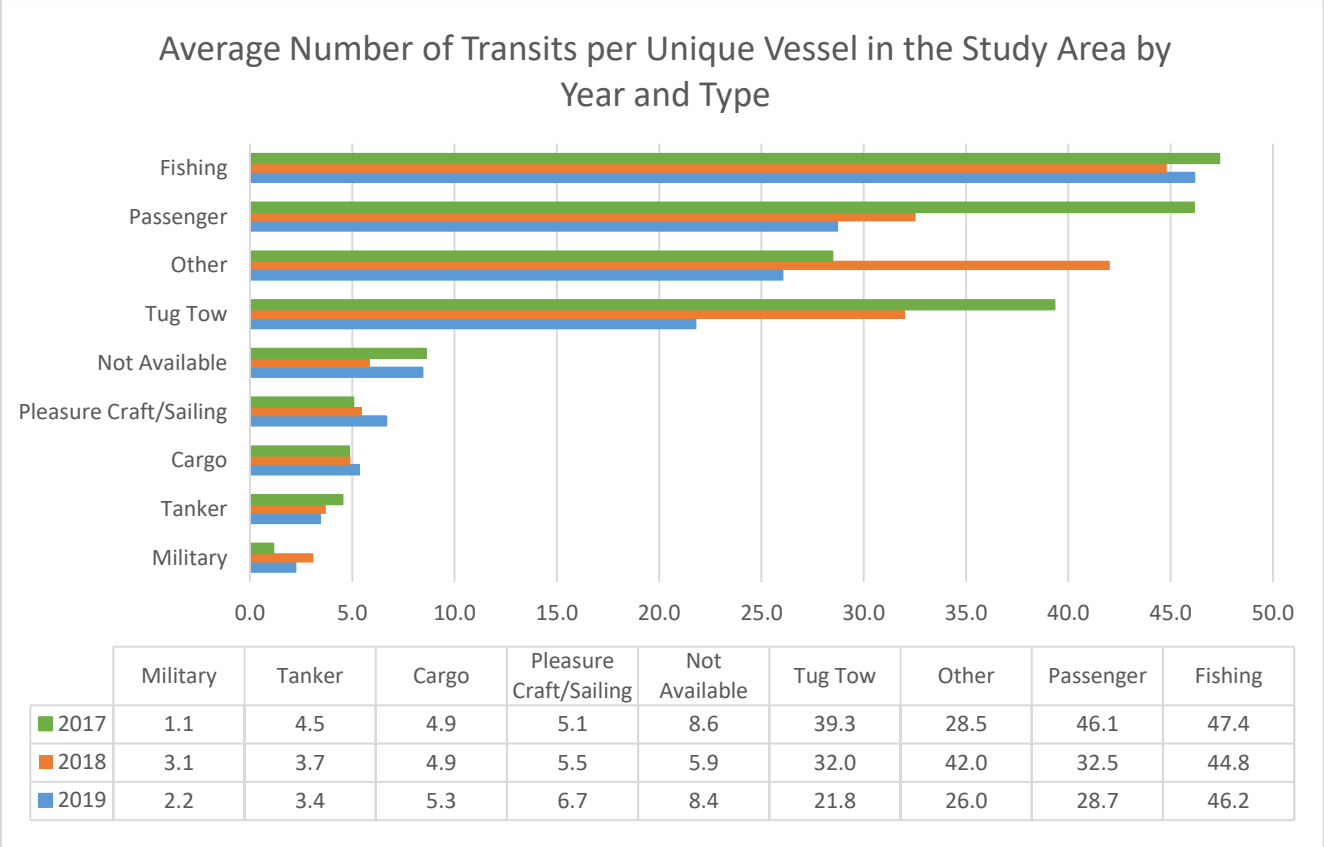


Figure 8: Unique Vessels in the Study Area by Vessel Type, 2017-2019

Calculating transits per unique vessel is a way to compare the traffic distribution between the three years of data. The average number of transits conducted by each unique vessel by type per year is calculated by dividing the total number of transits by the total number of unique vessels, shown in Figure 8. In practice, some vessels visit the study area more frequently than others. The overall average number of transits per vessel per year are shown in Table 4.

Year	Average Number of Transits per Unique Vessel
2017	11.0
2018	10.7
2019	10.8

Table 4: Average Number of Transits per Unique Vessel by Year



	Military	Tanker	Cargo	Pleasure Craft/Sailing	Not Available	Tug Tow	Other	Passenger	Fishing
2017	1.1	4.5	4.9	5.1	8.6	39.3	28.5	46.1	47.4
2018	3.1	3.7	4.9	5.5	5.9	32.0	42.0	32.5	44.8
2019	2.2	3.4	5.3	6.7	8.4	21.8	26.0	28.7	46.2

Figure 9: Average Number of Transits Per Unique Vessel in the Study Area by Year and Type

Observations About the Traffic Composition From Year to Year

The number of transits by each type of vessel as well as the number of unique vessels appear to vary annually with the exception of cargo, tanker, and fishing vessels (Figure 4-Figure 8). The number of pleasure craft transits counted increased from 2017-2019 by at least 5500 tracks per year, which may partially be due to the increasing popularity of AIS units among pleasure craft and not entirely an increase in number of vessels. The tug tow transit count decreased from 2017 to 2019 by at least 3000 tracks per year, however the number of unique vessels remained consistent within this vessel type. Passenger Vessel tracks decreased annually as well. In 2017, there were both more unique passenger vessels and number of tracks for this vessel type than in either

2018 or 2019. Between 2018 and 2019, Passenger Vessel tracks showed a decrease in both the track count and number of unique vessels. Additionally, in 2017 there were both more vessels grouped as “Not Available” and more transits tallied in this category. Overall, the largest number of transits were completed by Fishing Vessels, although Fishing Vessels comprise only about 9% of the total unique vessel count.

The number of trips per vessel (Figure 9) appears to remain consistent across most types with the exception of tug tow, other, and passenger vessels. This indicates that, even if the number of transits change between years, the change is proportional to the number of unique vessels that transit in the area, indicating the distribution of each type of vessel remained consistent.

Although these observations are informative, data across a longer timeframe is needed to make definitive conclusions about the traffic trends for this area over the years.

Passage Line Analysis

The Total Crossings chart (Figure 10) shows the number of crossings across all vessel types for each of the designated passage lines shown in Figure 2. Charts for each individual passage line showing the number of crossings by type are also provided in Figure 11-Figure 32 and are shown in Table 5.

Vessel crossings where the vessel registered a “Not Available” type were higher in 2017 for all vessel types in the passage line analysis. This is consistent with the observations about overall number of unique vessels and trips made in the Traffic Composition Section of this document and will not be specifically discussed in the observations about the passage lines below.

Passage Line Number	Name	Figure Number (All figure numbers are linked. Ctrl+click below to jump to the desired chart.)	Total Crossings Recorded 2017-2019
NA	Total Crossings	Figure 10: Total Crossings Across Twenty-One Passage Lines in the NJ PARS Study Area	161,262
1	Ocean City Inlet	Figure 11	4,797
2	Delaware Bay Entrance Pilot Area	Figure 12	24,564
3	Two-Way Traffic Lane - South East of Cape May	Figure 13	4,641
4	Cape May Inlet	Figure 14	19,525
5	Informal Traffic Lane NJ to NY North of Cape May, South Split	Figure 15	2,575
6	Informal Traffic Lane NJ to NY North of Cape May, North Split	Figure 16	1,326
7	Townsends Inlet	Figure 17	2,851
8	Great Egg Harbor Inlet	Figure 18	2,972
9	Absecon Inlet	Figure 19	18,823
10	Little Egg Inlet	Figure 20	515
11	Barnegat Inlet	Figure 21	6,728
12	Manasquan Inlet	Figure 22	15,736
13	Shark River Inlet	Figure 23	2,533
14	Informal Traffic Lane NJ to NY Near Manasquan	Figure 24	3,210
15	Barnegat to Ambrose and Ambrose to Barnegat	Figure 25	12,328
16	Entering Hudson South	Figure 26	10,172
17a	Tug Tow Extension in Hudson South (South to North)	Figure 27	2,917
17b	Tug Tow Extension in Hudson South (North to South)	Figure 28	2,860
18	Ocean Wind and Atlantic Shores Boundary	Figure 29	3,988
19	Fishing Area North	Figure 30	7,342
20	Fishing Area West	Figure 31	5,443
21	Fishing Area South	Figure 32	5,416

Table 5: Passage Lines and Figure Numbers

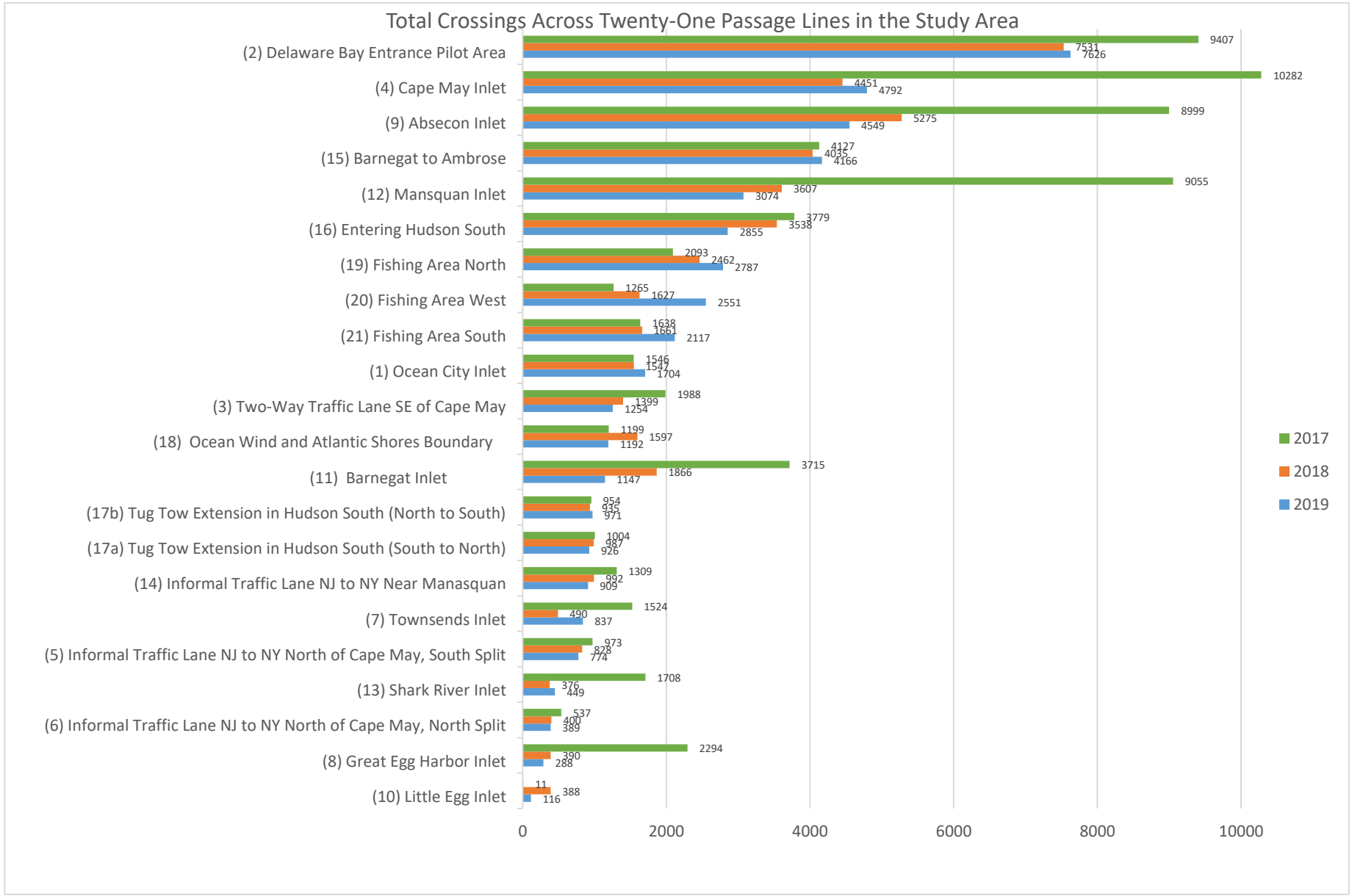


Figure 10: Total Crossings Across Twenty-One Passage Lines in the NJ PARS Study Area

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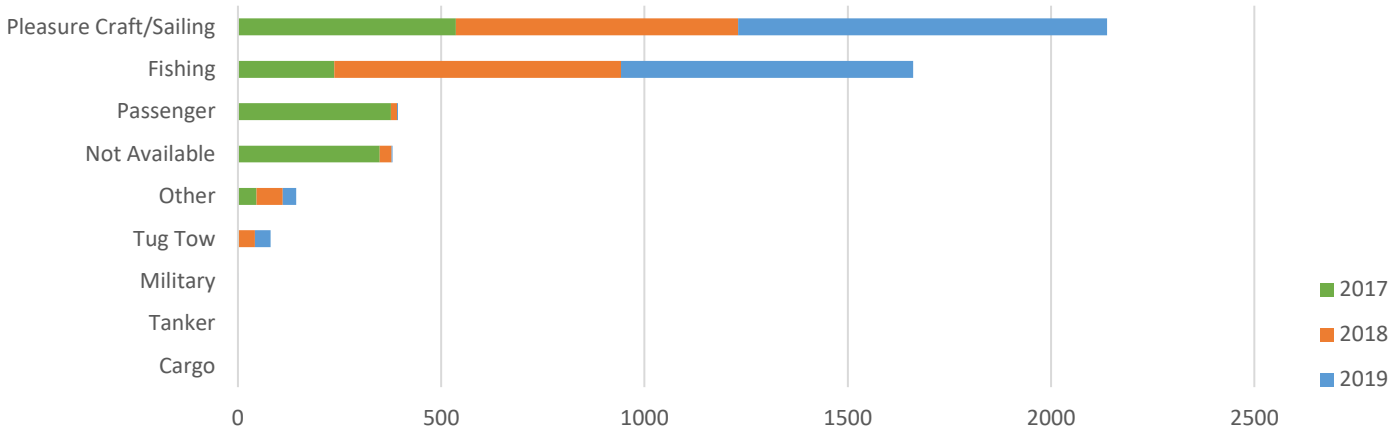
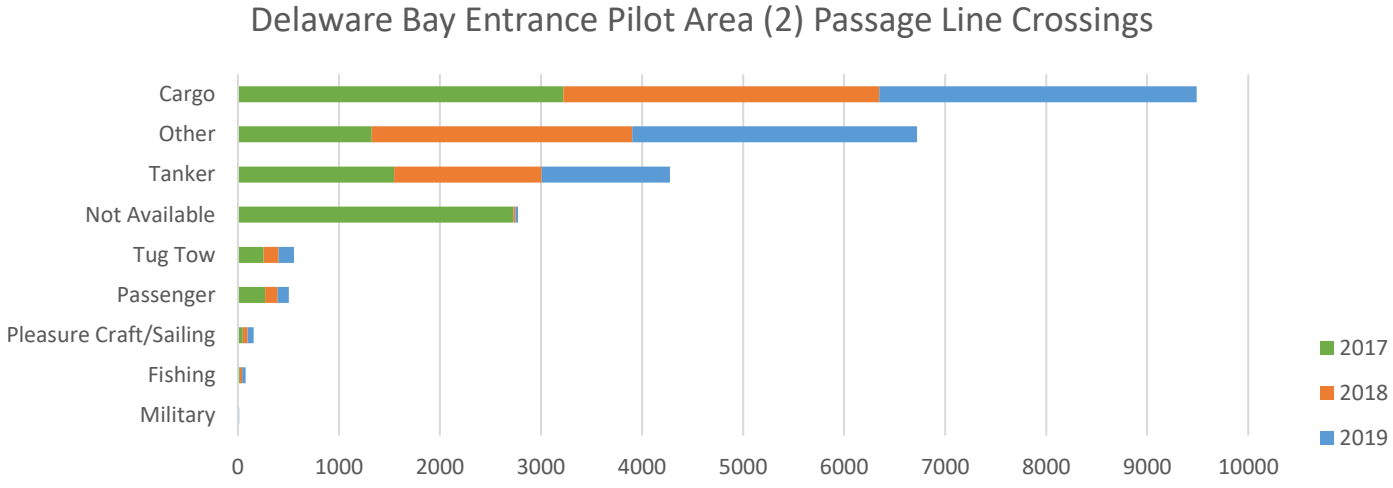


	Cargo	Tanker	Military	Tug Tow	Other	Not Available	Passenger	Fishing	Pleasure Craft/Sailing
2017	0	0	0	2	46	349	376	237	536
2018	0	0	0	40	64	29	15	705	694
2019	0	0	1	38	33	2	3	719	908
% of Total	0.00%	0.00%	0.02%	1.67%	2.98%	7.92%	8.21%	34.63%	44.57%

Figure 11: Ocean City Inlet (1) Passage Line Crossings

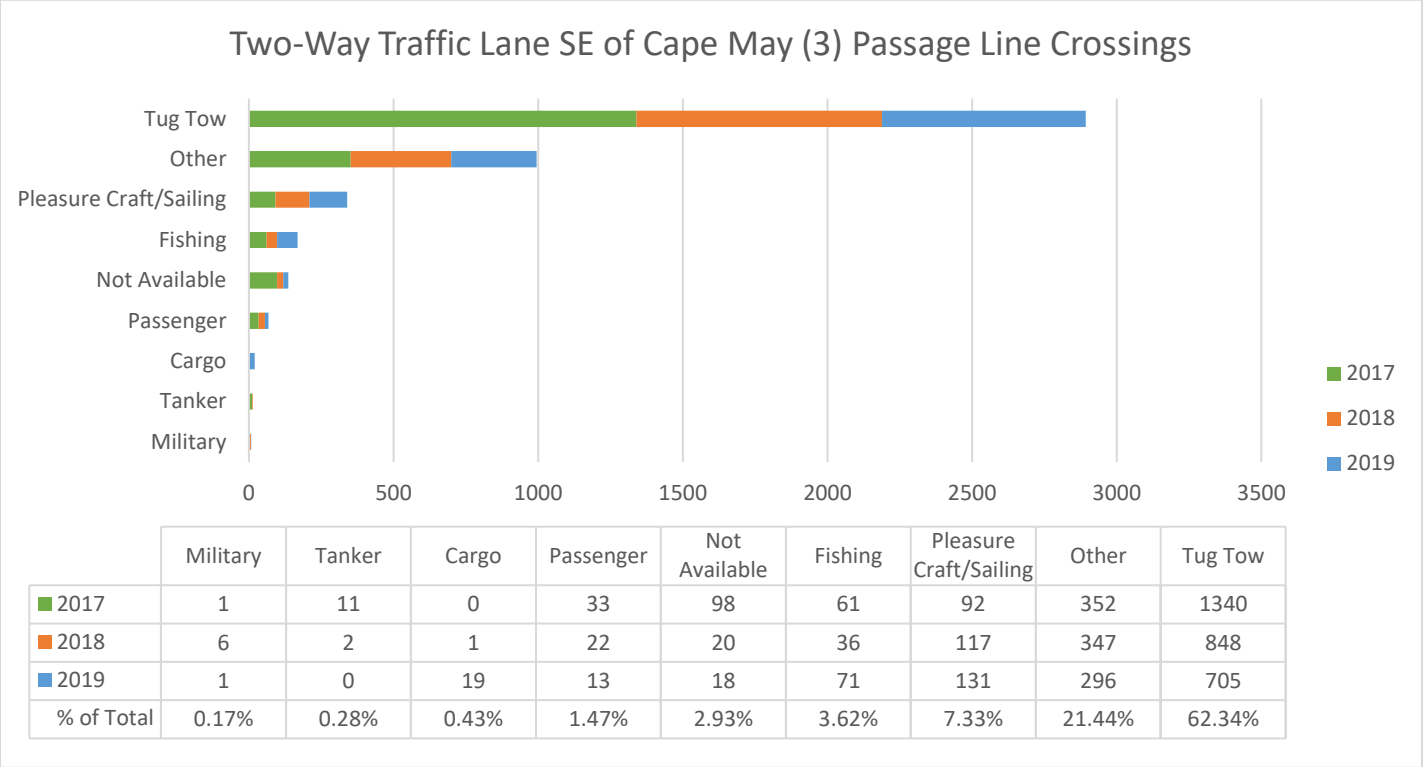


	Military	Fishing	Pleasure Craft/Sailing	Passenger	Tug Tow	Not Available	Tanker	Other	Cargo
2017	0	18	48	268	254	2727	1547	1324	3221
2018	8	23	47	124	147	19	1458	2579	3126
2019	4	35	60	113	155	27	1272	2818	3142
% of Total	0.05%	0.31%	0.63%	2.06%	2.26%	11.29%	17.41%	27.36%	38.63%

Figure 12: Delaware Bay Entrance Pilot Area (2) Passage Line Crossings

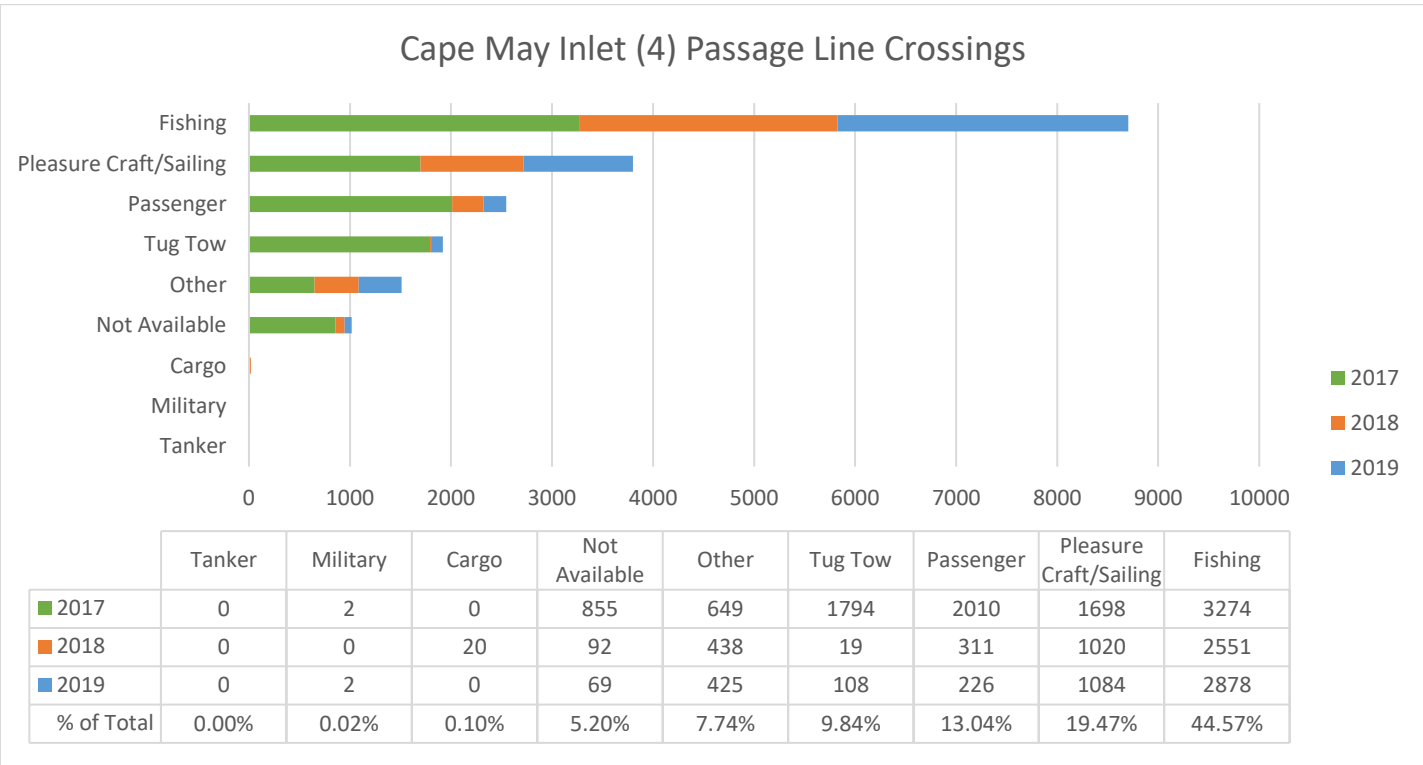
(RETURN TO Table 5: Passage Lines and Figure Numbers)

(RETURN TO Table 5: Passage Lines and Figure Numbers)



	Military	Tanker	Cargo	Passenger	Not Available	Fishing	Pleasure Craft/Sailing	Other	Tug Tow
2017	1	11	0	33	98	61	92	352	1340
2018	6	2	1	22	20	36	117	347	848
2019	1	0	19	13	18	71	131	296	705
% of Total	0.17%	0.28%	0.43%	1.47%	2.93%	3.62%	7.33%	21.44%	62.34%

Figure 13: Two-Way Traffic Lane SE of Cape May (3) Passage Line Crossings

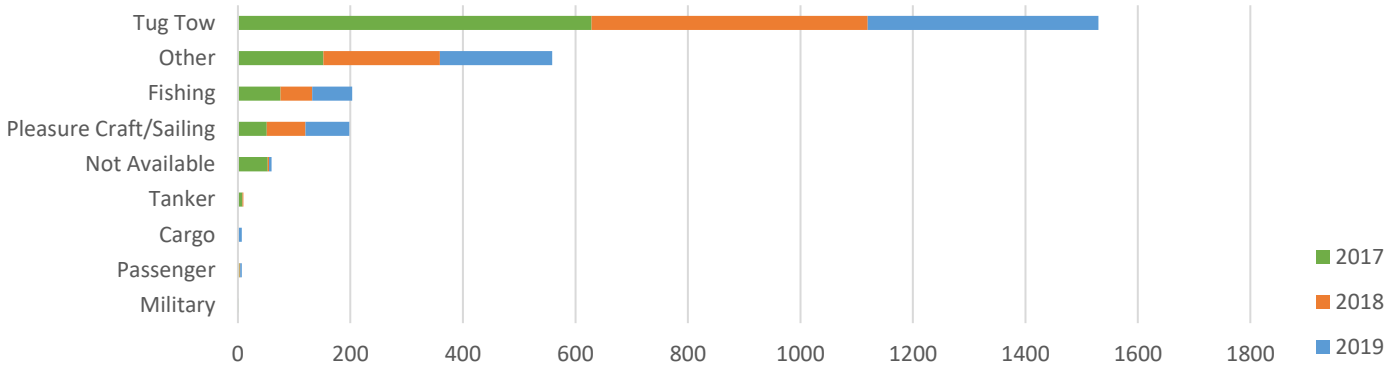


	Tanker	Military	Cargo	Not Available	Other	Tug Tow	Passenger	Pleasure Craft/Sailing	Fishing
2017	0	2	0	855	649	1794	2010	1698	3274
2018	0	0	20	92	438	19	311	1020	2551
2019	0	2	0	69	425	108	226	1084	2878
% of Total	0.00%	0.02%	0.10%	5.20%	7.74%	9.84%	13.04%	19.47%	44.57%

Figure 14: Cape May Inlet (4) Passage Line Crossings

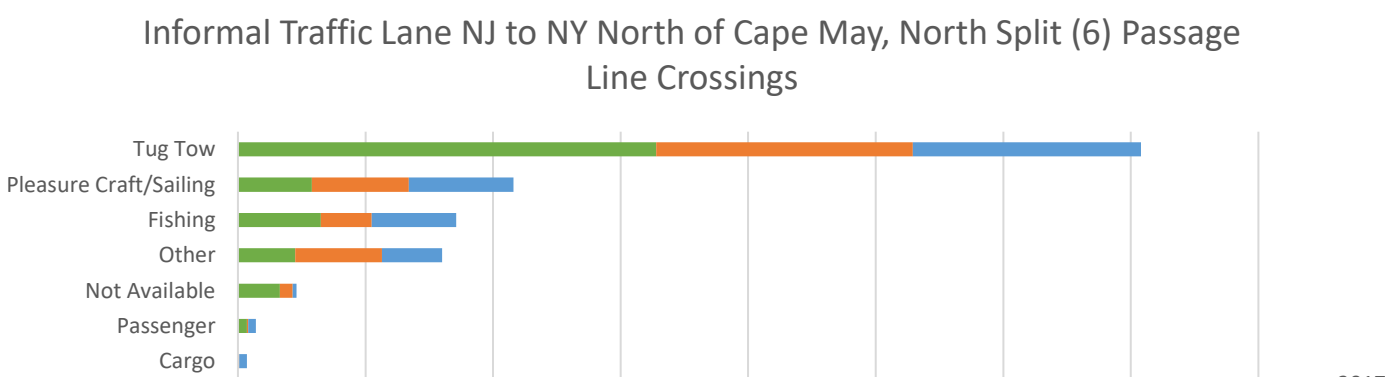
(RETURN TO Table 5: Passage Lines and Figure Numbers)

(RETURN TO Table 5: Passage Lines and Figure Numbers)



	Military	Passenger	Cargo	Tanker	Not Available	Pleasure Craft/Sailing	Fishing	Other	Tug Tow
2017	1	3	0	8	53	51	76	152	629
2018	0	1	0	2	2	69	56	207	491
2019	0	3	7	0	5	78	71	200	410
% of Total	0.04%	0.27%	0.27%	0.39%	2.33%	7.69%	7.88%	21.71%	59.42%

Figure 15: Informal Traffic Lane NJ to NY North of Cape May, South Split (5) Passage Line Crossings

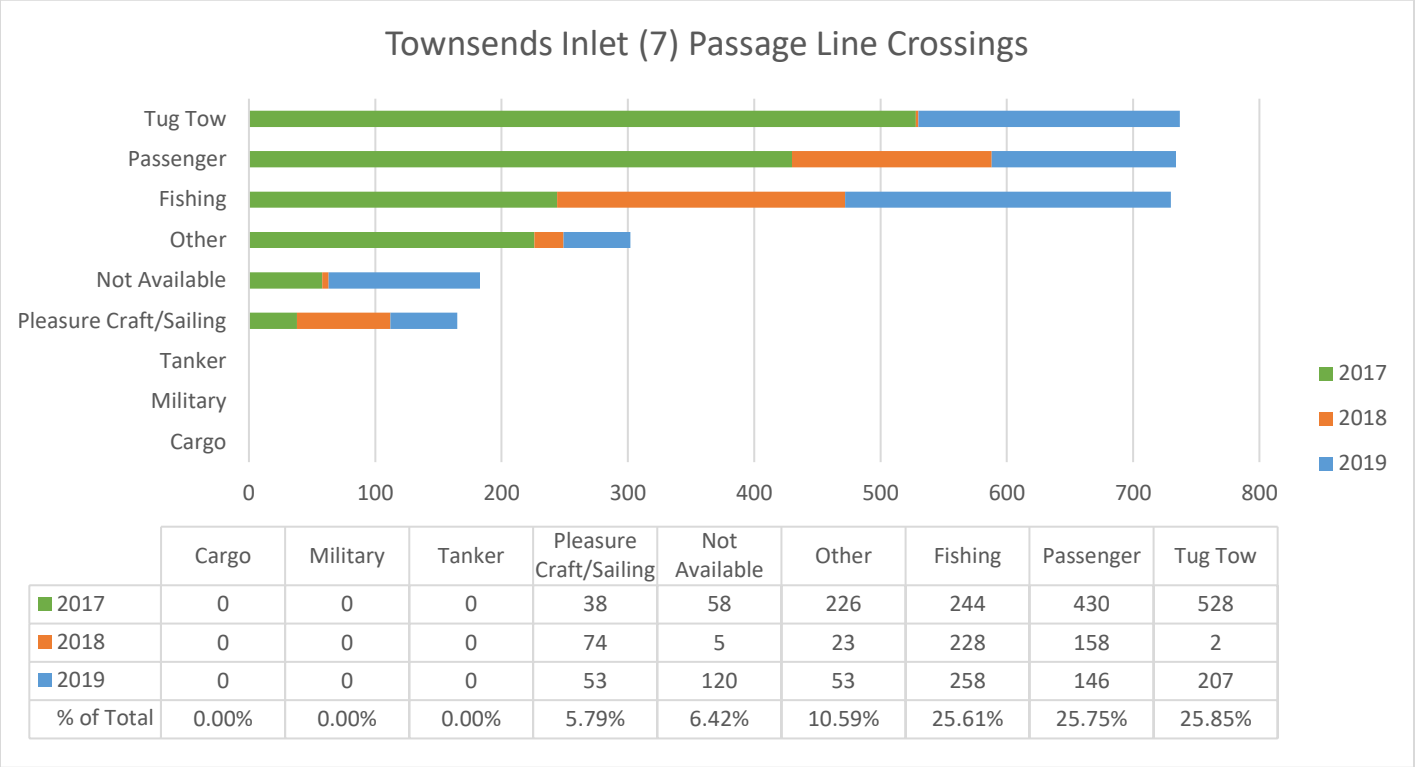


	Tanker	Military	Cargo	Passenger	Not Available	Other	Fishing	Pleasure Craft/Sailing	Tug Tow
2017	1	0	0	7	33	45	65	58	328
2018	0	3	1	1	10	68	40	76	201
2019	0	0	6	6	3	47	66	82	179
% of Total	0.08%	0.23%	0.53%	1.06%	3.47%	12.07%	12.90%	16.29%	53.39%

Figure 16: Informal Traffic Lane NJ to NY North of Cape May, North Split (6) Passage Line Crossings

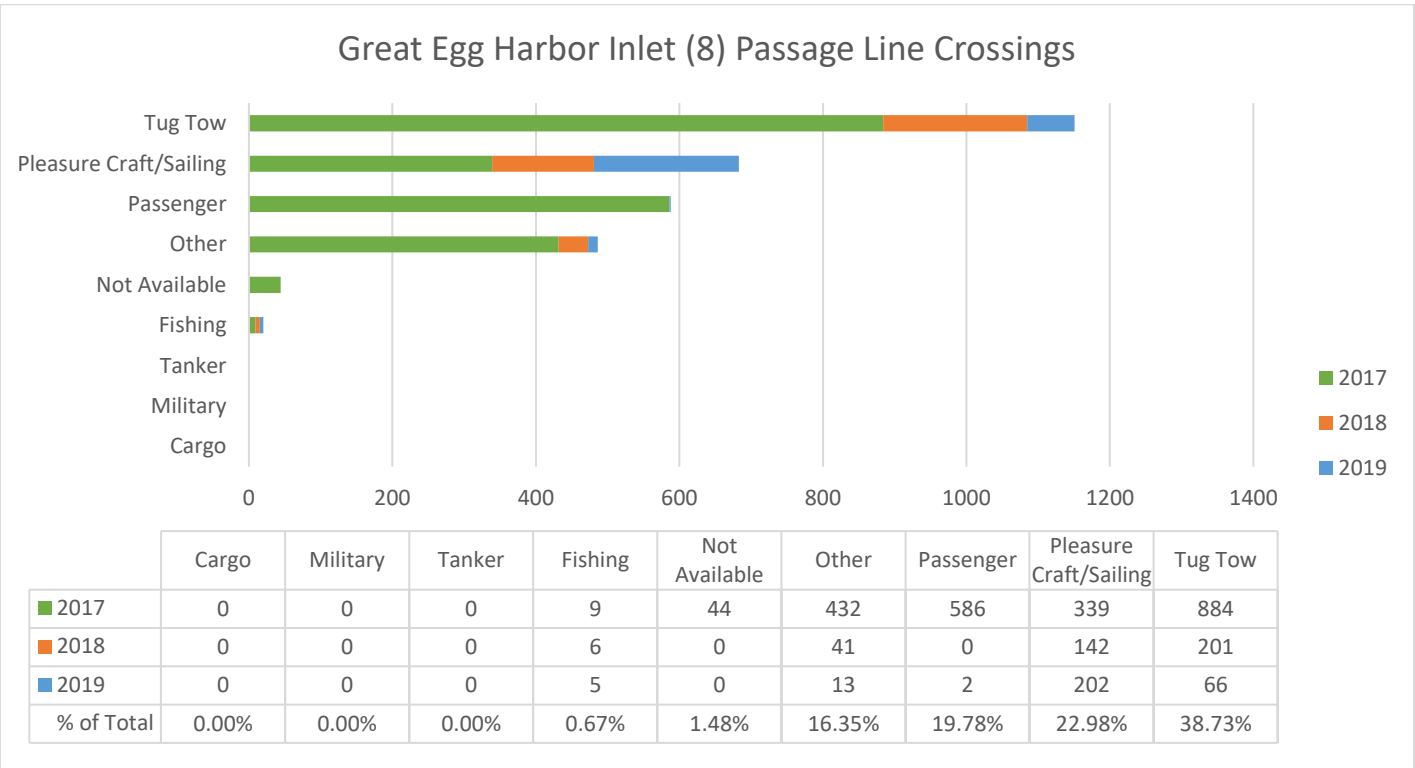
(RETURN TO Table 5: Passage Lines and Figure Numbers)

(RETURN TO Table 5: Passage Lines and Figure Numbers)



	Cargo	Military	Tanker	Pleasure Craft/Sailing	Not Available	Other	Fishing	Passenger	Tug Tow
2017	0	0	0	38	58	226	244	430	528
2018	0	0	0	74	5	23	228	158	2
2019	0	0	0	53	120	53	258	146	207
% of Total	0.00%	0.00%	0.00%	5.79%	6.42%	10.59%	25.61%	25.75%	25.85%

Figure 17: Townsends Inlet (7) Passage Line Crossings

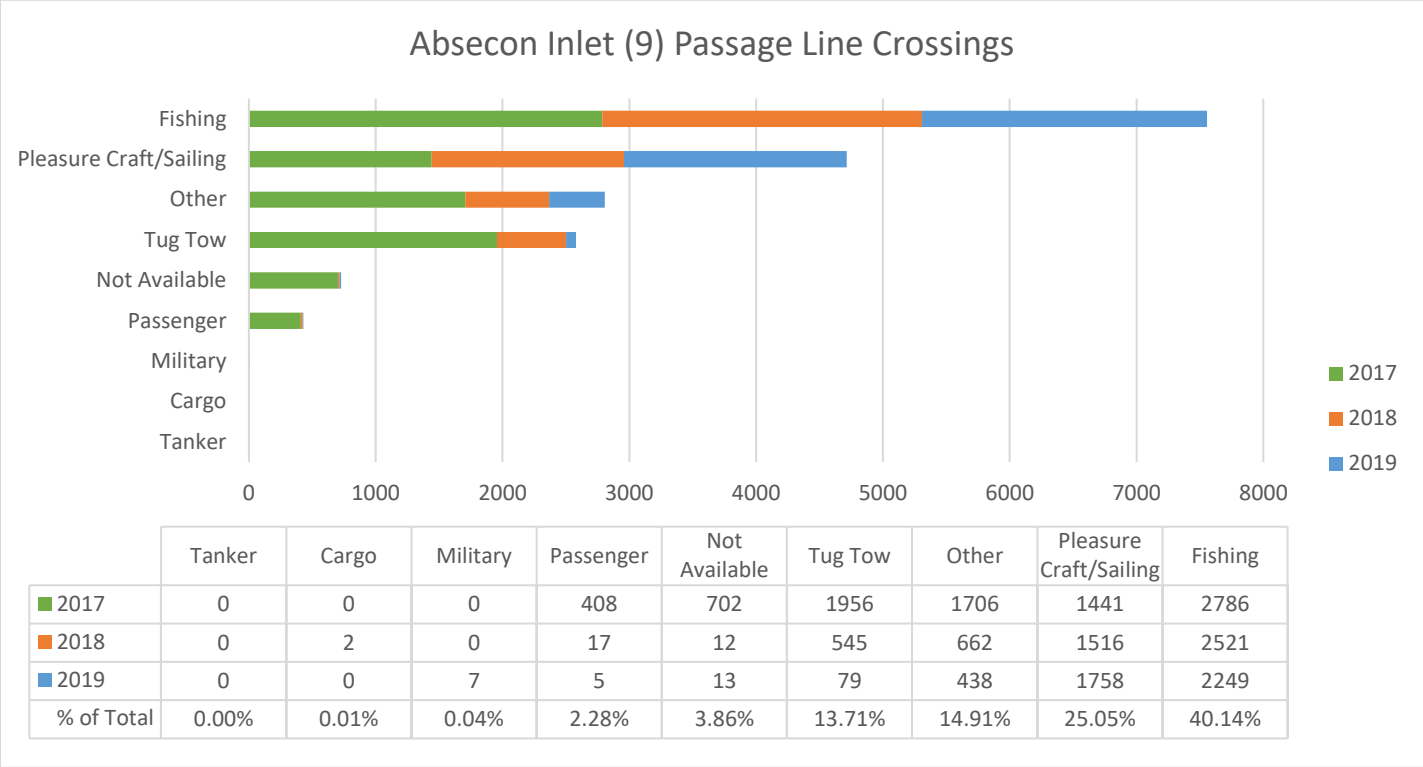


	Cargo	Military	Tanker	Fishing	Not Available	Other	Passenger	Pleasure Craft/Sailing	Tug Tow
2017	0	0	0	9	44	432	586	339	884
2018	0	0	0	6	0	41	0	142	201
2019	0	0	0	5	0	13	2	202	66
% of Total	0.00%	0.00%	0.00%	0.67%	1.48%	16.35%	19.78%	22.98%	38.73%

Figure 18: Great Egg Harbor Inlet (8) Passage Line Crossings

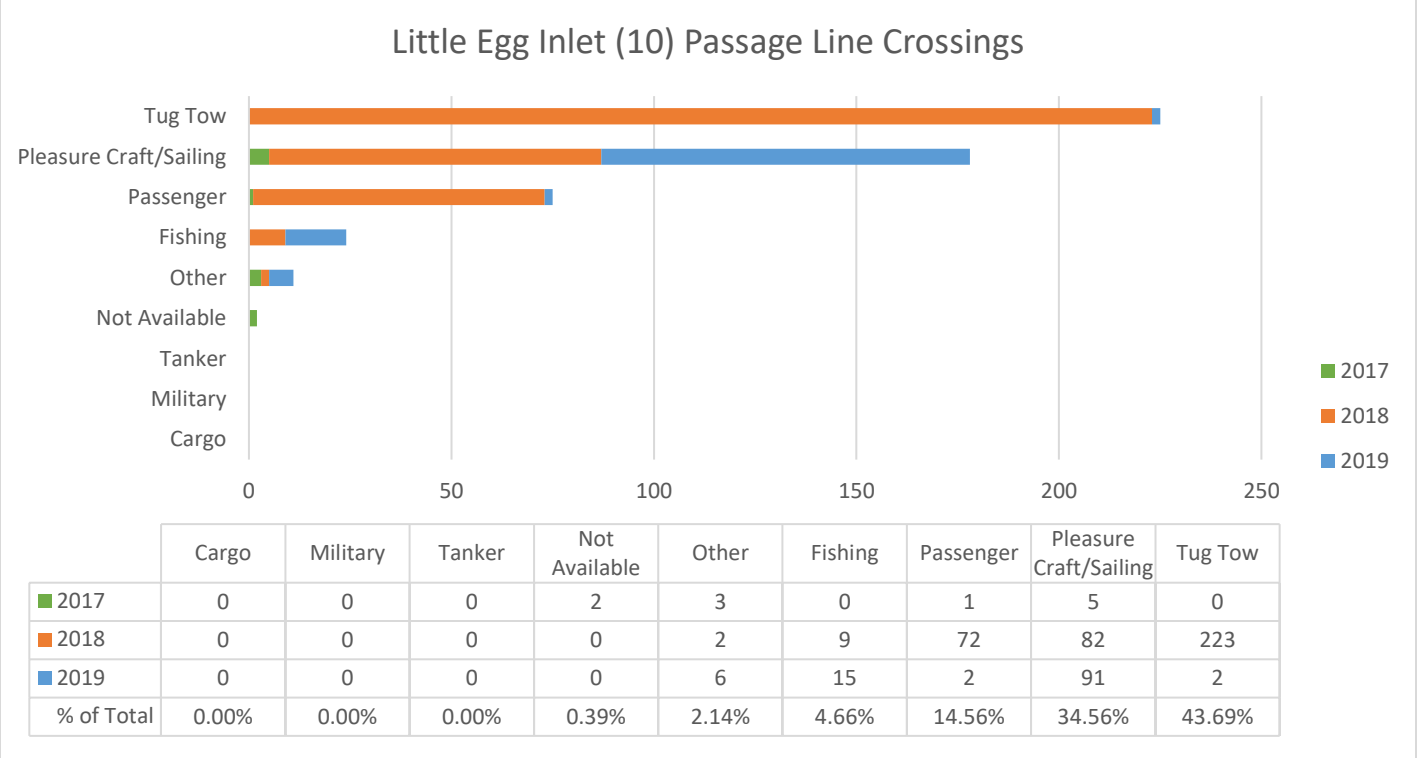
(RETURN TO Table 5: Passage Lines and Figure Numbers)

(RETURN TO Table 5: Passage Lines and Figure Numbers)



	Tanker	Cargo	Military	Passenger	Not Available	Tug Tow	Other	Pleasure Craft/Sailing	Fishing
2017	0	0	0	408	702	1956	1706	1441	2786
2018	0	2	0	17	12	545	662	1516	2521
2019	0	0	7	5	13	79	438	1758	2249
% of Total	0.00%	0.01%	0.04%	2.28%	3.86%	13.71%	14.91%	25.05%	40.14%

Figure 19: Absecon Inlet (9) Passage Line Crossings

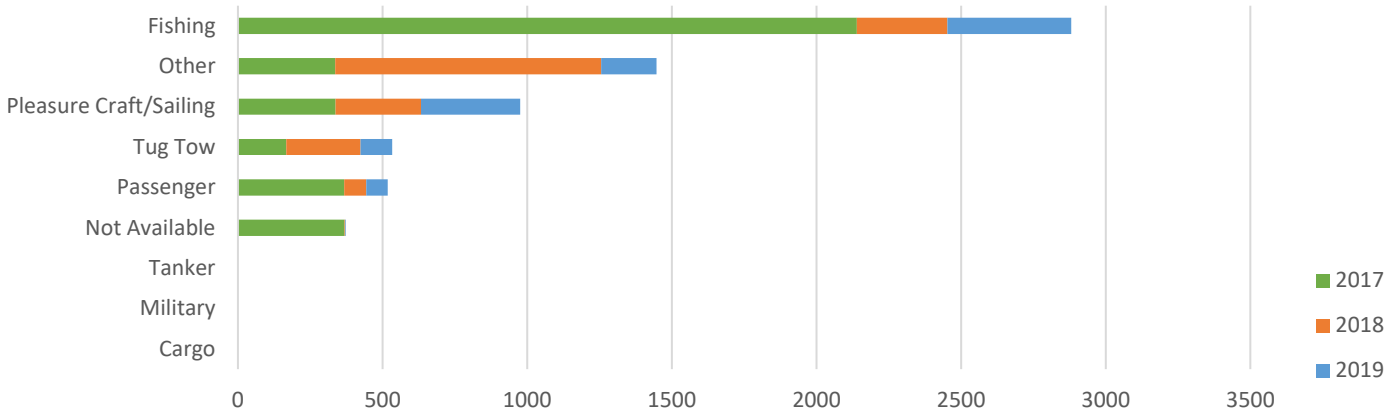


	Cargo	Military	Tanker	Not Available	Other	Fishing	Passenger	Pleasure Craft/Sailing	Tug Tow
2017	0	0	0	2	3	0	1	5	0
2018	0	0	0	0	2	9	72	82	223
2019	0	0	0	0	6	15	2	91	2
% of Total	0.00%	0.00%	0.00%	0.39%	2.14%	4.66%	14.56%	34.56%	43.69%

Figure 20: Little Egg Inlet (10) Passage Line Crossings

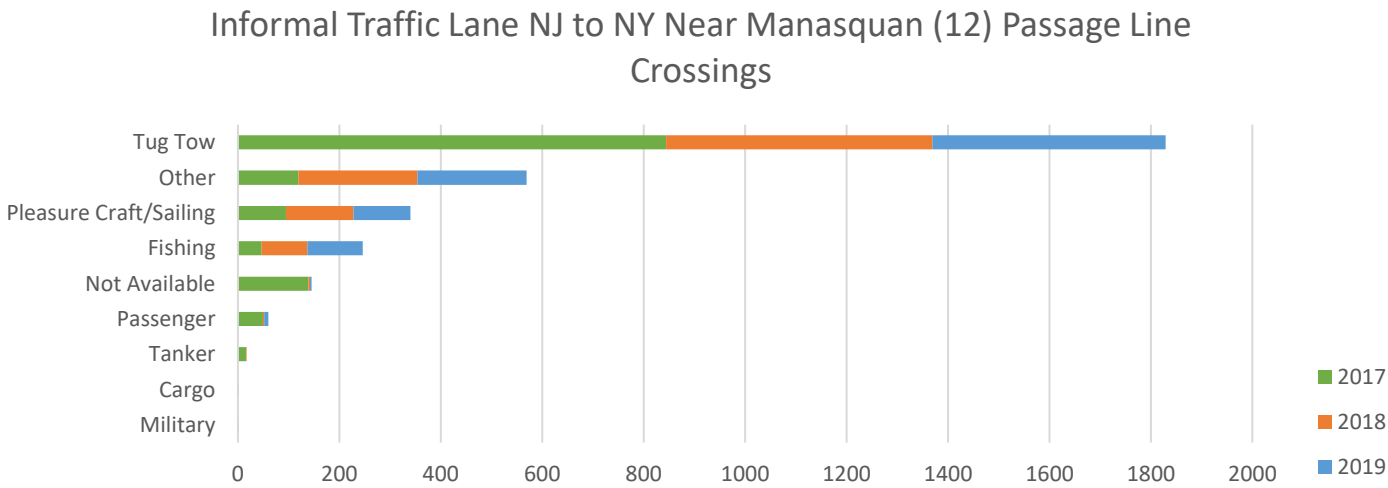
(RETURN TO Table 5: Passage Lines and Figure Numbers)

(RETURN TO Table 5: Passage Lines and Figure Numbers)



	Cargo	Military	Tanker	Not Available	Passenger	Tug Tow	Pleasure Craft/Sailing	Other	Fishing
2017	0	0	0	368	367	167	337	336	2140
2018	0	0	0	3	77	257	296	920	313
2019	0	0	0	2	74	109	343	191	428
% of Total	0.00%	0.00%	0.00%	5.54%	7.70%	7.92%	14.51%	21.51%	42.82%

Figure 21: Barnegat Inlet (11) Passage Line Crossings

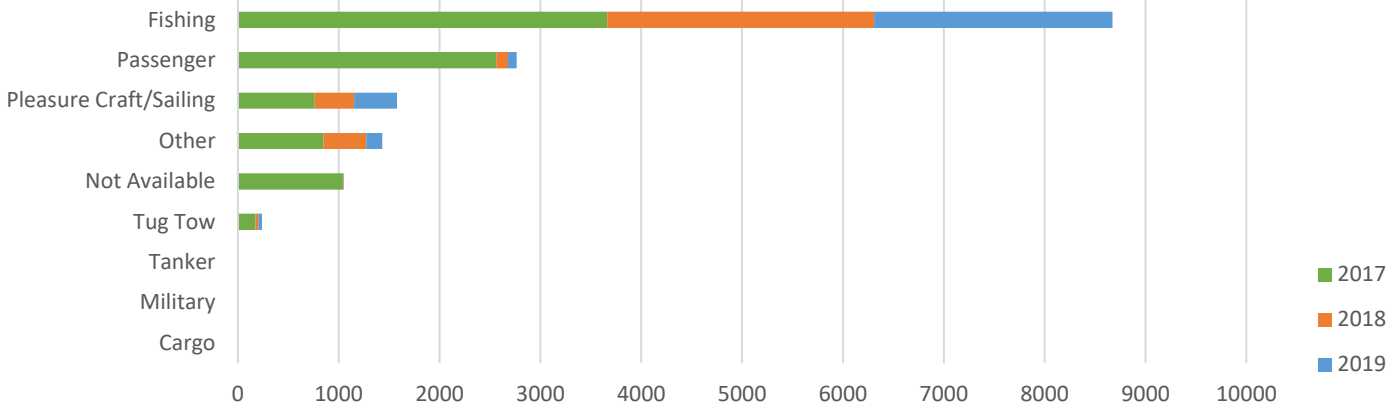


	Military	Cargo	Tanker	Passenger	Not Available	Fishing	Pleasure Craft/Sailing	Other	Tug Tow
2017	0	0	16	49	139	47	95	119	844
2018	2	0	1	3	3	90	133	235	525
2019	0	2	0	8	3	109	112	215	460
% of Total	0.06%	0.06%	0.53%	1.87%	4.52%	7.66%	10.59%	17.73%	56.98%

Figure 22: Informal Traffic Lane NJ to NY Near Manasquan (12) Passage Line Crossings

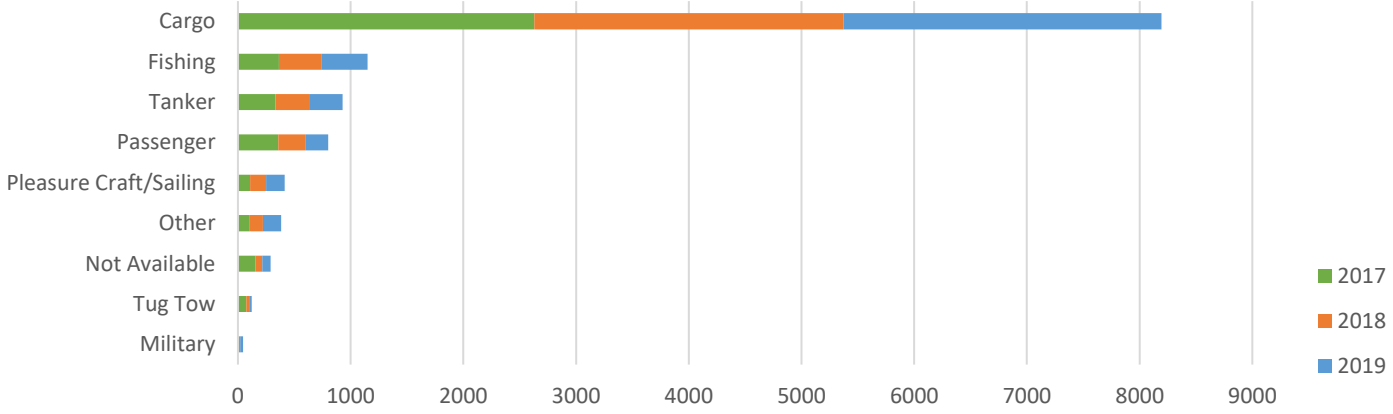
(RETURN TO Table 5: Passage Lines and Figure Numbers)

(RETURN TO Table 5: Passage Lines and Figure Numbers)



	Cargo	Military	Tanker	Tug Tow	Not Available	Other	Pleasure Craft/Sailing	Passenger	Fishing
2017	0	0	0	176	1042	848	763	2562	3664
2018	0	0	0	28	5	424	390	116	2644
2019	0	0	0	34	5	159	424	87	2365
% of Total	0.00%	0.00%	0.00%	1.51%	6.69%	9.09%	10.02%	17.57%	55.12%

Figure 23: Manasquan Inlet (13) Passage Line Crossings

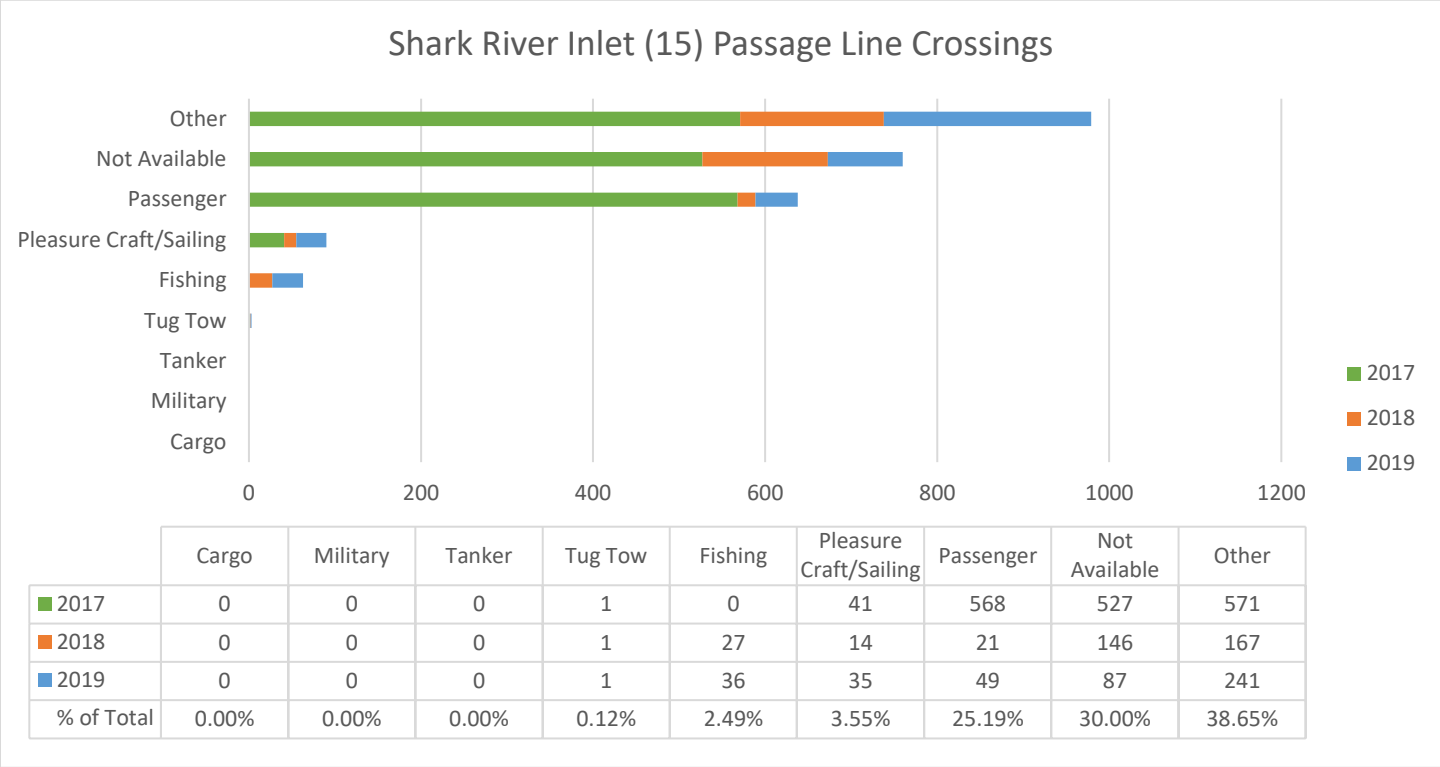


	Military	Tug Tow	Not Available	Other	Pleasure Craft/Sailing	Passenger	Tanker	Fishing	Cargo
2017	5	75	156	100	109	357	333	364	2628
2018	15	25	60	121	140	245	306	380	2743
2019	25	22	73	162	165	200	289	406	2824
% of Total	0.37%	0.99%	2.34%	3.11%	3.36%	6.51%	7.53%	9.33%	66.47%

Figure 24: Barnegat to Ambrose (14) Passage Line Crossings

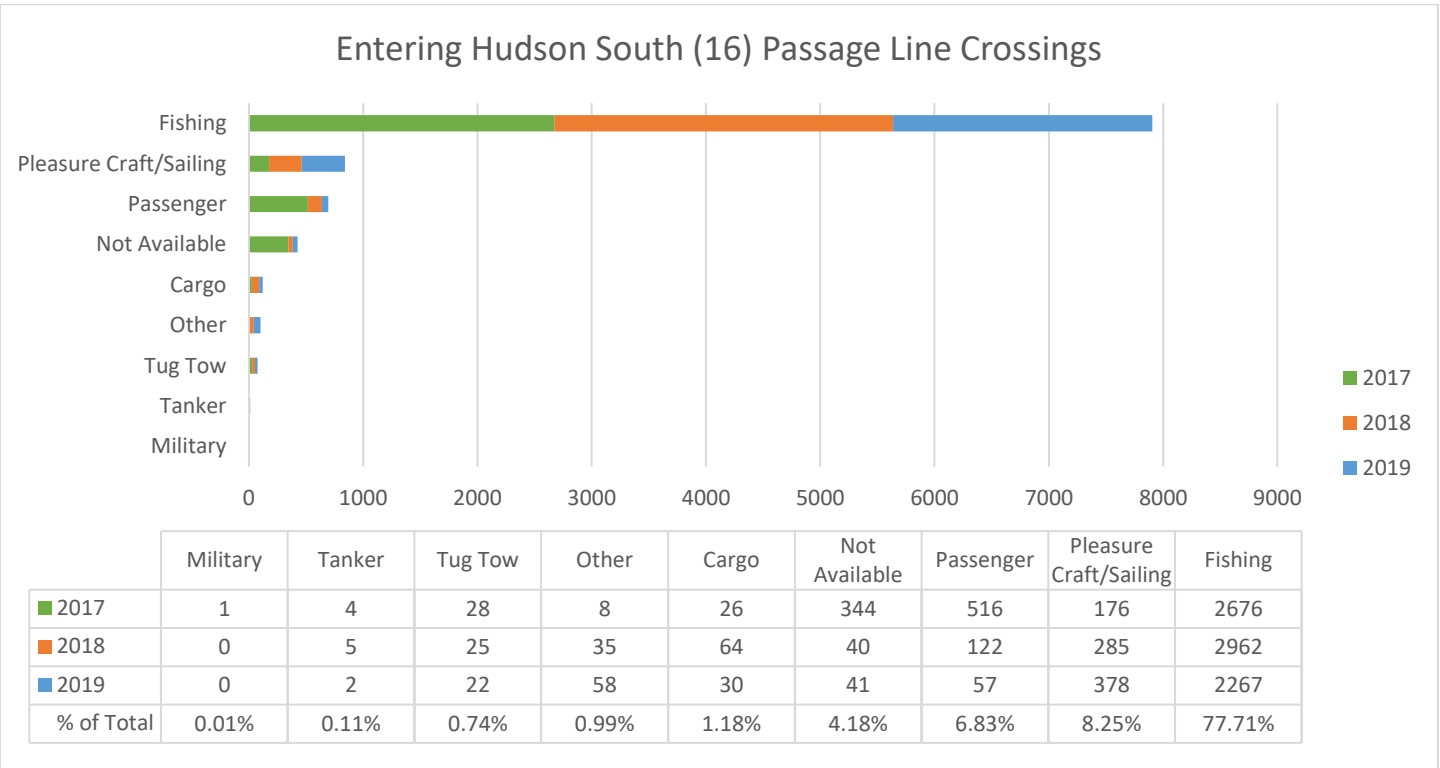
(RETURN TO Table 5: Passage Lines and Figure Numbers)

(RETURN TO Table 5: Passage Lines and Figure Numbers)



	Cargo	Military	Tanker	Tug Tow	Fishing	Pleasure Craft/Sailing	Passenger	Not Available	Other
2017	0	0	0	1	0	41	568	527	571
2018	0	0	0	1	27	14	21	146	167
2019	0	0	0	1	36	35	49	87	241
% of Total	0.00%	0.00%	0.00%	0.12%	2.49%	3.55%	25.19%	30.00%	38.65%

Figure 25: Shark River Inlet (15) Passage Line Crossings

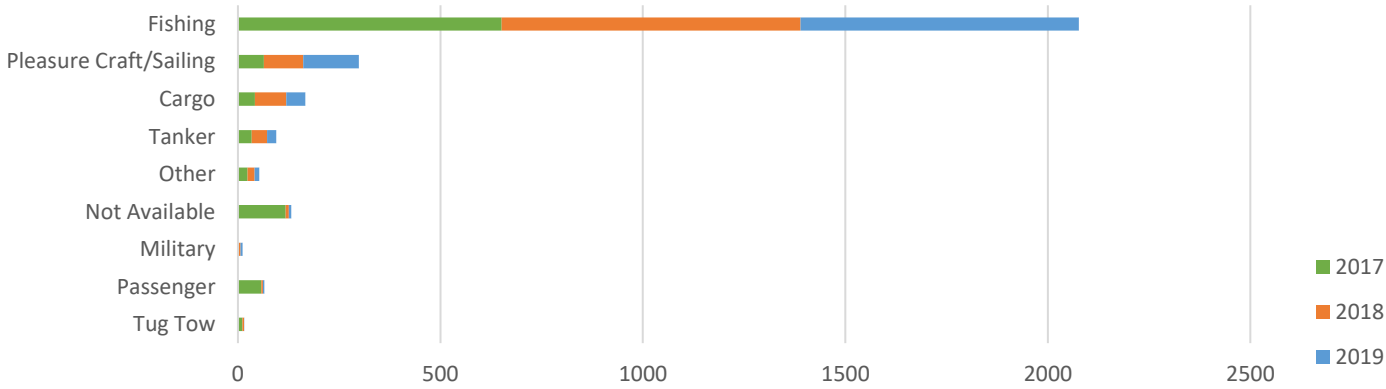


	Military	Tanker	Tug Tow	Other	Cargo	Not Available	Passenger	Pleasure Craft/Sailing	Fishing
2017	1	4	28	8	26	344	516	176	2676
2018	0	5	25	35	64	40	122	285	2962
2019	0	2	22	58	30	41	57	378	2267
% of Total	0.01%	0.11%	0.74%	0.99%	1.18%	4.18%	6.83%	8.25%	77.71%

Figure 26: Entering Hudson South (16) Passage Line Crossings

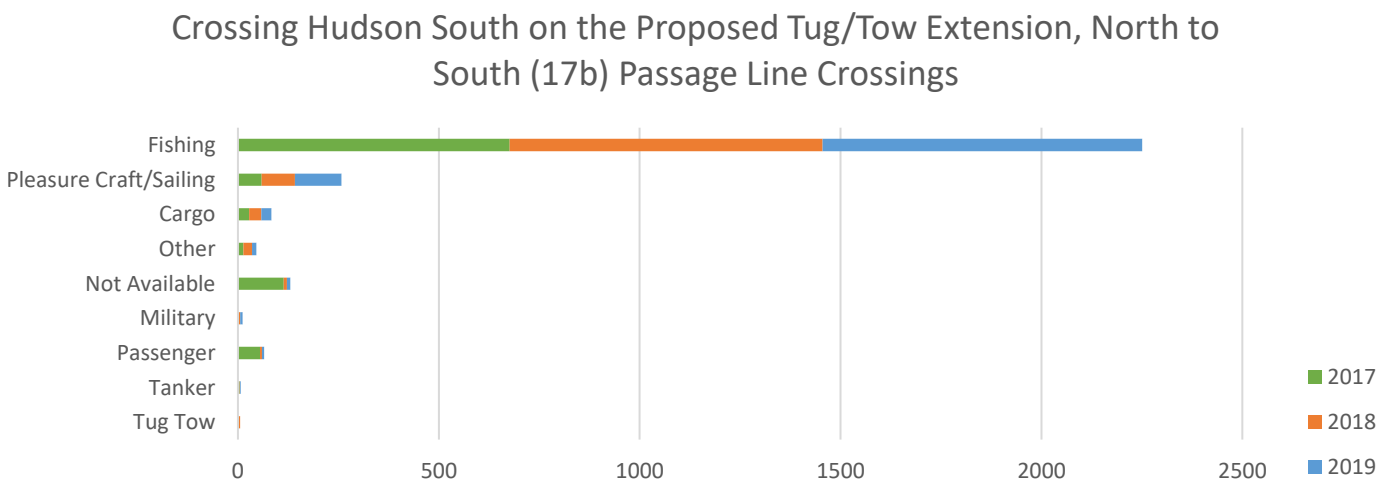
(RETURN TO Table 5: Passage Lines and Figure Numbers)

(RETURN TO Table 5: Passage Lines and Figure Numbers)



	Tug Tow	Passenger	Military	Not Available	Other	Tanker	Cargo	Pleasure Craft/Sailing	Fishing
2017	11	58	2	118	24	34	42	64	651
2018	4	4	4	8	17	38	77	97	738
2019	1	4	6	6	12	23	48	138	688
% of Total	0.55%	2.26%	0.41%	4.53%	1.82%	3.26%	5.73%	10.25%	71.20%

Figure 27: Crossing Hudson South on the Proposed Tug/Tow Extension, South to North (17a) Passage Line Crossings



	Tug Tow	Tanker	Passenger	Military	Not Available	Other	Cargo	Pleasure Craft/Sailing	Fishing
2017	2	4	55	2	114	14	28	59	676
2018	4	1	5	4	8	21	30	83	779
2019	0	2	5	6	9	11	26	116	796
% of Total	0.21%	0.24%	2.27%	0.42%	4.58%	1.61%	2.94%	9.02%	78.71%

Figure 28: Crossing Hudson South on the Proposed Tug/Tow Extension, North to South (17b) Passage Line Crossings

(RETURN TO Table 5: Passage Lines and Figure Numbers)

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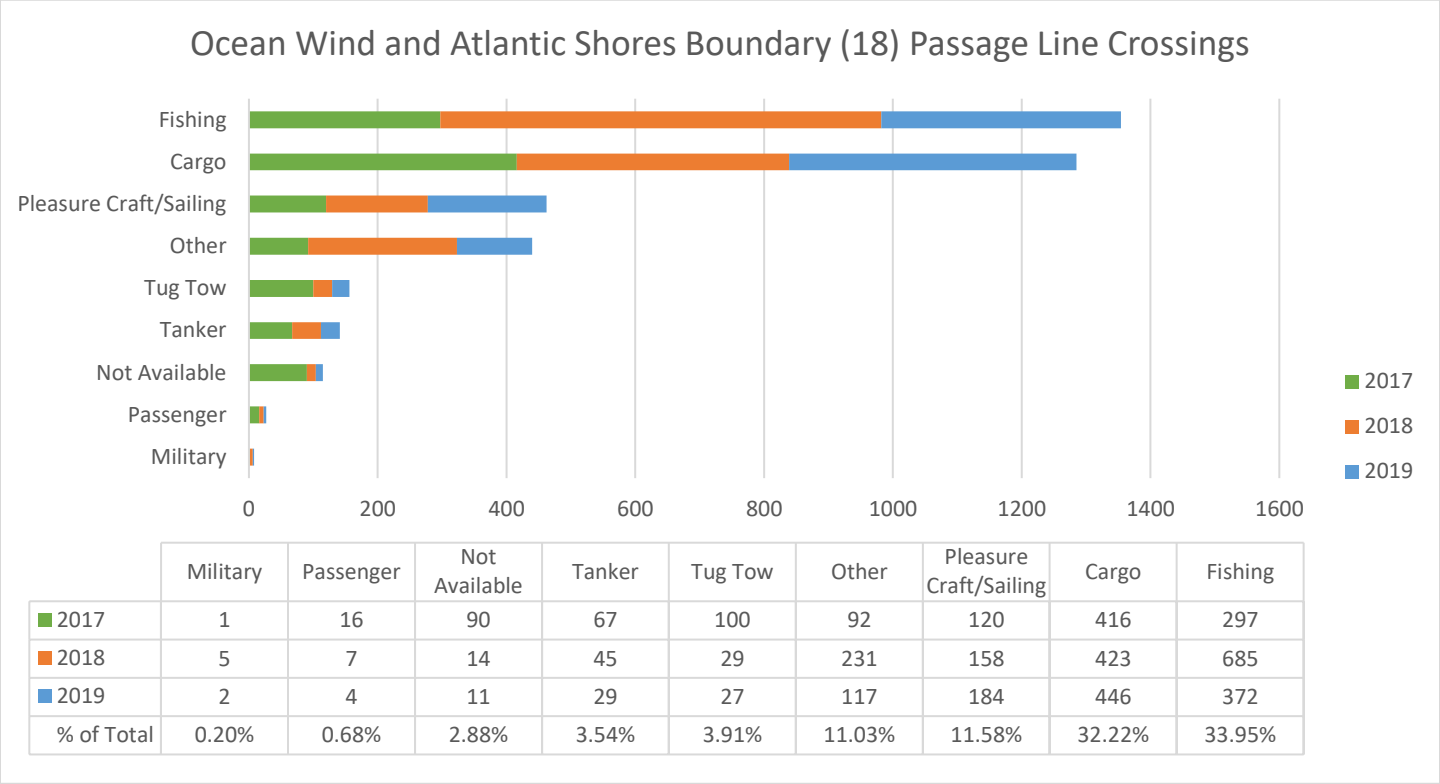
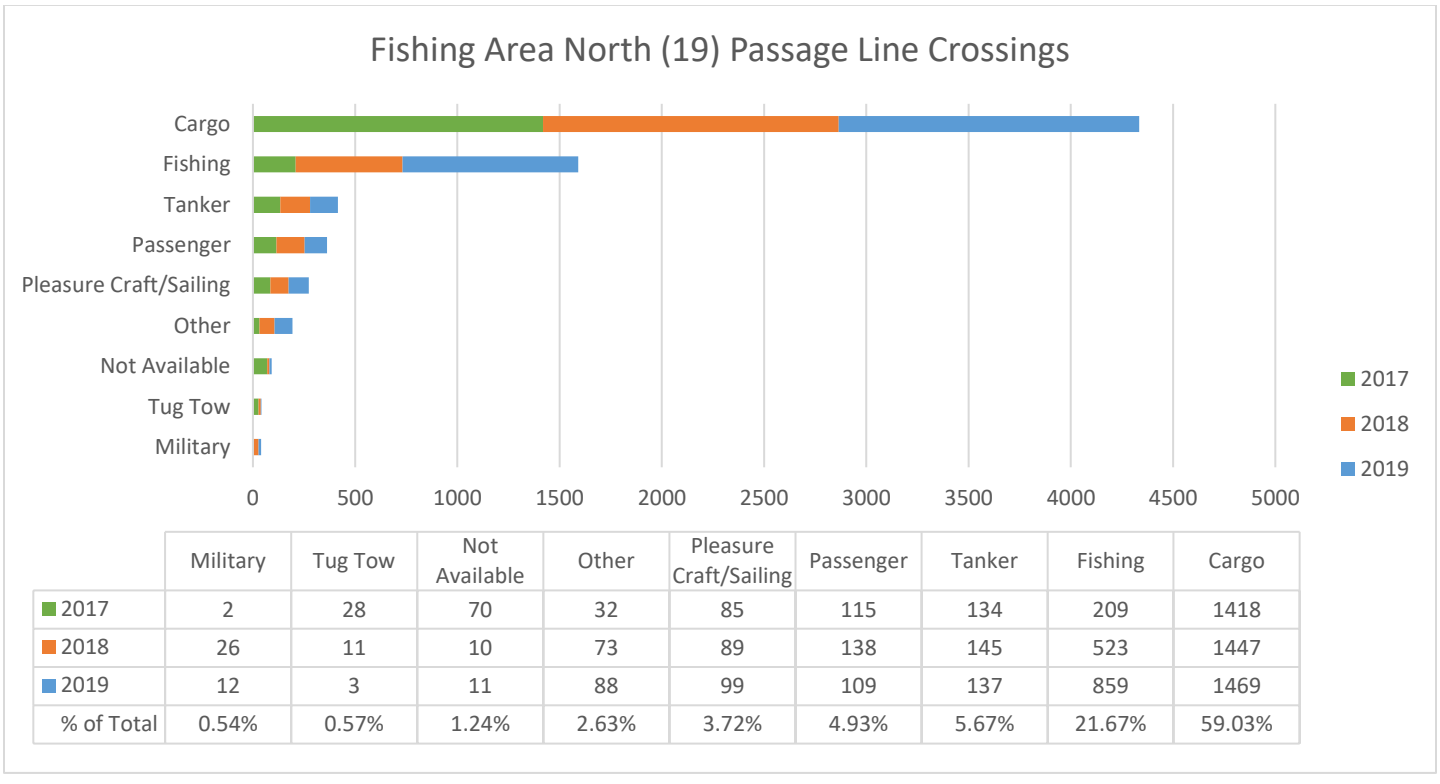


	Military	Passenger	Not Available	Tanker	Tug Tow	Other	Pleasure Craft/Sailing	Cargo	Fishing
2017	1	16	90	67	100	92	120	416	297
2018	5	7	14	45	29	231	158	423	685
2019	2	4	11	29	27	117	184	446	372
% of Total	0.20%	0.68%	2.88%	3.54%	3.91%	11.03%	11.58%	32.22%	33.95%

Figure 29: Ocean Wind and Atlantic Shores Boundary (18) Passage Line Crossings

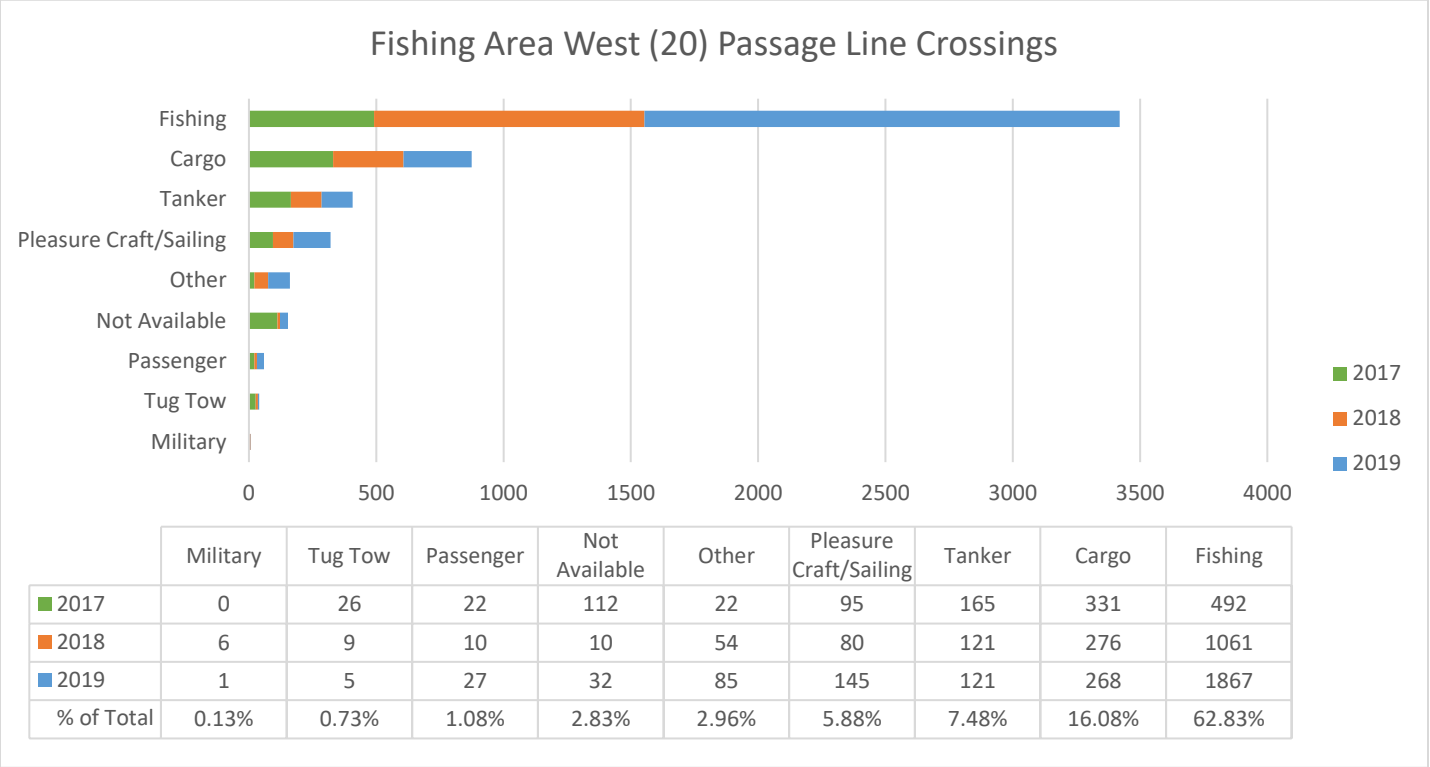


	Military	Tug Tow	Not Available	Other	Pleasure Craft/Sailing	Passenger	Tanker	Fishing	Cargo
2017	2	28	70	32	85	115	134	209	1418
2018	26	11	10	73	89	138	145	523	1447
2019	12	3	11	88	99	109	137	859	1469
% of Total	0.54%	0.57%	1.24%	2.63%	3.72%	4.93%	5.67%	21.67%	59.03%

Figure 30: Fishing Area North (19) Passage Line Crossings

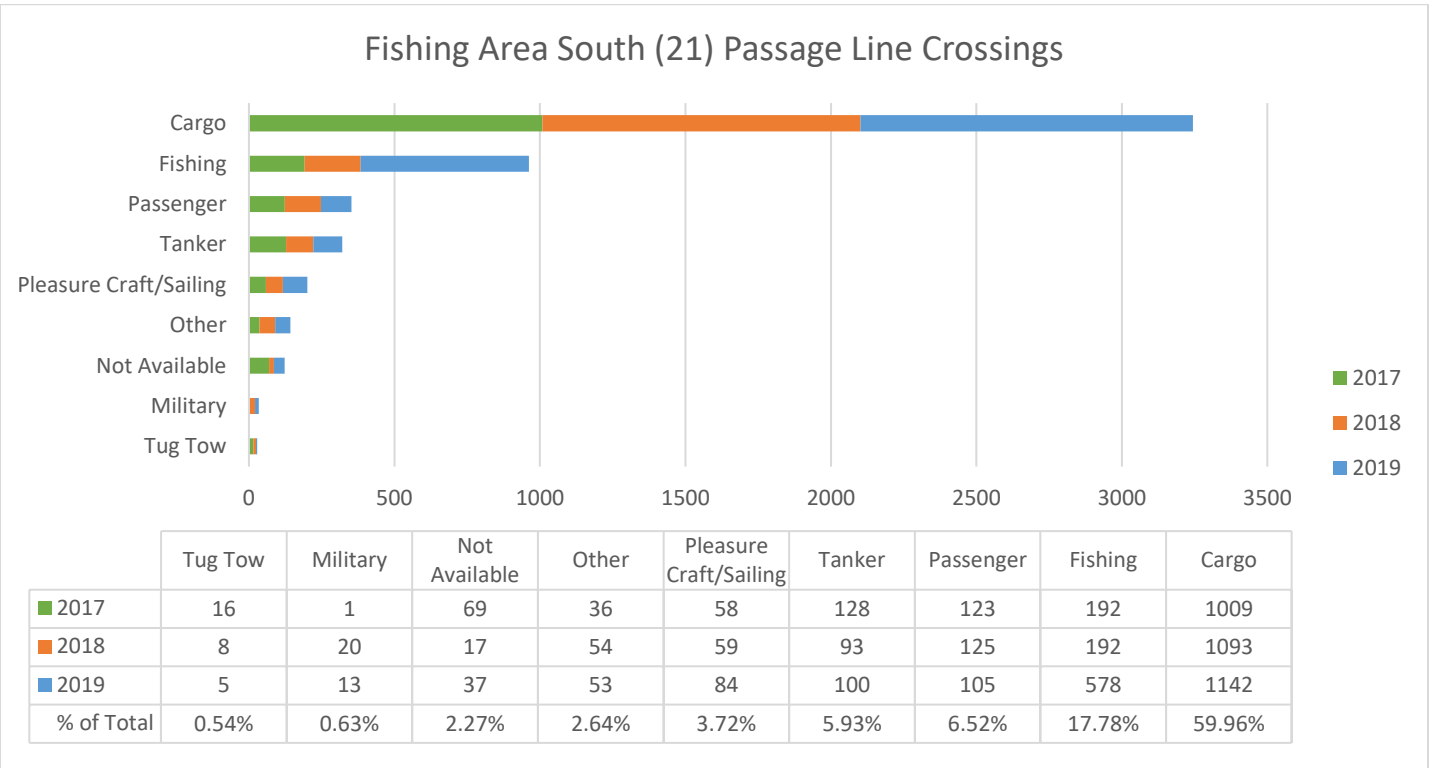
(RETURN TO Table 5: Passage Lines and Figure Numbers)

(RETURN TO Table 5: Passage Lines and Figure Numbers)



	Military	Tug Tow	Passenger	Not Available	Other	Pleasure Craft/Sailing	Tanker	Cargo	Fishing
2017	0	26	22	112	22	95	165	331	492
2018	6	9	10	10	54	80	121	276	1061
2019	1	5	27	32	85	145	121	268	1867
% of Total	0.13%	0.73%	1.08%	2.83%	2.96%	5.88%	7.48%	16.08%	62.83%

Figure 31: Fishing Area West (20) Passage Line Crossings



	Tug Tow	Military	Not Available	Other	Pleasure Craft/Sailing	Tanker	Passenger	Fishing	Cargo
2017	16	1	69	36	58	128	123	192	1009
2018	8	20	17	54	59	93	125	192	1093
2019	5	13	37	53	84	100	105	578	1142
% of Total	0.54%	0.63%	2.27%	2.64%	3.72%	5.93%	6.52%	17.78%	59.96%

Figure 32: Fishing Area South (21) Passage Line Crossings

(RETURN TO Table 5: Passage Lines and Figure Numbers)

Delaware Bay Entrance Pilot Area

The traffic in the pilot area is primarily cargo vessels, tankers, and work boats (other vessels), as expected. In 2017 fewer "Other" vessel crossings were recorded; some other vessels may be counted under the "Not Available" category for this year.

Two-Way Traffic Lane and Informal Traffic Lane NJ to NY

The two-way traffic lane and its informal continuation moving up the New Jersey coast towards New York is primarily tug and tow vessel traffic. Other vessels and some pleasure craft also transit in these areas.

Hudson South Wind Planning Area Traffic

Over 70% of the crossings into or through the Hudson South Wind Planning Area are fishing vessels, as seen in Figure 26-Figure 28. Some cargo ships pass through the area, likely leaving or entering the Barnegat to Ambrose traffic lanes. Pleasure craft also transit the area. Tank vessels are the only type that shows a noticeable difference in pattern between the North to South (Figure 28) and South to North (Figure 27) directions. Tankers show a tendency to transit towards New York (South to North) but few cross the passage line 17b, North to South.

Ocean and Atlantic Shores Boundary

The traffic along the boundary between the US and Atlantic Shores Lease Blocks, shown in Figure 29, consists largely of fishing vessels and cargo ships. See the "US and Atlantic Shores Boundary Box" section for further analysis of the traffic in this area.

Fishing Area

Passage lines 19-21 in Figure 30-Figure 32 are intended to observe three sides (north, west, south) of an area where vessels are presumed to be fishing within the study area. Indeed, fishing vessels make up the second highest portion of the crossings observed on the north and south lines and the majority of the traffic across the west line. Cargo vessels and tank ships also cross the north and south passage lines, possibly engaged in coastwise trade.

Inlet Traffic Including Some Monthly Breakdowns by Vessel Type

Depending on the location, the traffic mixture in the inlets includes pleasure craft, passenger, tug/tow, other, and fishing vessels. Military, tankers, and cargo ships generally do not operate in these shallower waters. Some significant variations are seen year-to-year in the traffic in these areas. For this analysis, vessel types that made up a large number of the crossings for a particular inlet and had noticeable variations in crossing numbers year-to-year were broken down by crossings per month. Specifically, a vessel type that made up 25% or more of the total crossings for an inlet and the variation observed across the studied years for that type was 50% or more, those crossings were further examined by month. This further breakdown of crossings was not carried out for "Fishing" or the group "Not Available." Variation between years is expected for fishing vessel traffic.

Townsends Inlet

The crossings in Townsends Inlet (Figure 17) show a spike in March of 2017 for Tug/Tow, Passenger, and Other ships (Figure 33-Figure 35). Except for this spike in March, passenger vessel traffic is primarily recorded in the summer, as expected. Although "Other" did not make up more than 25% of the total for this inlet, it is included to examine its possible correlation to the other spikes.

Vessel Type	Average Number of Trips by Vessel Type	Percent of Total	Percent Change
Passenger	245	26%	66%
Other	101	11%	90%
Tug/Tow	246	26%	100%

Table 6: Townsends Inlet Crossings Examination

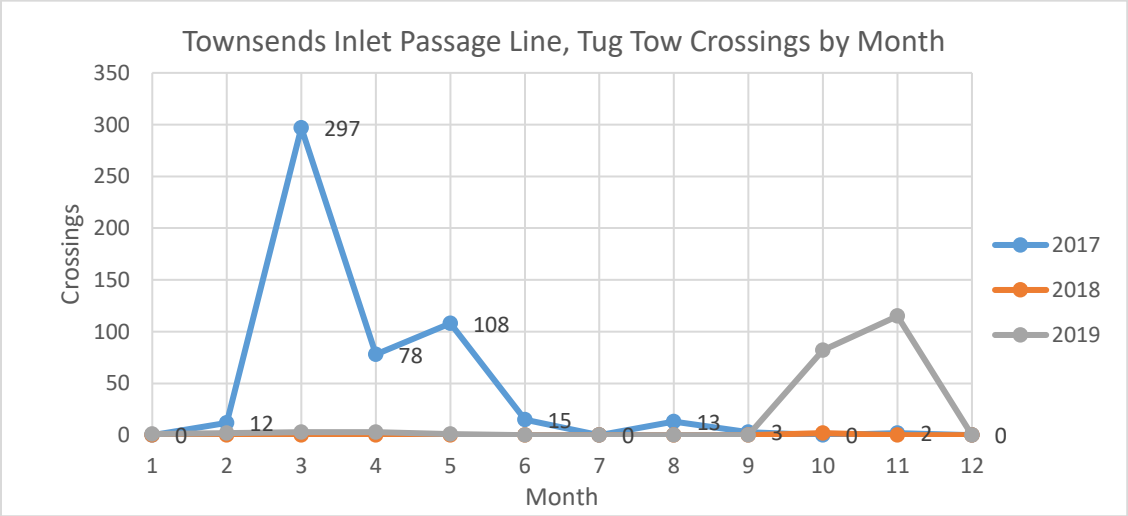


Figure 33: Townsends Inlet Passage Line, Tug/Tow Crossings by Month

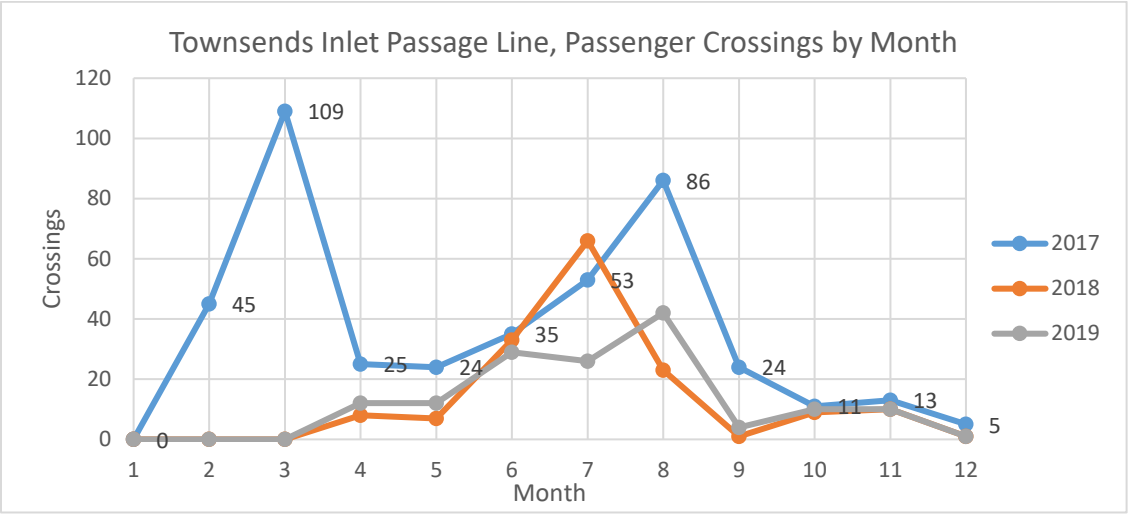


Figure 34: Townsends Inlet Passage Line, Passenger Crossings by Month

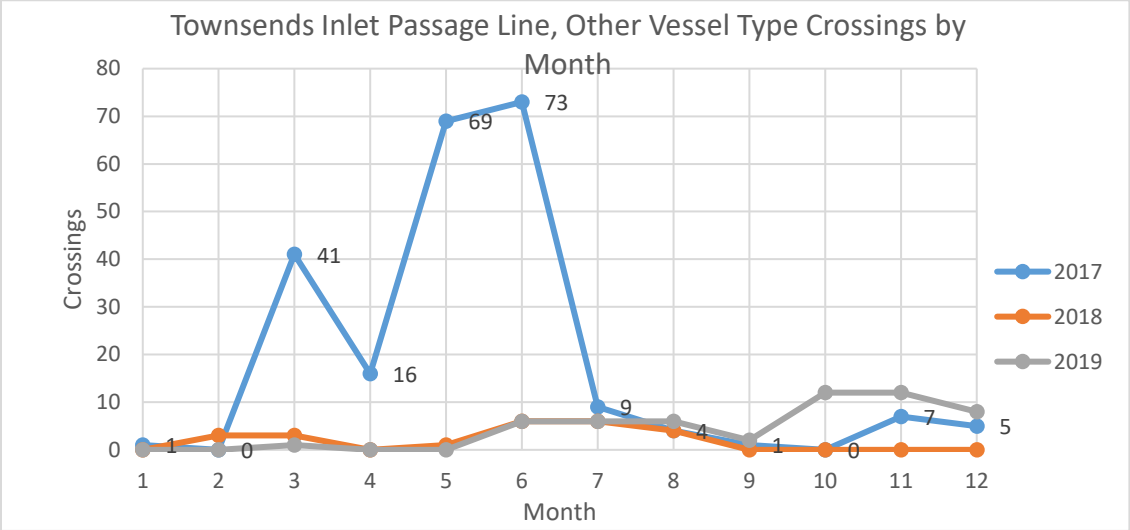


Figure 35: Townsends Inlet Passage Line, Other Vessel Type Crossings by Month

Great Egg Harbor Inlet

The recorded Great Egg Harbor Inlet Tug/Tow crossings (Figure 18) were consistent between 2017 and 2019 except for spike in November and December of 2017 as shown in Figure 36.

Vessel Type	Average Number of Trips by Vessel Type	Percent of Total	Percent Change
Tug/Tow	384	39%	93%

Table 7: Great Egg Harbor Inlet Crossings Examination

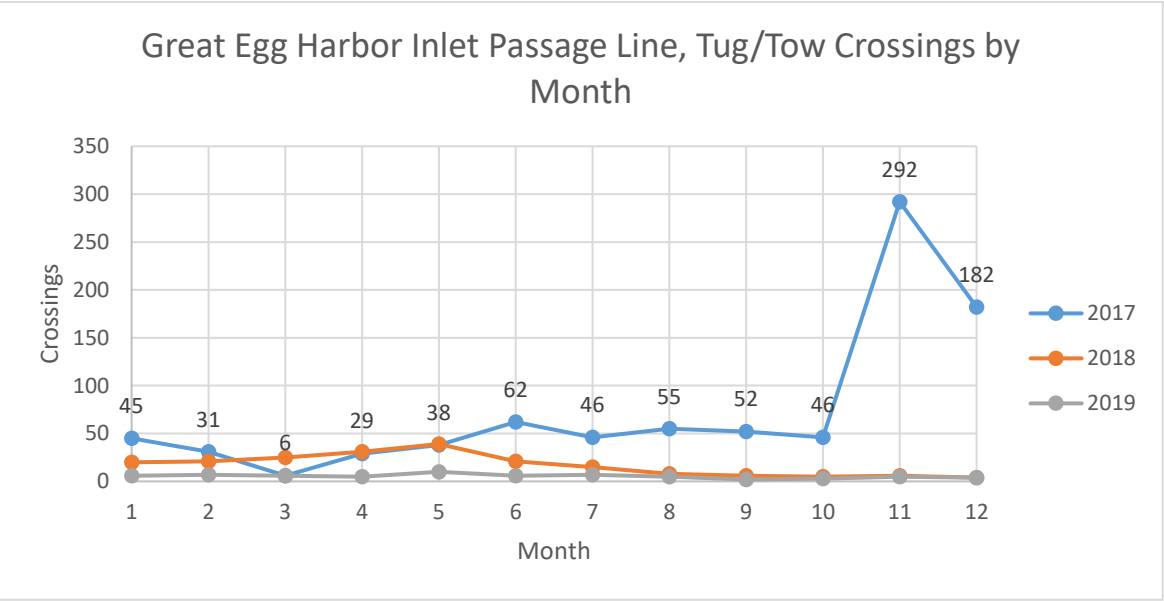


Figure 36: Great Egg Harbor Inlet Passage Line, Tug/Tow Crossings by Month

Little Egg Inlet

Crossings on the Little Egg Inlet passage line (Figure 20) showed a large percent change for Pleasure Craft and Tug/Tow vessels between 2017 and 2019, see Table 8. Tug/Tow crossings were examined in further detail as shown in Figure 37: Little Egg Inlet Passage Line, Tug/Tow Crossings by Month. The majority of the tug and tow crossings were in February of 2018. An increase in the pleasure craft traffic in the area in 2018 and 2019 was also observed (Figure 38).

Vessel Type	Average Number of Trips by Vessel Type	Percent of Total	Percent Change
Pleasure Craft	59	35%	95%
Tug/Tow	75	44%	100%

Table 8: Little Egg Inlet Crossings Examination

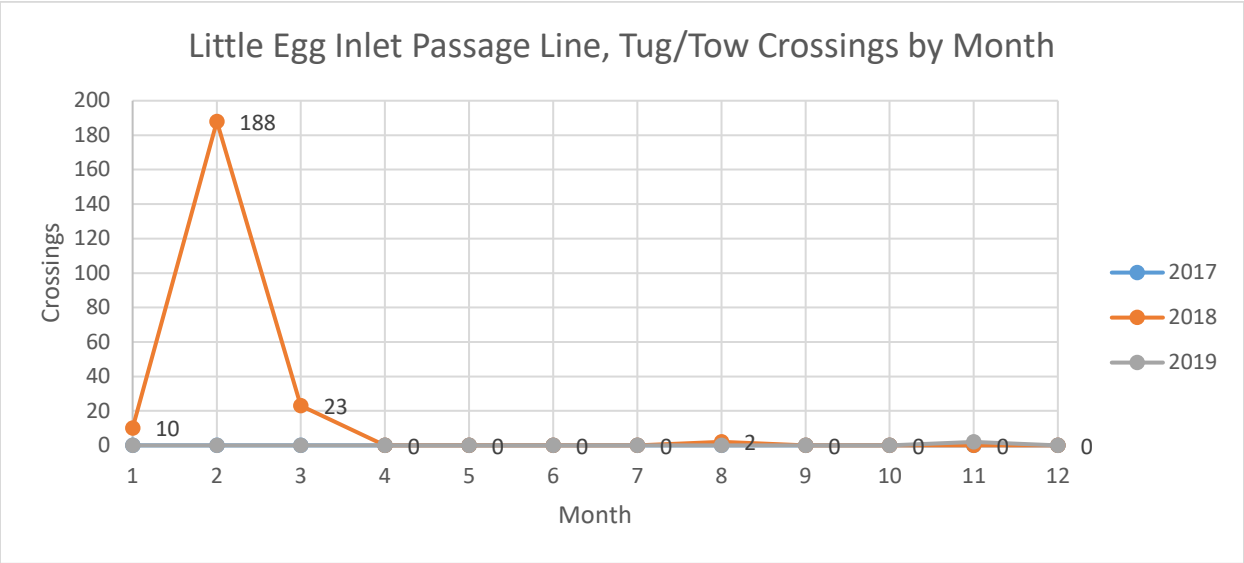


Figure 37: Little Egg Inlet Passage Line, Tug/Tow Crossings by Month

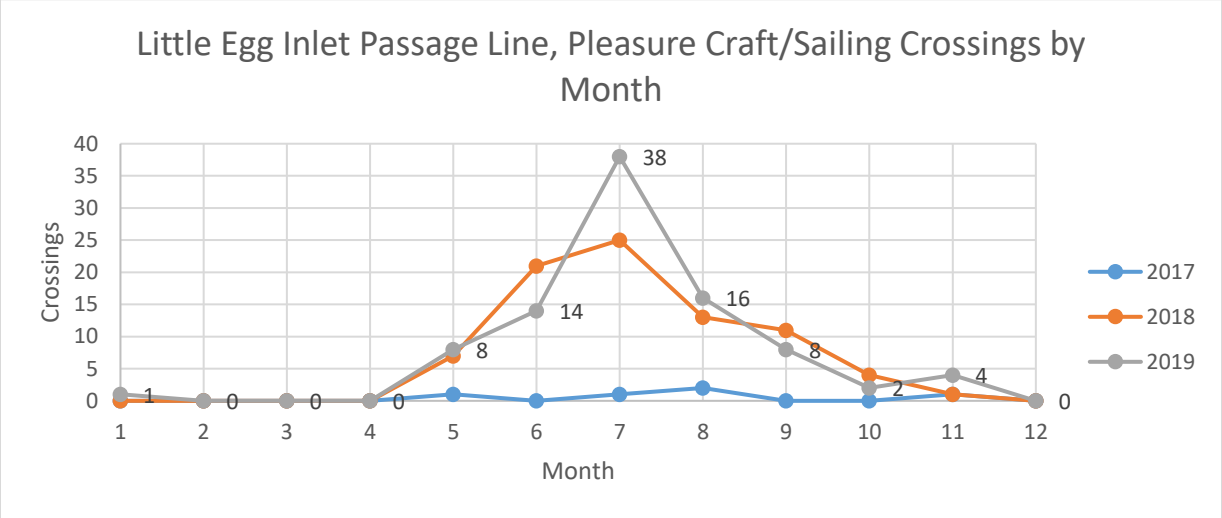


Figure 38: Little Egg Inlet Passage Line, Pleasure Craft/Sailing Crossings by Month

Shark River Inlet

Vessel types "Other" and "Passenger" showed large variations over the three year period for the Shark River Inlet crossings (Figure 25) as shown in Table 9. "Other" vessels have a regular increase in traffic in the summer and show a large spike in January of 2017 (Figure 39). As seen in Figure 40: Shark River Inlet Passage Line, Passenger Crossings by Month, "Passenger" vessel traffic in Shark River Inlet was higher across the 12 months in 2017 as compared to 2018 or 2019. In 2017, the traffic shows a steadily increase through the summer months and falling off in the fall and winter.

Vessel Type	Average Number of Trips by Vessel Type	Percent of Total	Percent Change
Other	326	39%	71%
Passenger	213	25%	96%

Table 9: Shark River Inlet Crossings Examination

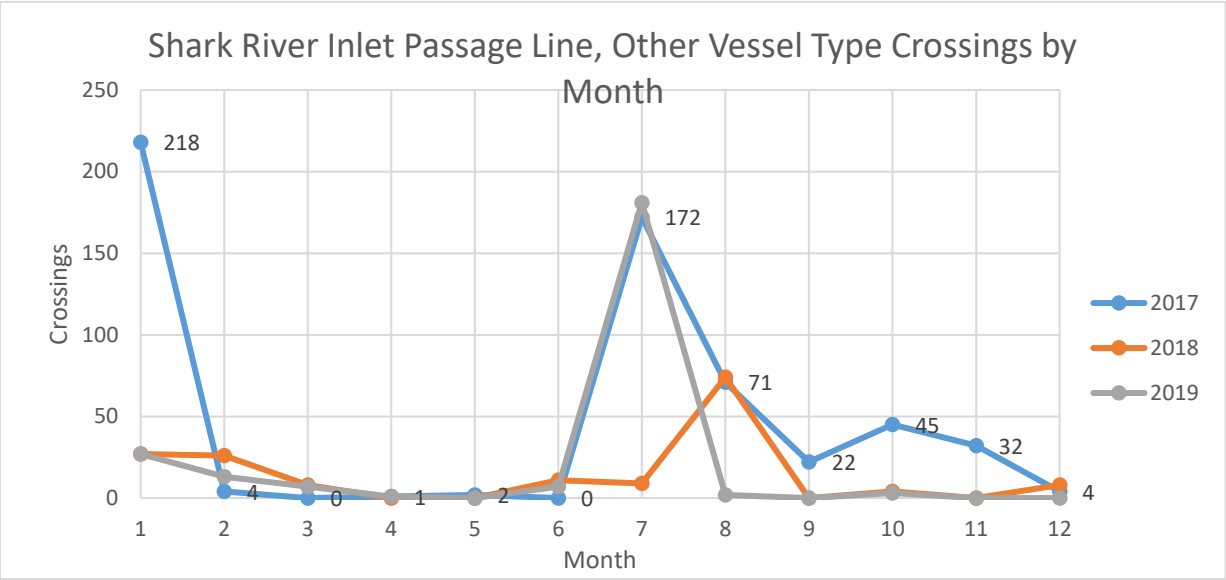


Figure 39: Shark River Inlet Passage Line, Other Vessel Type Crossings by Month

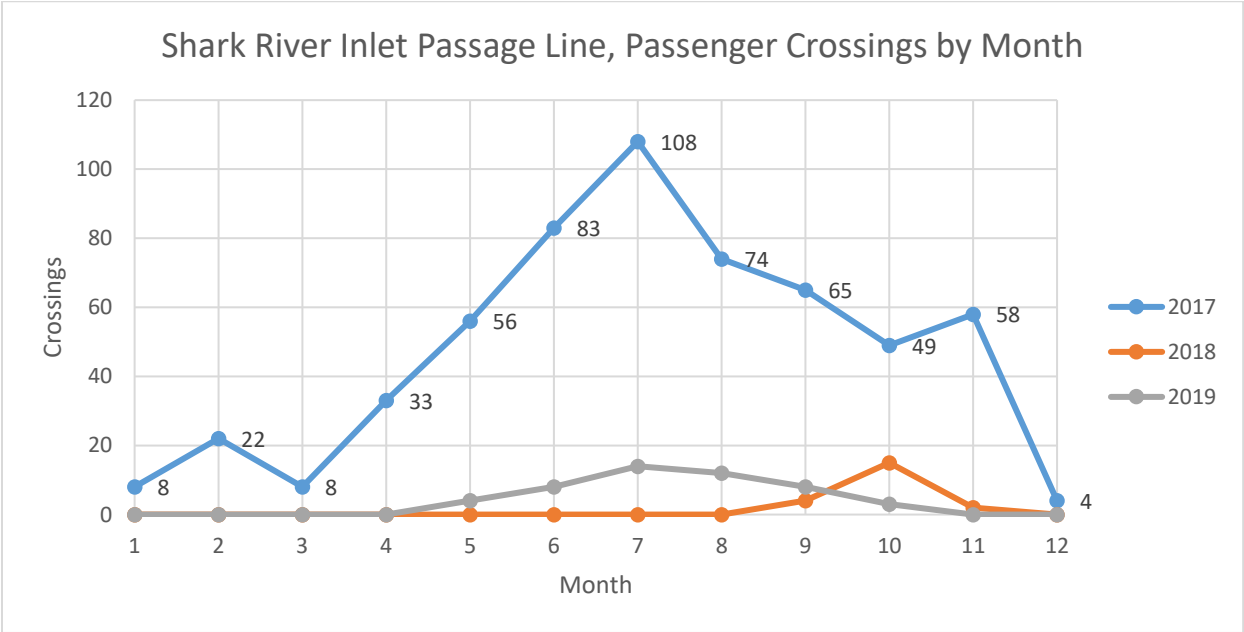


Figure 40: Shark River Inlet Passage Line, Passenger Crossings by Month

Ocean Wind and Atlantic Shores Boundary Box

Figure 41 shows the counts of each type of vessel that passed through the area overlapping and in between Atlantic Shores and Ocean Wind Renewable Energy lease blocks (as shown in Figure 3). Overall, the traffic distribution is consistent between the three years of data, with fishing vessels primarily transiting in this area. There is an increase in cargo vessel traffic in 2019.

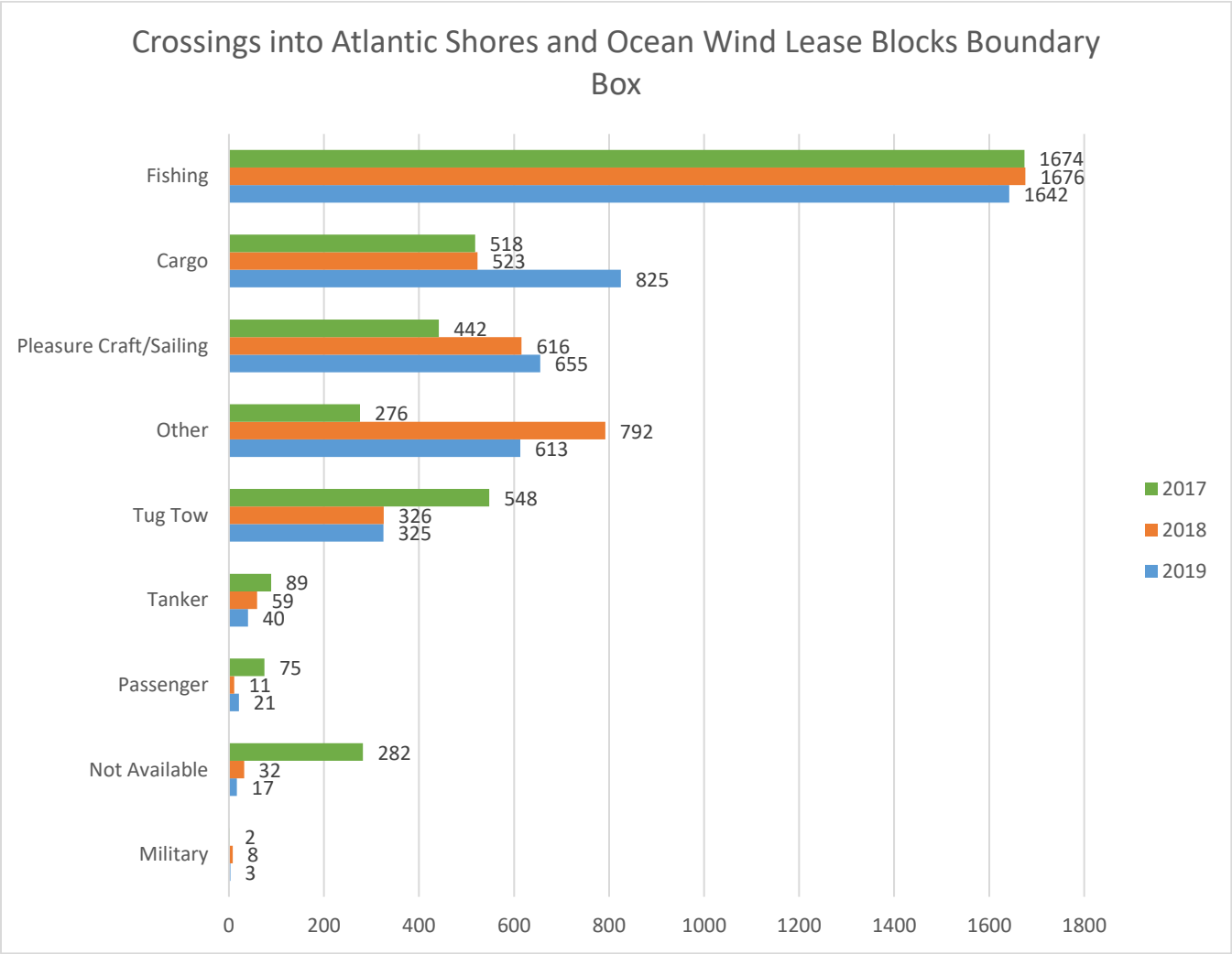
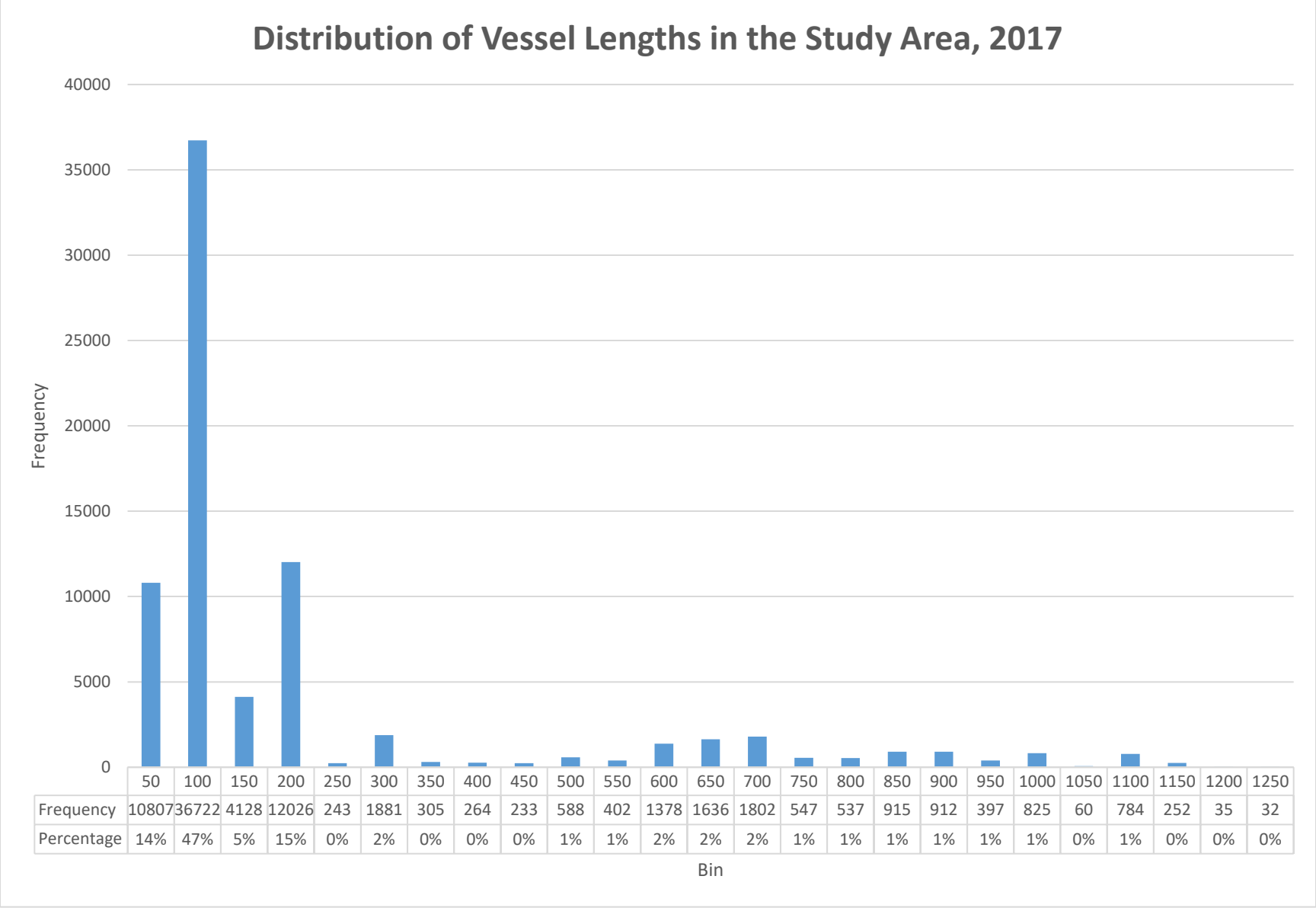


Figure 41: Crossings into Atlantic Shores and Ocean Wind Lease Blocks Boundary Box

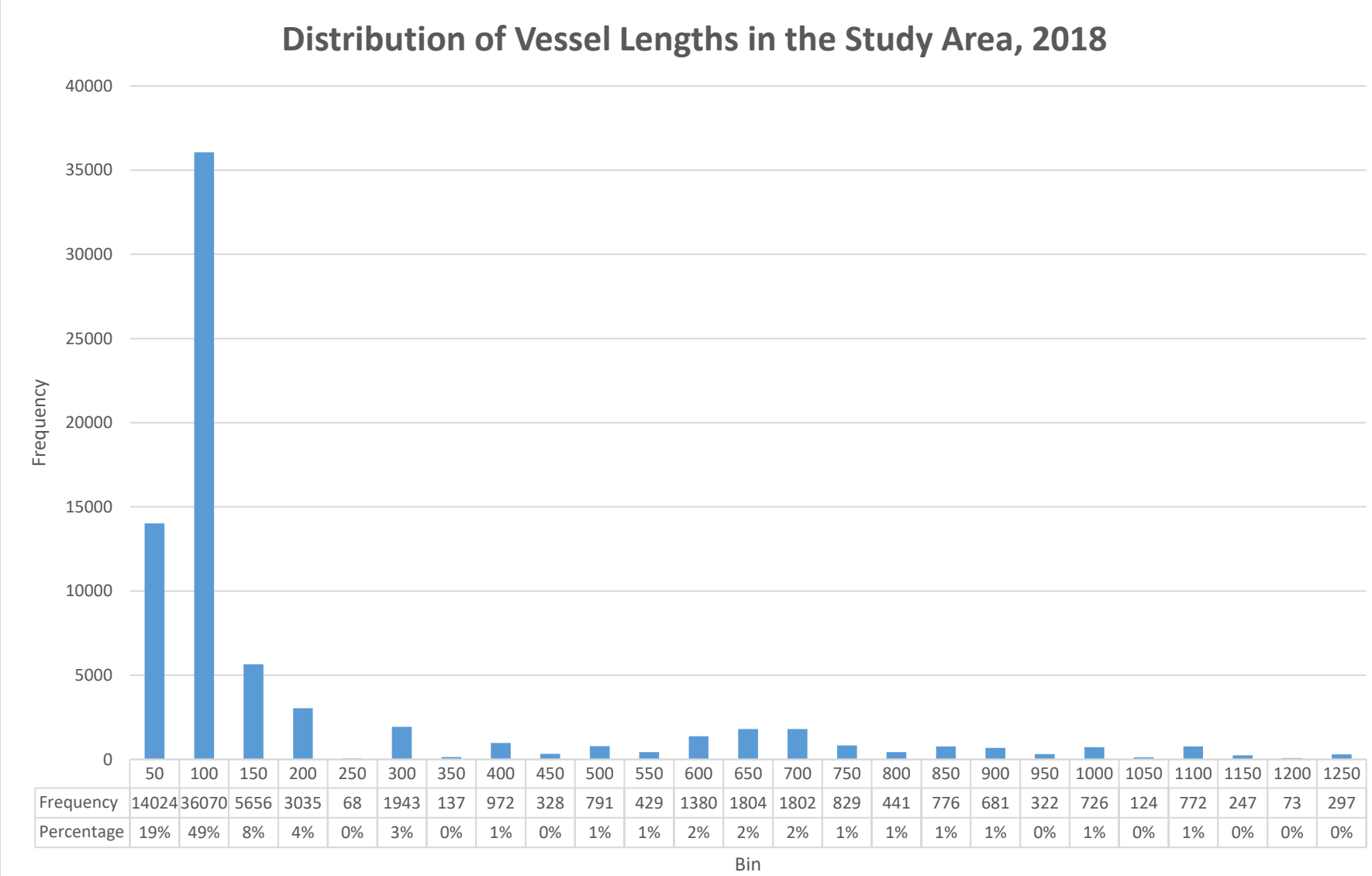
Vessel Length Distributions

Vessel length distributions are reported by year in Figure 42-Figure 44. Most vessels in the study area are between zero and 200 feet in length, which remained consistent over the years. In these figures, bins are defined by the highest value counted. For example, Bin 50 counts vessel lengths less than or equal to 50 feet, and Bin 100 counts vessel lengths greater than 50 and less than or equal to 100 feet.



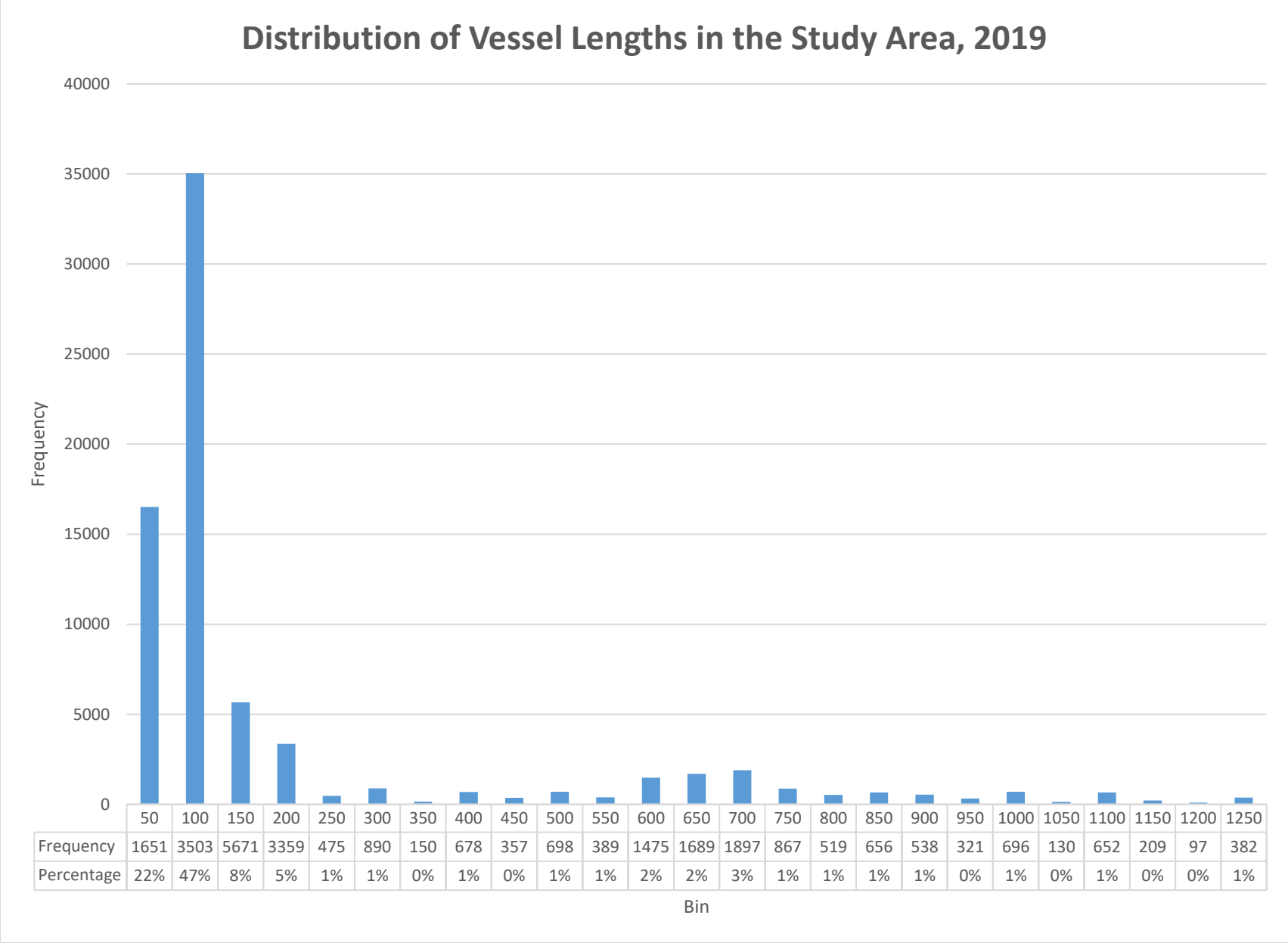
Bin	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250
Frequency	10807	36722	4128	12026	243	1881	305	264	233	588	402	1378	1636	1802	547	537	915	912	397	825	60	784	252	35	32
Percentage	14%	47%	5%	15%	0%	2%	0%	0%	0%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%	0%	1%	0%	0%	0%

Figure 42: Distribution of Vessel Lengths in the Study Area, 2017



Bin	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250
Frequency	14024	36070	5656	3035	68	1943	137	972	328	791	429	1380	1804	1802	829	441	776	681	322	726	124	772	247	73	297
Percentage	19%	49%	8%	4%	0%	3%	0%	1%	0%	1%	1%	2%	2%	2%	1%	1%	1%	1%	0%	1%	0%	1%	0%	0%	0%

Figure 43: Distribution of Vessel Lengths in the Study Area, 2018

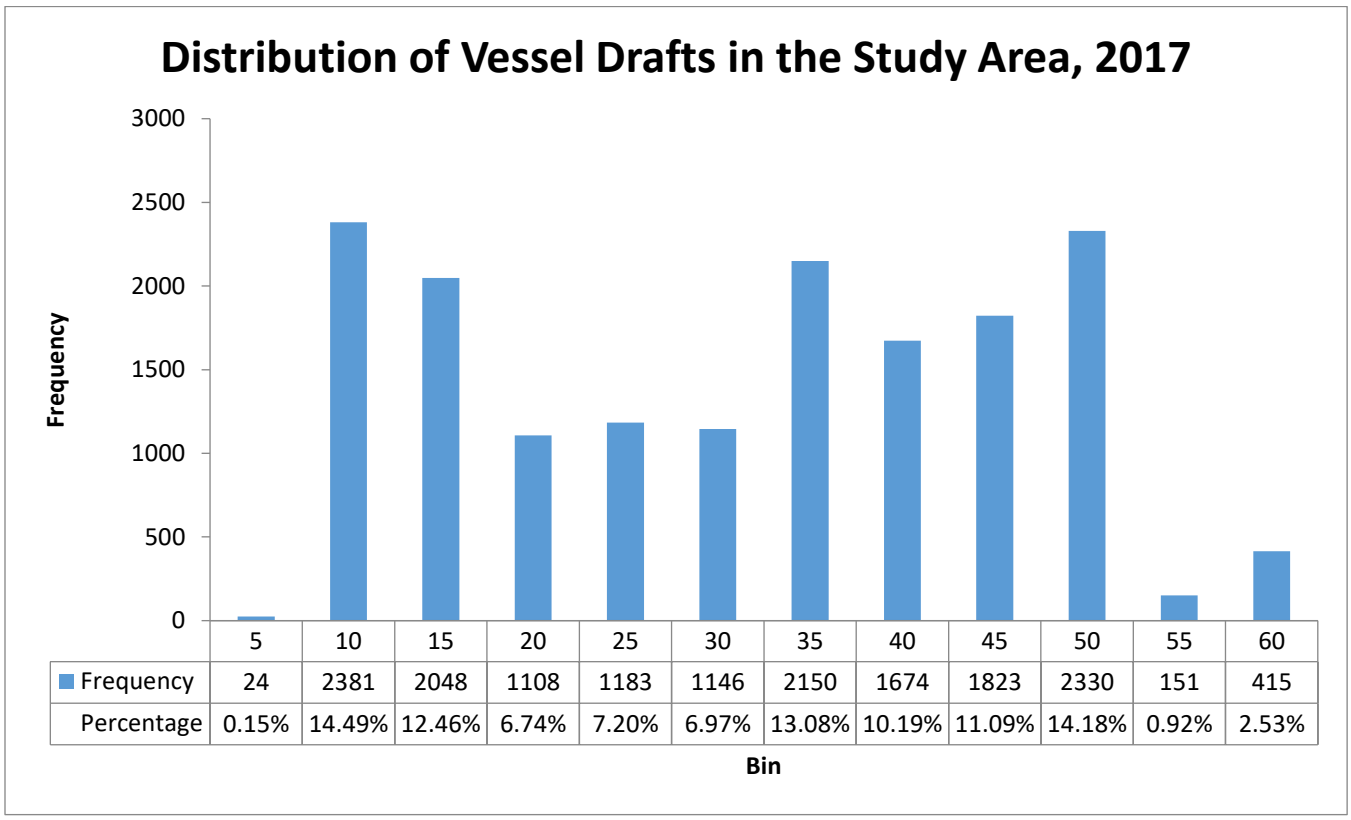


	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250
Frequency	1651	3503	5671	3359	475	890	150	678	357	698	389	1475	1689	1897	867	519	656	538	321	696	130	652	209	97	382
Percentage	22%	47%	8%	5%	1%	1%	0%	1%	0%	1%	1%	2%	2%	3%	1%	1%	1%	1%	0%	1%	0%	1%	0%	0%	1%

Figure 44: Distribution of Vessel Lengths in the Study Area, 2019

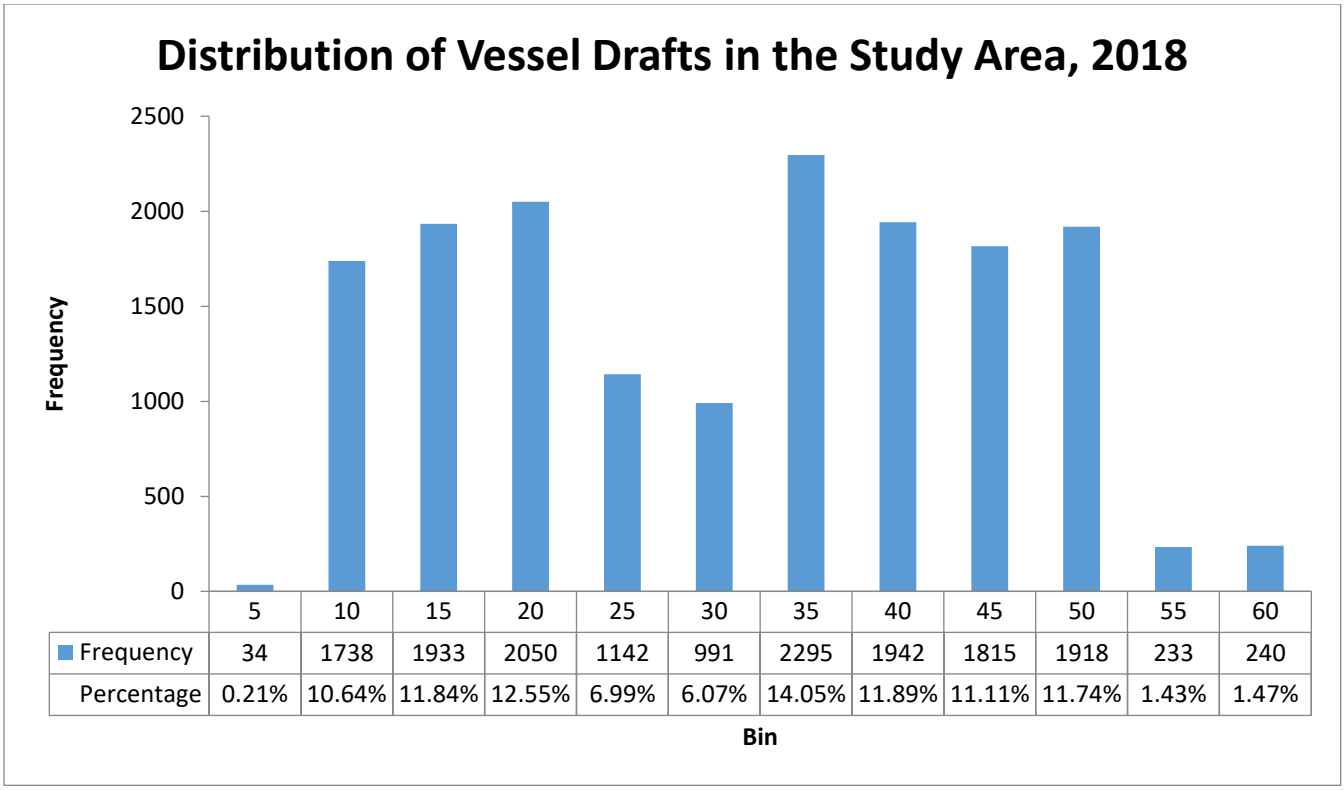
Vessel Draft Distributions

Reported vessel drafts are displayed in Figure 45-Figure 47. They remained consistent across all three years. These draft distributions are comprised of draft values present in the data set. Approximately 80% of the trips were found to be missing an associated vessel draft value. This lack of data is unsurprising because "Vessel Draft" is a user defined input and optional for many vessels. Bins in these charts are defined the same way as the length distributions, by the highest value counted (ex: Bin 5 counts vessel drafts less than or equal to 5 feet and Bin 10 counts vessel lengths greater than 5 and less than or equal to 10 feet).



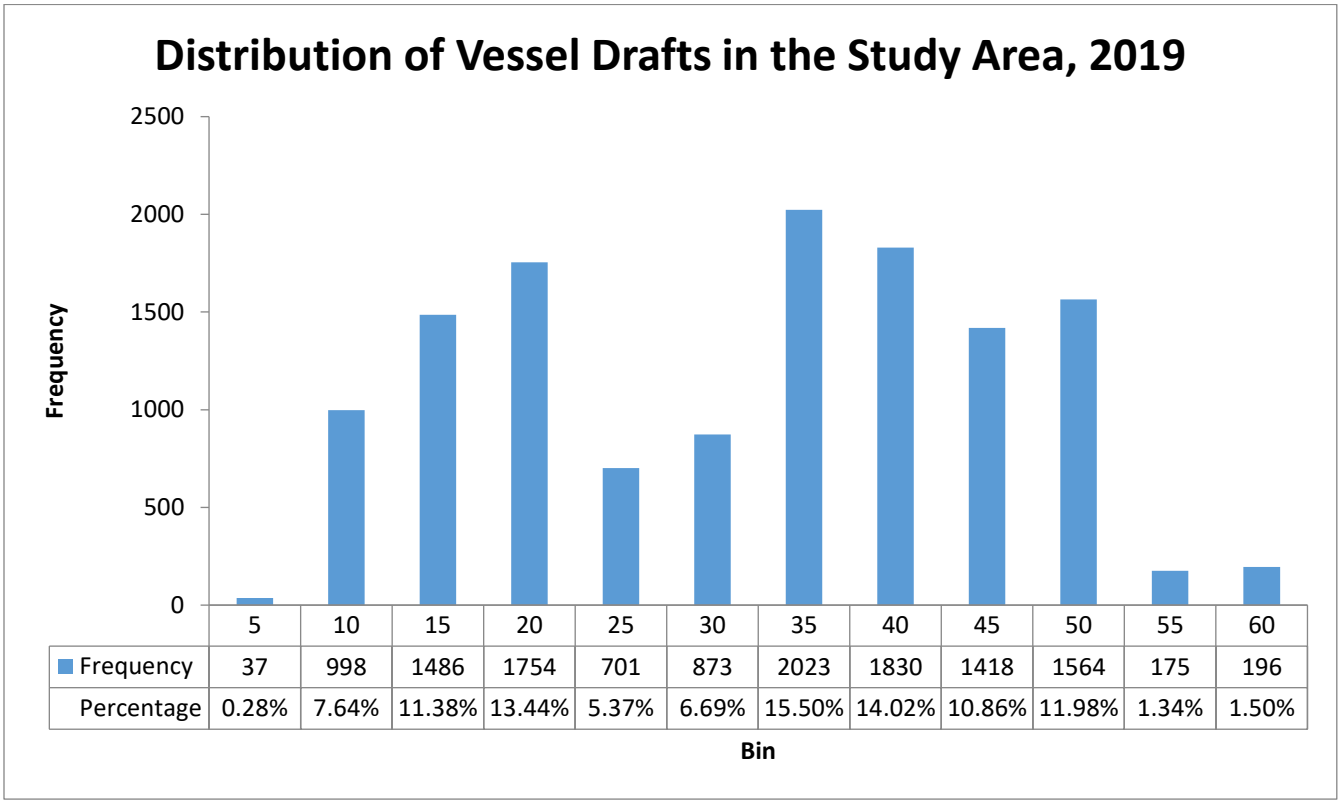
	5	10	15	20	25	30	35	40	45	50	55	60
Frequency	24	2381	2048	1108	1183	1146	2150	1674	1823	2330	151	415
Percentage	0.15%	14.49%	12.46%	6.74%	7.20%	6.97%	13.08%	10.19%	11.09%	14.18%	0.92%	2.53%

Figure 45: Distribution of Vessel Drafts in the Study Area, 2017



	5	10	15	20	25	30	35	40	45	50	55	60
Frequency	34	1738	1933	2050	1142	991	2295	1942	1815	1918	233	240
Percentage	0.21%	10.64%	11.84%	12.55%	6.99%	6.07%	14.05%	11.89%	11.11%	11.74%	1.43%	1.47%

Figure 46: Distribution of Vessel Drafts in the Study Area, 2018



	5	10	15	20	25	30	35	40	45	50	55	60
Frequency	37	998	1486	1754	701	873	2023	1830	1418	1564	175	196
Percentage	0.28%	7.64%	11.38%	13.44%	5.37%	6.69%	15.50%	14.02%	10.86%	11.98%	1.34%	1.50%

Figure 47: Distribution of Vessel Drafts in the Study Area, 2019

Traffic Densities

Two sets of traffic densities are provided as Attachments 1 and 2. Attachment 1 details only the traffic density in the study area, while the Attachment 2 displays the traffic densities with the following layers: wind lease and planning areas, ACPARS proposed fairways, and proposed anchorages. Each set of traffic density charts are organized by year and type in the attachments and are labelled as listed in Table 10.

The traffic patterns observed in the traffic densities for each year are consistent with the findings in the passage line and traffic composition analyses. For example, if a large number of passenger vessel transits were counted in the passage line section for a particular inlet, the traffic density for that area also reflected a high density of passenger vessels. Specific observations from these densities about each vessel type are discussed in the following pages. It is important to note when analyzing the traffic densities that the color scale on each map is relative and similar colors cannot be directly compared between maps.

	Year		
Vessel Type	**2017**	**2018**	**2019**
All Vessels	A.1	A.2	A.3
Cargo	B.1	B.2	B.3
Fishing	C.1	C.2	C.3
Not Available	D.1	D.2	D.3
Other	E.1	E.2	E.3
Passenger	F.1	F.2	F.3
Pleasure Craft / Sailing	G.1	G.2	G.3
Tankers	H.1	H.2	H.3
Tug / Tow	I.1	I.2	I.3

Table 10: Traffic Density Labels Shown in Attachments 1 and 2

All Vessels

General vessel traffic patterns (Charts A.1-A.3 in Attachments 1 and 2) in the study area were consistent between 2017 and 2019, with some variation near shore, off the coast of New Jersey as well as offshore and east of the Delaware Bay. Some areas that show a variation in traffic pattern are identified with black circles in Figure 48.

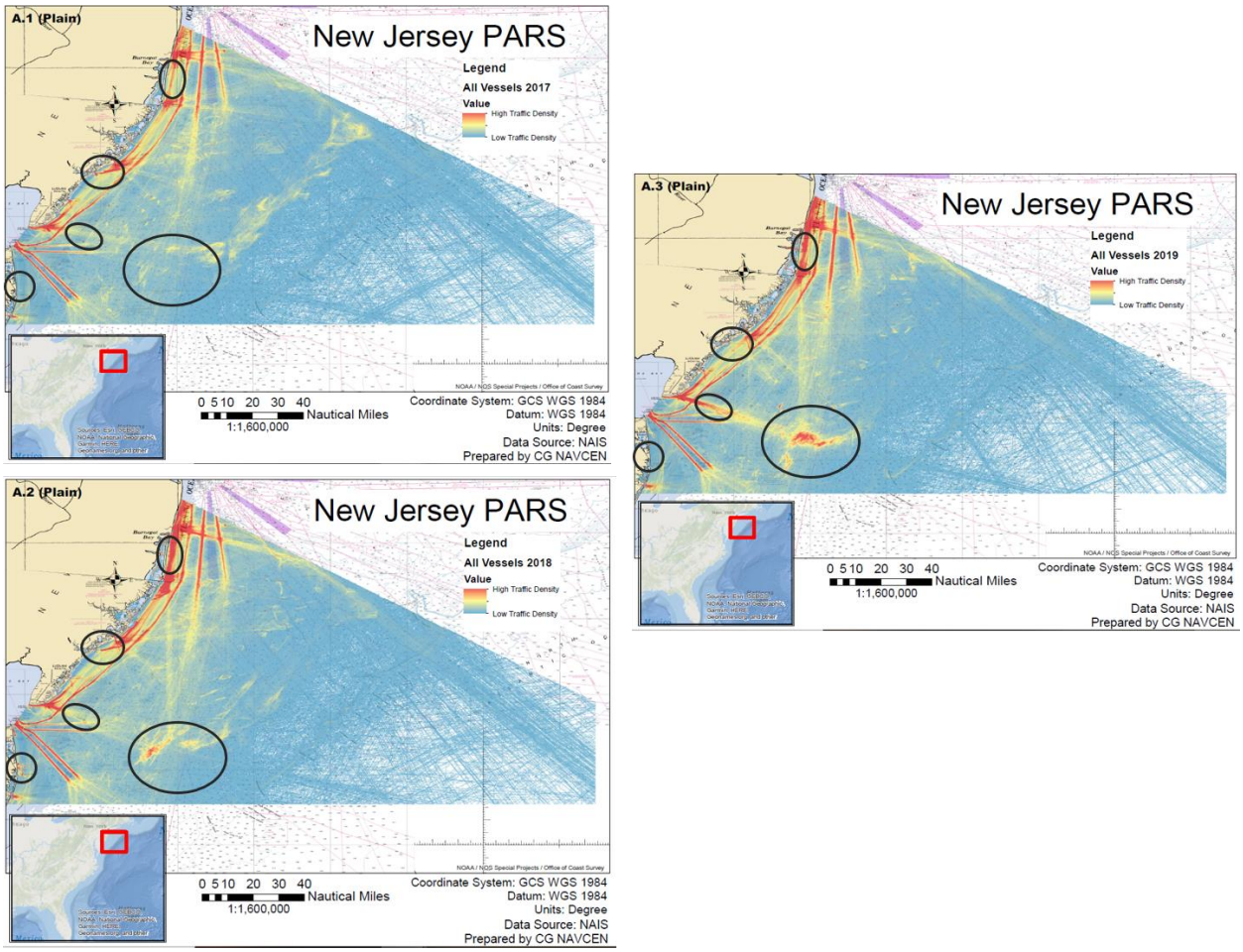


Figure 48: All Vessels Densities Comparison

Cargo and Tanker

Cargo vessels ((Charts B.1-B.3 in Attachments 1 and 2) and tank ships (Charts H.1-H.3 in Attachments 1 and 2) consistently transit in the designated traffic lanes in the study area, including approaches to New York and the Delaware Bay.

Fishing

The traffic densities for fishing vessels show that fishing vessels operate primarily out of Cape May Inlet, Absecon Inlet near Atlantic City, Barnegat Inlet, and Manasquan Inlet (Charts C.1-C.3 in

Attachments 1 and 2). These vessels transit and fish in a variety of locations that vary from year to year. Some of these locations are circled in black in Figure 49.

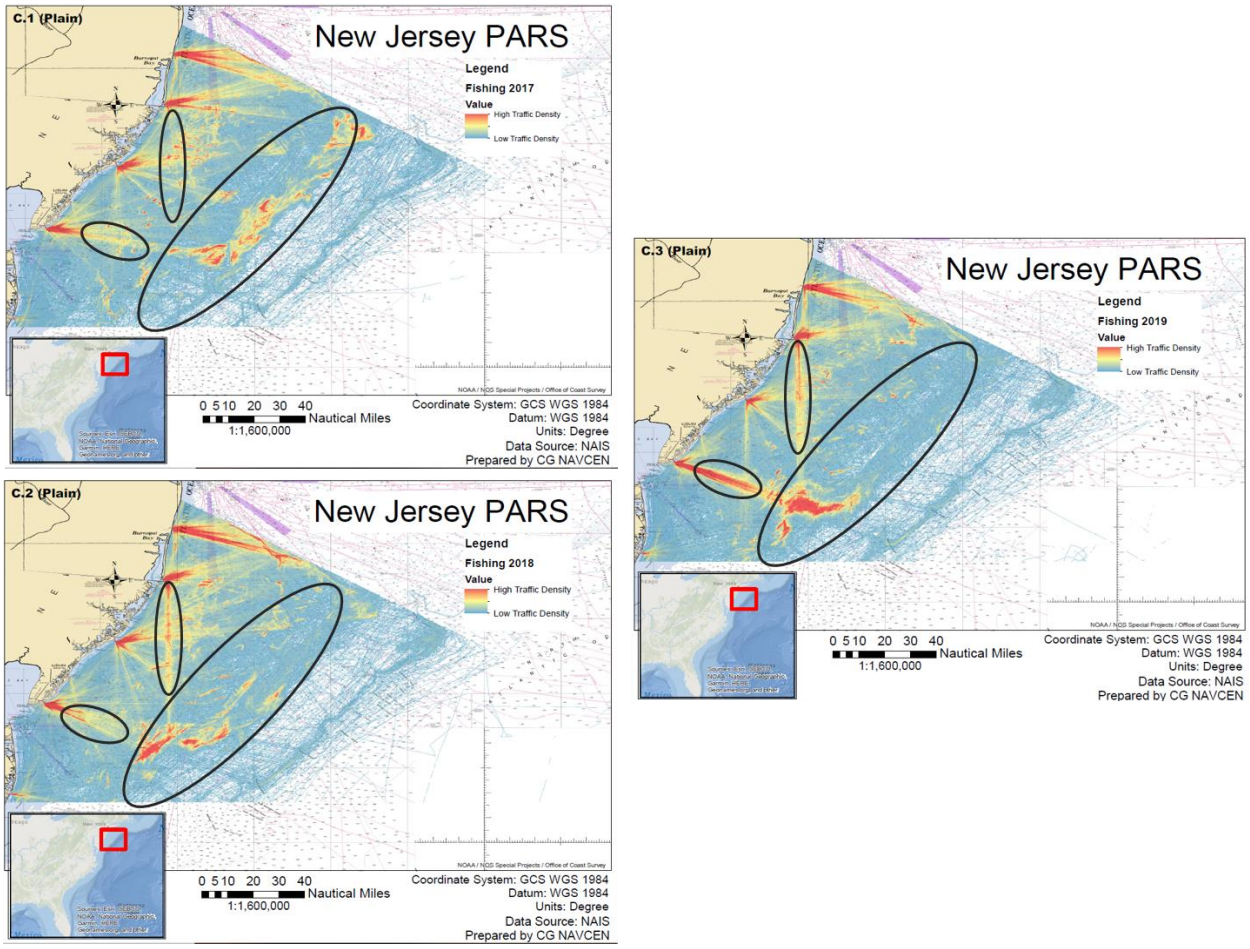


Figure 49: Fishing Vessel Densities Comparison

Not Available

"Not Available" vessel densities show the same general patterns as found in the "All Vessels" densities (Charts D.1-D.3 in Attachments 1 and 2). The "Not Available" types are likely a mixture of all the vessel types analyzed in this study. In 2017, there are areas along the coast with higher traffic density than observed in 2018 and 2019. This area is circled in black in Figure 50. These vessels could be passenger, fishing, pleasure craft, or tug/tow, based on the patterns shown in the densities for those vessel types.

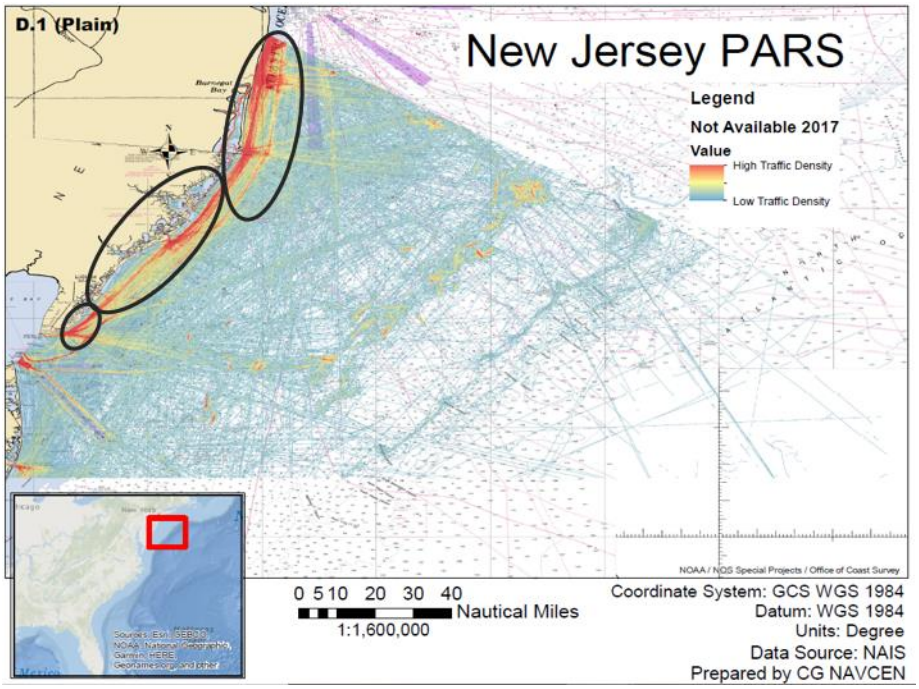


Figure 50: Not Available Vessel Density 2017 Differences

Other

"Other" vessels operate in the Delaware Bay Pilot area and out of various inlets off the NJ shore, especially Cape May Inlet, Great Egg Inlet, Absecon Inlet, Little Egg Inlet, and Manasquan Inlet (Charts E.1-E.3 in Attachments 1 and 2). In 2018, there is also a noticeable amount of "Other" traffic originating from Barnegat Inlet, circled in black in Figure 51. The offshore area in yellow in 2018 and red in 2019 is located in the wind energy lease areas.

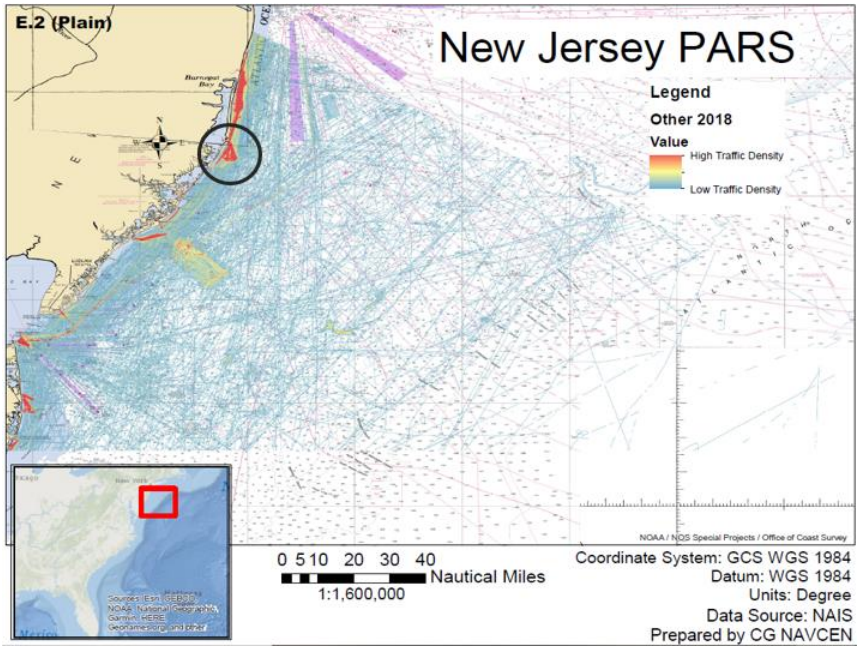


Figure 51: Other Vessel Density Differences

Passenger

The traffic patterns observed for passenger vessels are consistent in all three years of data, with dense areas near the shore and in the approach to New York (Charts F.1-F.3 in Attachments 1 and 2). The traffic is especially dense near Cape May and Manasquan Inlets.

Pleasure Craft / Sailing

Pleasure craft remain primarily near the coast (Charts G.1-G.3 in Attachments 1 and 2). This includes the Jersey shore and Ocean City Inlet in Maryland. This pattern is consistent in all three years of data.

Tug / Tow

The tug/tow traffic consistently uses the two-way traffic lane from the Delaware Bay that ends northeast of Hereford Inlet or east of Seven Mile Beach (Charts I.1-I.3 in Attachments 1 and 2). Near the end of this lane, the traffic splits as it moves up the coast towards New York. Areas with notably different traffic patterns for this vessel type are circled in black in Figure 52.

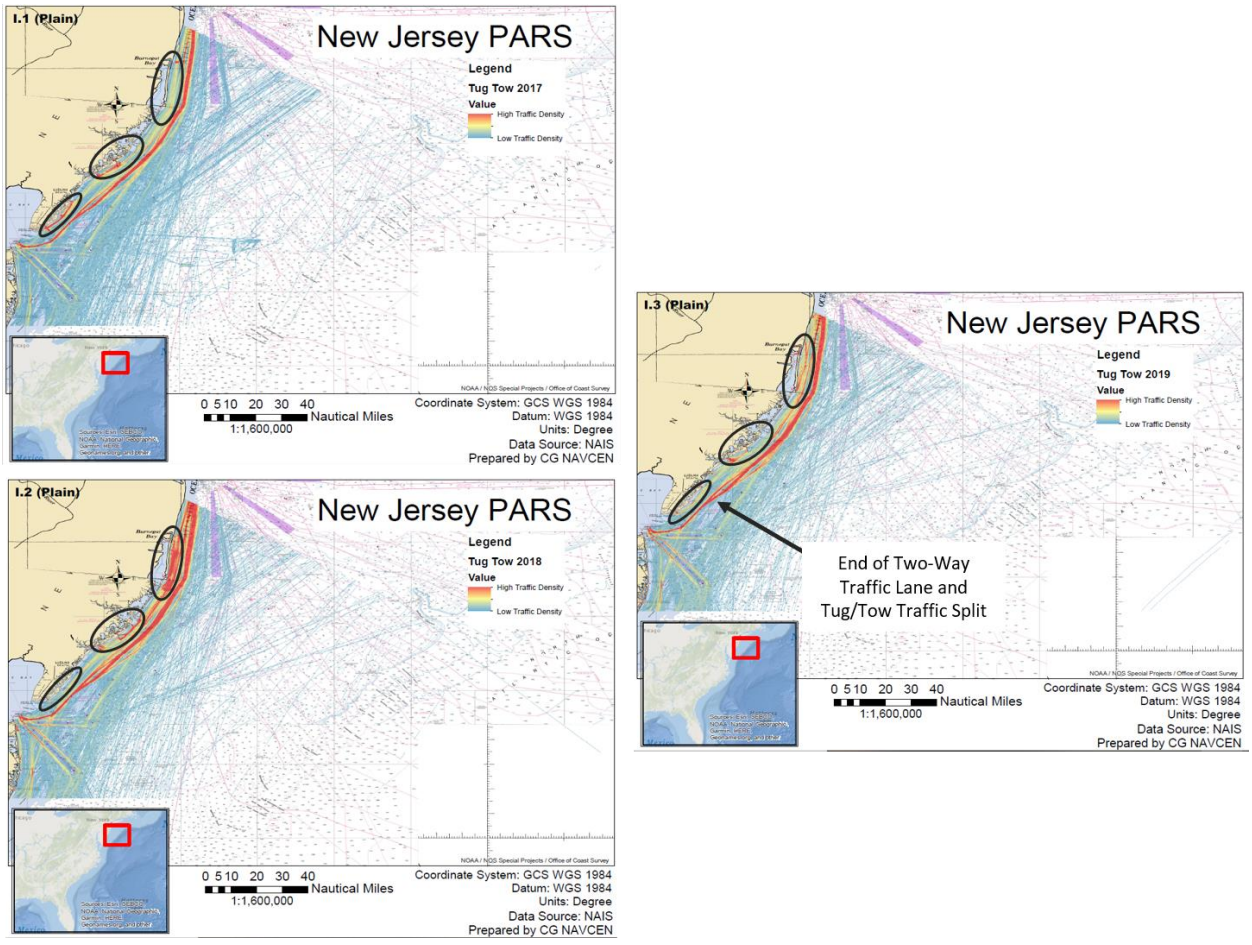
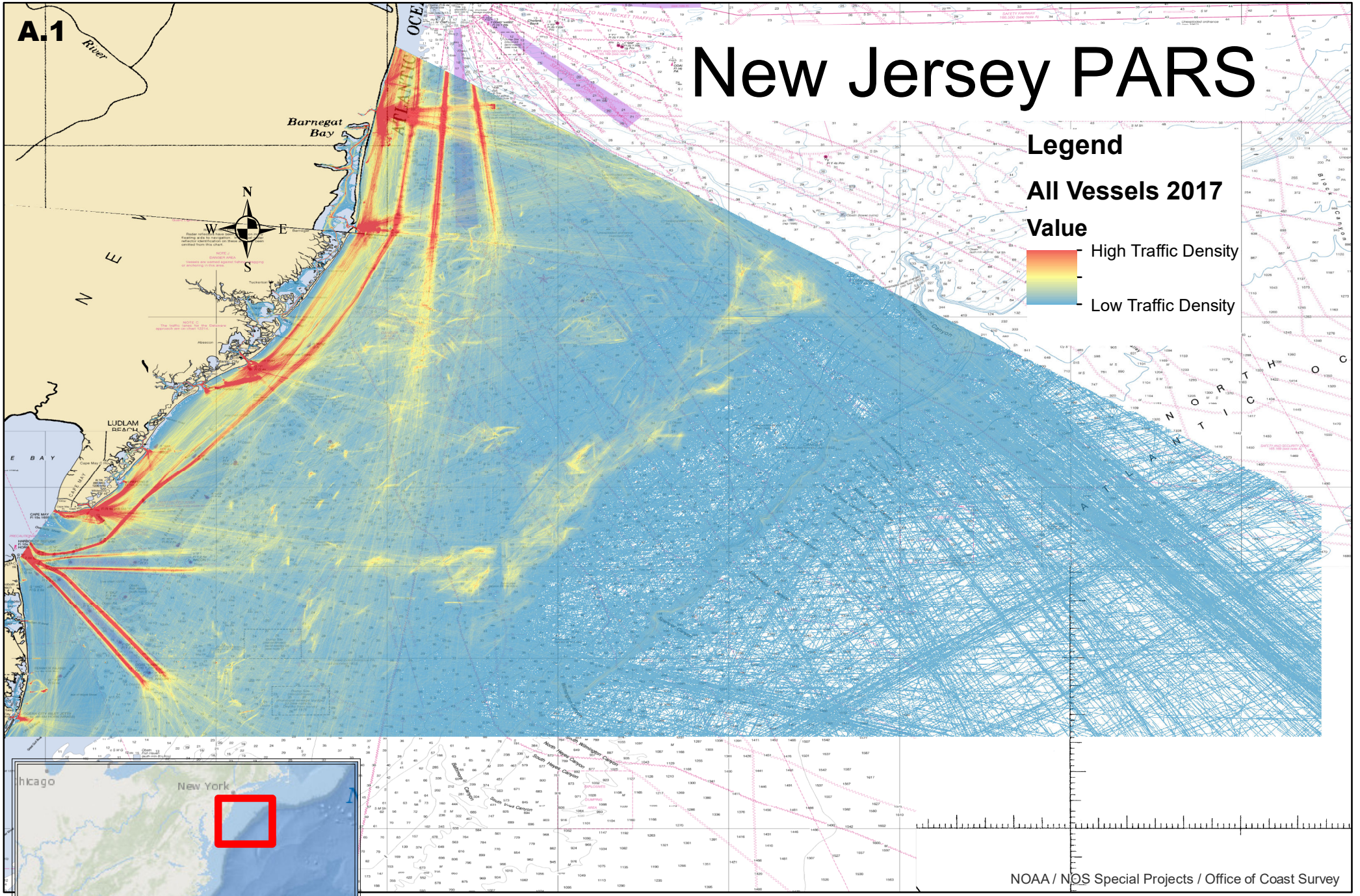
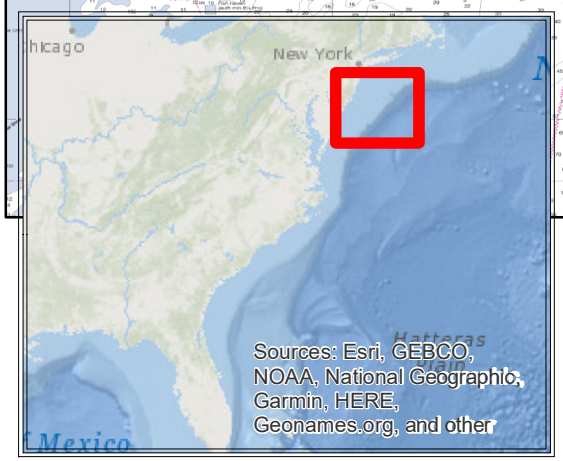


Figure 52: Tug Tow Vessel Densities Comparison

Attachment 1: Traffic Densities for the NJ PARS





0 5 10 20 30 40

Nautical Miles

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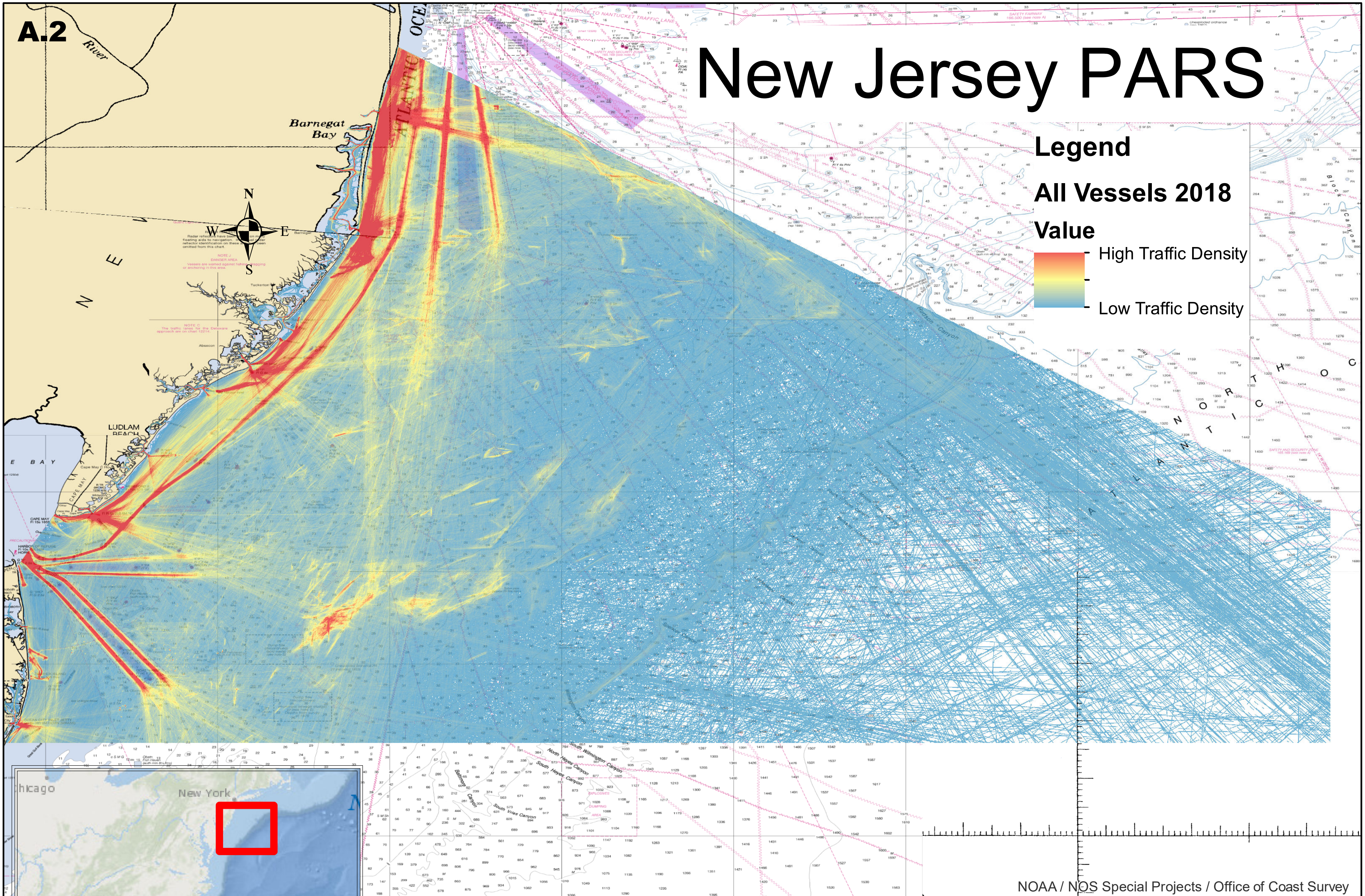
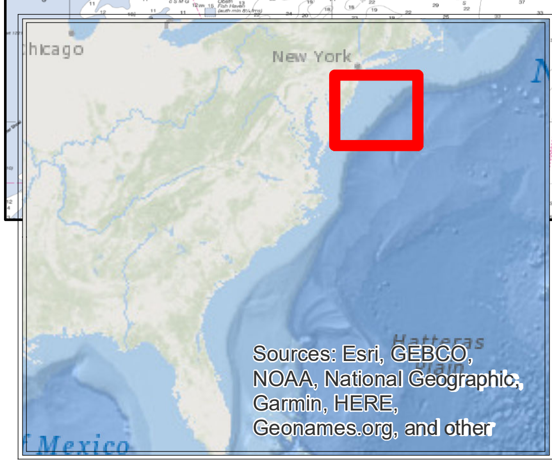
Datum: WGS 1984

Units: Degree

Data Source: NAIS

Prepared by CG NAVCEN





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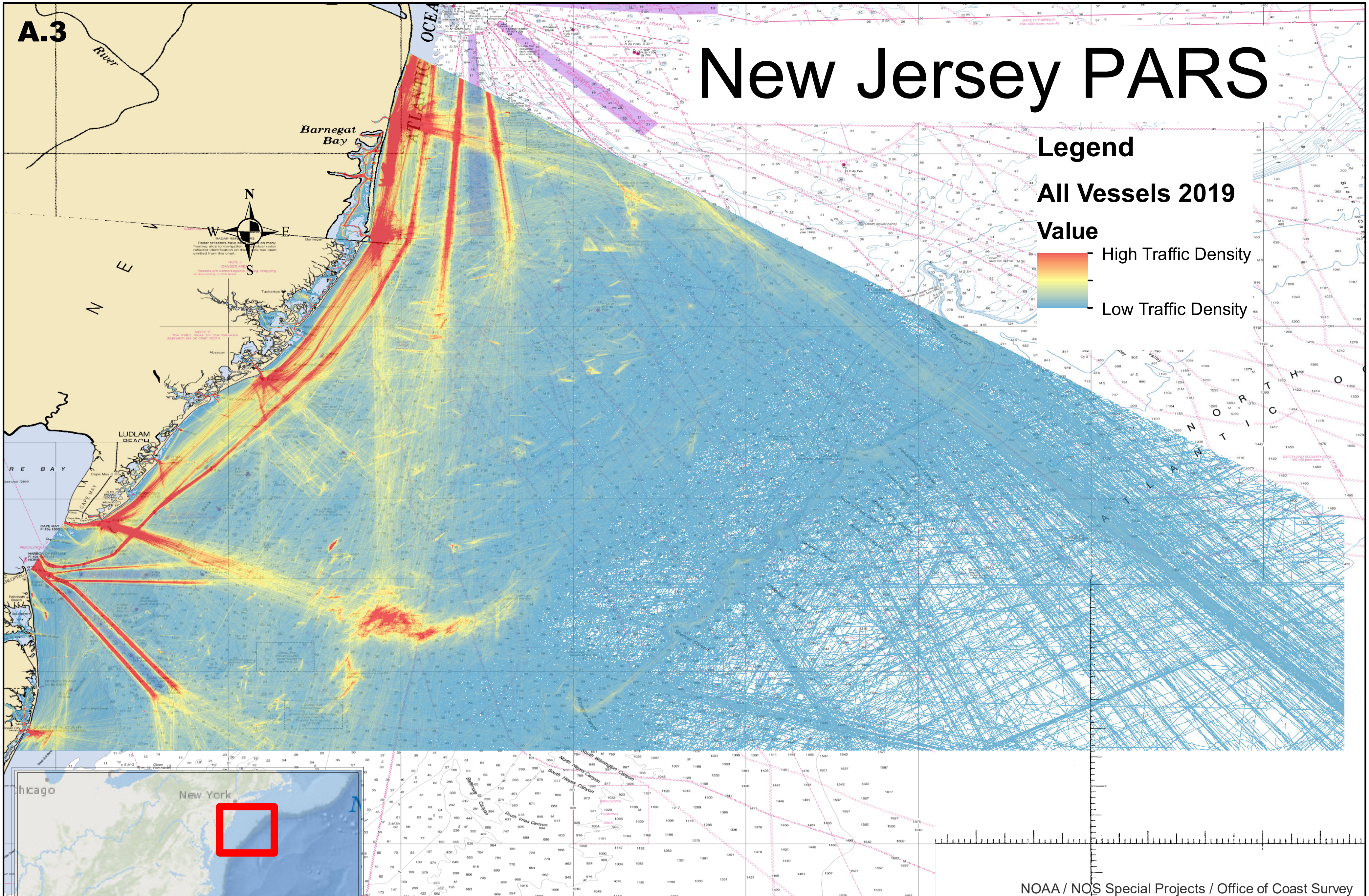

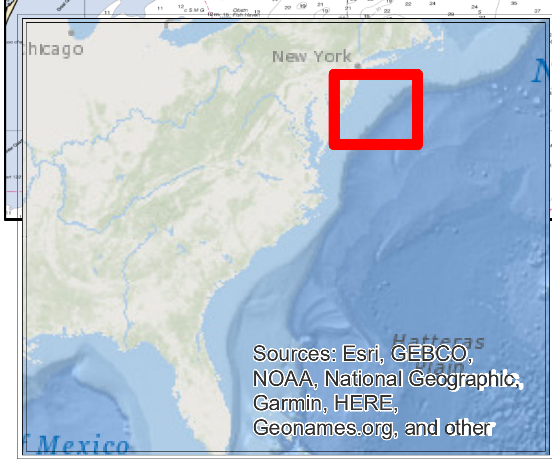

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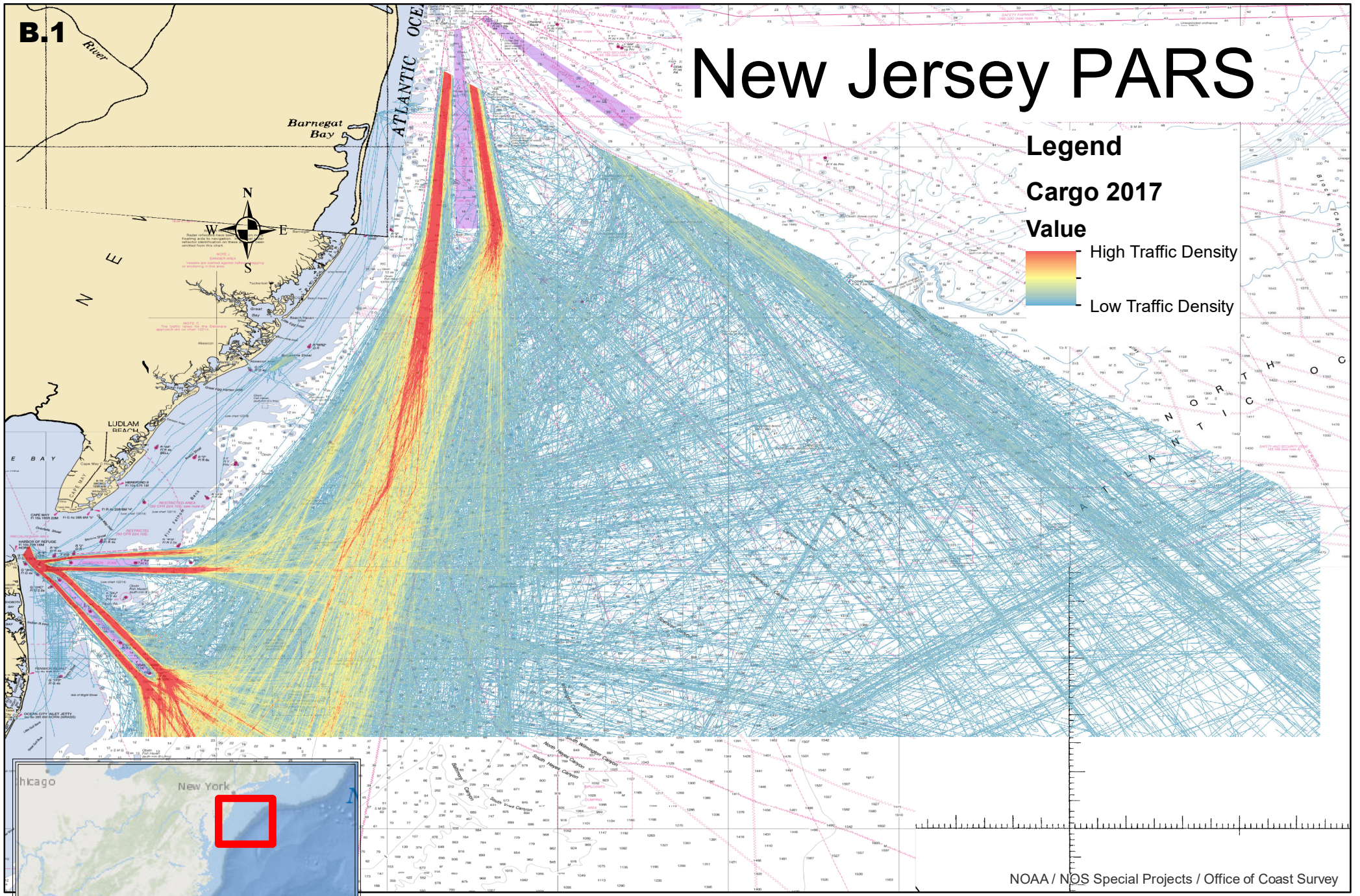

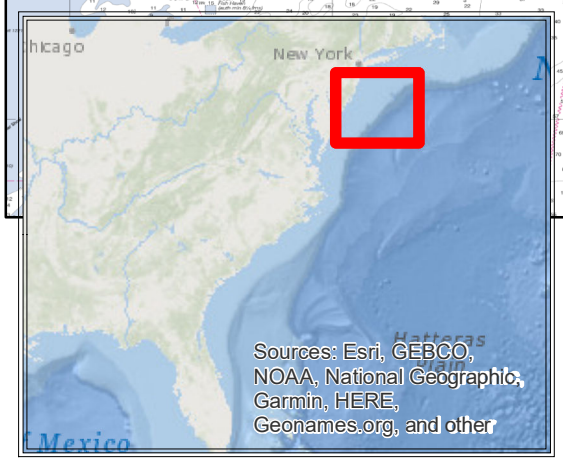

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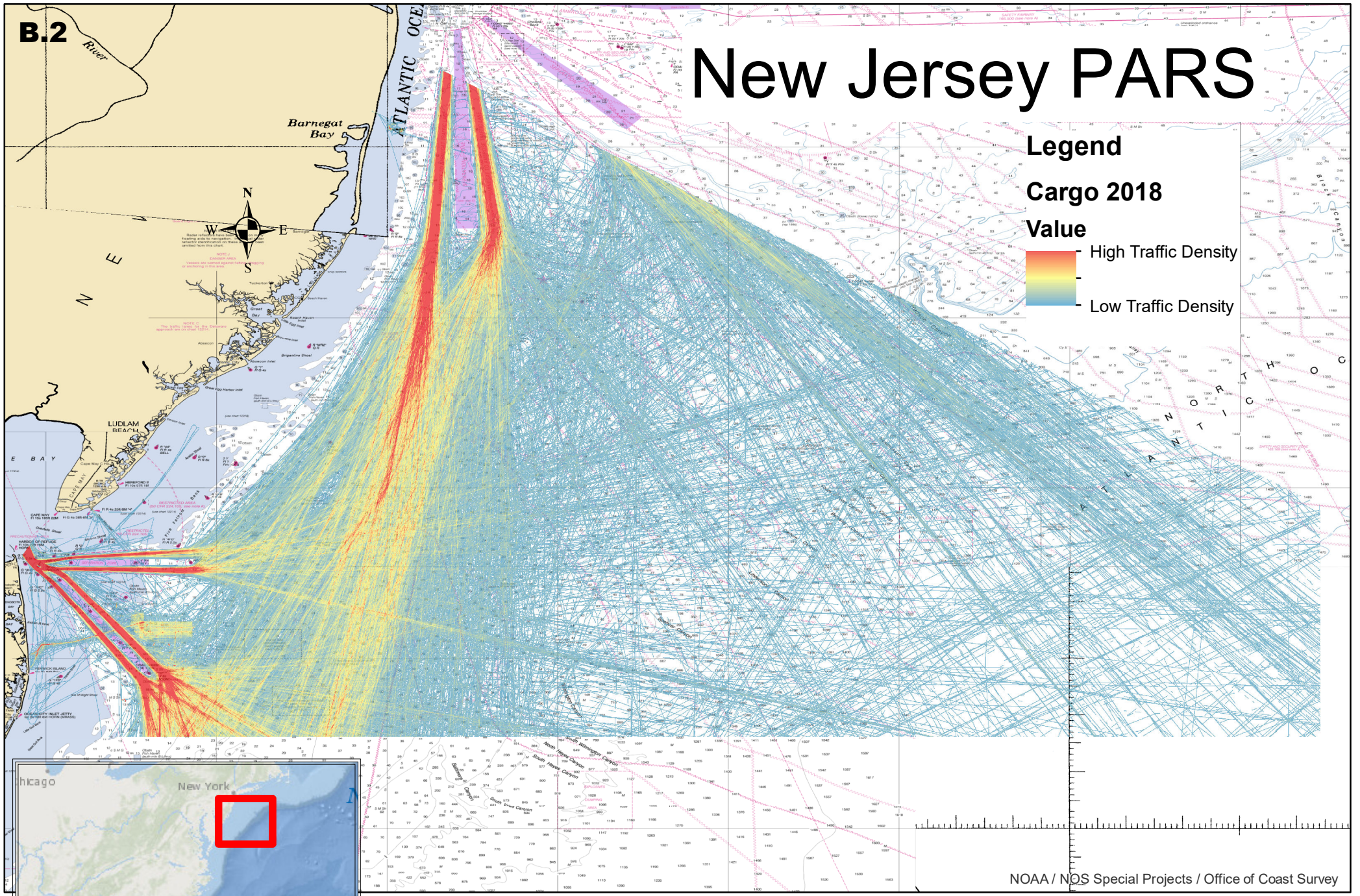

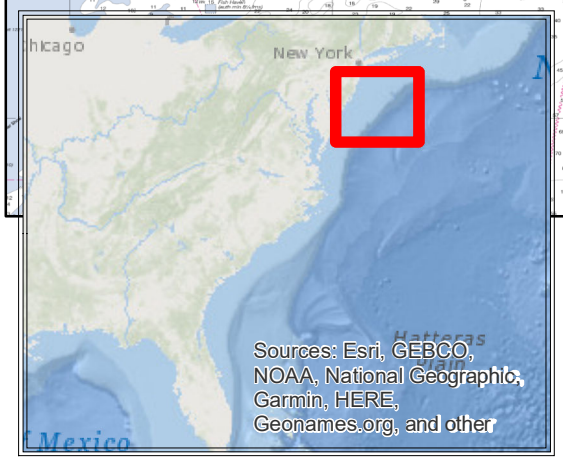

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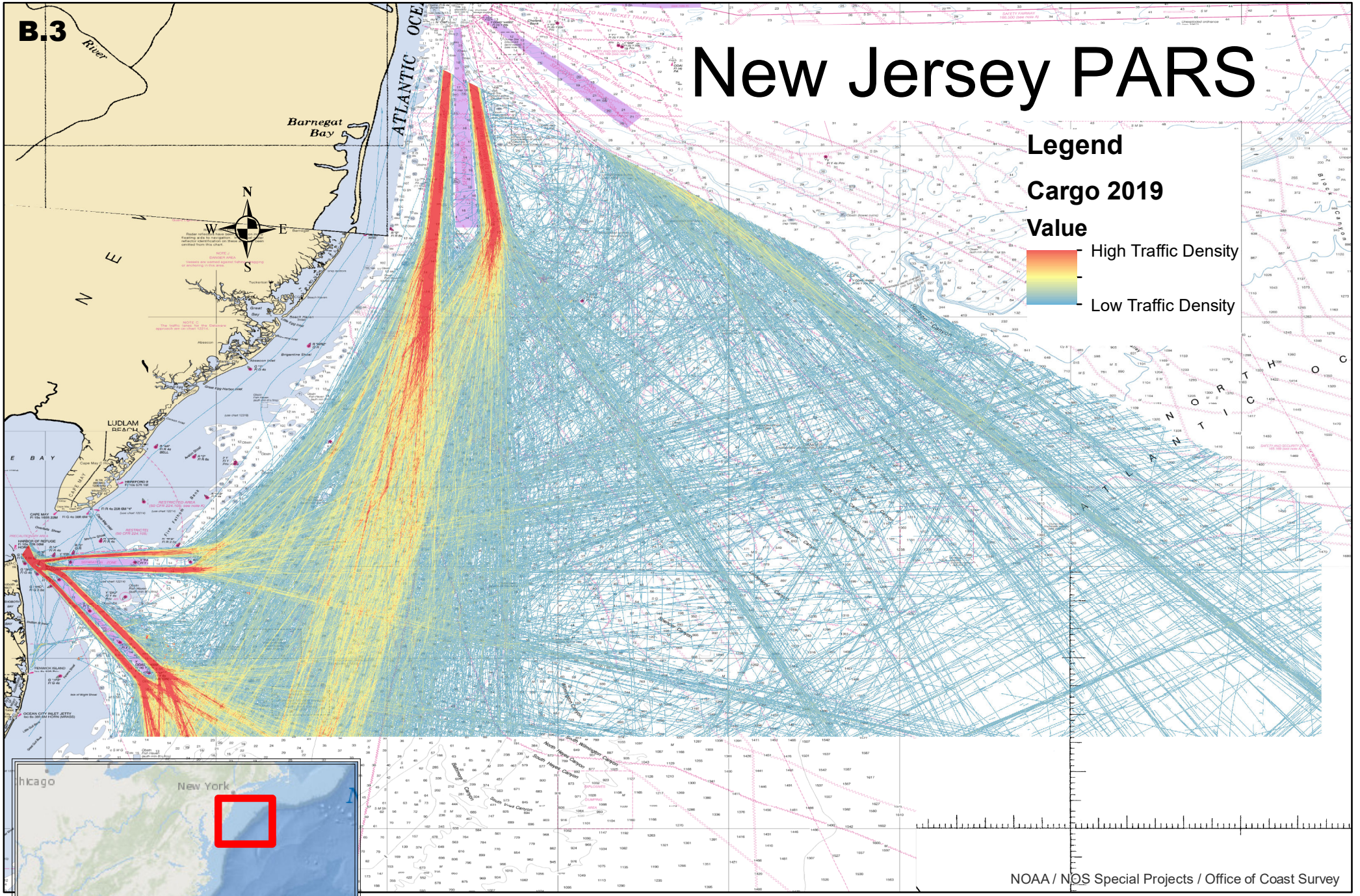

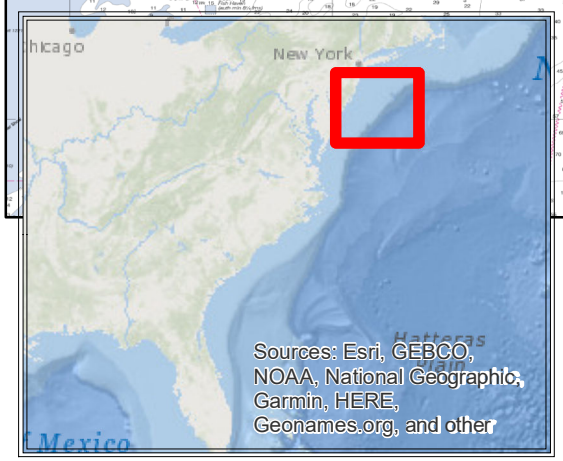

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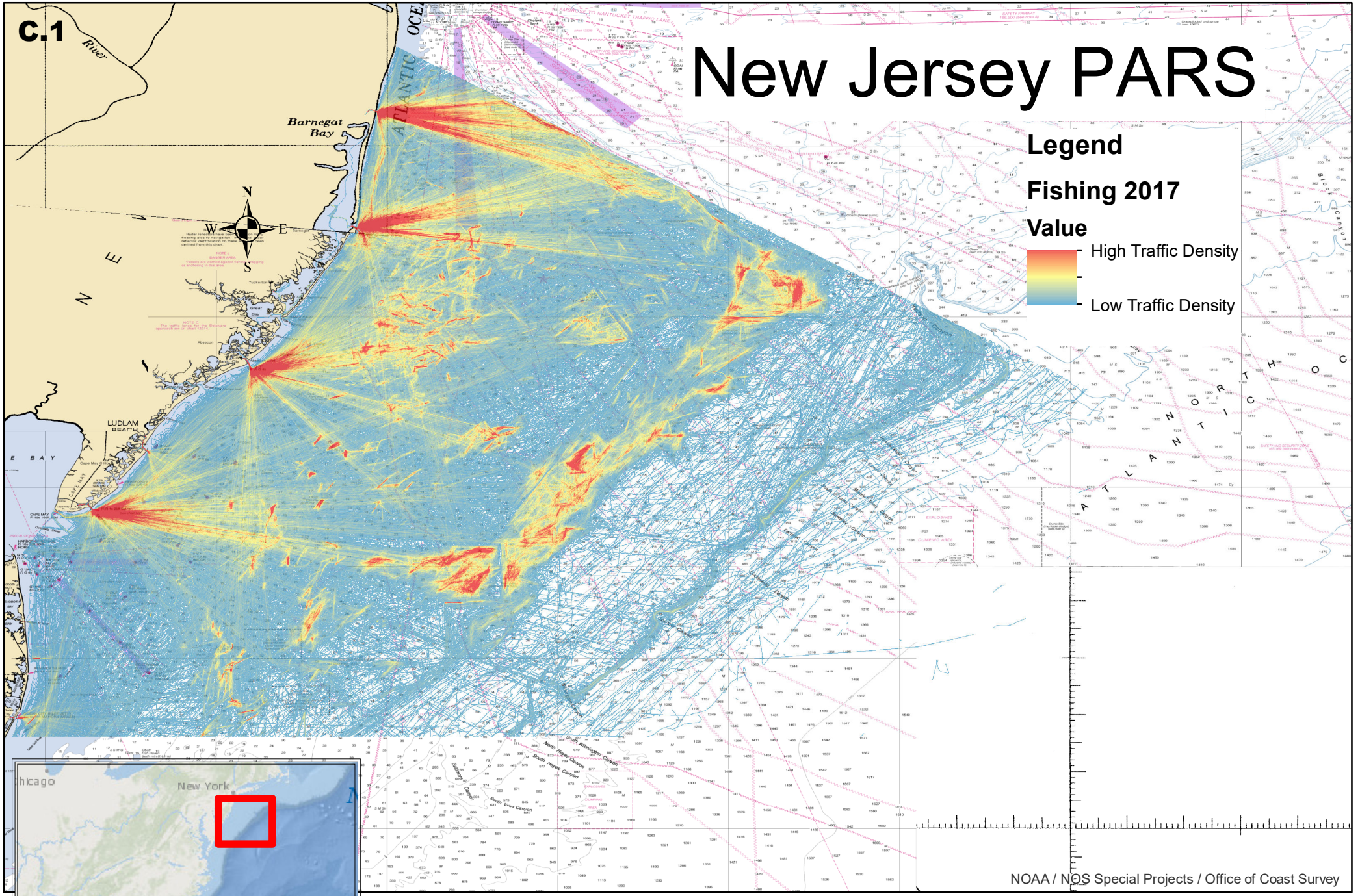

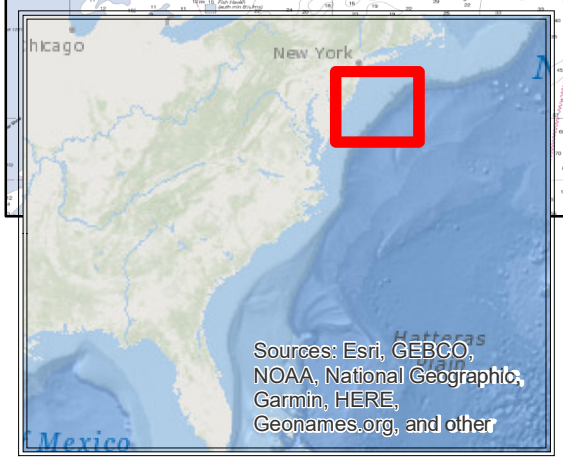

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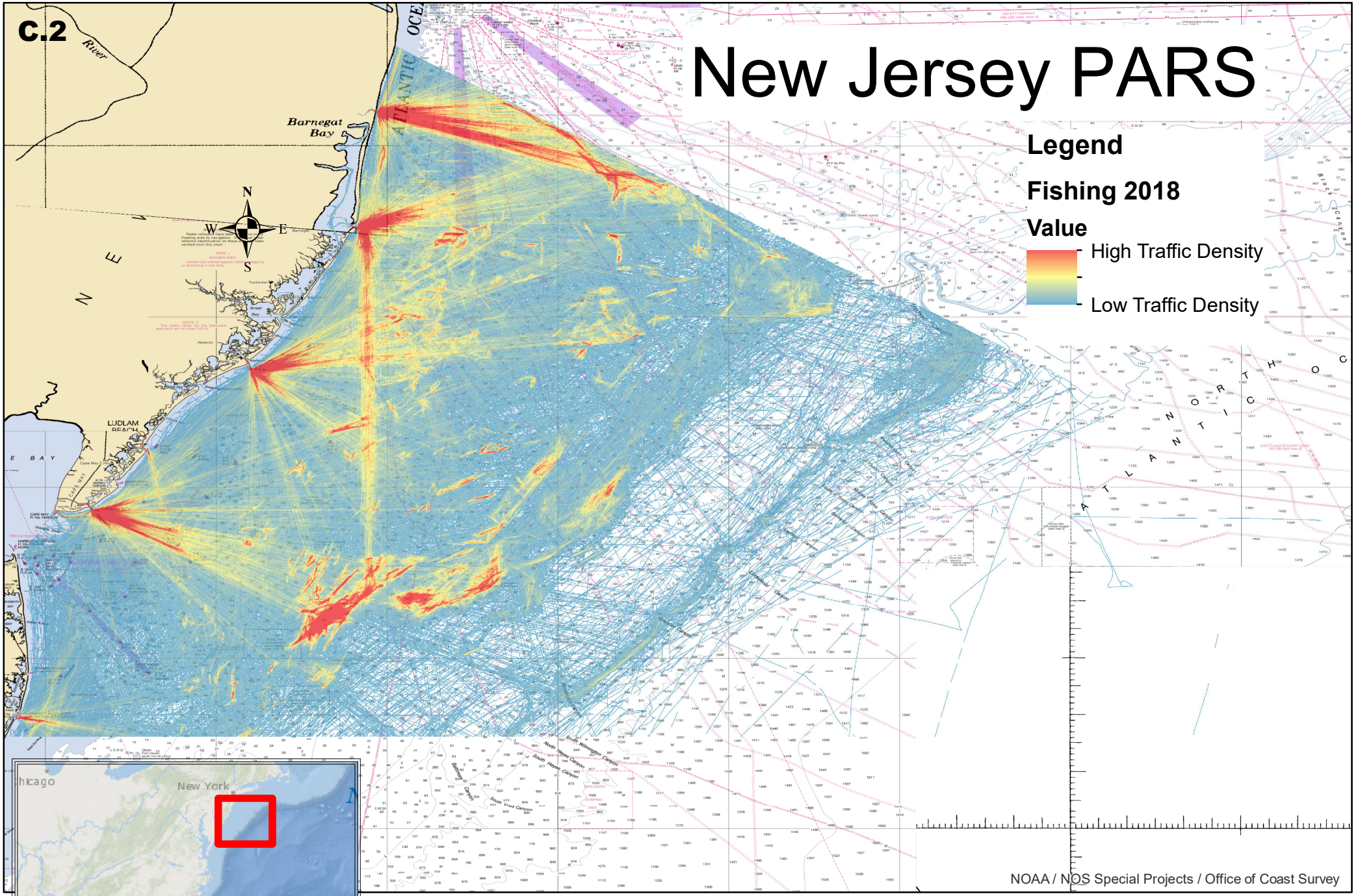

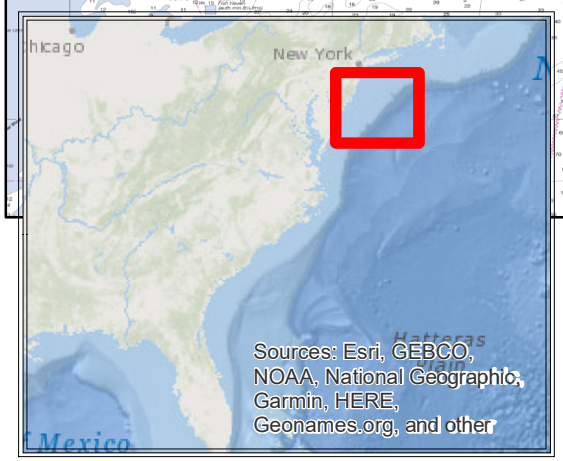

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Nautical Miles

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Datum: WGS 1984

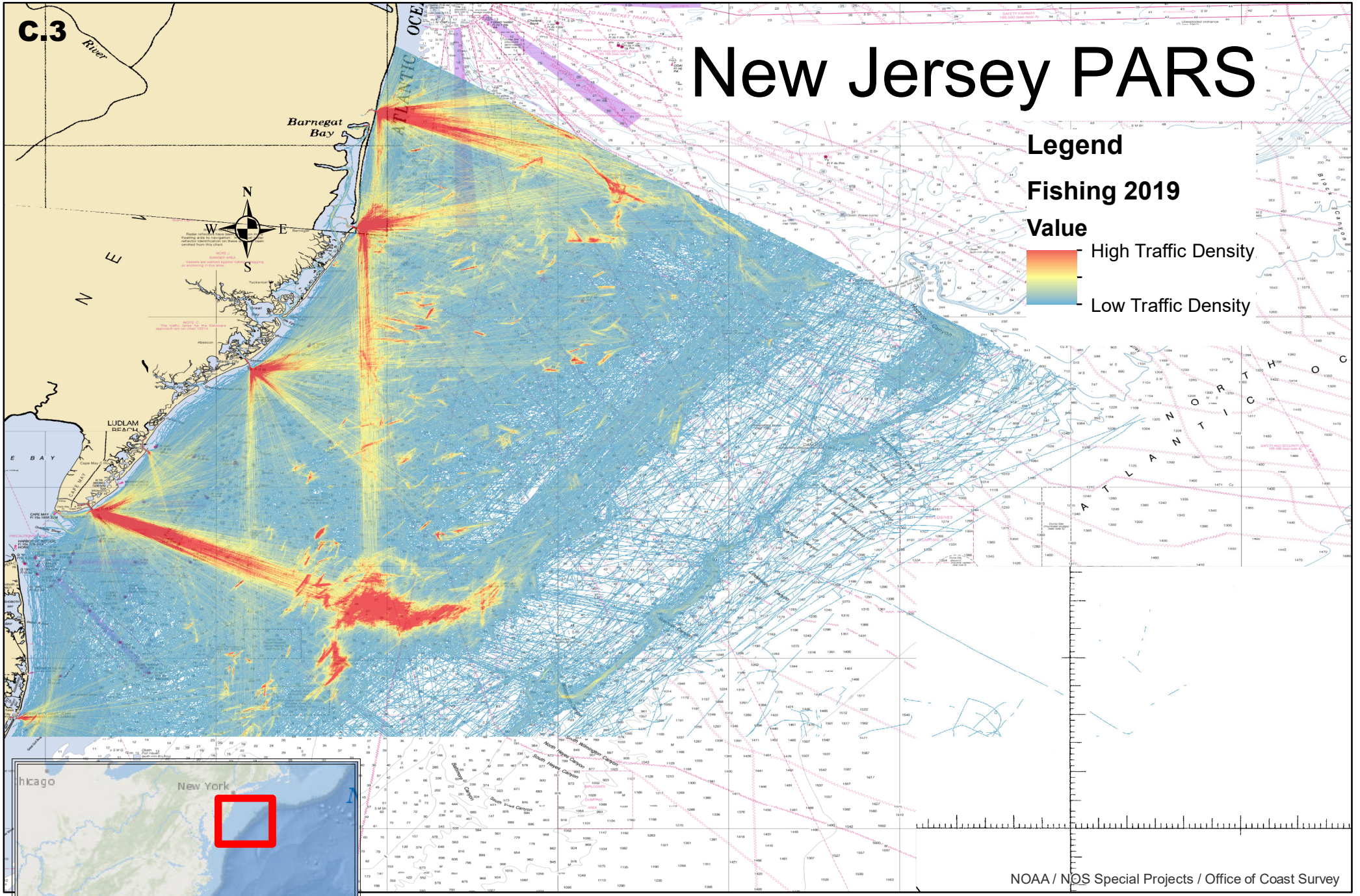
Units: Degree

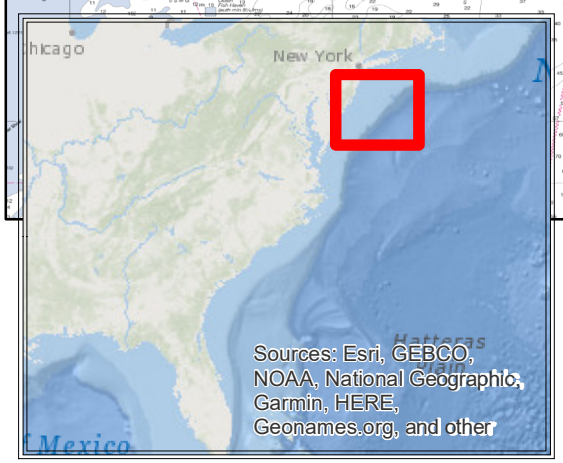
Data Source: NAIS

Prepared by CG NAVCEN

C.3

New Jersey PARS





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Nautical Miles

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Datum: WGS 1984

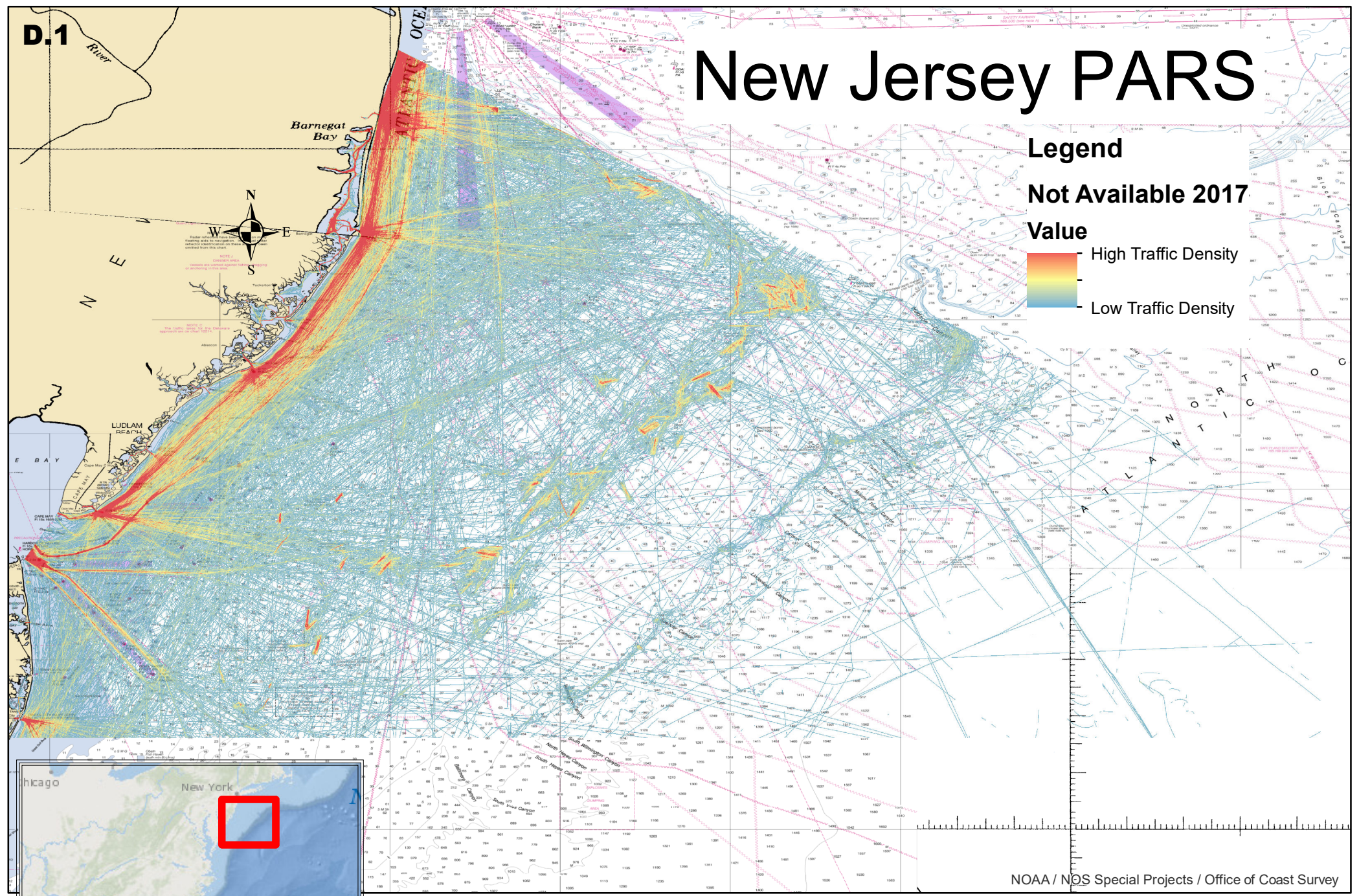
Units: Degree

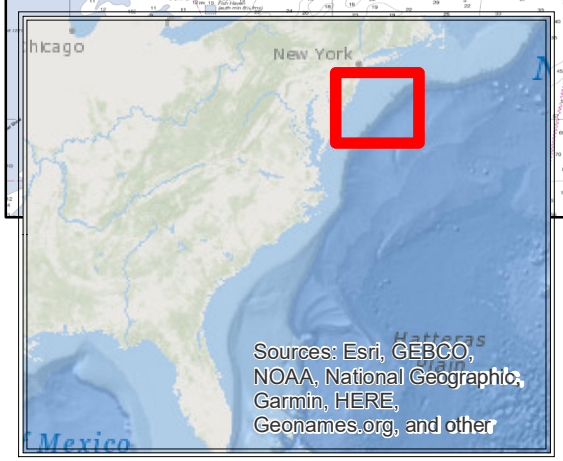
Data Source: NAIS

Prepared by CG NAVCEN

D.1

New Jersey PARS





0 5 10 20 30 40

Nautical Miles

1:1,600,000

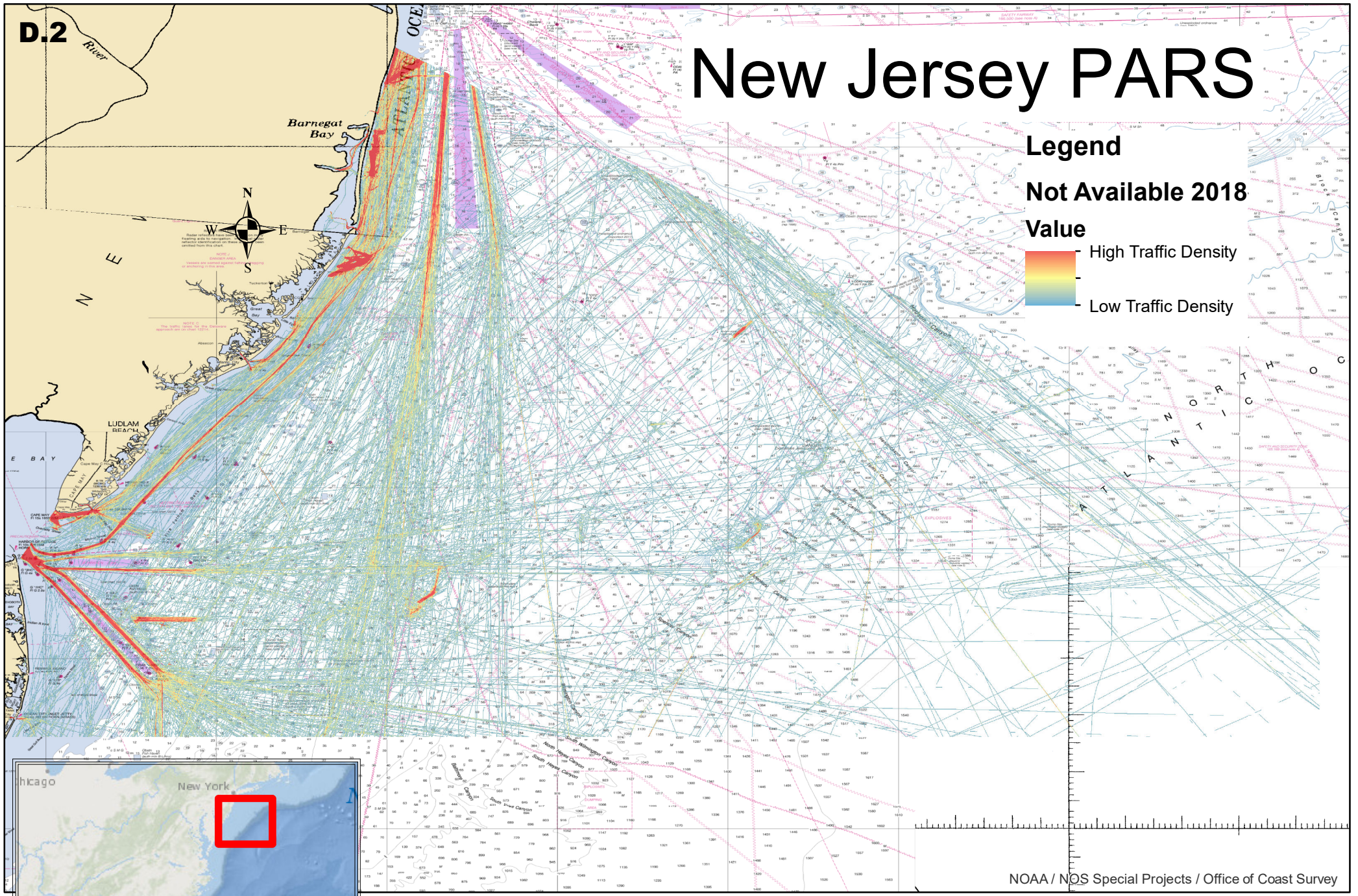
Coordinate System: GCS WGS 1984

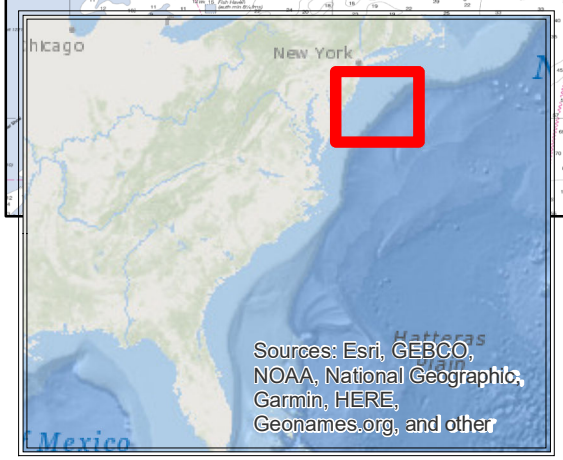
Datum: WGS 1984

Units: Degree

Data Source: NAIS

Prepared by CG NAVCEN





0 5 10 20 30 40

Nautical Miles

1:1,600,000

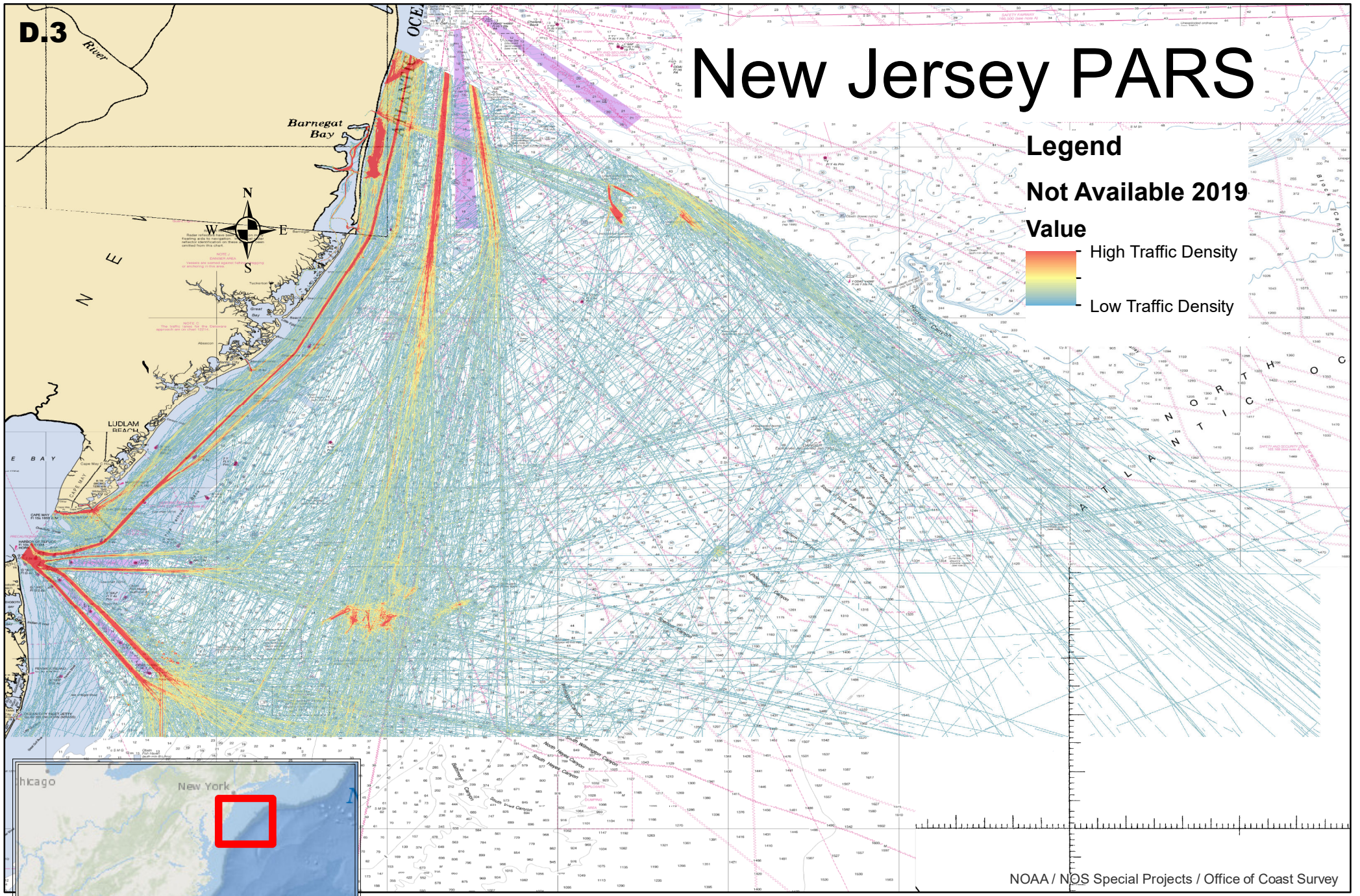
Coordinate System: GCS WGS 1984

Datum: WGS 1984

Units: Degree

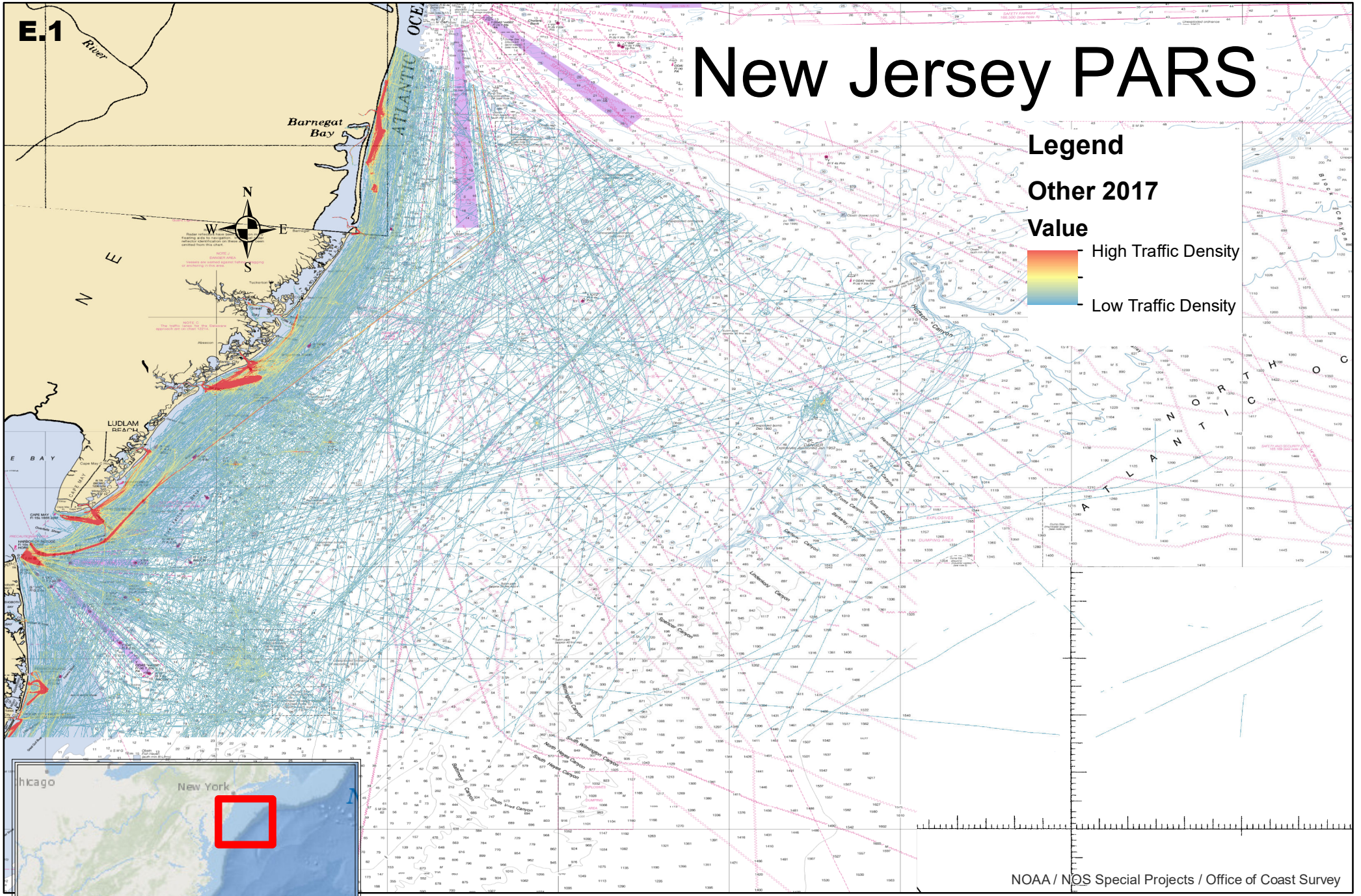
Data Source: NAIS

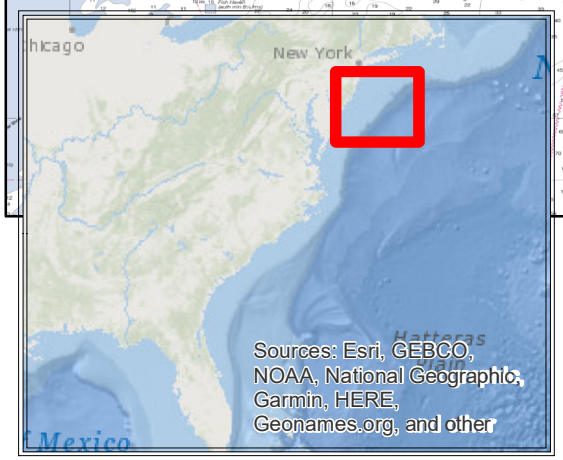
Prepared by CG NAVCEN


D.3
New Jersey PARS
Legend
Not Available 2019
Value
High Traffic Density
Low Traffic Density
Barnegat Bay
LUDLAM BEACH
NOAA / NOS Special Projects / Office of Coast Survey
New York
Sources: Esri, GEBCO, NOAA, National Geographic, Garmin, HERE, Geonames.org, and other
0 5 10 20 30 40
Nautical Miles
1:1,600,000
Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NAIS
Prepared by CG NAVCEN

E.1

New Jersey PARS



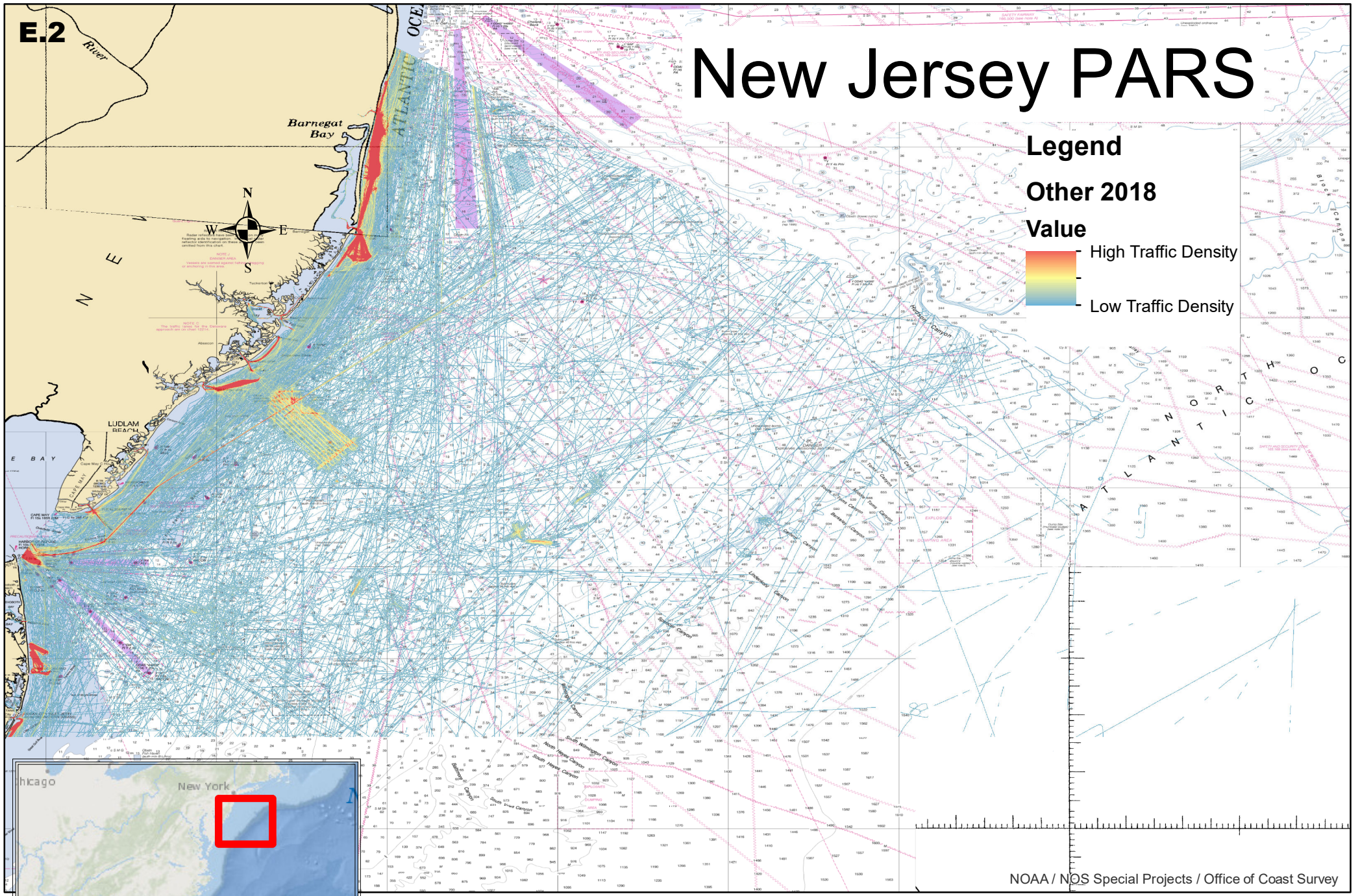


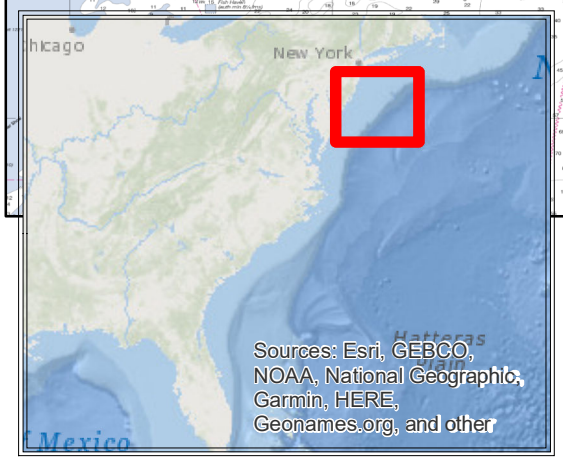
0 5 10 20 30 40

Nautical Miles

1:1,600,000

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NAIS
Prepared by CG NAVCEN





0 5 10 20 30 40

Nautical Miles

1:1,600,000

Coordinate System: GCS WGS 1984

Datum: WGS 1984

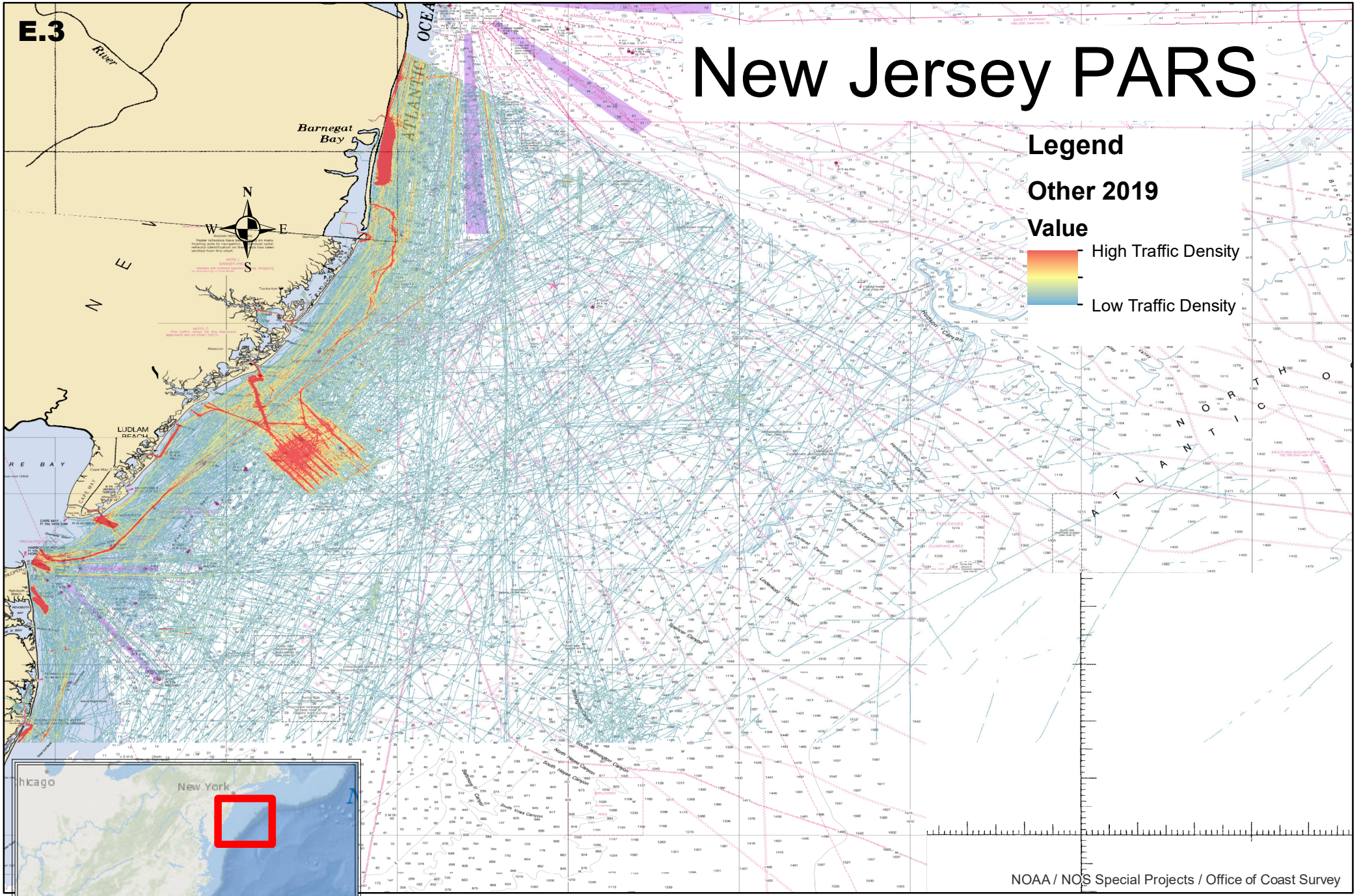
Units: Degree

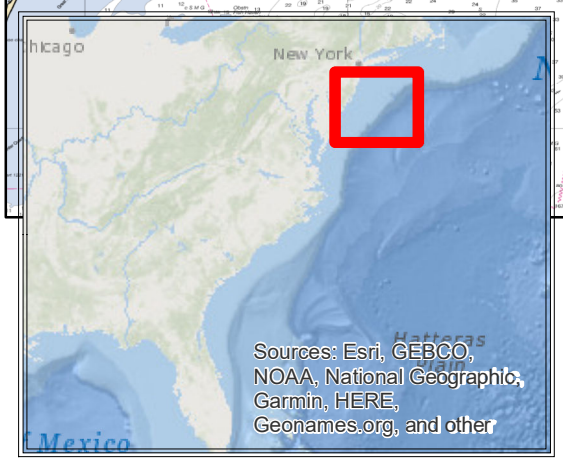
Data Source: NAIS

Prepared by CG NAVCEN

E.3

New Jersey PARS





0 5 10 20 30 40

Nautical Miles

1:1,600,000

Coordinate System: GCS WGS 1984

Datum: WGS 1984

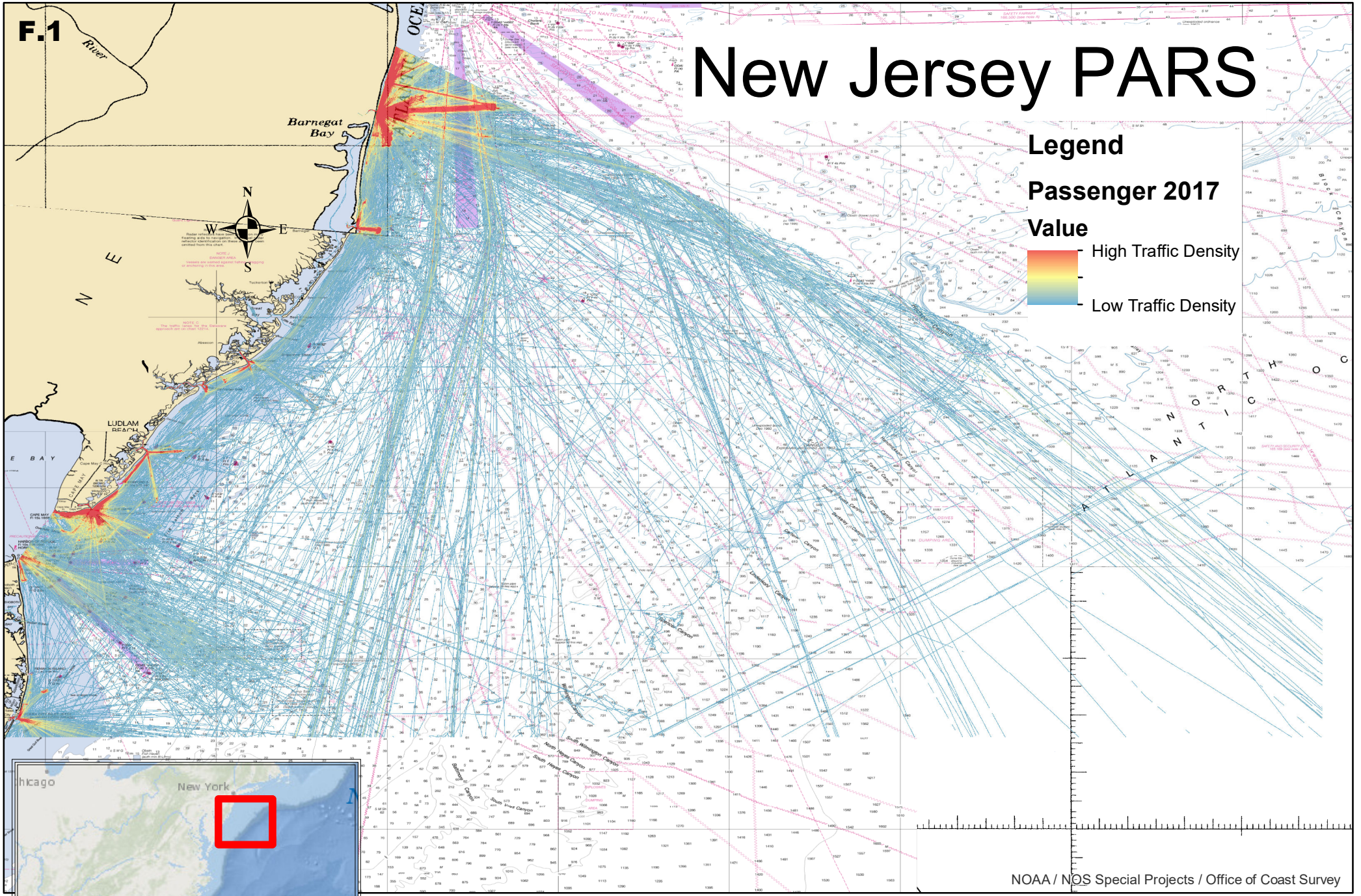
Units: Degree

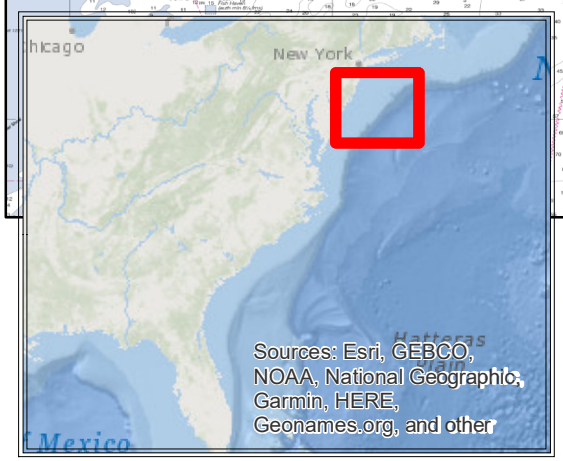
Data Source: NAIS

Prepared by CG NAVCEN

F.1

New Jersey PARS





0 5 10 20 30 40

Nautical Miles

1:1,600,000

Coordinate System: GCS WGS 1984

Datum: WGS 1984

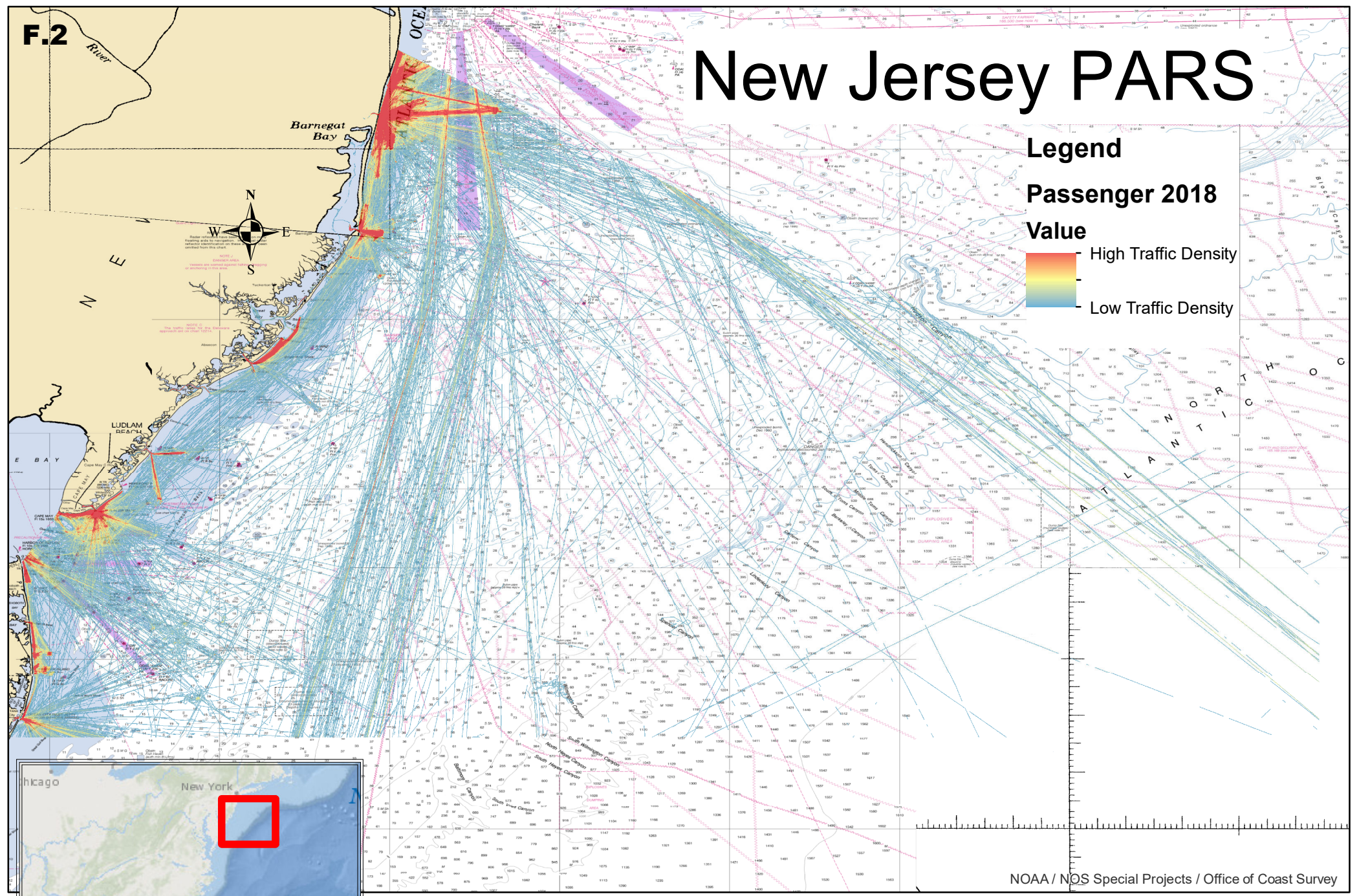
Units: Degree

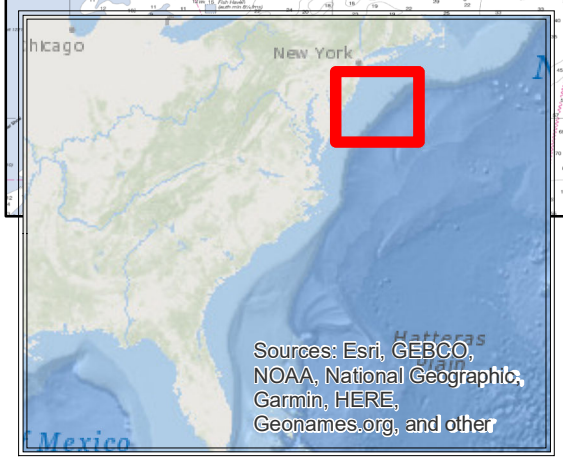
Data Source: NAIS

Prepared by CG NAVCEN

F.2

New Jersey PARS





0 5 10 20 30 40

Nautical Miles

1:1,600,000

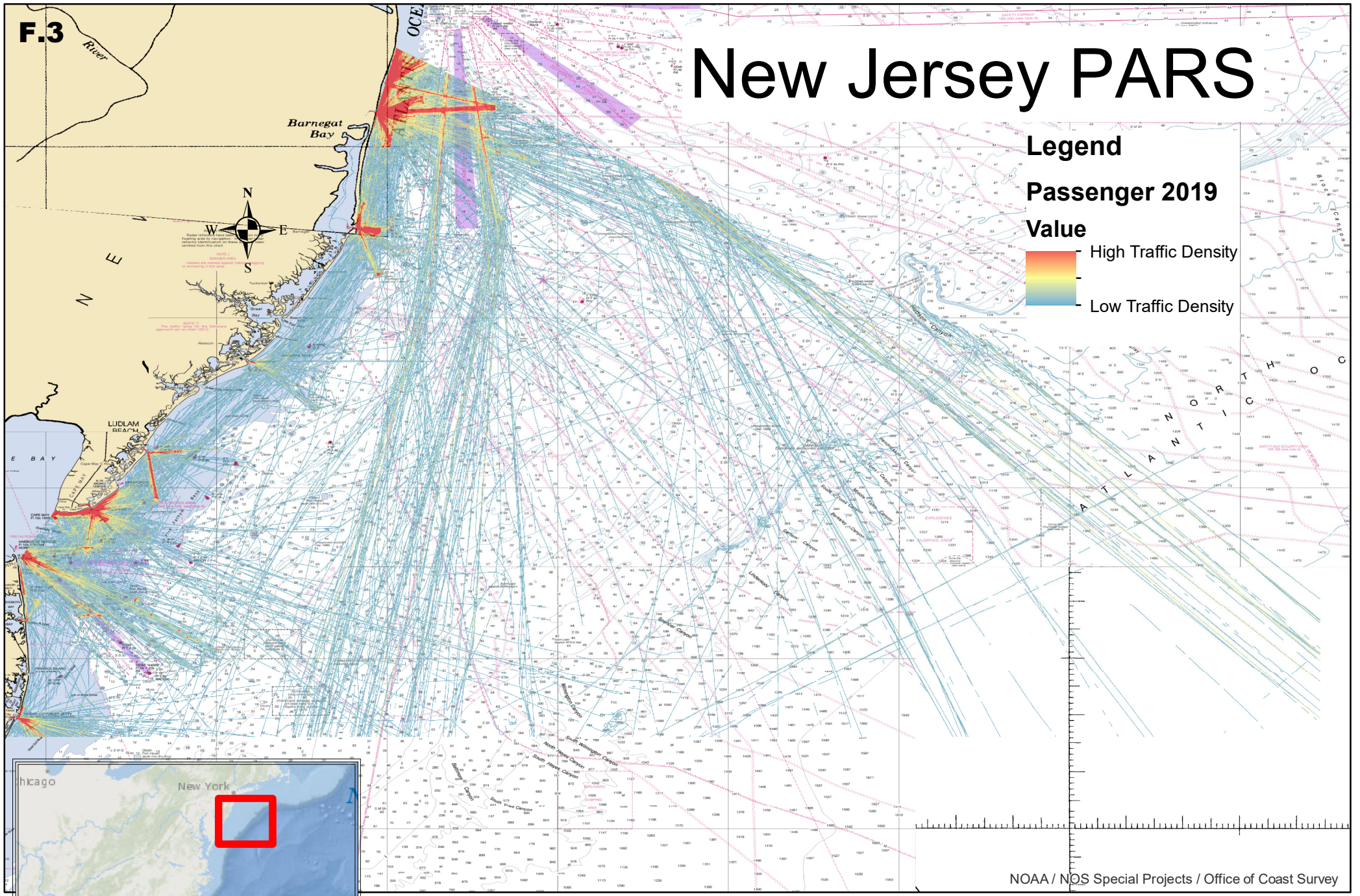
Coordinate System: GCS WGS 1984

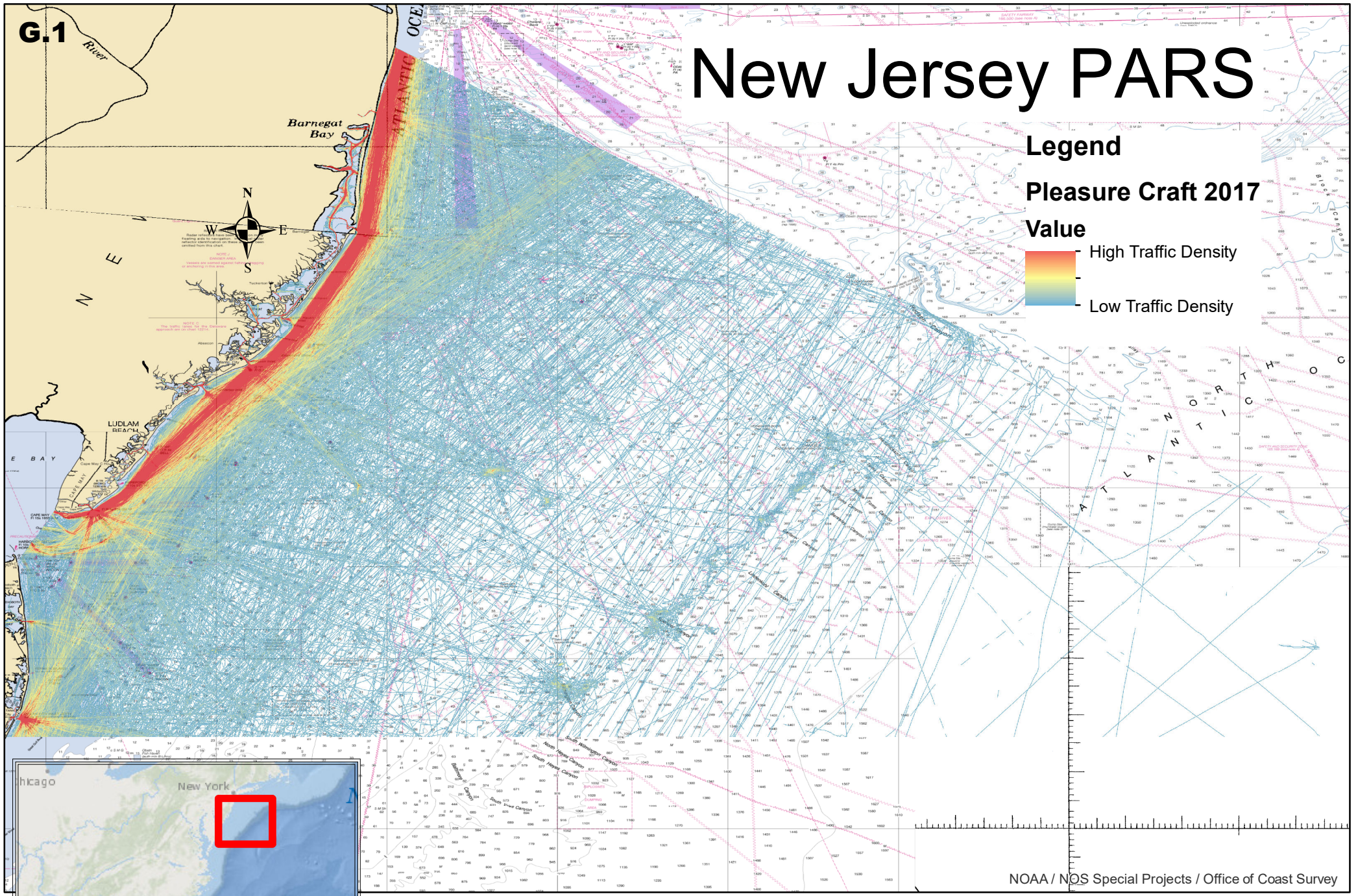
Datum: WGS 1984

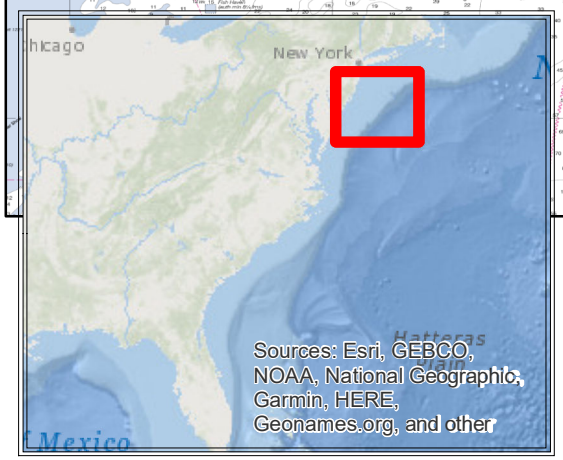
Units: Degree

Data Source: NAIS

Prepared by CG NAVCEN


F.3
New Jersey PARS
Legend
Passenger 2019
Value
High Traffic Density
Low Traffic Density
Barnegat Bay
LUDLAM BEACH
NORTH ATLANTIC OCEAN
New York
Sources: Esri, GEBCO, NOAA, National Geographic, Garmin, HERE, Geonames.org, and other
NOAA / NOS Special Projects / Office of Coast Survey
0 5 10 20 30 40
Nautical Miles
1:1,600,000
Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NAIS
Prepared by CG NAVCEN





0 5 10 20 30 40

Nautical Miles

1:1,600,000

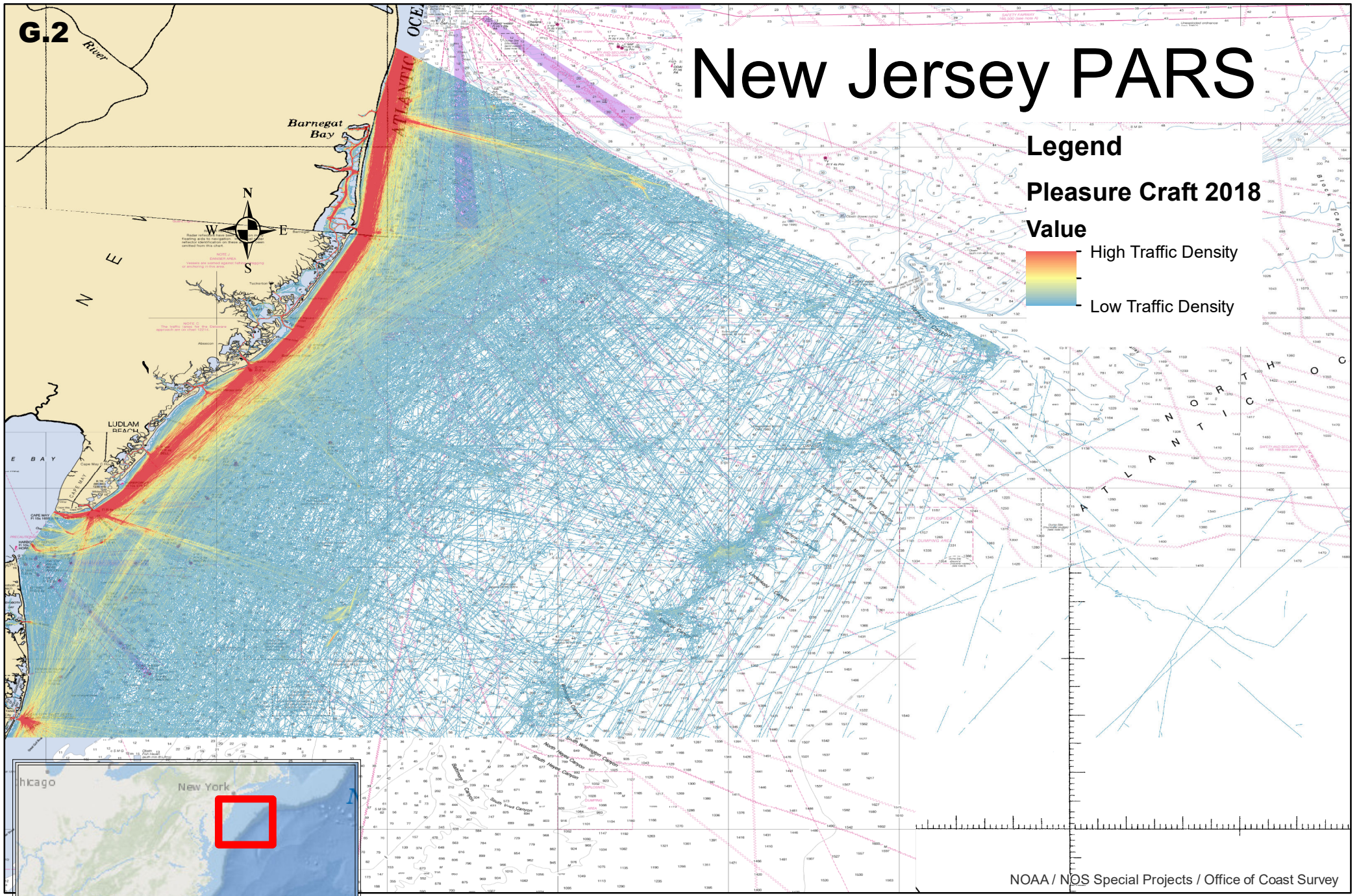
Coordinate System: GCS WGS 1984

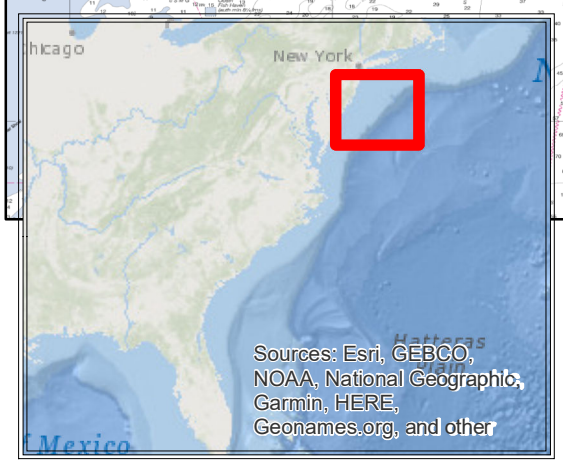
Datum: WGS 1984

Units: Degree

Data Source: NAIS

Prepared by CG NAVCEN





0 5 10 20 30 40

Nautical Miles

1:1,600,000

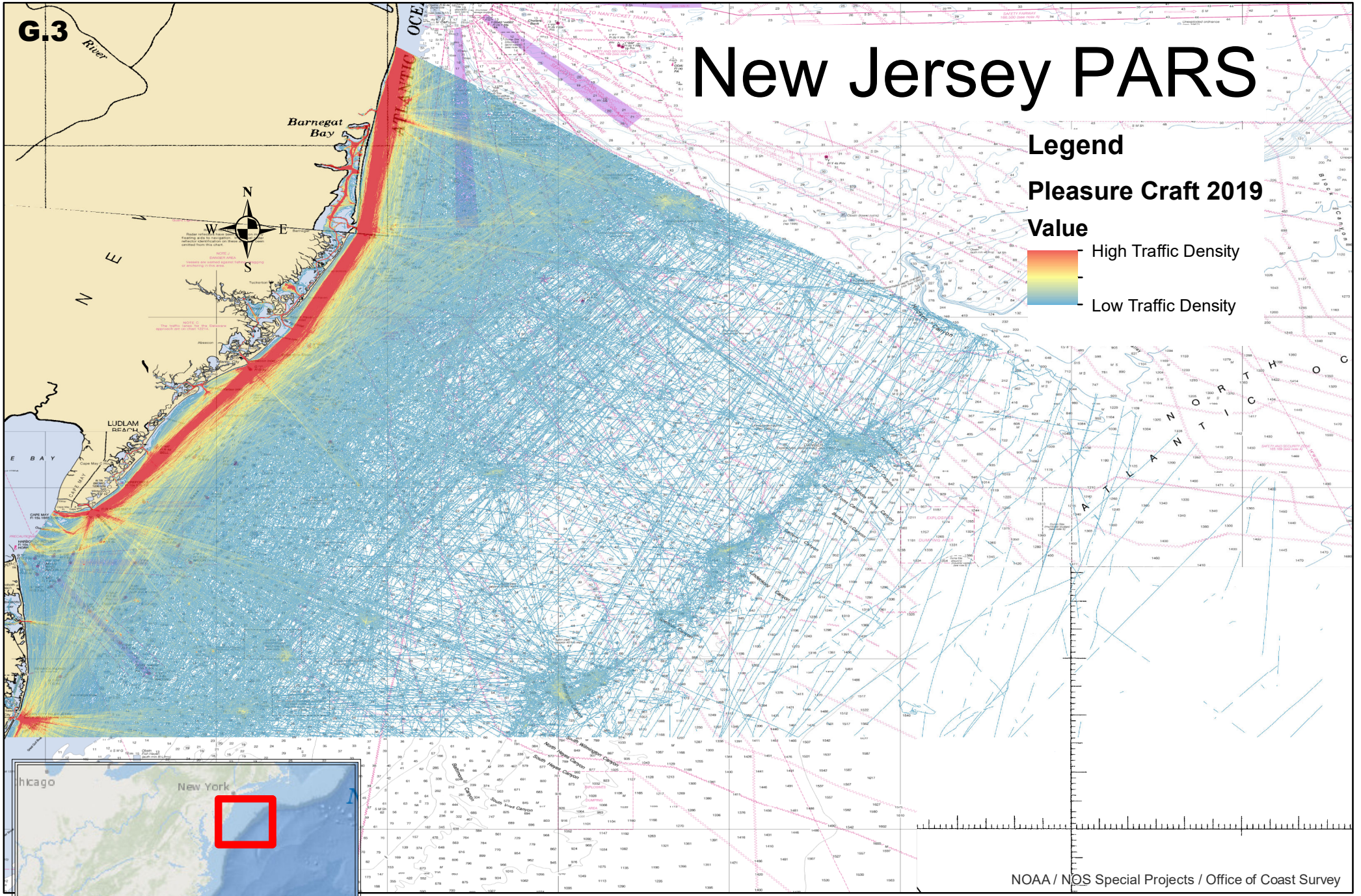
Coordinate System: GCS WGS 1984

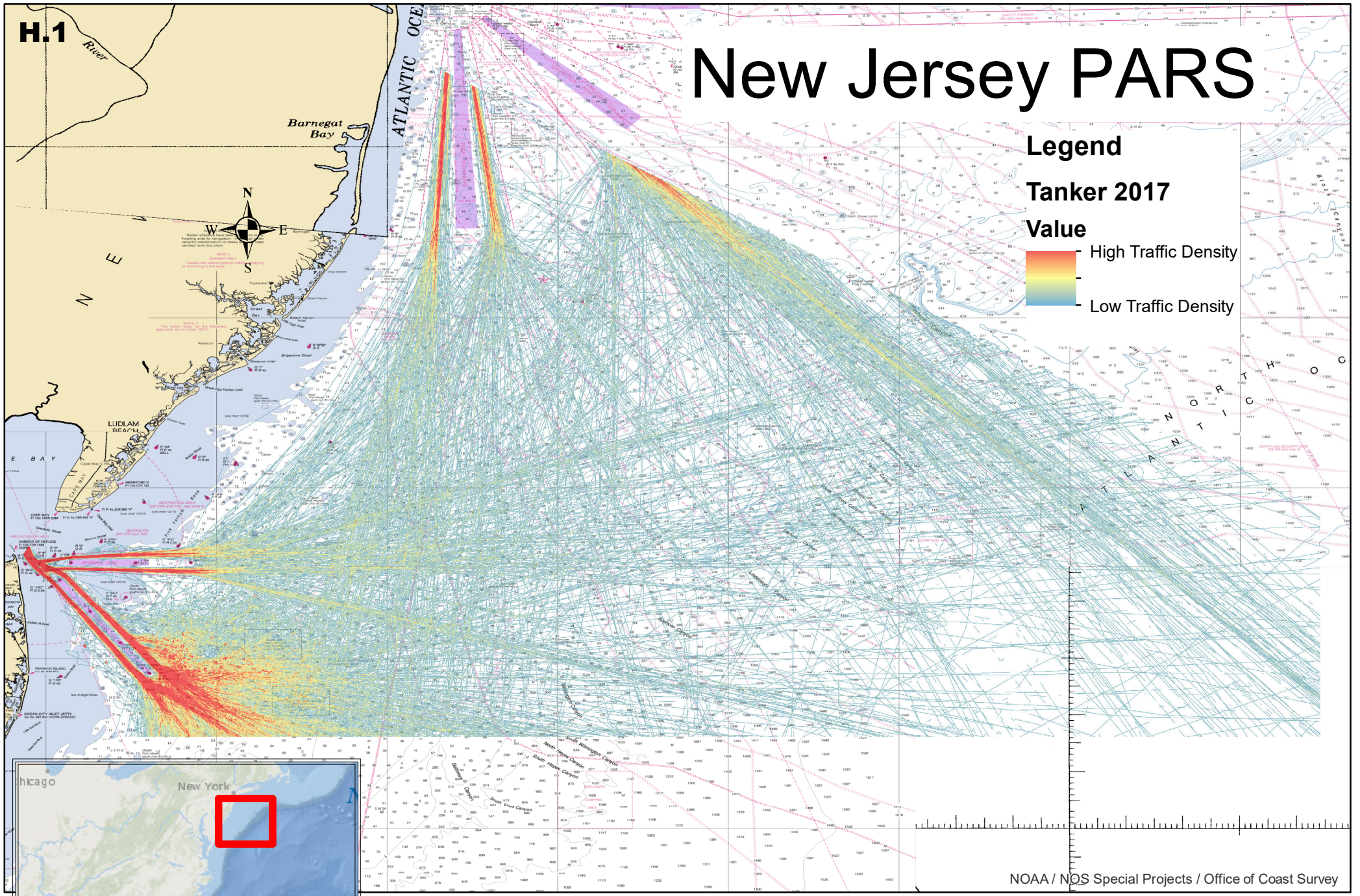
Datum: WGS 1984

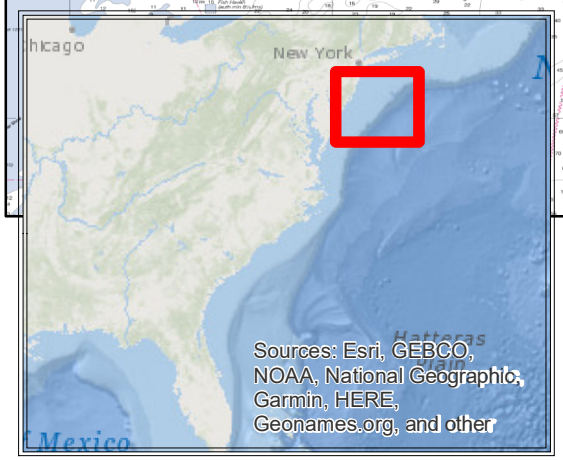
Units: Degree

Data Source: NAIS

Prepared by CG NAVCEN


G.3
New Jersey PARS
Legend
Pleasure Craft 2019
Value
High Traffic Density
Low Traffic Density
Barnegat Bay
LUDLAM BEACH
ATLANTIC
NORTH ATLANTIC OCEAN
NOAA / NOS Special Projects / Office of Coast Survey
New York
Sources: Esri, GEBCO, NOAA, National Geographic, Garmin, HERE, Geonames.org, and other
0 5 10 20 30 40
Nautical Miles
1:1,600,000
Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NAIS
Prepared by CG NAVCEN





0 5 10 20 30 40

Nautical Miles

1:1,600,000

Coordinate System: GCS WGS 1984

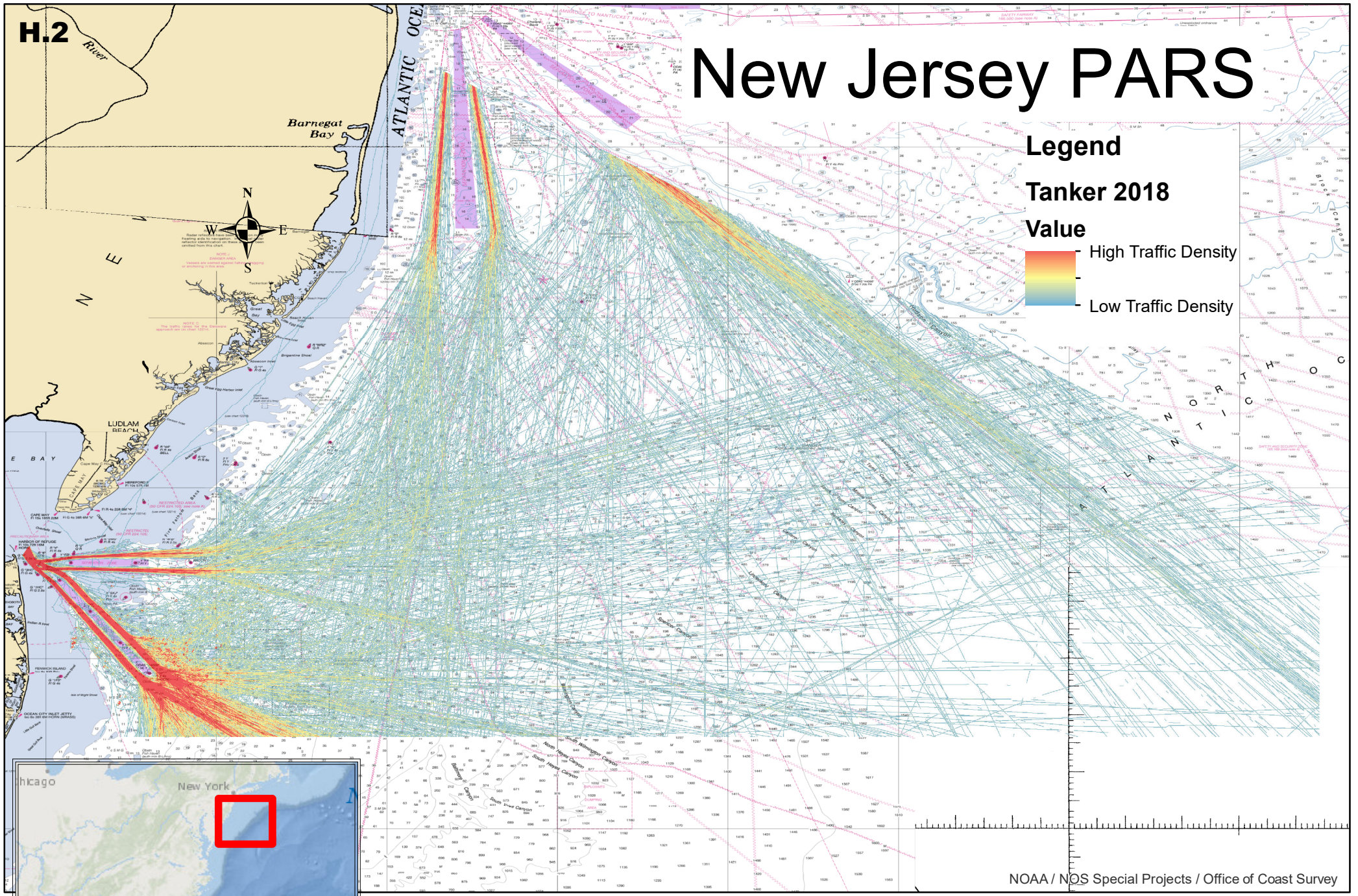
Datum: WGS 1984

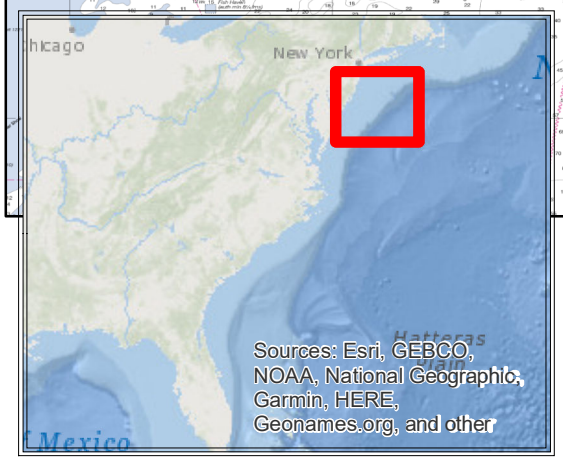
Units: Degree

Data Source: NAIS

Prepared by CG NAVCEN

New Jersey PARS





0 5 10 20 30 40

Nautical Miles

1:1,600,000

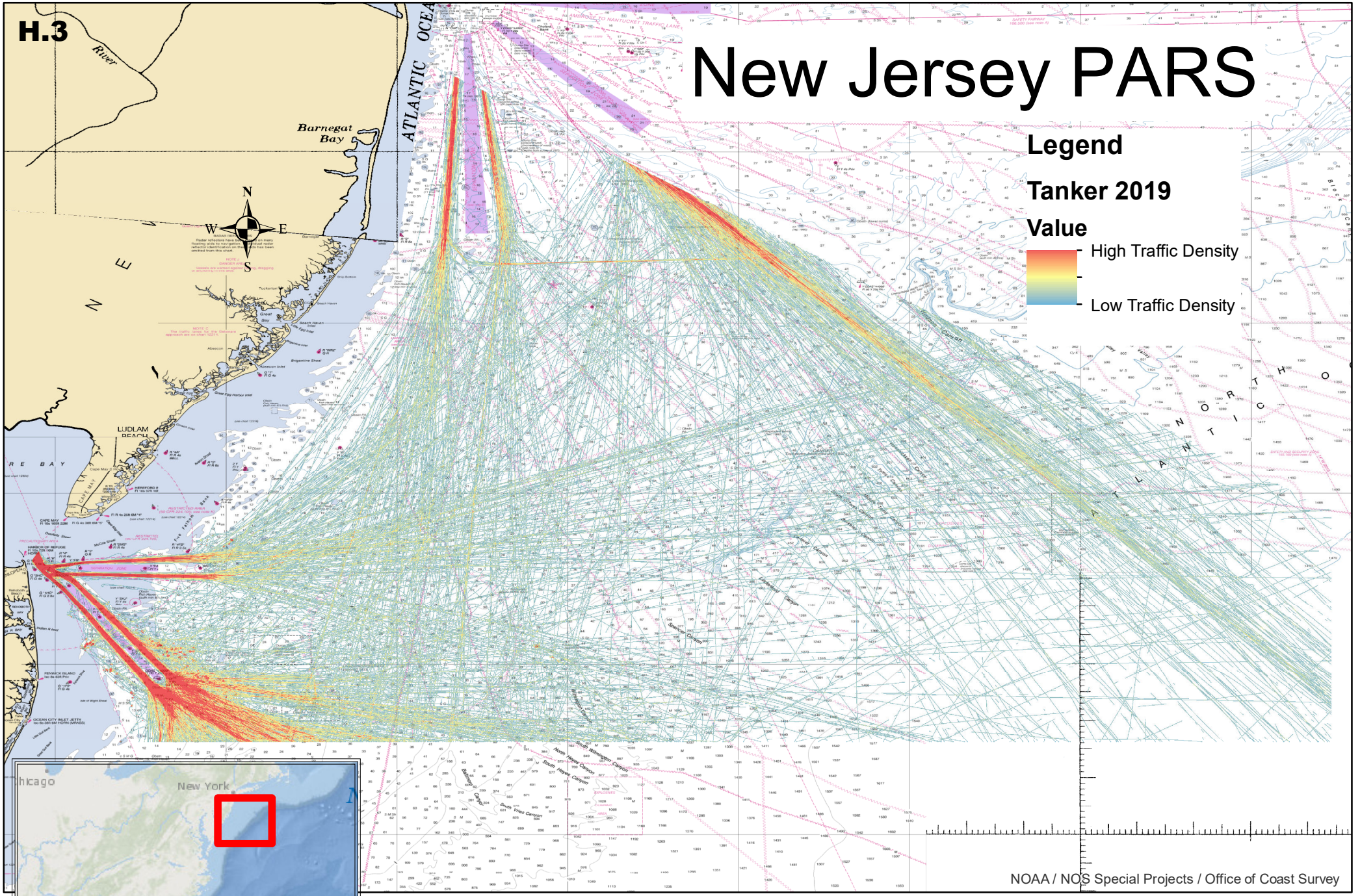
Coordinate System: GCS WGS 1984

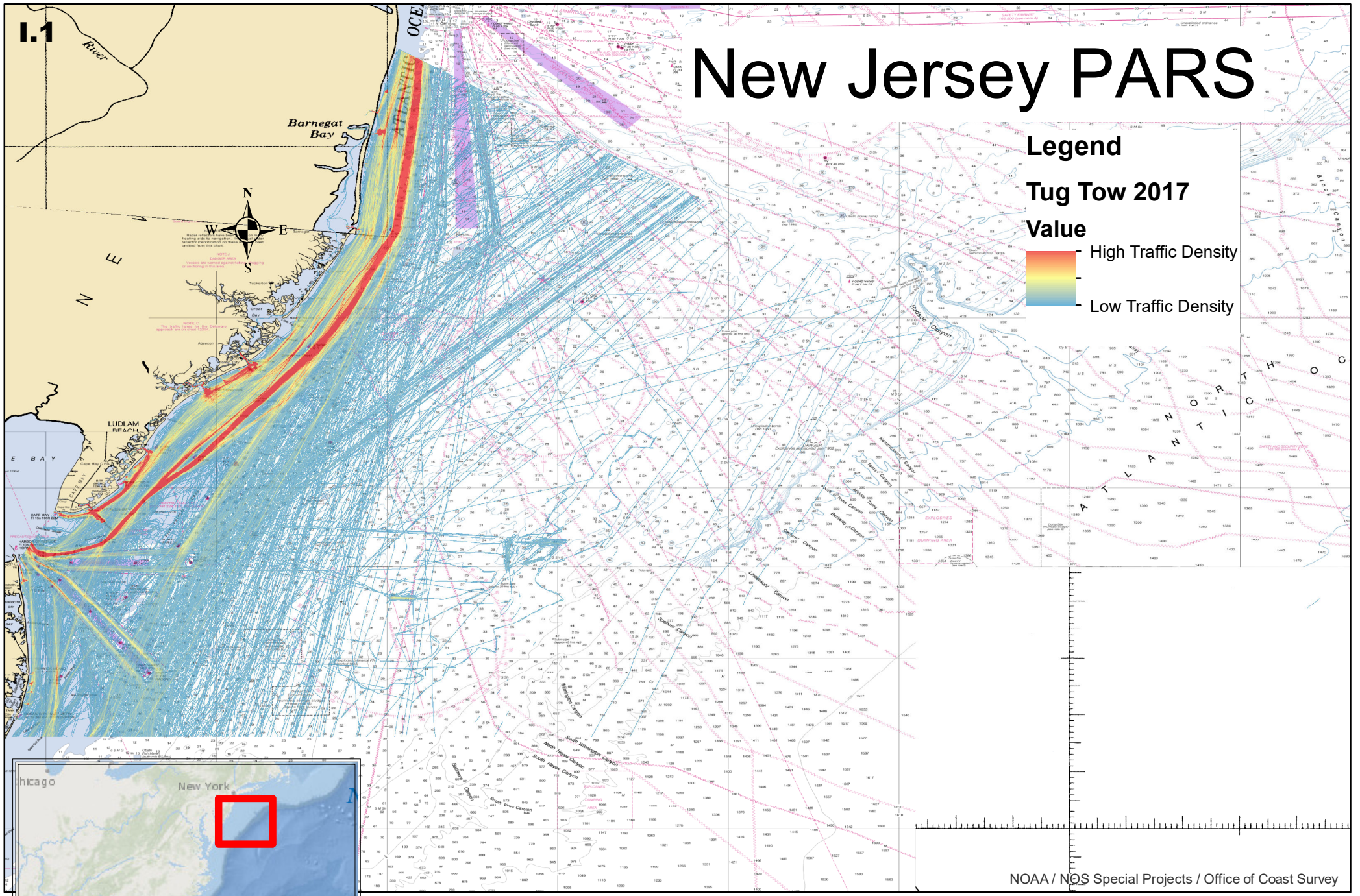
Datum: WGS 1984

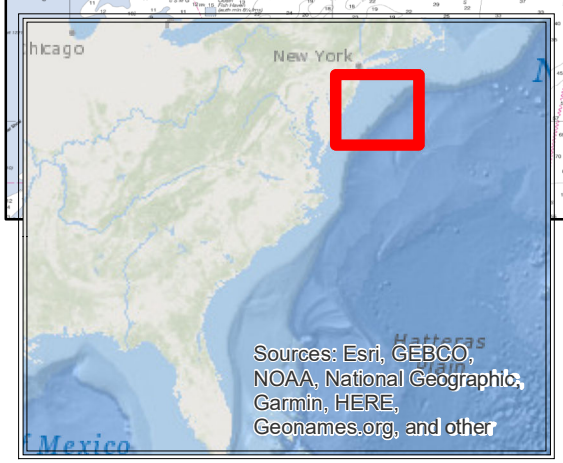
Units: Degree

Data Source: NAIS

Prepared by CG NAVCEN


H.3
New Jersey PARS
Legend
Tanker 2019
Value
High Traffic Density
Low Traffic Density
Barnegat Bay
ATLANTIC OCEAN
LUDLAM BEACH
NORTH ATLANTIC
NOAA / NOS Special Projects / Office of Coast Survey
New York
Sources: Esri, GEBCO, NOAA, National Geographic, Garmin, HERE, Geonames.org, and other
0 5 10 20 30 40
Nautical Miles
1:1,600,000
Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NAIS
Prepared by CG NAVCEN





0 5 10 20 30 40

Nautical Miles

1:1,600,000

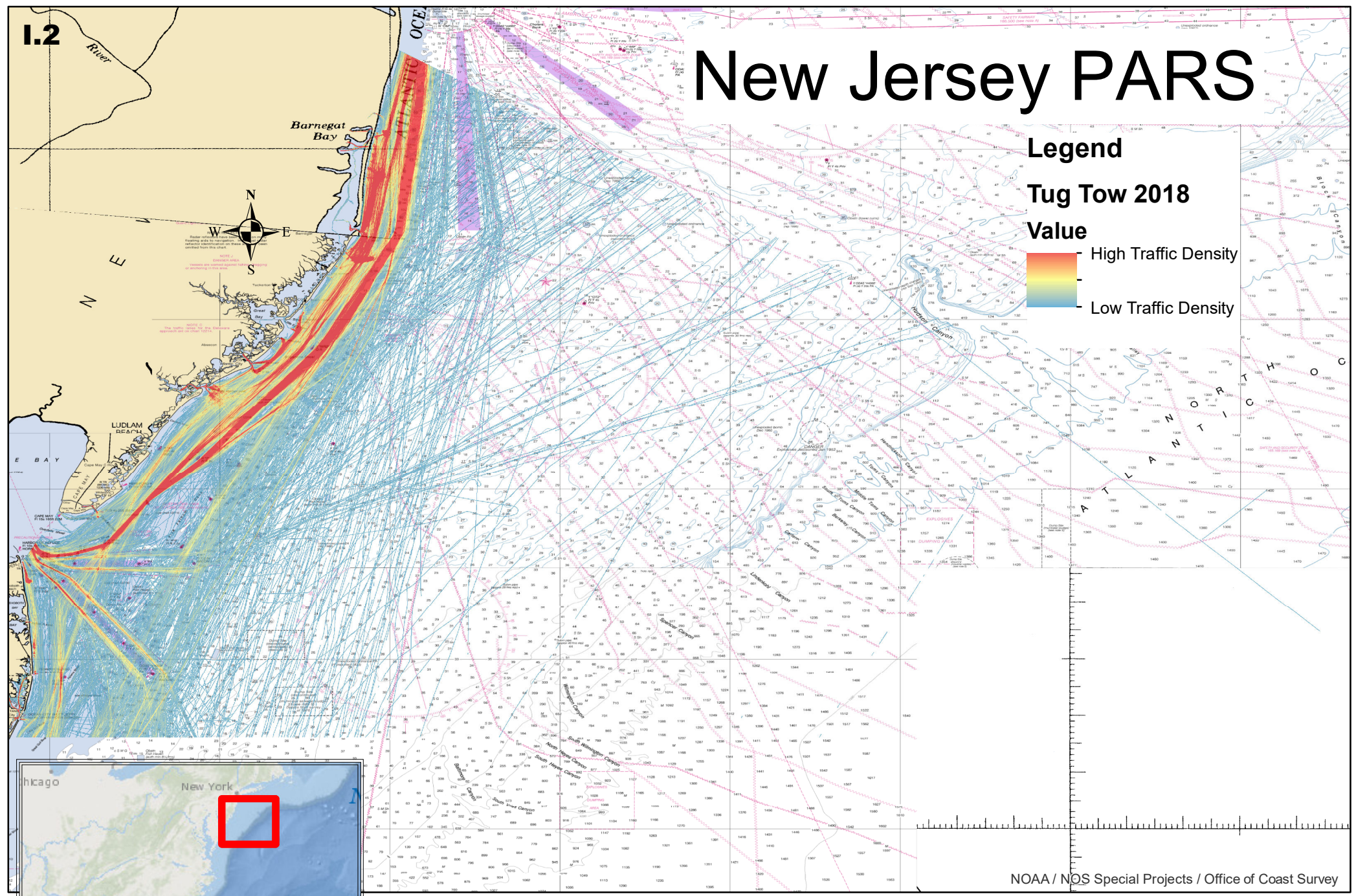
Coordinate System: GCS WGS 1984

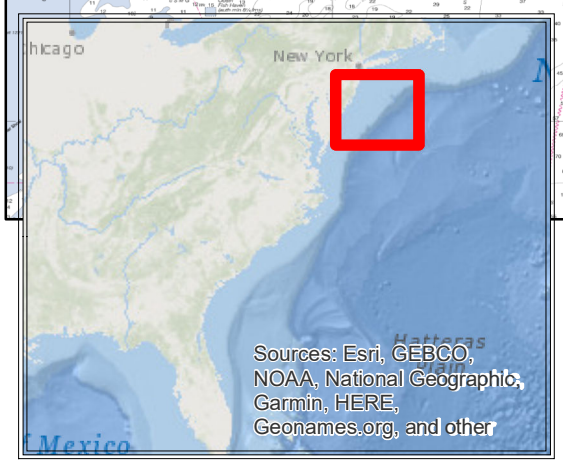
Datum: WGS 1984

Units: Degree

Data Source: NAIS

Prepared by CG NAVCEN





0 5 10 20 30 40

Nautical Miles

1:1,600,000

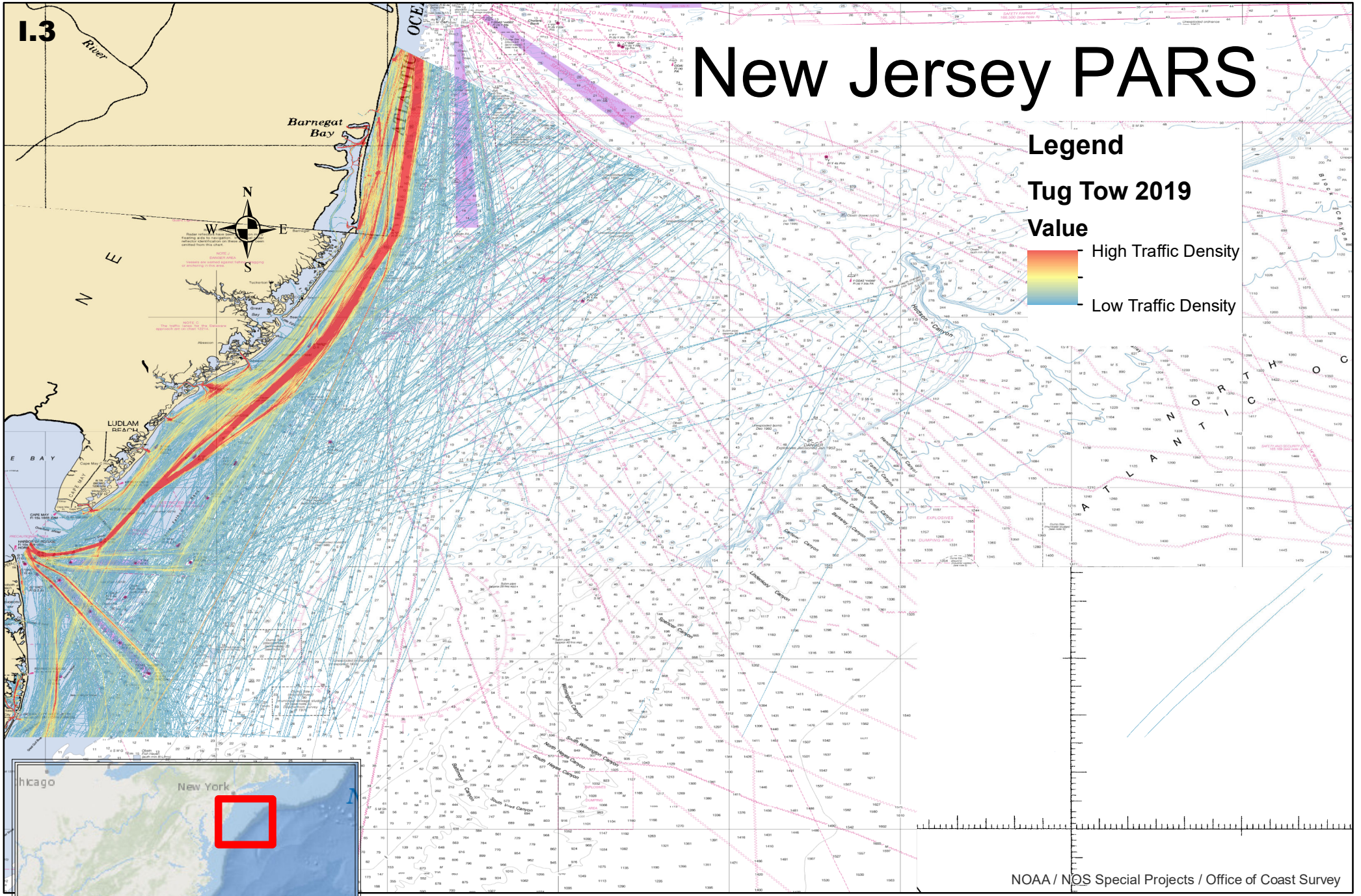
Coordinate System: GCS WGS 1984

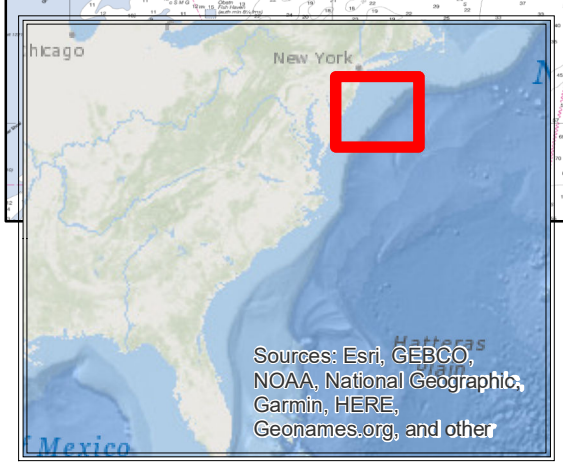
Datum: WGS 1984

Units: Degree

Data Source: NAIS

Prepared by CG NAVCEN





0 5 10 20 30 40

Nautical Miles

1:1,600,000

Coordinate System: GCS WGS 1984

Datum: WGS 1984

Units: Degree

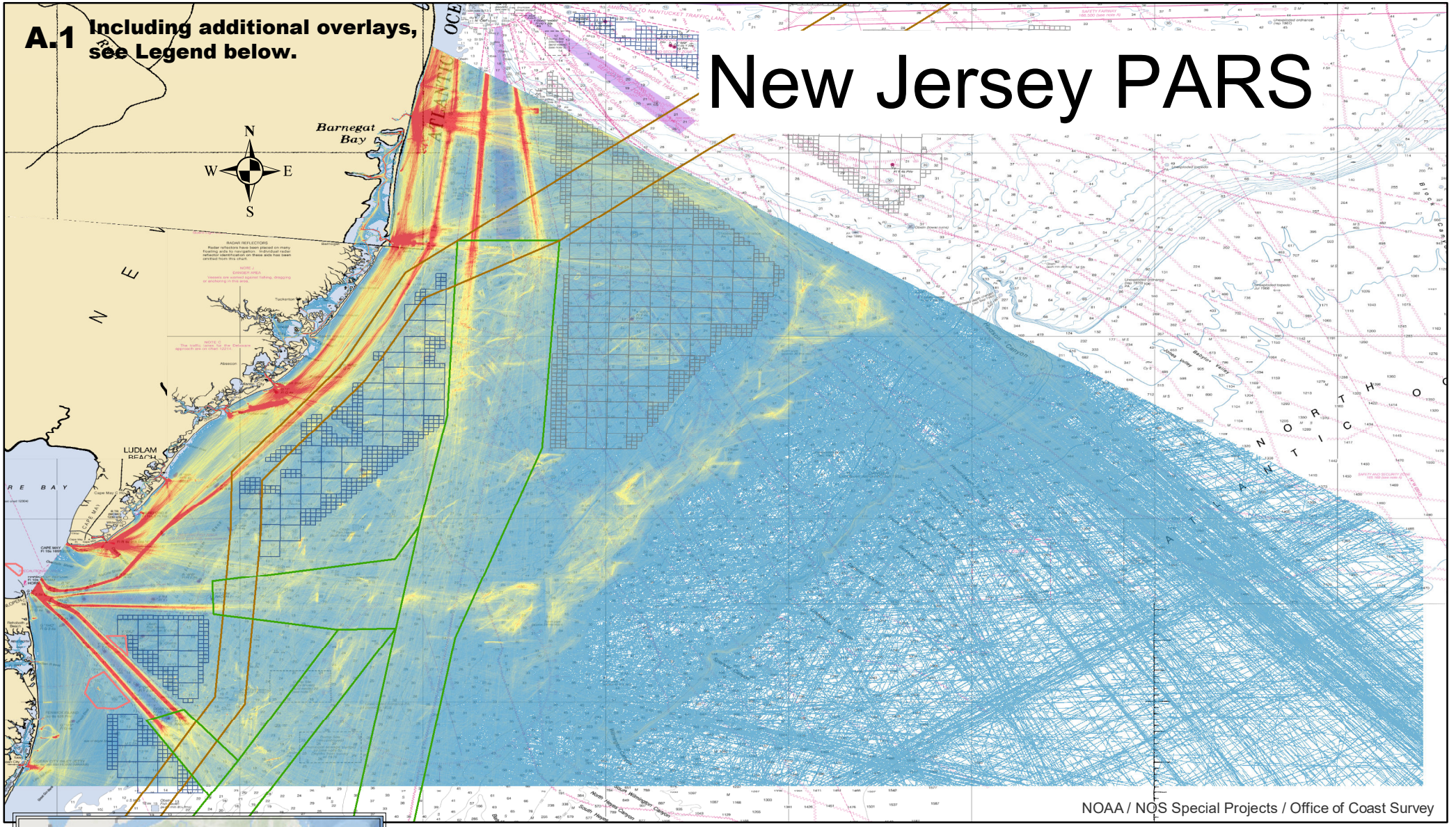
Data Source: NAIS

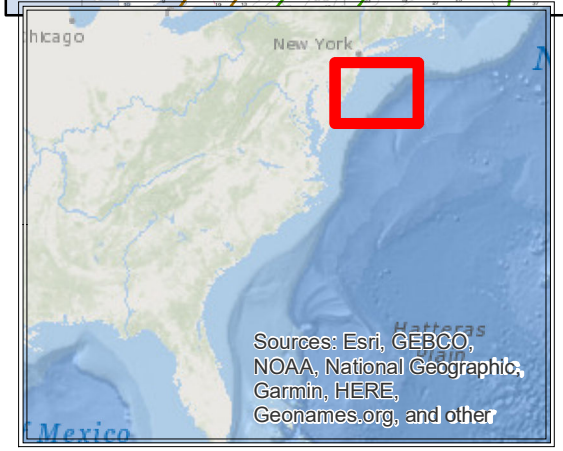
Prepared by CG NAVCEN

Attachment 2: Traffic Densities for the NJ PARS Including Additional Overlays

A.1 **Including additional overlays, see Legend below.**

New Jersey PARS





0 5 10 20 30 40

Nautical Miles

1:1,600,000

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NAIS
Prepared by CG NAVCEN

Legend

- Wind Lease Areas
- Wind Planning Areas
- Anchorages

All Vessels 2017

Value

- High Traffic Density
- Low Traffic Density

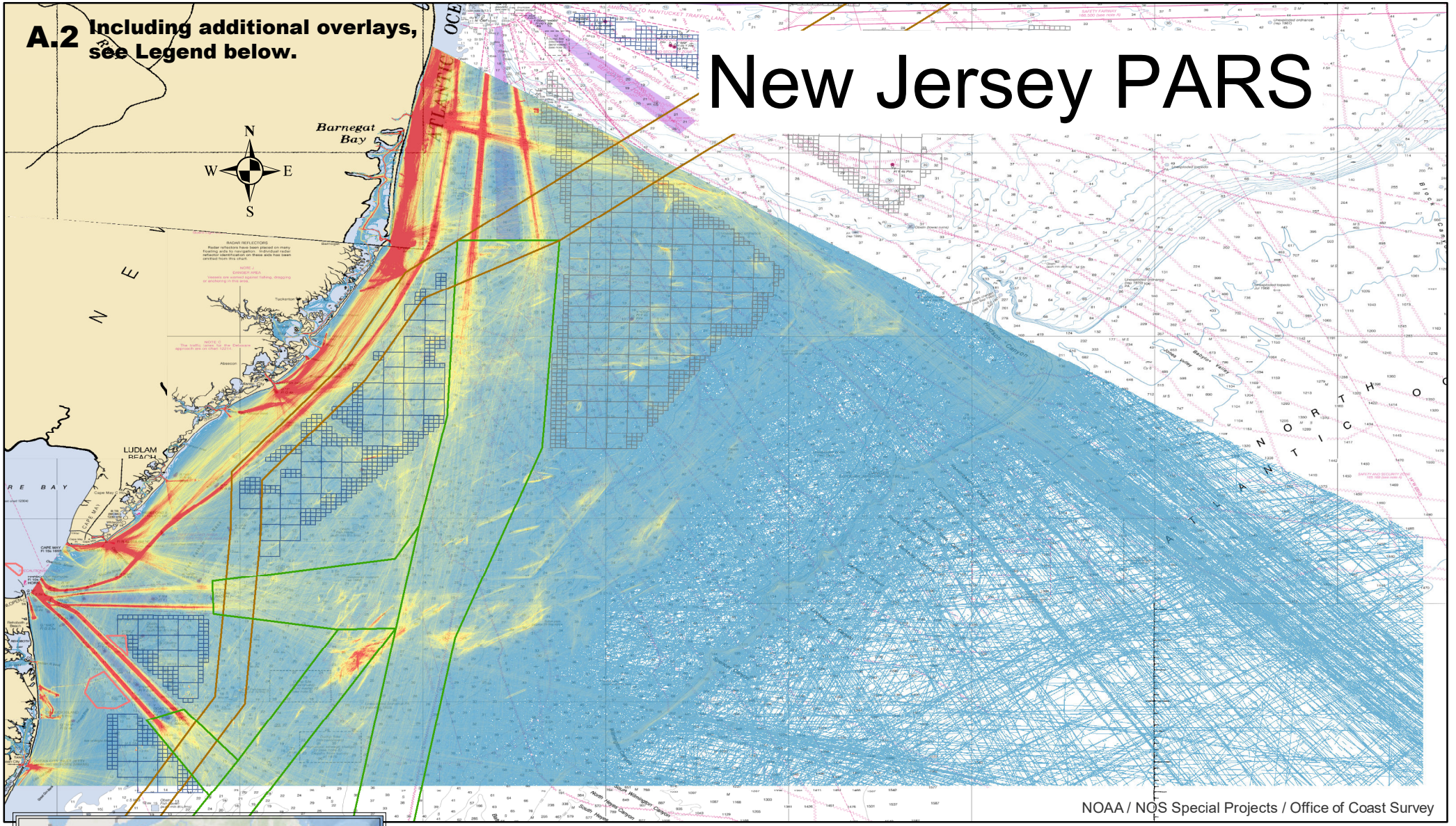
ACPARS Fairways

Type

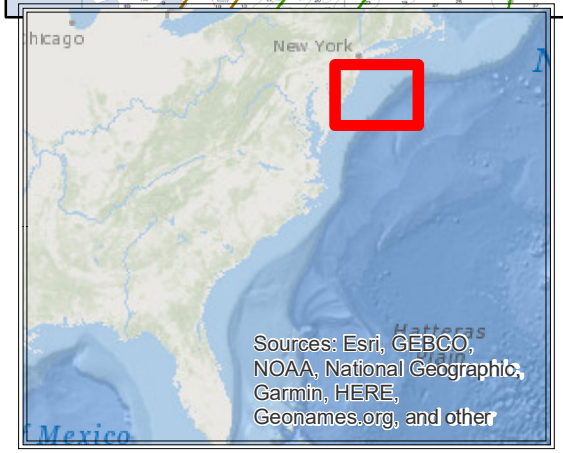
- Deep Draft Lane
- Tug Tow Extension

A.2 **Including additional overlays, see Legend below.**

New Jersey PARS



NOAA / NOS Special Projects / Office of Coast Survey



0 5 10 20 30 40

Nautical Miles

1:1,600,000

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NAIS
Prepared by CG NAVCEN

Legend

- Wind Lease Areas
- Wind Planning Areas
- Anchorages

All Vessels 2018

Value

- High Traffic Density
- Low Traffic Density

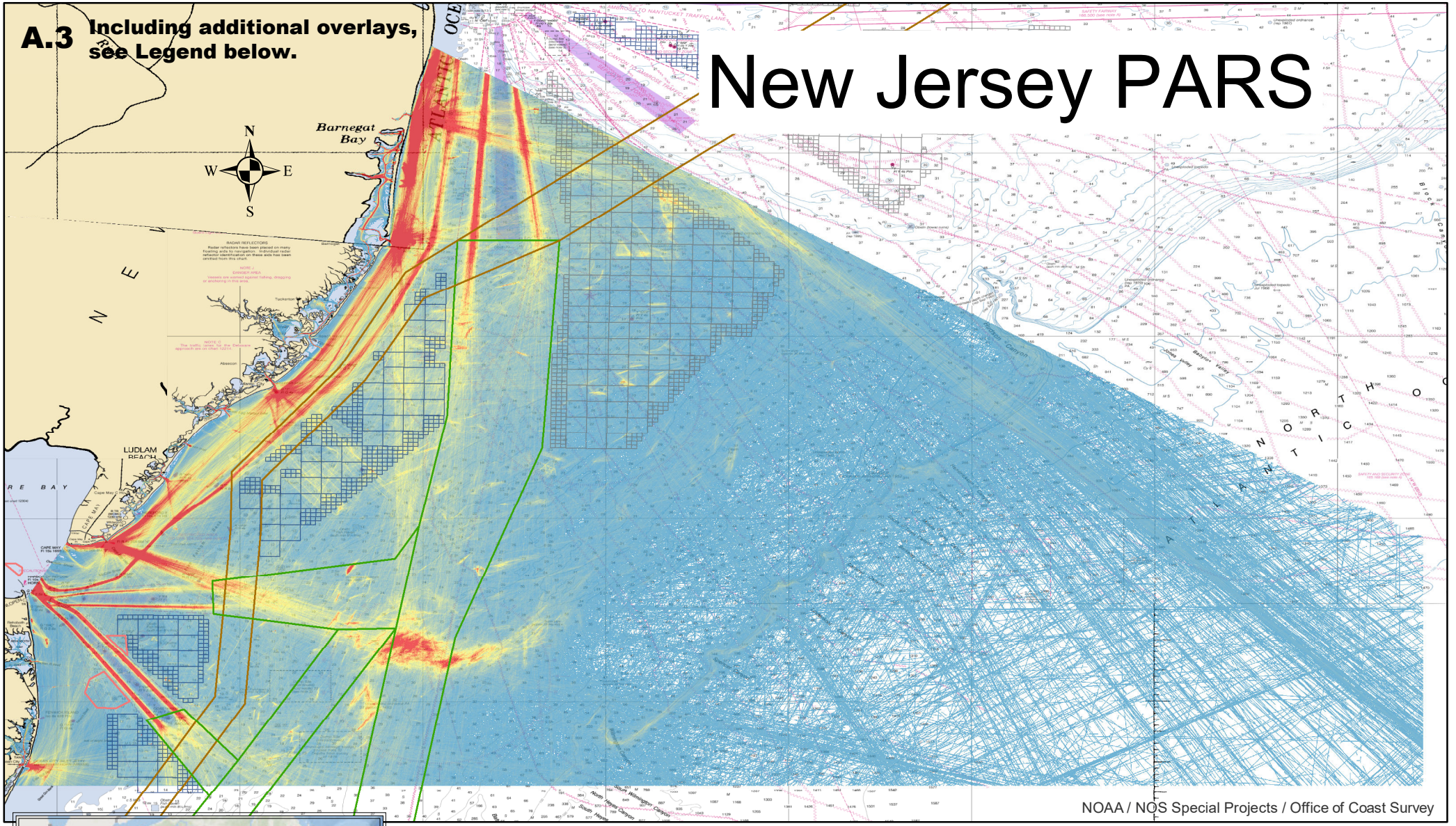
ACPARS Fairways

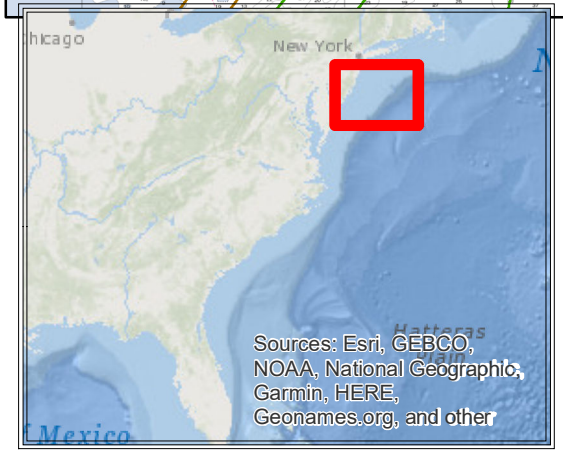
Type

- Deep Draft Lane
- Tug Tow Extension

A.3 Including additional overlays, see Legend below.

New Jersey PARS





0 5 10 20 30 40 Nautical Miles

1:1,600,000

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NAIS
Prepared by CG NAVCEN

Legend

- Wind Lease Areas
- Wind Planning Areas
- Anchorages

All Vessels 2019

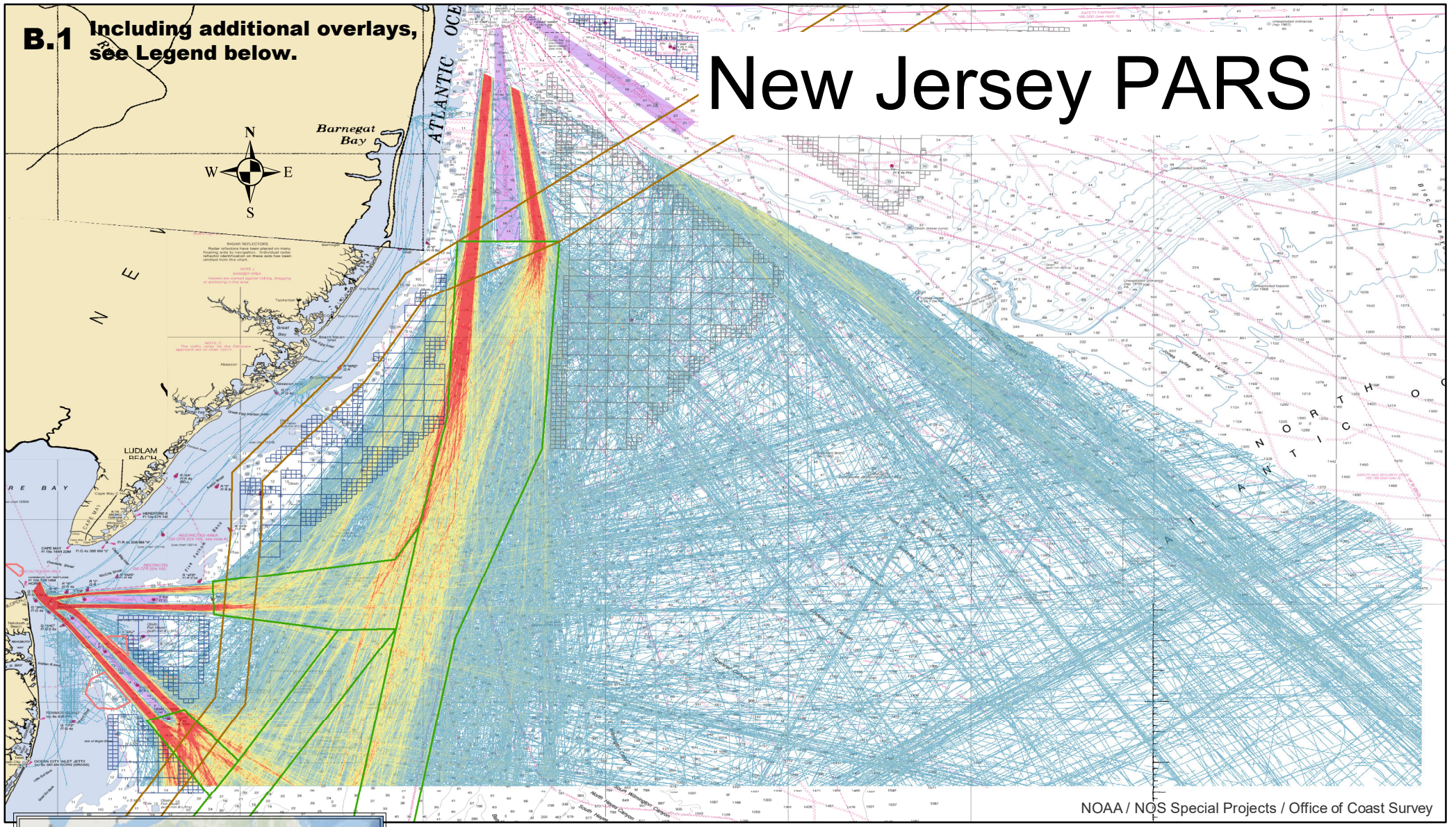
Value

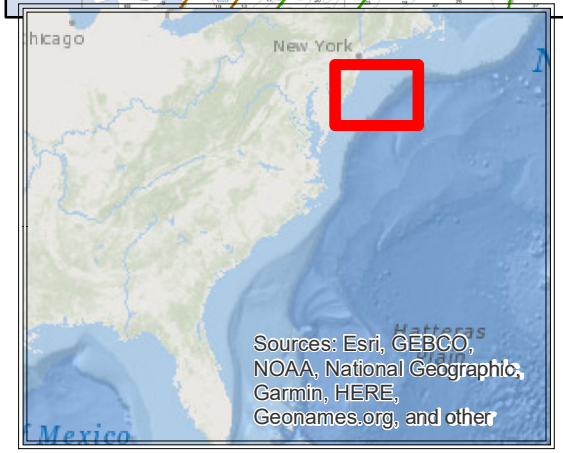
- High Traffic Density
- Low Traffic Density

ACPARS Fairways

Type

- Deep Draft Lane
- Tug Tow Extension





0 5 10 20 30 40 Nautical Miles

1:1,600,000

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NAIS
Prepared by CG NAVCEN

Legend

- Wind Lease Areas
- Wind Planning Areas
- Anchorages

Cargo 2017

Value

- High Traffic Density
- Low Traffic Density

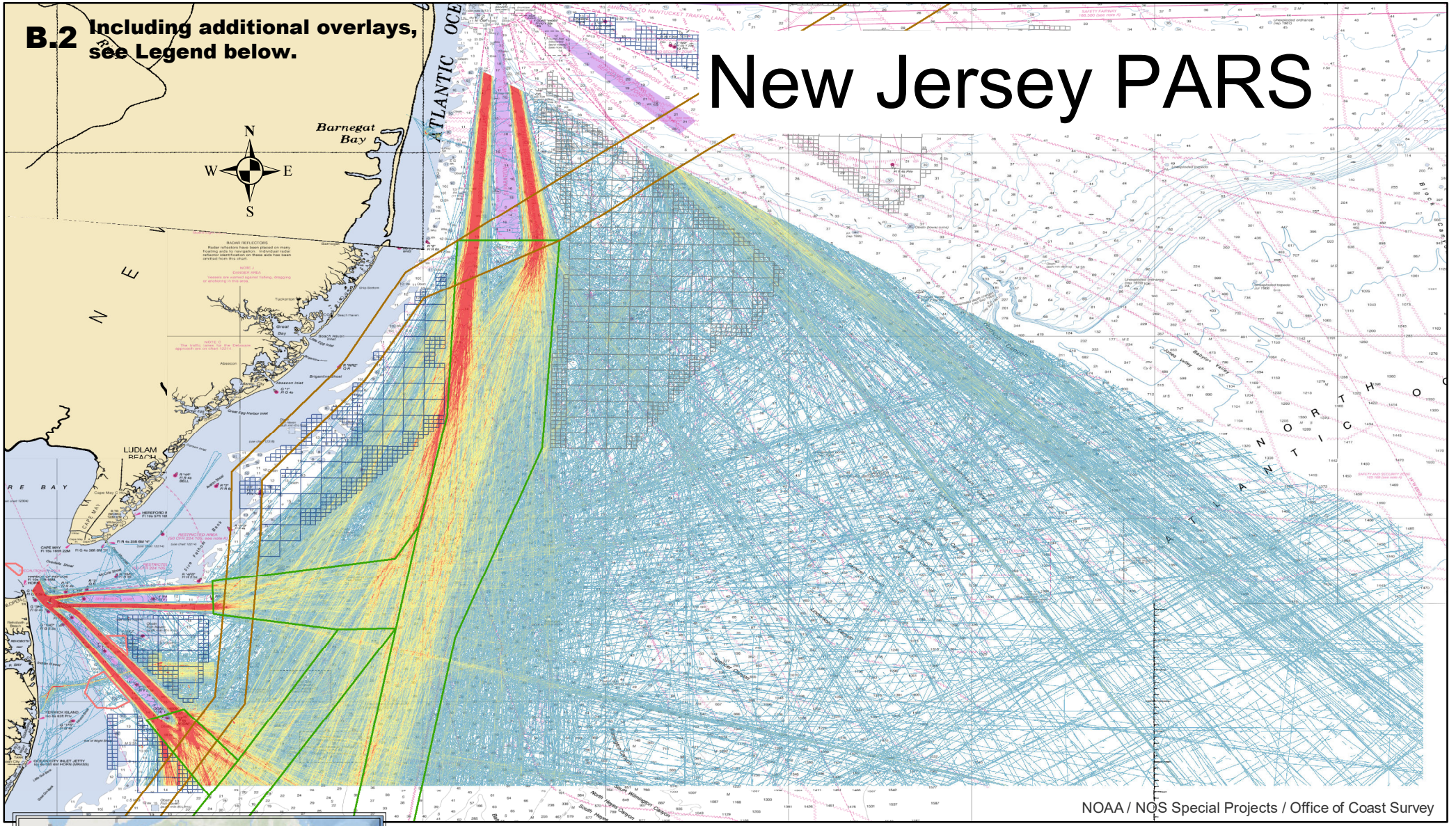
ACPARS Fairways

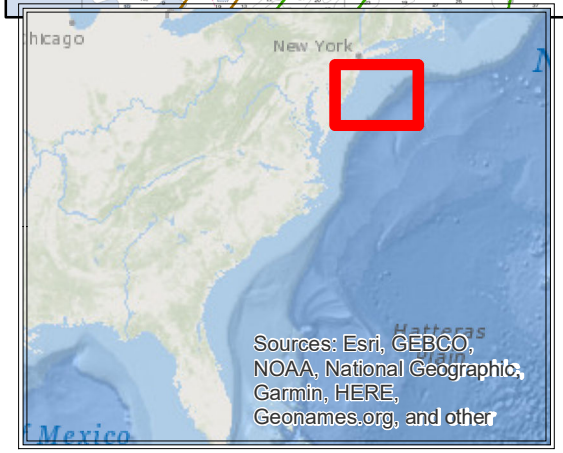
Type

- Deep Draft Lane
- Tug Tow Extension

B.2 **Including additional overlays, see Legend below.**

New Jersey PARS





0 5 10 20 30 40 Nautical Miles

1:1,600,000

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NAIS
Prepared by CG NAVCEN

Legend

- Wind Lease Areas
- Wind Planning Areas
- Anchorages

Cargo 2018

Value

- High Traffic Density
- Low Traffic Density

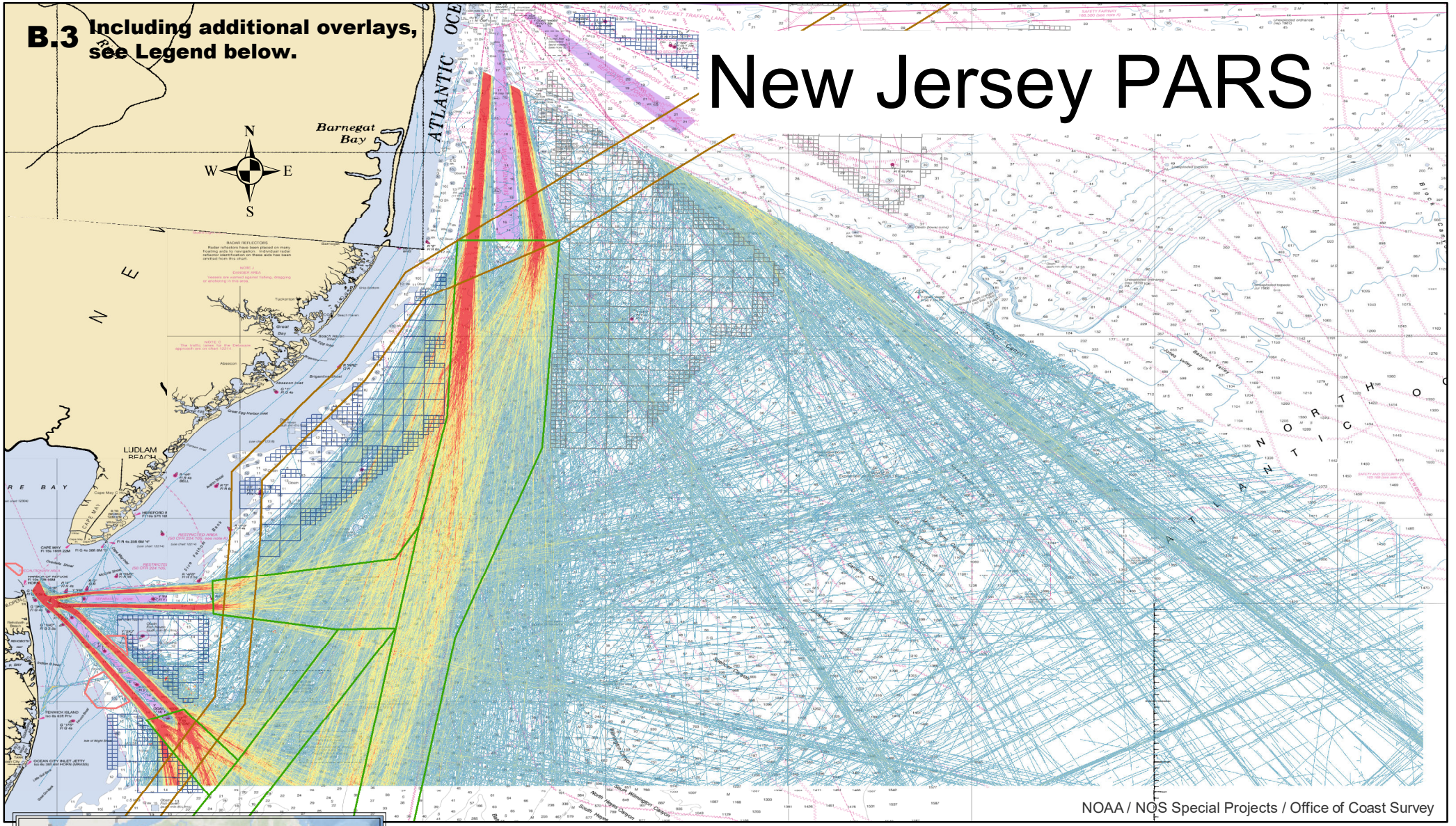
ACPARS Fairways

Type

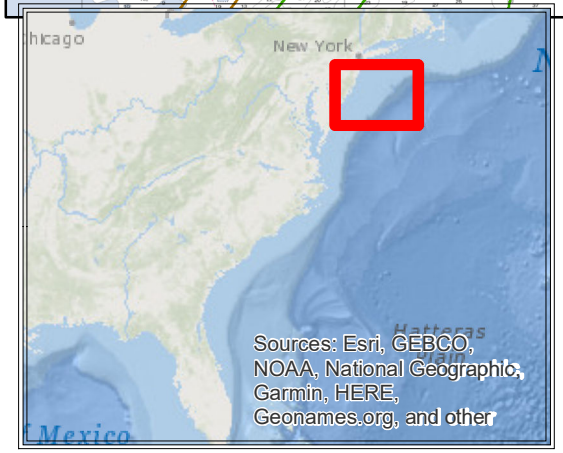
- Deep Draft Lane
- Tug Tow Extension

B.3 **Including additional overlays, see Legend below.**

New Jersey PARS



NOAA / NOS Special Projects / Office of Coast Survey



0 5 10 20 30 40 Nautical Miles

1:1,600,000

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NAIS
Prepared by CG NAVCEN

Legend

- Wind Lease Areas
- Wind Planning Areas
- Anchorages

Cargo 2019

Value

- High Traffic Density
- Low Traffic Density

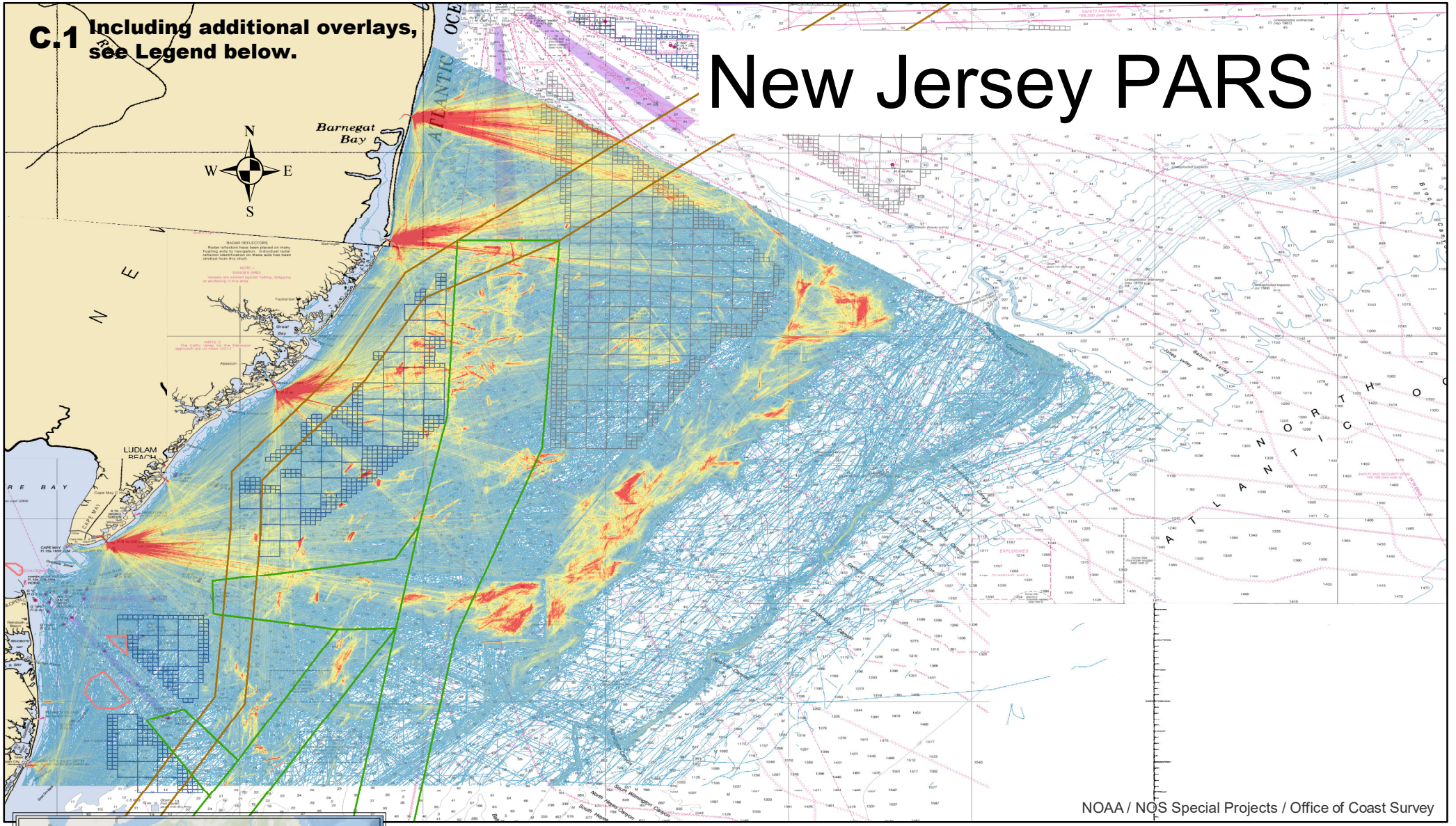
ACPARS Fairways

Type

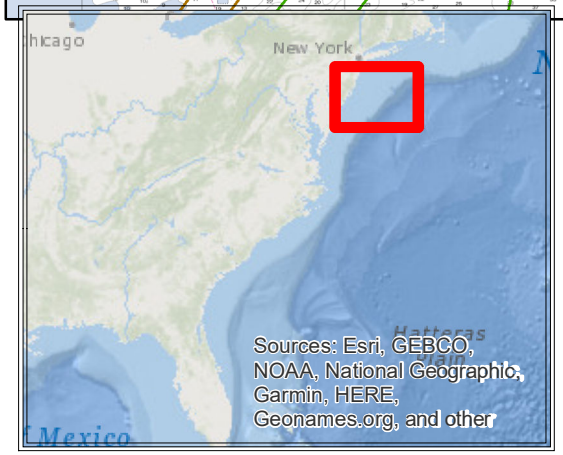
- Deep Draft Lane
- Tug Tow Extension

C.1 Including additional overlays, see Legend below.

New Jersey PARS



NOAA / NOS Special Projects / Office of Coast Survey



0 5 10 20 30 40

Nautical Miles

1:1,600,000

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NAIS
Prepared by CG NAVCEN

Legend

- Wind Lease Areas
- Wind Planning Areas
- Anchorages

Fishing 2017

Value

- High Traffic Density
- Low Traffic Density

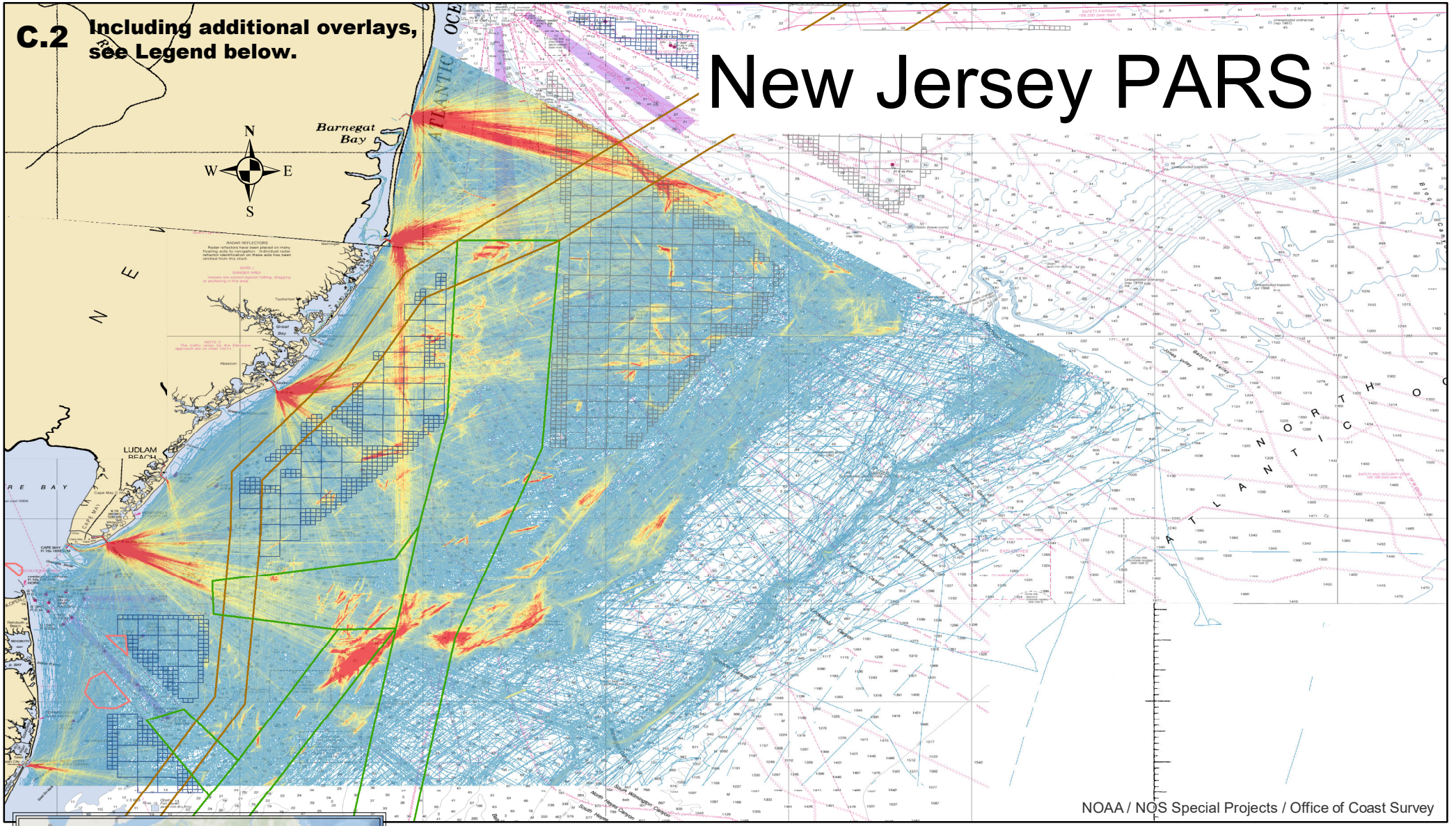
ACPARS Fairways

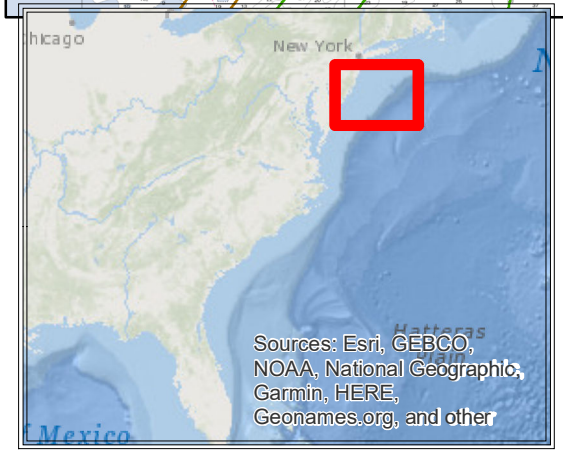
Type

- Deep Draft Lane
- Tug Tow Extension

C.2 Including additional overlays, see Legend below.

New Jersey PARS





0 5 10 20 30 40 Nautical Miles

1:1,600,000

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NAIS
Prepared by CG NAVCEN

Legend

- Wind Lease Areas
- Wind Planning Areas
- Anchorages

Fishing 2018

Value

- High Traffic Density
- Low Traffic Density

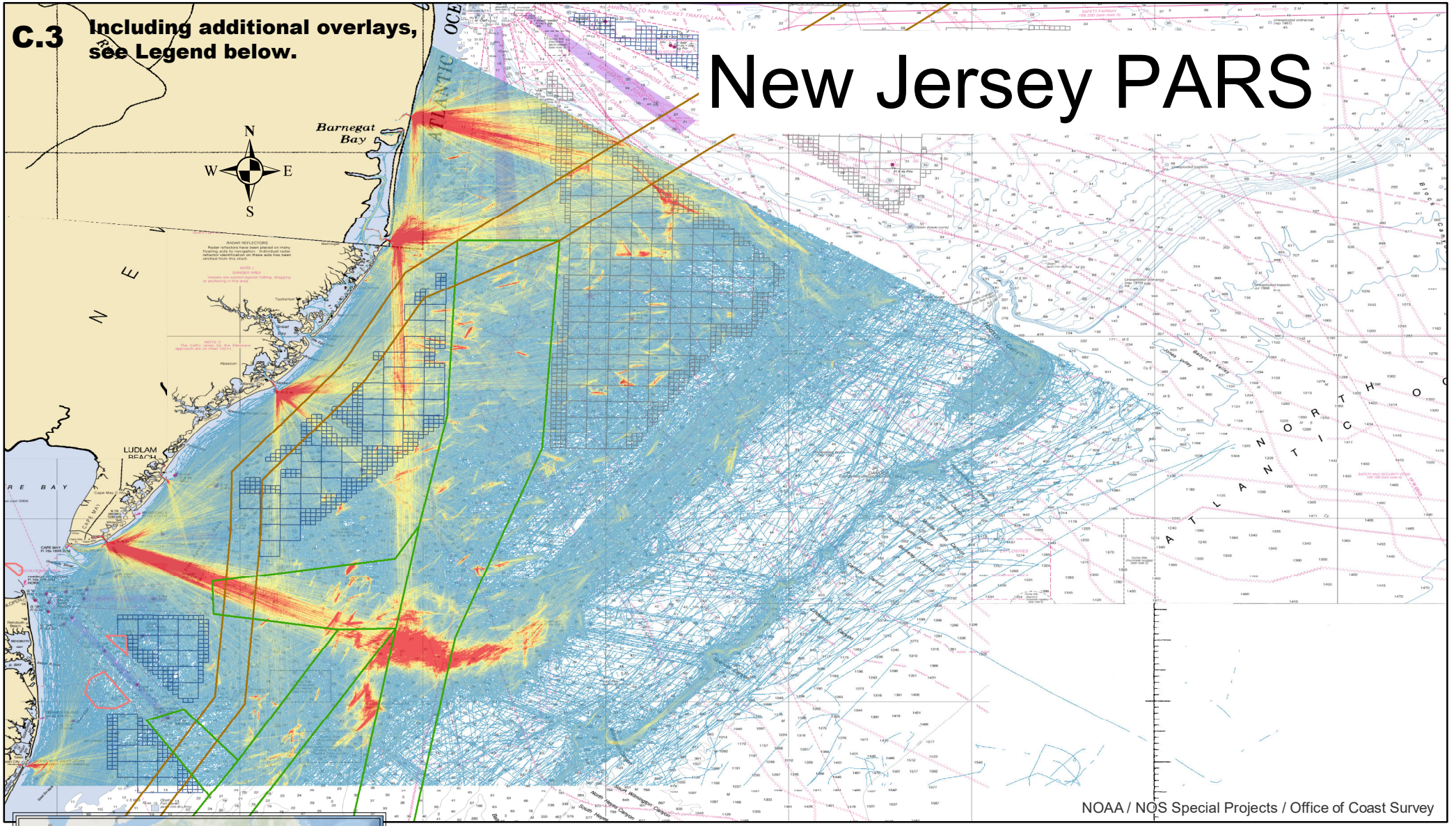
ACPARS Fairways

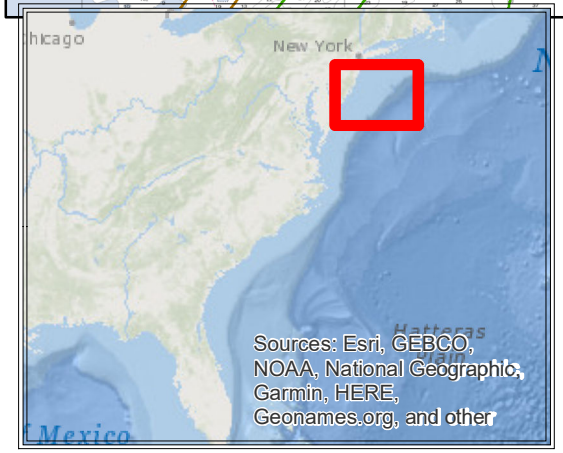
Type

- Deep Draft Lane
- Tug Tow Extension

C.3 Including additional overlays, see Legend below.

New Jersey PARS





0 5 10 20 30 40 Nautical Miles

1:1,600,000

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NAIS
Prepared by CG NAVCEN

Legend

- Wind Lease Areas
- Wind Planning Areas
- Anchorages

Fishing 2019

Value

- High Traffic Density
- Low Traffic Density

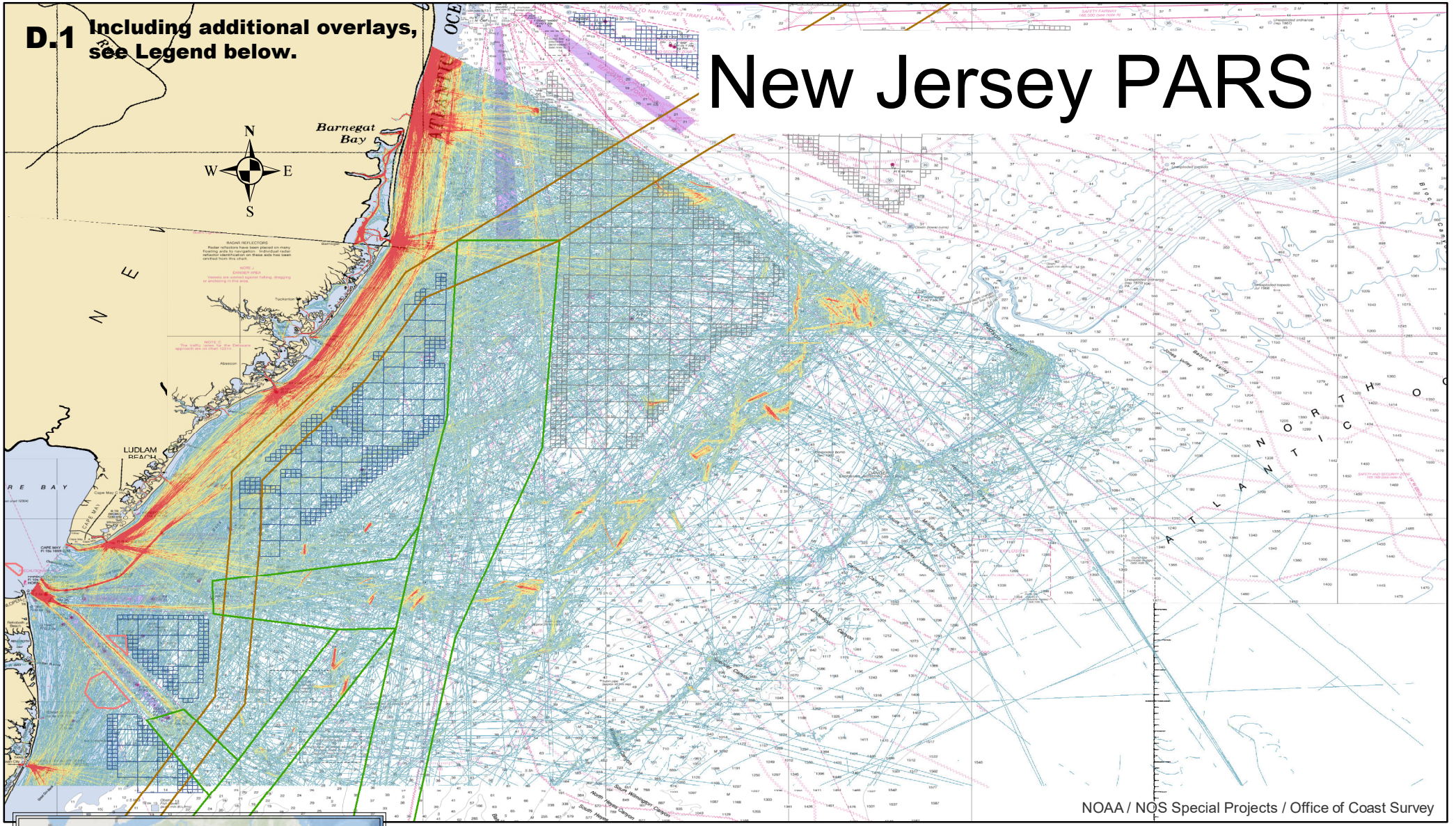
ACPARS Fairways

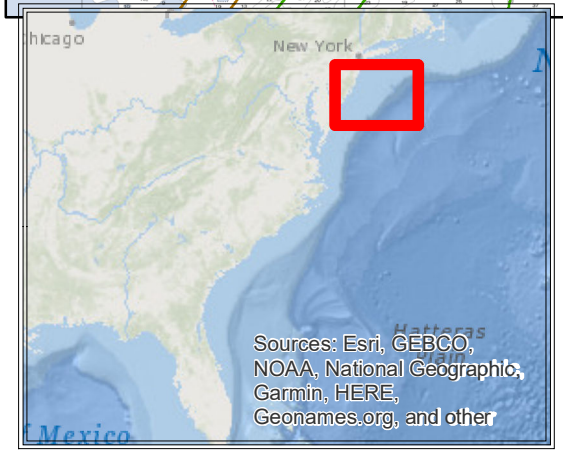
Type

- Deep Draft Lane
- Tug Tow Extension

D.1 **Including additional overlays, see Legend below.**

New Jersey PARS





0 5 10 20 30 40 Nautical Miles

1:1,600,000

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NAIS
Prepared by CG NAVCEN

Legend

- Wind Lease Areas
- Wind Planning Areas
- Anchorages

Not Available 2017

ACPARS Fairways

Type

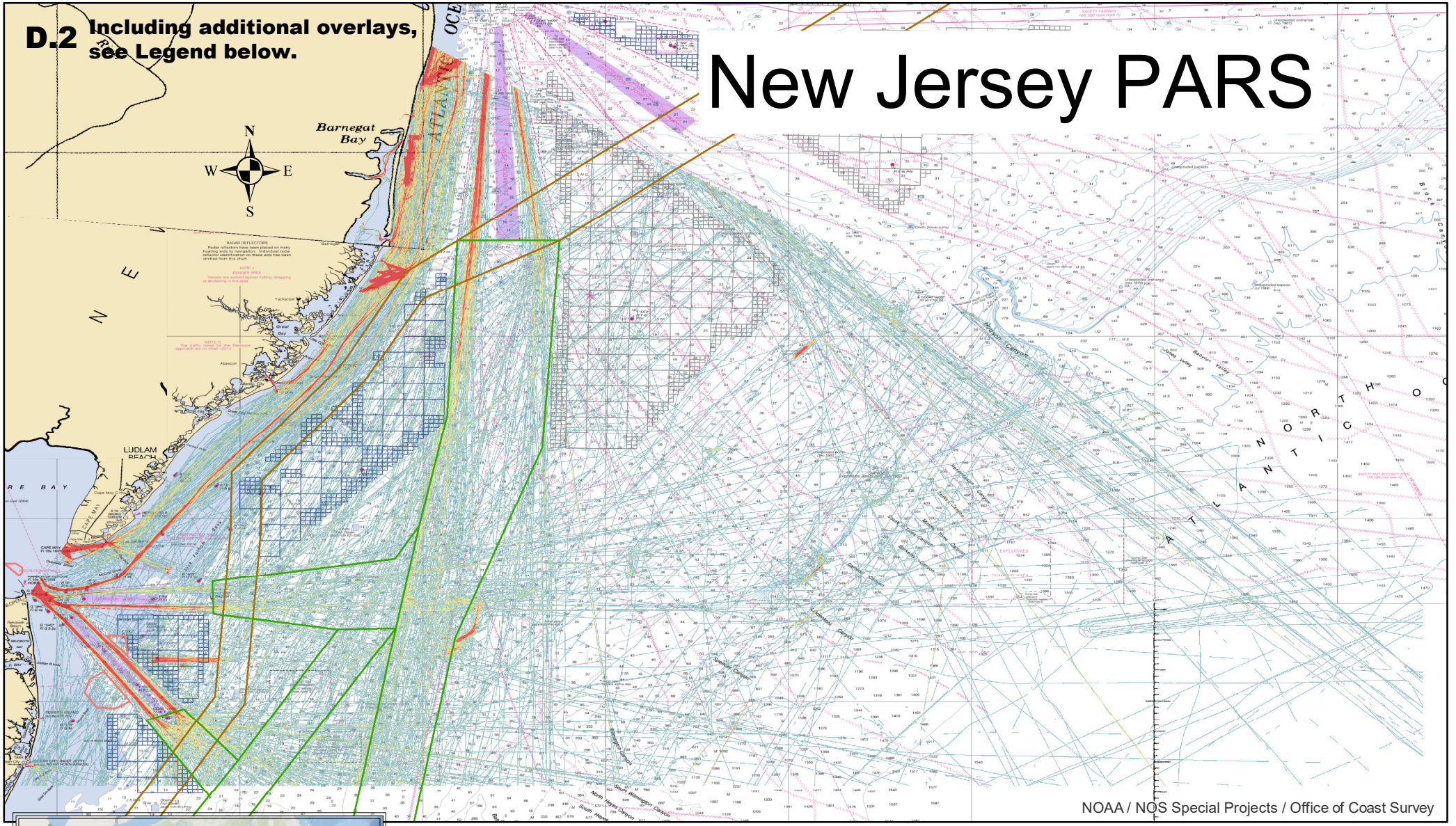
- Deep Draft Lane
- Tug Tow Extension

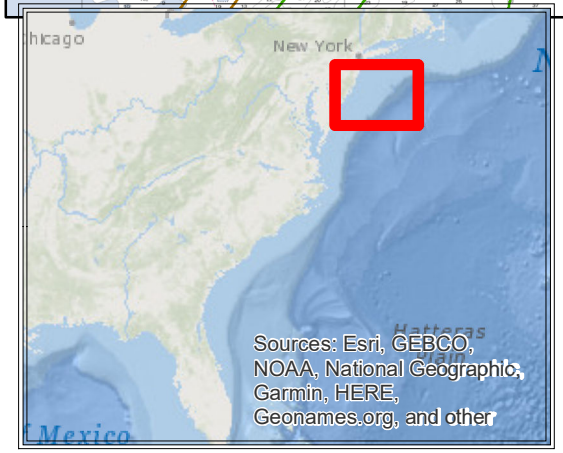
Value

- High Traffic Density
- Low Traffic Density

D.2 **Including additional overlays, see Legend below.**

New Jersey PARS





0 5 10 20 30 40 Nautical Miles

1:1,600,000

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NAIS
Prepared by CG NAVCEN

Legend

- Wind Lease Areas
- Wind Planning Areas
- Anchorages

Not Available 2018

ACPARS Fairways

Type

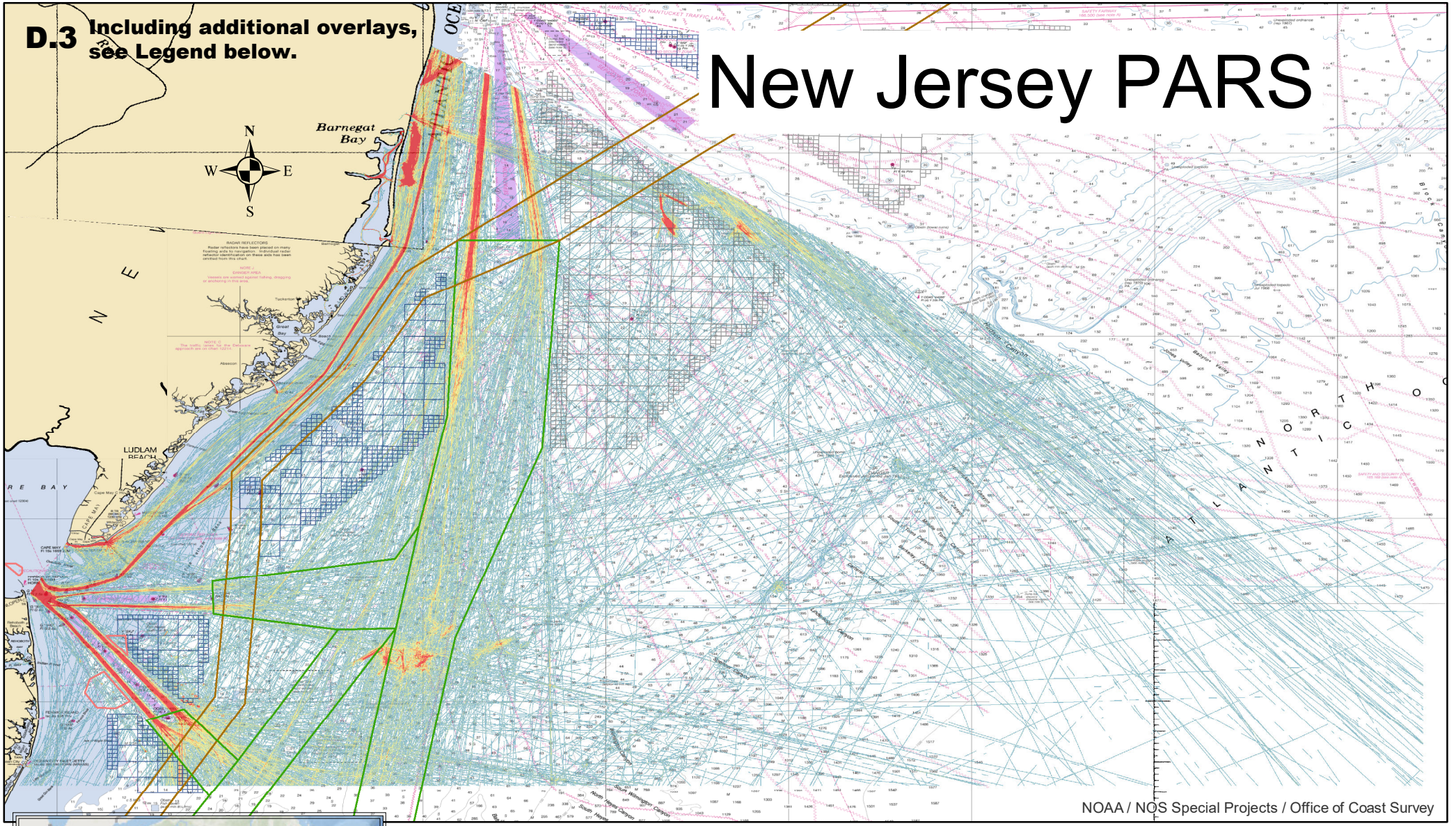
- Deep Draft Lane
- Tug Tow Extension

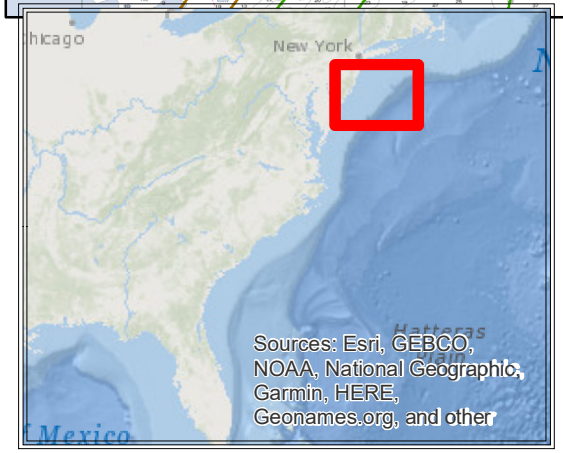
Value

- High Traffic Density
- Low Traffic Density

D.3 **Including additional overlays, see Legend below.**

New Jersey PARS





0 5 10 20 30 40

Nautical Miles

1:1,600,000

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NAIS
Prepared by CG NAVCEN

Legend

- Wind Lease Areas
- Wind Planning Areas
- Anchorages

Not Available 2019

ACPARS Fairways

Type

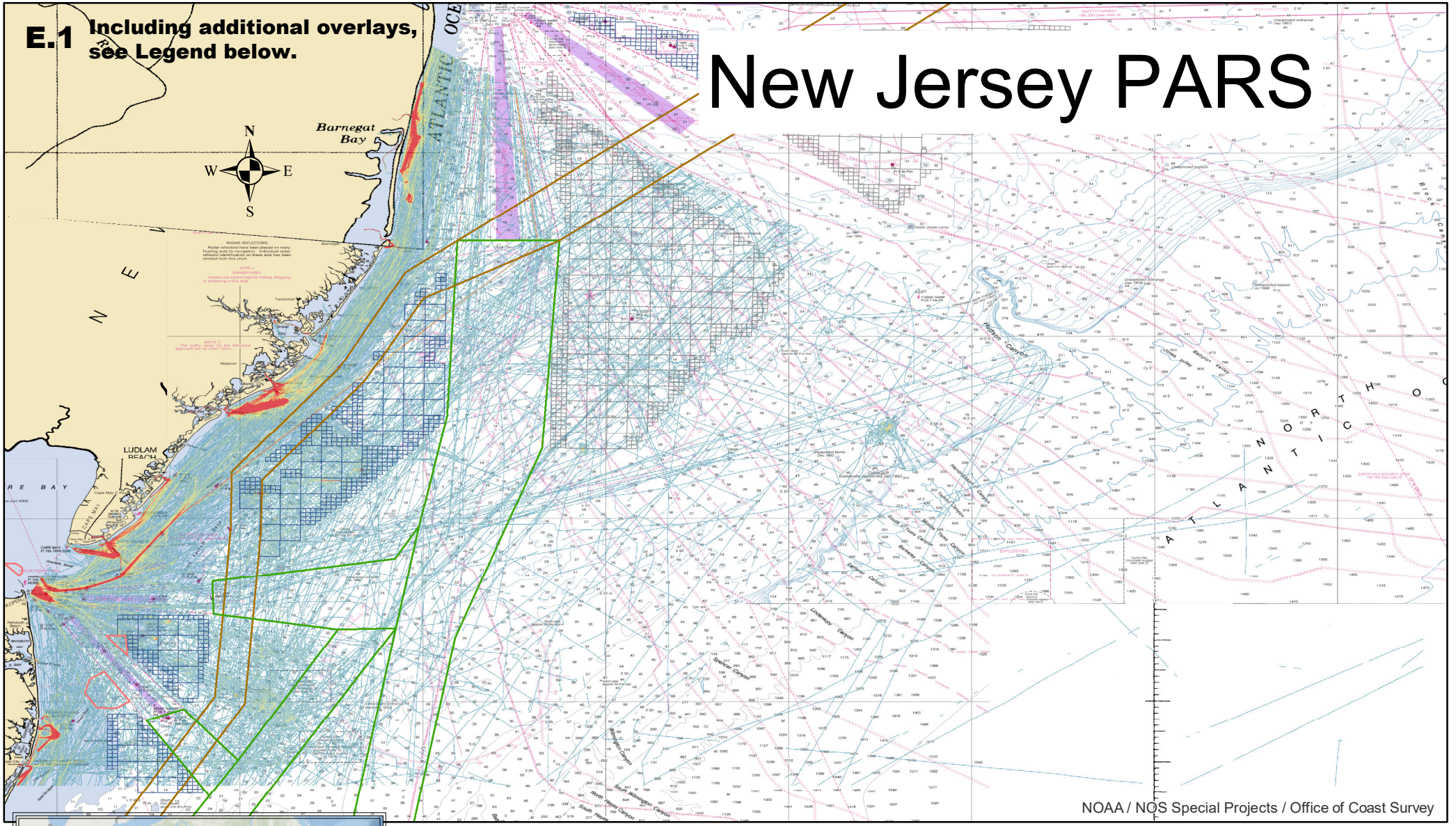
- Deep Draft Lane
- Tug Tow Extension

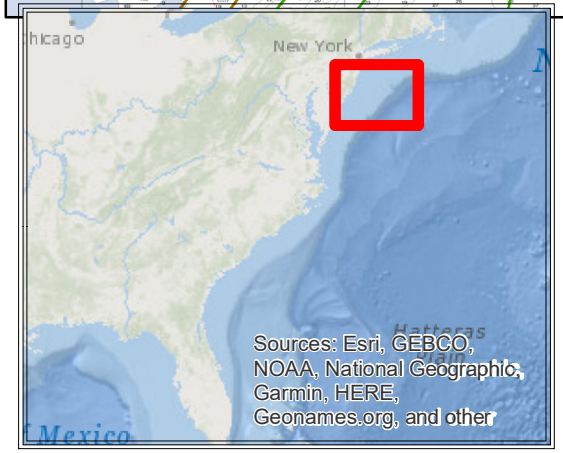
Value

- High Traffic Density
- Low Traffic Density

New Jersey PARS

E.1 **Including additional overlays, see Legend below.**





0 5 10 20 30 40 Nautical Miles

1:1,600,000

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NAIS
Prepared by CG NAVCEN

Legend

- Wind Lease Areas
- Wind Planning Areas
- Anchorages

Other 2017

Value

- High Traffic Density
- Low Traffic Density

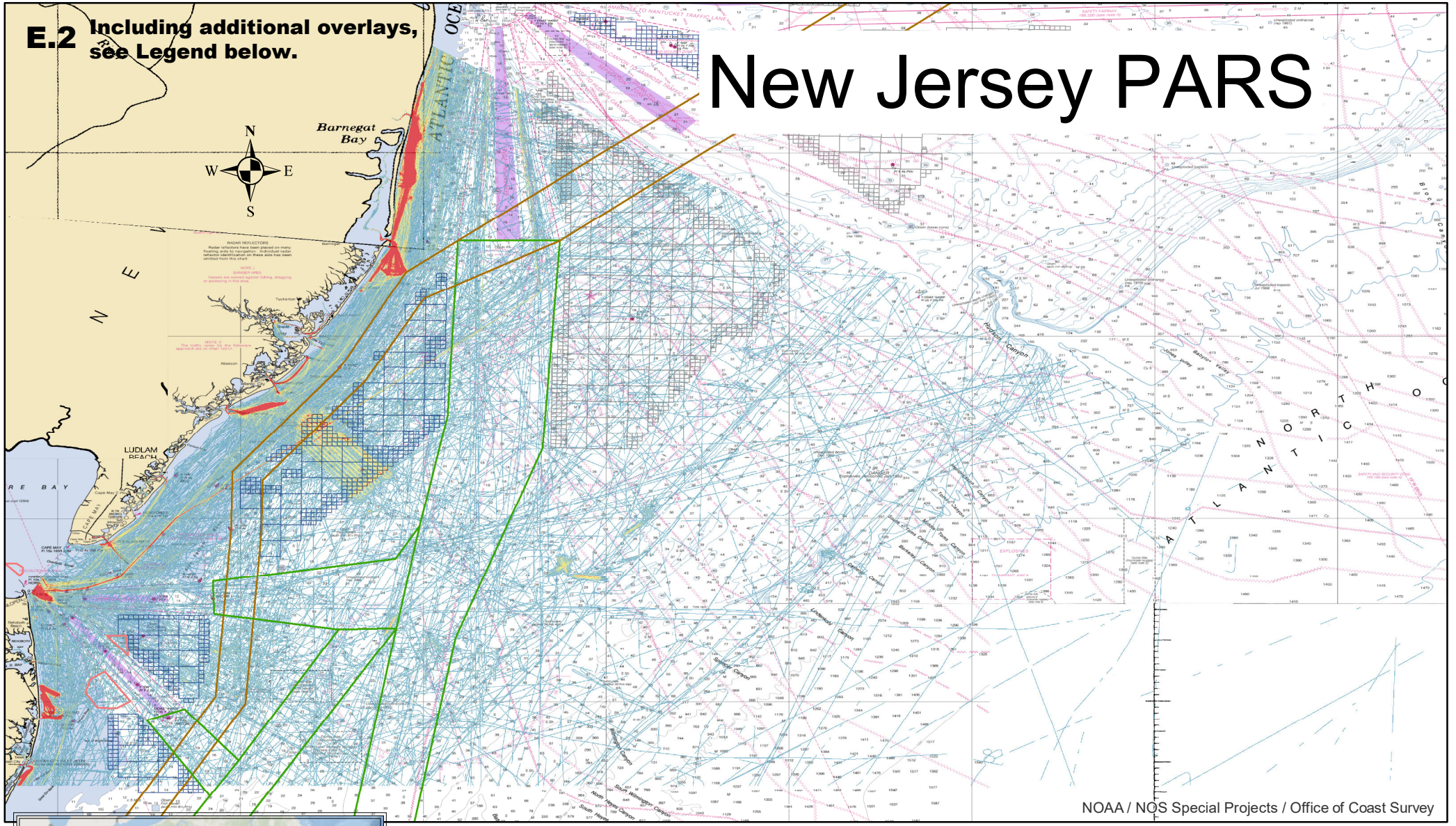
ACPARS Fairways

Type

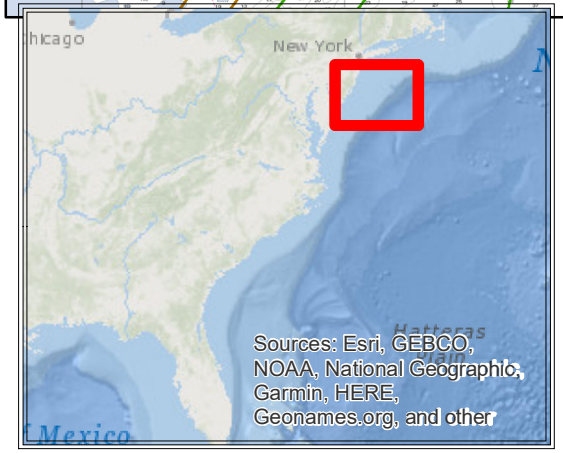
- Deep Draft Lane
- Tug Tow Extension

E.2 **Including additional overlays, see Legend below.**

New Jersey PARS



NOAA / NOS Special Projects / Office of Coast Survey



0 5 10 20 30 40 Nautical Miles

1:1,600,000

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NAIS
Prepared by CG NAVCEN

Legend

- Wind Lease Areas
- Wind Planning Areas
- Anchorages

ACPARS Fairways

Type

- Deep Draft Lane
- Tug Tow Extension

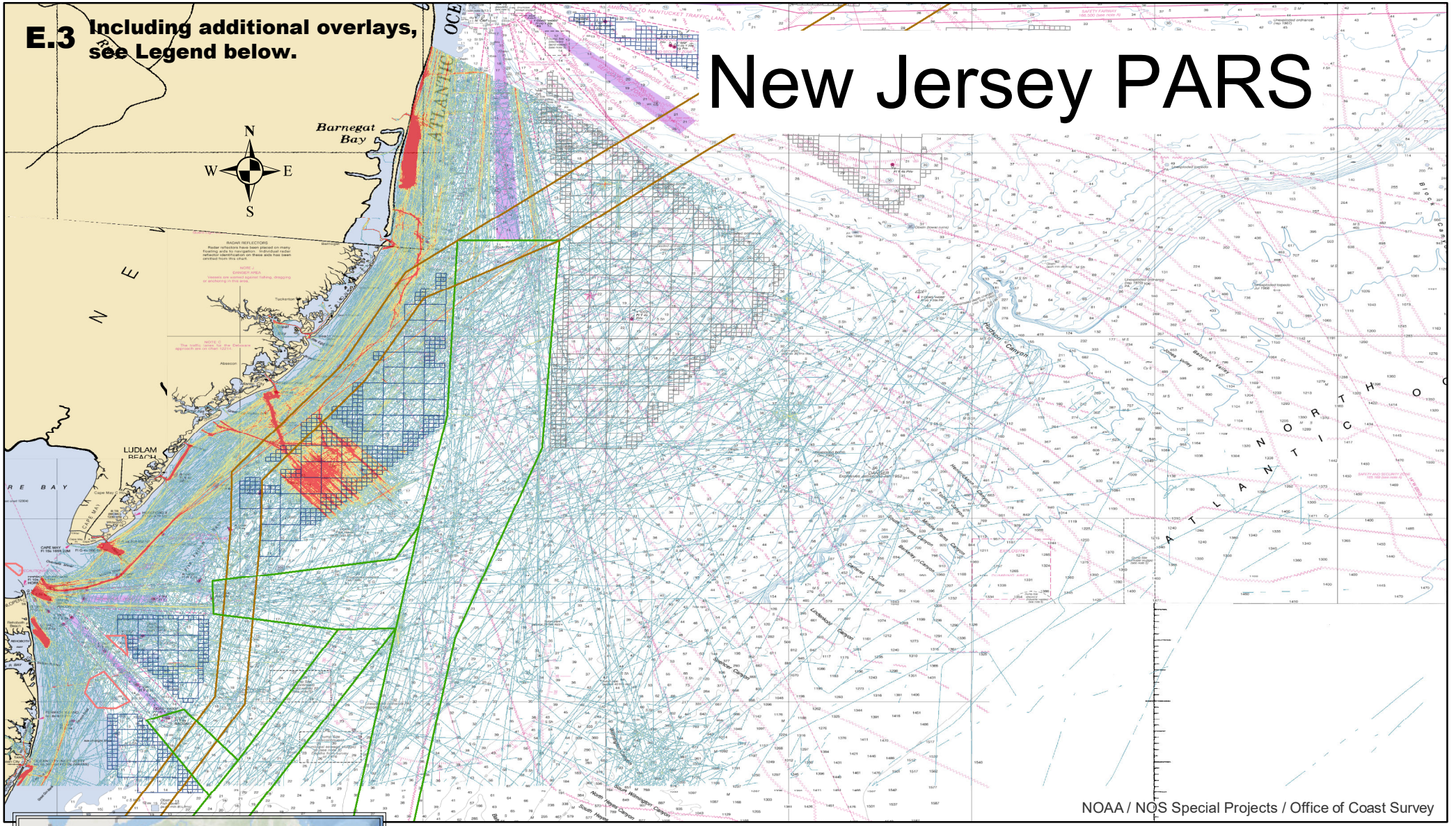
Other 2018

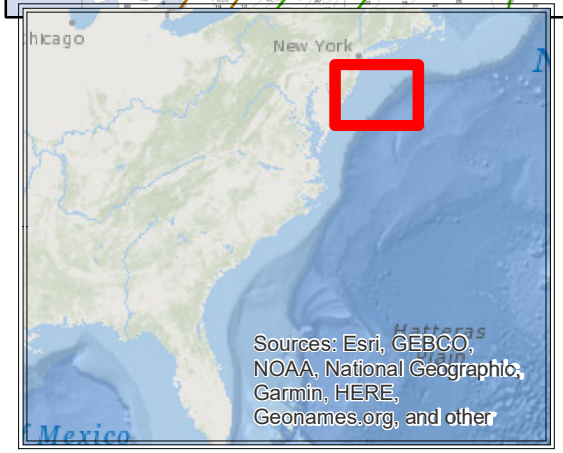
Value

- High Traffic Density
- Low Traffic Density

E.3 **Including additional overlays, see Legend below.**

New Jersey PARS





0 5 10 20 30 40 Nautical Miles

1:1,600,000

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NAIS
Prepared by CG NAVCEN

Legend

- Wind Lease Areas
- Wind Planning Areas
- Anchorages

Other 2019

Value

- High Traffic Density
- Low Traffic Density

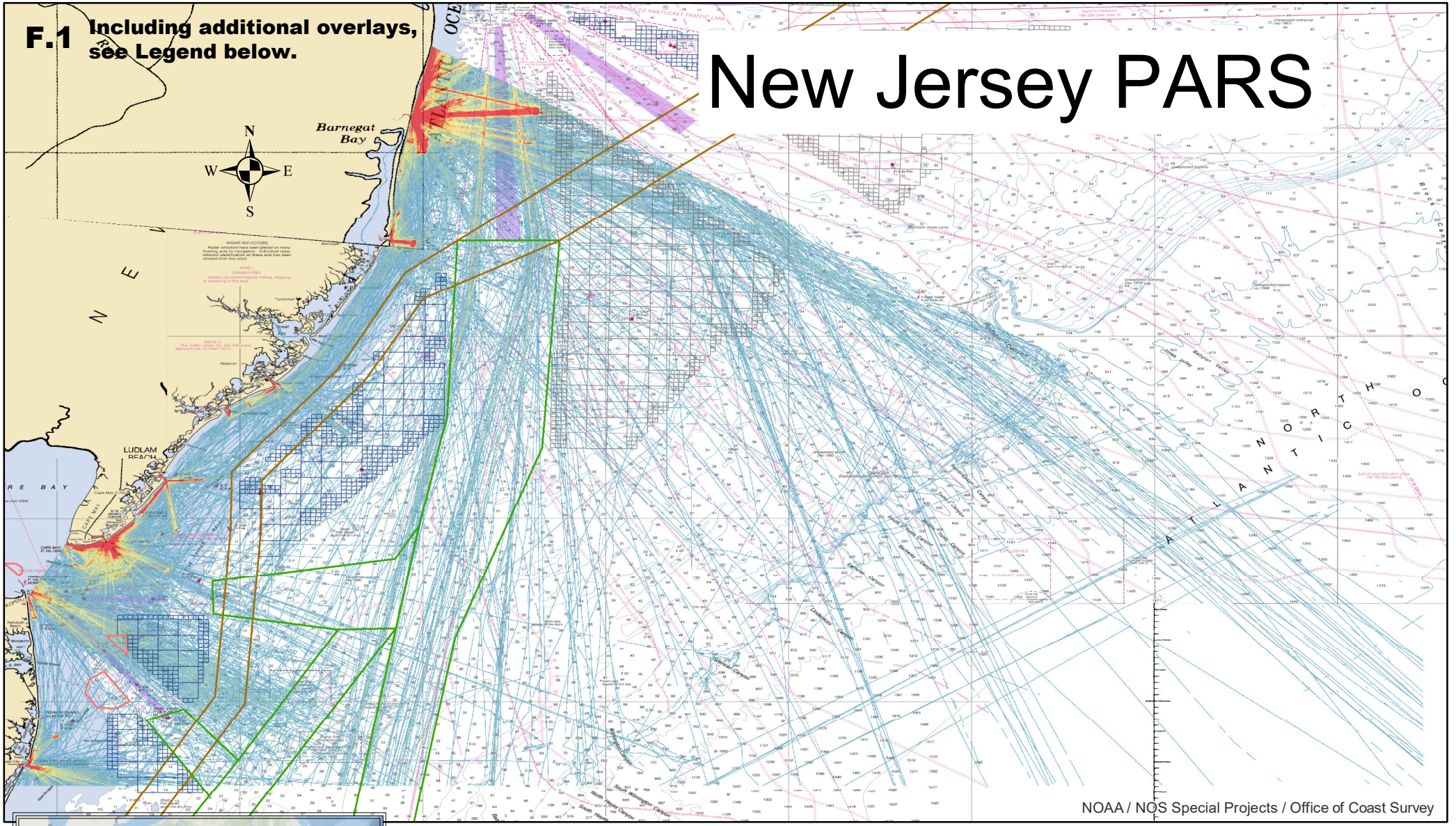
ACPARS Fairways

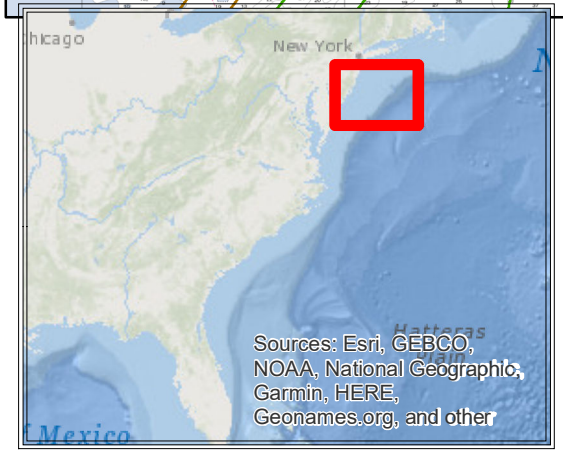
Type

- Deep Draft Lane
- Tug Tow Extension

F.1 **Including additional overlays, see Legend below.**

New Jersey PARS





0 5 10 20 30 40 Nautical Miles

1:1,600,000

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NAIS
Prepared by CG NAVCEN

Legend

- Wind Lease Areas
- Wind Planning Areas
- Anchorages

Passenger 2017

Value

- High Traffic Density
- Low Traffic Density

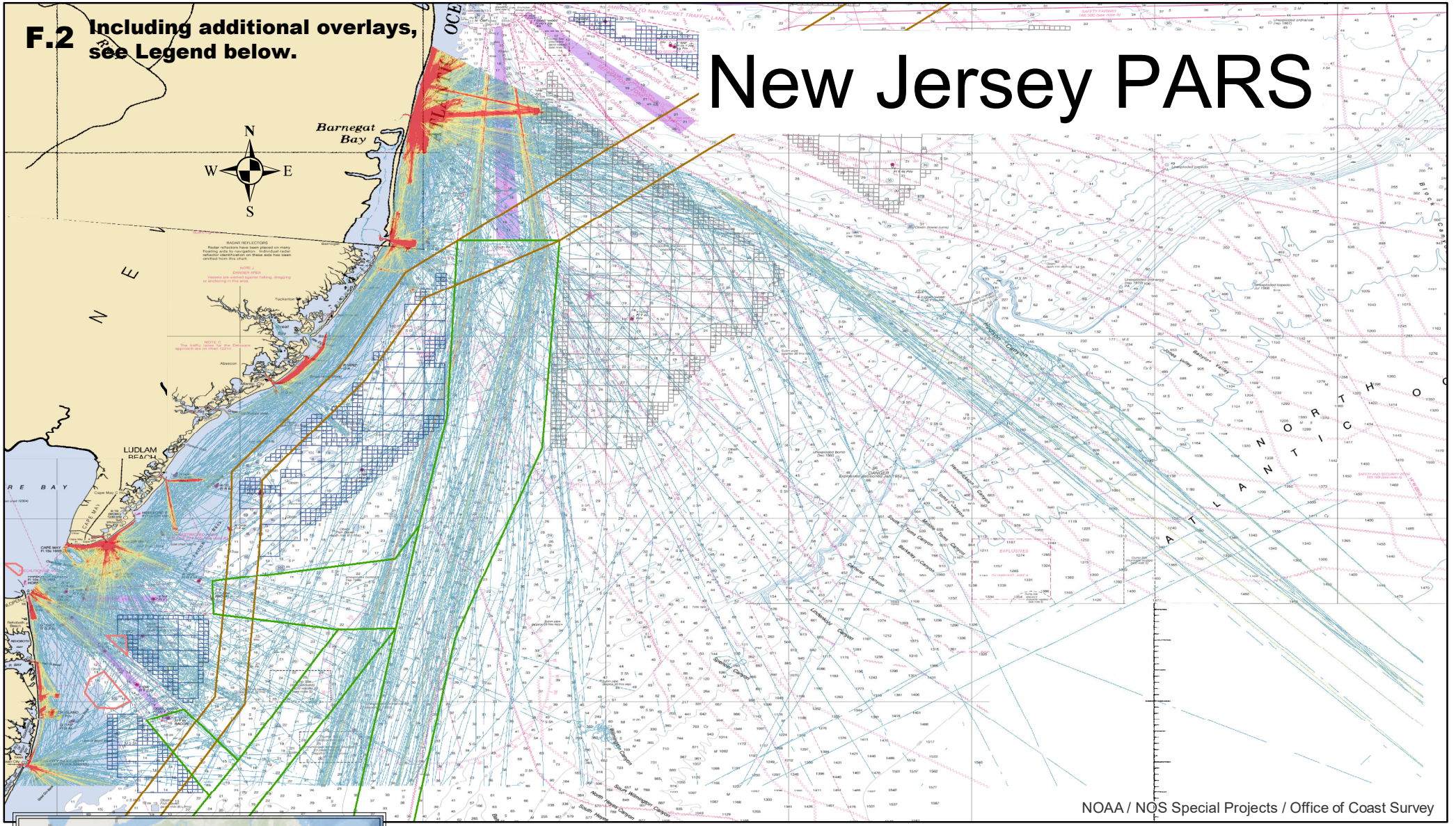
ACPARS Fairways

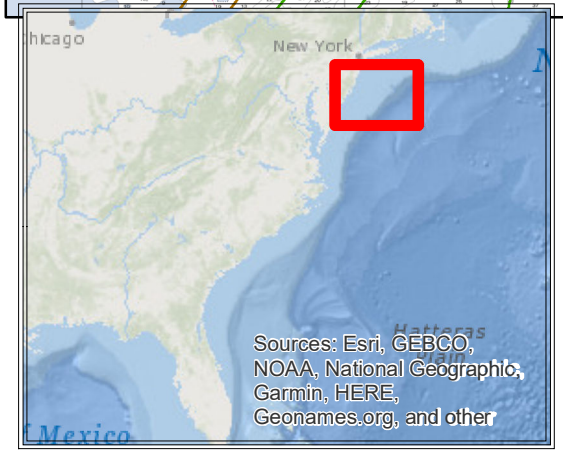
Type

- Deep Draft Lane
- Tug Tow Extension

F.2 **Including additional overlays, see Legend below.**

New Jersey PARS





0 5 10 20 30 40 Nautical Miles

1:1,600,000

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NAIS
Prepared by CG NAVCEN

Legend

- Wind Lease Areas
- Wind Planning Areas
- Anchorages

Passenger 2018

Value

- High Traffic Density
- Low Traffic Density

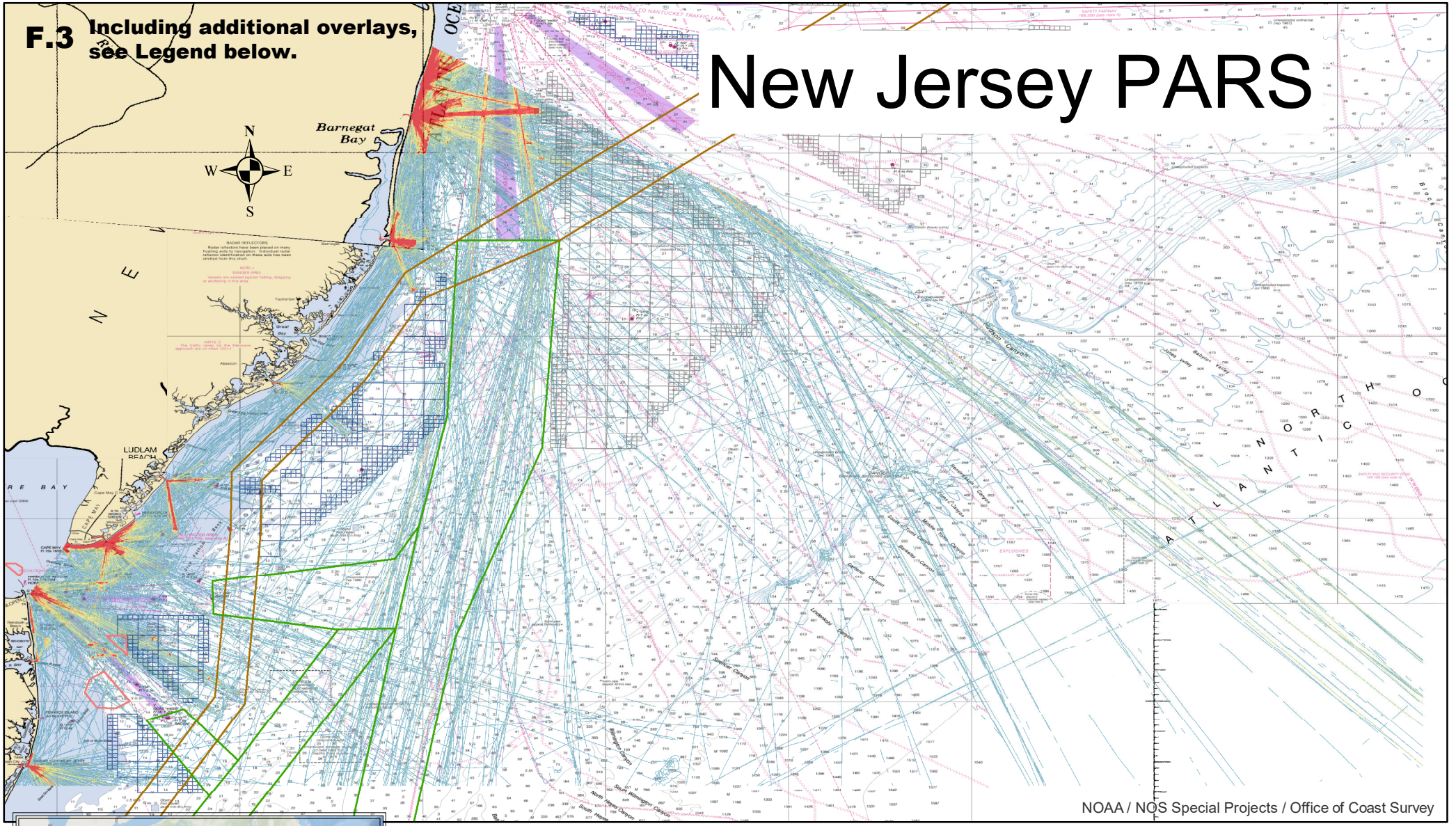
ACPARS Fairways

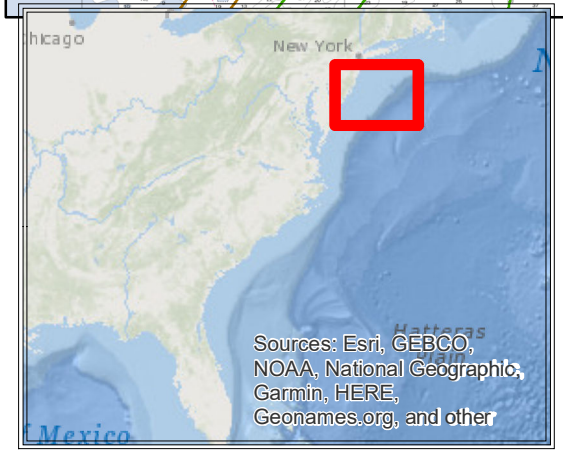
Type

- Deep Draft Lane
- Tug Tow Extension

F.3 **Including additional overlays, see Legend below.**

New Jersey PARS





0 5 10 20 30 40 Nautical Miles

1:1,600,000

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NAIS
Prepared by CG NAVCEN

Legend

- Wind Lease Areas
- Wind Planning Areas
- Anchorages

Passenger 2019

Value

- High Traffic Density
- Low Traffic Density

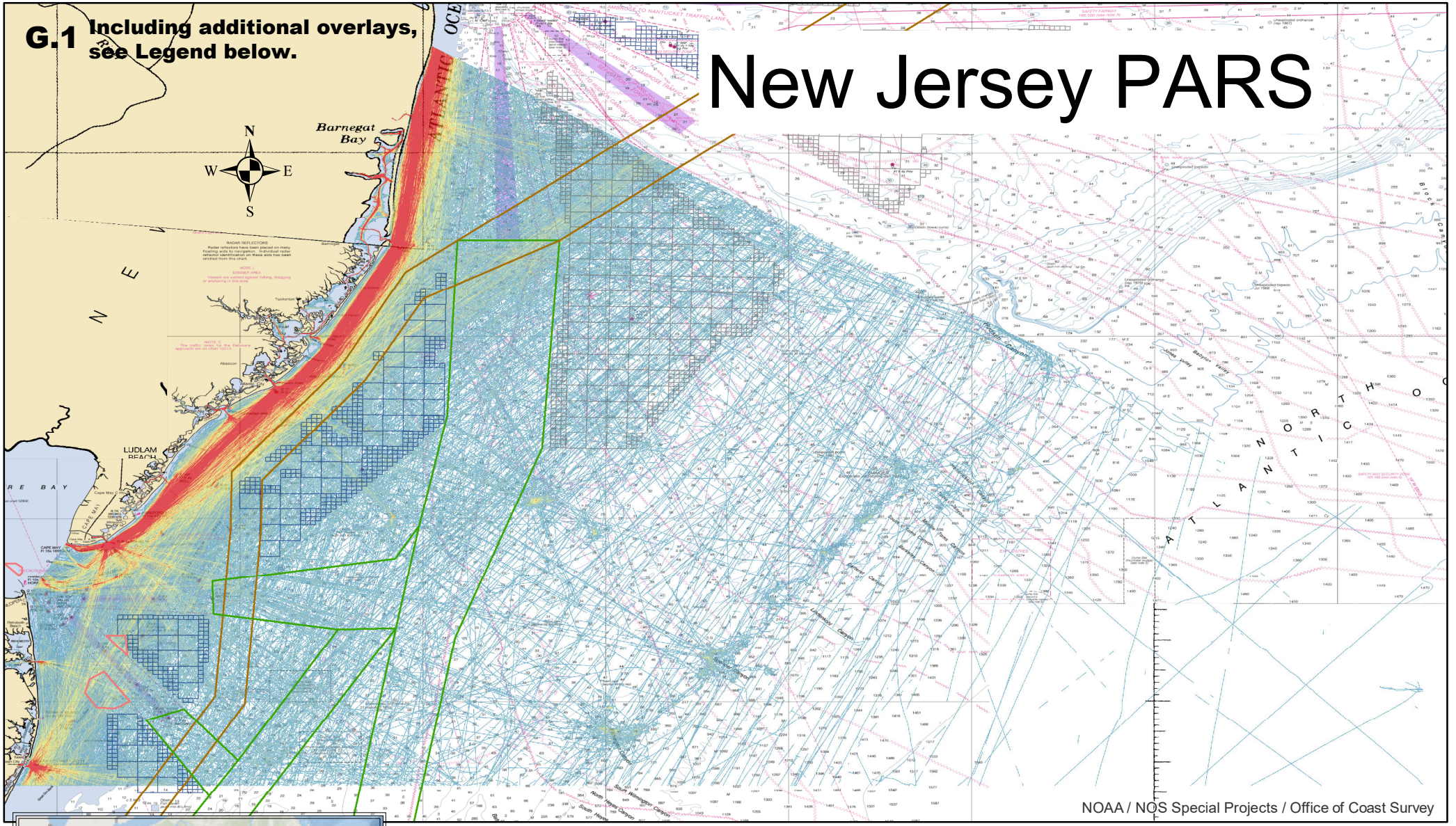
ACPARS Fairways

Type

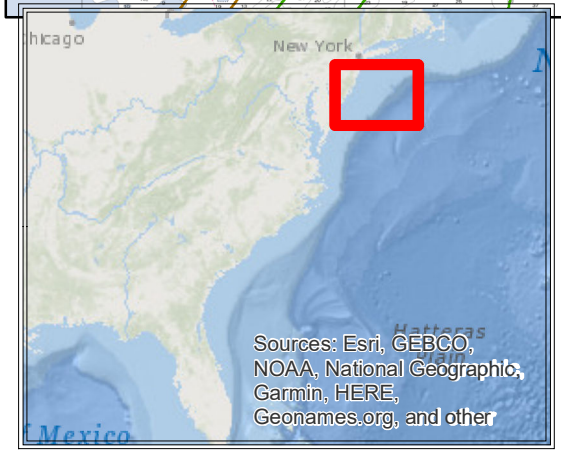
- Deep Draft Lane
- Tug Tow Extension

G.1 **Including additional overlays, see Legend below.**

New Jersey PARS



NOAA / NOS Special Projects / Office of Coast Survey



0 5 10 20 30 40 Nautical Miles

1:1,600,000

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NAIS
Prepared by CG NAVCEN

Legend

- Wind Lease Areas
- Wind Planning Areas
- Anchorages

Pleasure Craft 2017

Value

- High Traffic Density
- Low Traffic Density

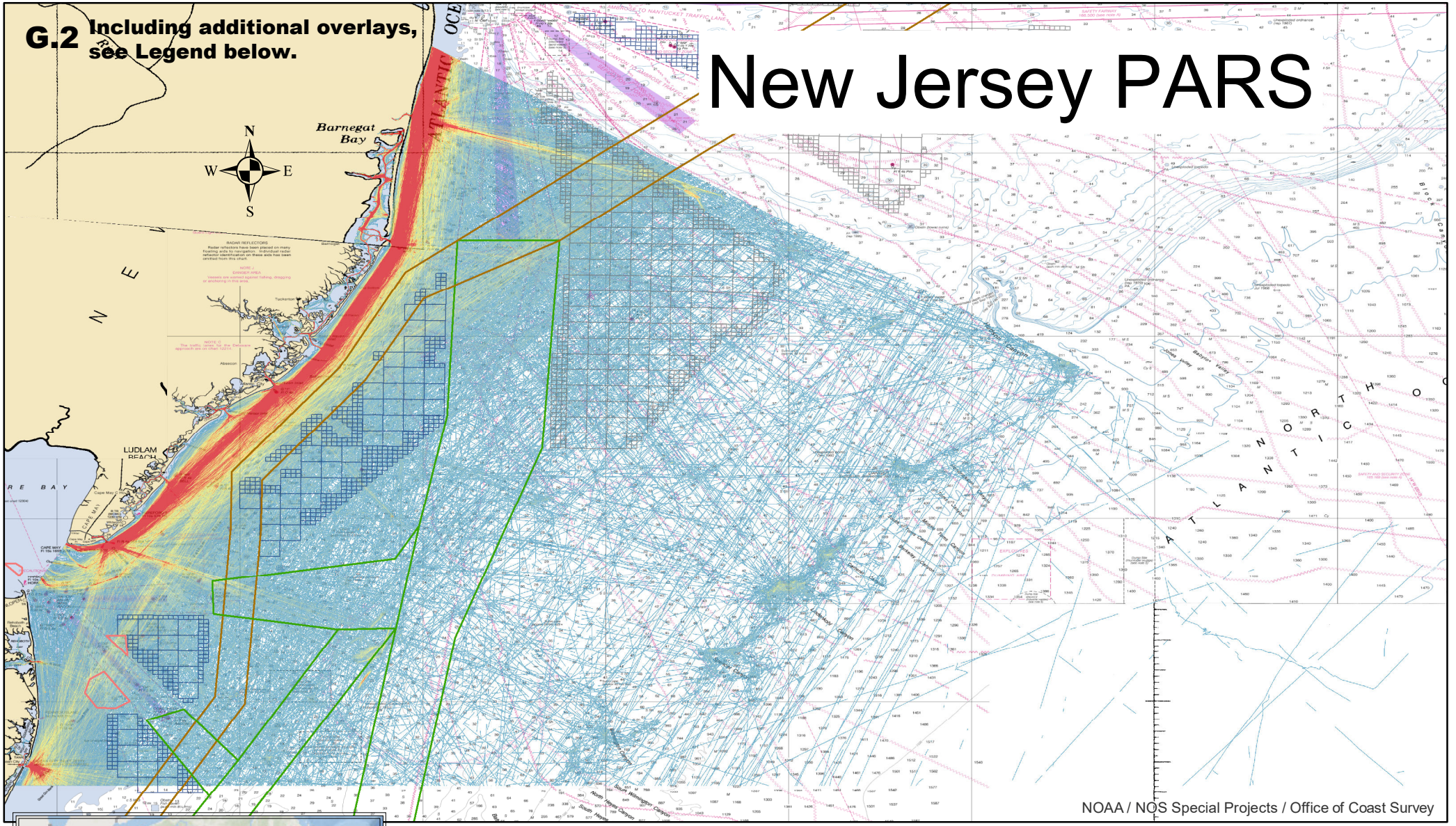
ACPARS Fairways

Type

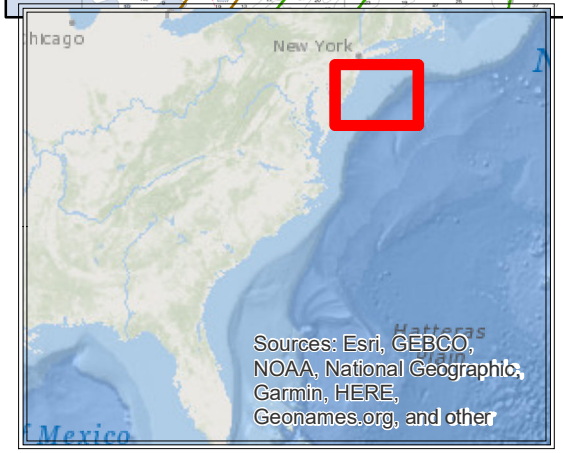
- Deep Draft Lane
- Tug Tow Extension

G.2 **Including additional overlays, see Legend below.**

New Jersey PARS



NOAA / NOS Special Projects / Office of Coast Survey



0 5 10 20 30 40 Nautical Miles

1:1,600,000

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NAIS
Prepared by CG NAVCEN

Legend

- Wind Lease Areas
- Wind Planning Areas
- Anchorages

Pleasure Craft 2018

Value

- High Traffic Density
- Low Traffic Density

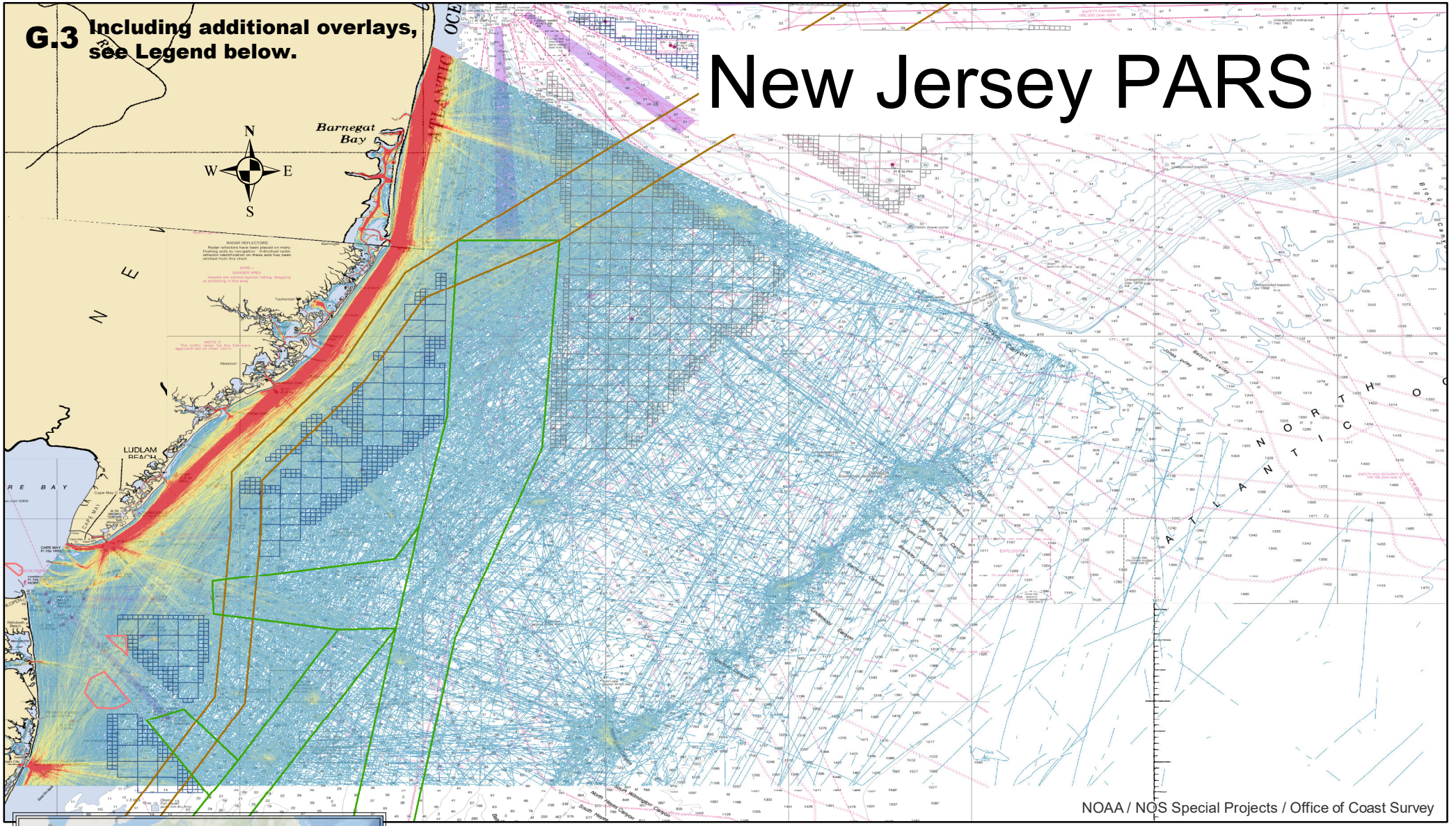
ACPARS Fairways

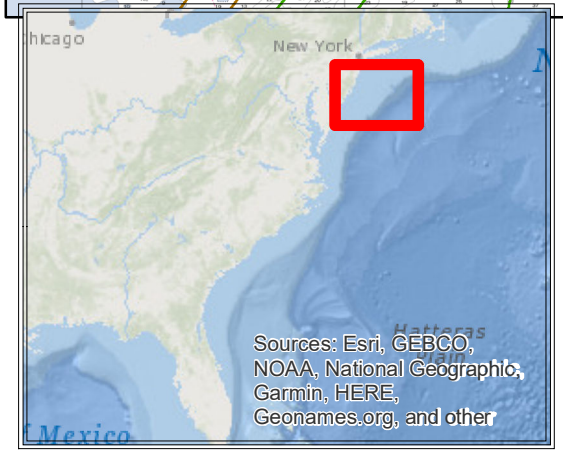
Type

- Deep Draft Lane
- Tug Tow Extension

G.3 **Including additional overlays, see Legend below.**

New Jersey PARS





0 5 10 20 30 40 Nautical Miles

1:1,600,000

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NAIS
Prepared by CG NAVCEN

Legend

- Wind Lease Areas
- Wind Planning Areas
- Anchorages

Pleasure Craft 2019

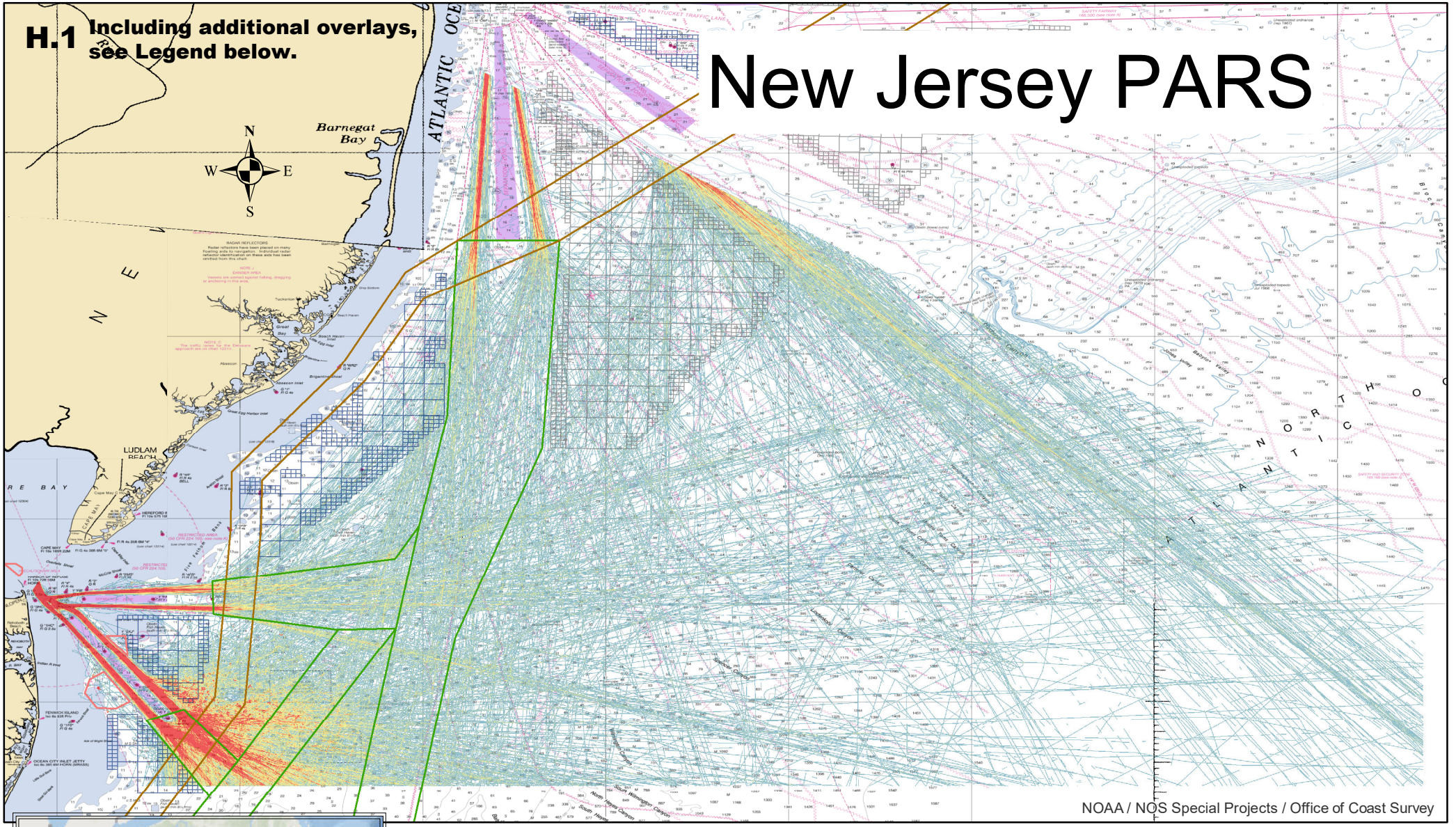
Value

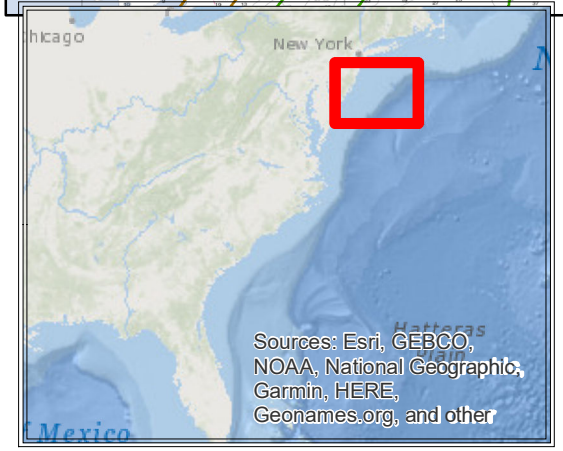
- High Traffic Density
- Low Traffic Density

ACPARS Fairways

Type

- Deep Draft Lane
- Tug Tow Extension





0 5 10 20 30 40 Nautical Miles

1:1,600,000

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NAIS
Prepared by CG NAVCEN

Legend

- Wind Lease Areas
- Wind Planning Areas
- Anchorages

Tanker 2017

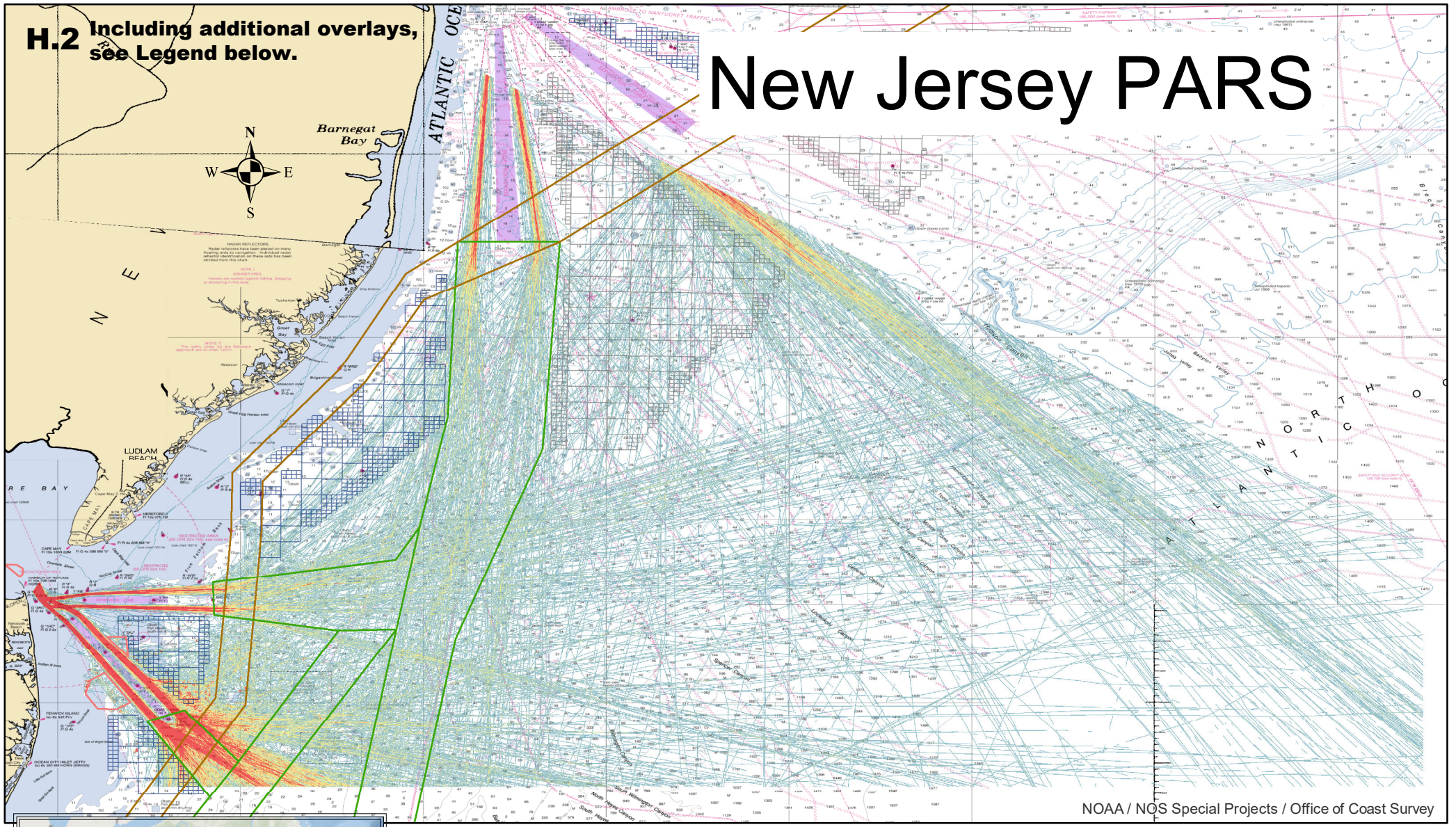
Value

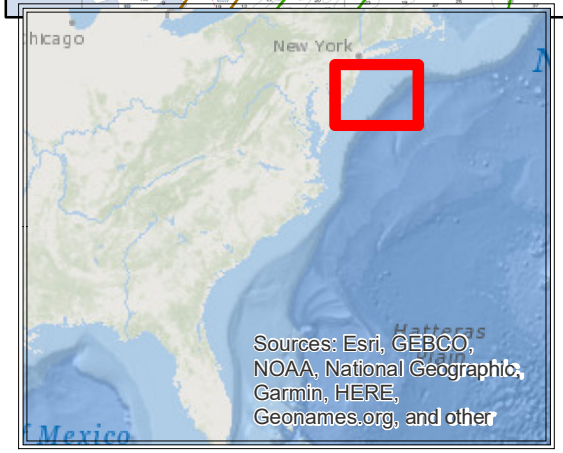
- High Traffic Density
- Low Traffic Density

ACPARS Fairways

Type

- Deep Draft Lane
- Tug Tow Extension





0 5 10 20 30 40 Nautical Miles

1:1,600,000

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NAIS
Prepared by CG NAVCEN

Legend

- Wind Lease Areas
- Wind Planning Areas
- Anchorages

Tanker 2018

Value

- High Traffic Density
- Low Traffic Density

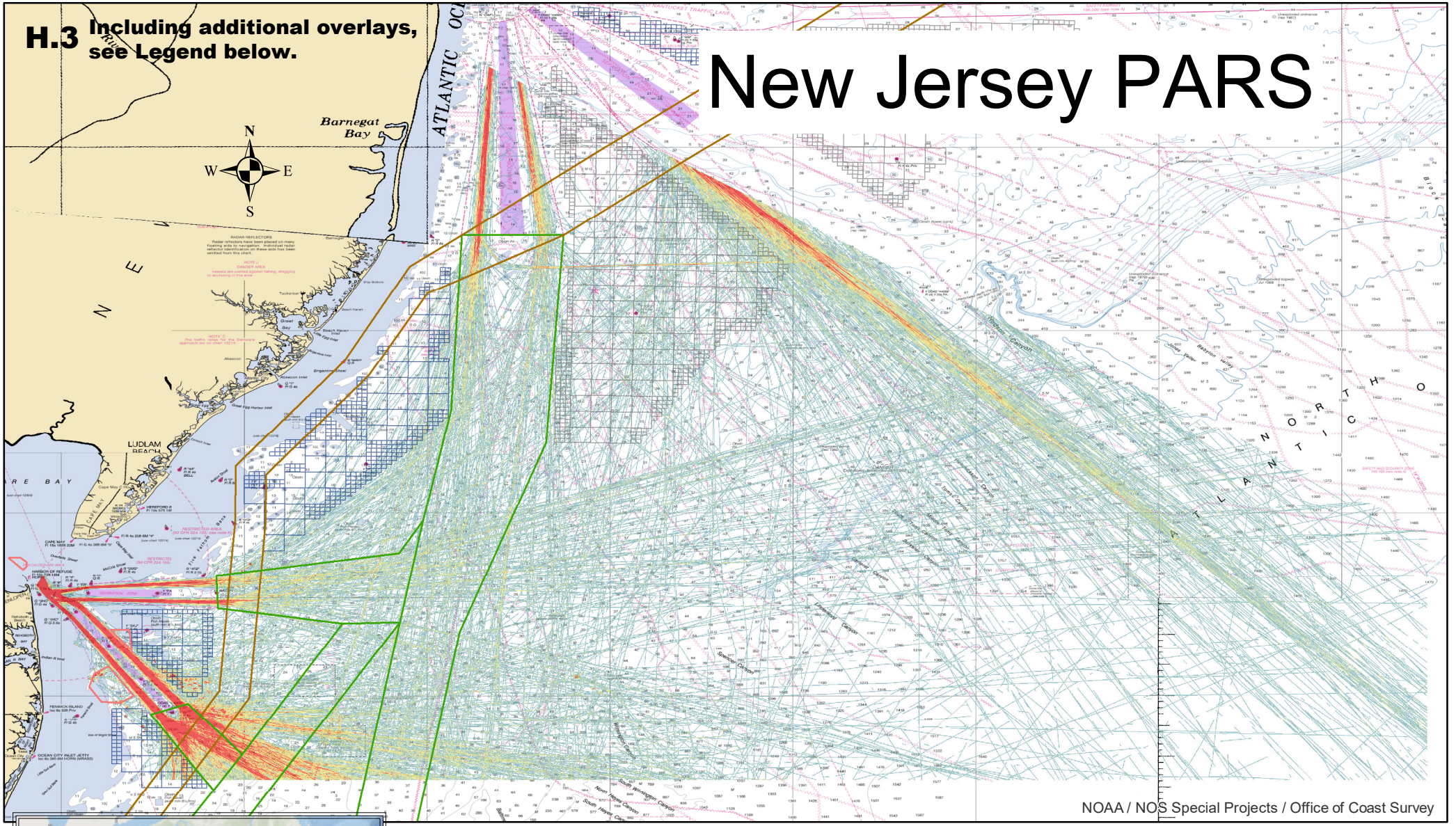
ACPARS Fairways

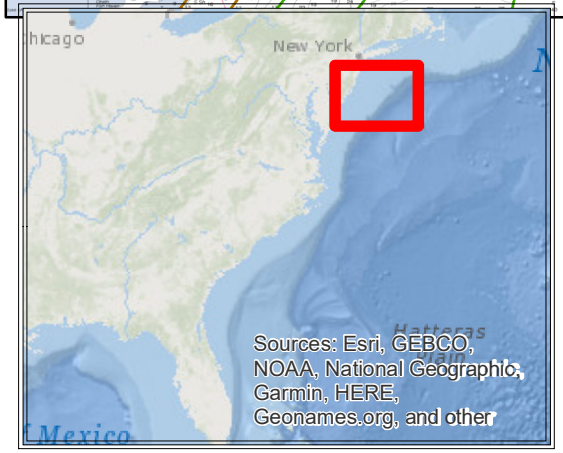
Type

- Deep Draft Lane
- Tug Tow Extension

H.3 **Including additional overlays, see Legend below.**

New Jersey PARS





0 5 10 20 30 40

Nautical Miles

1:1,600,000

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NAIS
Prepared by CG NAVCEN

Legend

- Wind Lease Areas
- Wind Planning Areas
- Anchorages

Tanker 2019

Value

- High Traffic Density
- Low Traffic Density

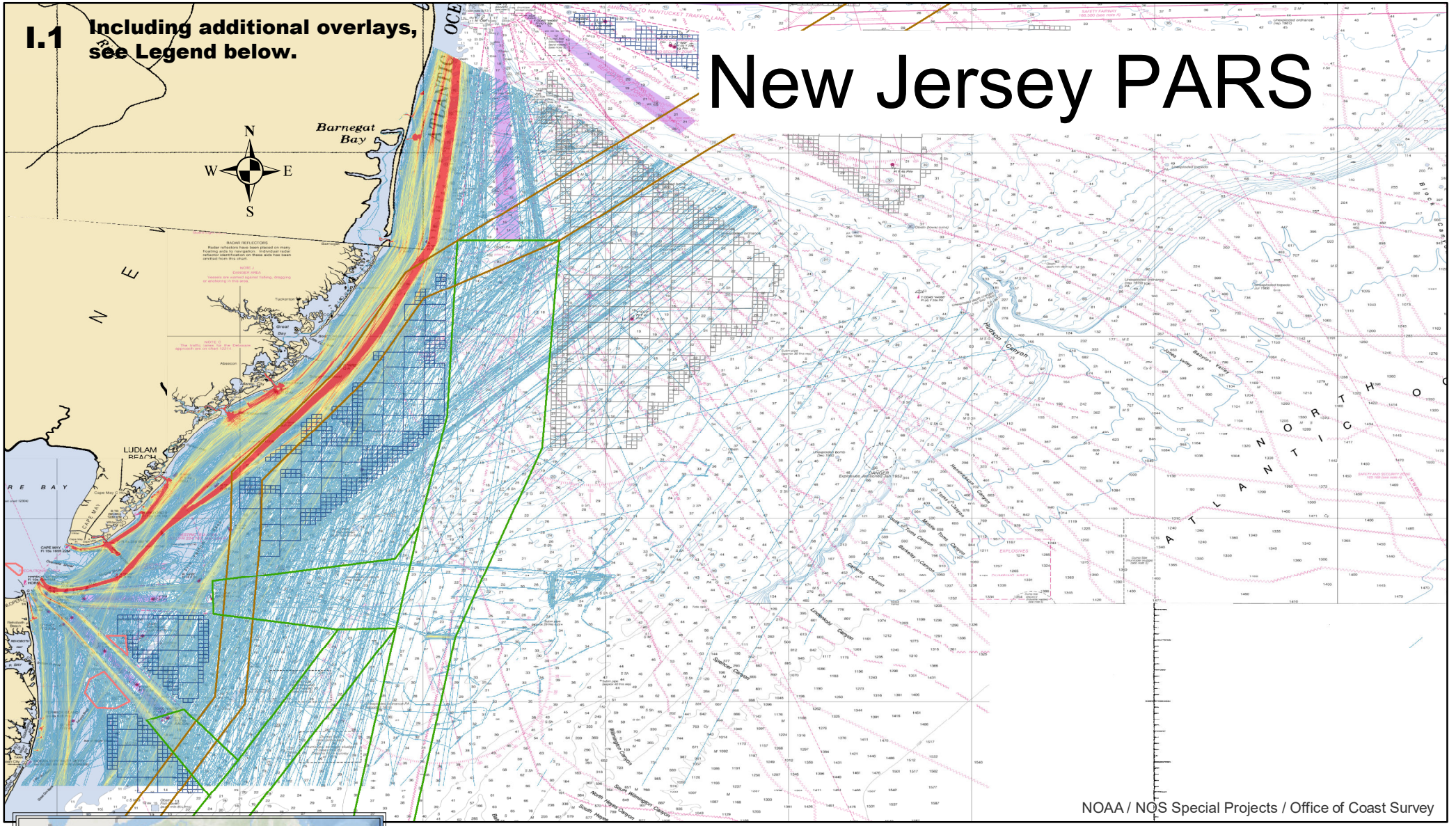
ACPARS Fairways

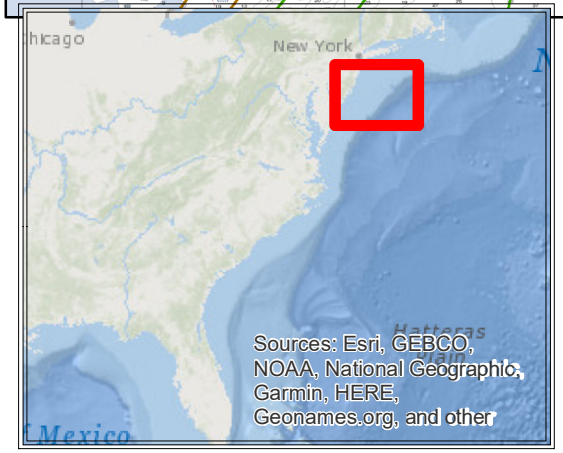
Type

- Deep Draft Lane
- Tug Tow Extension

I.1 **Including additional overlays, see Legend below.**

New Jersey PARS





0 5 10 20 30 40 Nautical Miles

1:1,600,000

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NAIS
Prepared by CG NAVCEN

Legend

- Wind Lease Areas
- Wind Planning Areas
- Anchorages

Tug Tow 2017

Value

- High Traffic Density
- Low Traffic Density

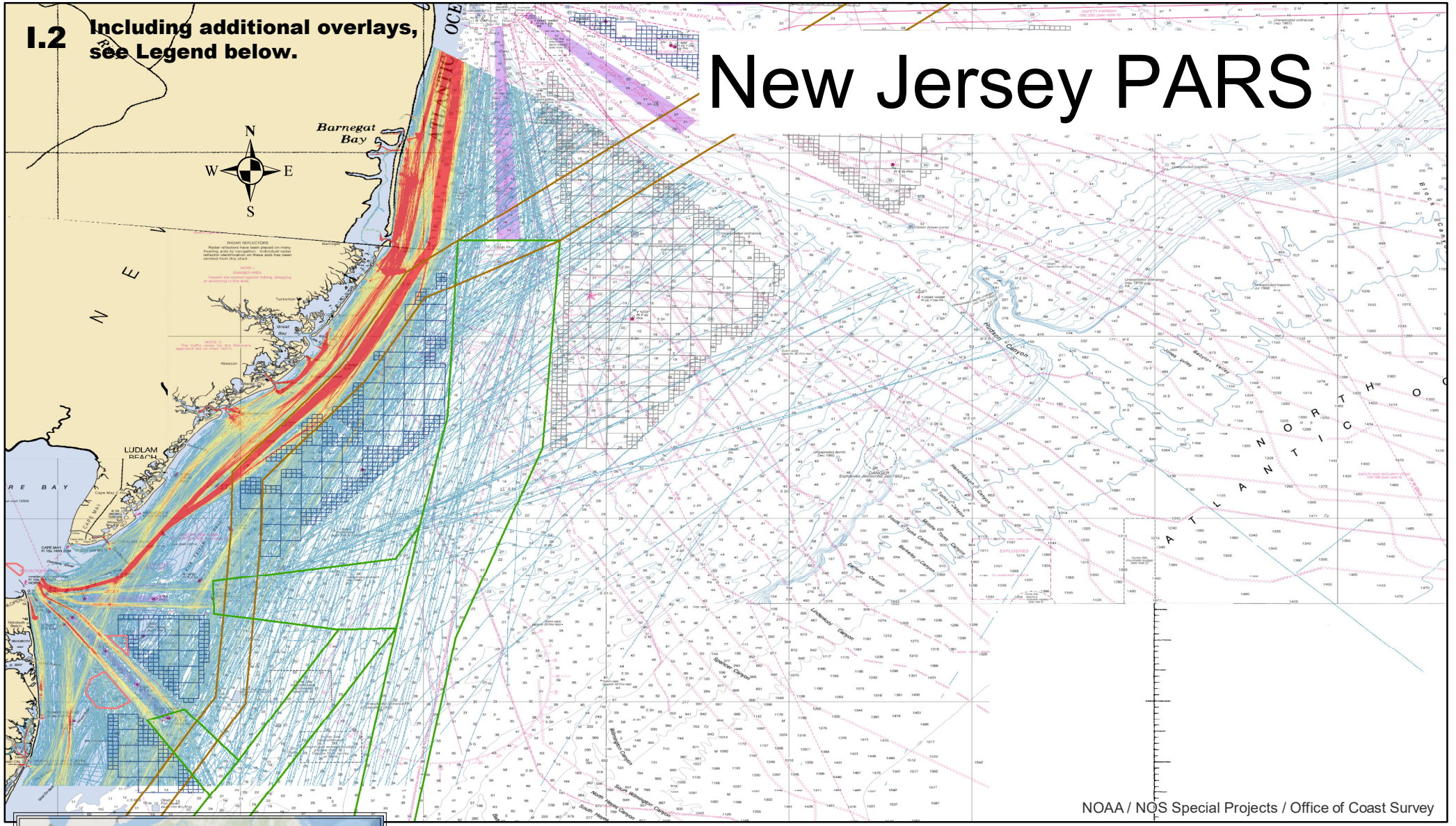
ACPARS Fairways

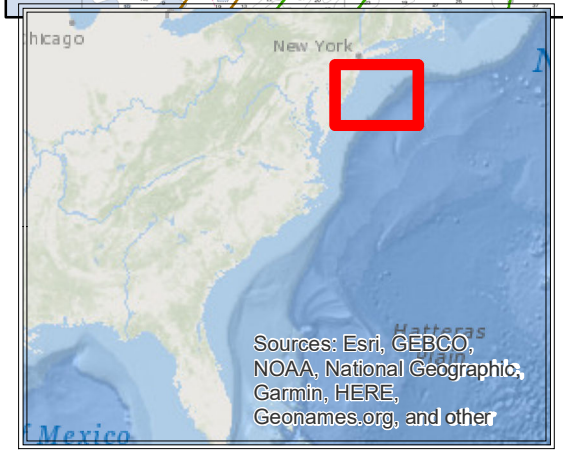
Type

- Deep Draft Lane
- Tug Tow Extension

I.2 **Including additional overlays, see Legend below.**

New Jersey PARS





0 5 10 20 30 40 Nautical Miles

1:1,600,000

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NAIS
Prepared by CG NAVCEN

Legend

- Wind Lease Areas
- Wind Planning Areas
- Anchorages

Tug Tow 2018

Value

- High Traffic Density
- Low Traffic Density

ACPARS Fairways

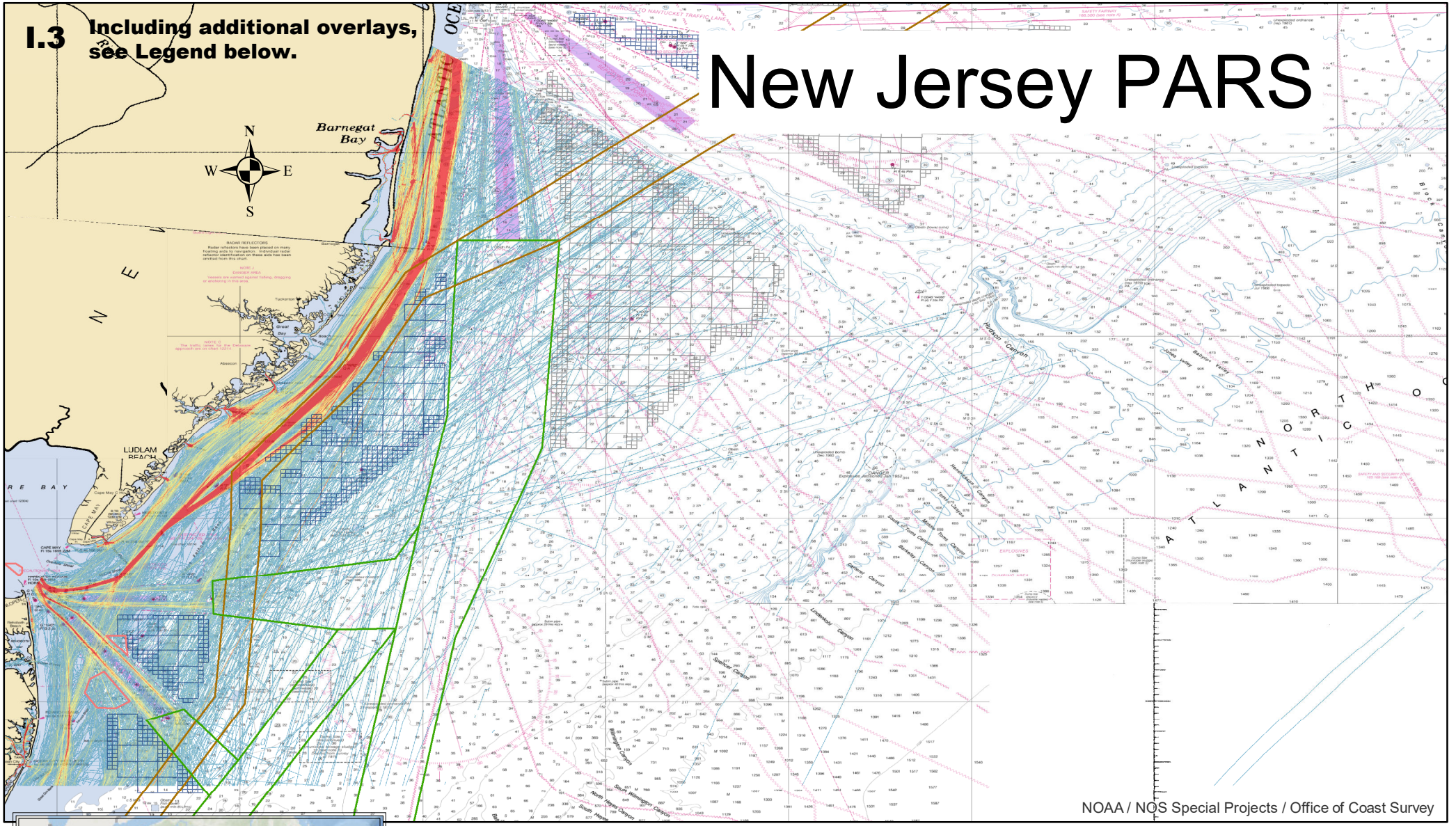
Type

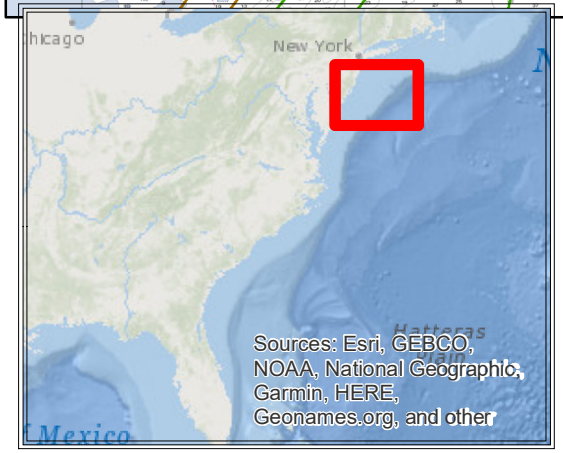
- Deep Draft Lane
- Tug Tow Extension

I.3

Including additional overlays, see Legend below.

New Jersey PARS





0 5 10 20 30 40

Nautical Miles

1:1,600,000

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NAIS
Prepared by CG NAVCEN

Legend

- Wind Lease Areas
- Wind Planning Areas
- Anchorages

Tug Tow 2019

Value

- High Traffic Density
- Low Traffic Density

ACPARS Fairways

Type

- Deep Draft Lane
- Tug Tow Extension

Addendum 1 to this Traffic Summary for the NJ PARS– NJ PARS Anchorage Analysis

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Proposed Anchorages Overview

An overview of the proposed anchorages in the NJ PARS study area is shown in Figure 1. Vessel traffic in these proposed anchorages as well as the traffic that is presumed to have anchored in the NJ PARS study area were analyzed using IWRAP, The International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) accepted risk analysis software.

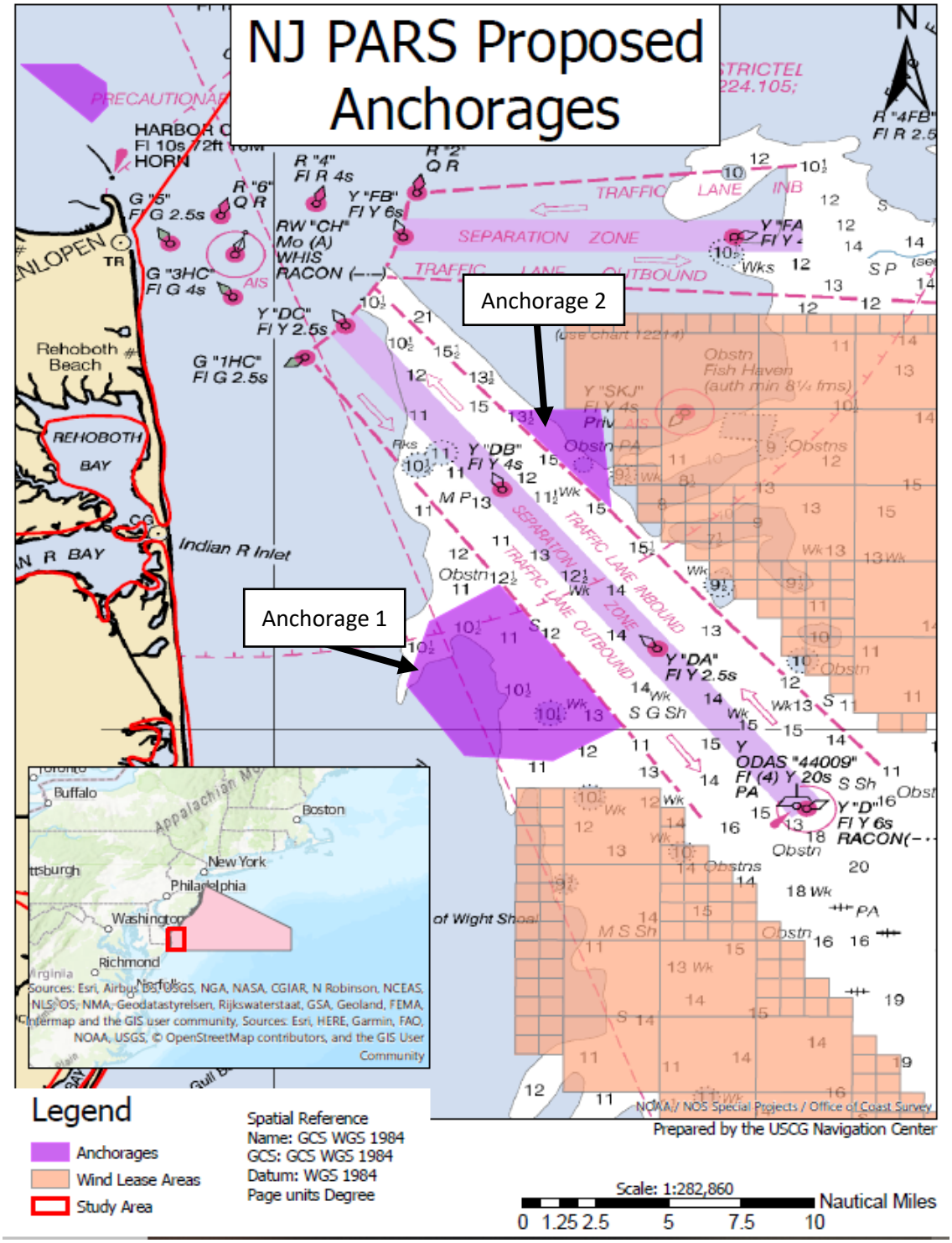

Figure 1: Anchorages Overview

Anchoring Activity in Study Area

To analyze the anchoring activity in the study area, heatmaps using vessel location data were created. The heatmaps are displayed in a blue to yellow to red scale, with red being the areas reflecting the greatest density of data. Vessel data was also filtered to display only vessels traveling at speeds of 0-1 nm/h to ensure only vessels travelling at very slow speeds or stopped were taken into account in these heatmaps. For these reasons, the large vessels such as cargo and tank ships reflected in the heatmaps are presumed to be anchored in the NJ PARS study area.

Figure 2 shows a count of how many unique vessels (determined by unique MMSI number) of each type were used to create the heatmaps in 2017-2019. All vessels are shown in Figure 3-Figure 14, while Figure 15-Figure 20 show only cargo ships and Figure 21-Figure 26 show only tank ships. For example, Figure 3-Figure 6 show information from all 3,562 vessels in 2019, while Figure 15 & Figure 16 show the information for the 416 cargo ships found by the filter in 2019. One set of figures is provided showing the AC PARS fairways, and one set without the fairways for all vessels, cargo ships, and tanks ships for each year. In addition to the proposed anchorages the wind lease areas are also displayed. Wind planning areas are not shown. The study area, wind areas, anchorages, and fairways are only labelled in Figure 3 but are reflected similarly in all the heatmaps.

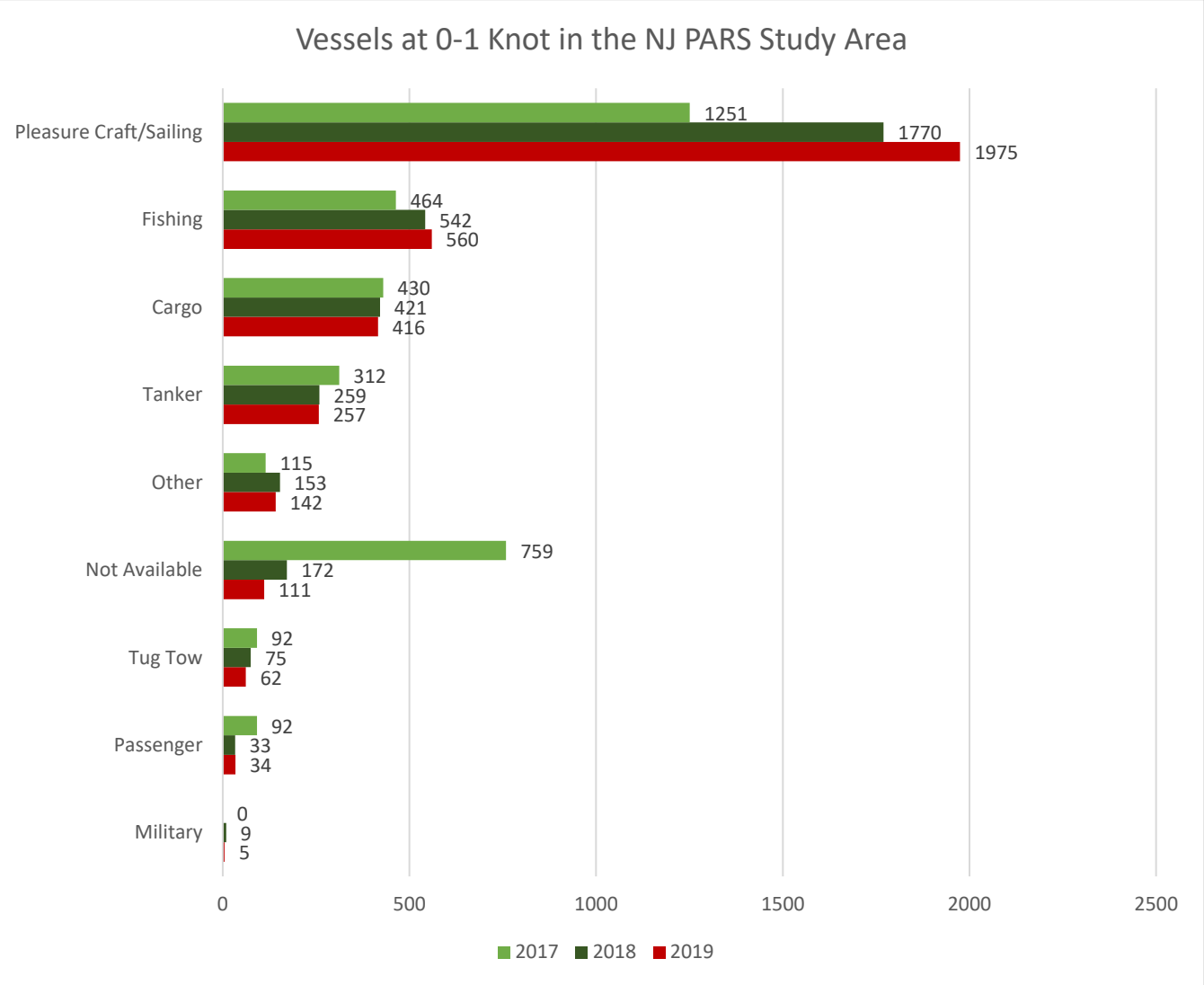

Figure 2: Vessel Types with 0-1 Knot Filer, 2017-2019

All Vessels – 2019

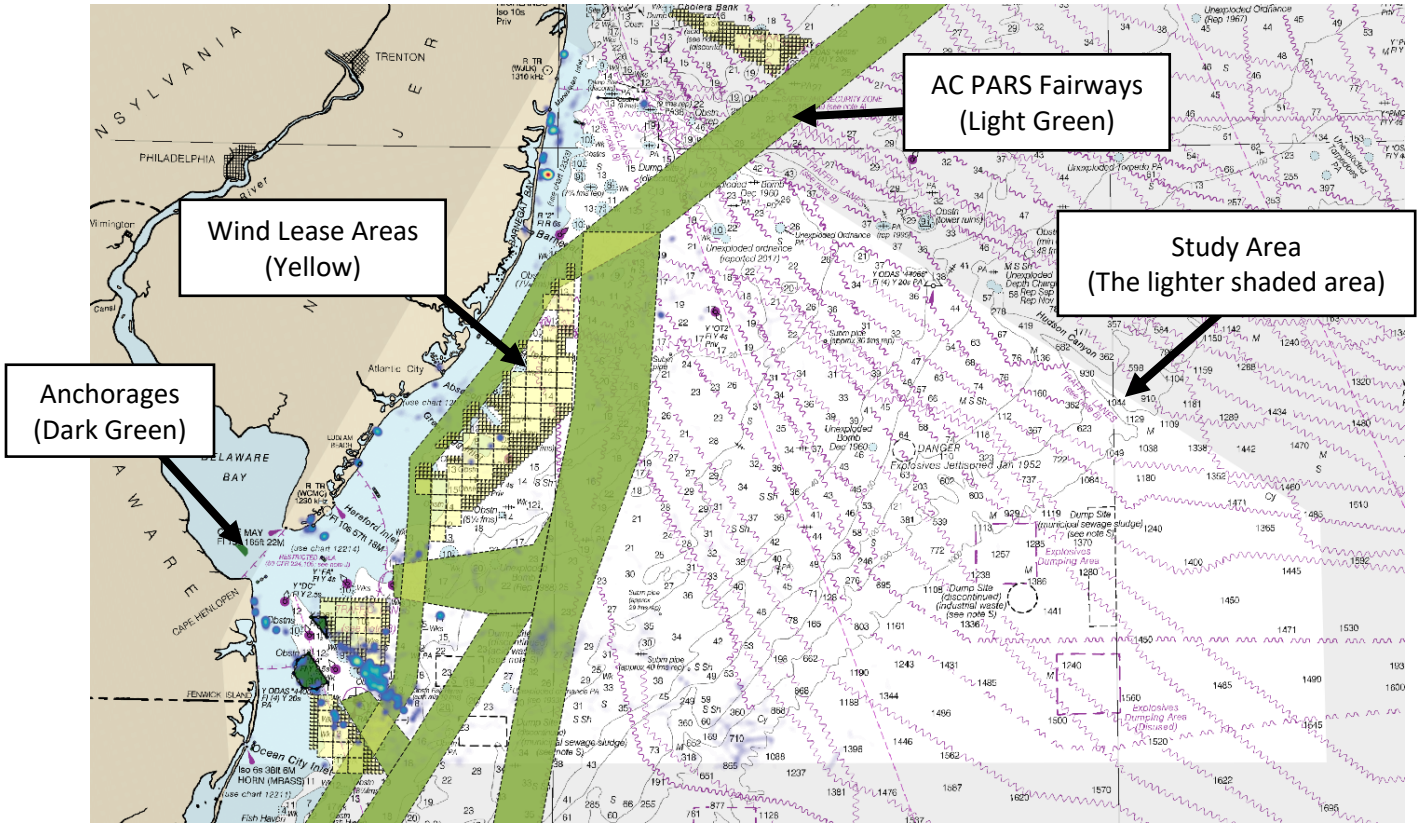

Figure 3: All Vessels Heatmap - 0-1 Knot Filter, Small Scale with Fairways, 2019

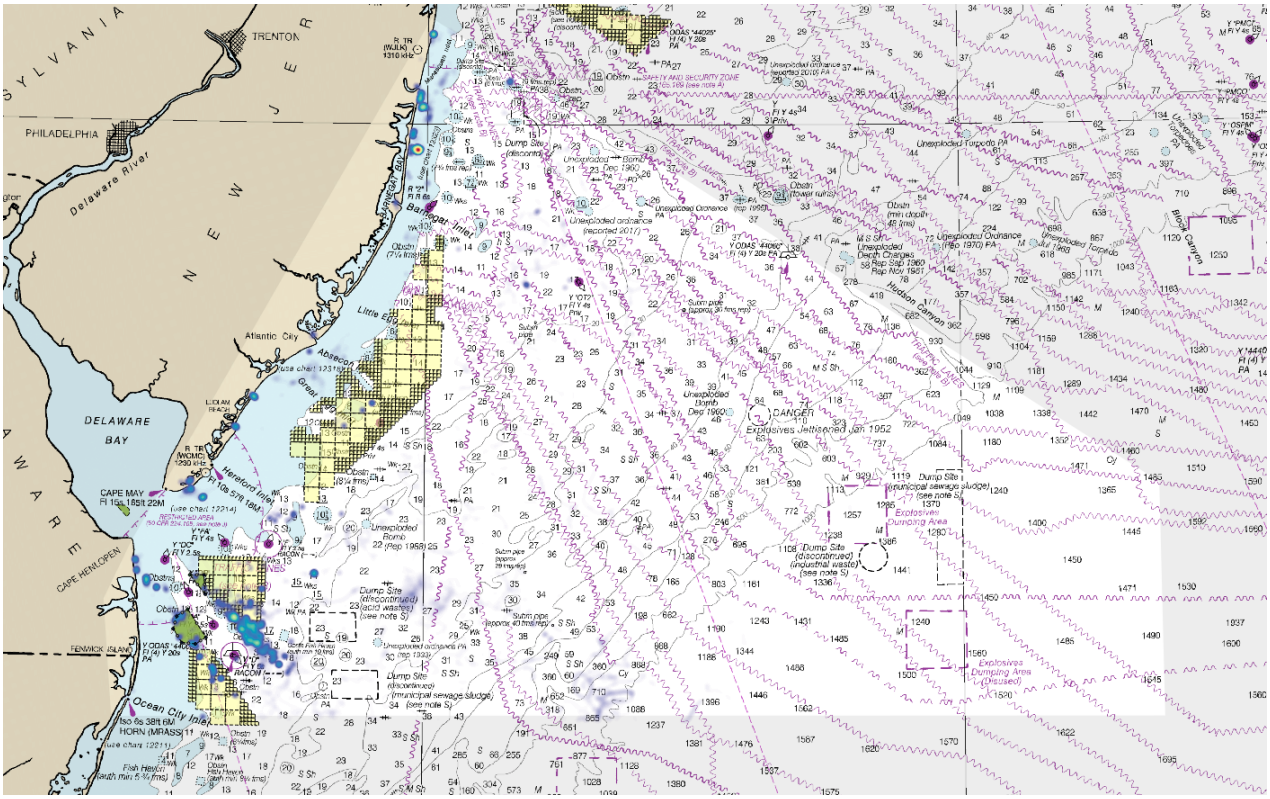

Figure 4: All Vessels Heatmap - 0-1 Knot Filter, Small Scale Without Fairways, 2019

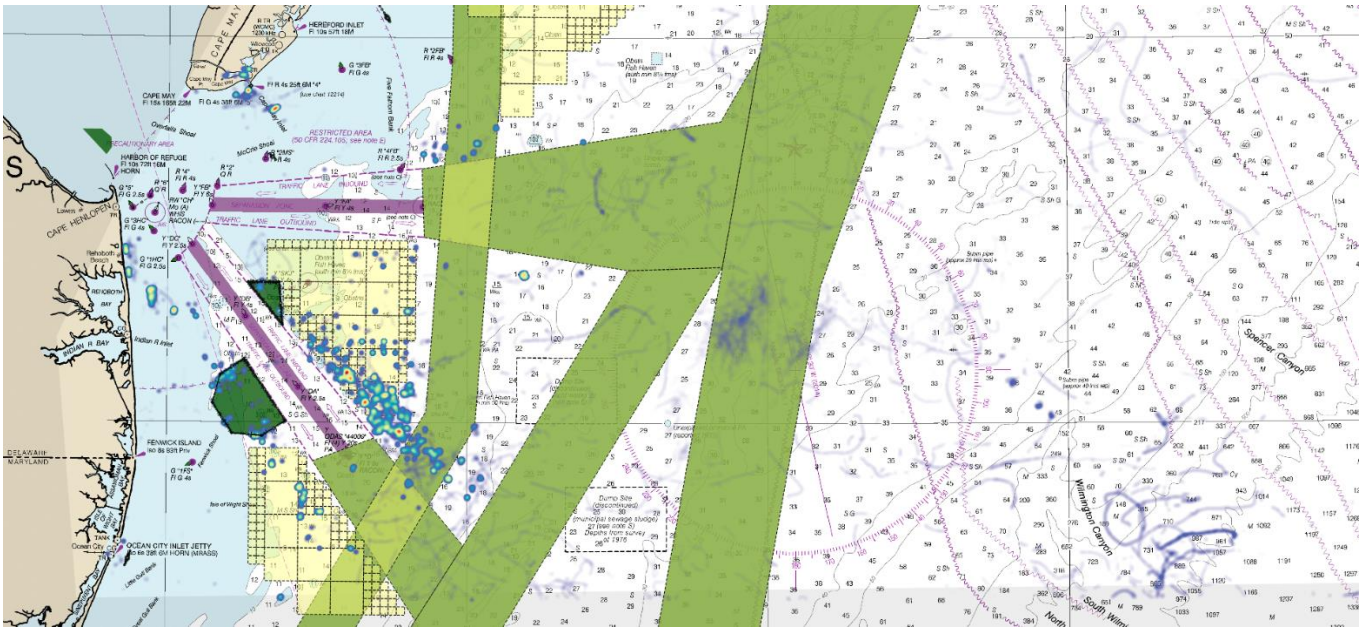

Figure 5: All Vessels Heatmap - 0-1 Knot Filter, Large Scale With Fairways, 2019

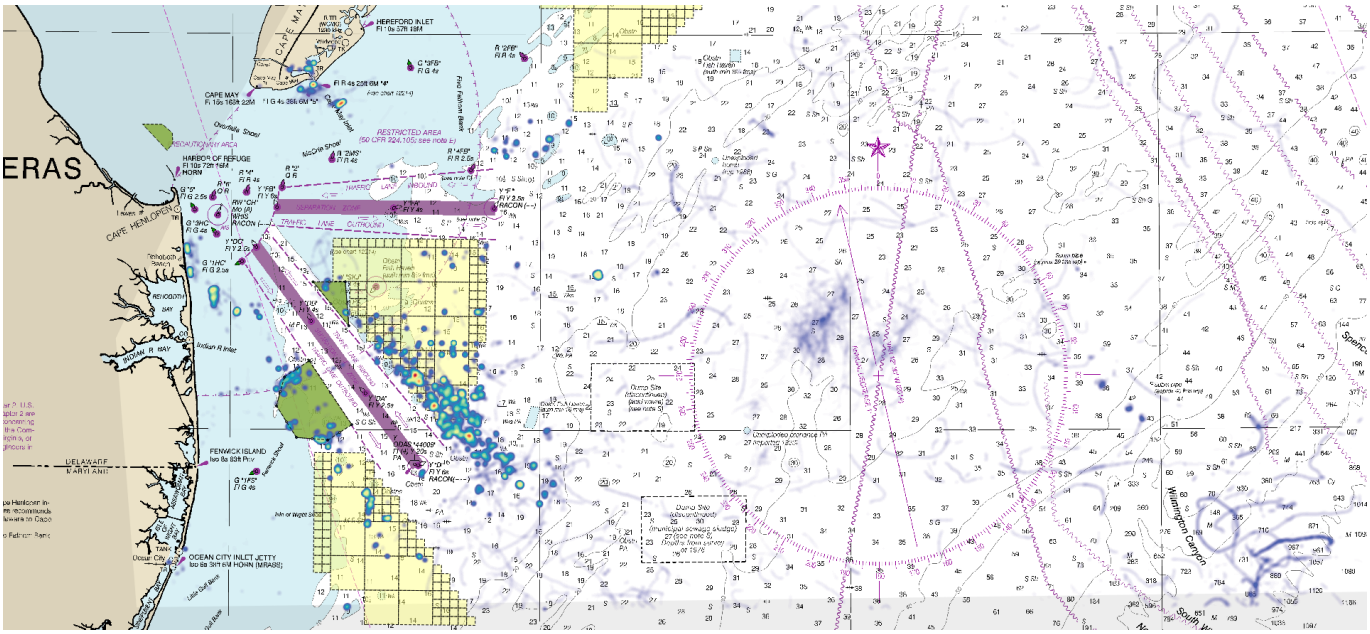

Figure 6: All Vessels Heatmap - 0-1 Knot Filter, Large Scale Without Fairways, 2019

All Vessels – 2018

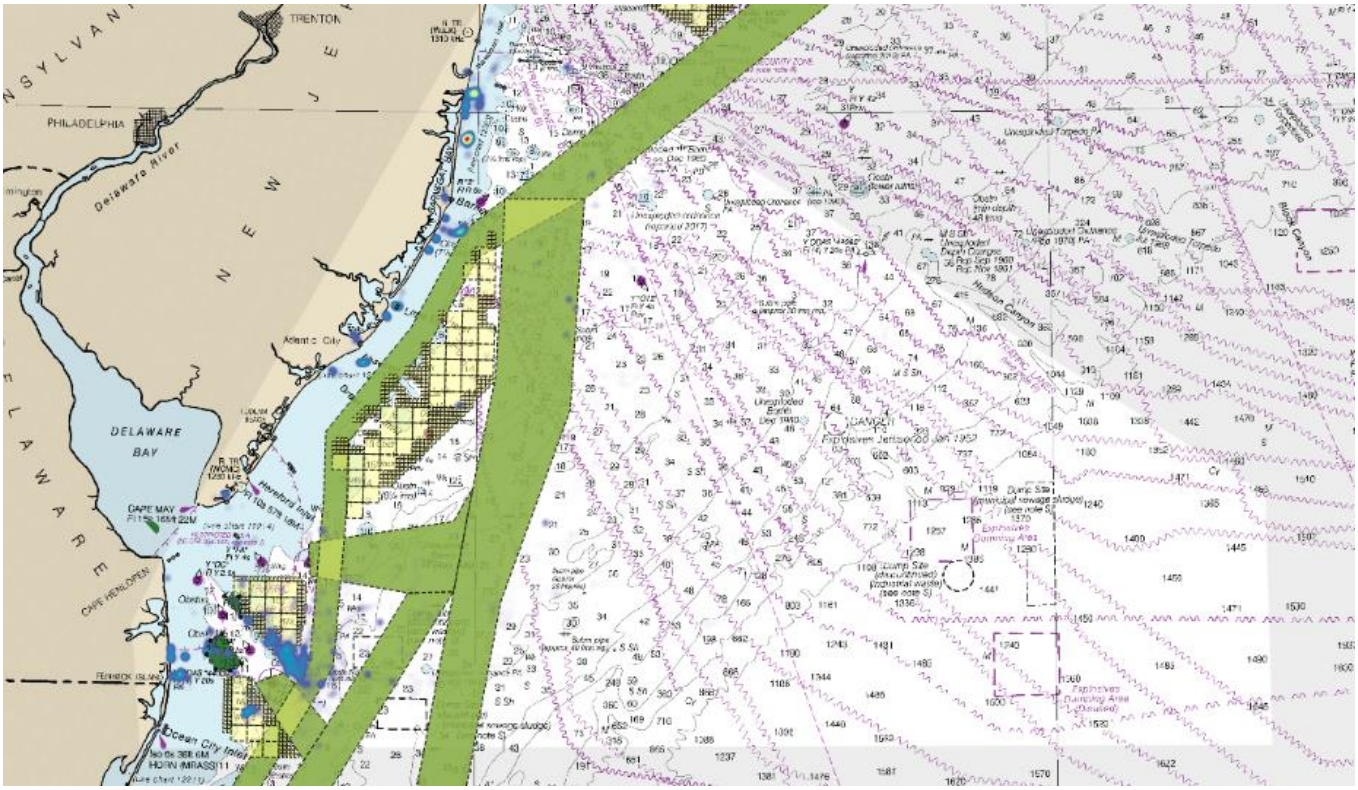

Figure 7: All Vessels Heatmap - 0-1 Knot Filter, Small Scale with Fairways, 2018

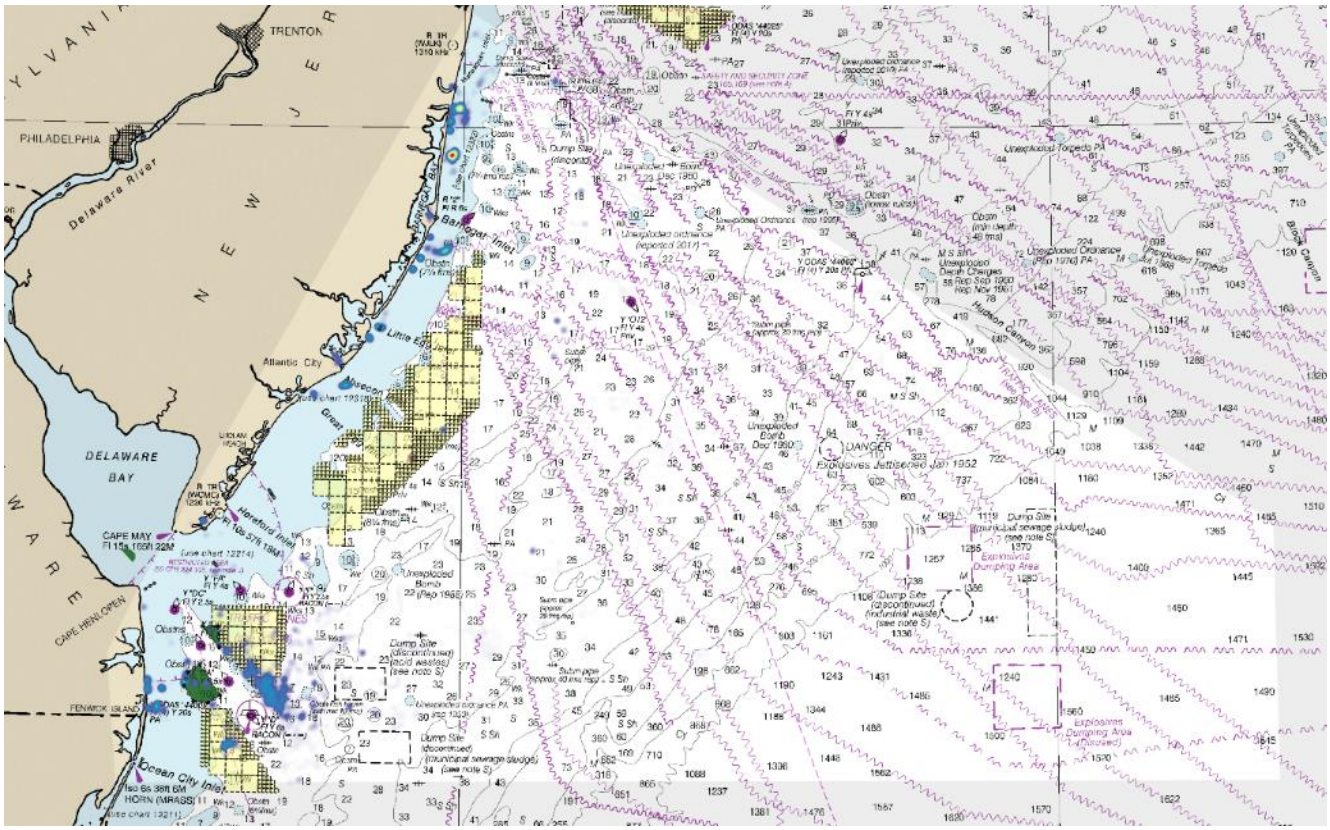

Figure 8: All Vessels Heatmap - 0-1 Knot Filter, Small Scale Without Fairways, 2018

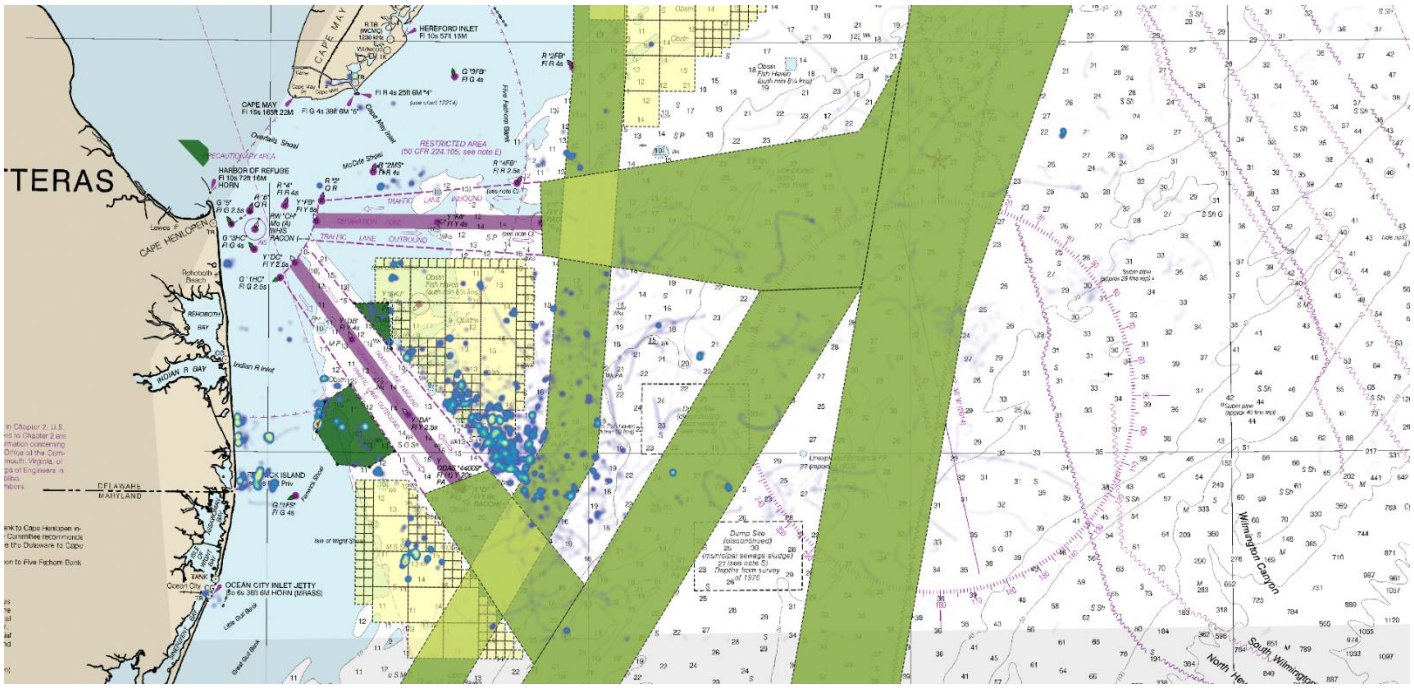

Figure 9: All Vessels Heatmap - 0-1 Knot Filter, Large Scale with Fairways, 2018

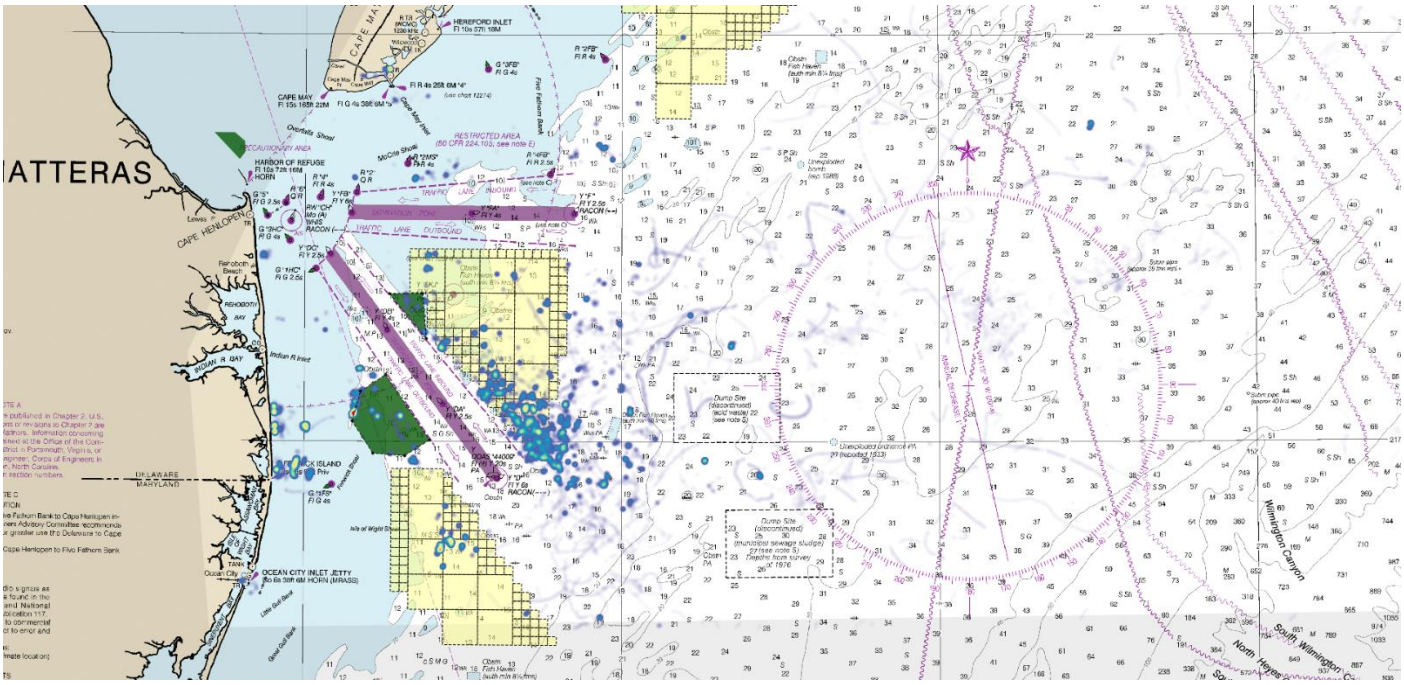

Figure 10: All Vessels Heatmap - 0-1 Knot Filter, Large Scale without Fairways, 2018

All Vessels – 2017

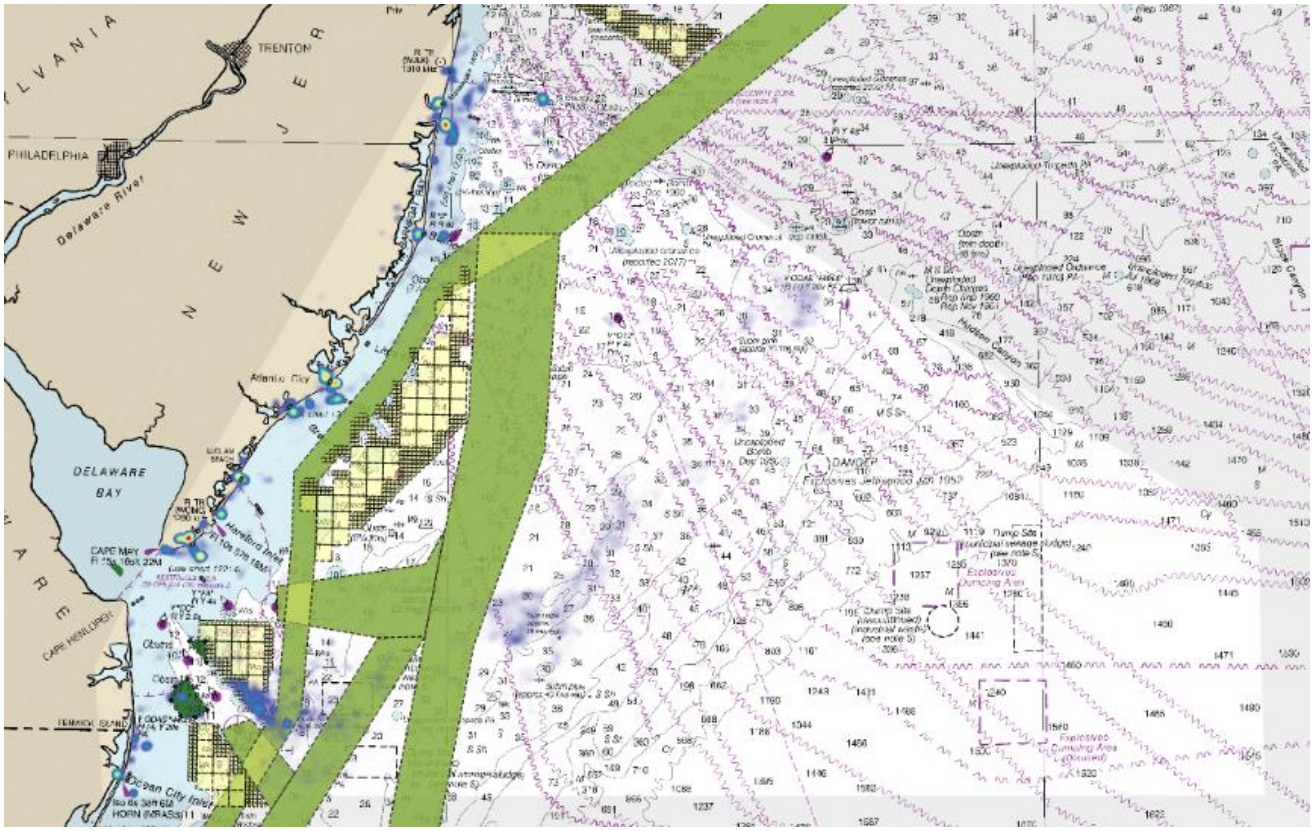

Figure 11: All Vessels Heatmap - 0-1 Knot Filter, Small Scale with Fairways, 2017

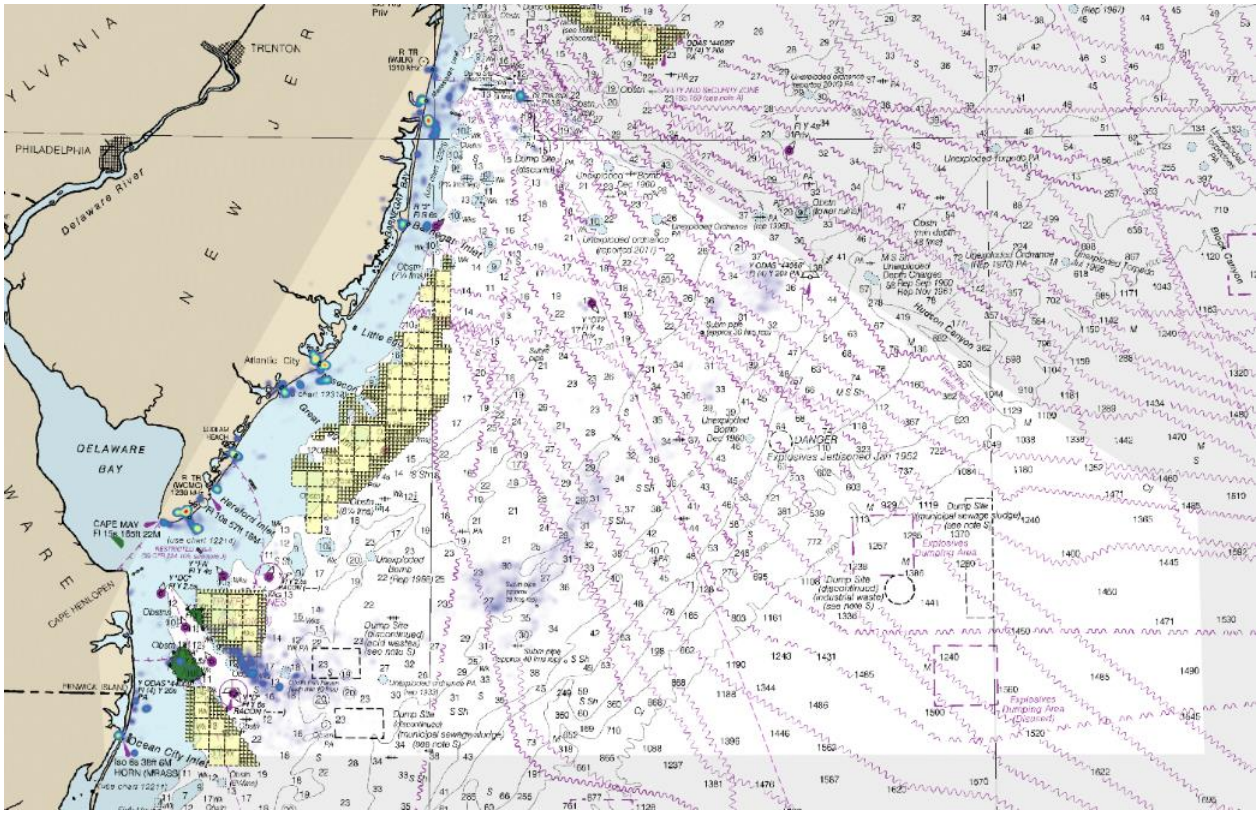

Figure 12: All Vessels Heatmap - 0-1 Knot Filter, Small Scale Without Fairways, 2017

Figure 13: All Vessels Heatmap - 0-1 Knot Filter, Large Scale with Fairways, 2017

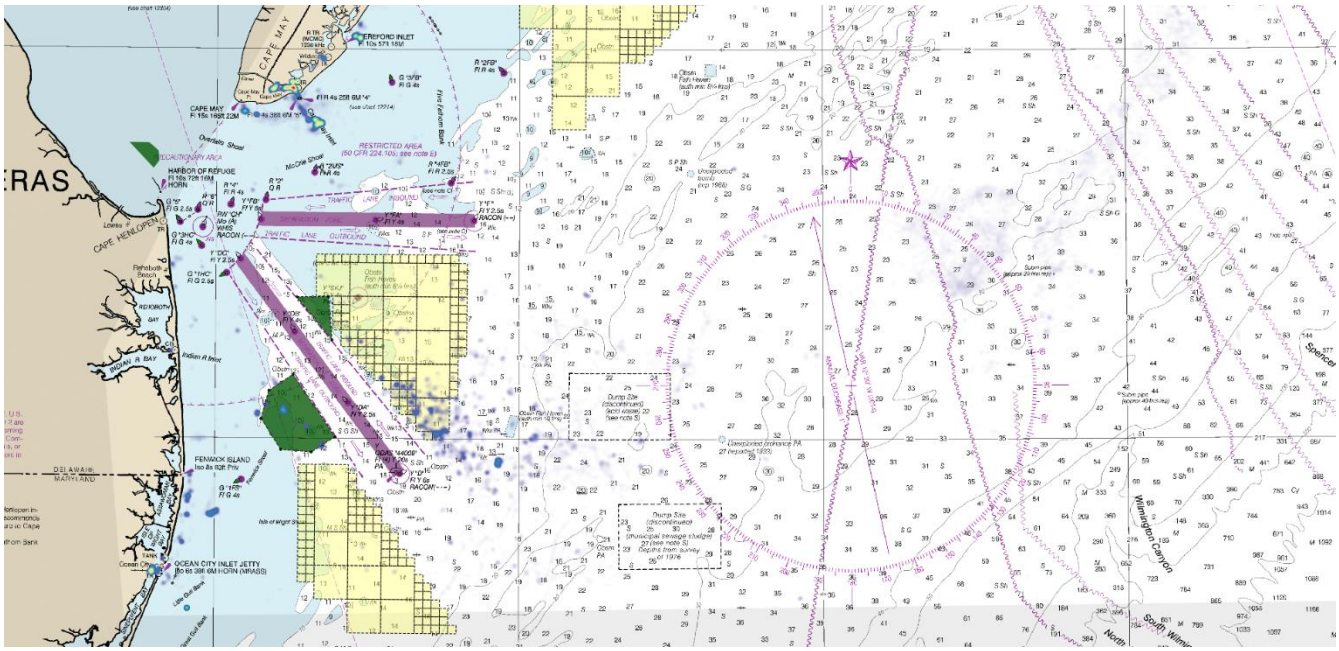

Figure 14: All Vessels Heatmap - 0-1 Knot Filter, Large Scale without Fairways, 2017

Cargo Ships- 2019

The cargo ships reflected in Figure 15 and Figure 16 are listed by MMSI, IMO number, and Vessel Name in Attachment 1; this information originated from the NAIS Data.

Figure 15: Cargo Ships Heatmap - 0-1 Knot Filter, With Fairways, 2019

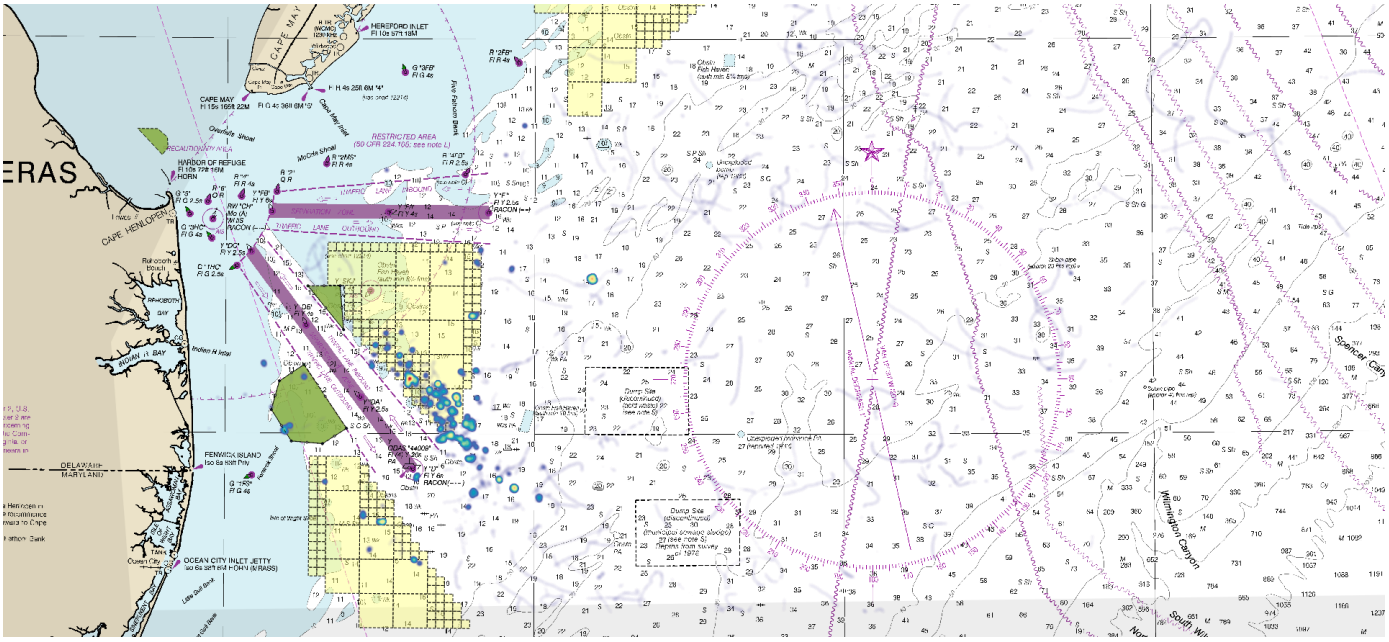

Figure 16: Cargo Ships Heatmap - 0-1 Knot Filter, Without Fairways, 2019

Cargo Ships – 2018

The cargo ships reflected in Figure 17 and Figure 18 are listed by MMSI, IMO number, and Vessel Name in Attachment 3; this information originated from the NAIS Data.

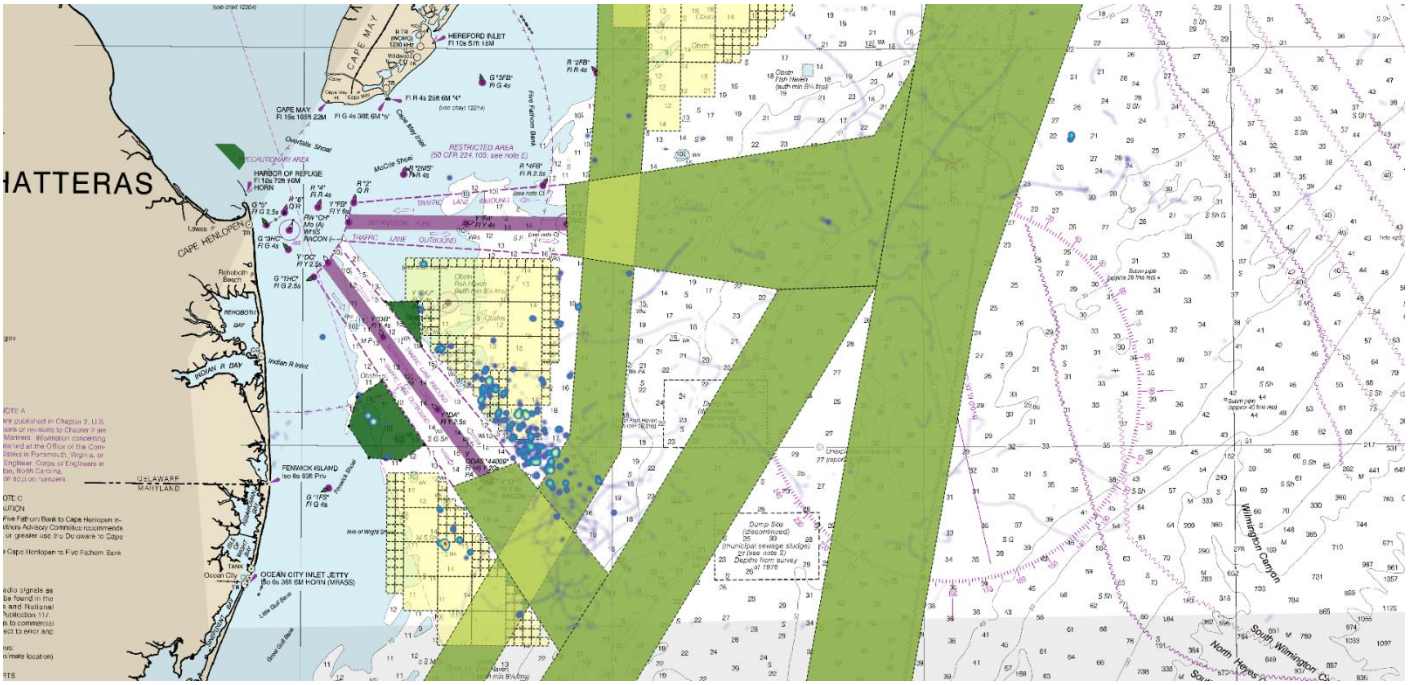

Figure 17: Cargo Ships Heatmap - 0-1 Knot Filter, With Fairways, 2018

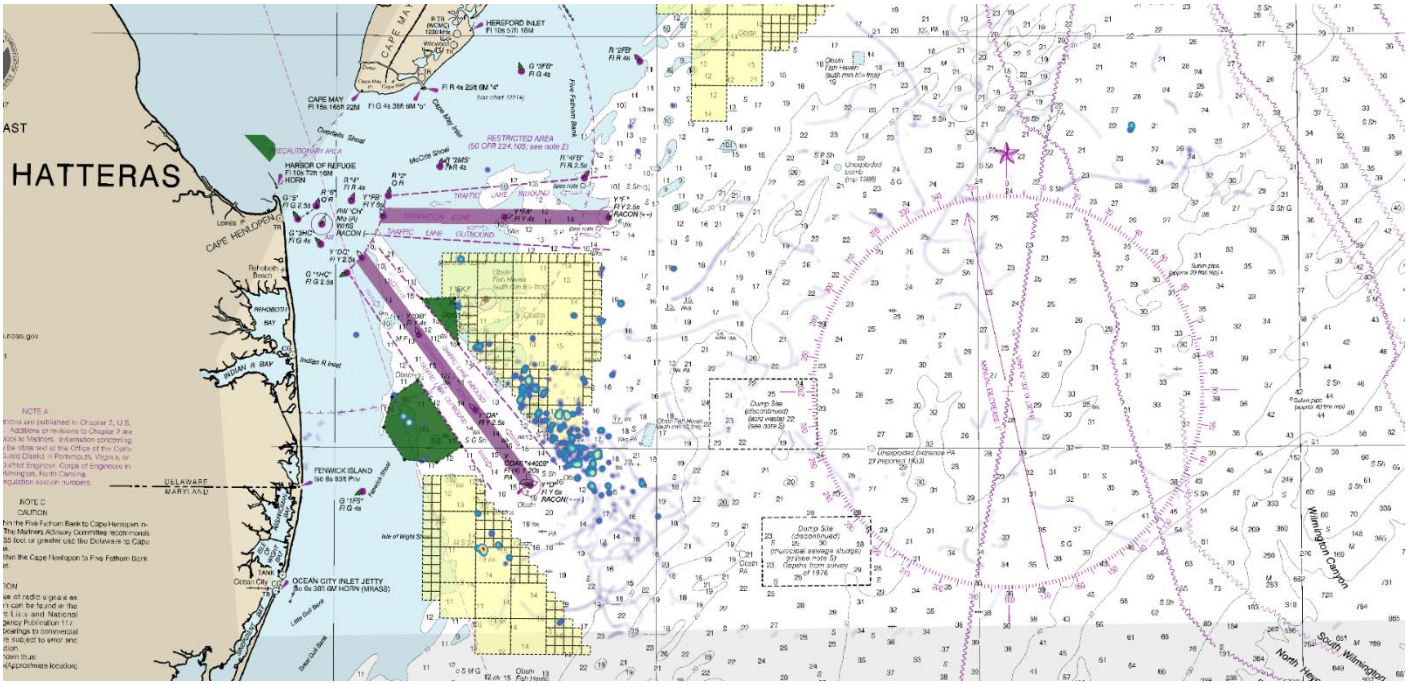

Figure 18: Cargo Ships Heatmap - 0-1 Knot Filter, Without Fairways, 2018

Cargo Ships – 2017

The cargo ships reflected in Figure 19 or Figure 20 are listed by MMSI and Vessel Name in Attachment 5; this information originated from the NAIS Data.

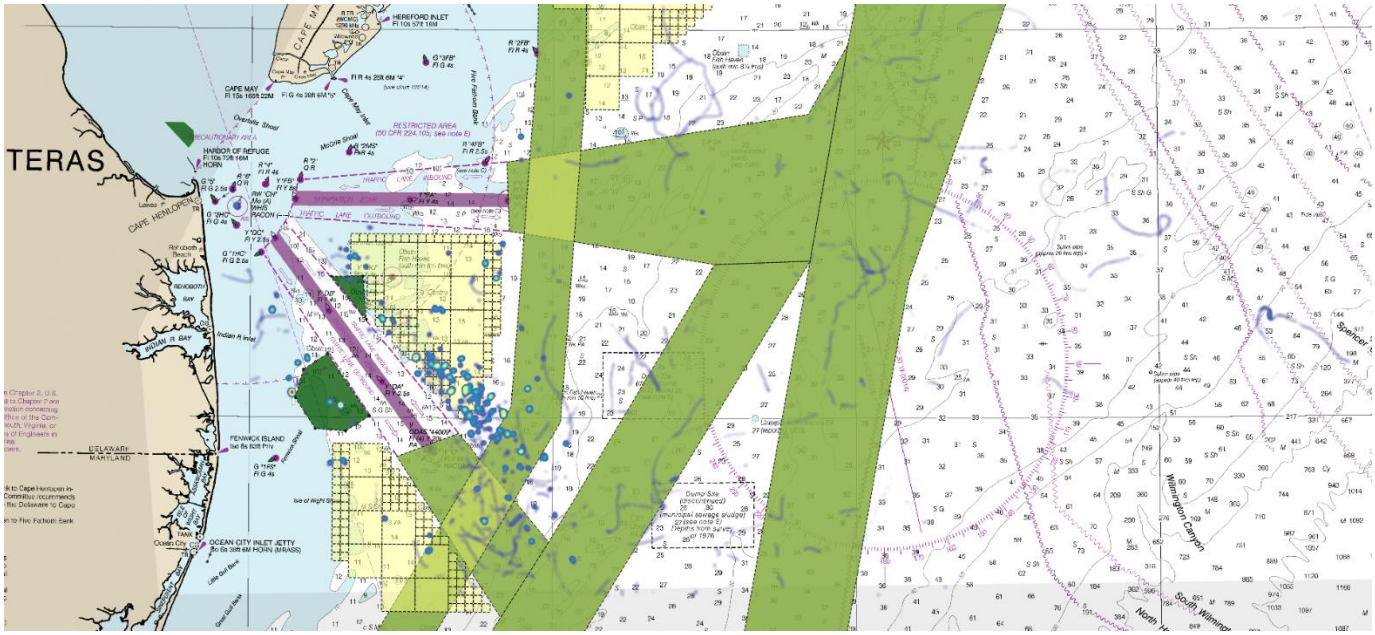

Figure 19: Cargo Ships Heatmap - 0-1 Knot Filter, With Fairways, 2017

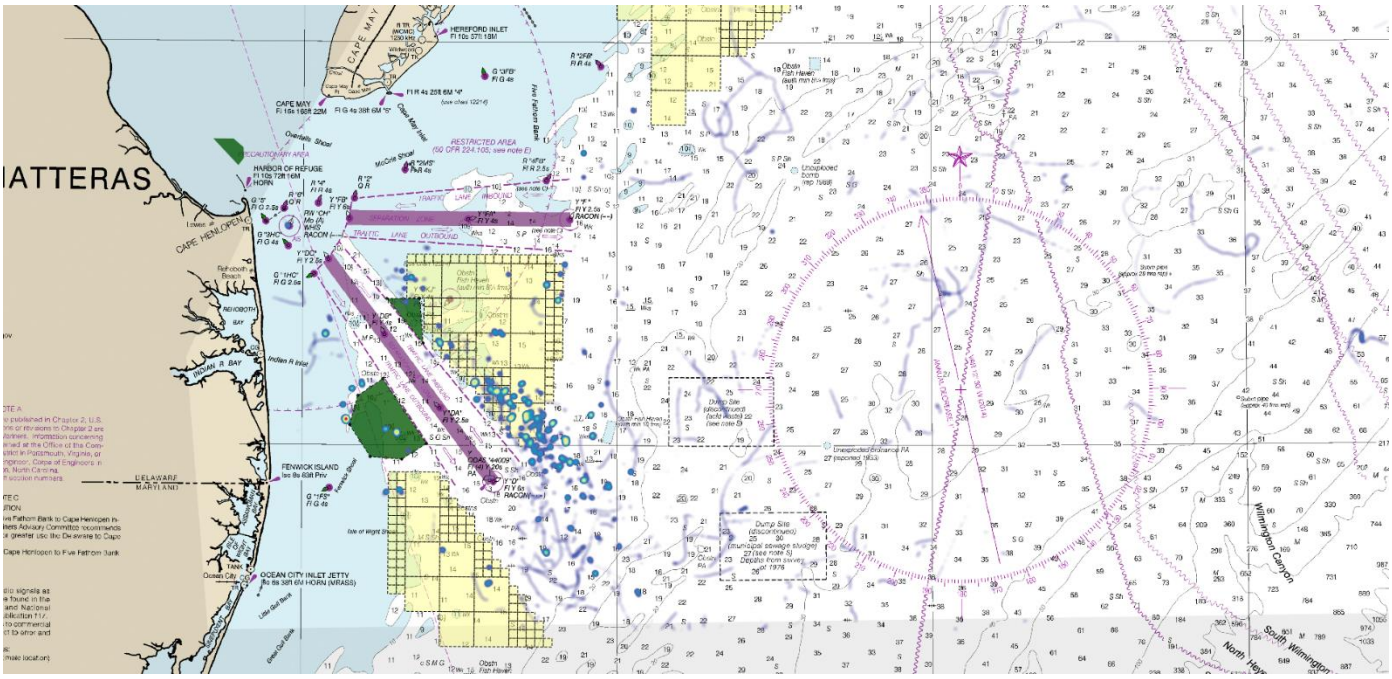

Figure 20: Cargo Ships Heatmap - 0-1 Knot Filter, Without Fairways, 2017

Tank Ships – 2019

The tank ships reflected in Figure 21 and Figure 22 are listed by MMSI, IMO number, and Vessel Name in Attachment 2; this information originated from the NAIS data.

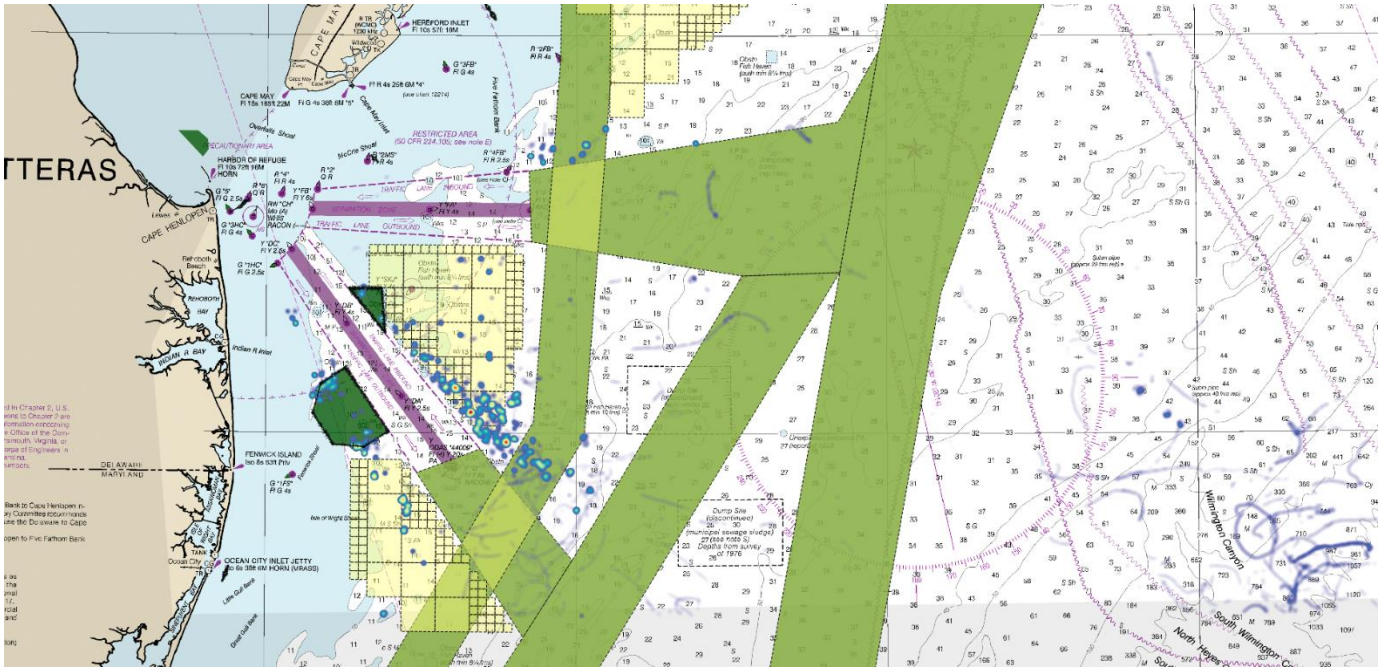

Figure 21: Tank Ships Heatmap - 0-1 Knot Filter, With Fairways, 2019

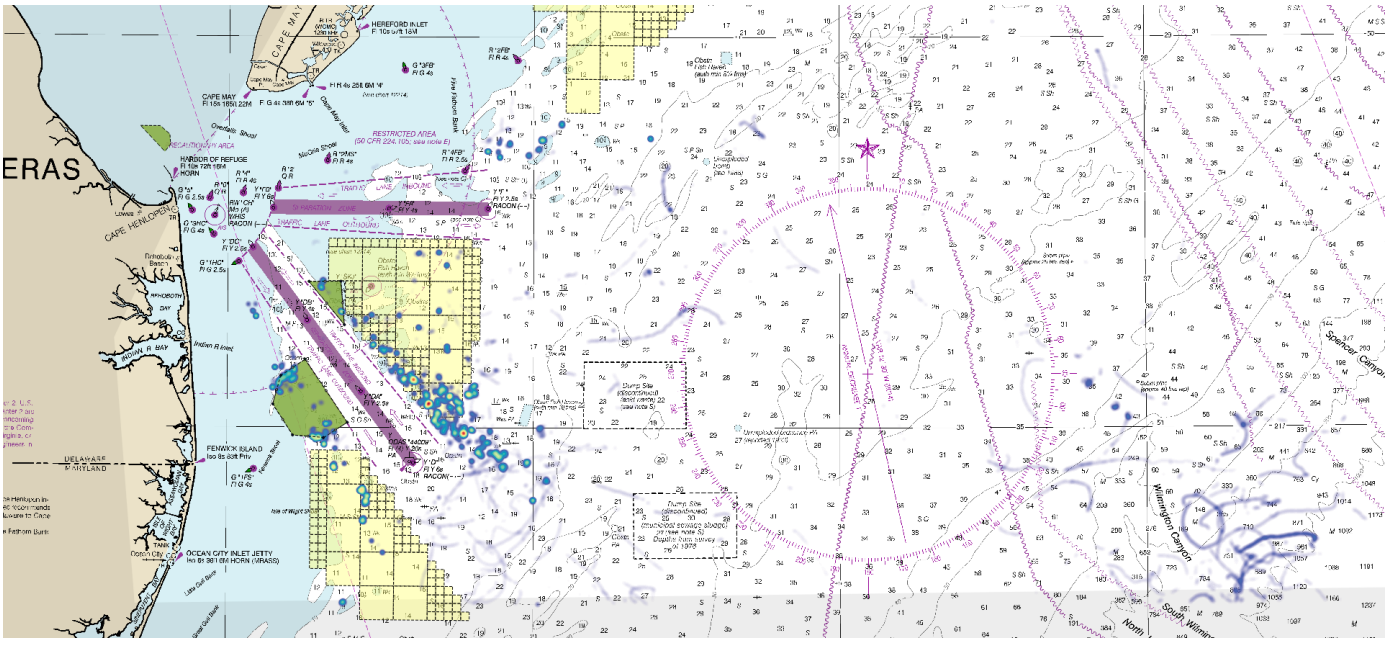

Figure 22: Tank Ships Heatmap - 0-1 Knot Filter, Without Fairways, 2019

Tank Ships – 2018

The tank ships reflected in Figure 23 and Figure 24 are listed by MMSI, IMO number, and Vessel Name in Attachment 4; this information originated from the NAIS data.

Figure 23: Tank Ships Heatmap - 0-1 Knot Filter, With Fairways, 2018

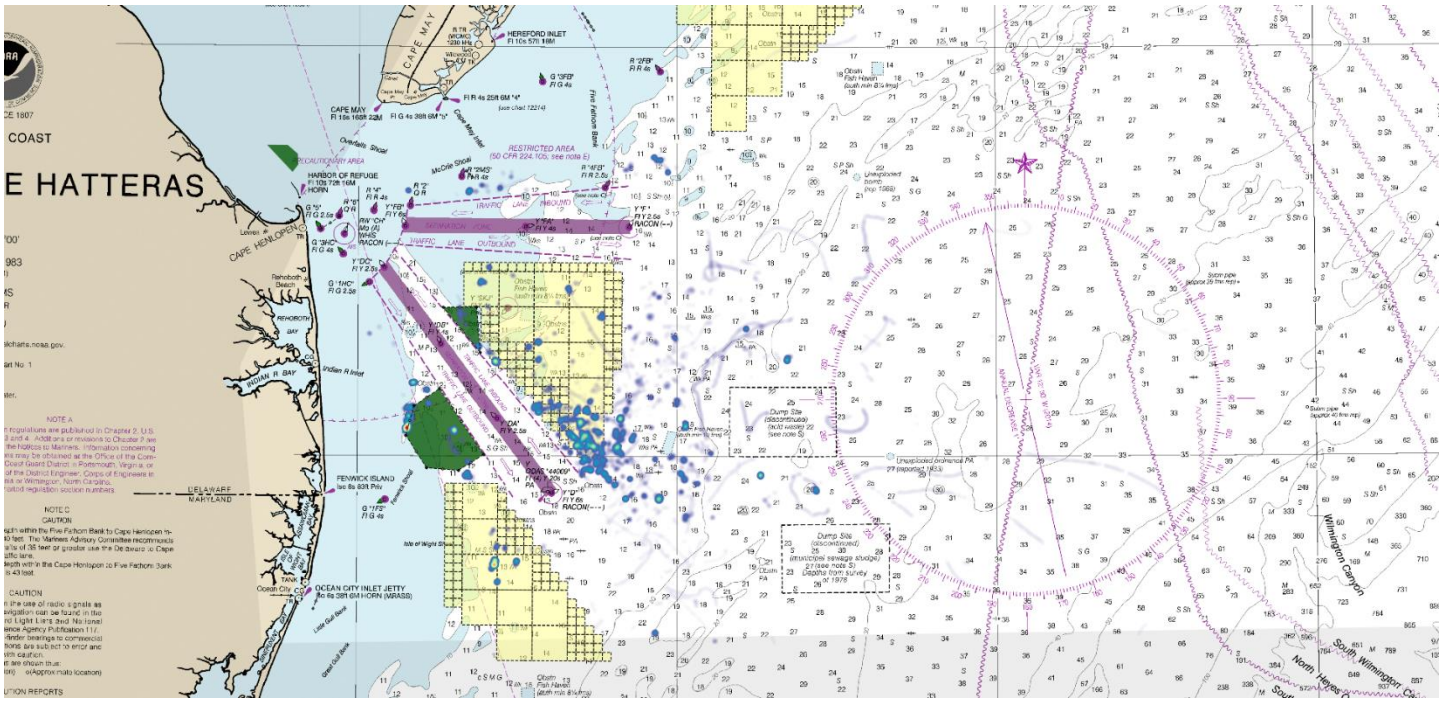

Figure 24: Tank Ships Heatmap - 0-1 Knot Filter, Without Fairways, 2018

Tank Ships – 2017

The tank ships reflected in Figure 25 and Figure 26 are listed by MMSI and Vessel Name in Attachment 6; this information originated from the NAIS data.

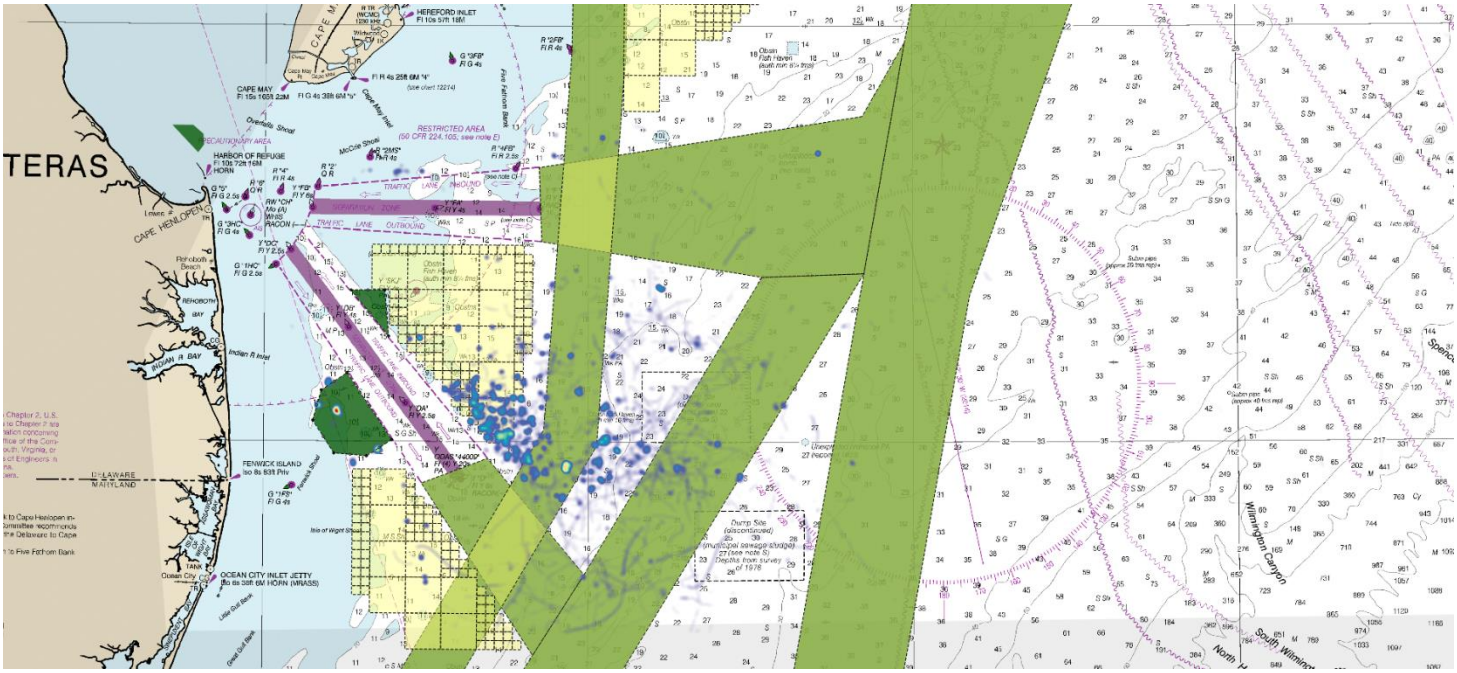

Figure 25: Tank Ships Heatmap - 0-1 Knot Filter, With Fairways, 2017

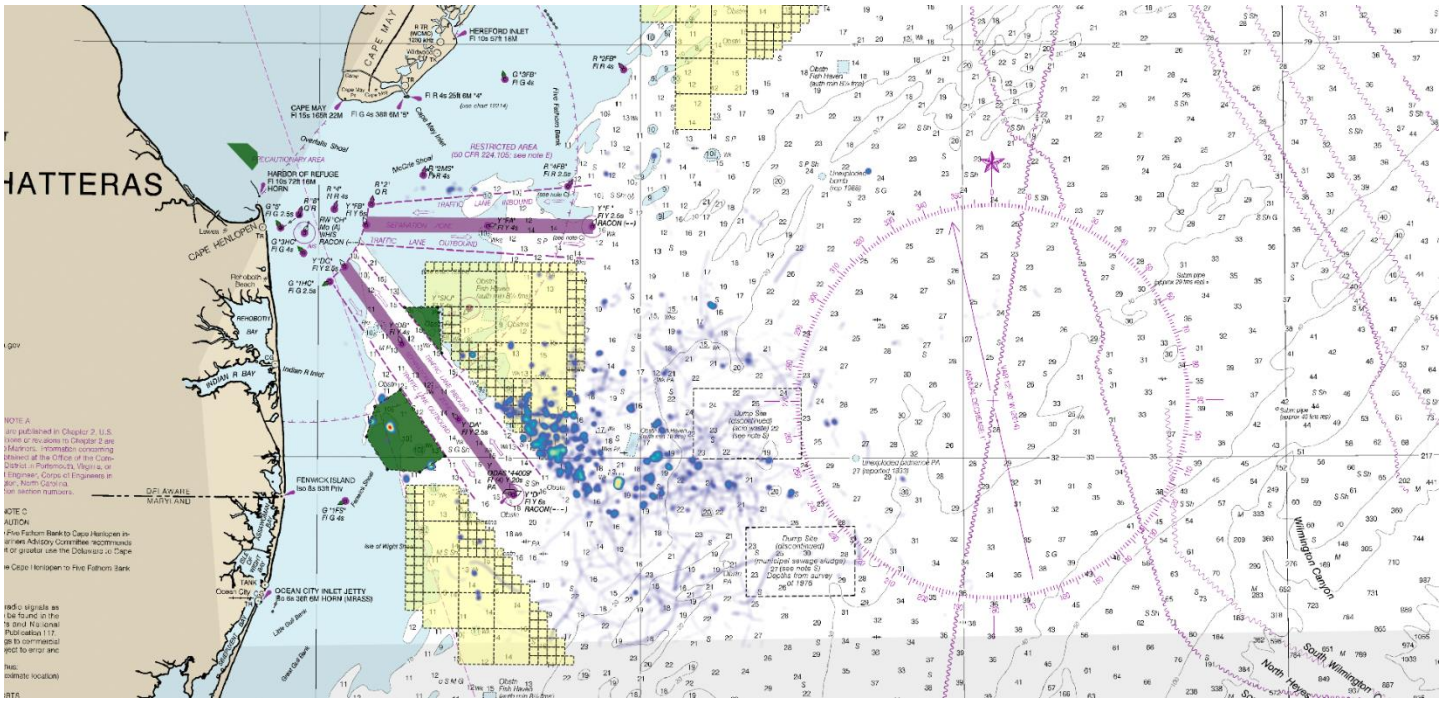

Figure 26: Tank Ships Heatmap - 0-1 Knot Filter, Without Fairways, 2017

Proposed Anchorages Historical Vessel Activity

Vessel traffic passing through the proposed anchorages was also analyzed. Vessels that transited into either anchorage were tallied by vessel type. Vessel activity within the anchorages for a given year is found in Figure 27 and Figure 28. For example, in 2019 338 fishing vessels entered Anchorage 1. This does not imply that these fishing vessels anchored in this location, only that they passed through.

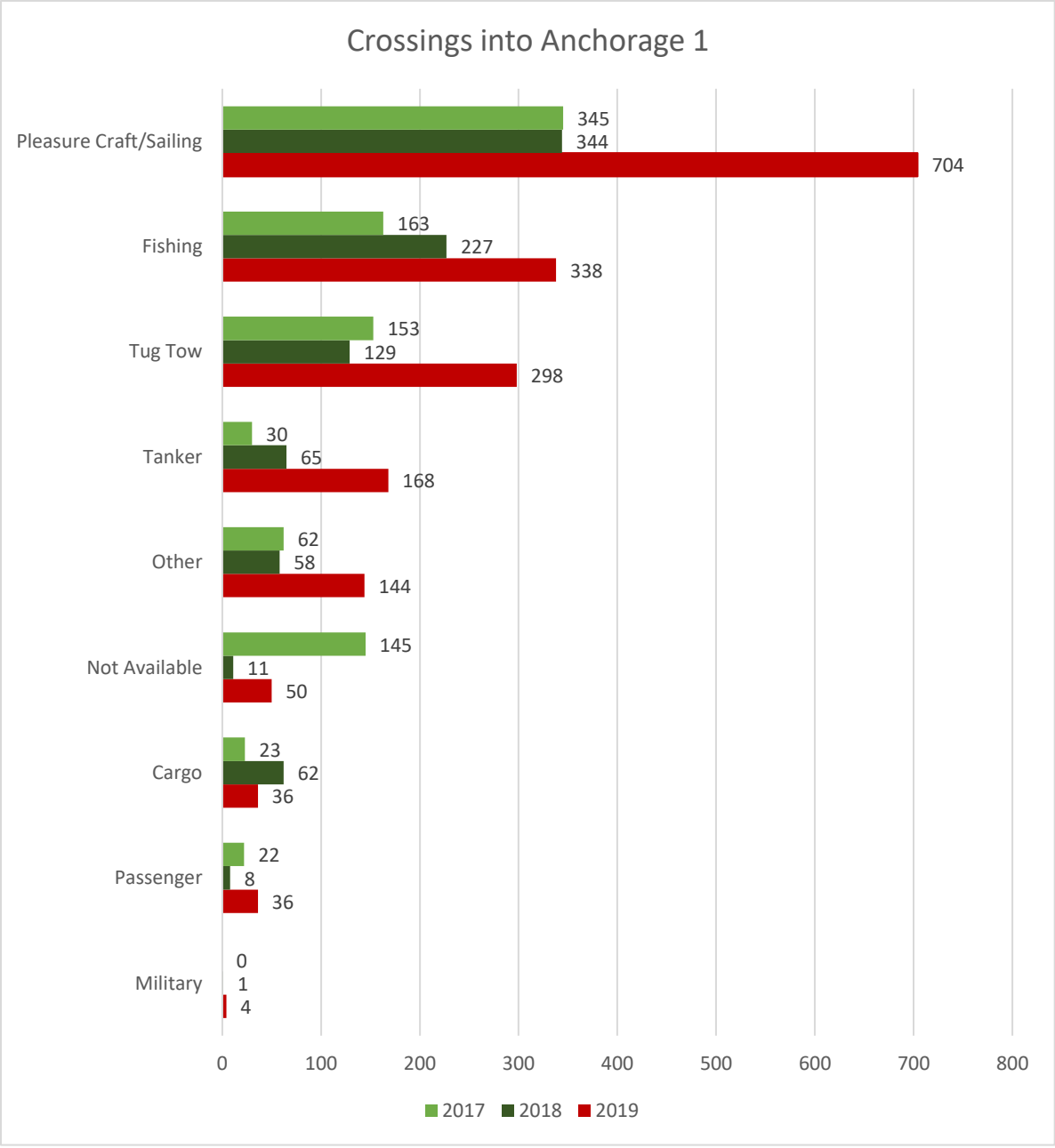

Figure 27: Historical Vessel Activity in Anchorage 1

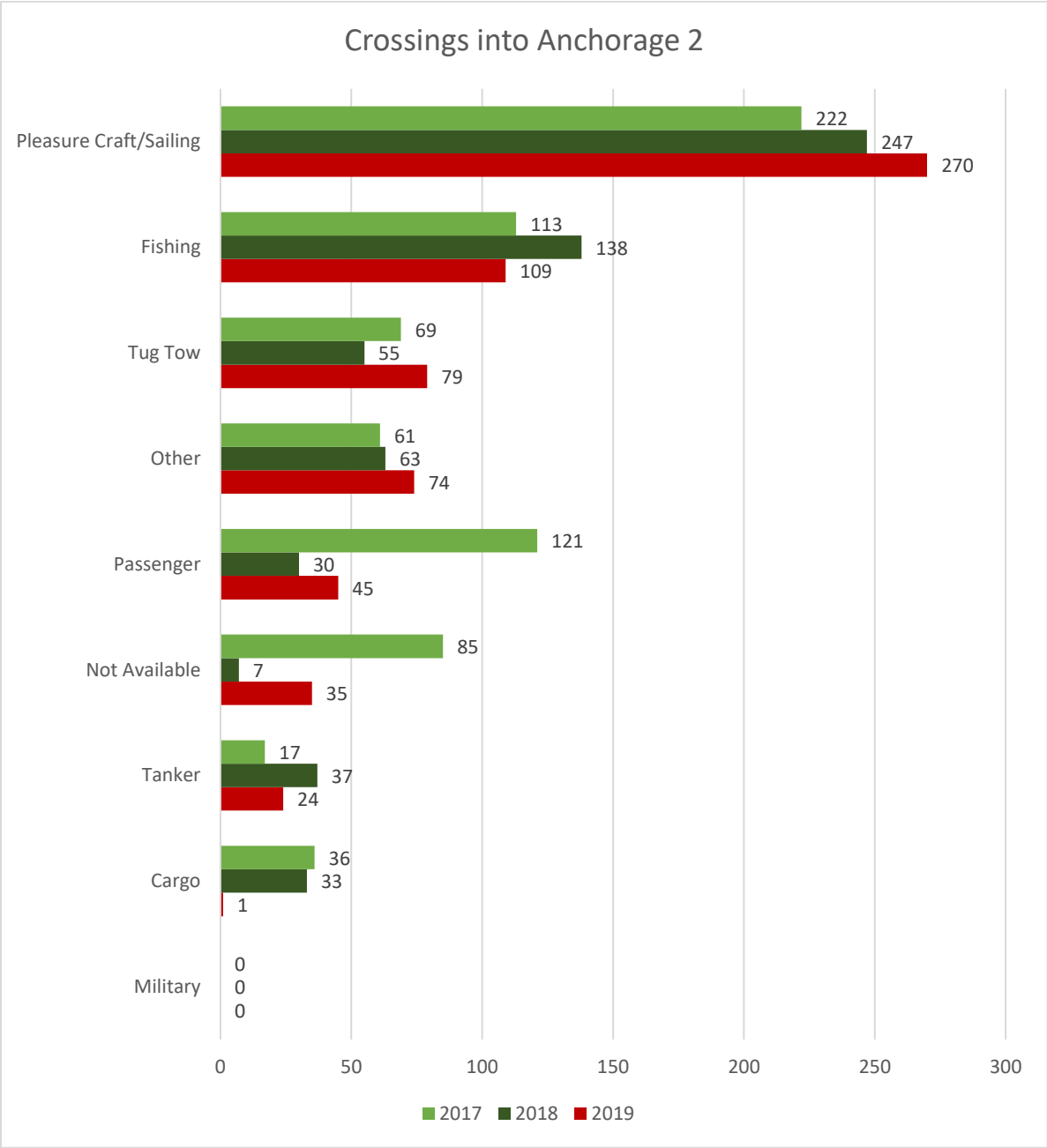

Figure 28: Historical Vessel Activity in Anchorage 2

Attachment 1 – Cargo Vessel List 2019

MMSI	IMO Number	Vessel Name
636015292	9589085	ADRIATIC PEARL
311000442	9701255	AFRICAN OWL
636015430	9514822	AGAPI S
636017350	9399789	ALGARROBO
372879000	9403255	ALONI
538090522	9464716	ALS CERES
232016246	9522881	ALSEA BAY
319570000	9397999	AMETHYST ACE
356315000	9700809	ANCASH QUEEN
636017351	9399765	ANDINO
636018150	9399806	ANGOL
477133100	9706334	ANSAC PHOENIX
477188500	9619737	ANSAC PRIDE
353013000	9728083	APOLLON HIGHWAY
431305000	9158276	AQUARIUS LEADER
538005485	9169330	AQUATA
636015743	9315379	ARCHIMIDIS
538007380	9522817	AROMA 2
305345000	9311787	AS CLEOPATRA
636092825	9410260	AS SAMANTA
255806122	9387451	AS SAVANNA
636092637	9225433	AS VEGA
440371000	9158616	ASIAN CAPTAIN
441722000	9176632	ASIAN EMPEROR
441993000	9122954	ASIAN PARADE
210565000	9245689	ASIAN TRADER
351374000	9658771	ASPRI
248097000	9143398	AST MALTA
256850000	9231145	ATLANTIC NAVIGATORII
256041000	9235983	ATLANTIC PROJECT II
235114667	9670585	ATLANTIC SAIL
235117615	9670602	ATLANTIC SKY
235112573	9670573	ATLANTIC STAR
357880000	9402718	AURIGA LEADER
305546000	9484223	BBC NAPLES
368026000	9218210	BENAVIDEZ
636092061	9509683	BERLIN TRADER
367070510	8036586	BLUEFIN
253639000	9238416	BRAHMAN EXPRESS
212372000	9393151	BRANT
319025600	9598012	BRILLIANT ACE

MMSI	IMO Number	Vessel Name
477434200	9494280	BUDAPEST BRIDGE
374846000	9659737	BUNUN BRAVE
352843000	9539535	BUNUN GLORY
255805677	9221827	BUXCOAST
636019574	9550371	CALYPSO
538006275	9711444	CALYPSO N
636017971	9275062	CAP BEATRICE
538004412	9571313	CAPE MANILA
538004165	9445916	CAPE MOSS
636016185	9629457	CARDIFF
431013000	9182277	CASSIOPEIA LEADER
319885000	9544918	CATTLEYA ACE
220059000	9245744	CHARLOTTE MAERSK
566708000	9613434	CHAYANEE NAREE
211839000	9295268	CHICAGO EXPRESS
477752900	9610755	CHILOE ISLAND
477230100	9722338	CL GEMMA
220164000	9245770	CLEMENTINE MAERSK
566395000	9605102	CLIPPER BETTINA
538007504	9801316	CLIPPER IMABARI
477168600	9543251	CLIPPER SELO
636017062	9363950	CLOVER ACE
228343900	9299642	CMA CGM FIDELIO
232007932	9780873	CMA CGM T.ROOSEVELT
215251000	9780873	CMA CGM T.ROOSEVELT
228335900	9299783	CMA CGM TOSCA
538008033	9832640	CMB RUBENS
371172000	9442873	COLUMBIA HIGHWAY
367514980	9132234	COMMANDER
209504000	9517422	CONTSHIP ICE
220061000	9245756	CORNELIA MAERSK
477135600	9472189	COSCO EXCELLENCE
477065200	9472127	COSCO FORTUNE
477397800	9472177	COSCO HARMONY
477598800	9472165	COSCO HOPE
477738200	9448762	COSCO PHILIPPINES
477764600	9472153	COSCO PRIDE
477269400	9785811	COSCO SHIPPING LOTUS
477266900	9448815	COSCO VIETNAM
355395000	9153563	COSMOS ACE
538007899	9670418	CS CELESTE

MMSI	IMO Number	Vessel Name
311057100	9640956	CSL TACOMA
368028980	0	DANIELLE MILLER
431550000	9174282	DELPHINUS LEADER
373383000	9642136	DIAMOND QUEEN
229411000	9662320	DODO
309942000	9185281	DOLE CHILE
309403000	9185293	DOLE COLOMBIA
311638000	8900323	DOLE HONDURAS
244848000	9420837	DONAUGRACHT
636017870	9748291	DONINGTON
636018057	9461465	DS LOTUS
218023000	9232577	DUBLIN EXPRESS
636018297	9214214	E.R. BERLIN
353321000	9687069	EARTH OCEAN
636091619	9372860	ELBSPIRIT
319015800	9561265	ELEGANT ACE
431205000	9293571	EMINENT ACE
255805663	9213105	EMS TRADER
538007861	9423592	ENGIADINA
636015002	9472103	ERATO
431223000	9498602	ERIDANUS LEADER
305161000	9435105	ERIK
374042000	9624055	ETERNAL TRIUMPH
371618000	9293595	EUPHONY ACE
373843000	9624328	EVER GALLANT
373721000	9595448	EVER LADEN
566673000	9595474	EVER LAUREL
566949000	9604093	EVER LEGEND
566970000	9604110	EVER LEGION
235110737	9629122	EVER LIFTING
563982000	9604134	EVER LIVELY
352135000	9604122	EVER LOTUS
636013148	8911073	EVEREST BAY
314005000	9055709	FEGULUS
353038000	9797682	FJ STAR
229376000	9643908	FLAG GANGOS
246619000	9509968	FLORAGRACHT
229033000	9486477	FLORIANA
477220800	9558282	FORTUNE TIGER
248510000	9450662	FOUR OTELLO
431868000	9293662	FREEDOM ACE
477252700	9751298	FU XING HAI

MMSI	IMO Number	Vessel Name
636015819	9624237	GALAXY ACE
371987000	9476769	GARNET ACE
538006748	9747613	GEIYO K
636015557	9610418	GENUINE ACE
220415000	9320245	GERD MAERSK
538007452	9735816	GH SKY BEAUTY
357422000	9720079	GINKGO ARROW
354440000	9434606	GLOBAL BRAVE
577139000	9650145	GLOBAL VENUS
538006603	9403126	GLOBE TRINCO
319409000	9561277	GLORIOUS ACE
538005127	9651113	GLOVIS CHAMPION
538005018	9460899	GLOVIS COMPANION
538005981	9706994	GLOVIS CROWN
538006102	9707003	GLOVIS CRYSTAL
566844000	9610999	GLOVIS MADRID
538007439	9798404	GLOVIS SKY
538005856	9445409	GLOVIS SOLOMON
538007414	9798387	GLOVIS SONIC
538006886	9749594	GLOVIS SPRING
311000459	9736808	GLOVIS STAR
538006693	9749568	GLOVIS SUN
538007440	9798416	GLOVIS SUNLIGHT
538005309	9674177	GLOVIS SUPREME
477866700	9481465	GOLDEN ENDURER
477150800	9802308	GOODWYN ISLAND
636015657	9604914	GRACIOUS ACE
355222000	9355238	GRAND DAHLIA
352879000	9284776	GRAND PAVO
354662000	9284764	GRAND PHOENIX
357983000	9184940	GRAND RACE
372399000	9325221	GRAND RUBY
356909000	9355252	GRAND VEGA
247375700	9784037	GRANDE BALTIMORA
247289800	9377482	GRANDE CAMEROON
247302700	9437921	GRANDE CONGO
247341500	9672105	GRANDE COTONOU
477302100	9496214	GRANDE ISLAND
247281100	9437907	GRANDE MAROCCO
477627100	9324667	GREAT LEGEND
477157500	9792888	GREAT PROFIT
220397000	9302889	GRETE MAERSK
368734000	9117038	GT SISLER

MMSI	IMO Number	Vessel Name
220379000	9302877	GUDRUN MAERSK
220595000	9359026	GUNHILDE MAERSK
220596000	9359038	GUSTAV MAERSK
220597000	9359040	GUTHORM MAERSK
538008164	9698587	HAMBURG EAGLE
636018561	9326835	HAMMONIA HUSUM
246660000	9551959	HAPPY DOVER
304182000	9235490	HC SVEA KIM
352915000	9252216	HEROIC ACE
259709000	9368912	HOEGH MANILA
257366000	9420045	HOEGH ST. PETERSBURG
257408000	9285483	HOEGH TOKYO
257712000	9176395	HOEGH TRANSPORTER
259025000	9431848	HOEGH XIAMEN
253579000	9004413	HOLSTEIN EXPRESS
308512000	9059640	HOOD ISLAND
636019333	9545053	HOPE
414225000	9743710	HUA YANG LONG
372665000	9302164	HUMEN BRIDGE
232018919	9725134	HYUNDAI JUPITER
538004729	8311132	ICE RANGER
636091480	9334375	INDEPENDENT HORIZON
636091318	9336189	INDEPENDENT PURSUIT
370135000	9438640	INDIGO DEVOTION
538005706	9714769	INTERLINK DIGNITY
538005699	9711779	INTERLINK SOLIDITY
636015284	9634969	IOANNA D
563550000	9186235	ISOLDANA
308438000	9030137	ITALIA STREAM
235067944	9429754	JACQUELINE C
636091688	9477359	JAMILA
477301100	9747558	JING LU HAI
369209000	9719068	KAIMANA HILA
249885000	9468619	KARVUNA
356347000	9236066	KEN GOH
211776000	9295256	KYOTO EXPRESS
538005170	9449871	LADY SALIHA
636015008	9493925	LAMBAY
636017306	9229312	LEO C
431554000	9293650	LIBERTY ACE
369222000	9777888	LIBERTY PASSION
368784000	9777890	LIBERTY PEACE

MMSI	IMO Number	Vessel Name
366102000	9448425	LIBERTY PROMISE
310761000	9290816	LIMARI
636017138	9613678	LOUISE B
563012100	9317559	LOWLANDS OPAL
538005062	9643166	LUMINOUS NOVA
431190000	9284752	LYRA LEADER
431981000	9805453	MADRID BRIDGE
338408000	9332975	MAERSK CHICAGO
338525000	9332987	MAERSK COLUMBUS
338474000	9333034	MAERSK DETROIT
563078400	9235567	MAERSK GAIRLOCH
338403000	9333008	MAERSK HARTFORD
566779000	9348170	MAERSK INNOSHIMA
303657000	9333010	MAERSK KENSINGTON
563073800	9193240	MAERSK KENTUCKY
338241000	9333022	MAERSK KINLOSS
563073700	9348651	MAERSK MEMPHIS
565473000	9215919	MAERSK NORTHAMPTON
369309000	9315197	MAERSK SELETAR
565485000	9315252	MAERSK SEMAKAU
563006800	9726669	MAERSK SHAMS
563000600	9308649	MAERSK SINGAPORE
564822000	9411379	MAERSK VARNA
564979000	9411367	MAERSK VISBY
636092824	9410284	MAERSK WINNIPEG
636092827	9410296	MAERSK WOLFSBURG
566184000	9179725	MANON
352610000	9063653	MARBELLA CARRIER
372158000	9426386	MARGUERITE ACE
304736000	9294965	MARMADURA
351780000	9267675	MARTORELL
565382000	9676723	MELCHIOR SCHULTE
370644000	9591052	MERCURY ACE
355139000	9561289	MERMAID ACE
538004166	9545510	MICHALIS
319149000	9293521	MIRACULOUS ACE
477655900	9407160	MOL EMPIRE
636090967	9314961	MONACO
353997000	9757204	MONACO BRIDGE
636092563	9358888	MONZA
370299000	9477919	MORNING CAMILLA
351392000	9338709	MORNING CARINA
357076000	9675585	MORNING CHERRY

MMSI	IMO Number	Vessel Name
371140000	9574054	MORNING CHRISTINA
373398000	9620683	MORNING CLAIRE
372802000	9383431	MORNING LUCY
212735000	9477828	MOTTLER
357506000	9203942	MSC ANIELLO
636016434	9227297	MSC ANISHA R.
636016432	9244881	MSC ARUSHI R
370437000	9307267	MSC CORINNA
357067000	9278143	MSC ELENI
636018276	9770763	MSC GAYANE
636016430	9227338	MSC JULIA R.
636016435	9227302	MSC KATYA R.
255806031	9778088	MSC MADHU B
355919000	9304423	MSC MARIA ELENA
371474000	9295385	MSC MARTA
351738000	9060637	MSC MARTINA
370273000	9349825	MSC NURIA
636018318	9161297	MSC PAOLA
255806027	9778076	MSC SHUBA B
354745000	9351579	MSC TAMARA
636016431	9227340	MSC VAISHNAVI
636016433	9238739	MSC VIDHI
636016437	9227326	MSC VIDISHA R.
636016436	9227314	MSC ZLATA R.
538005042	9365829	MUKADDES KALKAVAN
370305000	9063665	MURCIA CARRIER
636017099	9699359	NAUTICAL JENNIFER
636018038	9408877	NAVIOS CONSTELLATION
636012808	9302621	NAVIOS UTMOST
355234000	9229398	NEW CENTURY 1
371429000	9811529	NEW CONFIDENCE
356005000	9021332	NEW NADA
357411000	9209104	NEWYORKER
477023200	9751339	NING YUE HAI
357960000	9478951	NORD EMPEROR
357725000	9079169	NORDIC BARENTS
232006748	9489974	NORDIC LONDON
212185000	9697014	NORDISABELLA
249892000	9741877	NORDMOSEL
212814000	9802487	NORDPACIFIC
636091346	9353228	NORTHERN DEBONAIR
636091525	9346017	NORTHERN DECISION
636091347	9329643	NORTHERN DEFENDER
255806038	9450337	NORTHERN JUBILEE
255806077	9252553	NORTHERN MAGNITUDE
311000408	9731224	NORWAY PEARL
212715000	9710189	NOWOWIEJSKI
312666000	8215613	OCEAN FORCE
477752500	9668300	OCEAN JOY
311000738	9401829	OCEAN PEARL
477288000	9245196	OCEAN PRINCESS
235011460	8207941	OCEAN RESEARCHER
220207000	9251626	OLUF MAERSK
431651000	9757993	OLYMPIAN HIGHWAY
255806180	9238351	ONEGO TRADER
636092846	9255725	ONEGO TRAVELLER
477293100	9627992	OOCL KOREA
432651000	9381677	ORCHID ACE
351360000	9401867	ORCHID ISLAND
577110000	9650157	ORIENT GRACE
305843000	9614842	PABAL
477900500	9712943	PACIFIC TALENT
255805801	9275115	PACON
538002149	9379650	PALAWAN
351340000	9207388	PALMELA
538007433	9550163	PALOMA
564137000	9401805	PANAMANA
538007272	9317004	PANSOLAR
352142000	9293648	PARADISE ACE
218820000	9491886	PASSERO
636014708	9453054	PATRICIA V
538006208	9712979	PHOENIX RISING
311000327	9731236	POLAND PEARL
351126000	9409338	PORGY
538008276	9846263	PORT IMABARI
477071800	9377975	PORT PHILLIP
636017519	9735103	PORT_ORIENT
355745000	9213454	PRESTIGE ACE
636015949	9355185	PRIMROSE ACE
356181000	9267699	PROMINENT ACE
311072400	9441611	RCC COMPASS
563003200	9781968	RED SAKURA
235101908	9338137	REUNION BAY
538002953	9302566	S SANTIAGO
477178300	9314210	SAFMARINE MAFADI
477001300	9644524	SAGA FORTUNE
538007573	9409481	SANDERLING ACE
352548000	7808463	SARAH M
563907000	9751224	SAVITREE NAREE
538006013	9705330	SBI ORION
636017388	9712151	SBI PERSEUS
636017535	9714680	SBI PHOENIX
538006146	9712498	SBI RUMBA
538007760	9721994	SBI VIRGO
538007908	9317547	SEA FORTRESS
371581000	9799707	SEA VOYAGER
477315000	9243394	SEAMAX DARIEN
248135000	9544748	SEASTAR ENDEAVOUR
236707000	9406051	SEASTAR TRADITION
636092712	9756092	SEATRADE WHITE
357988000	9567661	SEROJA LIMA
248647000	9550668	SEVEN LADY
566454000	9238521	SEVEN SEAS HIGHWAY
538004096	9525821	SFL HUDSON
538007784	9775828	SILVER RAY
636017972	9347437	SM HONG KONG
636016978	9189366	SM TACOMA
636016928	9189495	SM VANCOUVER
258775000	9734991	SPAR INDUS
258731000	9735012	SPAR PAVO
255805610	9337028	SPINEL
232013516	9360752	SPIRIT OF AUCKLAND
538090492	9431800	SPIRIT OF LISBON
232013522	9362401	SPIRIT OF SHANGHAI
232013524	9362396	SPIRIT OF SINGAPORE
232013525	9391672	SPIRIT OF SYDNEY
232011803	9222120	SPIRIT OF TOKYO
431349000	9252228	SPLENDID ACE
538005986	9693757	SSI EXCELLENT
357743000	9615327	SSI MARVELOUS
538004352	9595943	SSI VICTORY
566006000	9350989	STAR BEST
538007655	9548835	STAR DALMATIA
538008060	9738349	STH OSLO
565613000	9723710	STRATEGIC ENTITY
563001900	9686338	STRATEGIC SAVANNAH
311013600	9338840	SUNRISE ACE
565088000	9691149	SUNRISE BRIGHT

MMSI	IMO Number	Vessel Name
309509000	9338620	SWALLOW ACE
636017469	9718026	TALIMEN
432440000	9272890	TEXAS HIGHWAY
563220000	9722314	THEMIS
566985000	9474802	THOR BREEZE
563039400	9440978	THOR COURAGE
566274000	9222493	THOR INTEGRITY
244750715	9546473	TIBERBORG
259895000	9377523	TIRRANNA
636092680	9612882	TIRUA
319013600	9561253	TRANQUIL ACE
354520000	9478573	TTM PHOENIX

MMSI	IMO Number	Vessel Name
246876000	9542350	UAL TEXAS
209156000	9287340	UBC STAVANGER
367822000	7825394	USNS SHUGHART
538004759	9610420	VALIANT ACE
374069000	9827255	VICTORIA HIGHWAY
218355000	9450416	VIENNA EXPRESS
565824000	9673018	VIKING ADVENTURE
566971000	9728851	VIKING CONQUEST
564893000	9481051	VIKING CORAL
229010000	9621895	VOLA
352044000	9641833	WISDOM ACE
477730800	9746023	XING HAO HAI

MMSI	IMO Number	Vessel Name
636013690	9337456	YM UTOPIA
636016703	9496604	YM ENLIGHTENMENT
416491000	9496599	YM ESSENCE
416490000	9496460	YM EVOLUTION
636016705	9496628	YM EXPRESS
371633000	9664897	YM MODERATION
636013693	9337482	YM UNIFORM
477948800	9704647	YM WARMTH
477002200	9708461	YM WIND
477478800	9684653	YM WORLD
538090152	9253143	ZEA ANTWERP
356329000	9446180	ZHOU SHAN HAI

Attachment 2 – Tank Vessel List 2019

MMSI	IMO Number	Vessel Name
316012950	9298715	ACADIAN
636018578	9337315	AG MARS
538008235	9385831	ALCYONE T
636015411	9579509	ALMI GALAXY
636015624	9579511	ALMI GLOBE
636014635	9460136	ALPINE AMALIA
538003913	9470959	ALPINE HIBISCUS
311000592	9779587	AMAZON FALCON
311000687	9820544	AMAZON FORTITUDE
367518920	9564578	AMERICAN PHOENIX
636090864	9296822	ANGELICA SCHULTE
239668000	9176773	ANGISTRI
477076700	9318321	ANTWERPEN
241458000	9749489	APACHE
565210000	9415650	AQUAMARINE PROGRESS
248620000	9789714	AQUARAMA
538006053	9707388	ARDMORE DAUNTLESS
636012767	9309253	ASOPOS
311000333	9427627	ASPEN SPIRIT
374614000	9738545	ASTOMOS VENUS
240125000	9281152	ASTRO POLARIS
232006316	9298313	ATHENS STAR
538002579	9312913	ATLANTAS II
538006645	9256236	AUGUSTA
311498000	9247455	AUSTRALIAN SPIRIT
636018549	9836440	AVON
367677560	9698018	BAY STATE
258947000	9047518	BOW CLIPPER
538005615	9674842	BREEZE
563019800	9743825	BRILLANTE
636017986	9433901	BSL ELSA
566554000	9607198	BW HAWK
563622000	9675509	BW LIONESS
563619000	9635808	BW LYNX
563041000	9393084	BW THAMES
338879000	9710206	CALIFORNIA VOYAGER
538090382	9441166	CAPE TAMPA
538003924	9423750	CELSIUS EAGLE
538008281	9392389	CELSIUS ROME
371005000	9310707	CHALLENGE PASSAGE
257357000	9288837	CHAMPION TIMUR
311000389	9714393	CHAPARRAL
538005215	9640138	CHEM AMSTERDAM
636017426	9286554	CHEM ANTARES
636019198	9716004	CHEM ARGON
636016360	9705720	CHEM HOUSTON
636019172	9407093	CHEM MIA
636016363	9705756	CHEM NEW ORLEANS
636016361	9705732	CHEM NEW YORK
636016965	9416044	CHEM POLARIS
538005478	9640140	CHEM ROTTERDAM
636017165	9558397	CHEM SIRIUS
636018459	9477505	CHEM TAURUS
538006569	9263136	CHEMBULK KOBE
563061100	9827475	CHEMICAL ENTERPRISE
366032000	6806444	CHEMICAL PIONEER
209446000	9316232	CHEMTRANS NOVA
241473000	9749491	CHEROKEE
636013947	9369772	CHESHIRE
311000387	9706504	CHEYENNE
311000546	9772113	CHIOS
636017134	9437684	CHRYSALIS
636012163	9280354	COMMANDER
538002089	9308089	CONQUEST
235060251	9353137	CPO ITALY
311000373	9702039	CRESQUES
565509000	9347152	CRIMSON RAY
477858500	9779757	DA HUA SHAN
477669700	9779745	DA MING SHAN
636019105	9258466	DANUBIA
441076000	9365374	DL ROSE
373067000	9420643	DREPANOS
538003617	9402495	DUBAI CHARM
563045300	9795048	EAGLE BARCELONA
565306000	9711846	EAGLE FORD LADY
235076272	9398723	EAGLE HANOVER
563759000	9417024	EAGLE KANGAR
563326000	9422196	EAGLE KINABALU
564939000	9422201	EAGLE KINARUT
564329000	9417892	EAGLE KLANG
565949000	9417012	EAGLE KUANTAN
351115000	9387255	EAGLE SAPPORO
564774000	9257802	EAGLE TACOMA
563936000	9253076	EAGLE TAMPA
563213000	9250892	EAGLE TOLEDO
565526000	9360453	EAGLE TORRANCE
563553000	9253064	EAGLE TUCSON
565770000	9360465	EAGLE TURIN
563136000	9363857	EBONY RAY
636018543	9831191	ELANDRA MAPLE
538006775	9509449	ELANDRA OAK
240415000	9259290	ELKA DELOS
636011396	9216901	ELKA NIKOLAS
235060303	9387281	ENERGY CENTAUR
563036700	9749453	ENSEMBLE
538003321	9394935	EVERGLADES
538007134	9749685	FAIRCHEM KATANA
371018000	9581447	FIDELITY 2
248409000	9544683	FMT KNIDOS
636015142	9433846	FPMC 26
538004030	9596985	FRIO
636013813	9407122	FRITZI N
215298000	9406013	FRONT LOKI
355147000	9611955	G. SWAN
374345000	9765562	GAS STELLA
374797000	9754824	GAS TIGERS
636014712	9455806	GLENDA MELANIE
636015587	9640102	GOLDEN RAY
311046700	9328132	GOTLAND CAROLINA
356024000	9264908	GRACE RIVER
538002221	9298739	GREAT EASTERN
311009900	9386940	HABARI
248952000	9332640	HAFNIA ARCTIC
249347000	9709788	HAFNIA DAISY
249345000	9726607	HAFNIA HENRIETTE
219414000	9461685	HAFNIA LUPUS
565969000	9263186	HAFNIA RAINIER
256742000	9732503	HELLAS GLADIATOR
256732000	9721140	HELLAS POSEIDON
232013527	9351426	HELLESPONT PROGRESS
232012083	9351452	HELLESPONT PROTECTOR
636012523	9289740	HIGH COURAGE
209406000	9540807	HIMALAYA

MMSI	IMO Number	Vessel Name
538008262	9796585	HOURAI MARU
367127000	8220761	HOUSTON
249263000	9396787	ISOLA CELESTE
538002784	9351921	IVER PROSPERITY
419001244	9516117	JAG LAKSHYA
538007372	9364588	JANE
219000034	9685437	JS INEOS INGENUITY
249658000	9744958	JS INEOS INNOVATION
219671000	9685425	JS INEOS INSIGHT
249208000	9685451	JS INEOS INSPIRATION
219676000	9685449	JS INEOS INTREPID
249557000	9771523	JS INEOS INTUITION
215077000	9799379	JS INEOS MARLIN
636017125	9783710	KASSAB
538006507	9718832	KHASAB SILVER
403562000	9384215	KHUZAMA
636017298	9519482	KIDAN
241525000	9284817	KRITI AMBER
248604000	9192375	LAGUNA D
374487000	9795672	LAUREL PRIME
477202500	9783394	LIAN SHAN HU
311476000	9312860	LIMERICK SPIRIT
311000455	9594779	LONDON SPIRIT
636018861	9307085	LR1 AMBASSADOR
355364000	9346457	LUMEN N
219127000	9299458	MAERSK BARRY
563079700	9786188	MAERSK CORSICA
566833000	9718076	MAERSK TOKYO
338302000	9697997	MAGNOLIA STATE
239962000	9232450	MAKRONISSOS
538008233	9297357	MANDALA
403560000	9384198	MANIFA
565592000	9722780	MARCELLUS LADY
538005804	9697234	MARLIN AMETRINE
538006225	9304344	MARMOTAS
241314000	9286023	MEGANISI
356537000	9596272	MERIDIAN EXPRESS
240728000	9318008	MINERVA VASO
249878000	9728239	MINERVA CORALIA
636017269	9321976	MITERA MARIGO
247226900	9379337	MV ICE POINT
538003853	9489118	NAVIG8 CONSTELLATION
538005991	9690626	NAVIG8 VIOLETTE
636017409	9726322	NAVIGATOR AURORA
636016658	9704506	NAVIGATOR CENTAURI
636017417	9761164	NAVIGATOR LUGA
636017412	9742326	NAVIGATOR PROMINENCE
636015941	9404819	NAVIGATOR VIRGO
636017416	9761176	NAVIGATOR YAUZA
538002220	9298727	NEW ENGLAND
403536000	9484730	NISALAH
354828000	9547506	NORD IMAGINATION
566739000	9629706	NORD STEADY
564390000	9422639	NORDIC AGNETHA
538006087	9304306	NORDIC AMERICAS
372267000	9800116	NORDIC AQUA
538003713	9438418	NORDIC CROSS
319130800	9818228	NORDIC CYGNUS
319099700	9194995	NORDIC SIRIUS
636014194	9413573	NS AFRICA
636012855	9312884	NS COLUMBUS
538006181	9746231	OBSIDIAN
366539000	9353591	OVERSEAS ANACORTES
366495000	9432218	OVERSEAS CHINOOK
371361000	9307140	PACIFIC DAWN
235076282	9453987	PARAMOUNT HALIFAX
235076276	9453975	PARAMOUNT HATTERAS
235076275	9453963	PARAMOUNT HELSINKI
249948000	9724348	PARTHENON TS
239635000	9176761	PELAGOS
566621000	9730139	PERSEVERANCE V
248851000	9793997	PHILOTIMOS
538090301	9246451	PORT UNION
477854700	9747326	PTI HUDSON
538002700	9323338	PUZE
538006178	9681170	QUARTZ
636018722	9307097	RADIANT PRIDE
247312700	9473054	RBD GINO FERRETTI
355733000	9380051	RICH BREEZE
538007233	9748215	SAHARA GAS
636014128	9382968	SALAMINA
636017654	9397559	SCF ANGARA
636017653	9397535	SCF IRTYSH
636017647	9384306	SCF USSURI
303104000	7816551	SEABULK CHALLENGE
538007376	9773753	SEACALM
538007825	9773765	SEACHARM
477881600	9457268	SEAFRONTIER
477760900	9259185	SEANOSTRUM
229319000	9629550	SEASALVIA
248602000	9787340	SEASUCCESS
248128000	9763033	SEASURFER
538007597	9730414	SEAWAYS HATTERAS
538004934	9607954	SEAWAYS REDWOOD
538002271	9275749	SEAWAYS REYMAR
538004375	9470284	SEAWAYS SAMAR
538002279	9239630	SEAWAYS SILVERMAR
538003322	9394947	SEAWAYS YELLOWSTONE
249598000	9447067	SELENKA
356075000	9397793	SHANGHAI DAWN
374369000	9683427	SILVER DUBAI
477854300	9718870	SILVER HEBA
538006666	9692375	SILVER VENUS
258676000	9301524	SKS SATILLA
311035500	9575553	SONANGOL.KALANDULA
538007747	9815458	STAR RIVER
259720000	9337389	STAVANGER BLOSSOM
248022000	9737395	STAVANGER TS
636092684	9379155	STEALTH FALCON
310602000	9391476	STENA PENGUIN
538005984	9735608	STI EXCEED
636017832	9505936	STOLT ILEX
636017829	9266243	STOLT KASHI
538003254	9425980	STOLT MEGAMI
538005435	9513139	SUEZ GEORGE
538004318	9524463	SUEZ HANS
249694000	9396775	SUNNY ISLES
636010736	9256860	TEXAS STAR
219014000	9392482	TORM LOUISE
219265000	9836062	TORM STRONG
538006542	9732773	TRF MANDAL
538006547	9732785	TRF MARQUETTE
345140007	9283734	TULA
319155600	9325843	ULRIKEN
466241000	9299733	UMLMA
477023800	9773739	UNITY VENTURE
247218600	9387580	VALLE BIANCA
636018925	9793258	VEGA SUN
636014089	9417218	VIRGO

MMSI	IMO Number	Vessel Name
311000224	9417323	WHISTLER SPIRIT
538007746	9799111	WHITE HORSE

MMSI	IMO Number	Vessel Name
538008268	9857212	YASA ALBATROSS
538002845	9339985	YASA GOLDEN DARDANEL

MMSI	IMO Number	Vessel Name
538002844	9337341	YASA GOLDEN MARMARA

Attachment 3 - Cargo Vessel List 2018

MMSI	IMO Number	Vessel Name
636013146	9019652	ACONCAGUA BAY
220245000	9260457	ADRIAN MAERSK
538007650	9389930	AFRICAN QUEEN
240963000	9291779	AGIOS NIKOLAS
636017350	9399789	ALGARROBO
311000808	9405162	ALGOMA INTEGRITY
373631000	9113719	ALONDRA
255805613	9692698	ALWINE OLDENDORFF
373025000	9615731	AMAMI K
319570000	9397999	AMETHYST ACE
374710000	9731535	AMIS GLORY
477903500	9583627	AMOY ACTION
636017361	9399739	ANDES
353691000	9667746	ANDES QUEEN
636017351	9399765	ANDINO
356571000	9273909	ANDROMEDA LEADER
636018151	9399791	ANGELES
636018150	9399806	ANGOL
311073400	9255593	ANNA
636010401	9107679	ANTON TOPIC
256102000	9304746	ANTWERP TRADER
357037000	9335953	APHRODITE LEADER
566797000	9597472	APL VANCOUVER
636015743	9315379	ARCHIMIDIS
311681000	8512956	ARCTIC PEARL
220206000	9260433	ARNOLD MAERSK
636016439	9339595	ARTEMIS
305345000	9311787	AS CLEOPATRA
636092825	9410260	AS SAMANTA
441947000	9203576	ASIAN MAJESTY
441992000	9122966	ASIAN VISION
548966000	9808675	ASTON TRADER
248289000	9403152	ATHERINA
311054900	9189897	ATLANTIC ACANTHUS
249225000	9509633	ATLANTIC ACTION II
229081000	9558244	ATLANTIC ELM
351450000	9561887	ATLANTIC EMBLEM
353156000	9250232	ATLANTIC HIGHWAY
353778000	9700873	ATLANTIC ISLAND
566735000	9767558	ATLANTIC MANZANILLO
249227000	9509619	ATLANTIC RUNNER II
235114667	9670585	ATLANTIC SAIL
235116052	9670597	ATLANTIC SEA
235117615	9670602	ATLANTIC SKY
235112573	9670573	ATLANTIC STAR
232004294	9670614	ATLANTIC SUN
308315000	9038323	AUTUMN STREAM
220187000	9260419	AXEL MAERSK
538003192	9387360	BALTIC JAGUAR
538003308	9387334	BALTIC LEOPARD
309841000	9008732	BALTIC PEARL
311000724	9143099	BALTIC PURPLE
636090893	9253806	BANZAI
305472000	9407598	BBC EDGE
374039000	9488035	BBC MISSOURI
636017393	9741152	BBC SWIFT
636018102	9318060	BELITA
538006425	9703825	BEN RINNES
368026000	9218210	BENAVIDEZ
235116731	9713208	BERGE SHARI
305387000	9431769	BERNHARD-S.
215877000	9607277	BLUE FIN
563262000	9176565	BOHEME
229979000	9338084	BOMAR BELLINI
255805683	9301445	BOMAR CALAIS
636016851	9275036	BOMAR JULIANA
636017767	9748289	BROOKLANDS
477434200	9494280	BUDAPEST BRIDGE
374628000	9683130	BULK ATACAMA
256079000	9419668	BUSAN TRADER
255805677	9221827	BUXCOAST
232003036	9687124	BW CANOLA
235103314	9317705	CALM BAY
636016126	9629445	CAP ANDREAS
564902000	9283863	CAPRICORNUS LEADER
636015771	9544920	CARNATION ACE
319885000	9544918	CATTLEYA ACE
373611000	9614385	CENTURY ROYAL
357069000	9490260	CENTURY VENUS
431079000	9291133	CETUS LEADER
636018470	9520651	CHARADE
636017062	9363950	CLOVER ACE
235070619	9449819	CMA CGM CENDRILLON
210728000	9335202	CMA CGM CHATEAU DIF
235067205	9350393	CMA CGM CORAL
229934000	9674529	CMA CGM ELBE
232007935	9780885	CMA CGM J. ADAMS
232007937	9780897	CMA CGM J. MADISON
228340900	9299795	CMA CGM LA TRAVIATA
229947000	9674531	CMA CGM LOIRE
255806114	9248124	CMA CGM PUGET
229989000	9674543	CMA CGM RHONE
256213000	9674567	CMA CGM THAMES
538005528	9294173	CMACGM POINTECARAIBE
249205000	9286231	CONTI EVEREST
372878000	9519212	COREOCEAN OL
477950300	9472139	COSCO DEVELOPMENT
477135600	9472189	COSCO EXCELLENCE
477108100	9472141	COSCO FAITH
477065200	9472127	COSCO FORTUNE
477397800	9472177	COSCO HARMONY
477598800	9472165	COSCO HOPE
477685300	9448750	COSCO KOREA
477770700	9448774	COSCO MALAYSIA
477764600	9472153	COSCO PRIDE
477351400	9448803	COSCO PRINCE RUPERT
355518000	9454723	COSCO TENGFEI
431312000	9252204	COURAGEOUS ACE
351827000	9159115	CROWN SAPPHIRE
311000788	9191498	CROWN TOPAZ
538004619	9539224	CRYSTAL ACE
311039000	9210440	CRYSTAL RAY
477020400	9286011	CSCL AFRICA
249716000	9774446	DACC ATLANTICO
256303000	9699165	DACC TIRRENO
369207000	9719056	DANIEL K. INOUYE
368028980	0	DANIELLE MILLER
477699800	9720316	DARYA TIANA

MMSI	IMO Number	Vessel Name
311642000	8513467	DOLE CALIFORNIA
309942000	9185281	DOLE CHILE
309403000	9185293	DOLE COLOMBIA
311588000	8543179	DOLE ECUADOR
311638000	8900323	DOLE HONDURAS
636017870	9748291	DONINGTON
258111550	0	DRAKEN HARALD H.
636018297	9214214	E.R. BERLIN
636092151	9507790	E.R.BRISTOL
566996000	9660085	EAGLE I-STAR
548916000	9470789	EASTERN CONFIDENCE
538007847	9739563	EKATERINI
636091014	9202869	ELVIRA
538007209	9231494	EM CORFU
538004697	9539236	EMERALD ACE
431205000	9293571	EMINENT ACE
255805663	9213105	EMS TRADER
371437000	9606479	ETERNAL ACE
351936000	9142162	EVER DELIGHT
373843000	9624328	EVER GALLANT
235093619	9595462	EVER LEADING
235098885	9604108	EVER LEARNED
566949000	9604093	EVER LEGEND
566970000	9604110	EVER LEGION
235102679	9629079	EVER LISSOME
563982000	9604134	EVER LIVELY
416482000	9604081	EVER LOGIC
416509000	9629055	EVER LUCID
371427000	9293911	FELICITY ACE
248493000	9450650	FOUR NABUCCO
431868000	9293662	FREEDOM ACE
271043758	9663817	FUAT BEY
371987000	9476769	GARNET ACE
477985400	9350094	GENCO CHAMPION
538002820	9474785	GENCO LORRAINE
636014783	9450739	GENCO OCEAN
636014799	9450777	GENCO SPIRIT
311003300	9391567	GENTLE LEADER
220416000	9320257	GEORG MAERSK
220415000	9320245	GERD MAERSK
220598000	9359052	GERDA MAERSK
220593000	9359002	GERNER MAERSK
477066200	9727285	GLENGYLE
371087000	9401843	GLOBAL FALCON
311475000	9237319	GLOBAL LEADER
373788000	9495959	GLOBAL ROSE
319409000	9561277	GLORIOUS ACE
311054300	9441594	GLOVIS CARAVEL
311054400	9441582	GLOVIS CLIPPER
440269000	9122942	GLOVIS COMET
538005045	9651101	GLOVIS COURAGE
538006791	9749582	GLOVIS SIRIUS
538007414	9798387	GLOVIS SONIC
538005600	9702417	GLOVIS SUMMIT
229600000	9406960	GLUECKSBURG
538003794	9418731	GOLDEN EAGLE
235093065	9602174	GRAIG CARDIFF
355222000	9355238	GRAND DAHLIA
357347000	9267663	GRAND EAGLE
372857000	9339806	GRAND HERO
371671000	9355240	GRAND LEGACY
355649000	9247584	GRAND MERCURY
372516000	9325233	GRAND SAPPHIRE
247281100	9437907	GRANDE MAROCCO
477139600	9792876	GREAT BEAUTY
477524200	9728655	GREAT PROGRESS
538007449	957526600	GREENWICH EAGLE
235069271	9528720	GRETA C
220397000	9302889	GRETE MAERSK
477990200	9285471	GSL TIANJIN
220596000	9359038	GUSTAV MAERSK
636091176	9336165	HAMMONIA PALATIUM
636017199	9440784	HARRIER HUNTER
311000187	9690523	HARVEST LEADER
305767000	9415052	HC MELINA
269008000	9614696	HELVETIA
432803000	9531753	HERCULES LEADER
636091222	9323493	HERMANN HESSE
311019100	9295842	HOEGH BERLIN
257368000	9420057	HOEGH COPENHAGEN
258975000	9673381	HOEGH JEDDAH
565234000	9330616	HOEGH KOBE
258758000	9312482	HOEGH SHANGHAI
257366000	9420045	HOEGH ST. PETERSBURG
257712000	9176395	HOEGH TRANSPORTER
257713000	9075709	HOEGH TRIDENT
257714000	9075711	HOEGH TROOPER
259274000	9710749	HOEGH TROTTER
431165000	8916267	HOJIN
372665000	9302164	HUMEN BRIDGE
636016201	9393307	HYUNDAI MERCURY
353150000	9409584	IKAN JERUNG
636017495	9524683	ILENAO
636091352	9336191	INDEPENDENT SPIRIT
432433000	9272888	INDIANA HIGHWAY
477514300	9602978	JIA LONG SHAN
477293600	9642045	JUMEIRAH BEACH
338919000	6621662	KENNEDY
636092195	9459955	LADY DORIS
354868000	9658783	LEFKES
249386000	9696474	LEONIDAS
431314000	9174490	LIBRA LEADER
356105000	9317755	LORD WELLINGTNLB
256989000	9327798	LOS ANGELES TRADER
563029700	9724192	LOWLANDS NELLO
431190000	9284752	LYRA LEADER
431981000	9805453	MADRID BRIDGE
565747000	9342516	MAERSK ALFIRK
565819000	9342528	MAERSK ALGOL
565570000	9342499	MAERSK ALTAIR
338078000	9348649	MAERSK ATLANTA
338474000	9333034	MAERSK DETROIT
220640000	9235567	MAERSK GAIRLOCH
338403000	9333008	MAERSK HARTFORD
303657000	9333010	MAERSK KENSINGTON
338071000	9342176	MAERSK PITTSBURGH
369309000	9315197	MAERSK SELETAR
636017723	9330070	MAERSK SEMARANG
636017473	9725158	MAERSK SHANGHAI
563001100	9299939	MAERSK SHEERNESS
563001200	9308637	MAERSK SOFIA

MMSI	IMO Number	Vessel Name
477622100	9410260	MAERSK WEYMOUTH
372707000	9550319	MAERSK WILMINGTON
477726900	9410284	MAERSK WINNIPEG
636092824	9410284	MAERSK WINNIPEG
477742500	9410296	MAERSK WOLFSBURG
538004793	9520613	MAINE EHIME
249837000	9302944	MARGARETE SCHULTE
351780000	9267675	MARTORELL
371710000	9293519	MARVELOUS ACE
352787000	9660592	MEDI YOKOHAMA
431989000	9805465	MEISHAN BRIDGE
370644000	9591052	MERCURY ACE
538007384	9515632	MERITIUS
319149000	9293521	MIRACULOUS ACE
248090000	9557123	MOLITOR
353997000	9757204	MONACO BRIDGE
563052400	9348077	MONTE ACONCAGUA
255805592	9348053	MONTE AZUL
563051700	9348053	MONTE AZUL
211691000	9283215	MONTE ROSA
563051400	9283215	MONTE ROSA
563052100	9357949	MONTE TAMARO
370299000	9477919	MORNING CAMILLA
355768000	9574092	MORNING CARA
351392000	9338709	MORNING CARINA
357076000	9675585	MORNING CHERRY
371706000	9574080	MORNING CRYSTAL
538005617	9681431	MORNING PRIDE
636090923	9289972	MP THE BRADY
370254000	9351593	MSC ANGELA
357506000	9203942	MSC ANIELLO
477305900	9619476	MSC ANTIGUA
636016432	9244881	MSC ARUSHI R
636018068	9756729	MSC AVNI
357455000	9102722	MSC CANBERRA
374586000	9720201	MSC DOMITILLE
372491000	9237151	MSC DONATA
352270000	9043756	MSC ERMINIA
636016430	9227338	MSC JULIA R.
636016435	9227302	MSC KATYA R.

MMSI	IMO Number	Vessel Name
356205000	9351581	MSC KIM
356330000	9372470	MSC KRYSTAL
352140000	9230490	MSC LORETTA
351248000	9251690	MSC LUDOVICA
636016429	9238741	MSC MARGARITA
351607000	9060649	MSC MONICA
255806029	9778117	MSC NITYA B
636016492	9147071	MSC SAO PAULO
255806028	9778105	MSC SHREYA B
354745000	9351579	MSC TAMARA
218614000	9299525	MSC TORONTO
636016431	9227340	MSC VAISHNAVI
636016437	9227326	MSC VIDISHA R.
636016436	9227314	MSC ZLATA R.
271042433	9365855	MUSTAFA DAYI
636015273	9521813	NAREW
636017100	9699361	NAUTICAL LUCIA
229214000	9625463	NEDIM
311045300	9584059	NEPTUNE ACE
355234000	9229398	NEW CENTURY 1
235086166	9493365	NOBLE ACE
259976000	9430519	NOCC ATLANTIC
538004037	9460289	NORAH
564648000	9362231	NORD GALAXY
538007203	9746712	NORD GEMINI
210284000	9697026	NORDSERENA
636091346	9353228	NORTHERN DEBONAIR
211801000	9252577	NORTHERN MONUMENT
311000408	9731224	NORWAY PEARL
431888000	9784776	NYK WREN
266283000	9377509	OBERON
367649340	9419008	OCEAN GLOBE
235011460	8207941	OCEAN RESEARCHER
538007623	9595187	ODYSSEAS
220198000	9251614	OLGA MAERSK
220216000	9251638	OLIVIA MAERSK
220207000	9251626	OLUF MAERSK
636015275	9521837	OLZA
372367000	9302152	ONE HARBOUR
244150212	9258985	ONEGO RIO
477105600	9300790	OOCL ASIA
477203100	9622605	OOCL BERLIN

MMSI	IMO Number	Vessel Name
477182200	9622588	OOCL POLAND
319058000	9539183	OPAL ACE
477133300	9397858	ORANGE RIVER
432651000	9381677	ORCHID ACE
209745000	9522893	ORIENT DELIVERY
371471000	9437311	OSLO FJORD 1
353788000	9835898	PACIFIC MYRA
236111884	9427952	PAGNA
247302400	9567946	PANNONIA G
311057300	9600970	PAUL E MARTIN
636016416	9432531	PLUTO
311000327	9731236	POLAND PEARL
356874000	9728095	POLARIS HIGHWAY
354299000	9423528	PORT SHANGHAI
636017519	9735103	PORT_ORIENT
319035500	9554200	PRECIOUS ACE
370516000	9502817	PRETTY IVY
353514000	9267687	PROGRESS ACE
354013000	9713466	PRT ACE
354591000	9284738	PYXIS LEADER
311003200	9391581	RCC ASIA
538090529	9244556	RICKMERS SEOUL
636090916	9216999	RIO BARROW
319819000	9476757	RUBY ACE
477178300	9314210	SAFMARINE MAFADI
477076500	9317406	SAGA ADVENTURE
477486300	9658953	SAGA FANTASY
477319400	9613862	SAGA FJORD
354410000	9283887	SAGITTARIUS LEADER
246293000	9288069	SAIMAAGRACHT
351357000	9650858	SAKURA DREAM
373281000	9609237	SAKURA GLORY
636017054	9620164	SAM LION
229220000	9657777	SAMSUN
636091532	9347267	SAN ANTONIO
636091017	9194921	SANTA LUCIA
636091004	9194957	SANTA MARIA
232008553	9771016	SARAH
636017461	9714745	SBI HERA
636017465	9763904	SBI PARAPARA
636017367	9710581	SBI ROCK
636092712	9756092	SEATRADE WHITE

MMSI	IMO Number	Vessel Name
209316000	9220988	SEATTLE
248647000	9550668	SEVEN LADY
538002876	9237187	SHRIKE
256761000	9373618	SIMGE AKSOY
246456000	9197947	SLOTERGRACHT
636010032	9018658	SOL DO BRASIL
258075000	9734989	SPAR APUS
257881000	9701920	SPAR ARIES
245789000	9197911	SPIEGELGRACHT
232013516	9360752	SPIRIT OF AUCKLAND
564078000	9360752	SPIRIT OF AUCKLAND
232013522	9362401	SPIRIT OF SHANGHAI
232013524	9362396	SPIRIT OF SINGAPORE
232013525	9391672	SPIRIT OF SYDNEY
232011803	9222120	SPIRIT OF TOKYO
431349000	9252228	SPLENDID ACE
538003047	9249300	STAR GAMMA
244584000	9288045	STATENGRACHT
311000076	9585558	STOJA

MMSI	IMO Number	Vessel Name
563642000	9648075	STRATEGIC ALLIANCE
565285000	9689897	STRATEGIC HARMONY
563935000	9648087	STRATEGIC SYNERGY
563947000	9648099	STRATEGIC UNITY
370737000	9691515	SUN EXCELSIOR
309509000	9338620	SWALLOW ACE
255805778	9294812	TABEA
477250400	9325104	TAMPA BAY
373605000	9489821	TBC PROGRESS
538006538	9701243	TIA MARTA
636092140	9307841	TIGER
371699000	9465772	TINA IV
636092782	9447914	TORRENTE
566087000	9605798	TOSCA
248110000	9286621	TRAMP LADY
371862000	9519121	TRITON ACE
352062000	9209506	TRIUMPH ACE
374519000	9719355	TS DELTA
351160000	9478561	TTM DRAGON
354520000	9478573	TTM PHOENIX

MMSI	IMO Number	Vessel Name
566441000	9070450	TURANDOT
371011000	9448217	ULTRA COLONSAY
538007385	9728863	VIKING DESTINY
311025100	9493690	VIRTUOUS STRIKER
255806181	9392092	WAAL CONFIDENCE
209862000	9395032	WARNOW WHALE
548922000	9743215	WESTERN MIAMI
255805847	9347281	WINNER
636016420	9355197	WISTERIA ACE
636016703	9496604	YM ENLIGHTENMENT
416491000	9496599	YM ESSENCE
416490000	9496460	YM EVOLUTION
636016705	9496628	YM EXPRESS
416468000	9462691	YM UNIFORMITY
636013691	9337468	YM UPWARD
636014530	9456989	ZIM ISTANBUL
636012904	9318163	ZIM QINGDAO
636014221	9398412	ZIM SAN DIEGO
428041000	9471214	ZIM TARRAGONA

Attachment 4 - Tanker Vessel List 2018

MMSI	IMO Number	Vessel Name
316012950	9298715	ACADIAN
538003233	9389679	ACE
538006198	9472622	ADVANTAGE ATOM
240800000	9379612	AEGEA
477547300	9387920	AEGEAN WAVE
636018578	9337315	AG MARS
325933000	9290294	AL HABIBAH
636018285	9282998	ALABAMA STAR
538008198	9297345	ALBA
636014307	9291250	ALMI STAR
538003913	9470959	ALPINE HIBISCUS
477185800	9391438	ALPINE MOMENT
311000592	9779587	AMAZON FALCON
367518920	9564578	AMERICAN PHOENIX
311497000	9247443	AMERICAS SPIRIT
636016949	9710490	ANIKITOS
240437000	9302592	ARCHANGEL
256182000	9350862	ARCTIC BLIZZARD
538006132	9708239	ARDMORE SEAHAWK
241055000	9288382	ASPHALT EAGLE
538006655	9763332	ASPHALT SPLENDOR
538007666	9794159	ASPHALT SYNERGY
240269000	9282792	ATALANDI
311000438	9578646	ATLANTA SPIRIT
538007883	9798935	ATLANTIC JOURNEY
538007896	9798959	ATLANTIC MARBLE
477542400	9392781	ATLANTIC PISCES
311498000	9247455	AUSTRALIAN SPIRIT
538005626	9238284	AVANCE
636013113	9315941	AXIOS
229847000	9259915	AZAHAR
538006540	9233777	BACALIAROS
311000334	9408073	BAKER SPIRIT
367677560	9698018	BAY STATE
308391000	9336414	BERGINA
351896000	9561370	BRIGHT FORTUNE
367361960	9385738	BROWNSVILLE
311985000	9324459	BUTTERFLY
563484000	9682239	BW MERLIN
259726000	9353242	BW PRINCESS
565593000	9306548	BW TRADER
338879000	9710206	CALIFORNIA VOYAGER
240556000	9321691	CAP GUILLAUME
538090174	9293117	CAPE BARI
565412000	9296119	CAPE BEIRA
564937000	9294616	CAPE ESMERALDA
538005129	9309629	CELSIUS MONACO
563847000	9242156	CEYLON
636016362	9705744	CHEM ALTAMIRA
636017426	9286554	CHEM ANTARES
636017335	9725835	CHEM BARCELONA
636016360	9705720	CHEM HOUSTON
636016363	9705756	CHEM NEW ORLEANS
636016965	9416044	CHEM POLARIS
538005478	9640140	CHEM ROTTERDAM
636017165	9558397	CHEM SIRIUS
636018039	9324215	CHEM VENUS
371838000	9743758	CHEMICAL CHALLENGER
366032000	6806444	CHEMICAL PIONEER
636013825	9439345	CHEMTRANS ELBE
636090886	9270488	CHEMTRANS MOON
636018456	9781279	CIELO DI ROTTERDAM
258929000	9253820	CLIPPER MOON
257928000	9630755	CLIPPER QUITO
538004034	9594767	COLORADO
311000378	9734678	CONCORDE
636012164	9280366	CONFIDENCE
564041000	9253313	CORAL SEA
249550000	9395331	COROSSOL
235084179	9443140	CPO AUSTRALIA
235060247	9353113	CPO NORWAY
374097000	9780641	CRYSTAL RIVER
241279000	9458016	DELTA STAR
240679000	9306562	DHONOUSSA
370697000	9694191	DONG-A KRIOS
636016005	9637129	DORIC BREEZE
636015875	9637117	DORIC PIONEER
636090891	9249312	DS MELODY
636090892	9249324	DS SYMPHONY
538003882	9422524	DUBAI ANGEL
564946000	9182930	EAGLE ATLANTA
564929000	9176034	EAGLE AUGUSTA
564754000	9176022	EAGLE AUSTIN
563045300	9795048	EAGLE BARCELONA
235076272	9398723	EAGLE HANOVER
563759000	9417024	EAGLE KANGAR
563326000	9422196	EAGLE KINABALU
564939000	9422201	EAGLE KINARUT
565949000	9417012	EAGLE KUANTAN
565108000	9417000	EAGLE KUCHING
351115000	9387255	EAGLE SAPPORO
565862000	9199828	EAGLE SIBU
370822000	9412995	EAGLE STAVANGER
563936000	9253076	EAGLE TAMPA
563553000	9253064	EAGLE TUCSON
565770000	9360465	EAGLE TURIN
241455000	9724075	ELIAS TSAKOS
636011396	9216901	ELKA NIKOLAS
311000222	9422005	EMERALD SPIRIT
235063329	9388003	ENERGY PATRIOT
563036700	9749453	ENSEMBLE
538006070	9702211	ESSIE C
311648000	9281009	EVEREST SPIRIT
636012762	9309241	EVROTAS
566479000	9590319	FAIRWAY
240991000	9405564	FOURNI
357736000	9367683	FREJA BALTIC
477831600	9408205	FRONT NJORD
373215000	9693549	GAS SUMMIT
636092004	9471018	GASCHEM HAMBURG
636014372	9411331	GEORGE S.
357460000	9472737	GINGA BOBCAT
538004994	9664720	GLADYS W
636014712	9455806	GLENDA MELANIE
311000817	9286229	GODAVARI SPIRIT
636015587	9640102	GOLDEN RAY
636016292	9676515	GREEN SKY
311009200	9381562	GULF BAYNUNAH
249347000	9709788	HAFNIA DAISY
249836000	9732709	HAFNIA MIKALA
219487000	9461702	HAFNIA PHOENIX
565969000	9263186	HAFNIA RAINIER
255804570	9473119	HARBOUR FIRST
311727000	9292503	HELGA SPIRIT

MMSI	IMO Number	Vessel Name
229208000	9397468	HELLAS ENTERPRISE
232012087	9351438	HELLESPONT PROMISE
248464000	9282558	HIGH PRIORITY
636091604	9391385	ISOLDE
538002784	9351921	IVER PROSPERITY
636015074	9505986	IVORY RAY
419001223	9568184	JAG LEELA
419001087	9709984	JAG PUNIT
403591000	9384227	JALADI
466213000	9239654	JINAN
219000034	9685437	JS INEOS INGENUITY
249658000	9744958	JS INEOS INNOVATION
219671000	9685425	JS INEOS INSIGHT
249208000	9685451	JS INEOS INSPIRATION
219676000	9685449	JS INEOS INTREPID
249557000	9771523	JS INEOS INTUITION
249652000	9744960	JS INEOSINDEPENDENCE
636014598	9377418	KARBALA
636013817	9386299	KAROLINE N
240990000	9405552	KASTOS
205706000	9687514	KORTRIJK
241454000	9724336	LEONTIOS H
414267000	9747089	LIAN HUAN HU
636016698	9577032	LIGURIAN SEA
311476000	9312860	LIMERICK SPIRIT
636018861	9307085	LR1 AMBASSADOR
249294000	9397511	LYSIAS
563681000	9315446	MAERSK PEARL
338302000	9697997	MAGNOLIA STATE
241487000	9761358	MARAN HELIOS
565592000	9722780	MARCELLUS LADY
247314300	9473066	MARIA BOTTIGLIERI
538006827	9359600	MESABI
319061700	9330783	MID OSPREY
636014469	9440382	MIKELA P.
319161000	9322839	MINERVA ATLANTICA
240480000	9297333	MINERVA CLARA
240110000	9271406	MINERVA CONCERT
241090000	9296195	MINERVA EMMA
240859000	9382750	MINERVA GLORIA
241193000	9305855	MINERVA GRACE

MMSI	IMO Number	Vessel Name
240014000	9236248	MINERVA ZENIA
314447000	9298351	MIRELLA S
229535000	9243382	MIRO D
636017269	9321976	MITERA MARIGO
566913000	9242338	MTM MUMBAI
247226900	9379337	MV ICE POINT
215471000	9269075	NARMADA SPIRIT
373664000	9459060	NAVE ATRIA
636015834	9589944	NAVE CETUS
319767000	9301976	NAVE CIELO
538005167	9379313	NAVE PULSAR
477476300	9513763	NAVE SYNERGY
636017409	9726322	NAVIGATOR AURORA
538002220	9298727	NEW ENGLAND
538005955	9380673	NIPPON PRINCESS
564390000	9422639	NORDIC AGNETHA
538002783	9350642	NOREASTER
636012661	9341081	NS CLIPPER
636014352	9412359	NS BRAVO
636012381	9299680	NS CHALLENGER
636012384	9299719	NS CHAMPION
563022800	9793387	ORIENT INNOVATION
636013157	9318149	ORPHEAS
366539000	9353591	OVERSEAS ANACORTES
366495000	9432218	OVERSEAS CHINOOK
368295000	9353606	OVERSEAS TAMPA
366273000	9353553	OVERSEAS TEXAS CITY
538007364	9772060	PACIFIC MARTINA
538006907	9747998	PALANCA RIO
209448000	9274616	PANTELIS
235076276	9453975	PARAMOUNT HATTERAS
538004032	9594743	PECOS
239635000	9176761	PELAGOS
311702000	9283629	PGC ASPROPYRGOS
311708000	9282625	PGC COMPANION
311000138	9299563	PGC MARINA
352451000	9568172	PHOENIX BEACON
538002773	9323376	PILTENE
538004561	9242209	PRINS ALEXANDER
357383000	9420758	PUMA
538005443	9316244	RADIANT SEA
538003037	9219056	RIDGEBURY ALINA L

MMSI	IMO Number	Vessel Name
538005321	9439773	RIDGEBURY CINDY A
538006391	9180140	RIDGEBURY PIONEER
241510000	9749518	RUNNER
538006700	9730373	SAN JACINTO
538004027	9593426	SAN SABA
477131900	9801081	SC TAURUS
636015051	9577094	SCF PROVIDER
303104000	7816551	SEABULK CHALLENGE
538006566	9382700	SEAMUSE
477760900	9259185	SEANOSTRUM
477999500	9304356	SEAPACIS
218292000	9423449	SEAPIKE
477192100	9442158	SEARANGER
538002281	9265873	SEAWAYS ALCMAR
538002277	9232620	SEAWAYS ROSEMAR
636013614	9388297	SELECAO
310704000	9378199	SICHEM MARSEILLE
636091686	9410650	SIGMA TRIUMPH
241448000	9312901	SIKINOS
636015953	9493133	SILVER RAY
538090513	9377664	SINGLE
258884000	9326718	SKS SEGURA
258881000	9326720	SKS SPEY
311974000	9315654	SONANGOL KASSANJE
309072000	9325049	SONANGOL NAMIBE
538005860	9409479	SPOTTAIL
352797000	9315068	STAR OSPREY
352179000	9413004	STAVANGER FALCON
310558000	9252436	STENA CONQUEST
538005399	9686869	STI BRIXTON
538005984	9735608	STI EXCEED
538005409	9706475	STI ROTHERHITHE
319445000	9178202	STOLT EFFORT
636010378	9102100	STOLT INVENTION
636017828	9266231	STOLT KIRI
319093800	9680073	STOLT PRIDE
319112500	9680102	STOLT TENACITY
636015366	9274305	STOLT VANGUARD
538090508	9380582	STONE I
351001000	9459266	SUNLIGHT EXPRESS
538005111	9659660	THE BLACKSMITH
538007137	9755725	THE JUDGE

MMSI	IMO Number	Vessel Name
249856000	9776767	TIGANI
311061400	9285847	TOFTEVIKEN
220518000	9277785	TORM EMILIE
565362000	9240885	TORM GERTRUD

MMSI	IMO Number	Vessel Name
538006546	9732797	TRF MEMPHIS
357044000	9271377	TRIDENT HOPE
240824000	9307085	UNITED AMBASSADOR
247226600	9391488	VALLE AZZURRA

MMSI	IMO Number	Vessel Name
538002845	9339985	YASA GOLDEN DARDANEL
538002844	9337341	YASA GOLDEN MARMARA
538006946	9619531	YASA HAWK

Attachment 5 – Cargo Vessel List 2017

MMSI	Vessel Name
636013146	ACONCAGUA BAY
220245000	ADRIAN MAERSK
636015892	AFRICAN KALMIA
538007006	AGGELIKI B
245634000	ALASKABORG
352707000	ALBATROSS
220263000	ALBERT MAERSK
538006286	ALBERTO TOPIC
636092683	ALGOL
338619000	ALLIANCE NORFOLK
367093000	ALLIANCE ST LOUIS
636092089	ALMANDIN
538090116	AMBER LAGOON
244693000	AMERICABORG
220199000	ANNA MAERSK
566264000	ANSAC WYOMING
432810000	ANTARES LEADER
256102000	ANTWERP TRADER
538003716	AP SVETI VLAHO
229726000	APL DANUBE
566960000	APL DETROIT
566956000	APL HOUSTON
431305000	AQUARIUS LEADER
636016971	ARAGONA
309402000	ARMONIA
246556000	ARNEBORG
440114000	ASIAN EMPIRE
441947000	ASIAN MAJESTY
441993000	ASIAN PARADE
241189000	ASIATIC
636015954	ASPASIA LUCK
356756000	ATLANTIC M

MMSI	Vessel Name
256041000	ATLANTIC PROJECT II
235112573	ATLANTIC STAR
232004294	ATLANTIC SUN
366733250	ATLANTIC SURVEYOR
373756000	ATLANTIC VENUS
308315000	AUTUMN WIND
373279000	BALSA 88
305238000	BBC CARIBBEAN
305097000	BBC JADE
305775000	BBC LIVORNO
305859000	BBC SAPPHIRE
305172000	BBC TENNESSEE
477639500	BEA SCHULTE
566377000	BENJAMAS NAREE
232003534	BERGE RISHIRI
477213800	BERLIN BRIDGE
305387000	BERNHARD-S
304586000	BERTA
477866300	BILBAO BRIDGE
367070510	BLUEFIN
563262000	BOHEME
255806043	BREB COUNTESS
372444000	BREMEN BELLE
477866200	BREVIK BRIDGE
477961600	BROTONNE BRIDGE
374968000	BUNUN HERO
255805678	BUXCLIFF
538090362	CAFER DEDE
636016126	CAP ANDREAS
477924000	CAPE YORK
374106000	CENTURY GOLD
357069000	CENTURY VENUS
538004925	CERAFINA

MMSI	Vessel Name
311667000	CHAITEN
636017218	CHIQUITA EXPRESS
372771000	CIELO DI IYO
538007057	CLIPPER NESTORIO
308598000	CLIPPER TARGET
228339600	CMA CGM ALMAVIVA
228337900	CMA CGM DALILA
228313800	CMA CGM FIGARO
255805973	CMA CGM INDUS
256888000	CMA CGM MELISANDE
228338600	CMA CGM NABUCCO
228353600	CMA CGM OTELLO
636090971	CMA CGM POINTE ALLEG
229989000	CMA CGM RHONE
232007932	CMA CGM T ROOSEVELT
477387900	CMB JULLIETTE
220129000	COLUMBINE MAERSK
636091016	COMOROS STREAM
636091393	CONTI ELEKTRA
351223000	CONTINENTAL HIGHWAY
565100000	COS ORCHID
477795300	COSCO GLORY
477655200	COSCO JAPAN
477351400	COSCO PRINCE RUPERT
431312000	COURAGEOUS ACE
636015289	CRINIS
370661000	CRONUS LEADER
477360800	CSCL ASIA
311057100	CSL TACOMA

MMSI	Vessel Name
373383000	DIAMOND QUEEN
311002900	DIGNITY ACE
353245000	DK IONE
309942000	DOLE CHILE
309403000	DOLE COLOMBIA
311588000	DOLE ECUADOR
311638000	DOLE HONDURAS
566088000	DON CARLOS
636017524	ERESSOS LUCK
431223000	ERIDANUS LEADER
352800000	ESTIA
371618000	EUPHONY ACE
636010789	EURO SPIRIT
235093569	EVER LAMBENT
566673000	EVER LAUREL
566794000	EVER LEADER
235098885	EVER LEARNED
566853000	EVER LEGACY
566949000	EVER LEGEND
566970000	EVER LEGION
235110737	EVER LIFTING
563143000	EVER LIVING
235102681	EVER LOADING
416482000	EVER LOGIC
416495000	EVER LOYAL
416509000	EVER LUCID
246465000	FAIRLIFT
235111681	FALCON BAY
538006434	FEDERAL BISCAY
538004384	FEDERAL SEVERN
266259000	FEDORA
314005000	FEGULUS
305167000	FINESSE
309656000	FIRMAMENT ACE
245466000	FIVELBORG
352801000	FREEDOM ACE
255805598	GALICIA D
371987000	GARNET ACE
373341000	GDF SUEZ NORTH SEA
477985300	GENCO CHALLENGER
538002980	GENCO HUNTER
538003016	GENCO RHONE

MMSI	Vessel Name
636015557	GENUINE ACE
255805672	GEORG OLDENDORFF
355026000	GLOBAL ANDES
352301000	GLOBAL KING
311475000	GLOBAL LEADER
351225000	GLOBAL ROUND
311054400	GLOVIS CLIPPER
440269000	GLOVIS COMET
538004127	GLOVIS CONDOR
538005045	GLOVIS COURAGE
311048300	GLOVIS PRESTIGE
538006791	GLOVIS SIRIUS
538006693	GLOVIS SUN
538005345	GLOVIS SUPERIOR
538005672	GLOVIS SYMPHONY
477962300	GOLDEN EMPRESS
355708000	GRAND DOLPHIN
371671000	GRAND LEGACY
355649000	GRAND MERCURY
371798000	GRAND ORION
352935000	GRAND PIONEER
247285500	GRANDE SENEGAL
247310400	GRANDE SIERRA LEONE
538005236	GREEN DALE
309281000	GREEN ITALIA
308397000	H A SKLENAR
370361000	HAGEN
372104000	HANNOVER BRIDGE
353592000	HANOI BRIDGE
210720000	HARMONY N
305767000	HC MELINA
353788000	HEIJIN
636091222	HERMANN HESSE
352915000	HEROIC ACE
311000101	HOEGH ANTWERP
258720000	HOEGH BANGKOK
258628000	HOEGH TRACER
257714000	HOEGH TROOPER
311040600	HORIZON LEADER
636009174	HORNBAY

MMSI	Vessel Name
636009381	HORNCAP
563495000	HOSANGER
636013649	HUMBOLDT BAY
354767000	IBI
538090373	IBRAHIM DEDE
538004731	ICE RIVER
244707000	IJSSELBORG
354953000	IKAN JEBUH
538005185	IKAN LANDUK
636091352	INDEPENDENT SPIRIT
636092181	INDEPENDENT VOYAGER
538005695	INTERLINK CAPACITY
247009600	ITAL USODIMARE
255805788	JAN
314436000	JENNIFER H
357478000	JEWEL OF NIPPON
477514300	JIA LONG SHAN
309193000	JORGEN REEFER
255805580	JPO AQUARIUS
636090861	JPO CAPRICORNUS
636016287	JUSTICE
477353800	K SPINEL
357769000	KAPETAN NONDAS
538005970	KBS STAR
576646000	KEN GOH
353383000	KEY EVOLUTION
212510000	KYPROS LOYALTY
538006850	LADY BEGUM
538005170	LADY SALIHA
370957000	LAKE DYNASTY
229312000	LAMBI
353332000	LAVENDER ACE
373057000	LEO SPIRIT
271044978	LEYLA KALKAVAN
368473000	LIBERTY PRIDE
310761000	LIMARI
636016044	LOCOMOTION
370372000	LUMINOUS ACE
247312400	LUSITANIA G
538007509	MADISON EAGLE
564399000	MAERSK BRANI

MMSI	Vessel Name
338408000	MAERSK CHICAGO
338474000	MAERSK DETROIT
338241000	MAERSK KINLOSS
366337000	MAERSK MEMPHIS
367759000	MAERSK MONTANA
563000900	MAERSK SANTANA
369309000	MAERSK SELETAR
563000700	MAERSK SEVILLE
563001200	MAERSK SOFIA
563000500	MAERSK SYDNEY
564979000	MAERSK VISBY
477547900	MAERSK WESTPORT
477622100	MAERSK WEYMOUTH
372707000	MAERSK WILMINGTON
477726900	MAERSK WINNIPEG
477742500	MAERSK WOLFSBURG
538003888	MAESTRO LION
538006340	MAESTRO PEARL
567015000	MALLIKA NAREE
352476000	MANIZALES
249837000	MARGARETE SCHULTE
246767000	MARSGRACHT
351780000	MARTORELL
371710000	MARVELOUS ACE
636092682	MEHUIN
351132000	MELOI
636091506	MEMPHIS
370644000	MERCURY ACE
229738000	MEXICAN BAY
477348300	MOL BEYOND
477462400	MOL GRATITUDE
238247000	MOLAT
218764000	MONTE ACONCAGUA
255805783	MONTE TAMARO
351628000	MORNING CALYPSO
370299000	MORNING CAMILLA
538005232	MORNING CAPO
355768000	MORNING CARA
370869000	MORNING CECILIE

MMSI	Vessel Name
357275000	MORNING CHARLOTTE
357076000	MORNING CHERRY
371140000	MORNING CHRISTINA
353647000	MORNING CINDY
564254000	MORNING CLARA
311072400	MORNING COMPASS
311698000	MORNING CROWN
356473000	MORNING LADY
356732000	MORNING LAURA
352960000	MORNING LENA
370567000	MORNING LINDA
370967000	MORNING LISA
563610000	MORNING NINNI
538003682	MS ATLANTIC
357096000	MSC AGRIGENTO
371602000	MSC ALABAMA
357506000	MSC ANIELLO
636016434	MSC ANISHA R
636016432	MSC ARUSHI R
353775000	MSC BARBARA
374361000	MSC BRUNELLA
357455000	MSC CANBERRA
357067000	MSC ELENI
352270000	MSC ERMINIA
636016430	MSC JULIA R
355216000	MSC MAUREEN
355813000	MSC MAXINE
636015404	MSC METHONI
636018058	MSC SAVANNAH
354745000	MSC TAMARA
356946000	MSC VANESSA
636016433	MSC VIDHI
636016437	MSC VIDISHA R
636016436	MSC ZLATA R
271042433	MUSTAFA DAYI
371810000	MY FAIR LADY
351952000	NANDU ARROW
311045300	NEPTUNE ACE
636017294	NEW CENTURY 2
353282000	NEW LEGEND SAPPHIRE
356911000	NICHIRIN

MMSI	Vessel Name
353804000	NIKKEI SIRIUS
354101000	NONNA ULIA
565462000	NORD EXPRESS
352031000	NORD TAIPEI
636091804	NORTHERN JASPER
636091801	NORTHERN JUSTICE
211781000	NORTHERN MAGNUM
211779000	NORTHERN MAJESTIC
248171000	NORWID
538007121	NOSHIMA
355717000	NYK DENEB
354891000	NYK NEBULA
371449000	NYK RIGEL
563079000	NYK ROMULUS
311453000	OCCITAN SKY
354395000	OCEAN SPLENDOR
477797100	OCEAN STAR
351026000	OCEANUS LEADER
538003345	OLUJA
636016096	ONYX ACE
477133300	ORANGE RIVER
209263000	ORIENT TRIBUNE
538004303	ORIOLE
564846000	OSLO BULK 10
564392000	OSLO BULK 3
564862000	PAC ANTARES
255805801	PACON
236111884	PAGNA
352367000	PARADISE ISLAND
236111883	PARANA
229276000	PEBBLE BEACH
311000327	POLAND PEARL
636092399	POLARSTREAM
357955000	POLLUX STAR
351126000	PORGY
477832100	PORT ALFRED
636015949	PRIMROSE ACE
352027000	PROCYON LEADER
477814100	PROMISE 2
354591000	PYXIS LEADER
236111696	RAINBOW QUEST

MMSI	Vessel Name
370191000	RED JACKET
636015272	REGALICA
636092259	RENATE
235101908	REUNION BAY
432664000	RHEA LEADER
636091400	RHL AGILITAS
255805978	RICKMERS NEW ORLEANS
247015300	ROSALIA DAMATO
304128000	ROTHORN
246428000	ROYAL KLIPPER
319819000	RUBY ACE
477486300	SAGA FANTASY
477897700	SAGA NAVIGATOR
566014000	SAGAR SAMRAT
538005306	SAINT NIKOLAOS
319913000	SANDERLING ACE
229979000	SANTA BETTINA
244810690	SARA
311015600	SARONIC SPIRE
636017585	SBI APOLLO
538006143	SBI CRONOS
636017382	SBI HERCULES
636017478	SBI MACARENA
636017455	SBI PHOEBE
538006004	SBI URSA
269074000	SCL BERN
241505000	SEA CHAMPION
538005518	SEAMAX GREENWICH
249008000	SILVER LADY
564561000	SIRIUS LEADER
311058500	SOLINA

MMSI	Vessel Name
257165000	SORLANDET
246452000	SPAARNEGRACHT
258251000	SPAR OCTANS
564077000	SPIRIT OF SINGAPORE
564053000	SPIRIT OF SYDNEY
232011803	SPIRIT OF TOKYO
564056000	SPIRIT OF TOKYO
431349000	SPLENDID ACE
257532000	STAR ISMENE
244584000	STATENGRACHT
248326000	STELIOS B
565607000	STRATEGIC EXPLORER
304137000	SUDKAP
311018600	SUNLIGHT ACE
538007036	SUNNY YOUNG
311013600	SUNRISE ACE
311015100	SUNSHINE ACE
309509000	SWALLOW ACE
255805778	TABEA
308599000	TALIA
373100000	TANIKAZE
269021000	THORCO BASILISK
305797000	THORCO CHINA
636092140	TIGER
232240000	TOLEDO
209016000	TORRENT
636017177	TRANS NANJING
377901012	TRANSPORT
357795000	TRITON LEADER
538005651	TRUE LOVE
371749000	TTM HARMONY

MMSI	Vessel Name
248264000	TUGELA
373403000	ULTRA DWARKA
374400000	ULTRA FITZ ROY
265884000	UNDINE
538005483	VALADON
356541000	VICTORIOUS ACE
565806000	VIKING BRAVERY
566167000	VIPHA NAREE
249840000	VITAGRACE
249227000	WARNOW STAR
209862000	WARNOW WHALE
311037500	WICKO
255805987	WIDUKIND
352044000	WISDOM ACE
636016420	WISTERIA ACE
413171000	XIN FEI ZHOU
477786200	XIN SHUN
413161000	XIN YA ZHOU
538004931	YASA CANARY
636016703	YM ENLIGHTENMENT
416491000	YM ESSENCE
416490000	YM EVOLUTION
636016705	YM EXPRESS
416466000	YM UNANIMITY
636012808	YM UTMOST
477243200	ZHOUSHAN ISLAND
538004094	ZIM ALABAMA
636014220	ZIM ANTWERP
636092603	ZIM CHICAGO
249830000	ZIM LUANDA

Attachment 6 - Tanker Vessel List 2017

MMSI	Vessel Name
538005593	ADS OSLO
538006204	ADVANTAGE AWARD
538006200	ADVANTAGE SOLAR
538006307	ADVANTAGE SUMMER
636015977	AFRA WILLOW
538007232	AFRICA GAS
249496000	AIAS
240339000	AKTEA
403047000	AL HABIBAH
240472000	ALASKA
636012766	ALIAKMON
477110300	ALPINE MADELEINE
636016403	ALPINE MARY
477595800	ALPINE MYSTERY
248694000	ALPS WIDESHINE
311000497	AMAZON BEAUTY
311000500	AMAZON BRILLIANCE
369042000	AMERICAN FREEDOM
369043000	AMERICAN LIBERTY
368199000	AMERICAN PRIDE
311497000	AMERICAS SPIRIT
636090864	ANGELICA SCHULTE
239668000	ANGISTRI
241315000	ANTIMILOS
240284000	ARCHANGELOS GABRIEL
256182000	ARCTIC BLIZZARD
538005093	ARDMORE ENCOUNTER
538006132	ARDMORE SEAHAWK
538005815	ARDMORE SEALEADER
311927000	ARIADNE
241055000	ASPHALT EAGLE
477852400	ATLANTIC PEGASUS
373051000	AURORA N
311000334	BAKER SPIRIT
636015300	BATTERSEA PARK
311000444	BEIJING SPIRIT
308391000	BERGINA
368004000	BRENTON REEF
372639000	BRIGHT DAWN
548942000	BRISTOL TRADER

MMSI	Vessel Name
232157000	BRITISH CYGNET
232156000	BRITISH ROBIN
311985000	BUTTERFLY
565134000	BW LARA
232004100	BW MALACCA
566902000	BW RHINE
373838000	C INNOVATOR
240546000	CAP PHILIPPE
538090174	CAPE BARI
538090175	CAPE BASTIA
538090338	CAPE BEALE
538090188	CAPE BONNY
538090401	CAPE DAWSON
564937000	CAPE ESMERALDA
636016693	CELTIC SEA
228071700	CHAMPLAIN
636016362	CHEM ALTAMIRA
538005215	CHEM AMSTERDAM
636017426	CHEM ANTARES
636016363	CHEM NEW ORLEANS
636016361	CHEM NEW YORK
636017165	CHEM SIRIUS
353772000	CHEM VENUS
636018039	CHEM VENUS
538006569	CHEMBULK KOBE
538006572	CHEMBULK SHANGHAI
366032000	CHEMICAL PIONEER
636013825	CHEMTRANS ELBE
636090886	CHEMTRANS MOON
636090747	CHEMTRANS SEA
636090883	CHEMTRANS STAR
311000387	CHEYENNE
235083098	CHRISTINA KIRK
257695000	CLIPPER SATURN
311000345	COBRA
311000377	COMMODORE
565135000	COMPASS
311000388	CONSTELLATION
338879000	CONSTITUTION
564041000	CORAL SEA
311000255	CORVETTE
235060233	CPO FRANCE

MMSI	Vessel Name
235060251	CPO ITALY
235084181	CPO NEW ZEALAND
311000374	CRATIS
538004487	DECATHLON
240957000	DELTA COMMANDER
538004593	DENSA WHALE
538001836	DHT CATHY
477694500	DIAMOND EXPRESS
636017061	DIAMONDWAY
373067000	DREPANOS
564967000	EAGLE ANAHEIM
564929000	EAGLE AUGUSTA
564754000	EAGLE AUSTIN
563326000	EAGLE KINABALU
564939000	EAGLE KINARUT
564329000	EAGLE KLANG
565949000	EAGLE KUANTAN
565108000	EAGLE KUCHING
566453000	EAGLE SAN ANTONIO
566539000	EAGLE SAN DIEGO
566644000	EAGLE SAN JUAN
566690000	EAGLE SAN PEDRO
351115000	EAGLE SAPPORO
565862000	EAGLE SIBU
370822000	EAGLE STAVANGER
352179000	EAGLE SYDNEY
563936000	EAGLE TAMPA
563213000	EAGLE TOLEDO
563553000	EAGLE TUCSON
565770000	EAGLE TURIN
563136000	EBONY RAY
241455000	ELIAS TSAKOS
311000222	EMERALD SPIRIT
235009400	ENERGY CHALLENGER
237928000	ERIKOUSSA
636013815	ERNEST N
636014875	ETC RAMSIS
636015348	EUROCHAMPION 2004
248224000	EURONIKE
241251000	EVINOS
636012762	EVROTAS

MMSI	Vessel Name
538007270	FAIRCHEM EDGE
374597000	FAIRCHEM TRIUMPH
240275000	FINESSE
538004854	FLAGSHIP IVY
538004388	FLAGSHIP PRIVET
356493000	FREJA HAFNIA
538007255	FRONT CLIPPER
538003675	FRONT THOR
565223000	FSL LONDON
311072000	GALWAY SPIRIT
538007171	GAS RAY
565407000	GC FUZHOU
636012884	GENER8 HARRIET G
538005144	GLORYCROWN
215482000	GODAVARI SPIRIT
636016193	GREEN RAY
309518000	GRIMSTAD
249456000	HAFNIA ANDROMEDA
249345000	HAFNIA HENRIETTE
249329000	HAFNIA LOTTE
249460000	HAFNIA NORDICA
241281000	HAPPY LADY
255804280	HARBOUR FEATURE
356251000	HECTOR N
538090209	HELLESPONT PROGRESS
636012523	HIGH COURAGE
356702000	HIGH ENTERPRISE
351838000	HIGH FORCE
371179000	HIGH GLOW
564591000	HIGH PEARL
636012731	HIGH PERFORMANCE
351365000	HIGH POWER
357563000	HIGH STRENGTH
209406000	HIMALAYA
636091121	IBLEA
232366000	INTEGRITY
636015074	IVORY RAY
538007028	JIA YUAN
257885000	JO PROVEL
249652000	JS INEOS INDEPENDENC
219000034	JS INEOS INGENUITY
249658000	JS INEOS INNOVATION

MMSI	Vessel Name
219671000	JS INEOS INSIGHT
249208000	JS INEOS INSPIRATION
219676000	JS INEOS INTREPID
636014807	KALAMAS
636013817	KAROLINE N
636013308	KENT
538090315	KING DUNCAN
636011914	KRYMSK
367861000	LARAMIE
368769000	LAWRENCE H GIANELLA
370573000	LEFKARA
356560000	LEO GREEN
636014351	LEONID LOZA
566904000	LEOPARD MOON
309987000	LILLESAND
538006701	LOIRE
355364000	LUMEN N
249294000	LYSIAS
338302000	MAGNOLIA STATE
249987000	MARATHON TS
538090279	MARE ATLANTIC
311039800	MARIPOSA
538005805	MARLIN AMMOLITE
538005808	MARLIN AVENTURINE
241271000	MATHRAKI
241314000	MEGANISI
256703000	MINERVA ASTRA
240480000	MINERVA CLARA
240653000	MINERVA DOXA
240788000	MINERVA JOANNA
256553000	MINERVA MEDITERRANEA
241285000	MINERVA RITA
240198000	MINERVA ROXANNE
636017269	MITERA MARIGO
255804750	MONTESPERANZA
538002866	MR AQUARIUS
538006702	NAMSEN
319768000	NAVE ARIADNE
319767000	NAVE CIELO
538005167	NAVE PULSAR
538005821	NAVIG8 GRACE
538006076	NAVIG8 SOLIDARITY

MMSI	Vessel Name
636017409	NAVIGATOR AURORA
636015946	NAVIGATOR GALAXY
371078000	NING HAI WAN
240849000	NISYROS
354828000	NORD IMAGINATION
564435000	NORDIC ANNE
319098500	NORDIC LUNA
210077000	NORDROSE
636014352	NS BRAVO
636012381	NS CHALLENGER
636012854	NS COMMANDER
636012382	NS CONCORD
636013274	NS LAGUNA
636013272	NS LEADER
636013275	NS LOTUS
636013277	NS PARADE
636015957	ORANGE BLOSSOM 2
636014800	ORANGE STAR
537985027	OVERSEAS ANDROMAR
538006773	PACIFIC TREASURES
538004791	PALANCA LUANDA
538006907	PALANCA RIO
235076282	PARAMOUNT HALIFAX
235076274	PARAMOUNT HAMILTON
235076272	PARAMOUNT HANOVER
235076275	PARAMOUNT HELSINKI
538004032	PECOS
240836000	PHAETHON
477300300	POLARIS
357383000	PUMA
565015000	REBECCA SCHULTE
538005422	RIVER SHINER
636013812	RONALD N
538006499	RUSTAQ SILVER
538004033	SABINE
538006700	SAN JACINTO
565960000	SANSOVINO
538004792	SAO DOMINGOS SAVIO
636014311	SCF BAIKAL
636014309	SCF SAMOTLOR
636014310	SCF SURGUT

MMSI	Vessel Name
303104000	SEABULK CHALLENGE
256702000	SEASTAR
248298000	SEAVALOUR
538004255	SEAWAYS LEYTE
636013614	SELECAO
311000460	SELETAR SPIRIT
538007059	SHAMROCK
563061000	SHANGHAI
310711000	SICHEM NEW YORK
538006644	SILVER MILLIE
240031000	SKOPELOS
636010032	SOL DO BRASIL
311066400	SONANGOL HUILA
311035500	SONANGOL KALANDULA
309072000	SONANGOL NAMIBE
311069200	SONANGOL RANGEL
538005860	SPOTTAIL
565113000	SPREAD EAGLE
636015203	ST AQUA
248571000	STEALTH BERANA
538090510	STEEL
257519000	STEN BALTIC

MMSI	Vessel Name
236501000	STEN BERGEN
235108755	STENA IMPRESSION
310602000	STENA PENGUIN
310554000	STENA PERROS
310549000	STENA PRESIDENT
310622000	STENA SUEDE
310654000	STENA SUNRISE
310643000	STENA SUPREME
538005172	STI AQUA
538007038	STI BOSPHORUS
538005982	STI EXCELLENCE
538005269	STI OPERA
538005409	STI ROTHERHITHE
319479000	STOLT CONCEPT
319605000	STOLT PERSEVERANCE
538090508	STONE I
367353090	SUNSHINE STATE
257833000	SUSANNE VICTORY
229619000	SYRA
636016731	TAVROPOS
311056700	TELLEVIKEN
538006646	TELLURIDE

MMSI	Vessel Name
369142000	TEXAS VOYAGER
311538000	THEO T
311061400	TOFTEVIKEN
219014000	TORM LOUISE
220561000	TORM PLATTE
220560000	TORM REPUBLICAN
564693000	TORM THUNDER
538006699	TRINITY
311066200	TROVIKEN
538003851	UACC MARAH
538002776	USMA
247227900	VALVERDE
477698300	VELA
538090231	VOYAGER
636012425	XANTHOS
538006503	YANKUL SILVER
636014470	YANNIS P
538002844	YASA GOLDEN MARMARA
538002662	YASA GOLDENBOSPHORUS
308329000	ZENITH SPIRIT

Addendum 2 to this Traffic Summary for the NJ PARS – Vessel Monitoring Service (VMS) Data Analysis

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Introduction and Background

This addendum to the "Vessel Traffic Analysis for Port Access Route Study: Seacoast of New Jersey including the offshore approaches to the Delaware Bay" contains an analysis of fishing vessel traffic using Vessel Monitoring System (VMS) data. These data are collected and maintained by National Oceanic and Atmospheric Administration (NOAA) Fisheries. The sharing and use of these data satisfies the criteria of section 1881a(b)(1)(H) of the Magnuson-Stevens Fisheries Management and Conservation Act.

50 CFR § Part 648 details the VMS complete requirements for fishing vessels in the Northeast United States. Fishing vessels in the northeast of the United States are required to carry a VMS if they are permitted to engage in the following fisheries: scallop, monkfish, surfclam, ocean quahog, herring, mackerel, and longfin squid, among others. Vessels must transmit at least once per hour, or at least twice per hour for scallopers.

Data, Software, and Methodology

VMS data from NOAA was obtained for the NJ PARS study area (as defined in the Federal Register, Agency Docket Number USCG-2020-0172) for this analysis.

Vessel Tracks

Vessel tracks were created in ArcGIS using VMS data points and time stamps. Unique tracks were determined by the provided documentation number and declaration code. A time split of one hour was used for these tracks and the distance split was five nautical miles. If no point was recorded for over one hour or within five nautical miles of the previous point, the track was ended.

Tracks were also created to separately examine fishing vessels with speeds greater than five knots, which were presumed to be transiting in the study area, rather than fishing.

Vessel Traffic Densities

Densities were made in ArcGIS and are calculated by enumerating the length of transits per square mile $^{Miles\ Transited\ (year)}/_{mile^2}$. Each density is represented on a blue, yellow, red scale where low density is shown in blue and high density is shown in red. These calculations are carried out independently for each traffic density, thus each density is shown on a different scale that best represents the data in each case. While some traffic density graphics are included in-line throughout the document, a complete set of densities can be found at the end of this addendum.

Overall Traffic Patterns

The overall traffic patterns section of this addendum contains a numerical breakdown of vessel tracks as well as the count of unique vessels in the data set, by year. The number of unique vessels was determined based on the number of unique documentation numbers in the data set. Additionally, general traffic patterns are noted from the overall traffic densities. This section also compares the patterns seen in the VMS data to those observed in the AIS data and the analysis of vessels transiting vs fishing.

Activity Declaration Code Analysis

Vessels using VMS transmit an Activity Declaration Code which provides information about general areas the vessel intends to fish, type of gear, and type of species intended for the catch. Each Activity Declaration Code contains 7 components: CCC-PPP-AADGTB. The name of each component is included in Table 1. The possible codes for each component and their meanings are detailed later in the report.

Component	Name
CCC	Plan Code
PPP	Program Code
AA	Area Identifier
D	Days-at-Sea Code
G	Gear Type
T	Trip Modifier
B	Broad Stock Area

Table 1: Activity Declaration Code Components

Vessel tracks have an associated declaration code. Each vessel track's declaration code was broken down by component and tallied. The only component not examined in this analysis was "Days at Sea."

Traffic densities are provided in this section, which were developed by sorting the tracks by certain component codes, and drawn using only the tracks that met that criteria. For example, if the component CCC could consist of Plan Codes ABC or XYZ, the fishing vessel tracks were sorted based on the Plan Codes ABC and XYZ and a traffic density was provided separately for both ABC and XYZ vessels.

Overall Traffic Patterns Based on VMS Data

The number of tracks and unique fishing vessels found between 2017 and 2019 in the data set were consistent as seen in Table 2.

Year	Tracks	Unique Vessels
2017	53,980	556
2018	24,343	493
2019	34,057	521

Table 2: VMS Tracks and Unique Vessels, 2017-2019

VMS and AIS Vessel Traffic Patterns

Comparing the traffic densities produced using AIS and VMS data show similar traffic patterns. Figure 1: Top: VMS Fishing Vessel Traffic Density, 2019 Bottom: AIS Fishing Vessel Traffic Density, 2019 is an example from 2019. Figure 2 is a traffic density showing vessels from 2017-2019 at speeds greater than five knots which are presumed to be transiting rather than fishing based on vessel speed.

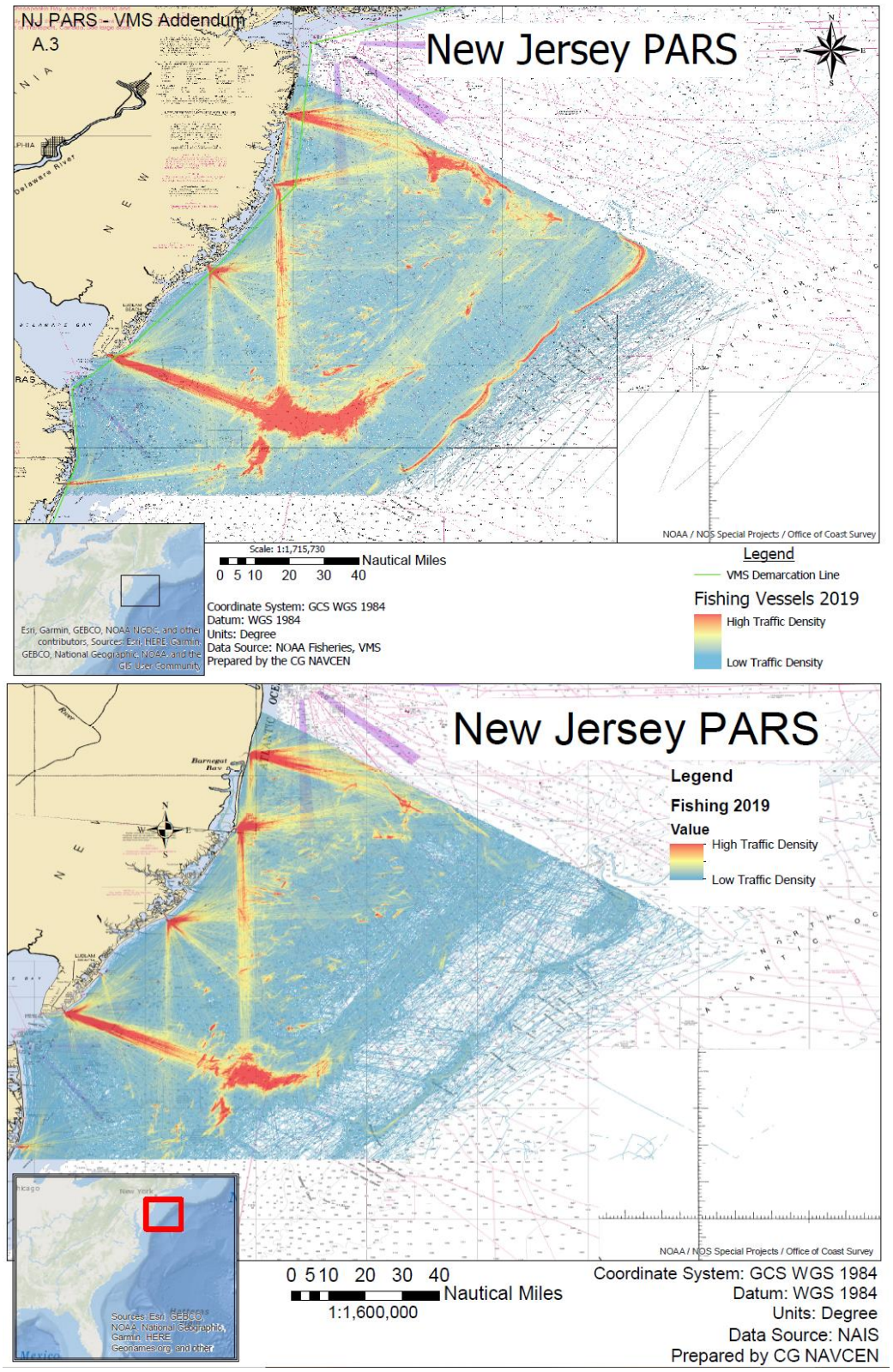


Figure 1: Top: VMS Fishing Vessel Traffic Density, 2019 Bottom: AIS Fishing Vessel Traffic Density, 2019

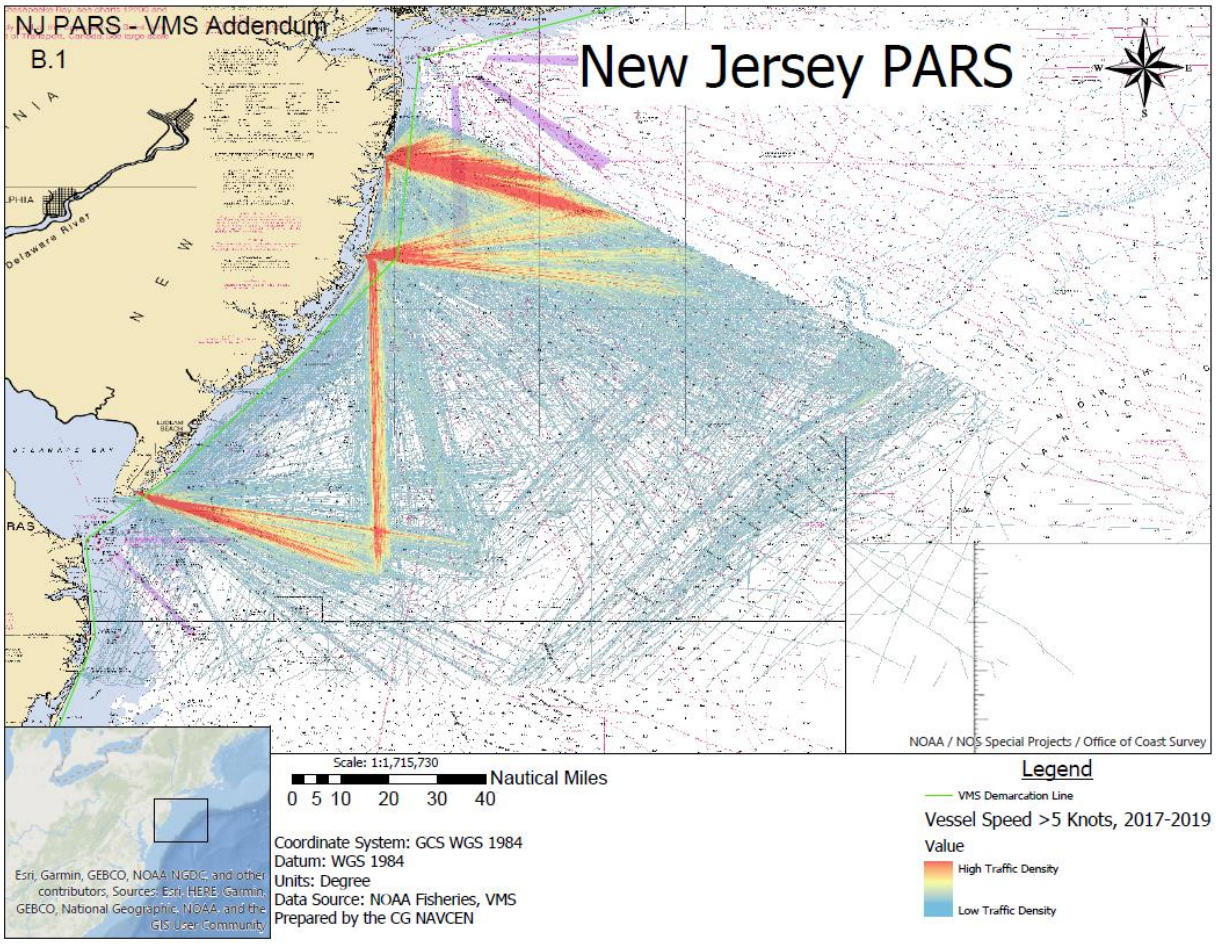


Figure 2: VMS Vessel Speed Greater than 5 Knots, 2017-2019

Activity Declaration Code Analysis

Plan Code

Plan Codes found in this data set and are included in Table 3. "Declare out of Fishery" made up the majority of the declared Plan Codes, followed by scallop, surfclam and ocean quahog, and squid, mackerel, and butterfish (Figure 3).

Code	Description
DOF	Declare out of Fishery
HER	Herring
MNK	Monkfish
NMS	Northeast Multispecies
PWD	Power Down
SCO	Surfclam and Ocean Quahog
SES	Scallop
SMB	Squid, Mackerel, Butterfish

Table 3: Plan Codes and Descriptions

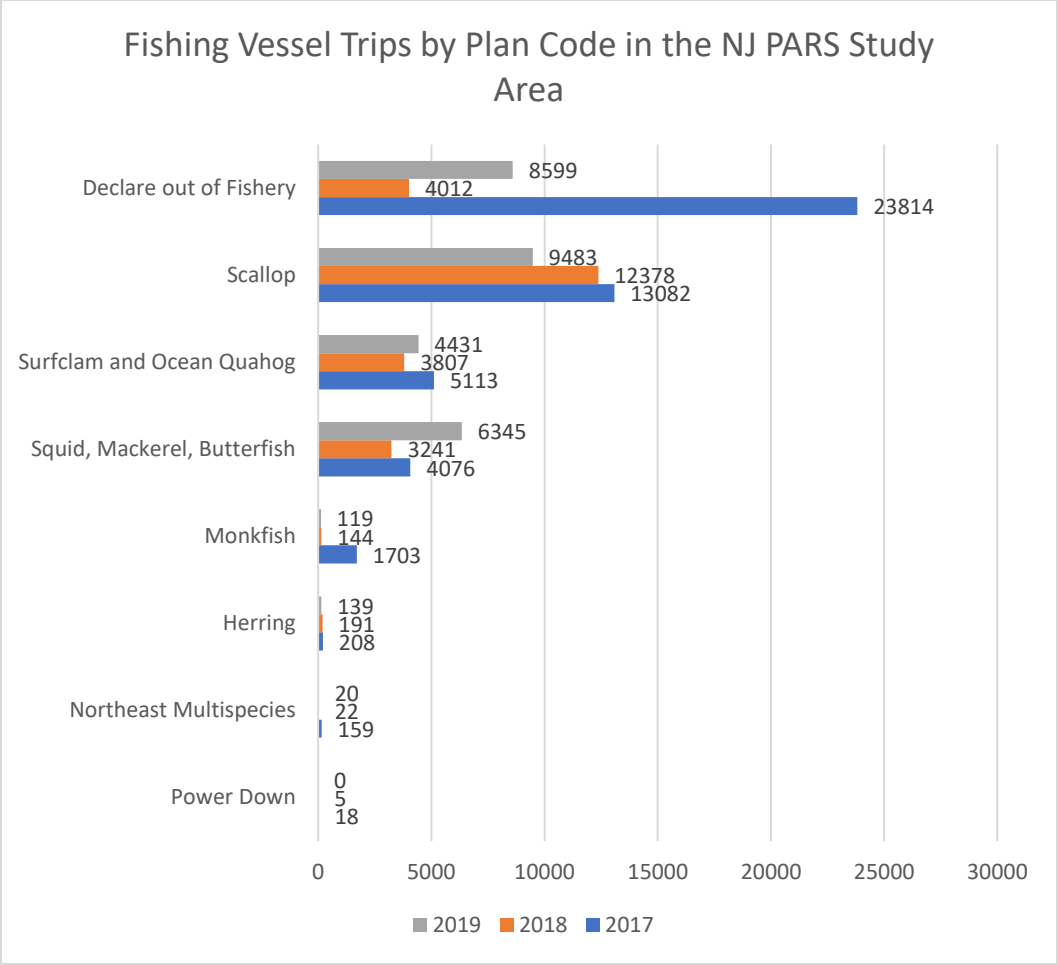


Figure 3: Fishing Vessel Trips by Plan Code in the NJ PARS Study Area

As expected and demonstrated in the traffic densities (the four most common types for 2019 are provided in Figure 4), the fishing vessel traffic patterns varied greatly based on the declared Plan Code.

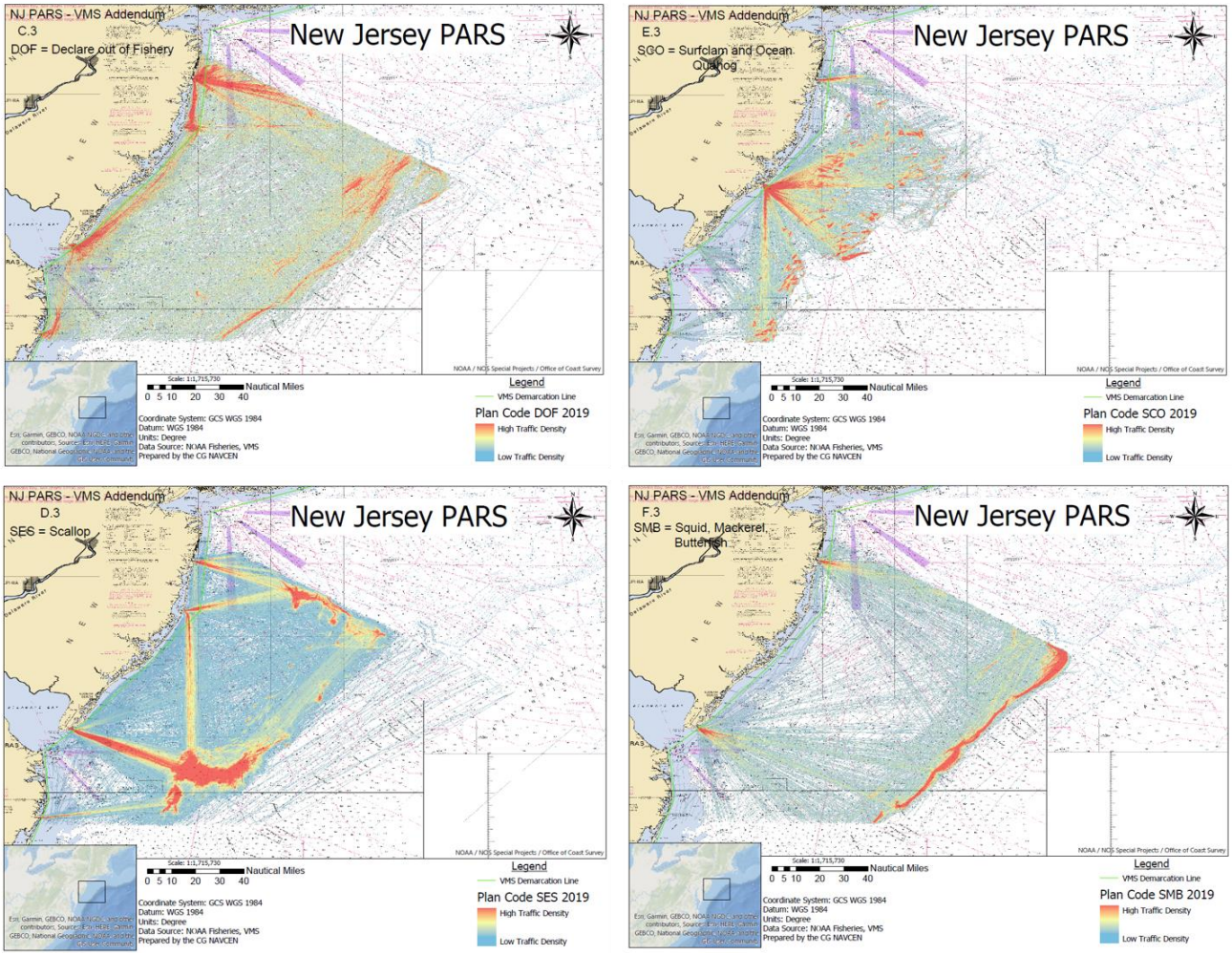


Figure 4: Fishing Vessel Traffic Densities Based on Plan Code, 2019

(Top left: DOF, Top right: SCO, Bottom left: SES, Bottom right: SMB)

Program Code

Of 46 Program Codes, 33 were found in the data set and are described in Table 4. While a variety of Program Codes were declared in this data set, "Fishing – Commercial" was the most common followed by "Limited Access General Category" and "Transit Without Product Onboard" (Figure 5). The 14 codes shown in Figure 5 make up over 98% of those declared in the data set.

Code	Description
CML	Fishing - Commercial
HER	Herring Trip
HMS	Herring Trip with Mackerel and/or Squid Retention
IHM	Illex Squid Trip with Herring and Mackerel Retention
LHM	Longfin Squid Trip with Herring and Mackerel Retention
MAC	Mackerel Trip
MAH	Mackerel Trip with Herring Retention
MAS	Mackerel Trip with Squid Retention
MHS	Mackerel Trip with Herring and Squid Retention
MMQ	Maine Mahogany Quahog
NAM	Monkfish Northern Management Area Monkfish-Only Vessel Trip
OQU	Ocean Quahog
PWD	Power Down
REC	Fishing – Recreational/Charter
SAA	Special Access Area
SAM	Monkfish Southern Management Area Monkfish-Only Vessel Trip
SAS	Monkfish Southern Management Area Sector Vessel Trip
SCA	Limited Access
SCG	Limited Access General Category (LAGC)
SCI	Scientific Research
SCM	Combination Longfin and Illex Squid with Mackerel Retention
SEC	Multispecies Sector Vessel Trip
SFC	Surfclam
SHM	Combination Longfin and Illex Squid with Herring and Mackerel Retention
SIM	Illex Squid Trip with Mackerel Retention
SLH	Longfin Squid Trip with Herring Retention
SLM	Longfin Squid Trip with Mackerel Retention
SQC	Combination Longfin and Illex Squid
SQI	Illex Squid Trip
SQL	Longfin Squid Trip
SWE	State Waters Exemption
TSP	Transit with Product Onboard
TST	Transit without Product Onboard

Table 4: Program Codes and Descriptions

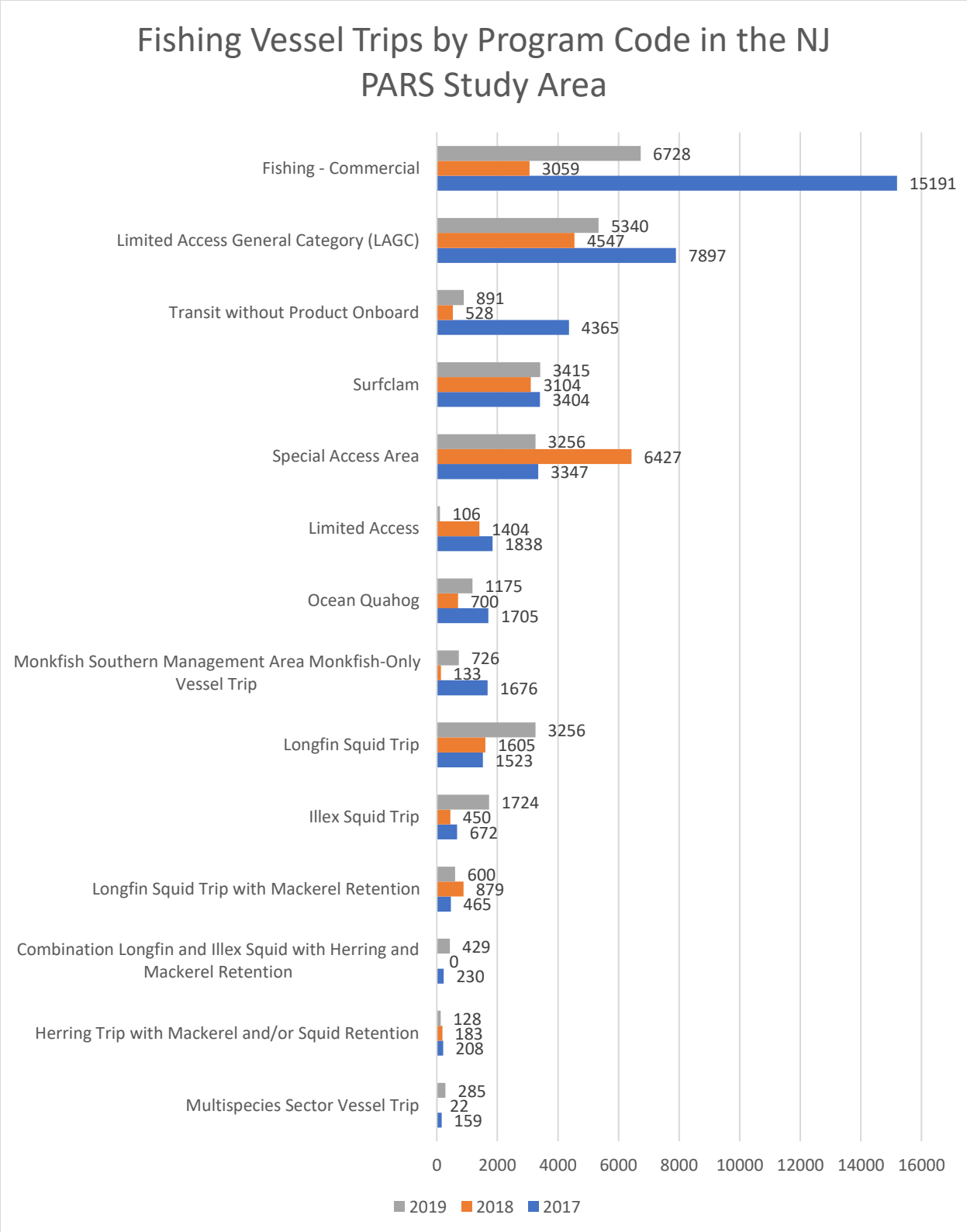


Figure 5: Fishing Vessel Trips by Program Code In the NJ PARS Study Area

Area Identifier

Table 5 shows the Area Identifiers found in the data set, 18 of 61 possible declarations. The most common (outside of none) are “Open Area” and “Mid-Atlantic Scallop Access Area.” The top four codes found are presented in Figure 6; these four codes make up over 98% of the area identifiers in the data set.

Code	Description
1S	CA-1 Scallop Access Area
2S	CA-2 Scallop Access Area Carry-Over Trip
DM	DELMARVA Scallop Access Area
EF	Elephant Trunk Flex Scallop Access Area
GB	Georges Bank PSP Area Reopened Portion
HC	Hudson Canyon Scallop Access Area
MA	Mid-Atlantic Scallop Access Area
NH	Nantucket Lightship South Scallop Access Area
NS	Nantucket Lightship Scallop Access Area Carry-Over Trip
NW	Nantucket Lightship West Scallop Access Area
O2	US/CANADA Area 2 (Eastern US/Canada Area) + Area 4 (Western US/Canada Area) + Open Area
O4	US/CANADA Area 4 (Western US/Canada Area) + Open Area
O8	US/CANADA Area 8 (Eastern US/Canada Area + CA-2 Yellowtail/Haddock SAP + Eastern US/Canada Haddock SAP) + Area 4 (Western US/Canada Area) + Open Area
OM	Maine Mahogany Quahog Zone
OP	Open Area
OQ	Surfclam & Ocean Quahog Open Area
SN	Northern Gulf of Maine (State only)
XX	None or Not Applicable

Table 5: Area Identifiers and Descriptions

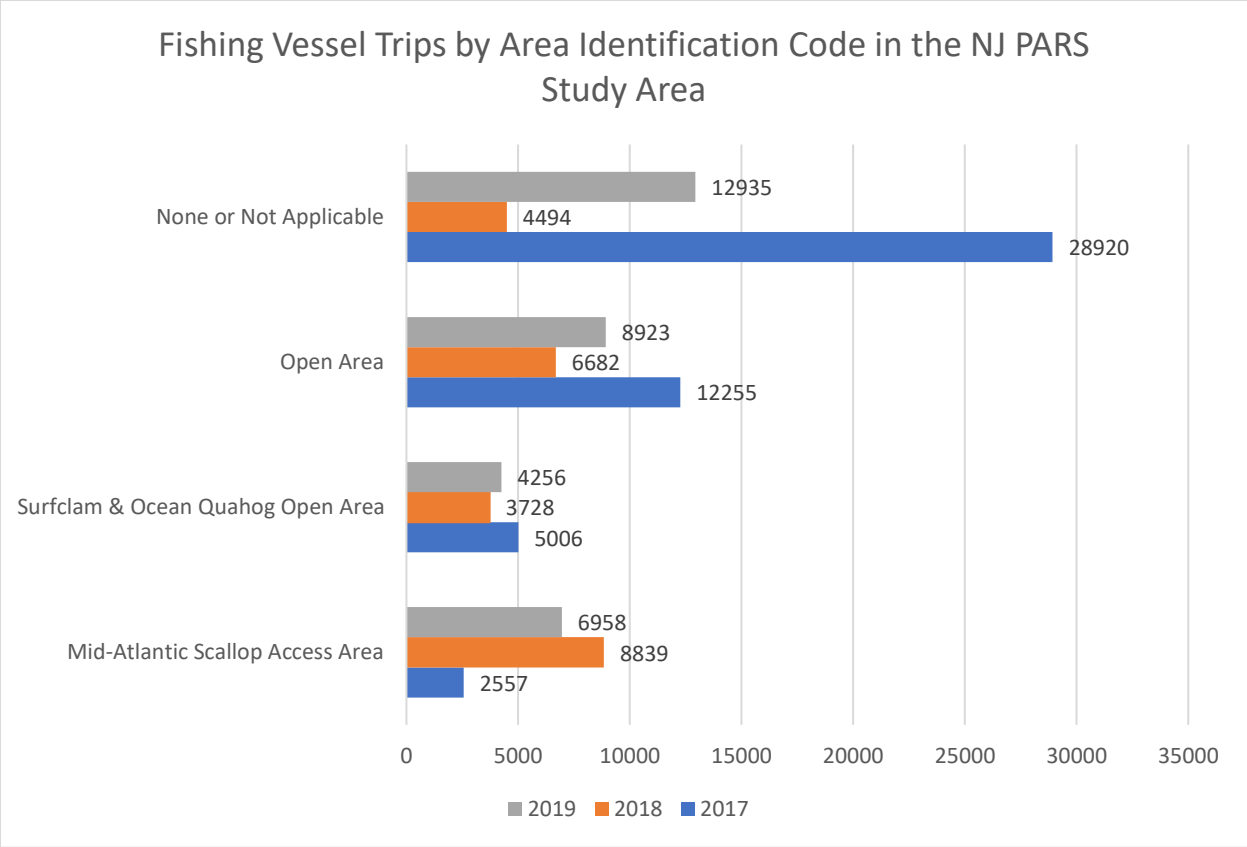


Figure 6: Fishing Vessel Trips by Area Identification Code in the NJ PARS Study Area

Gear Type

All Gear Type codes were recorded in the data set and are shown in Table 6. Most commonly, no gear was recorded, followed by bottom trawl and dredge (Figure 7). The three most commonly found gear types in the data set were used to sort the tracks and create traffic densities. An example from 2019 is found in Figure 8.

Code	Description
B	Bottom Hook
D	Dredge
G	Gillnet
H	Hook
K	Pelagic Hook
M	Mid-Water Trawl
O	Other Gear
P	Pot/Trap
S	Purse Seine
W	Bottom Trawl
X	None or Not applicable

Table 6: Gear Types and Descriptions

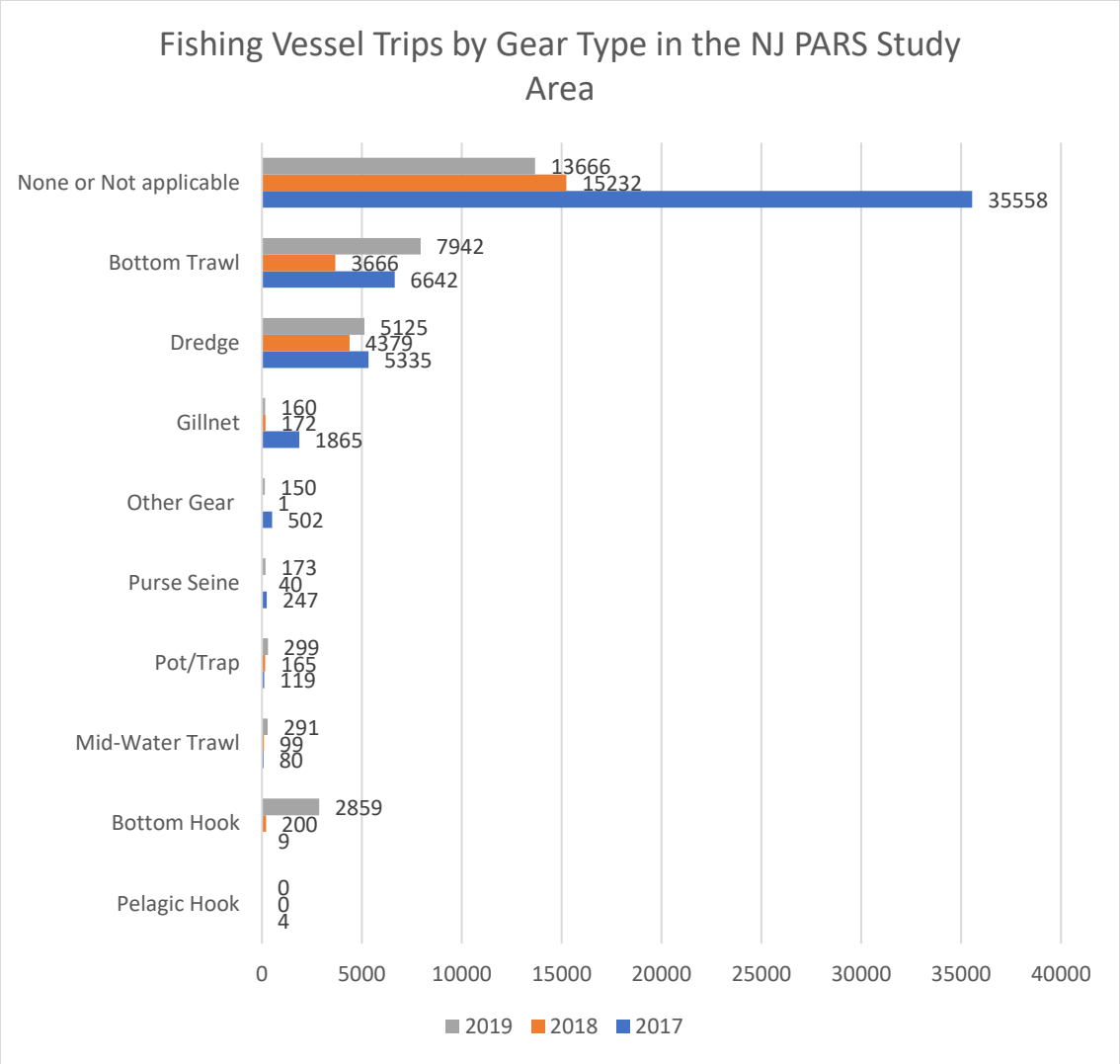


Figure 7: Fishing Vessel Trips by Gear Type in the NJ PARS Study Area

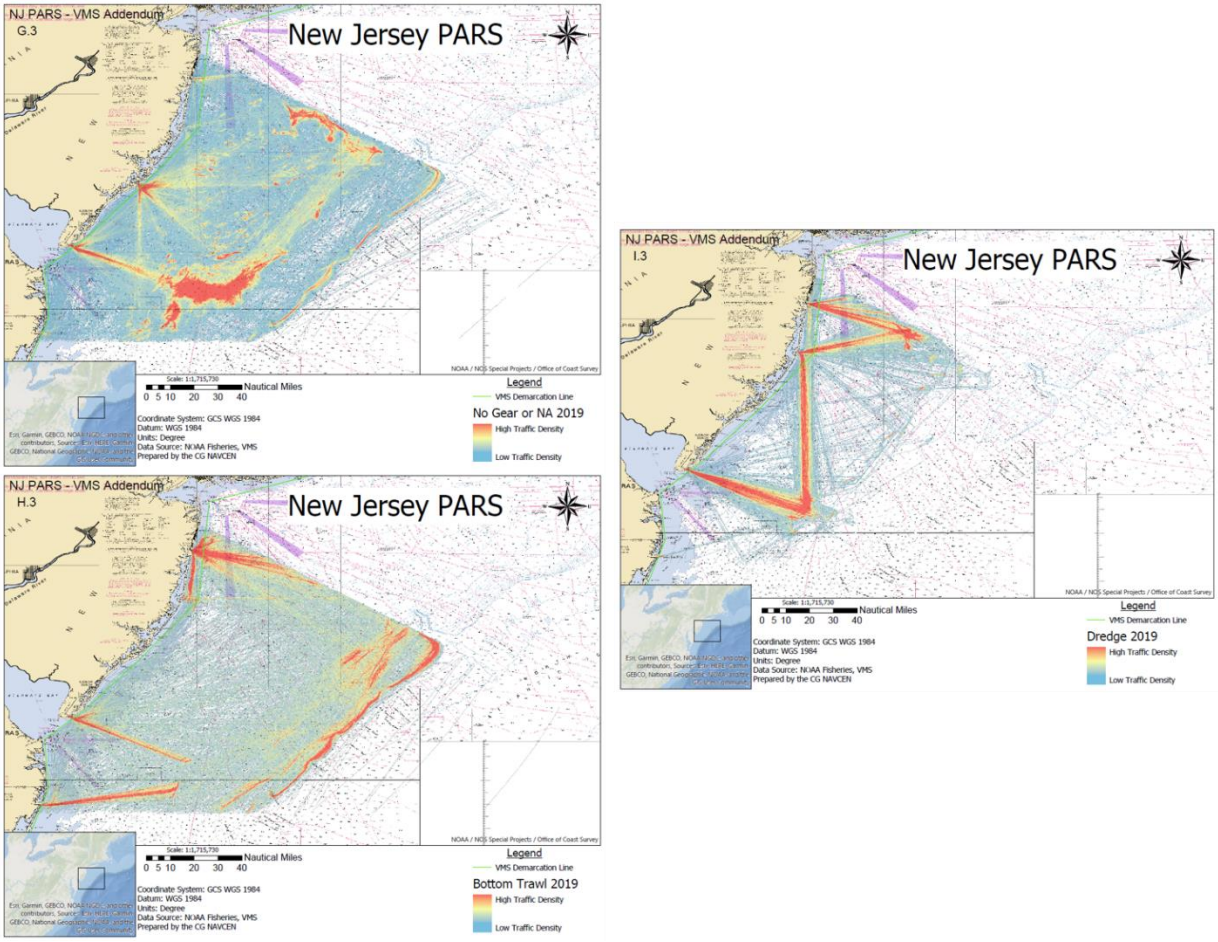


Figure 8: Traffic Densities by Gear Types, 2019

Trip Modifier

All 3 Trip Modifiers are seen in the data set and are included in Table 7. Over 99% of the time, no trip modifier was specified.

Code	Description
M	Monkfish Option
R	Research Set Aside Trip
X	None

Table 7: Trip Modifiers and Descriptions

Broad Stock Area

Table 8 describes the six Broad Stock Area codes in the data set of the 16 options. The majority of the time (over 99%) "None" was declared.

Code	Description
D	Southern New England (SNE)
I	Inshore Georges Bank and Southern New England (IGB + SNE)
J	Offshore Georges Bank and Southern New England (OGB + SNE)
N	Inshore Georges Bank and Offshore Georges Bank and Southern New England (IGB + OGB + SNE)
O	Gulf of Maine and Inshore Georges Bank and Offshore Georges Bank and Southern New England (GOM + IGB + OGB + SNE)
X	None

Table 8: Broad Stock Areas and Descriptions

Full Sized Densities

Two sets of traffic densities are provided. The first set details only the traffic density in the study area, while the second set displays traffic densities with the following layers: wind lease and planning areas, ACPARS proposed fairways, and proposed anchorages. Each set of traffic density charts are organized by year and type, as listed in Table 9: Labels for Traffic Densities.

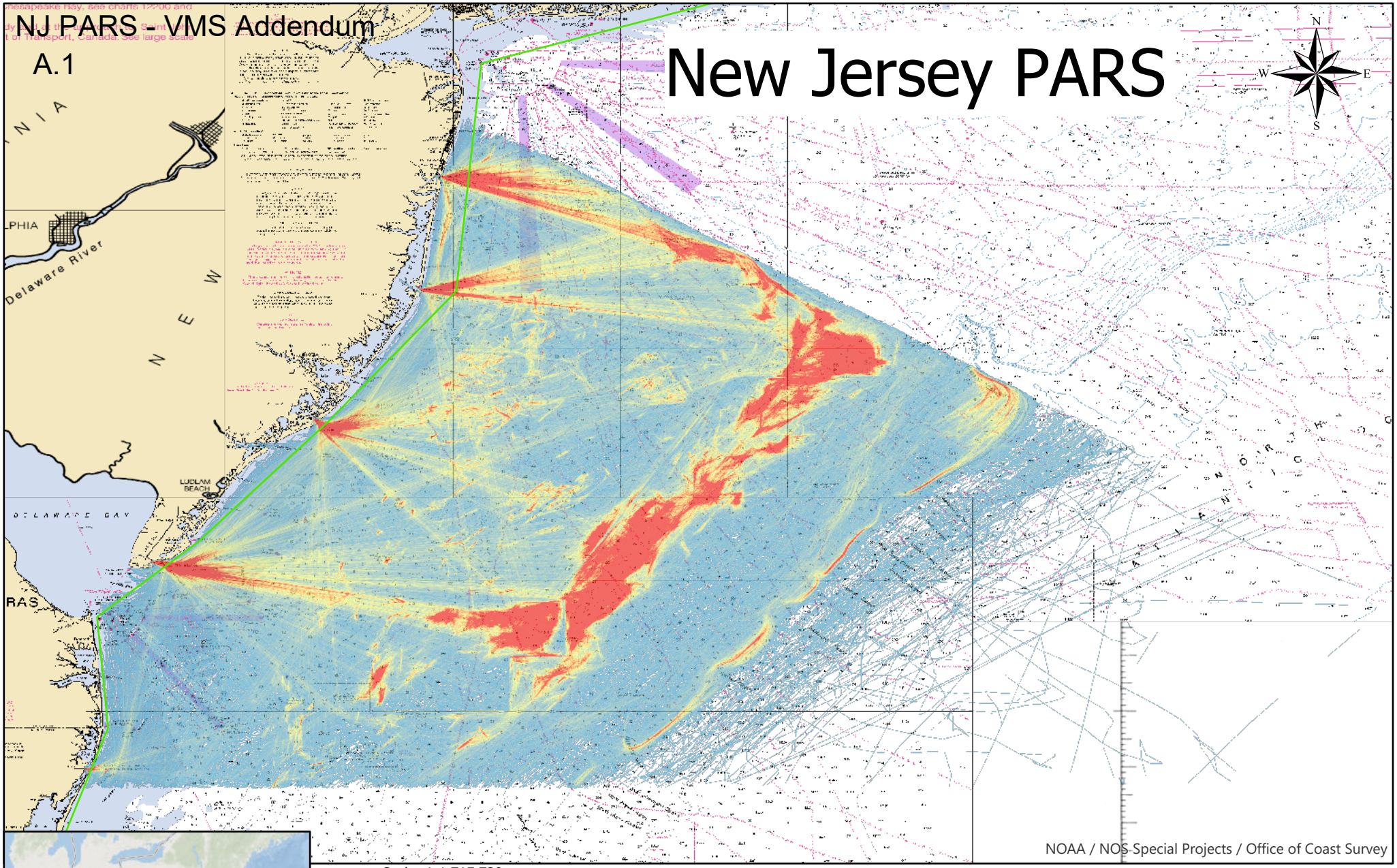
	Year(s)			
Type	2017-2019	2017	2018	2019
All VMS Vessels	NA	A.1	A.2	A.3
Speed > 5 Knots	B.1	B.2	B.3	B.4
Plan Code DOF	NA	C.1	C.2	C.3
Plan Code SES	NA	D.1	D.2	D.3
Plan Code SCO	NA	E.1	E.2	E.3
Plan Code SMB	NA	F.1	F.2	F.3
Gear None/NA	NA	G.1	G.2	G.3
Gear Bottom Trawl	NA	H.1	H.2	H.3
Gear Dredge	NA	I.1	I.2	I.3

Table 9: Labels for Traffic Densities

NJ PARS - VMS Addendum

A.1

New Jersey PARS



Scale: 1:1,715,730

0 5 10 20 30 40 Nautical Miles

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN

Legend

VMS Demarcation Line

Fishing Vessels 2017

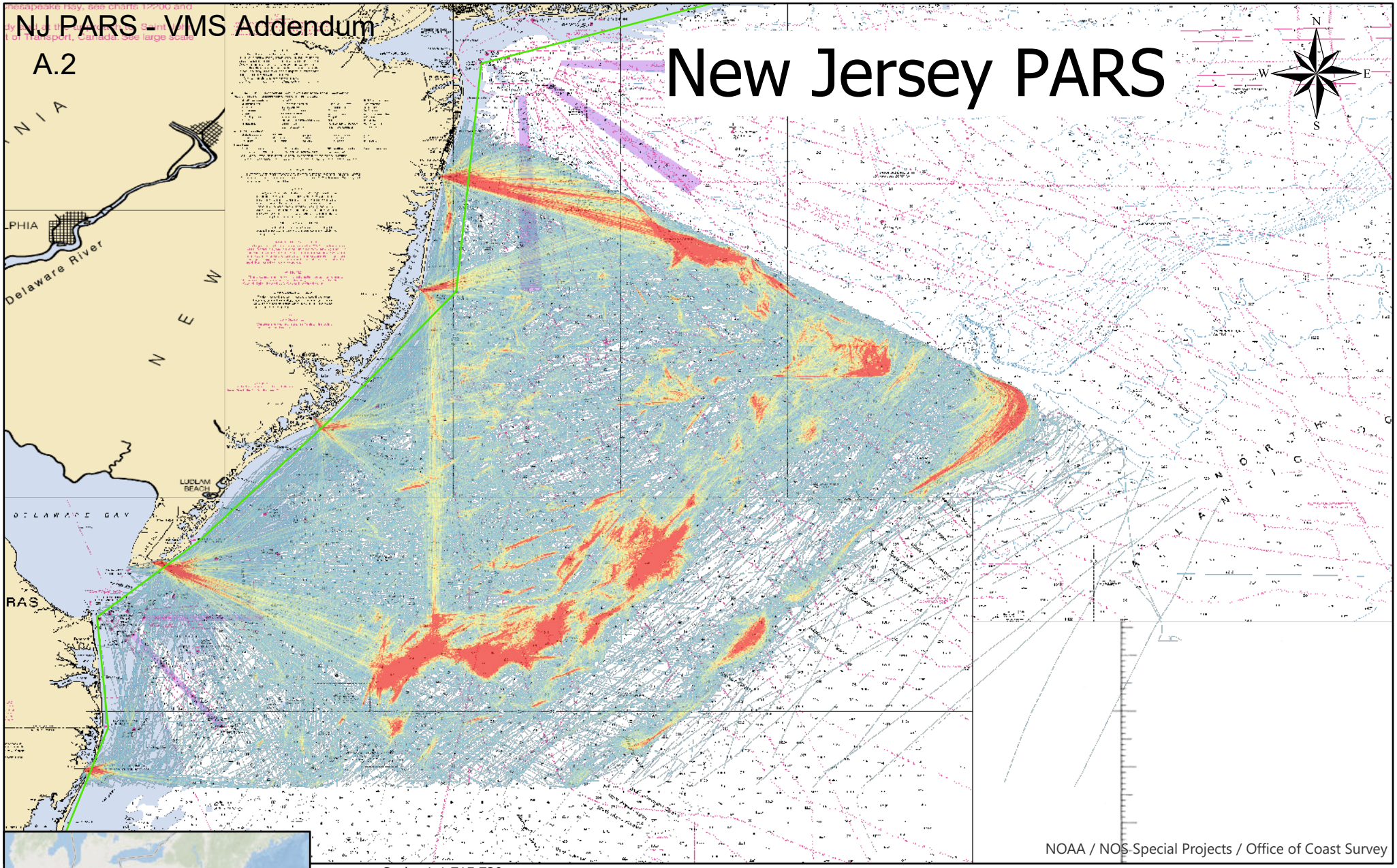
High Traffic Density

Low Traffic Density

NJ PARS - VMS Addendum

A.2

New Jersey PARS



Scale: 1:1,715,730

Nautical Miles

0 5 10 20 30 40

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN

Legend

VMS Demarcation Line

Fishing Vessels 2018

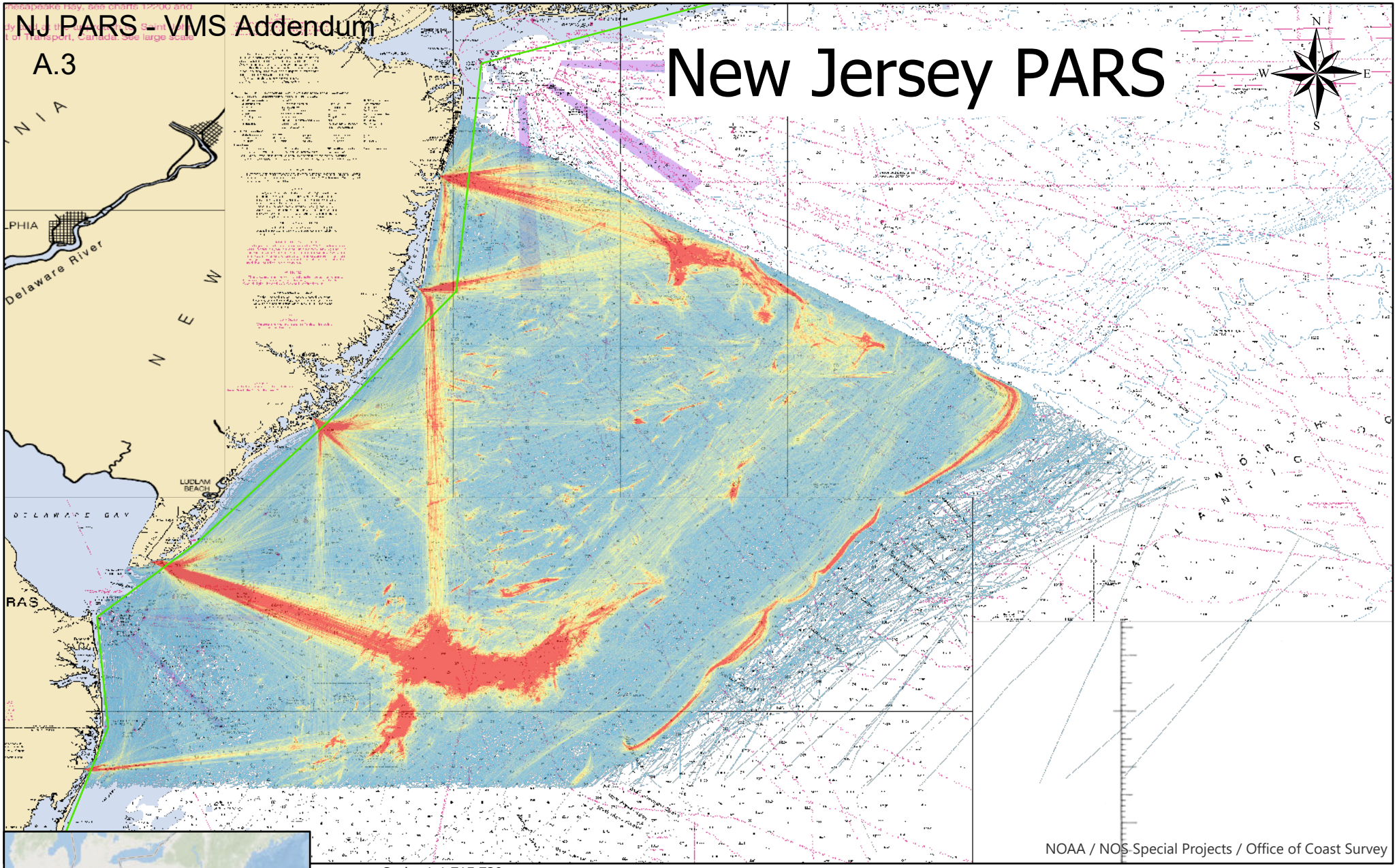
High Traffic Density

Low Traffic Density

NJ PARS - VMS Addendum

A.3

New Jersey PARS



Scale: 1:1,715,730

Nautical Miles

0 5 10 20 30 40

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN

Legend

VMS Demarcation Line

Fishing Vessels 2019

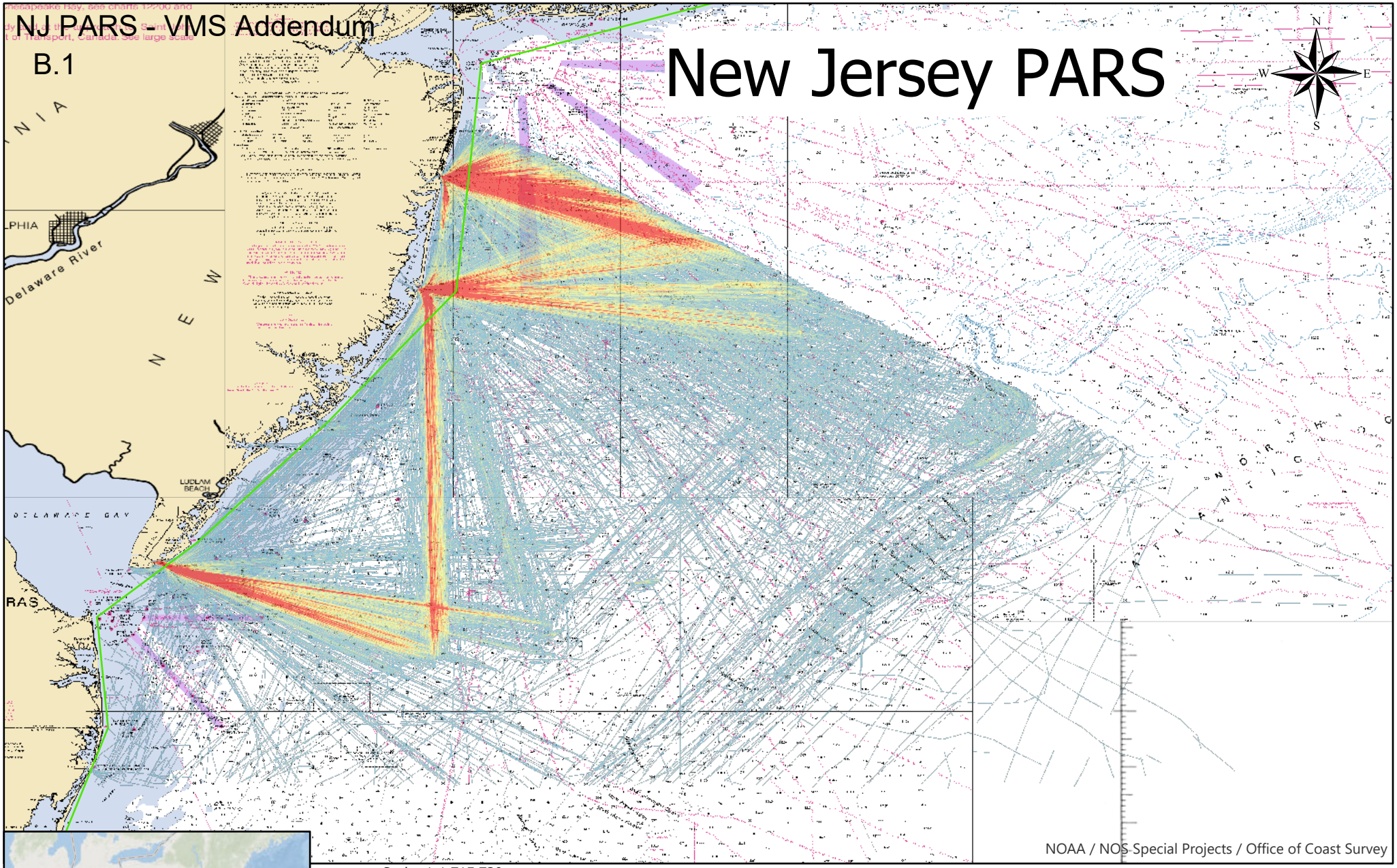
High Traffic Density

Low Traffic Density

NJ PARS - VMS Addendum

B.1

New Jersey PARS



Scale: 1:1,715,730

0 5 10 20 30 40 Nautical Miles

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN

Legend

VMS Demarcation Line

Vessel Speed >5 Knots, 2017-2019

Value

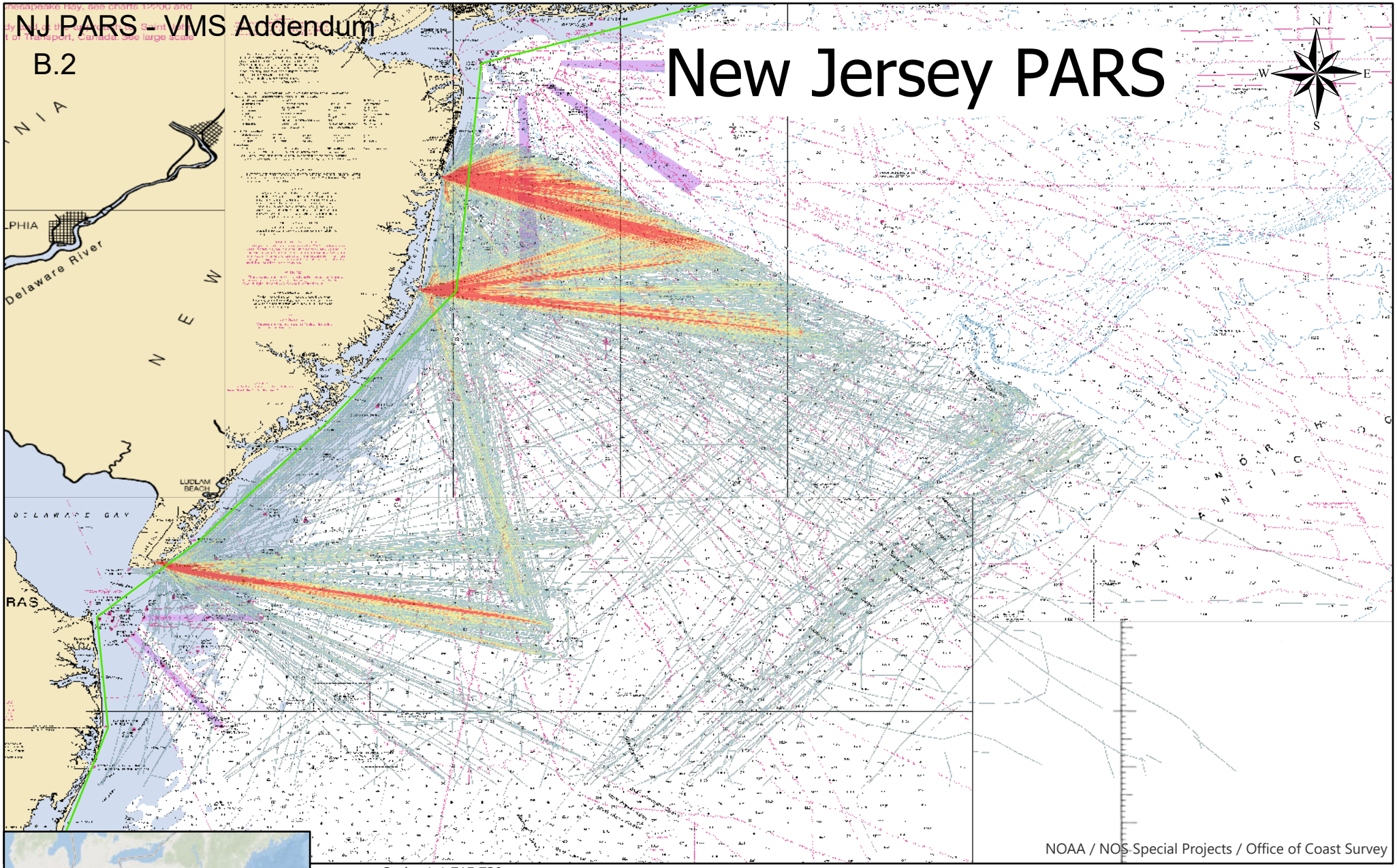
High Traffic Density

Low Traffic Density

NJ PARS - VMS Addendum

B.2

New Jersey PARS



Scale: 1:1,715,730

0 5 10 20 30 40 Nautical Miles

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN

Legend

VMS Demarcation Line

Vessel Speed >5 Knots, 2017

Value

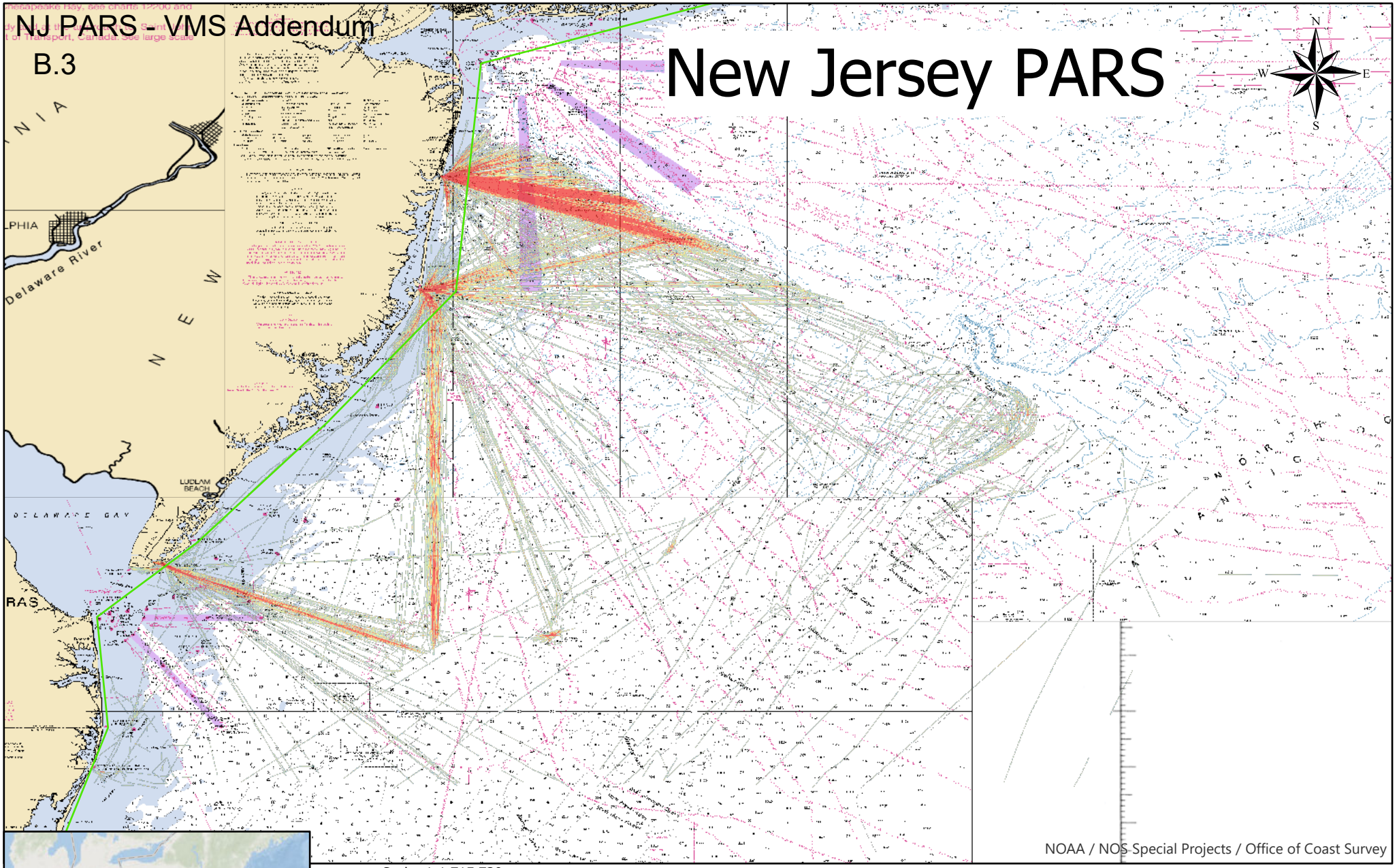
High Traffic Density

Low Traffic Density

NJ PARS - VMS Addendum

B.3

New Jersey PARS



Scale: 1:1,715,730

Nautical Miles

0 5 10 20 30 40

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN

Legend

VMS Demarcation Line

Vessel Speed >5 Knots, 2018

Value

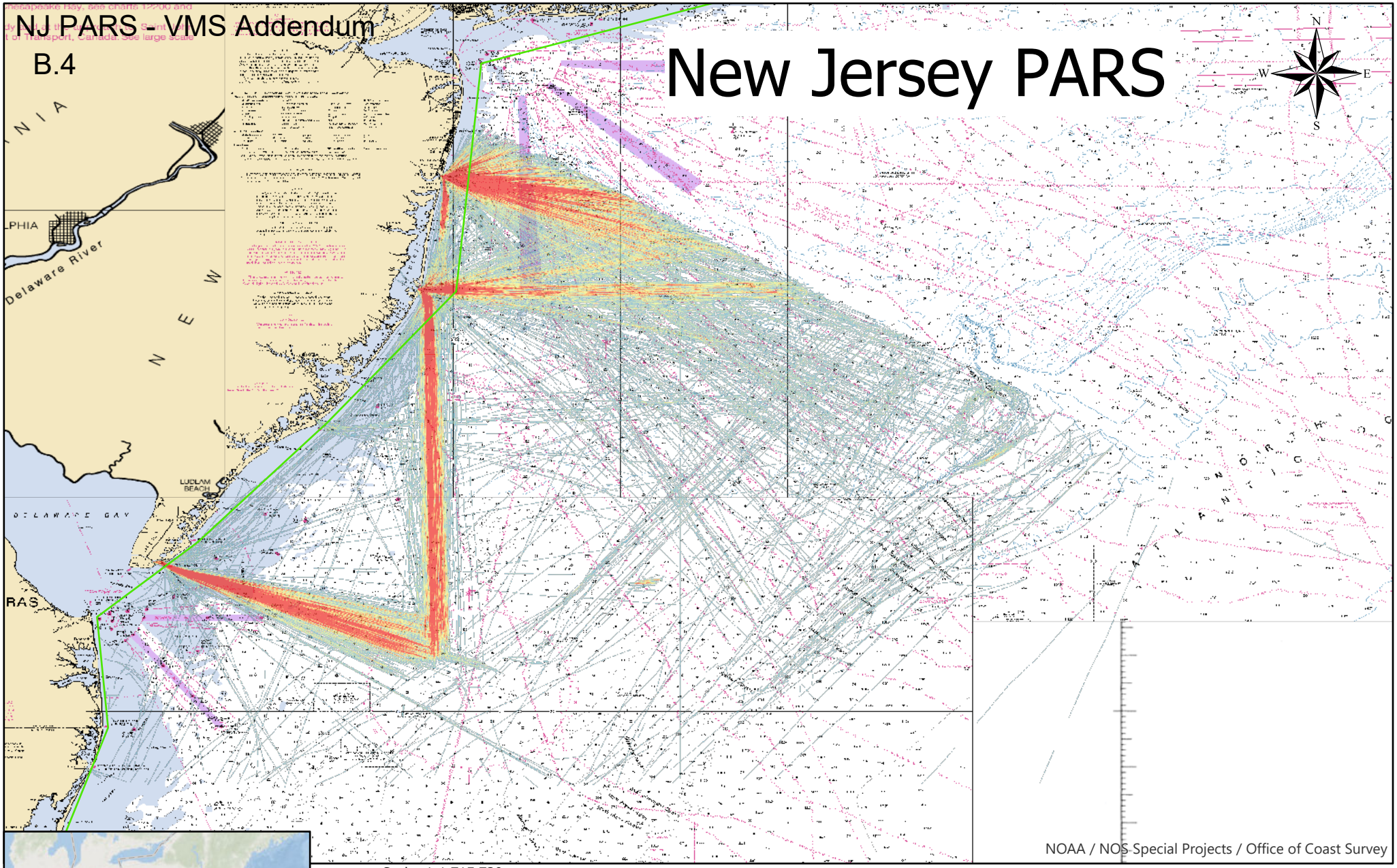
High Traffic Density

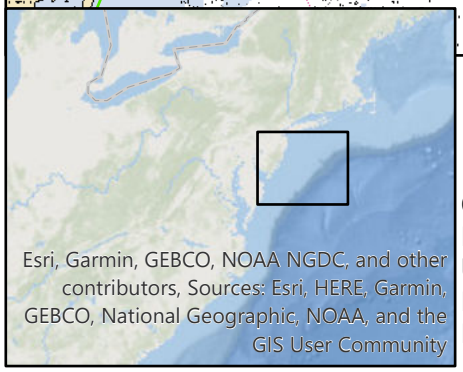
Low Traffic Density

NJ PARS - VMS Addendum

B.4

New Jersey PARS





Scale: 1:1,715,730

0 5 10 20 30 40 Nautical Miles

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN

Legend

VMS Demarcation Line

Vessel Speed >5 Knots, 2019

Value

High Traffic Density

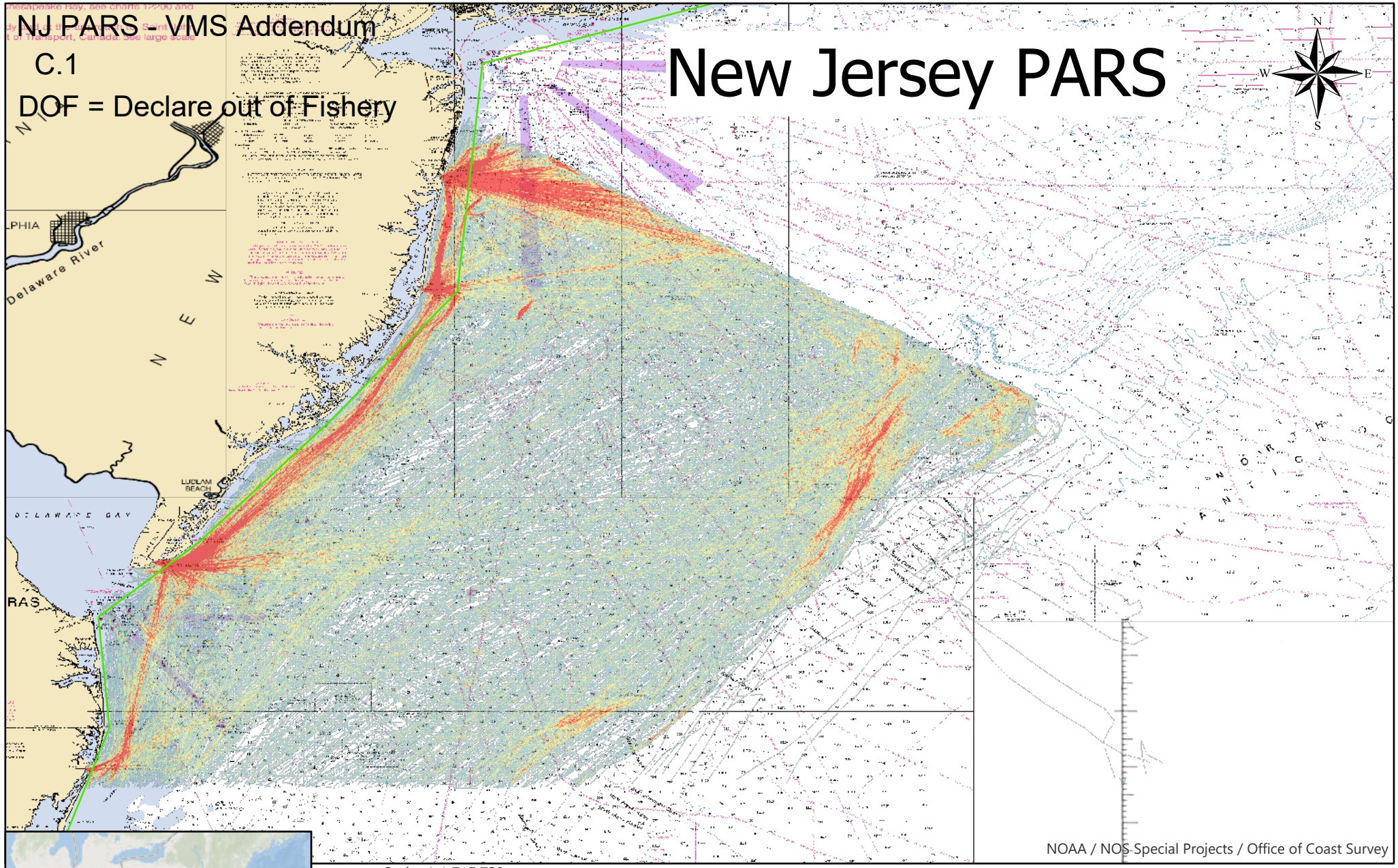
Low Traffic Density

NJ PARS - VMS Addendum

C.1

DOF = Declare out of Fishery

New Jersey PARS



Scale: 1:1,715,730

0 5 10 20 30 40 Nautical Miles

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN

Legend

VMS Demarcation Line

Plan Code DOF 2017

High Traffic Density

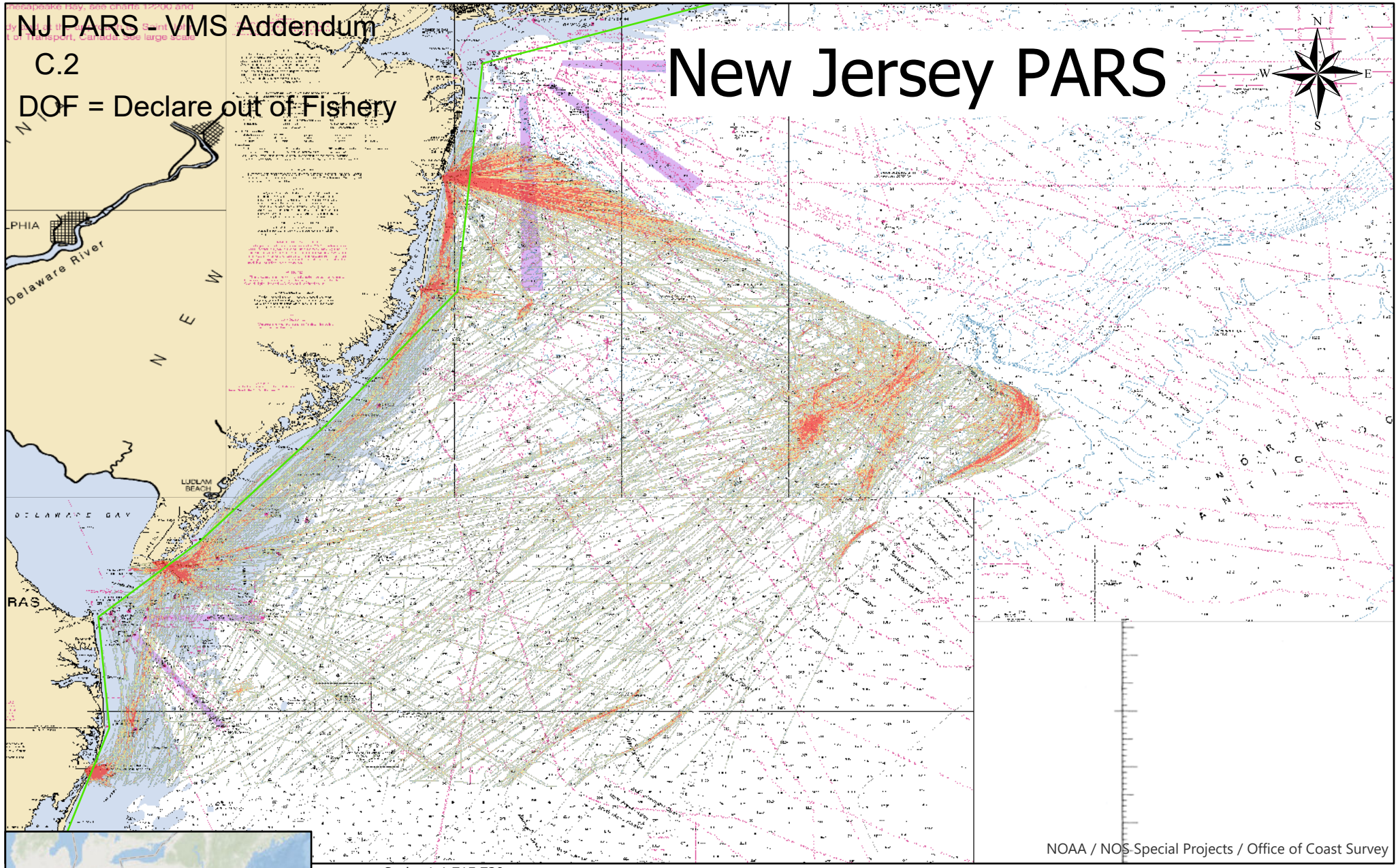
Low Traffic Density

NJ PARS - VMS Addendum

C.2

DOF = Declare out of Fishery

New Jersey PARS



Scale: 1:1,715,730

0 5 10 20 30 40 Nautical Miles

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN

Legend

VMS Demarcation Line

Plan Code DOF 2018

High Traffic Density

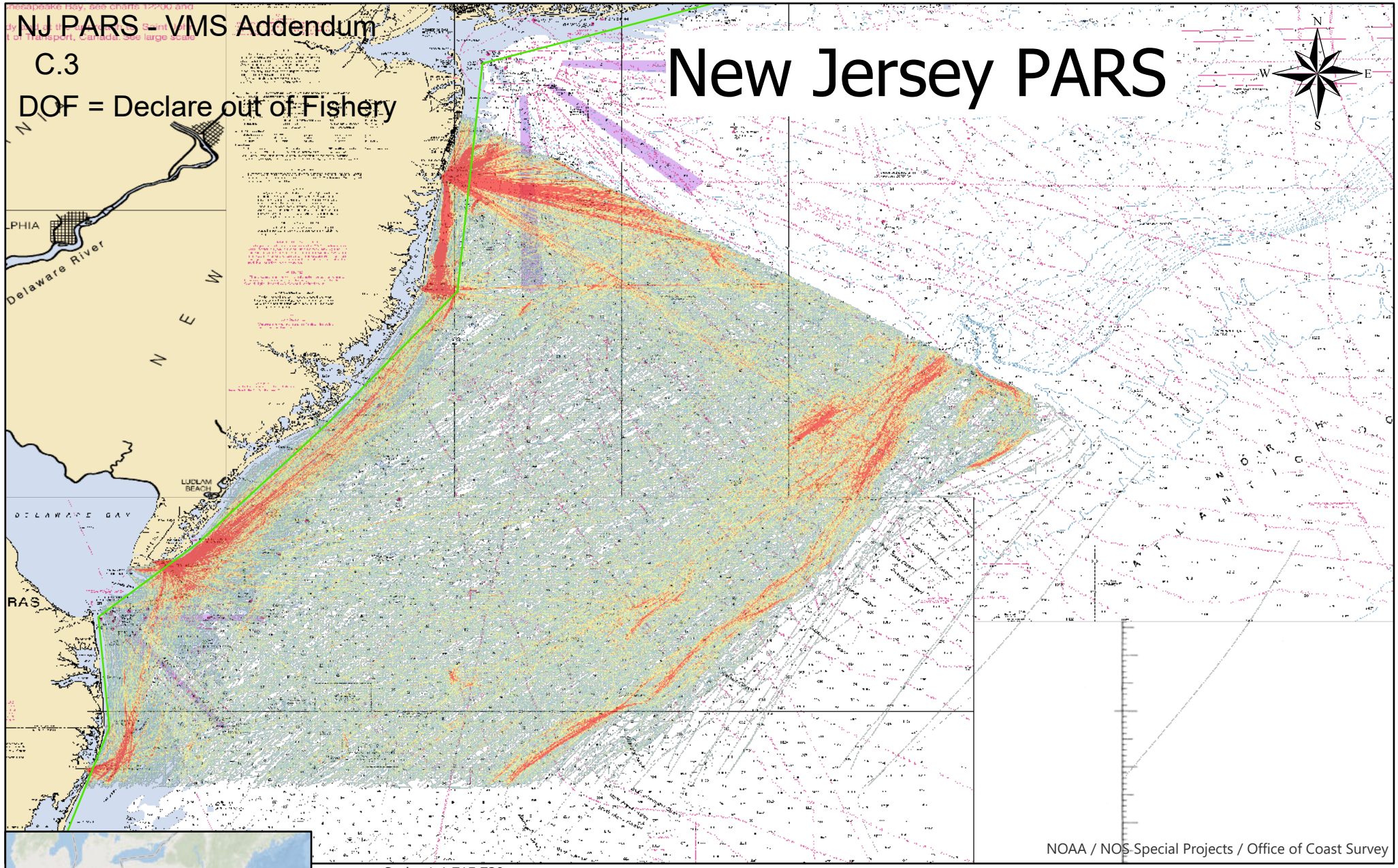
Low Traffic Density

NJ PARS - VMS Addendum

C.3

DOF = Declare out of Fishery

New Jersey PARS



Scale: 1:1,715,730

0 5 10 20 30 40 Nautical Miles

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN

Legend

VMS Demarcation Line

Plan Code DOF 2019

High Traffic Density

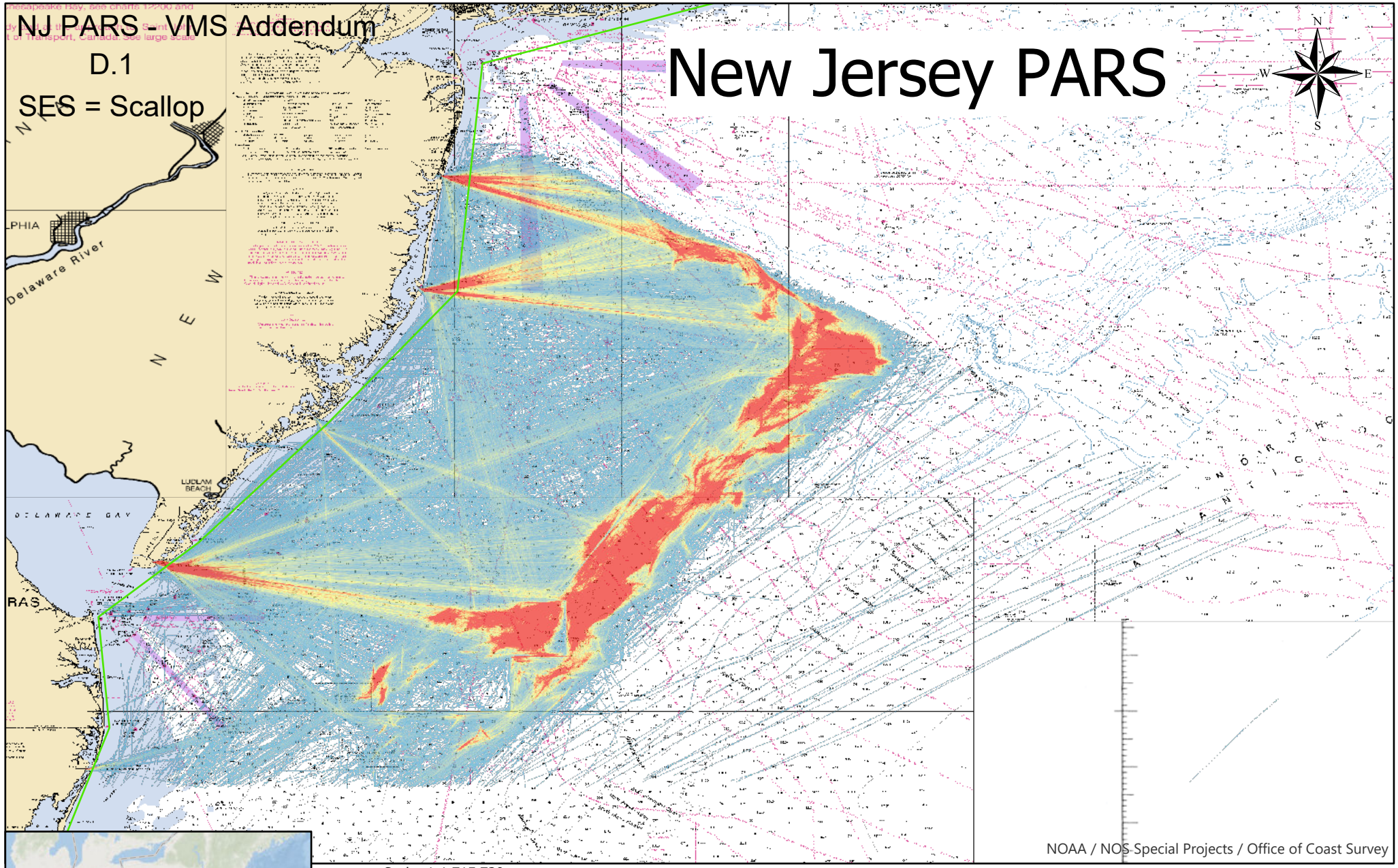
Low Traffic Density

NJ PARS - VMS Addendum

D.1

SES = Scallop

New Jersey PARS



Scale: 1:1,715,730

0 5 10 20 30 40 Nautical Miles

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN

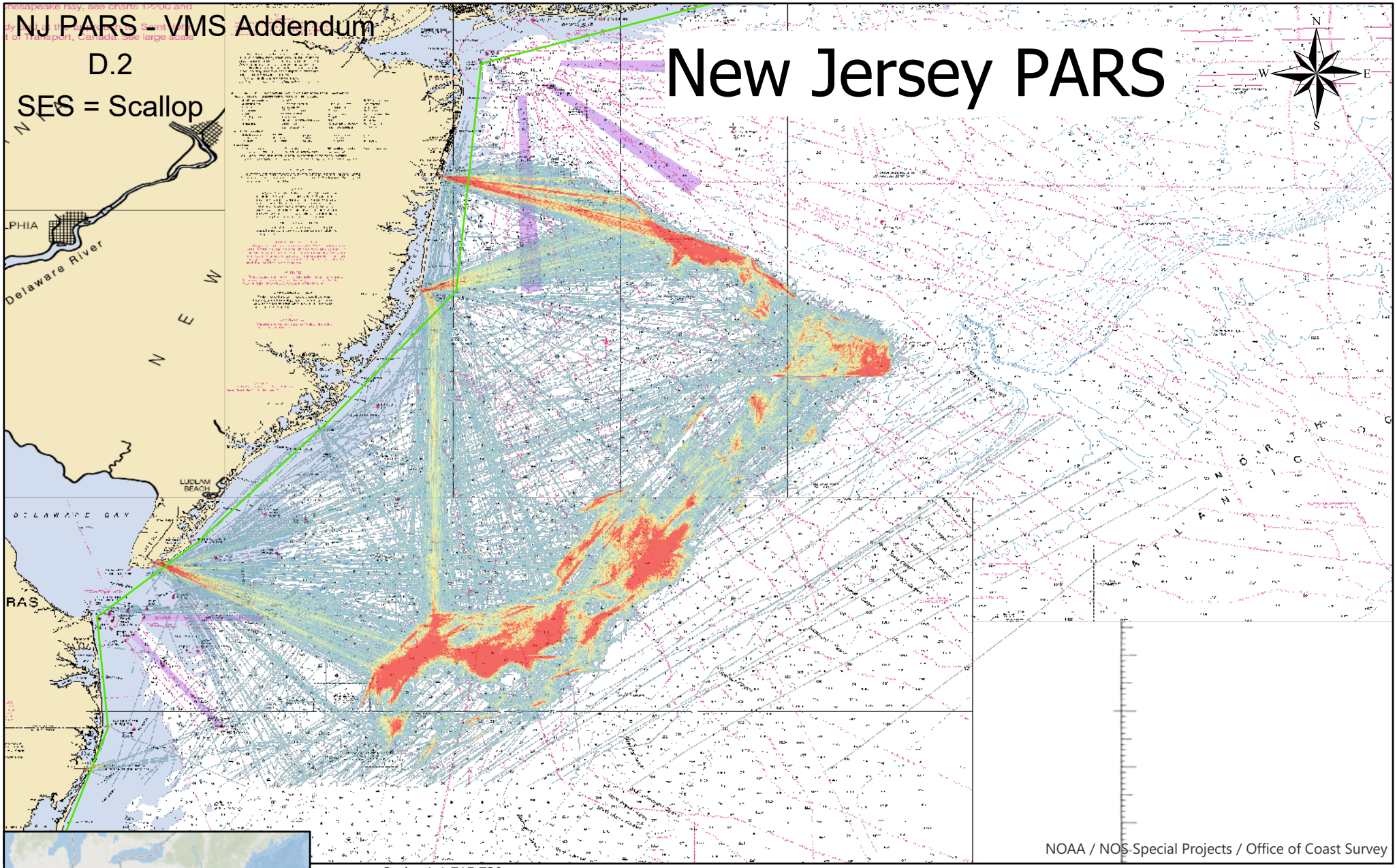
Legend

VMS Demarcation Line

Plan Code SES 2017

High Traffic Density

Low Traffic Density

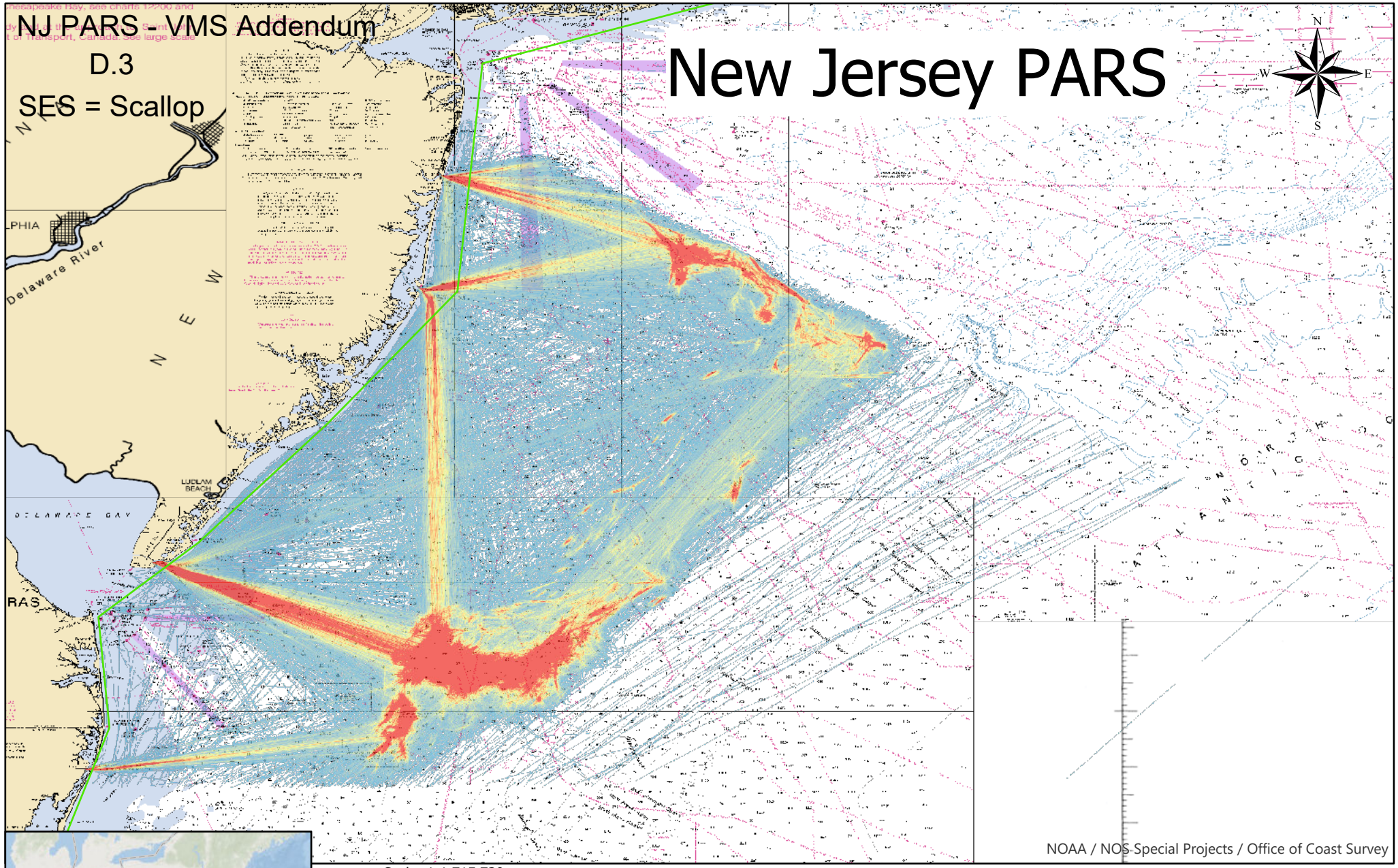

NJ PARS - VMS Addendum
D.2
SES = Scallop
New Jersey PARS
N
W
E
S
Delaware River
LUDLAM BEACH
NOAA / NOS Special Projects / Office of Coast Survey
Scale: 1:1,715,730
Nautical Miles
0 5 10 20 30 40
Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN
Esri, Garmin, GEBCO, NOAA NGDC, and other contributors, Sources: Esri, HERE, Garmin, GEBCO, National Geographic, NOAA, and the GIS User Community
Legend
VMS Demarcation Line
Plan Code SES 2018
High Traffic Density
Low Traffic Density

NJ PARS - VMS Addendum

D.3

SES = Scallop

New Jersey PARS



Scale: 1:1,715,730

Nautical Miles

0 5 10 20 30 40

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN

Legend

VMS Demarcation Line

Plan Code SES 2019

High Traffic Density

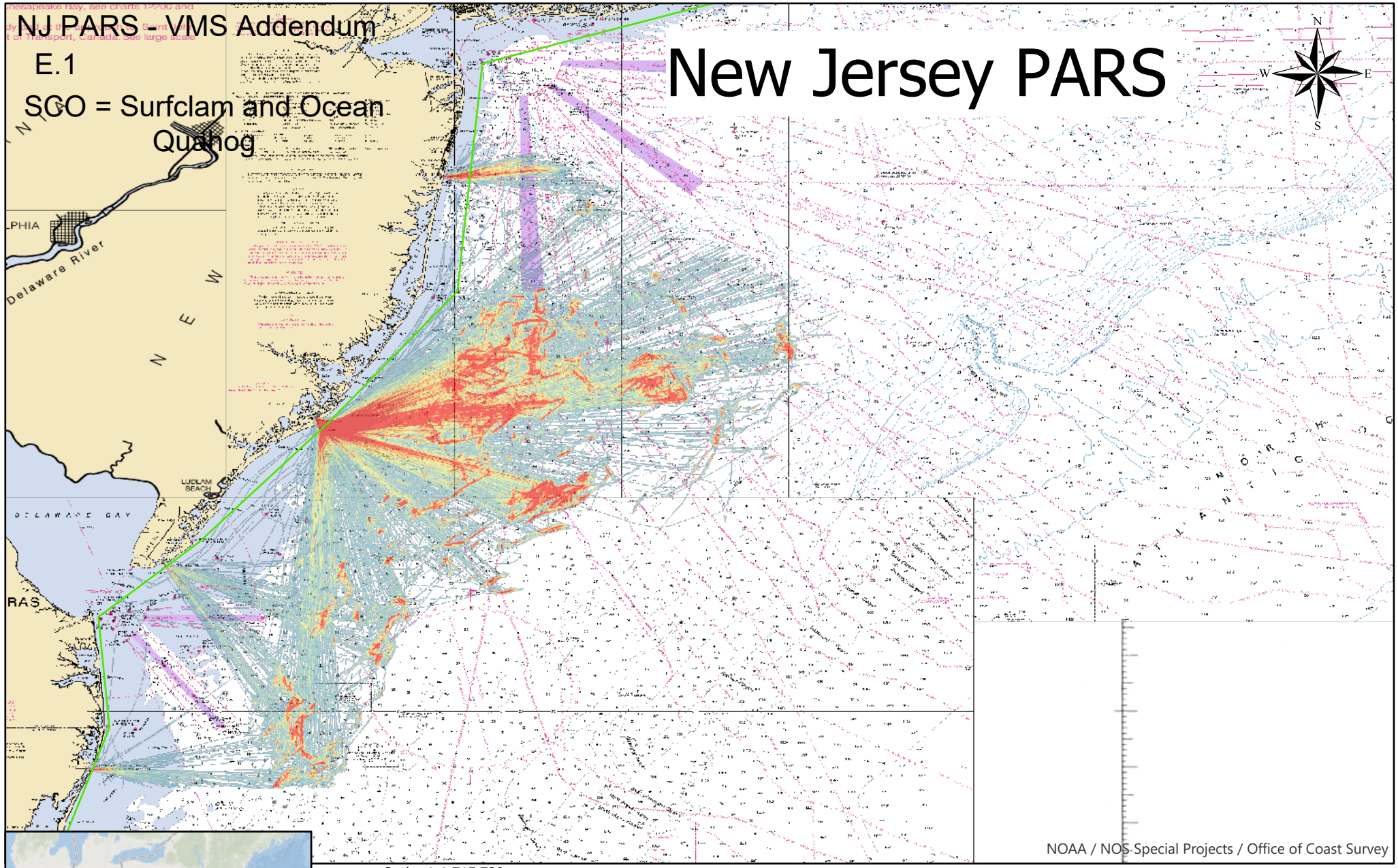
Low Traffic Density

NJ PARS - VMS Addendum

E.1

SCO = Surfclam and Ocean Quahog

New Jersey PARS



Scale: 1:1,715,730

0 5 10 20 30 40 Nautical Miles

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN

Legend

VMS Demarcation Line

Plan Code SCO 2017

High Traffic Density

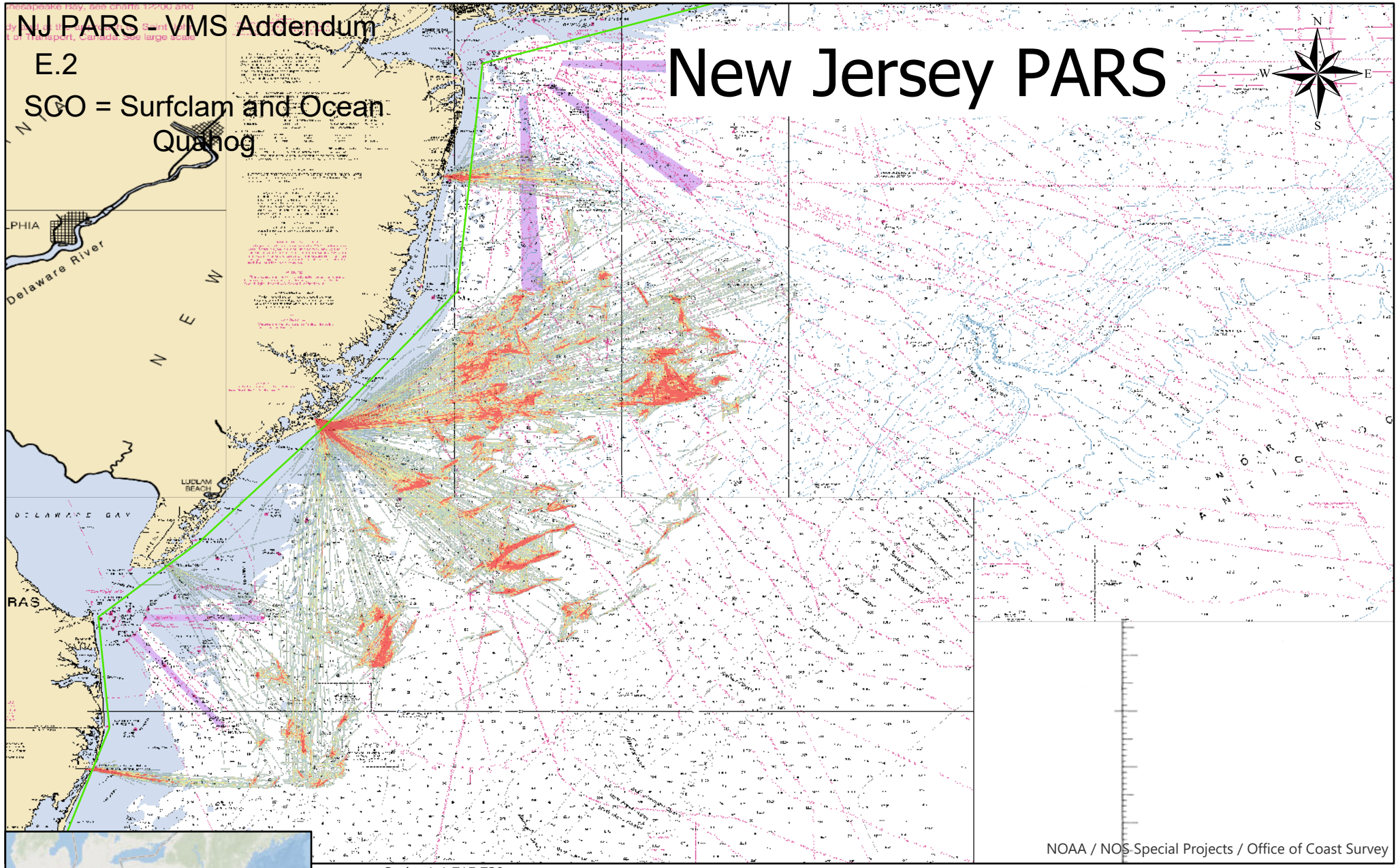
Low Traffic Density

NJ PARS - VMS Addendum

E.2

SCO = Surfclam and Ocean Quahog

New Jersey PARS



Scale: 1:1,715,730

0 5 10 20 30 40 Nautical Miles

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN

Legend

VMS Demarcation Line

Plan Code SCO 2018

High Traffic Density

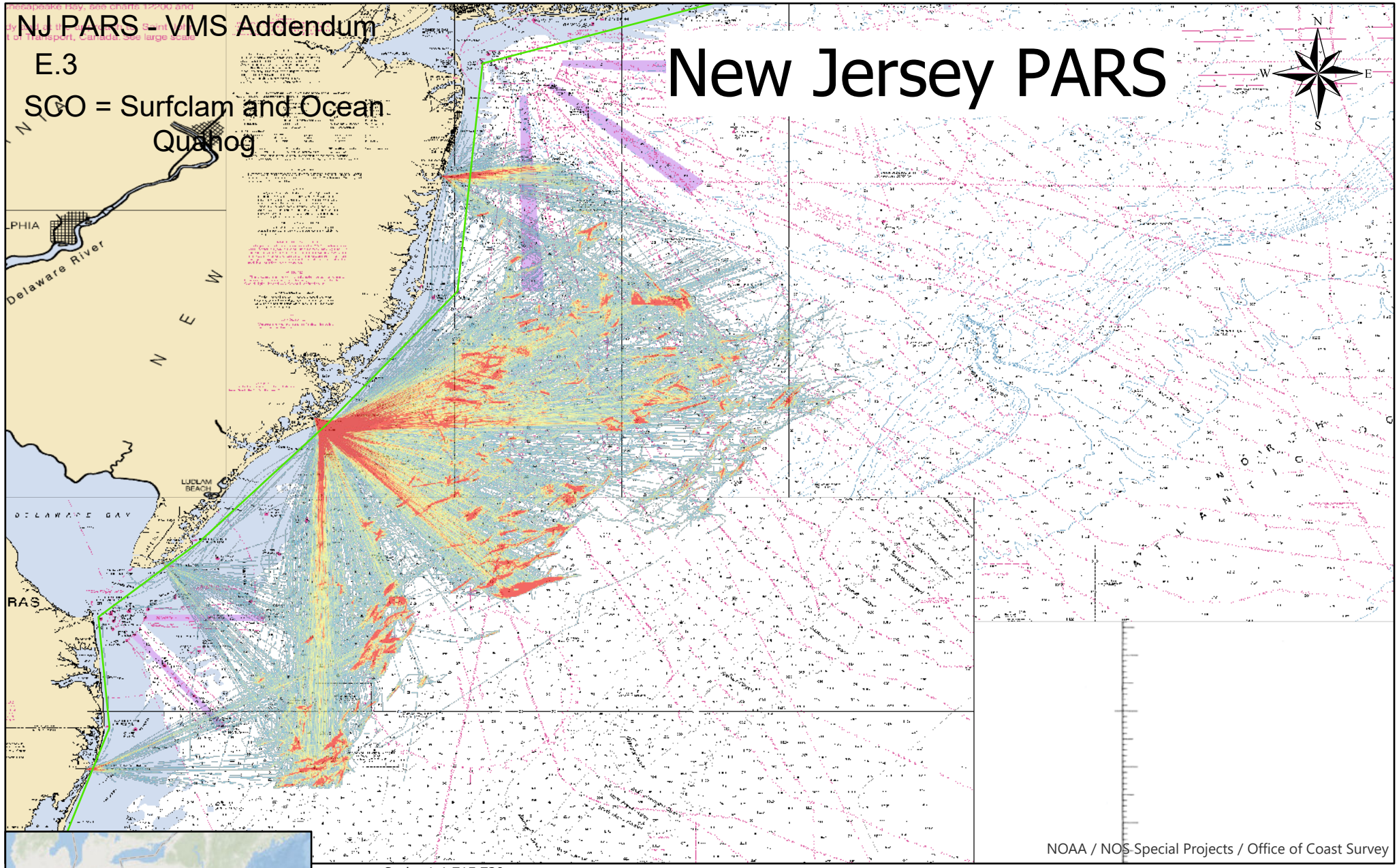
Low Traffic Density

NJ PARS - VMS Addendum

E.3

SCO = Surfclam and Ocean Quahog

New Jersey PARS



Scale: 1:1,715,730

0 5 10 20 30 40 Nautical Miles

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN

Legend

VMS Demarcation Line

Plan Code SCO 2019

High Traffic Density

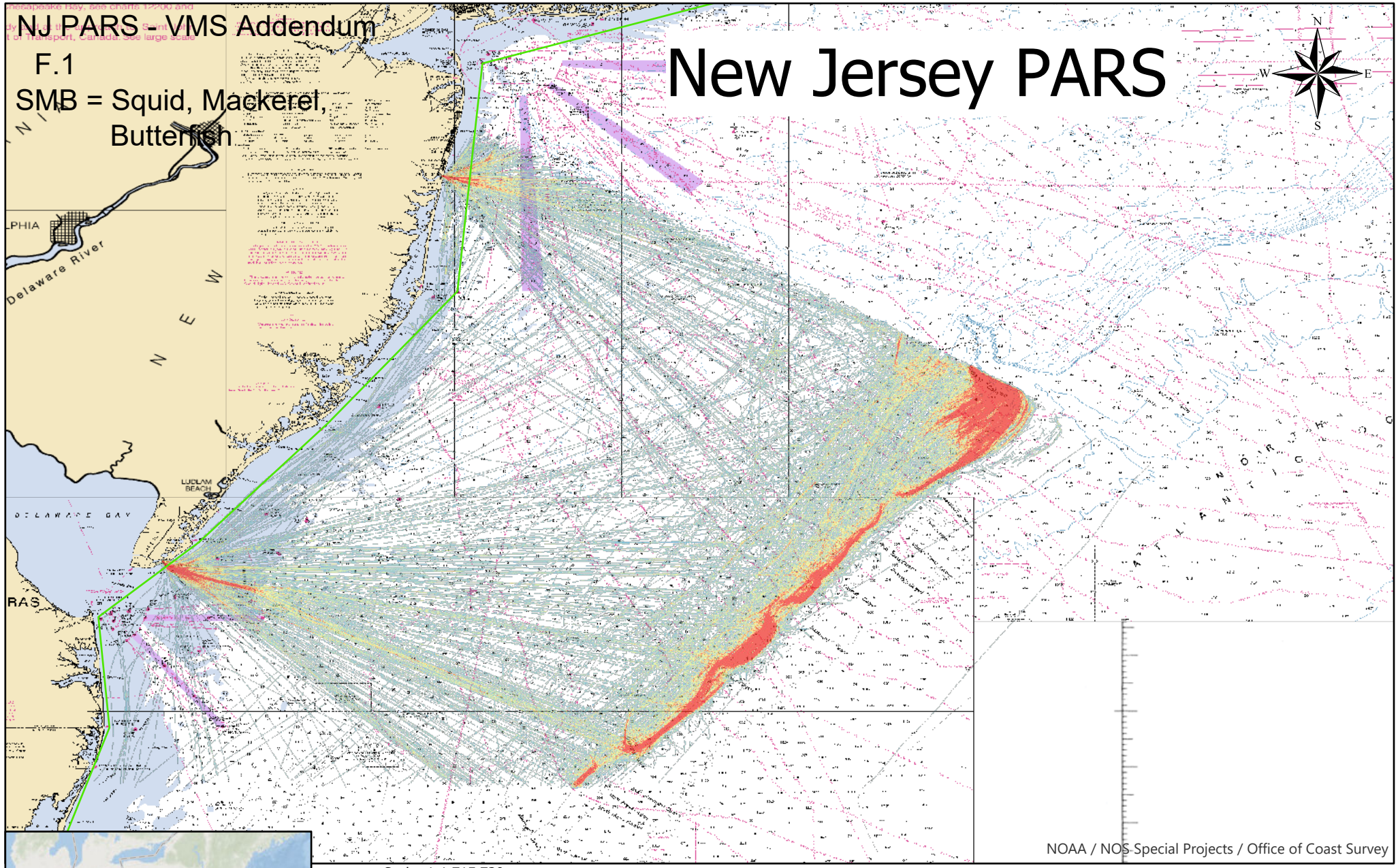
Low Traffic Density

NJ PARS - VMS Addendum

F.1

SMB = Squid, Mackerel, Butterfish

New Jersey PARS



Scale: 1:1,715,730

0 5 10 20 30 40 Nautical Miles

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN

Legend

VMS Demarcation Line

Plan Code SMB 2017

High Traffic Density

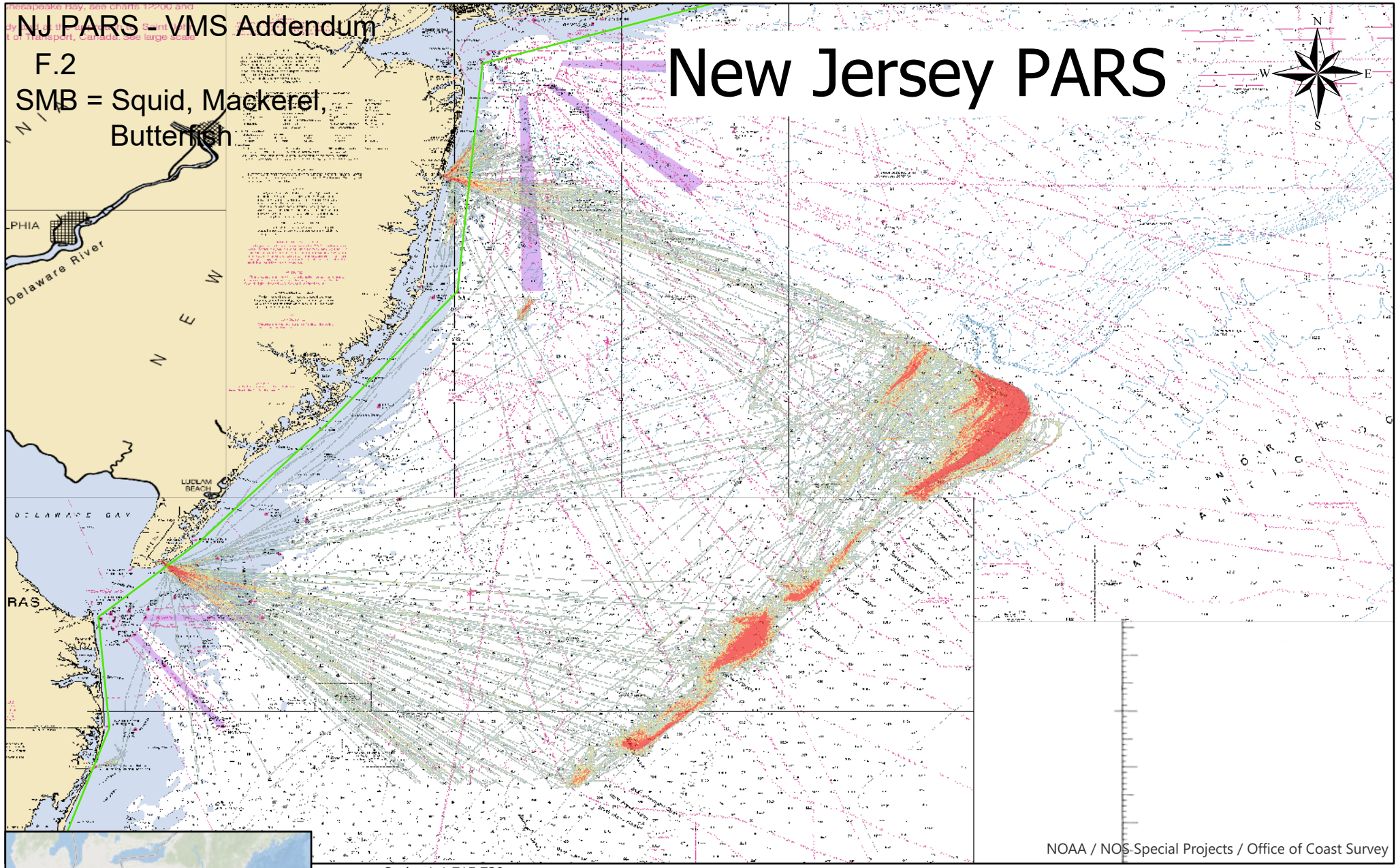
Low Traffic Density

NJ PARS - VMS Addendum

F.2

SMB = Squid, Mackerel, Butterfish

New Jersey PARS



Scale: 1:1,715,730

0 5 10 20 30 40 Nautical Miles

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN

Legend

VMS Demarcation Line

Plan Code SMB 2018

High Traffic Density

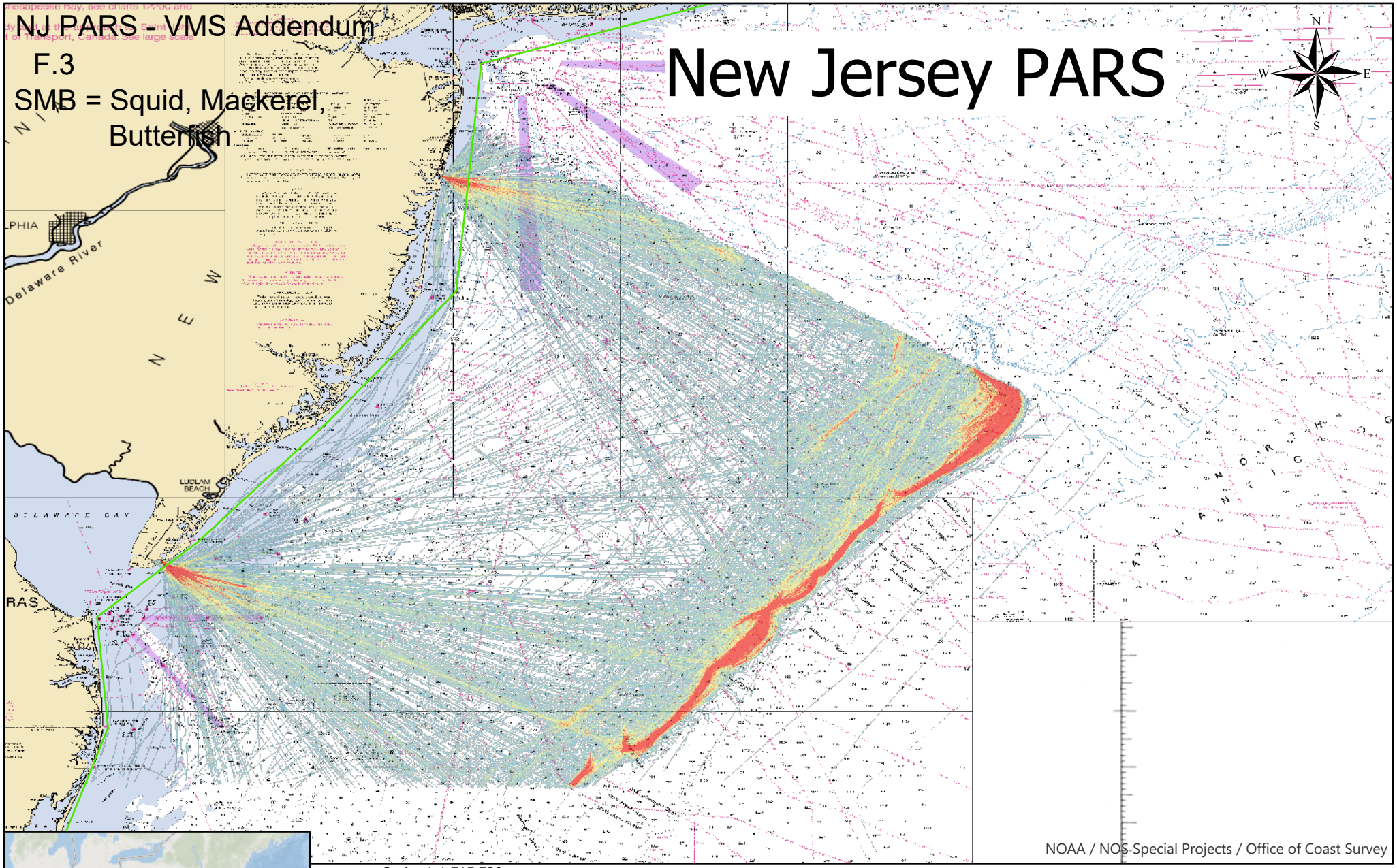
Low Traffic Density

NJ PARS - VMS Addendum

F.3

SMB = Squid, Mackerel, Butterfish

New Jersey PARS



Scale: 1:1,715,730

0 5 10 20 30 40 Nautical Miles

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN

Legend

VMS Demarcation Line

Plan Code SMB 2019

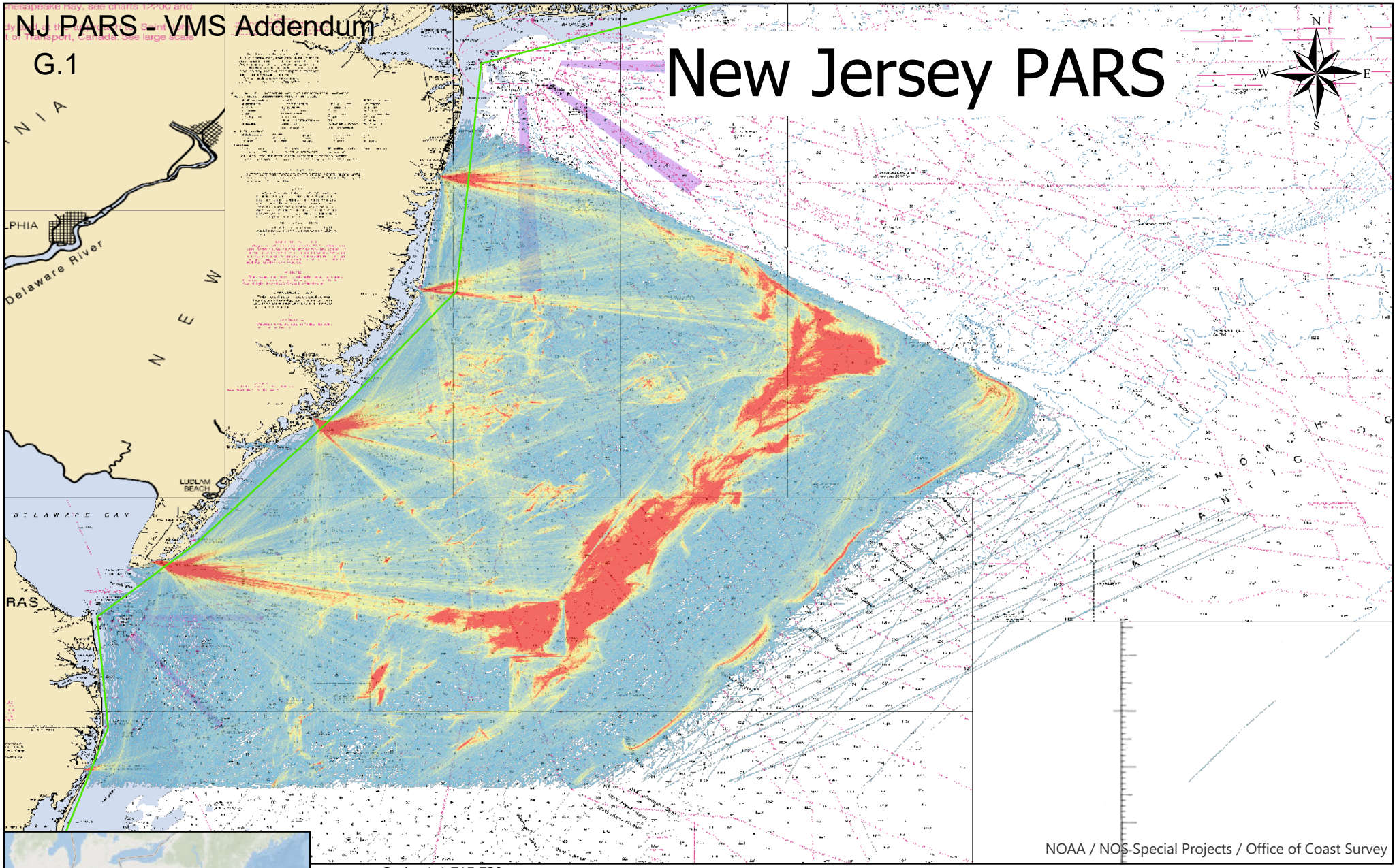
High Traffic Density

Low Traffic Density

NJ PARS - VMS Addendum

G.1

New Jersey PARS



Scale: 1:1,715,730

Nautical Miles

0 5 10 20 30 40

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN

Legend

VMS Demarcation Line

No Gear or NA 2017

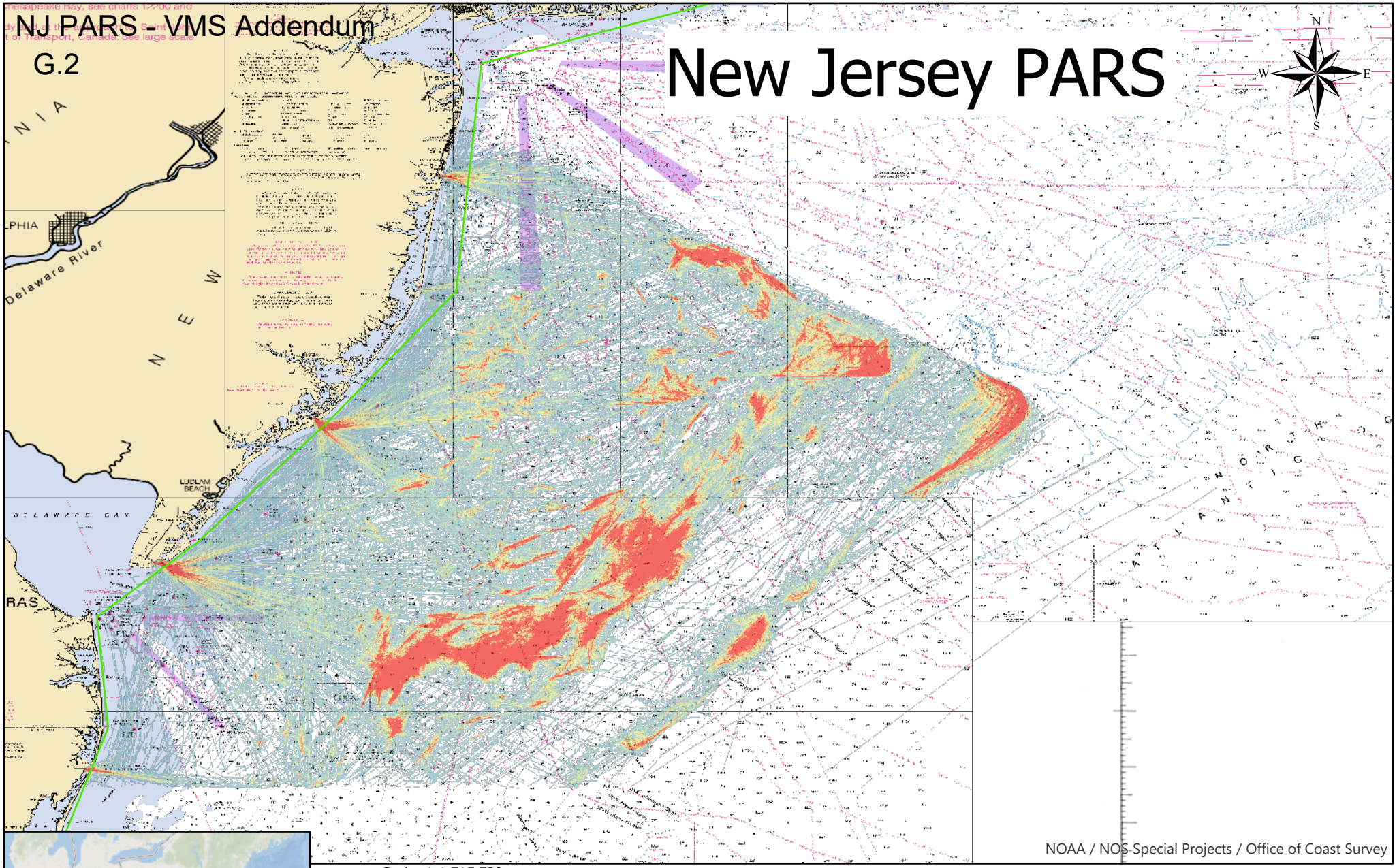
High Traffic Density

Low Traffic Density

NJ PARS - VMS Addendum

G.2

New Jersey PARS



Scale: 1:1,715,730

0 5 10 20 30 40 Nautical Miles

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN

Legend

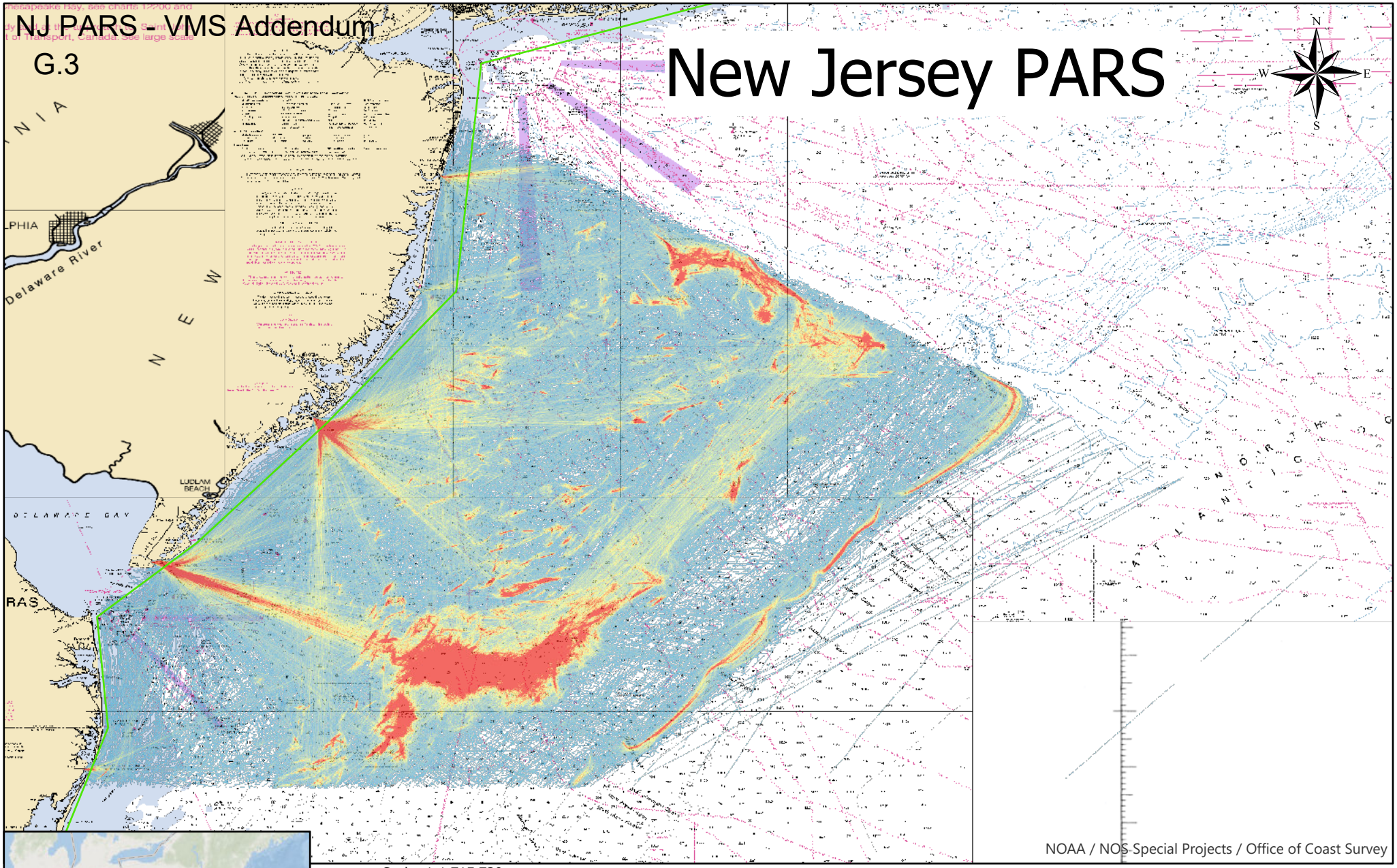
VMS Demarcation Line

No Gear or NA 2018

High Traffic Density

Low Traffic Density

New Jersey PARS



Scale: 1:1,715,730

0 5 10 20 30 40 Nautical Miles

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN

Legend

VMS Demarcation Line

No Gear or NA 2019

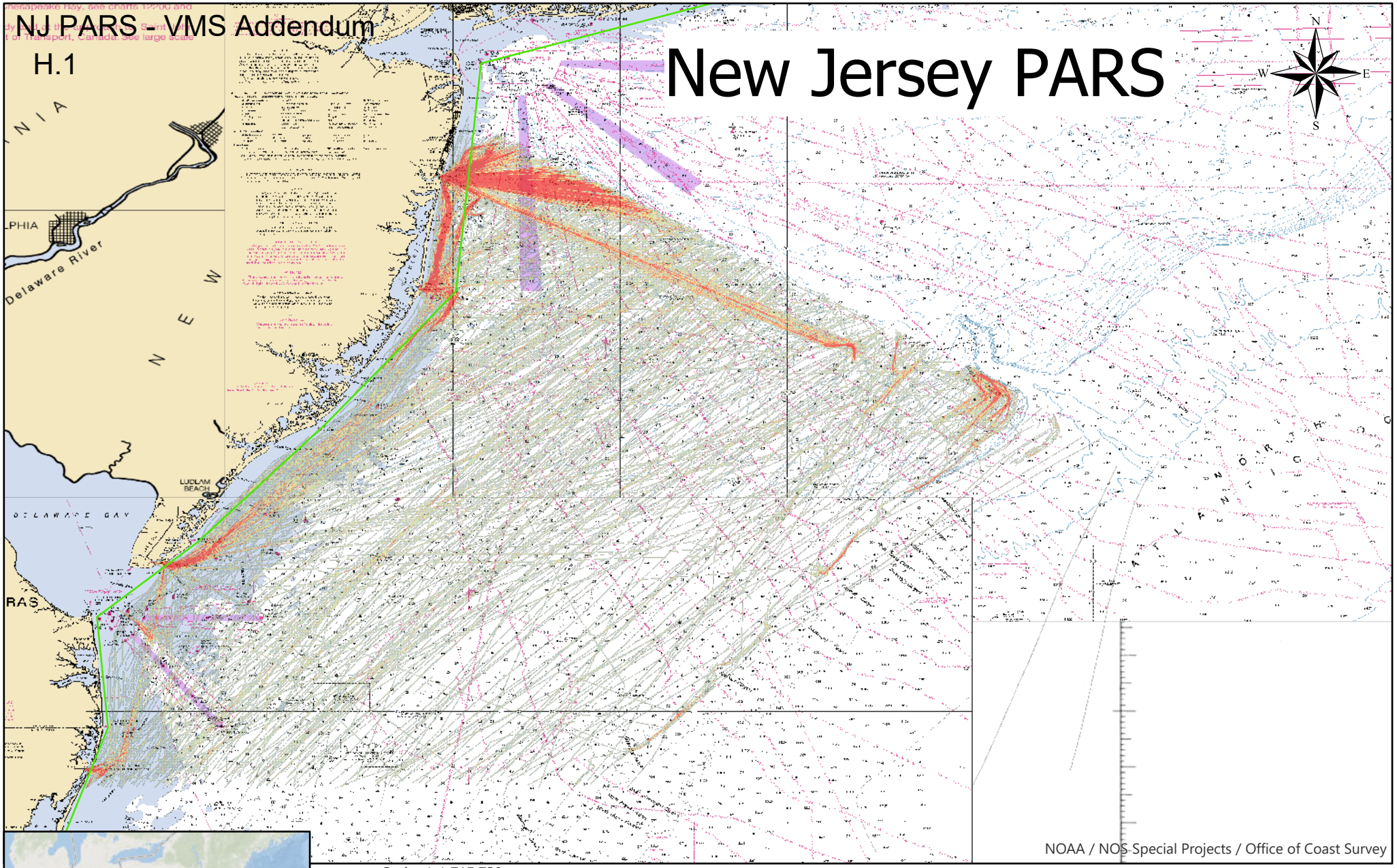
High Traffic Density

Low Traffic Density

NJ PARS - VMS Addendum

H.1

New Jersey PARS



Scale: 1:1,715,730

0 5 10 20 30 40 Nautical Miles

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN

Legend

VMS Demarcation Line

Bottom Trawl 2017

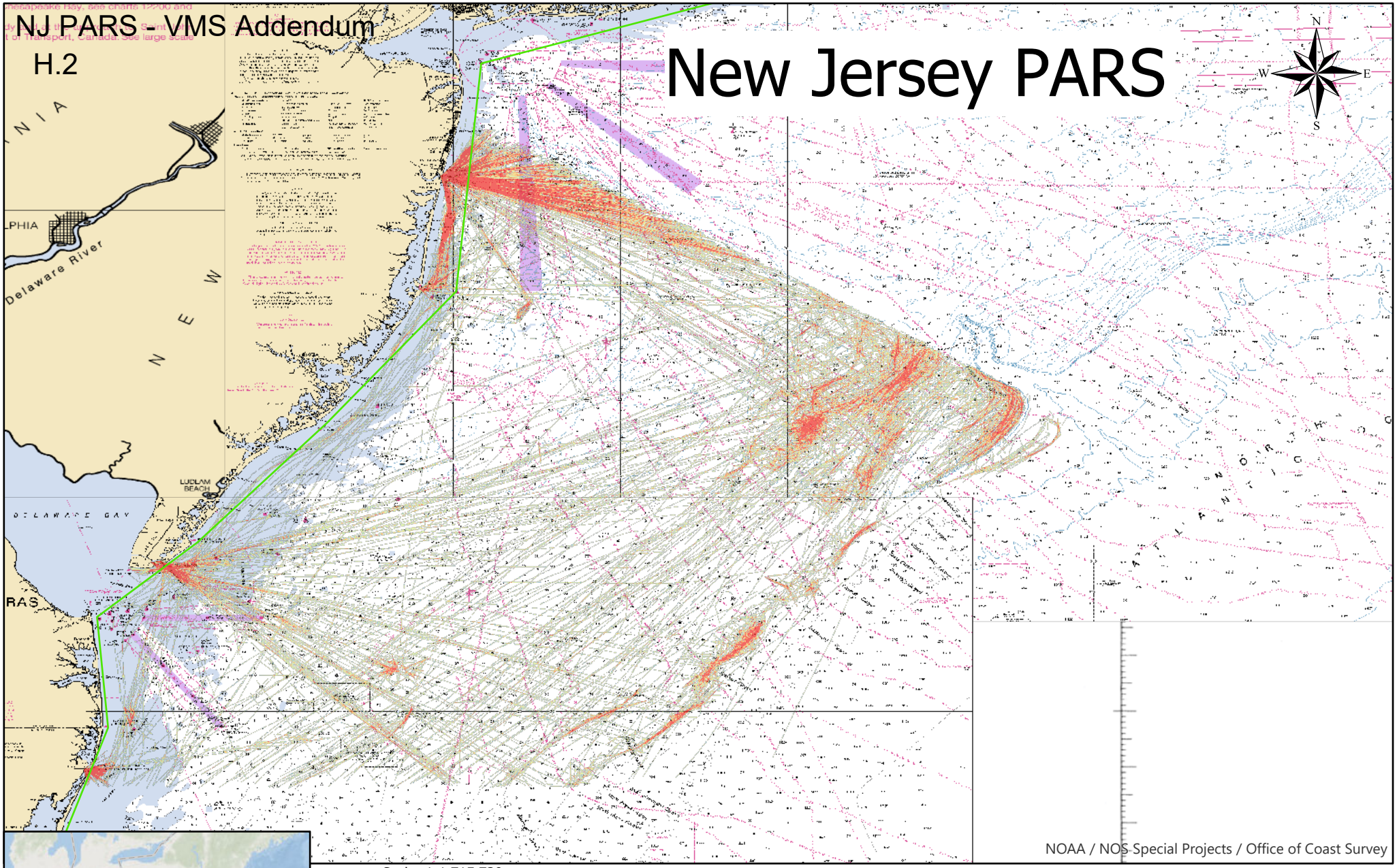
High Traffic Density

Low Traffic Density

NJ PARS - VMS Addendum

H.2

New Jersey PARS



Scale: 1:1,715,730

Nautical Miles

0 5 10 20 30 40

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN

Legend

VMS Demarcation Line

Bottom Trawl 2018

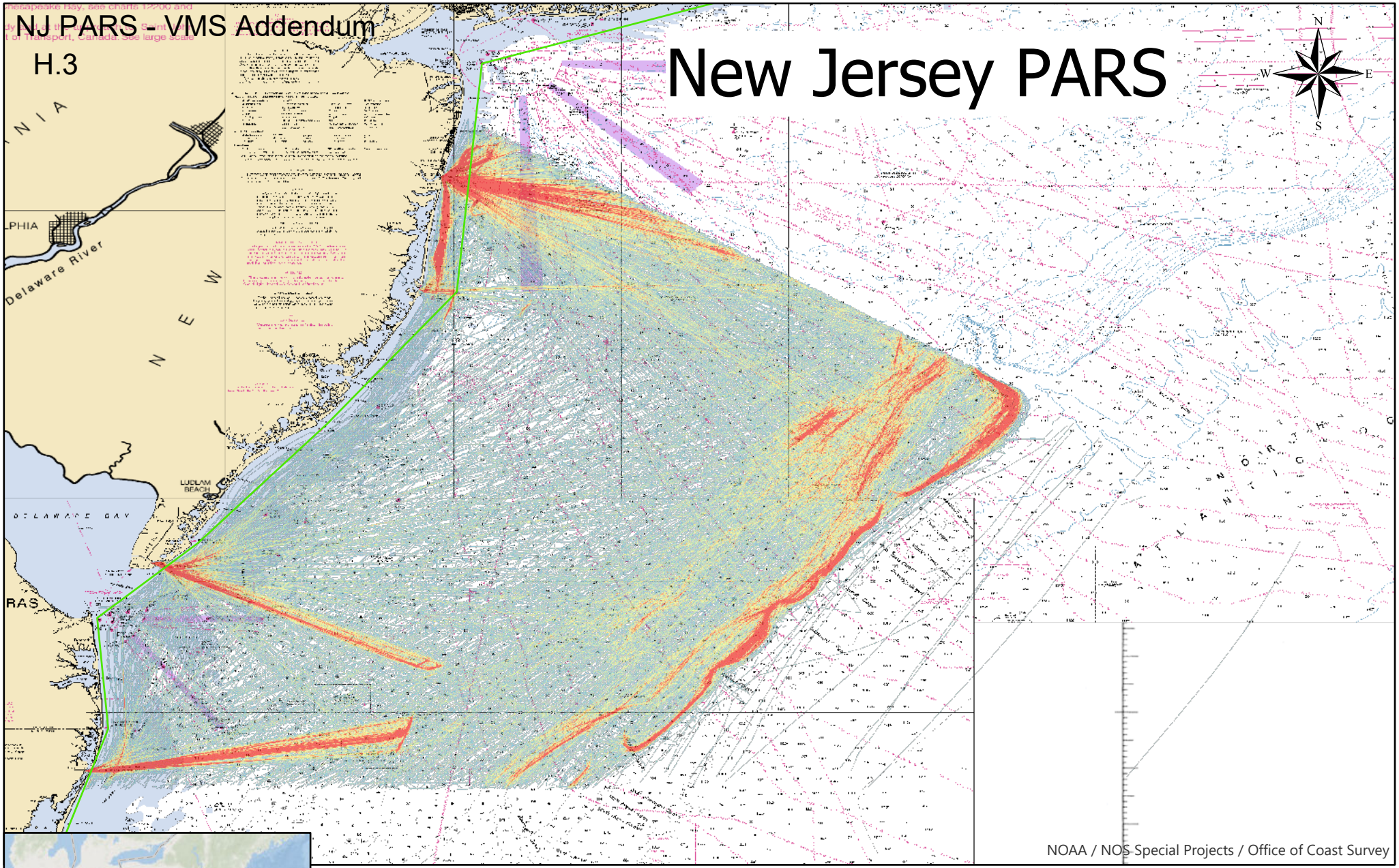
High Traffic Density

Low Traffic Density

NJ PARS - VMS Addendum

H.3

New Jersey PARS



Scale: 1:1,715,730

0 5 10 20 30 40 Nautical Miles

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN

Legend

VMS Demarcation Line

Bottom Trawl 2019

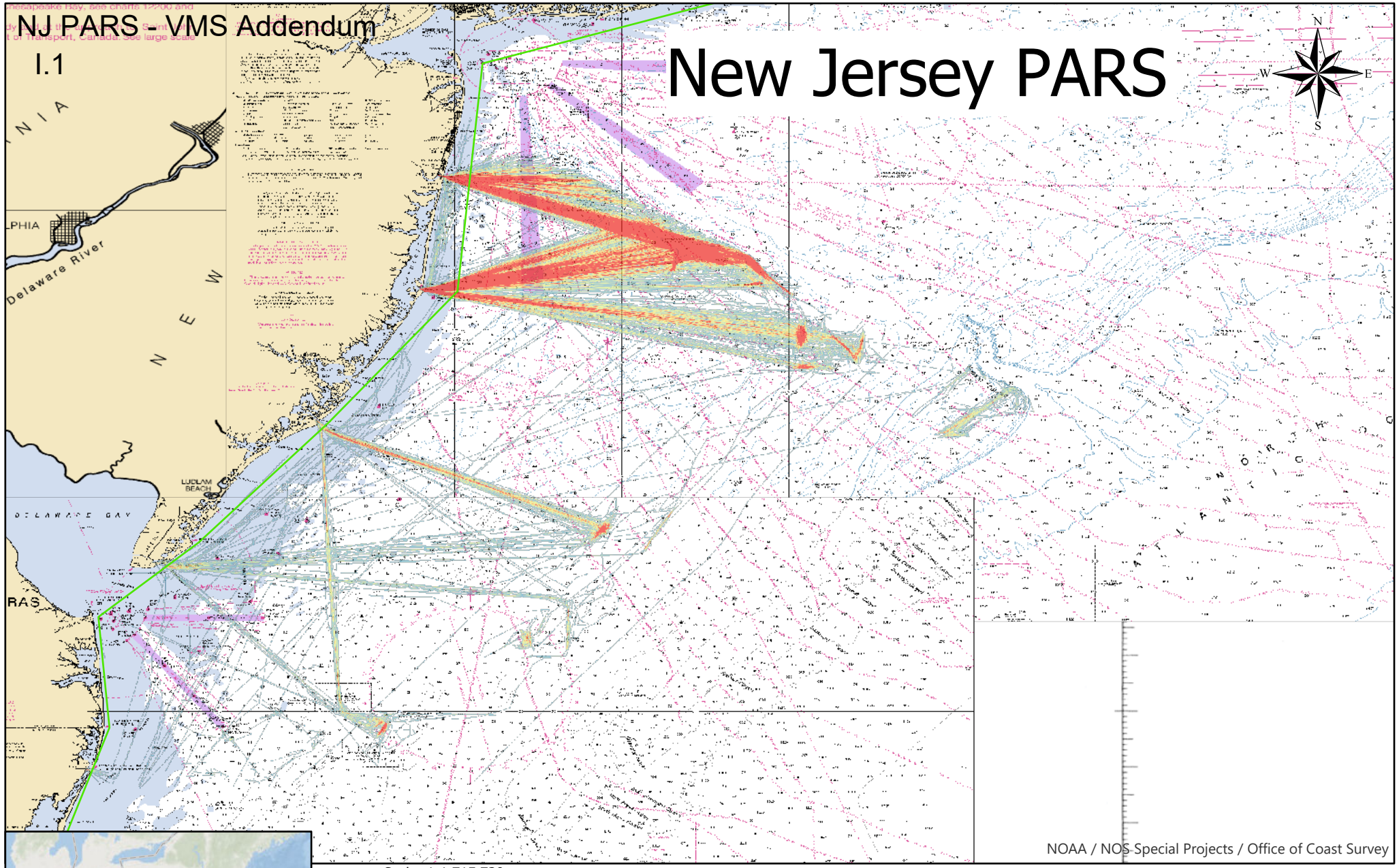
High Traffic Density

Low Traffic Density

NJ PARS - VMS Addendum

I.1

New Jersey PARS



Scale: 1:1,715,730

Nautical Miles

0 5 10 20 30 40

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN

Legend

VMS Demarcation Line

Dredge 2017

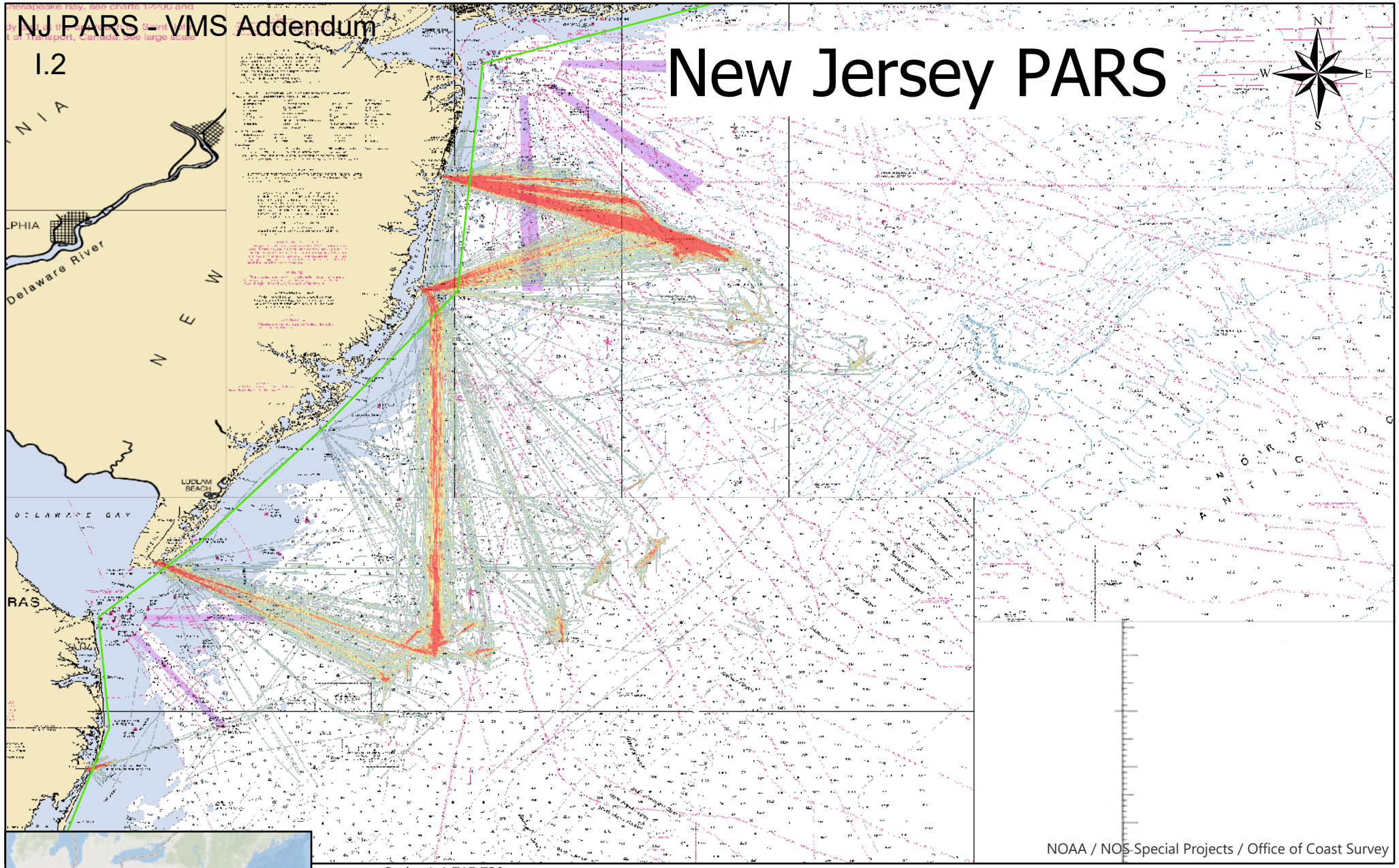
High Traffic Density

Low Traffic Density

NJ PARS - VMS Addendum

I.2

New Jersey PARS



Scale: 1:1,715,730

Nautical Miles

0 5 10 20 30 40

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN

Legend

VMS Demarcation Line

Dredge 2018

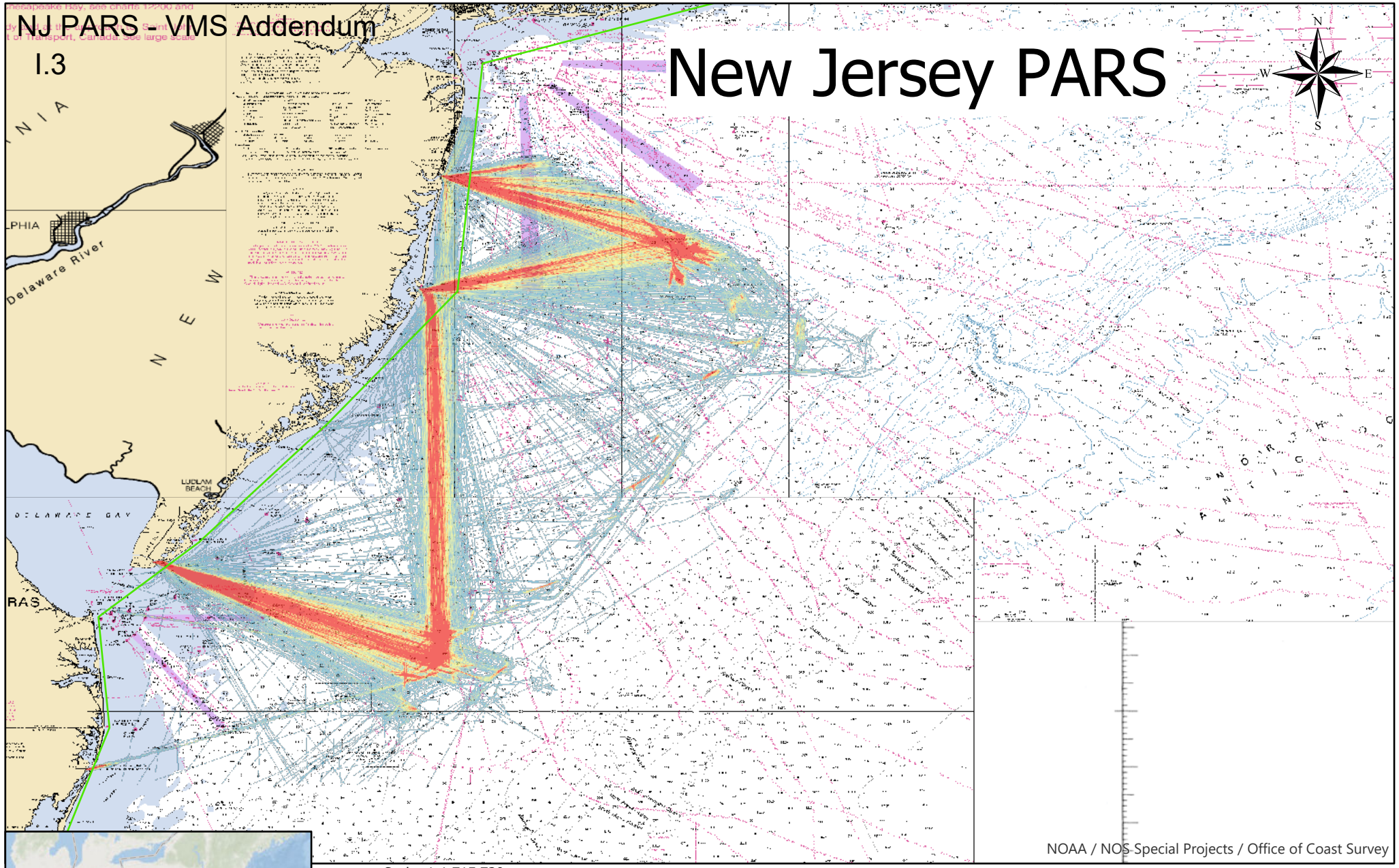
High Traffic Density

Low Traffic Density

NJ PARS - VMS Addendum

I.3

New Jersey PARS



Scale: 1:1,715,730

0 5 10 20 30 40 Nautical Miles

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN

Legend

VMS Demarcation Line

Dredge 2019

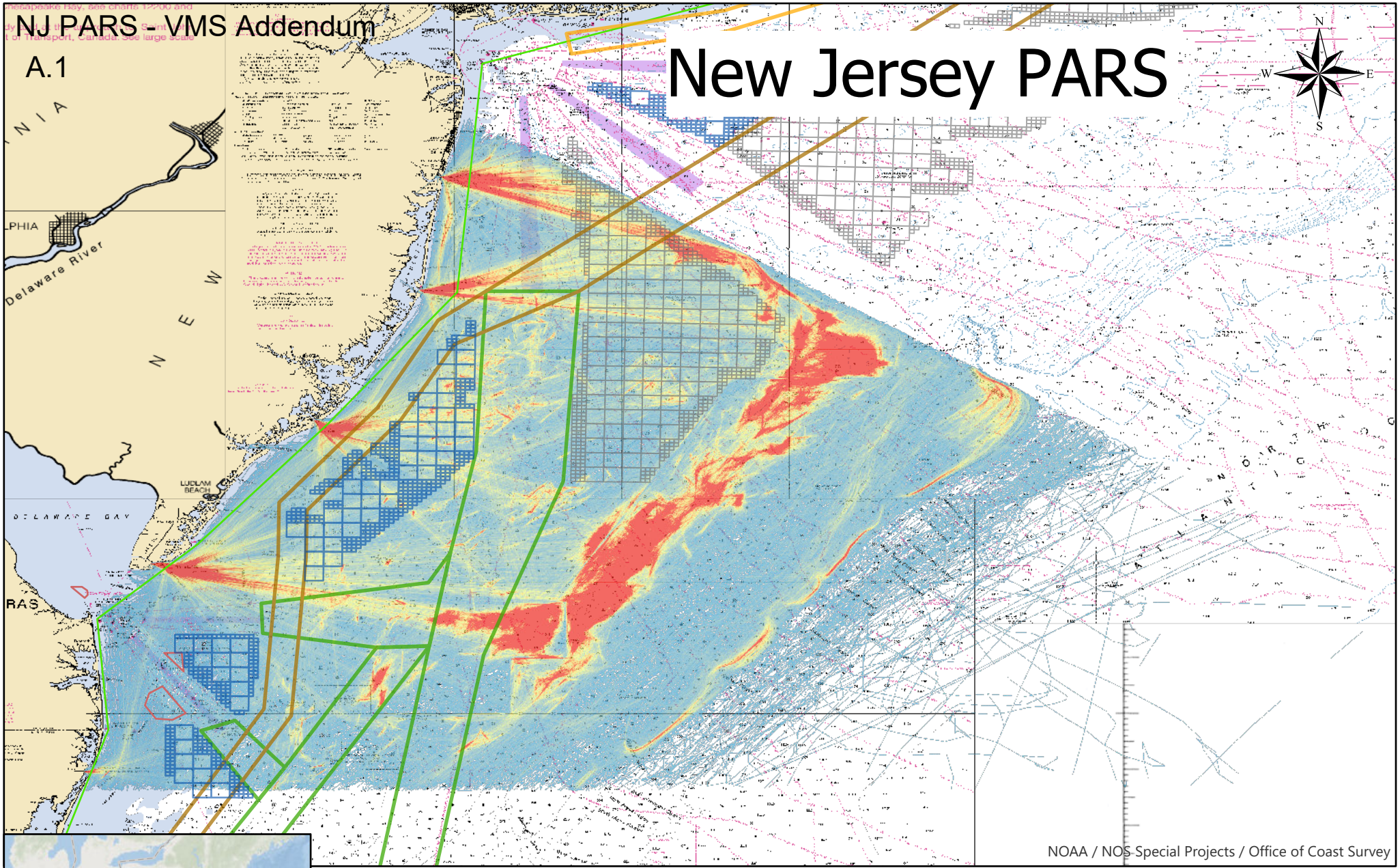
High Traffic Density

Low Traffic Density

NJ PARS - VMS Addendum

A.1

New Jersey PARS



Scale: 1:1,715,730

0 5 10 20 30 40 Nautical Miles

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN

Legend

- Wind Lease Areas
- Wind Planning Areas
- Deep Draft Lane
- Tug Tow Extension
- Tug Tow Lane
- Anchorages
- VMS Demarcation Line

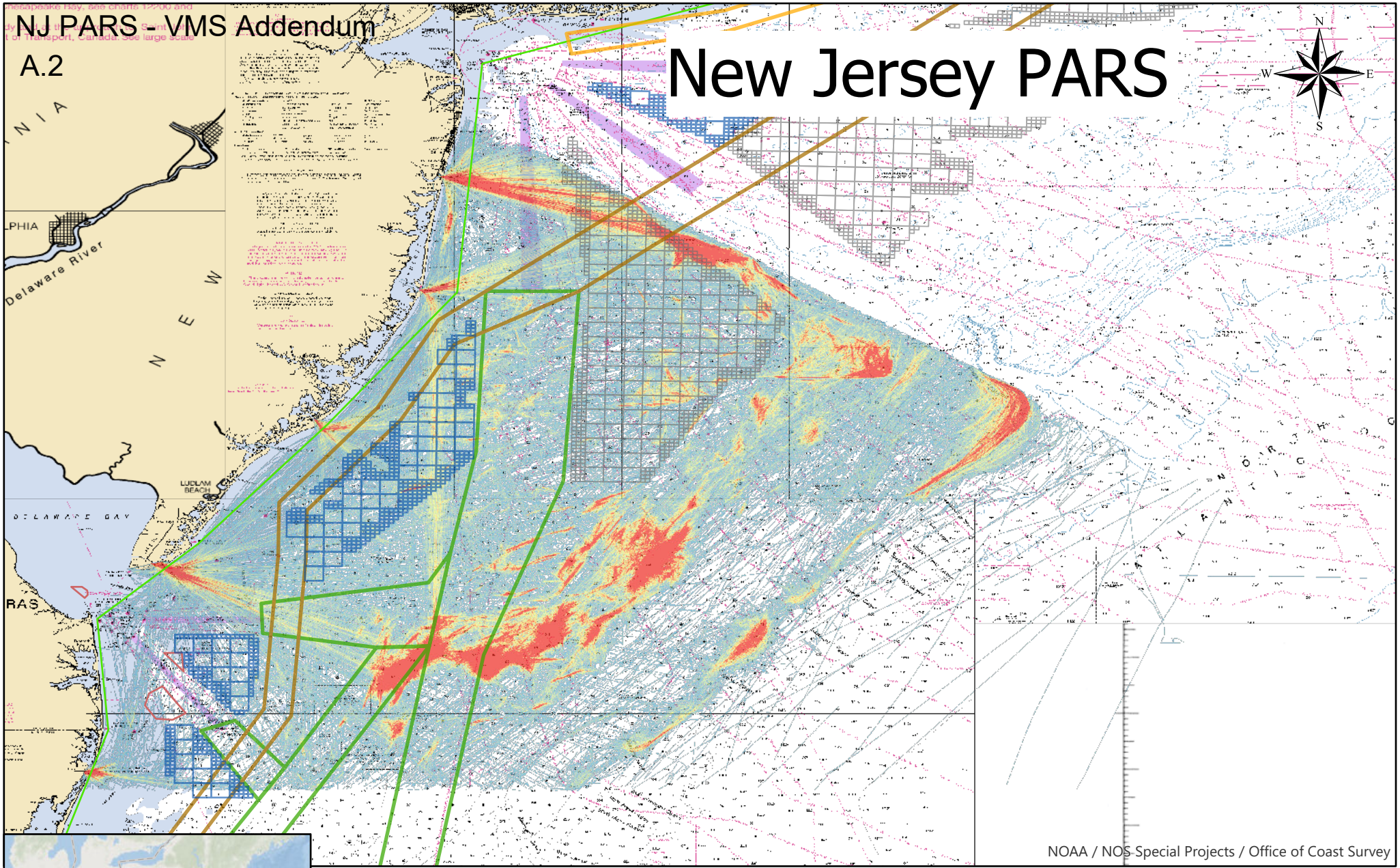
Fishing Vessels 2017

- High Traffic Density
- Low Traffic Density

NJ PARS - VMS Addendum

A.2

New Jersey PARS



Scale: 1:1,715,730

0 5 10 20 30 40 Nautical Miles

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN

Legend

- Wind Lease Areas
- Wind Planning Areas
- Deep Draft Lane
- Tug Tow Extension
- Tug Tow Lane
- Anchorages
- VMS Demarcation Line

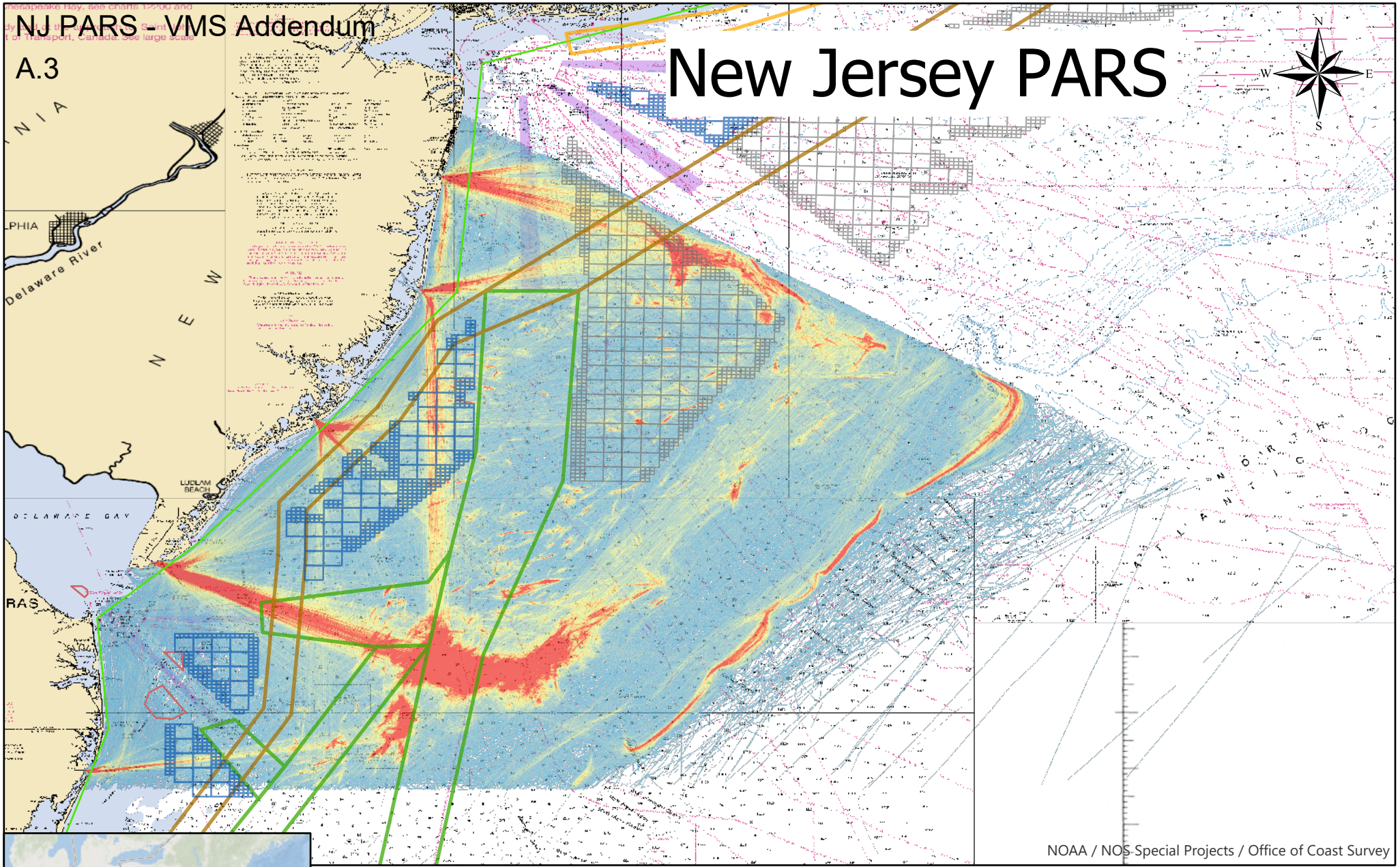
Fishing Vessels 2018

- High Traffic Density
- Low Traffic Density

NJ PARS - VMS Addendum

A.3

New Jersey PARS



Scale: 1:1,715,730

0 5 10 20 30 40 Nautical Miles

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN

Legend

- Wind Lease Areas
- Wind Planning Areas
- Deep Draft Lane
- Tug Tow Extension
- Tug Tow Lane
- Anchorages
- VMS Demarcation Line

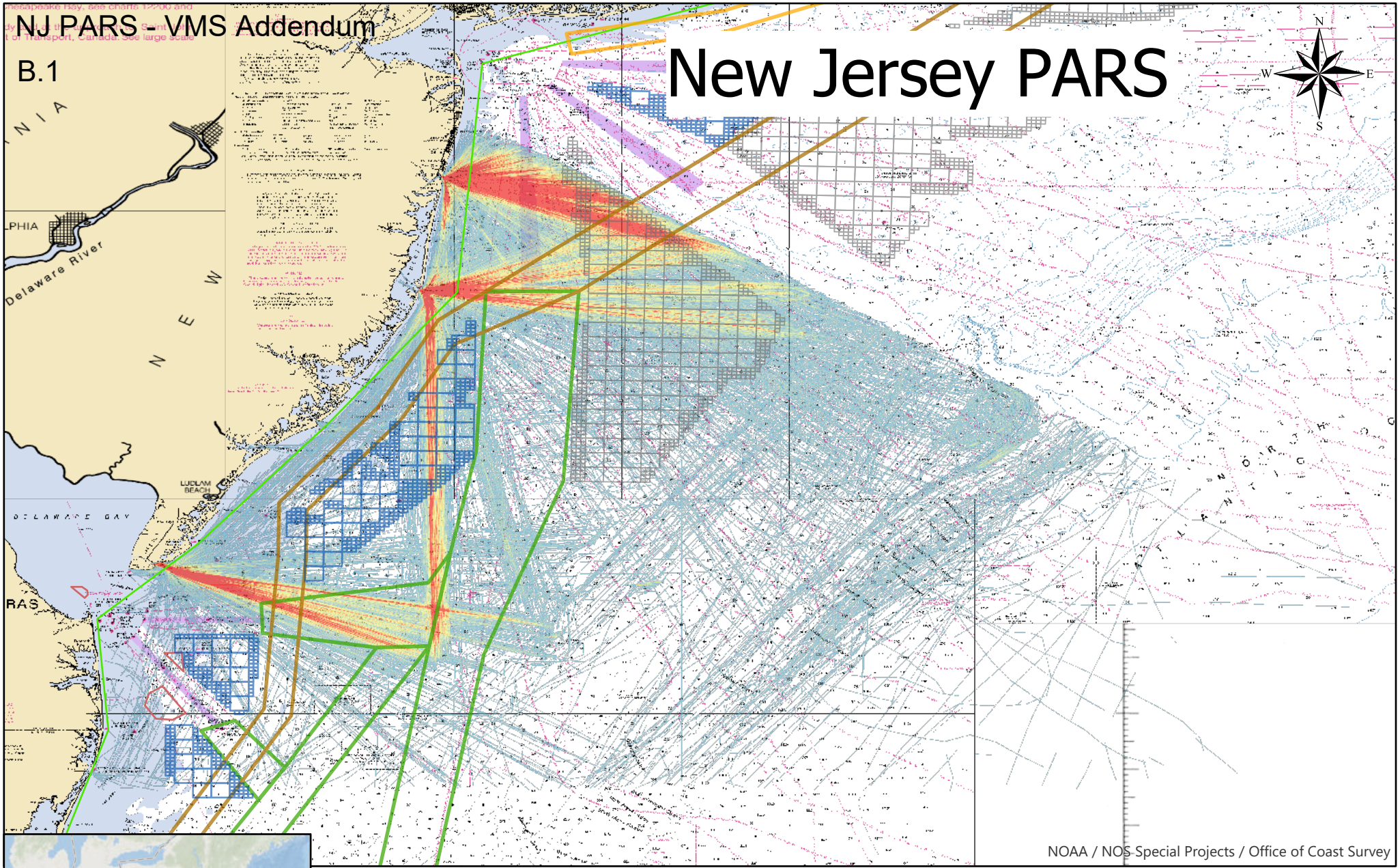
Fishing Vessels 2019

- High Traffic Density
- Low Traffic Density

NJ PARS - VMS Addendum

B.1

New Jersey PARS



Scale: 1:1,715,730

0 5 10 20 30 40 Nautical Miles

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN

Legend

- Wind Lease Areas
- Wind Planning Areas
- Deep Draft Lane
- Tug Tow Extension
- Tug Tow Lane
- Anchorages
- VMS Demarcation Line

Vessel Speed >5 Knots, 2017-2019

Value

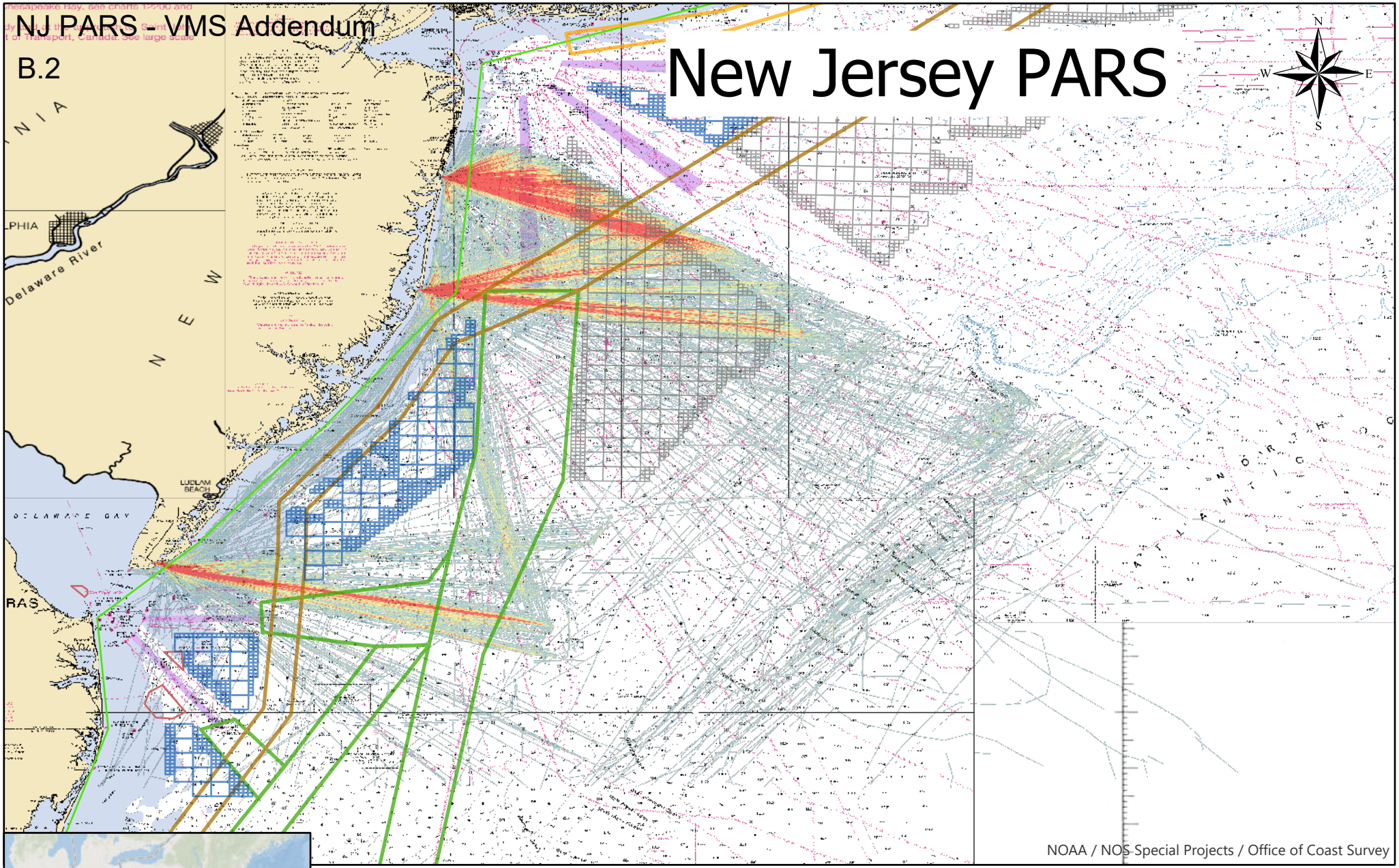
High Traffic Density

Low Traffic Density

NJ PARS - VMS Addendum

B.2

New Jersey PARS



Scale: 1:1,715,730

0 5 10 20 30 40 Nautical Miles

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN

Legend

- Wind Lease Areas
- Wind Planning Areas
- Deep Draft Lane
- Tug Tow Extension
- Tug Tow Lane
- Anchorages
- VMS Demarcation Line

Vessel Speed >5 Knots, 2017

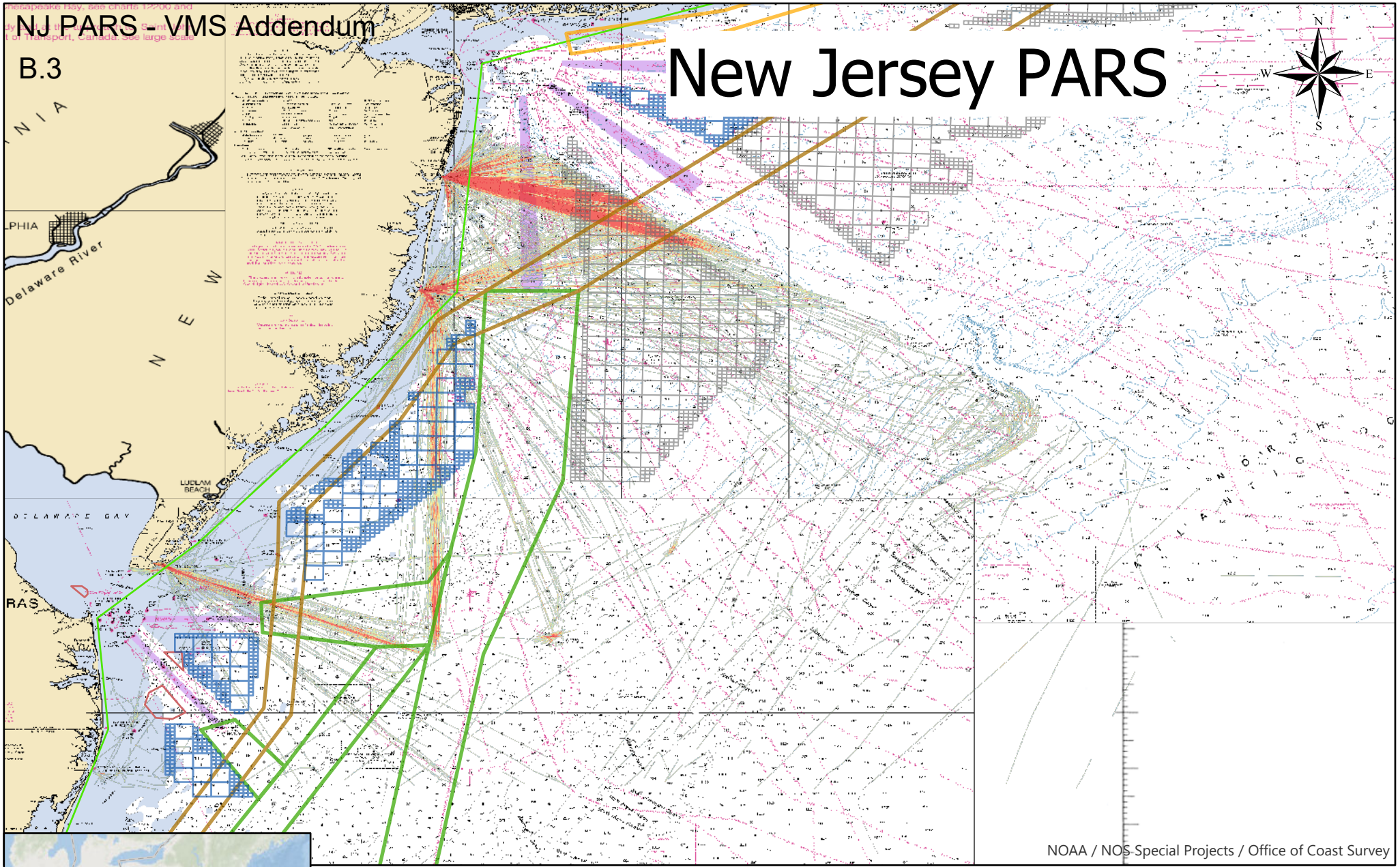
Value

- High Traffic Density
- Low Traffic Density

NJ PARS - VMS Addendum

B.3

New Jersey PARS



Scale: 1:1,715,730

0 5 10 20 30 40 Nautical Miles

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN

Legend

- Wind Lease Areas
- Wind Planning Areas
- Deep Draft Lane
- Tug Tow Extension
- Tug Tow Lane
- Anchorages
- VMS Demarcation Line

Vessel Speed >5 Knots, 2018

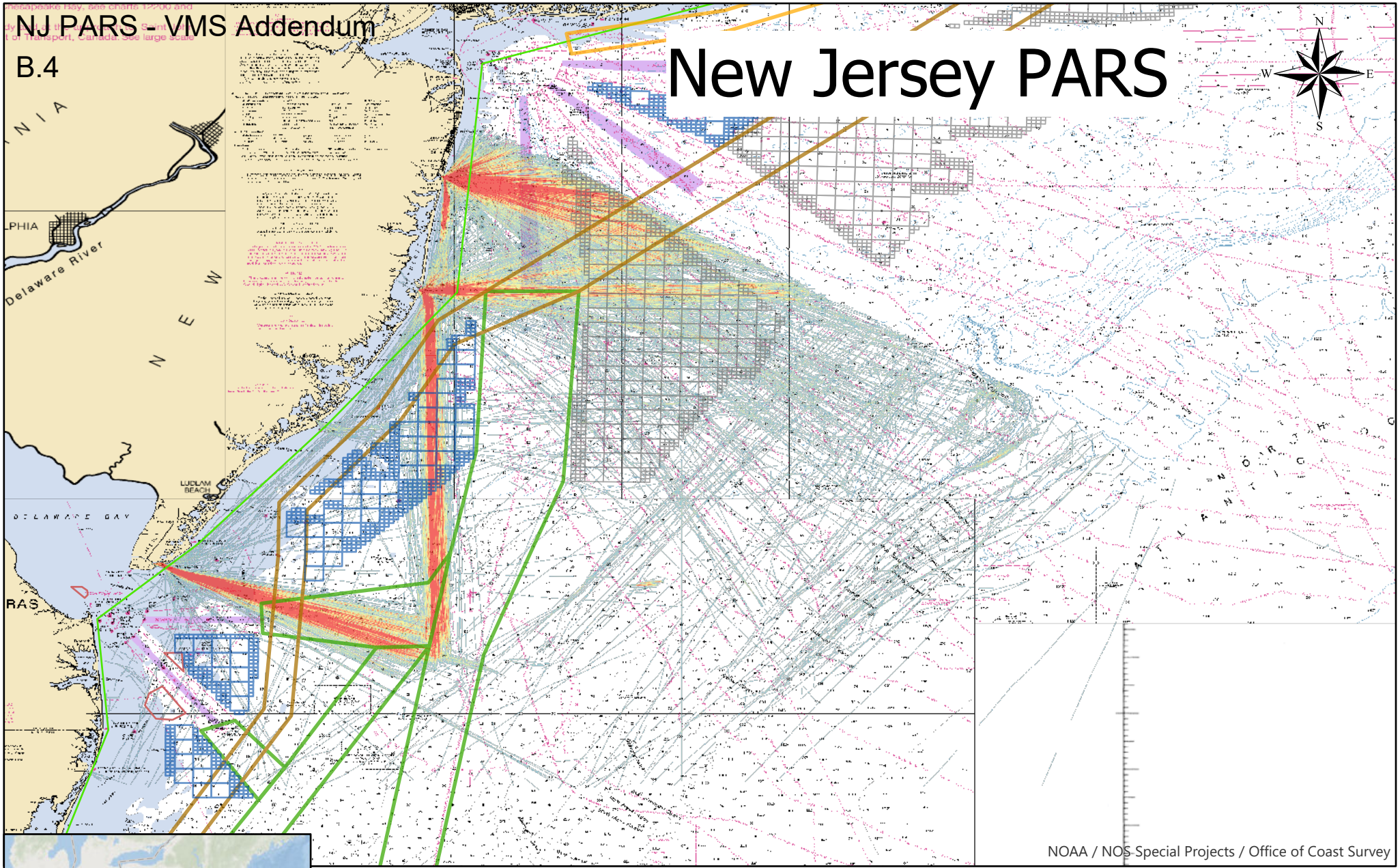
Value

- High Traffic Density
- Low Traffic Density

NJ PARS - VMS Addendum

B.4

New Jersey PARS



Scale: 1:1,715,730

0 5 10 20 30 40 Nautical Miles

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN

Legend

- Wind Lease Areas
- Wind Planning Areas
- Deep Draft Lane
- Tug Tow Extension
- Tug Tow Lane
- Anchorages
- VMS Demarcation Line

Vessel Speed >5 Knots, 2019

Value

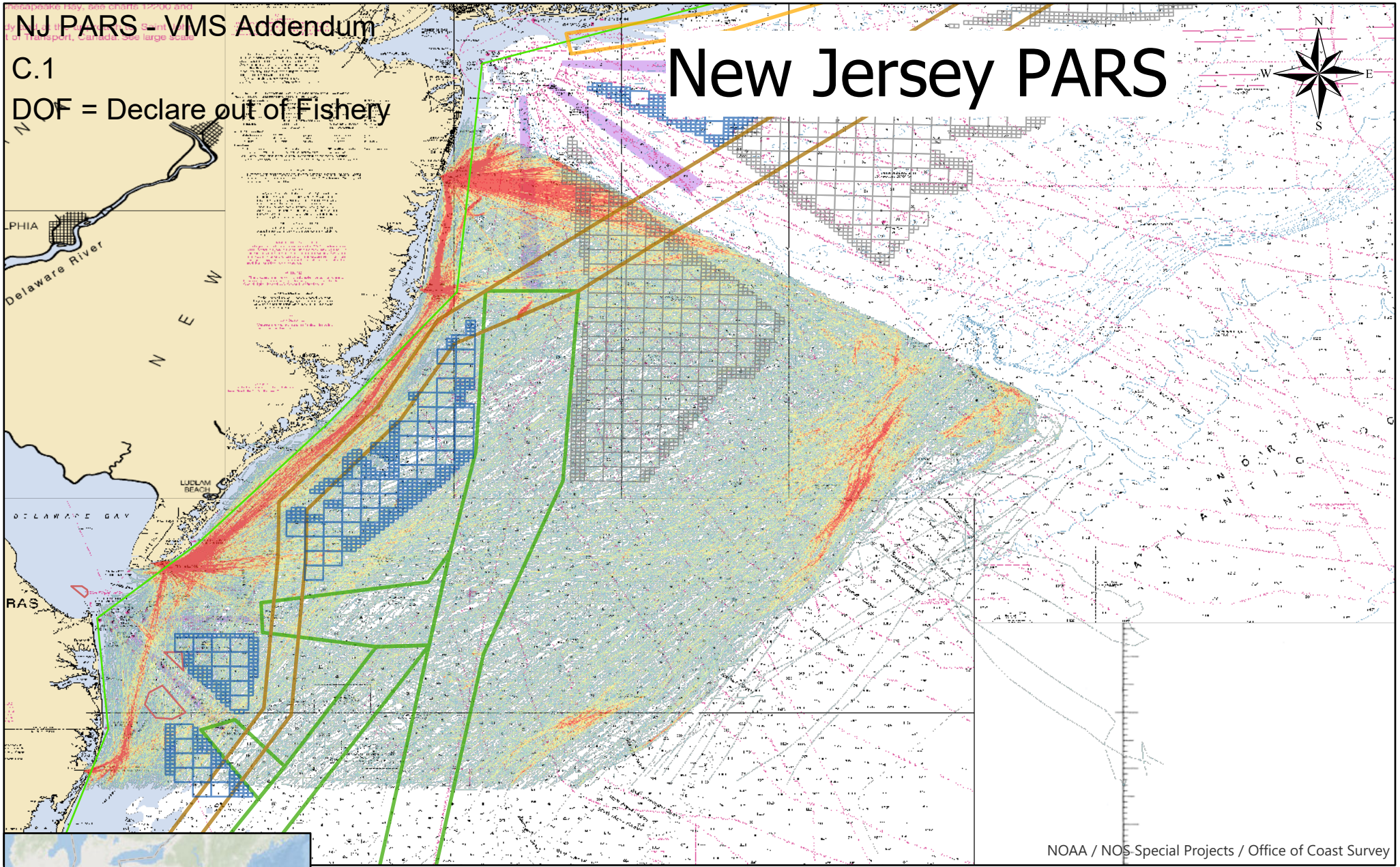
- High Traffic Density
- Low Traffic Density

NJ PARS - VMS Addendum

C.1

DOF = Declare out of Fishery

New Jersey PARS



Scale: 1:1,715,730

0 5 10 20 30 40 Nautical Miles

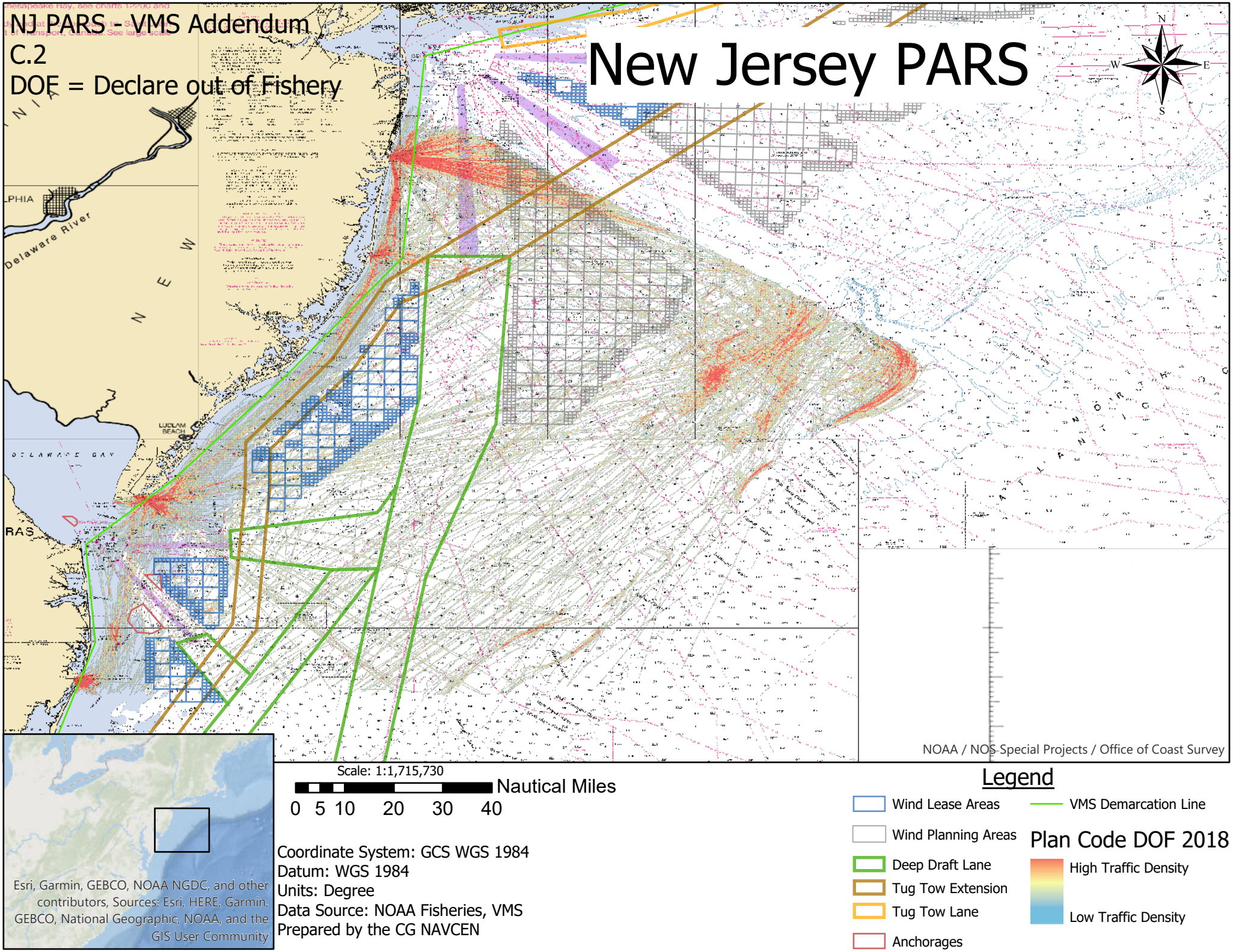
Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN

Legend

- Wind Lease Areas
- Wind Planning Areas
- Deep Draft Lane
- Tug Tow Extension
- Tug Tow Lane
- Anchorages
- VMS Demarcation Line

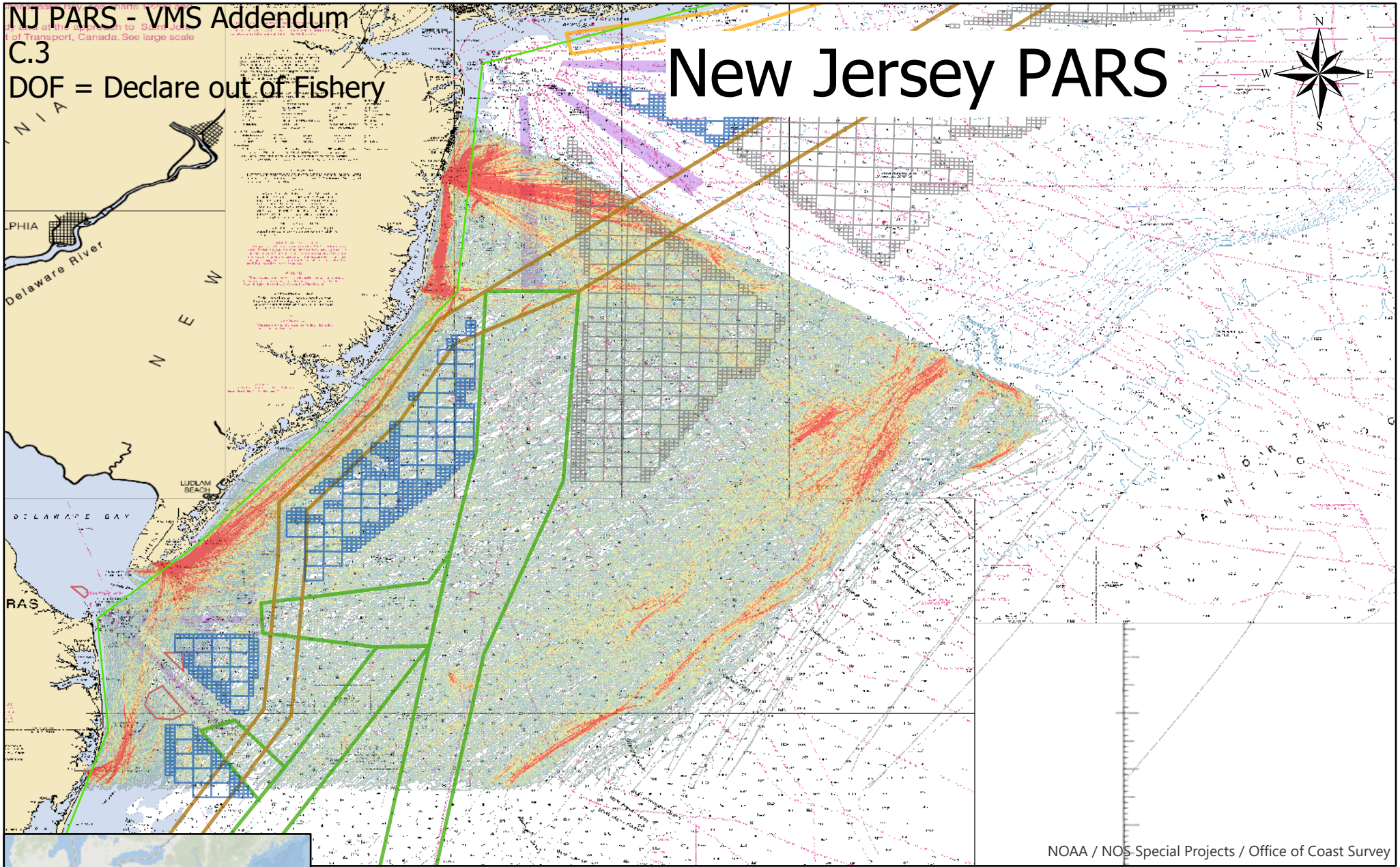
Plan Code DOF 2017

- High Traffic Density
- Low Traffic Density


NJ PARS - VMS Addendum
C.2
DOF = Declare out of Fishery
New Jersey PARS
Delaware River
NOAA / NOS Special Projects / Office of Coast Survey
Scale: 1:1,715,730
Nautical Miles
0 5 10 20 30 40
Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN
Esri, Garmin, GEBCO, NOAA NGDC, and other contributors, Sources: Esri, HERE, Garmin, GEBCO, National Geographic, NOAA, and the GIS User Community
Legend
Wind Lease Areas
Wind Planning Areas
Deep Draft Lane
Tug Tow Extension
Tug Tow Lane
Anchorages
VMS Demarcation Line
Plan Code DOF 2018
High Traffic Density
Low Traffic Density

NJ PARS - VMS Addendum
C.3
DOF = Declare out of Fishery

New Jersey PARS



Scale: 1:1,715,730

0 5 10 20 30 40 Nautical Miles

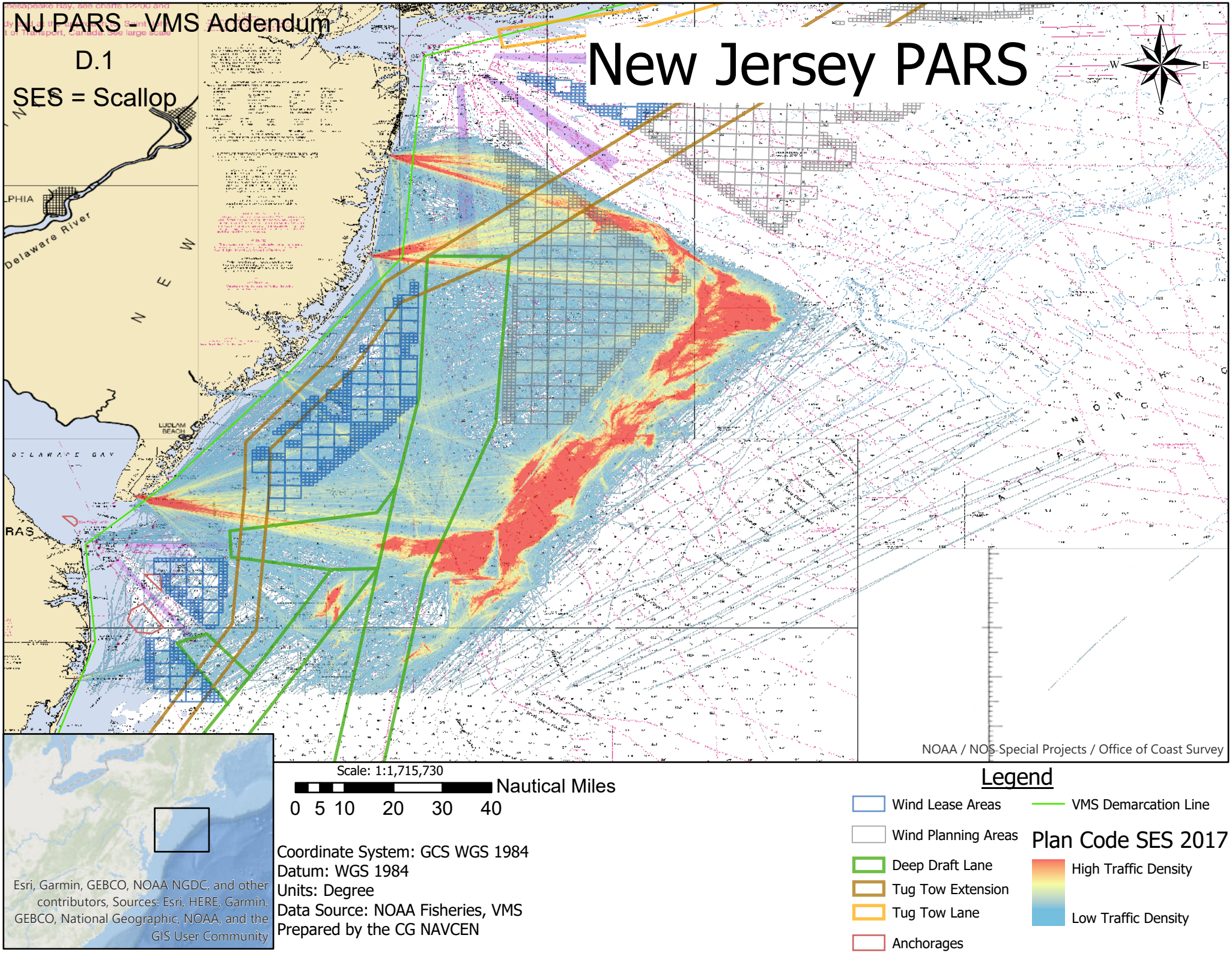
Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN

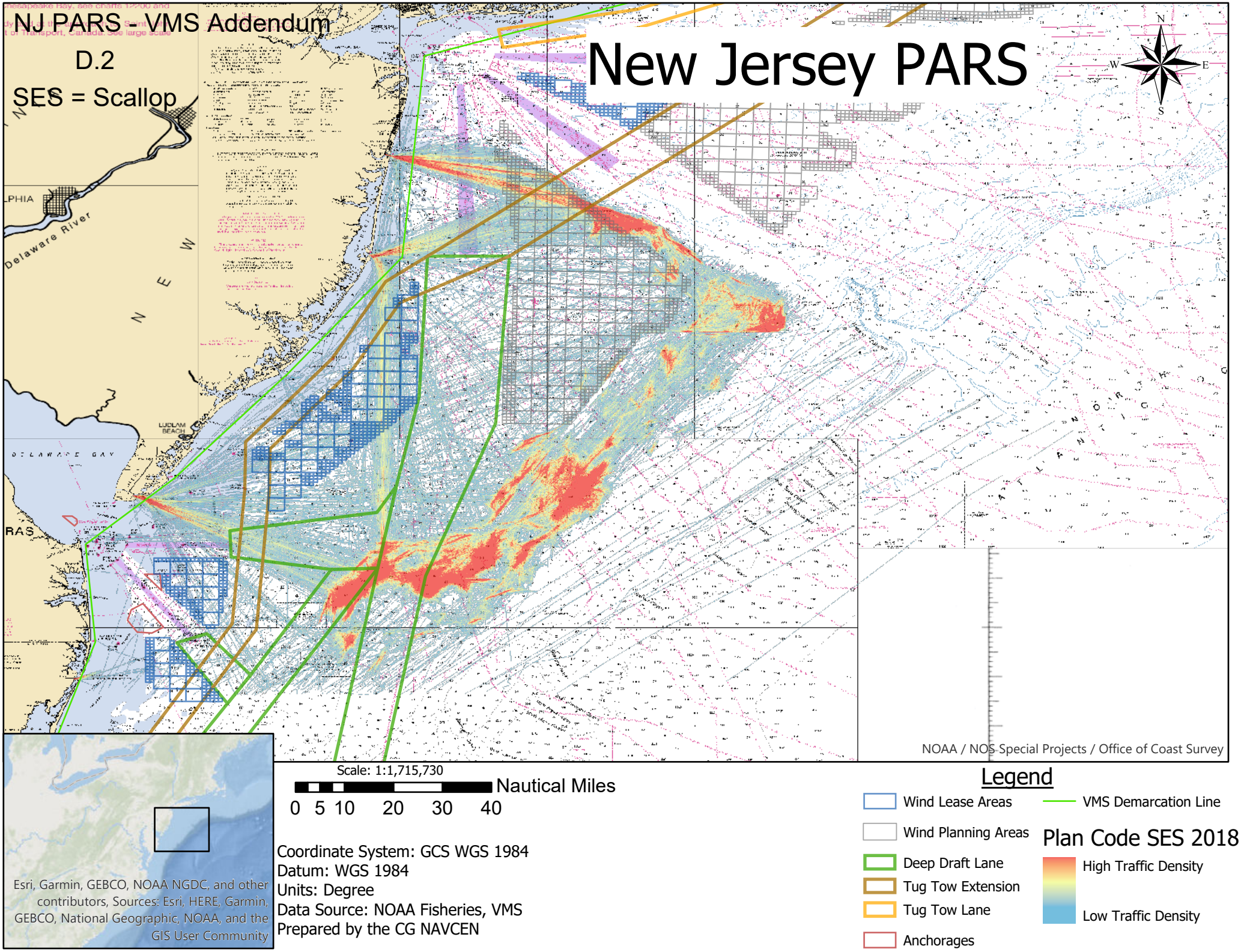
Legend

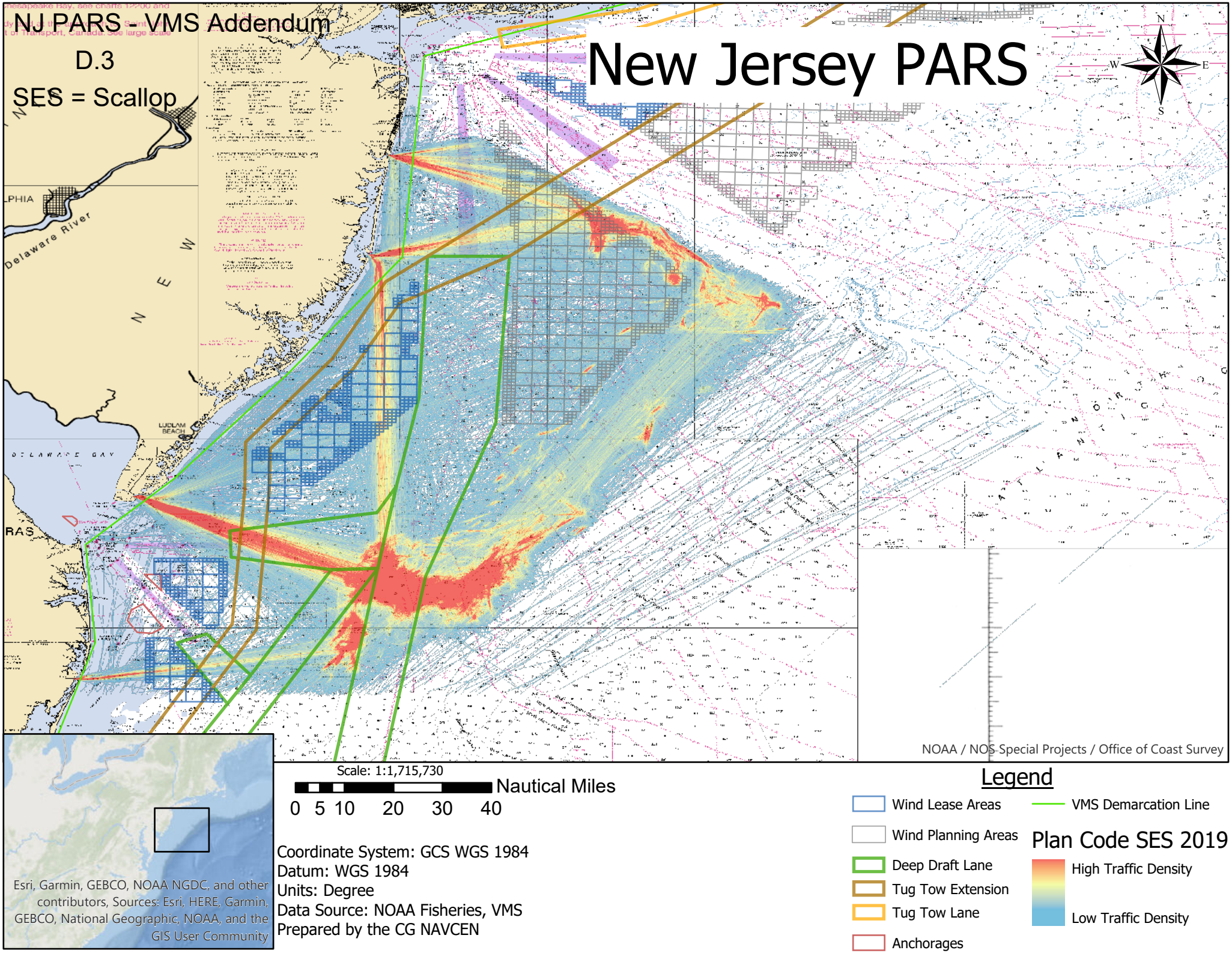
- Wind Lease Areas
- Wind Planning Areas
- Deep Draft Lane
- Tug Tow Extension
- Tug Tow Lane
- Anchorages
- VMS Demarcation Line

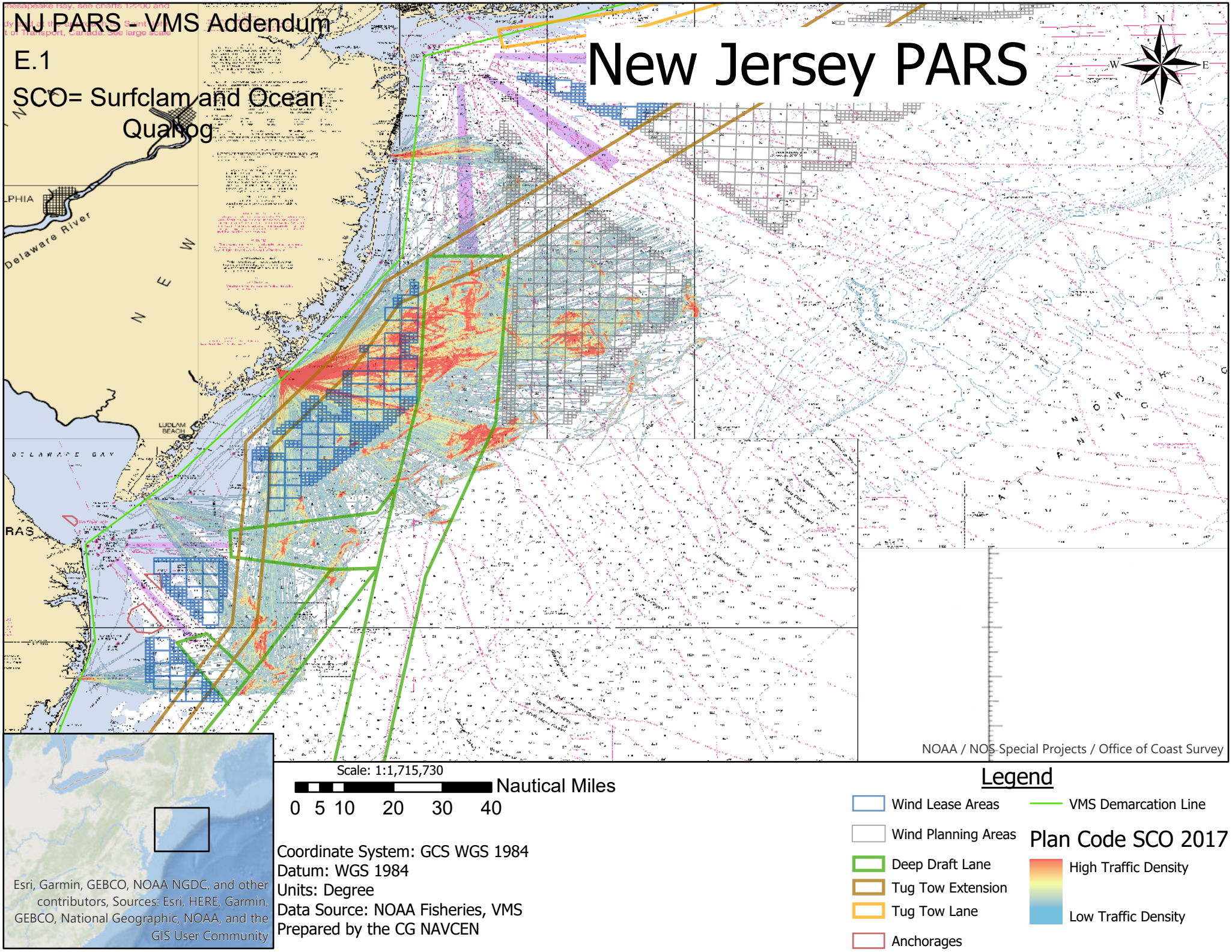
Plan Code DOF 2019

- High Traffic Density
- Low Traffic Density


NJ PARS - VMS Addendum
D.1
SES = Scallop
New Jersey PARS
N
S
E
W
Delaware River
DELAWARE BAY
LUDLAM BEACH
NOAA / NOS Special Projects / Office of Coast Survey
Esri, Garmin, GEBCO, NOAA NGDC, and other contributors, Sources: Esri, HERE, Garmin, GEBCO, National Geographic, NOAA, and the GIS User Community
Scale: 1:1,715,730
Nautical Miles
0 5 10 20 30 40
Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN
Legend
Wind Lease Areas
Wind Planning Areas
Deep Draft Lane
Tug Tow Extension
Tug Tow Lane
Anchorages
VMS Demarcation Line
Plan Code SES 2017
High Traffic Density
Low Traffic Density


NJ PARS - VMS Addendum
D.2
SES = Scallop
New Jersey PARS
N
S
E
W
Delaware River
DELAWARE BAY
LUDLAM BEACH
NOAA / NOS Special Projects / Office of Coast Survey
Scale: 1:1,715,730
Nautical Miles
0 5 10 20 30 40
Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN
Esri, Garmin, GEBCO, NOAA NGDC, and other contributors, Sources: Esri, HERE, Garmin, GEBCO, National Geographic, NOAA, and the GIS User Community
Legend
Wind Lease Areas
Wind Planning Areas
Deep Draft Lane
Tug Tow Extension
Tug Tow Lane
Anchorages
VMS Demarcation Line
Plan Code SES 2018
High Traffic Density
Low Traffic Density


NJ PARS - VMS Addendum
D.3
SES = Scallop
New Jersey PARS
N
S
E
W
Delaware River
DELAWARE BAY
LUDLAM BEACH
NOAA / NOS Special Projects / Office of Coast Survey
Esri, Garmin, GEBCO, NOAA NGDC, and other contributors, Sources: Esri, HERE, Garmin, GEBCO, National Geographic, NOAA, and the GIS User Community
Scale: 1:1,715,730
Nautical Miles
0 5 10 20 30 40
Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN
Legend
Wind Lease Areas
Wind Planning Areas
Deep Draft Lane
Tug Tow Extension
Tug Tow Lane
Anchorages
VMS Demarcation Line
Plan Code SES 2019
High Traffic Density
Low Traffic Density

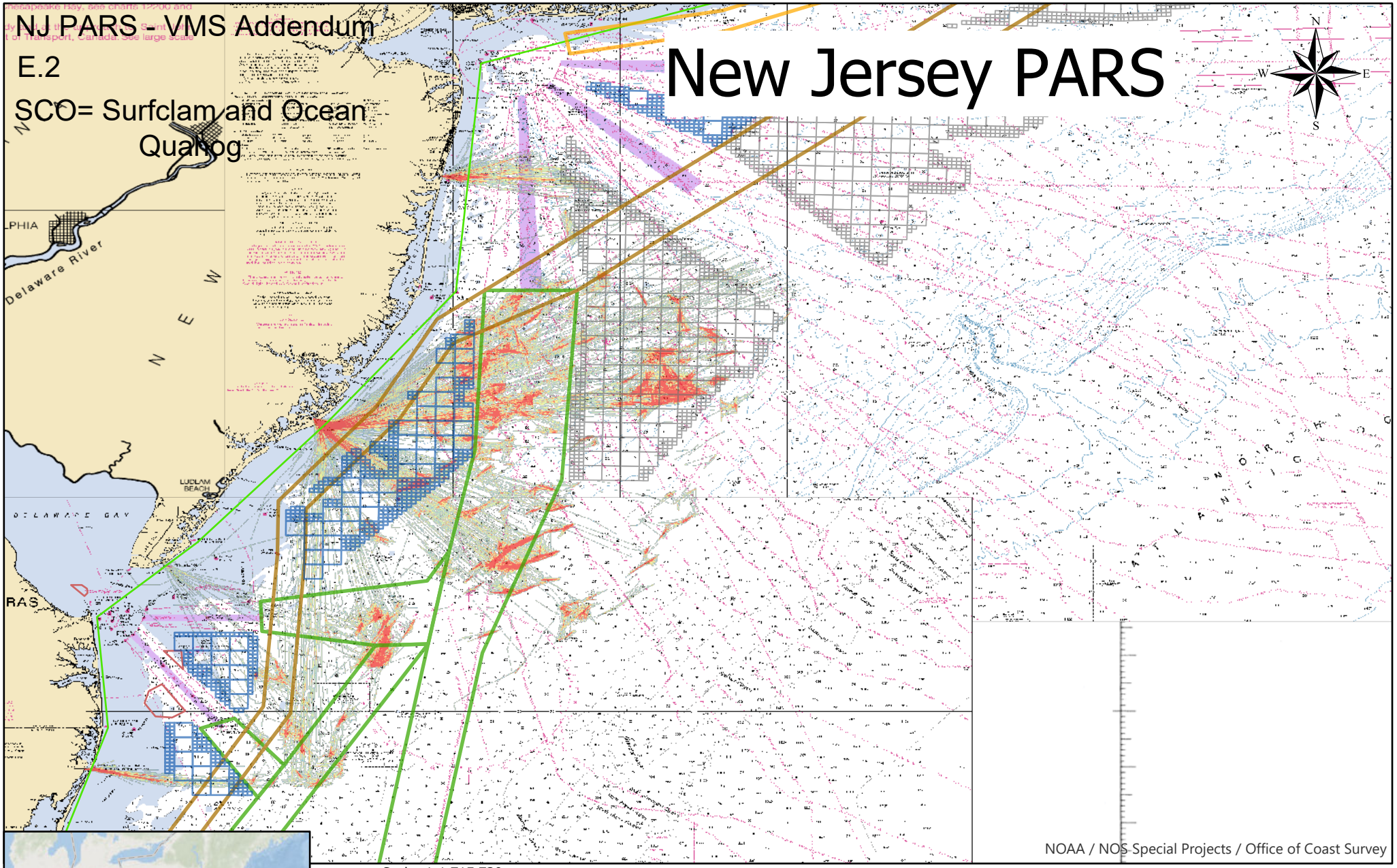

NJ PARS - VMS Addendum
E.1
SCO= Surfclam and Ocean Quahog
New Jersey PARS
N
S
E
W
Delaware River
DELAWARE BAY
LUDLAM BEACH
NOAA / NOS Special Projects / Office of Coast Survey
Scale: 1:1,715,730
Nautical Miles
0 5 10 20 30 40
Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN
Esri, Garmin, GEBCO, NOAA NGDC, and other contributors, Sources: Esri, HERE, Garmin, GEBCO, National Geographic, NOAA, and the GIS User Community
Legend
Wind Lease Areas
Wind Planning Areas
Deep Draft Lane
Tug Tow Extension
Tug Tow Lane
Anchorages
VMS Demarcation Line
Plan Code SCO 2017
High Traffic Density
Low Traffic Density

NJ PARS - VMS Addendum

E.2

SCO= Surfclam and Ocean Quahog

New Jersey PARS



Scale: 1:1,715,730

0 5 10 20 30 40 Nautical Miles

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN

Legend

- Wind Lease Areas
- Wind Planning Areas
- Deep Draft Lane
- Tug Tow Extension
- Tug Tow Lane
- Anchorages
- VMS Demarcation Line

Plan Code SCO 2018

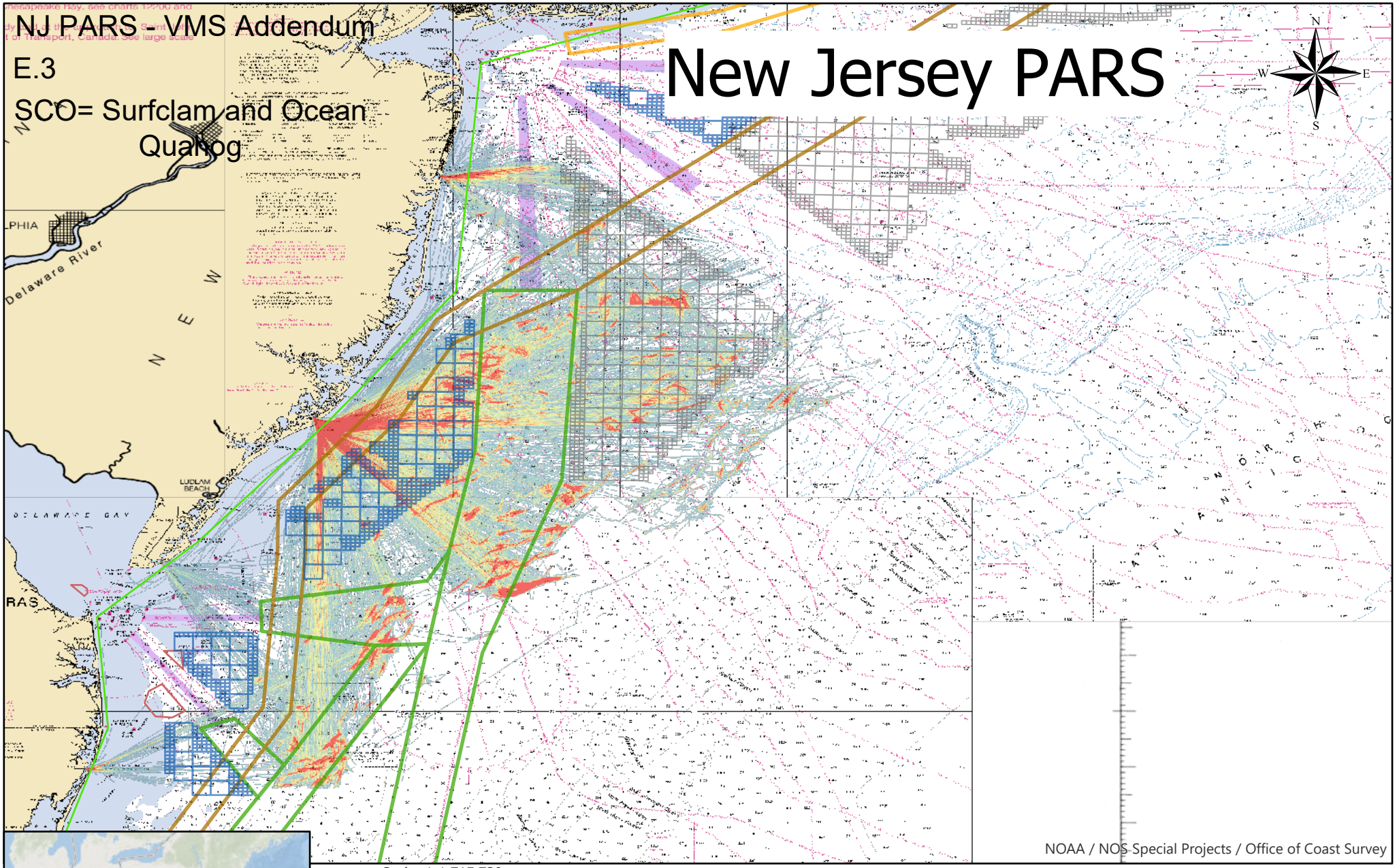
- High Traffic Density
- Low Traffic Density

NJ PARS - VMS Addendum

E.3

SCO= Surfclam and Ocean Quahog

New Jersey PARS



Scale: 1:1,715,730

0 5 10 20 30 40 Nautical Miles

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN

Legend

- Wind Lease Areas
- Wind Planning Areas
- Deep Draft Lane
- Tug Tow Extension
- Tug Tow Lane
- Anchorages
- VMS Demarcation Line

Plan Code SCO 2019

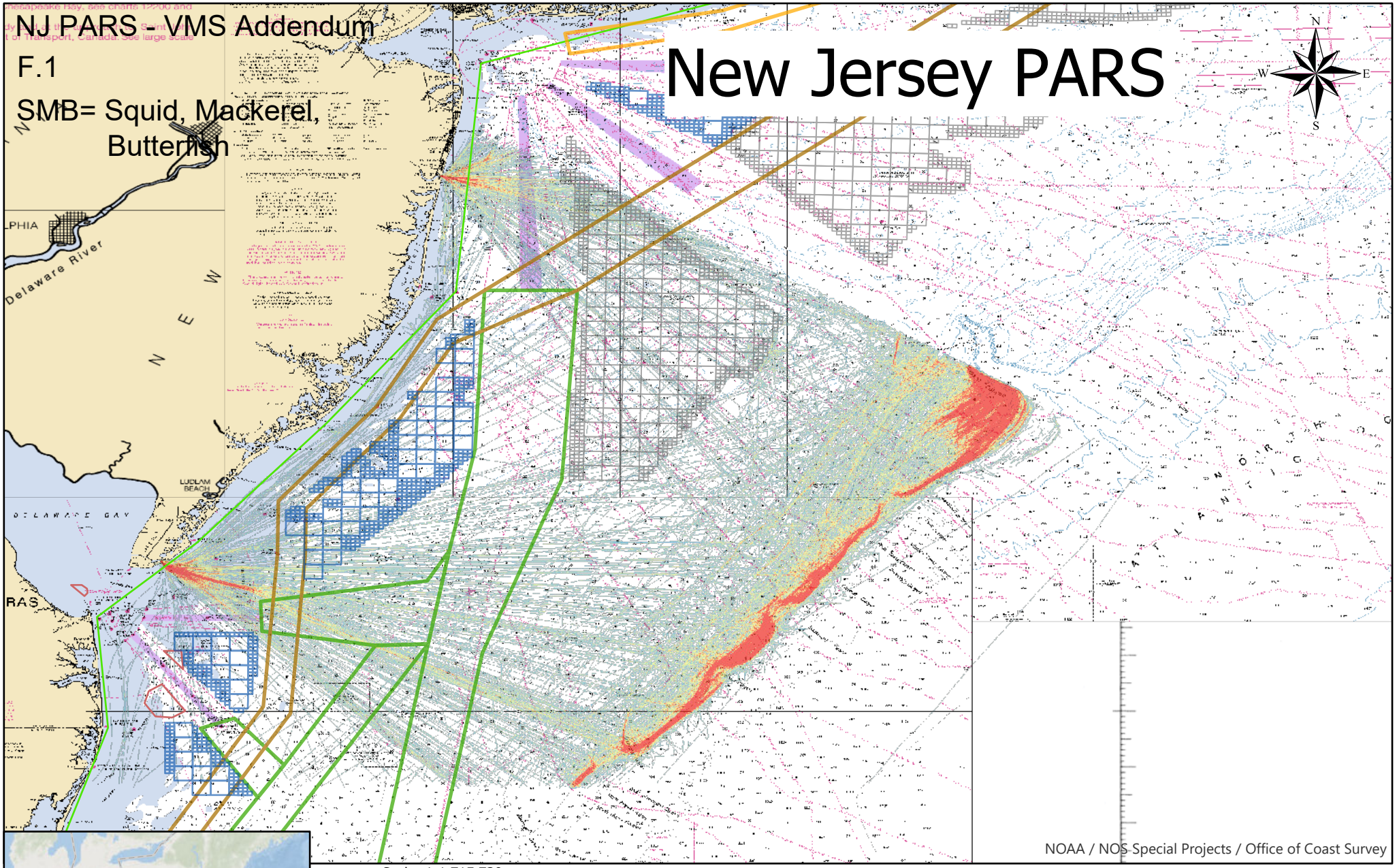
- High Traffic Density
- Low Traffic Density

NJ PARS - VMS Addendum

F.1

SMB= Squid, Mackerel, Butterfish

New Jersey PARS



Scale: 1:1,715,730

0 5 10 20 30 40 Nautical Miles

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN

Legend

- Wind Lease Areas
- Wind Planning Areas
- Deep Draft Lane
- Tug Tow Extension
- Tug Tow Lane
- Anchorages
- VMS Demarcation Line

Plan Code SMB 2017

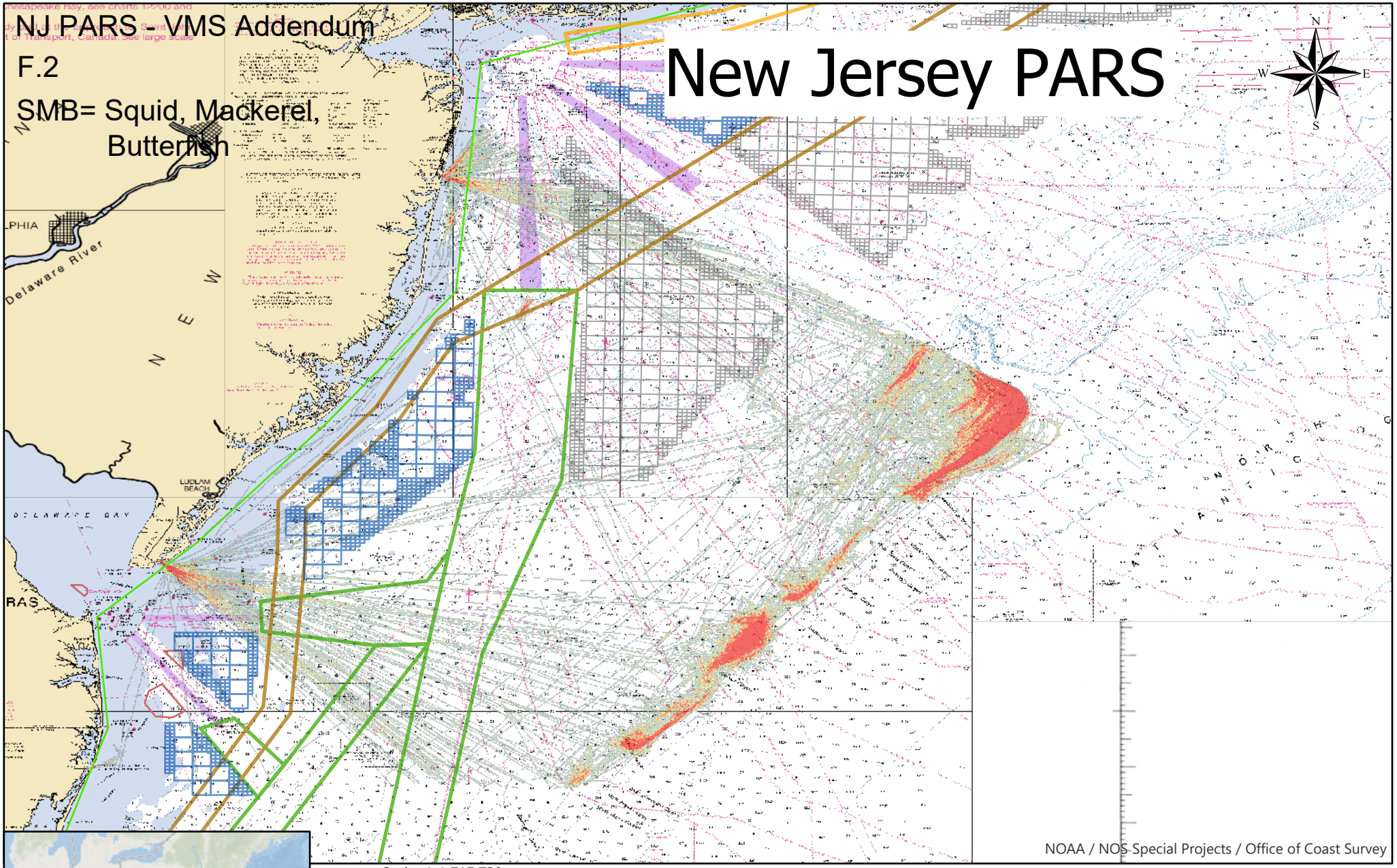
- High Traffic Density
- Low Traffic Density

NJ PARS - VMS Addendum

F.2

SMB= Squid, Mackerel, Butterfish

New Jersey PARS



Scale: 1:1,715,730

0 5 10 20 30 40 Nautical Miles

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN

Legend

- Wind Lease Areas
- Wind Planning Areas
- Deep Draft Lane
- Tug Tow Extension
- Tug Tow Lane
- Anchorages
- VMS Demarcation Line

Plan Code SMB 2018

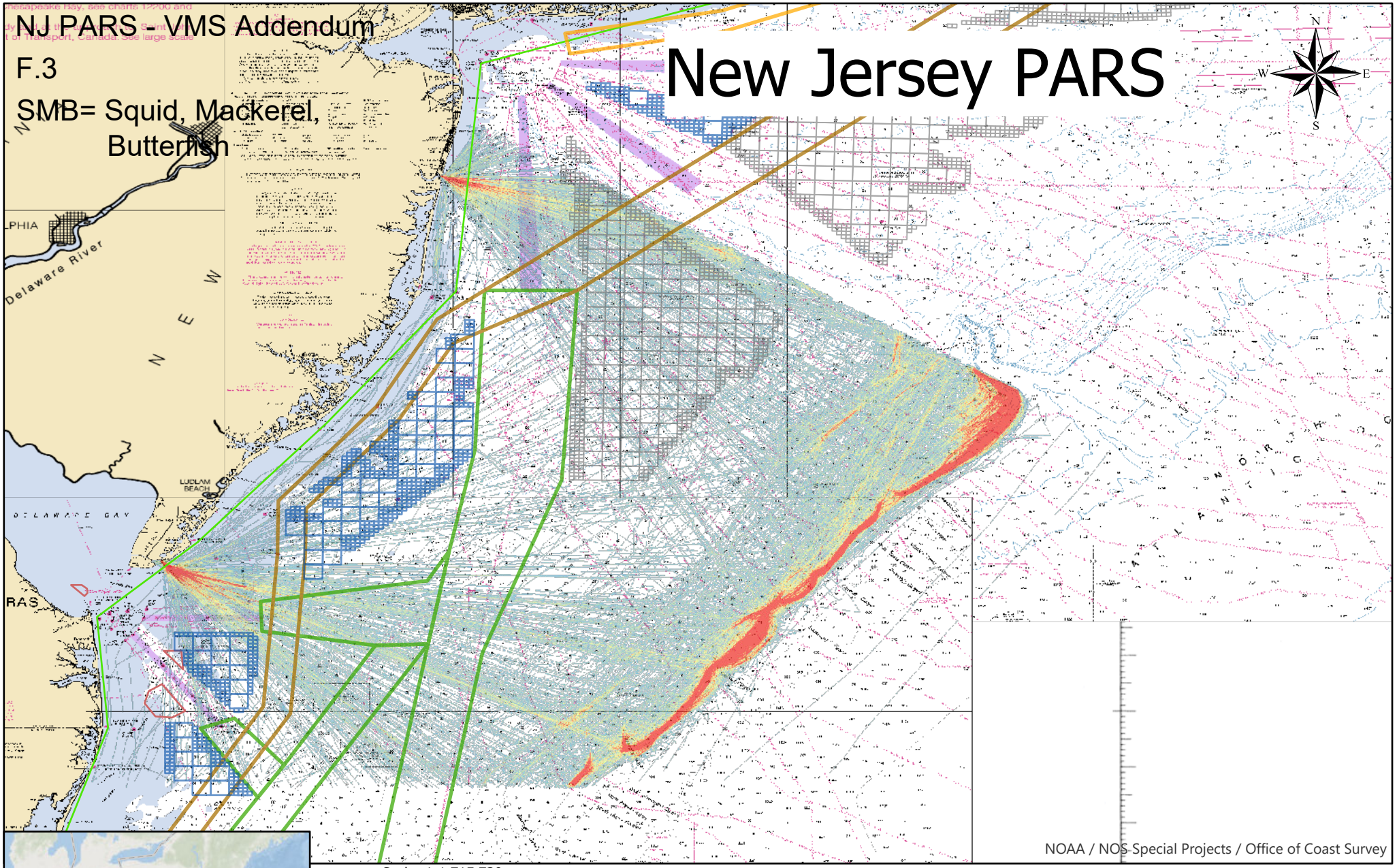
- High Traffic Density
- Low Traffic Density

NJ PARS - VMS Addendum

F.3

SMB= Squid, Mackerel, Butterfish

New Jersey PARS



Scale: 1:1,715,730

0 5 10 20 30 40 Nautical Miles

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN

Legend

- Wind Lease Areas
- Wind Planning Areas
- Deep Draft Lane
- Tug Tow Extension
- Tug Tow Lane
- Anchorages
- VMS Demarcation Line

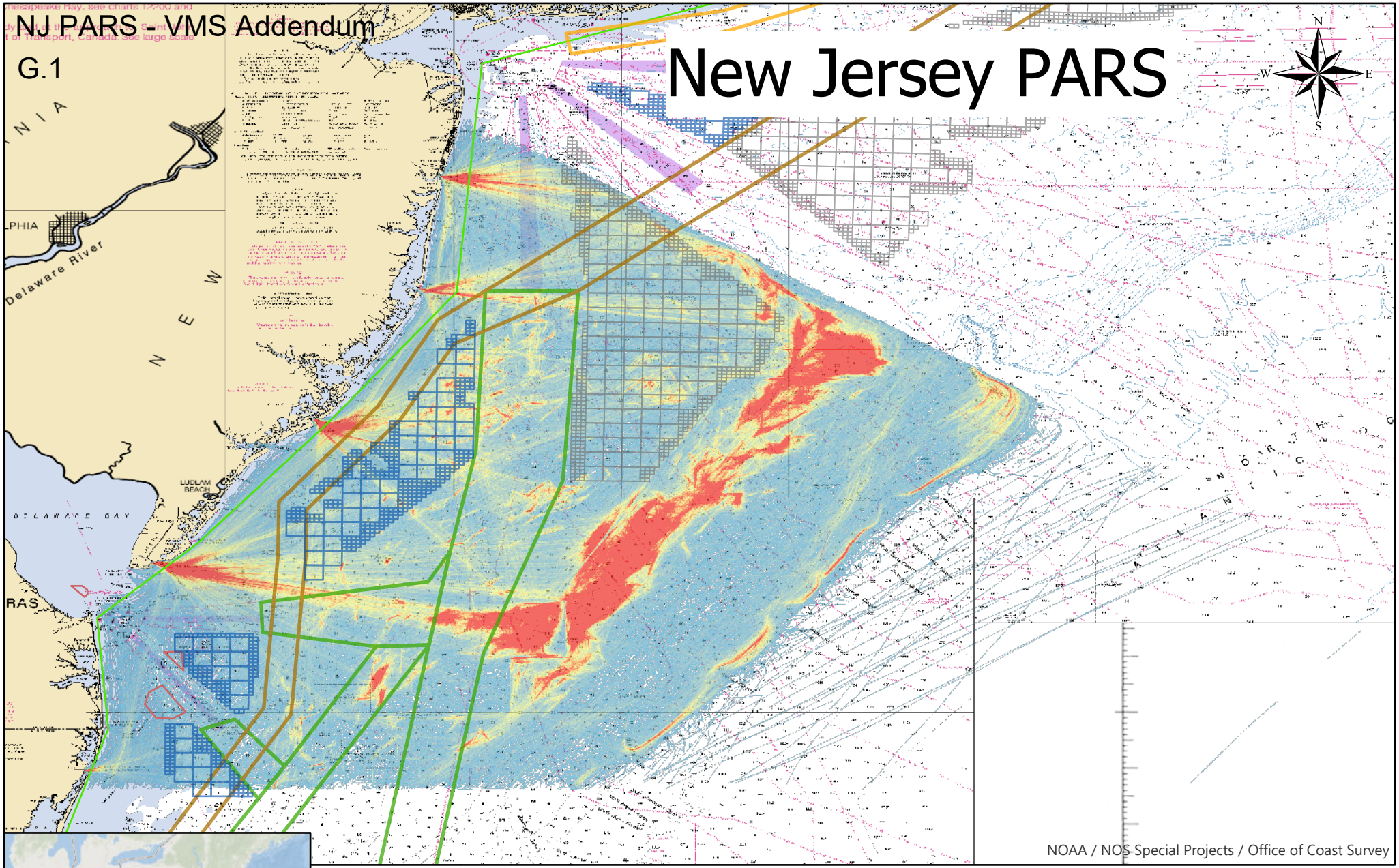
Plan Code SMB 2019

- High Traffic Density
- Low Traffic Density

NJ PARS - VMS Addendum

G.1

New Jersey PARS



Scale: 1:1,715,730

0 5 10 20 30 40 Nautical Miles

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN

Legend

- Wind Lease Areas
- Wind Planning Areas
- Deep Draft Lane
- Tug Tow Extension
- Tug Tow Lane
- Anchorages
- VMS Demarcation Line

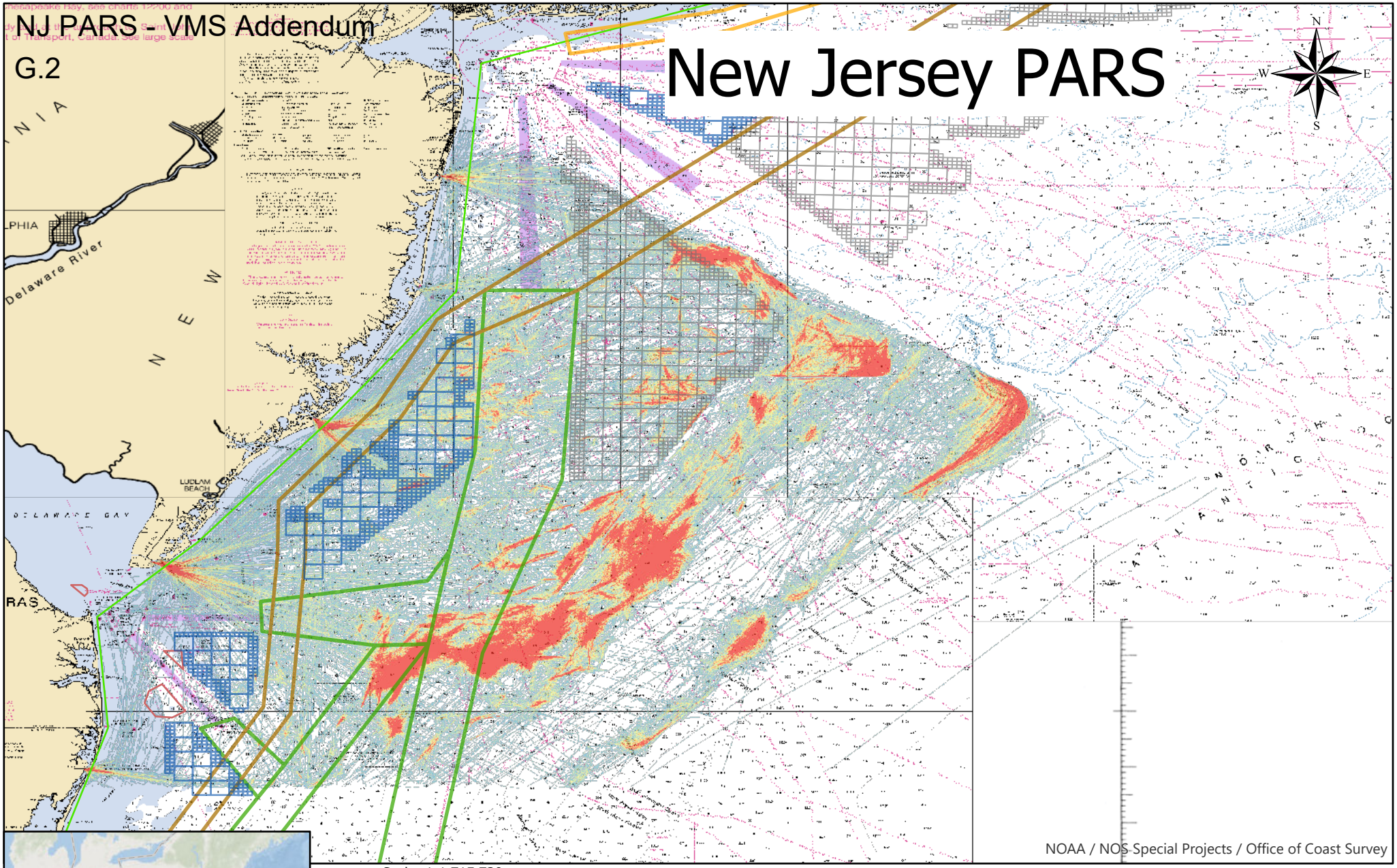
No Gear or NA 2017

- High Traffic Density
- Low Traffic Density

NJ PARS - VMS Addendum

G.2

New Jersey PARS



Scale: 1:1,715,730

0 5 10 20 30 40 Nautical Miles

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN

Legend

- Wind Lease Areas
- Wind Planning Areas
- Deep Draft Lane
- Tug Tow Extension
- Tug Tow Lane
- Anchorages
- VMS Demarcation Line

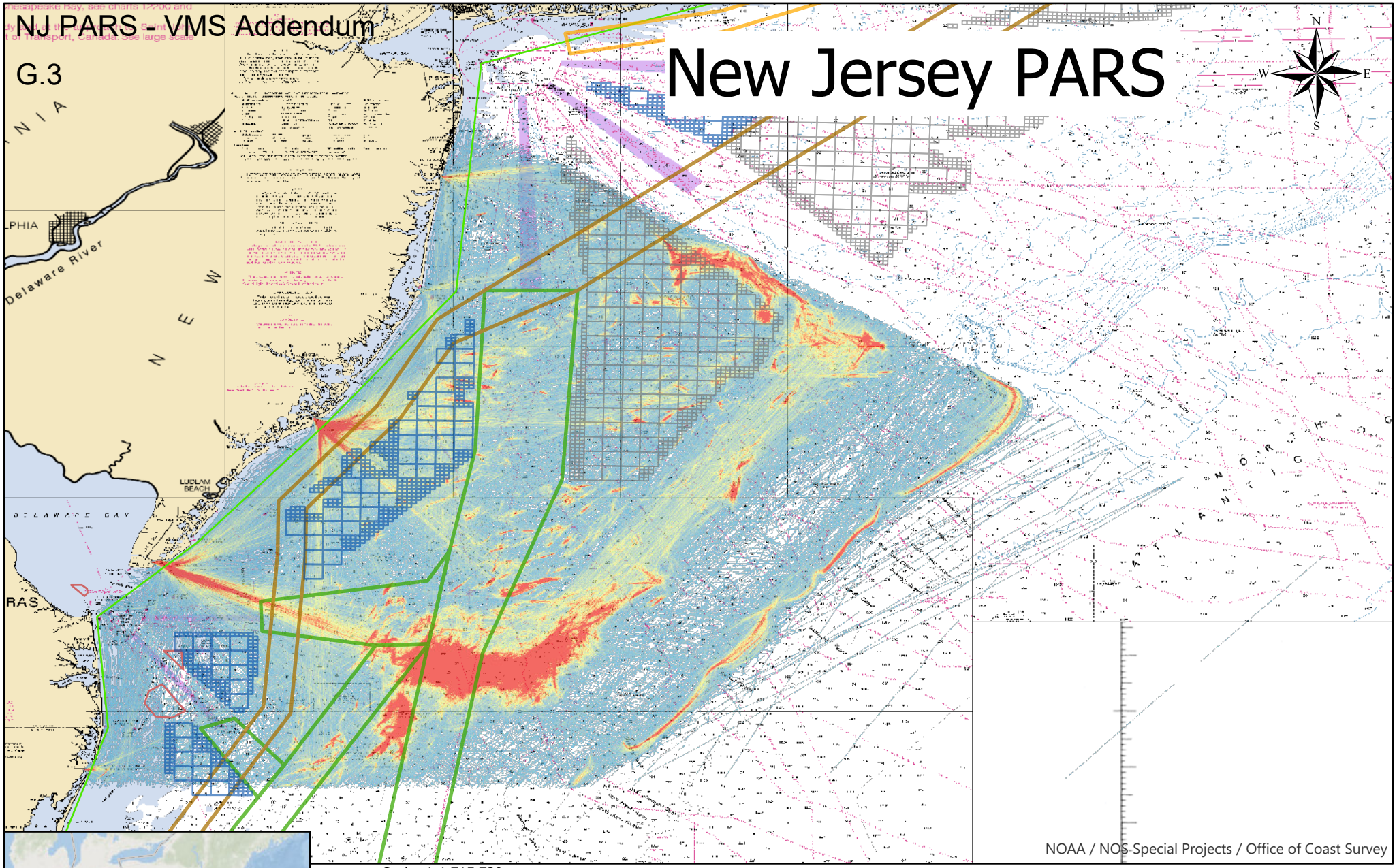
No Gear or NA 2018

- High Traffic Density
- Low Traffic Density

NJ PARS - VMS Addendum

G.3

New Jersey PARS



Scale: 1:1,715,730

0 5 10 20 30 40 Nautical Miles

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN

Legend

- Wind Lease Areas
- Wind Planning Areas
- Deep Draft Lane
- Tug Tow Extension
- Tug Tow Lane
- Anchorages
- VMS Demarcation Line

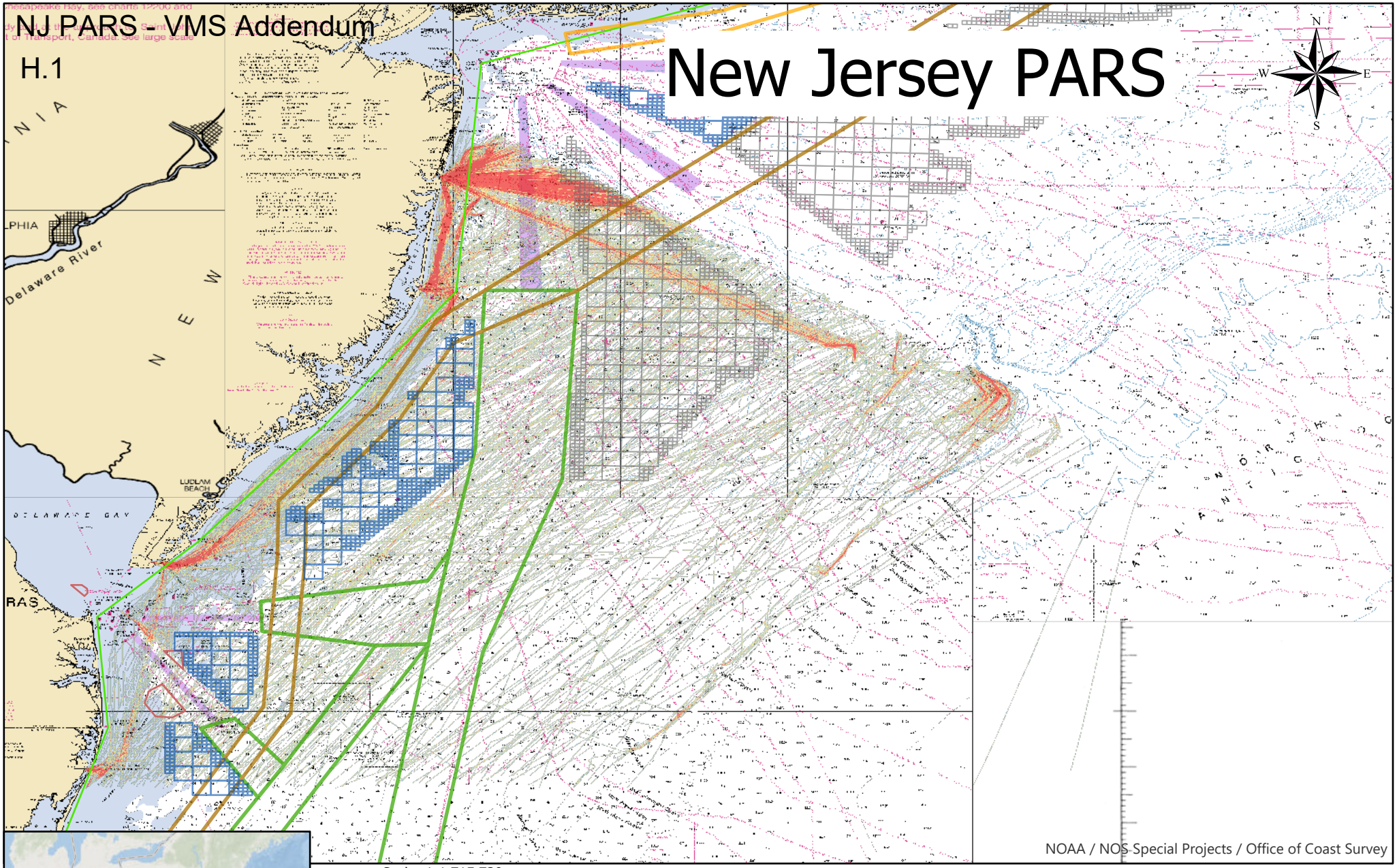
No Gear or NA 2019

- High Traffic Density
- Low Traffic Density

NJ PARS - VMS Addendum

H.1

New Jersey PARS



Scale: 1:1,715,730

0 5 10 20 30 40 Nautical Miles

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN

Legend

- Wind Lease Areas
- Wind Planning Areas
- Deep Draft Lane
- Tug Tow Extension
- Tug Tow Lane
- Anchorages
- VMS Demarcation Line

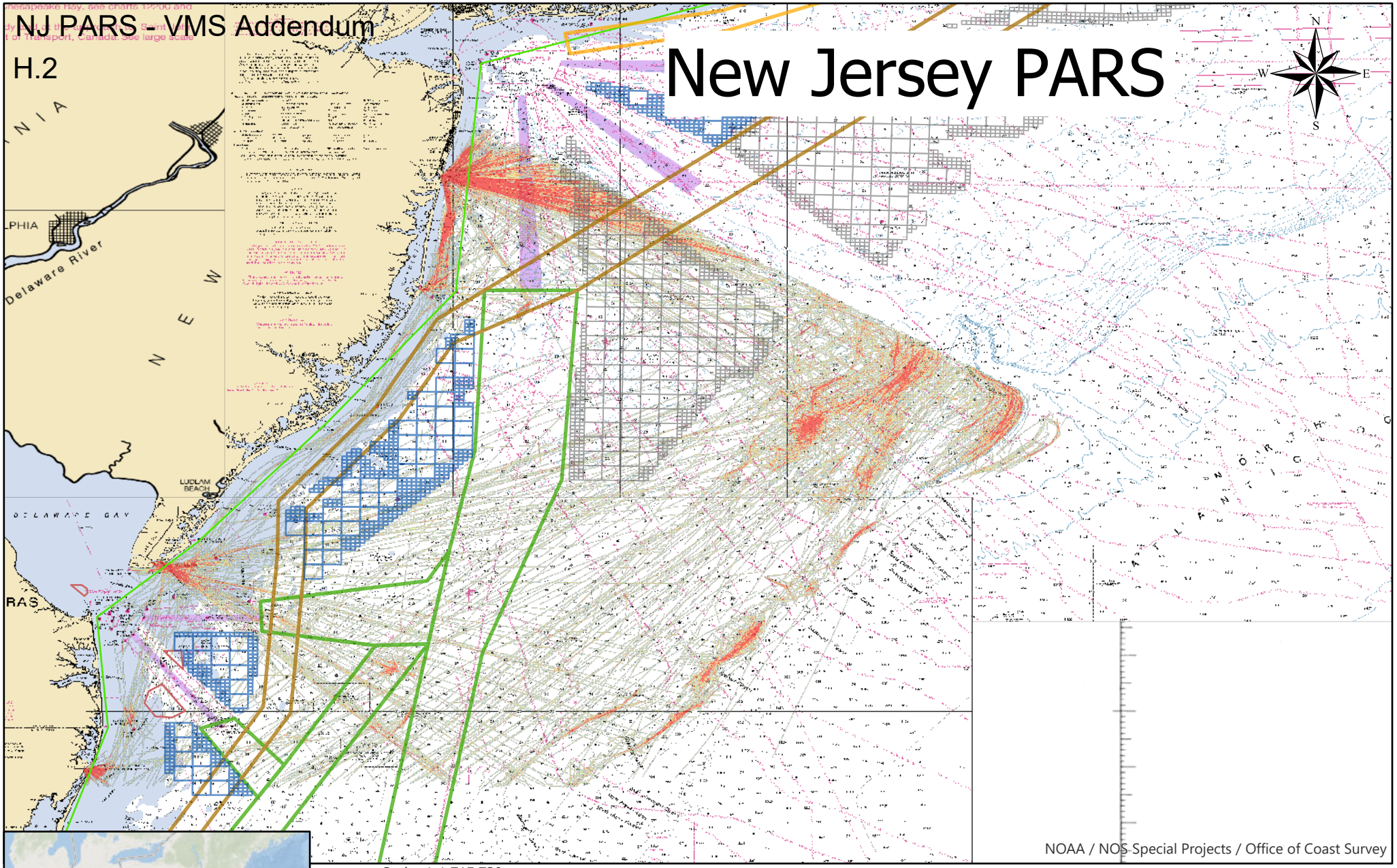
Bottom Trawl 2017

- High Traffic Density
- Low Traffic Density

NJ PARS - VMS Addendum

H.2

New Jersey PARS



Scale: 1:1,715,730

0 5 10 20 30 40 Nautical Miles

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN

Legend

- Wind Lease Areas
- Wind Planning Areas
- Deep Draft Lane
- Tug Tow Extension
- Tug Tow Lane
- Anchorages
- VMS Demarcation Line

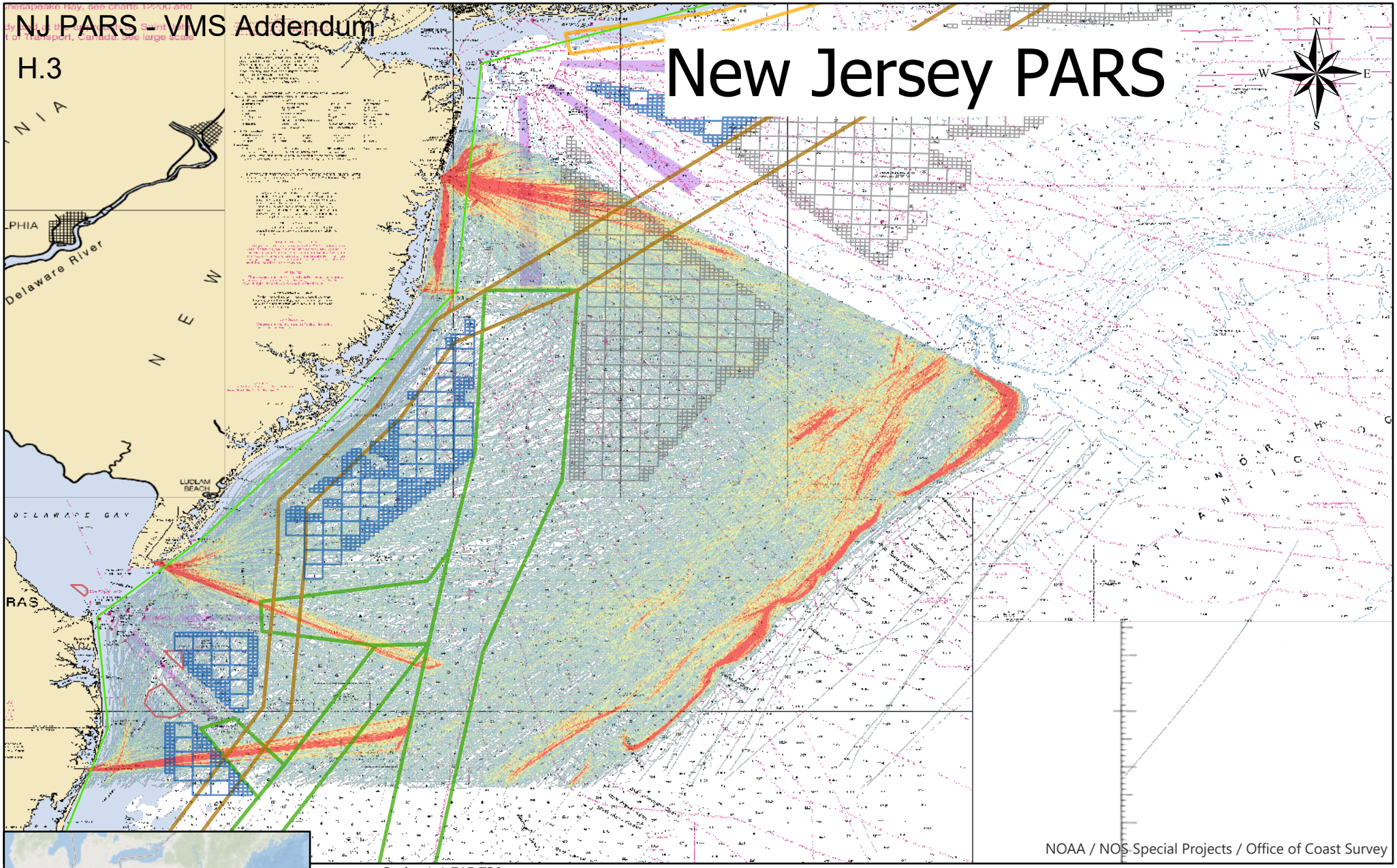
Bottom Trawl 2018

- High Traffic Density
- Low Traffic Density

NJ PARS - VMS Addendum

H.3

New Jersey PARS



Scale: 1:1,715,730

0 5 10 20 30 40 Nautical Miles

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN

Legend

- Wind Lease Areas
- Wind Planning Areas
- Deep Draft Lane
- Tug Tow Extension
- Tug Tow Lane
- Anchorages
- VMS Demarcation Line

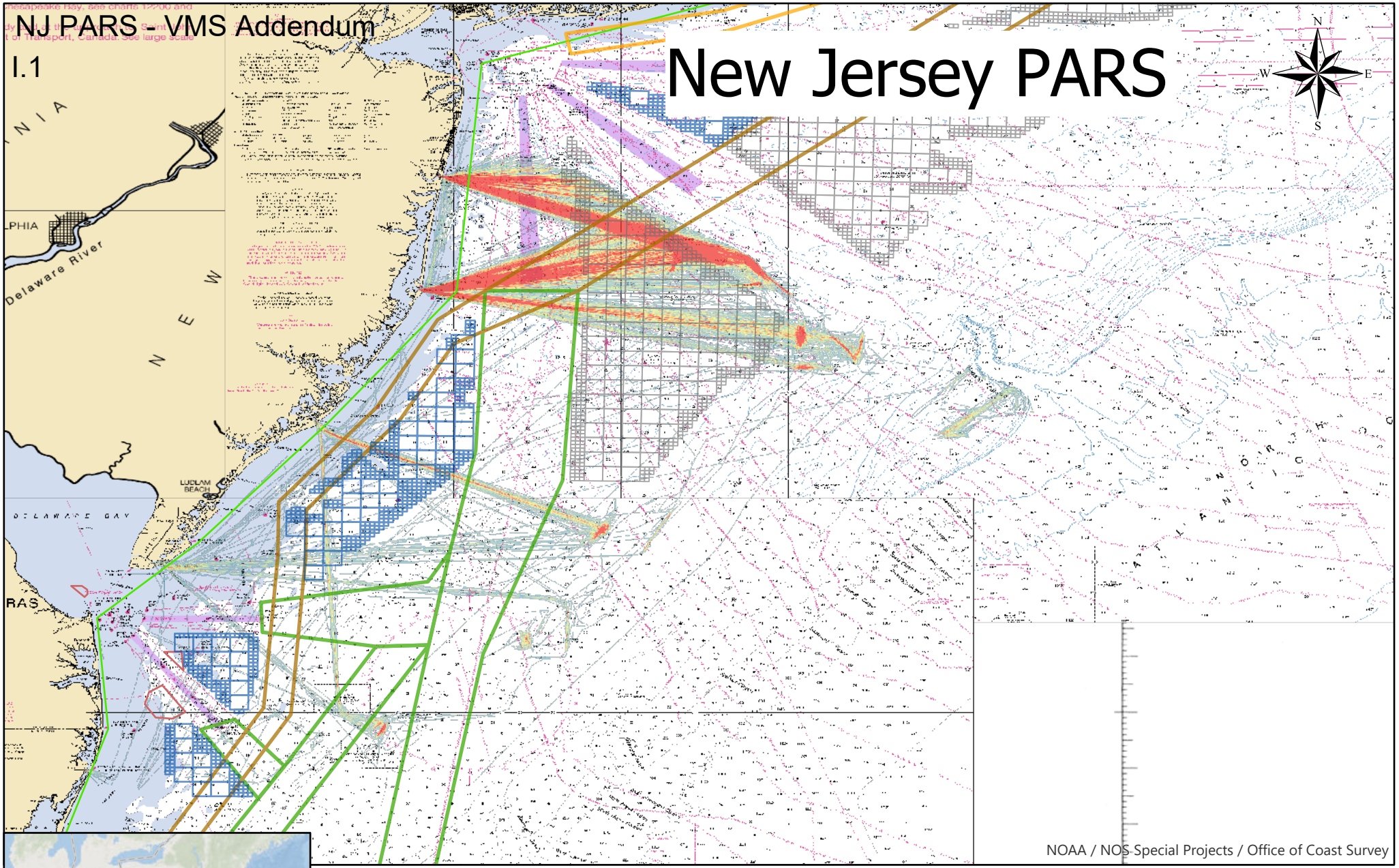
Bottom Trawl 2019

- High Traffic Density
- Low Traffic Density

NJ PARS - VMS Addendum

I.1

New Jersey PARS



Scale: 1:1,715,730

0 5 10 20 30 40 Nautical Miles

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN

Legend

- Wind Lease Areas
- Wind Planning Areas
- Deep Draft Lane
- Tug Tow Extension
- Tug Tow Lane
- Anchorages
- VMS Demarcation Line

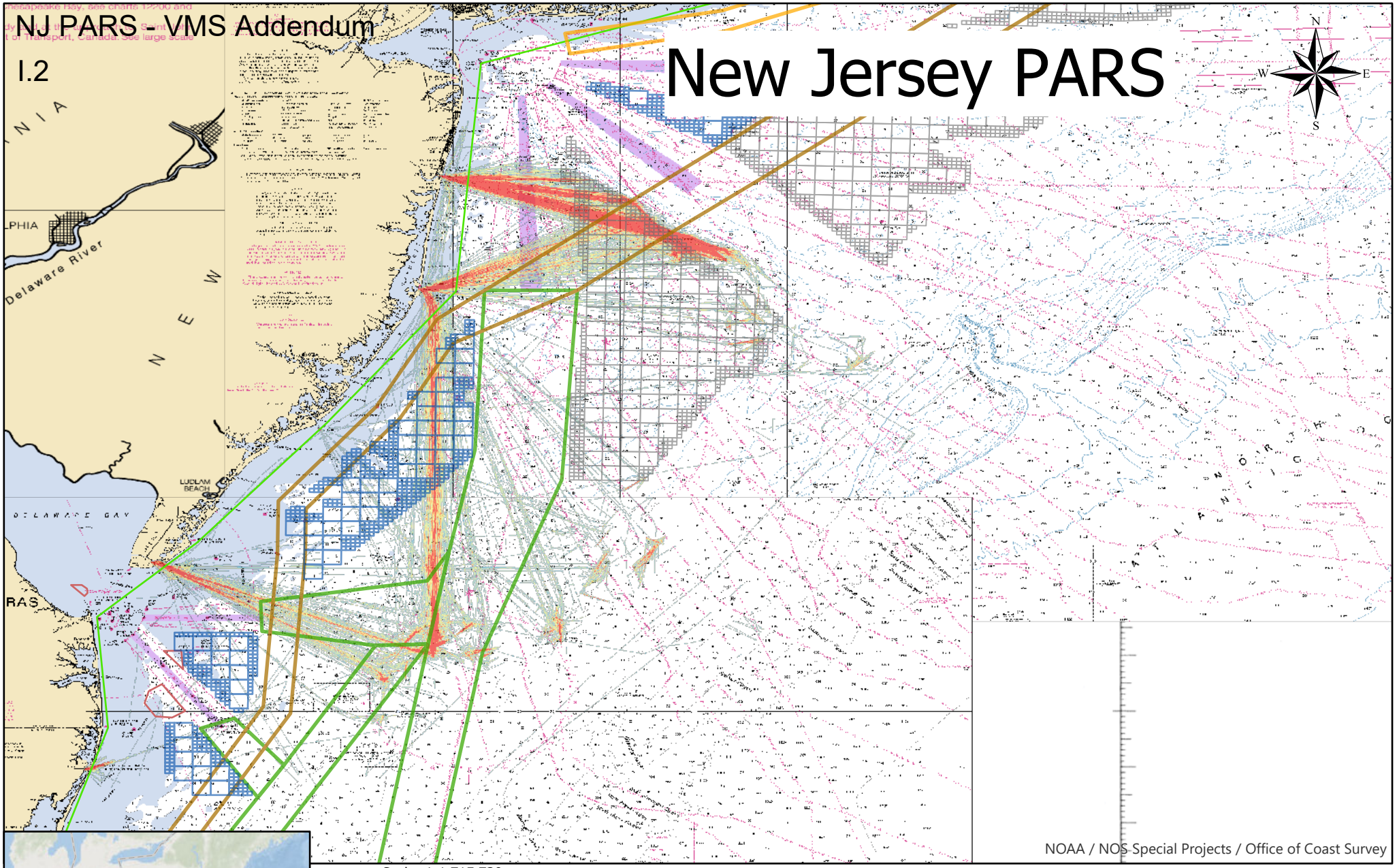
Dredge 2017

- High Traffic Density
- Low Traffic Density

NJ PARS - VMS Addendum

I.2

New Jersey PARS



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0 5 10 20 30 40 Nautical Miles

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN

Legend

- Wind Lease Areas
- Wind Planning Areas
- Deep Draft Lane
- Tug Tow Extension
- Tug Tow Lane
- Anchorages
- VMS Demarcation Line

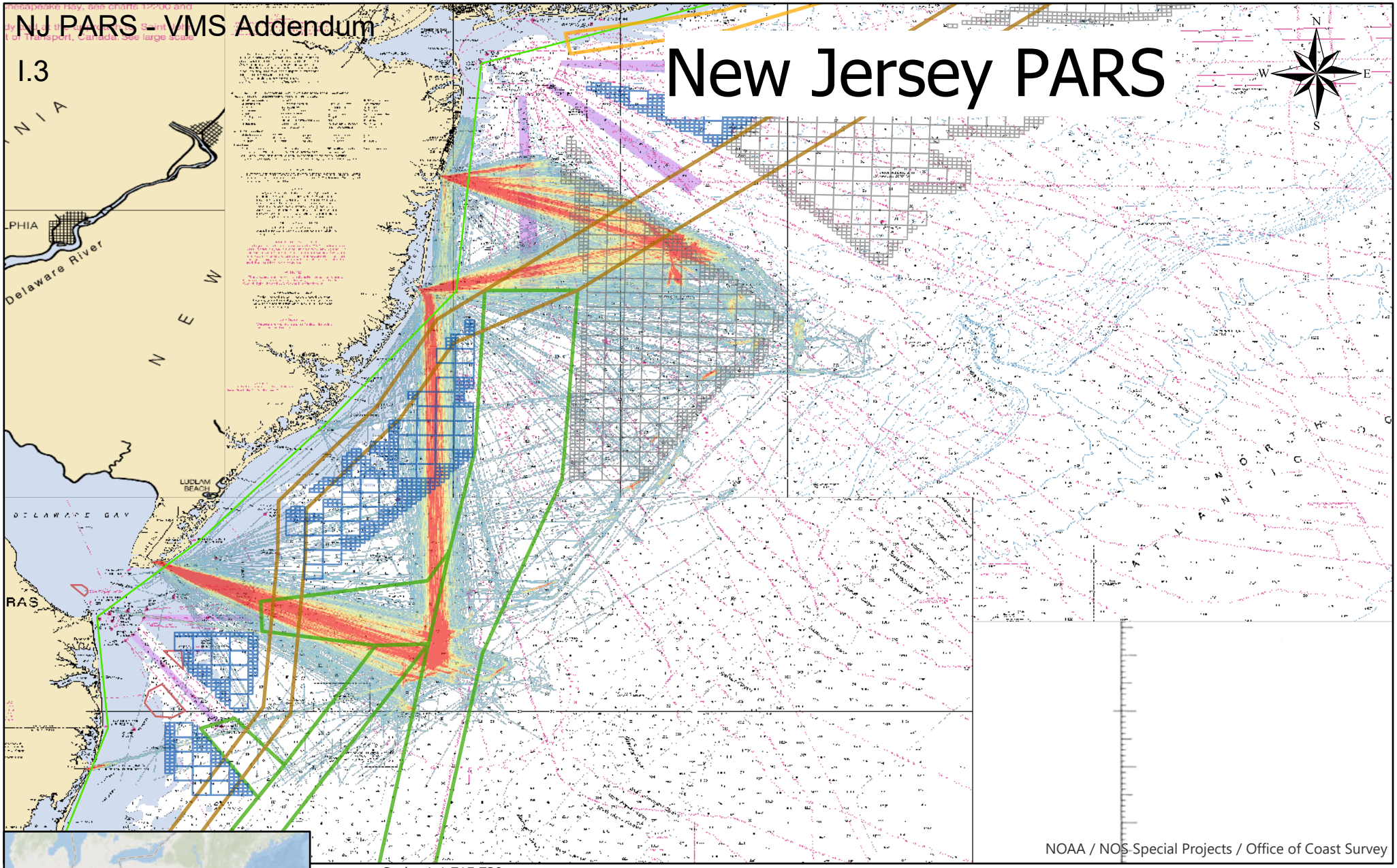
Dredge 2018

- High Traffic Density
- Low Traffic Density

NJ PARS - VMS Addendum

I.3

New Jersey PARS



Scale: 1:1,715,730

0 5 10 20 30 40 Nautical Miles

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Data Source: NOAA Fisheries, VMS
Prepared by the CG NAVCEN

Legend

- Wind Lease Areas
- Wind Planning Areas
- Deep Draft Lane
- Tug Tow Extension
- Tug Tow Lane
- Anchorages
- VMS Demarcation Line

Dredge 2019

- High Traffic Density
- Low Traffic Density

Addendum 3 to the Traffic Analysis for the NJ PARS – Tug/Tow Coastwise Traffic Analysis