Traffic Lane Analyses

For the six passage lines that pass through traffic lanes, the majority of the recorded trips are cargo vessels and tankers, with some passenger and fishing vessels. Fewer tank ships transit from Ambrose to Barnegat or Barnegat to Ambrose than in the other traffic lanes, although the majority of the traffic in all lanes is still cargo or tank vessels. Fishing vessel tracks remain largely consistent, although there are more tracks for this vessel type from Ambrose to Hudson Canyon, especially in 2017.

The number of passenger vessel tracks for each passage line is also similar across all traffic lanes. To determine more specifically what type of passenger vessels transit in the traffic lanes, a sample of 116 passenger track lines in 2019 was selected in the Ambrose to Hudson lane for further examination. These tracks were created by 18 unique vessels, all with valid IMO numbers. The naming conventions of these ships (ADVENTURE OF THE SEAS, CARNIVAL TRIUMPH, and DISNEY MAGIC, for example) indicate they are cruise ships. Thus, within the traffic lanes, the type "Passenger" is understood to mean mostly larger passenger vessels such as cruise ships.

In terms of total crossings, Ambrose to Barnegat and Nantucket to Ambrose have the greatest number (except for NJ Near Shore, discussed below). Additionally, Ambrose to Barnegat has a slightly higher volume of pleasure craft transits, likely due to its close proximity to the Jersey Shore.

Long Island Near Shore Analysis

Overall, Long Island Near Shore traffic is comprised of Fishing, Tug / Tow, and Other vessels with a few Pleasure Craft / Sailing. There are almost no passenger, military, tanker, or cargo ships in this traffic mix. In 2018, there were more fishing vessel transits than in any other year.

NJ Near Shore Analysis

New Jersey Near Shore has by far the most crossings. This result is not surprising for several reasons. This passage line spans a wide area of two way traffic, while several of the other passage lines only cover one way deep draft traffic. The traffic near the NJ shore is largely Pleasure Craft, Tug / Tow, and Passenger vessels, which tend to concentrate in the in-shore areas. The cargo traffic that approaches New York is distributed across the traffic lanes; smaller pleasure craft and towing vessels tend to stay closer to shore and thus are concentrated in this area.

Based on a sample of 369 passenger track lines near the NJ shore in 2019, the passenger vessels in this area are largely certificated small passenger vessels. This contrasts the vessels represented by the type "Passenger" in the main traffic lanes. In the track line sample, there were 56 unique vessels, the majority of which are head boats that carry passengers, dinner or sunset cruises, whale watching tours, and other types of passenger vessels that operate near shore.

Vessel Length Distributions

The vessel length distributions are reported by year in Figure 16, Figure 17, and Figure 18. The vast majority of the vessels in the study area are between zero and 150 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.
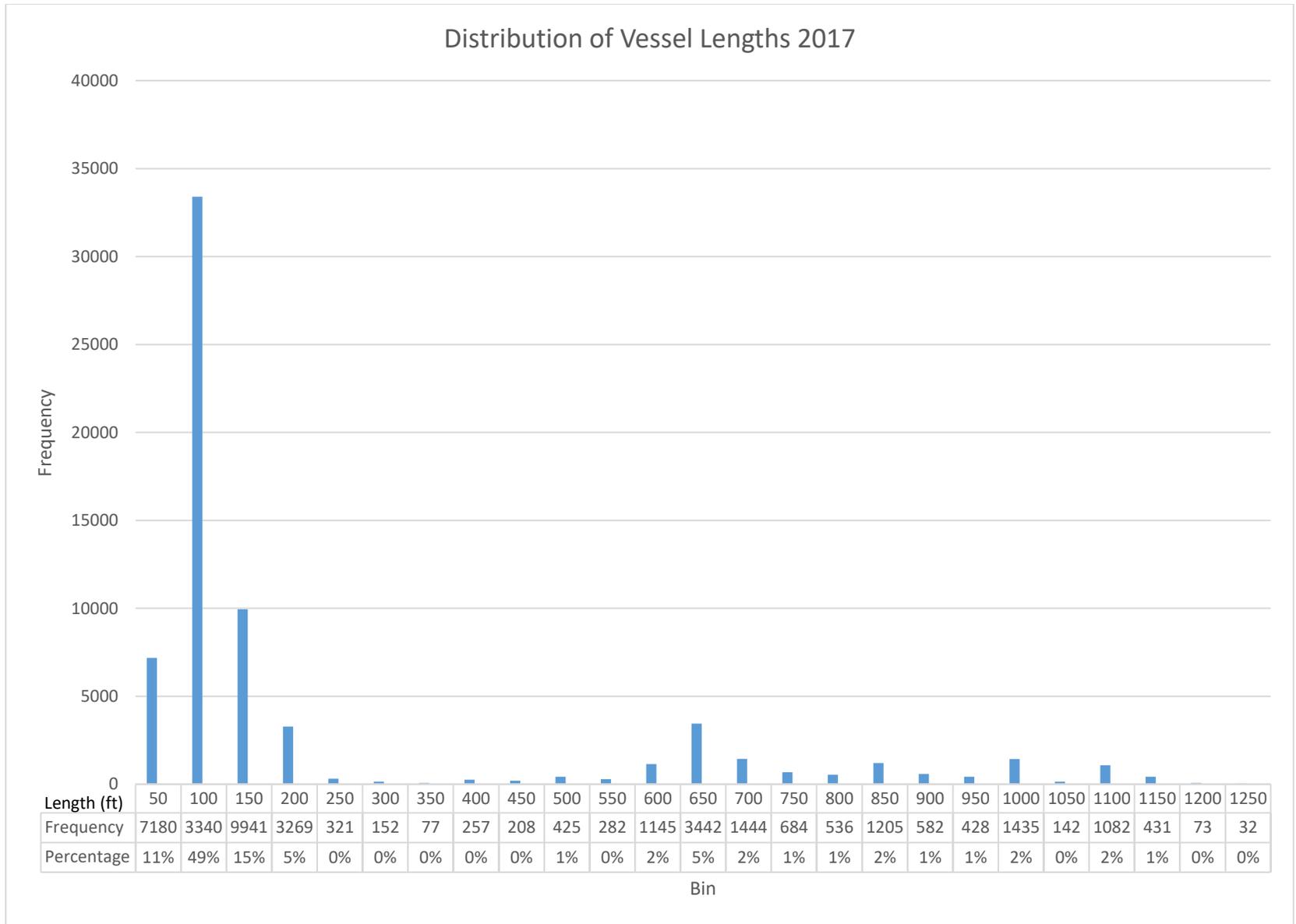
Distribution of Vessel Lengths 2017

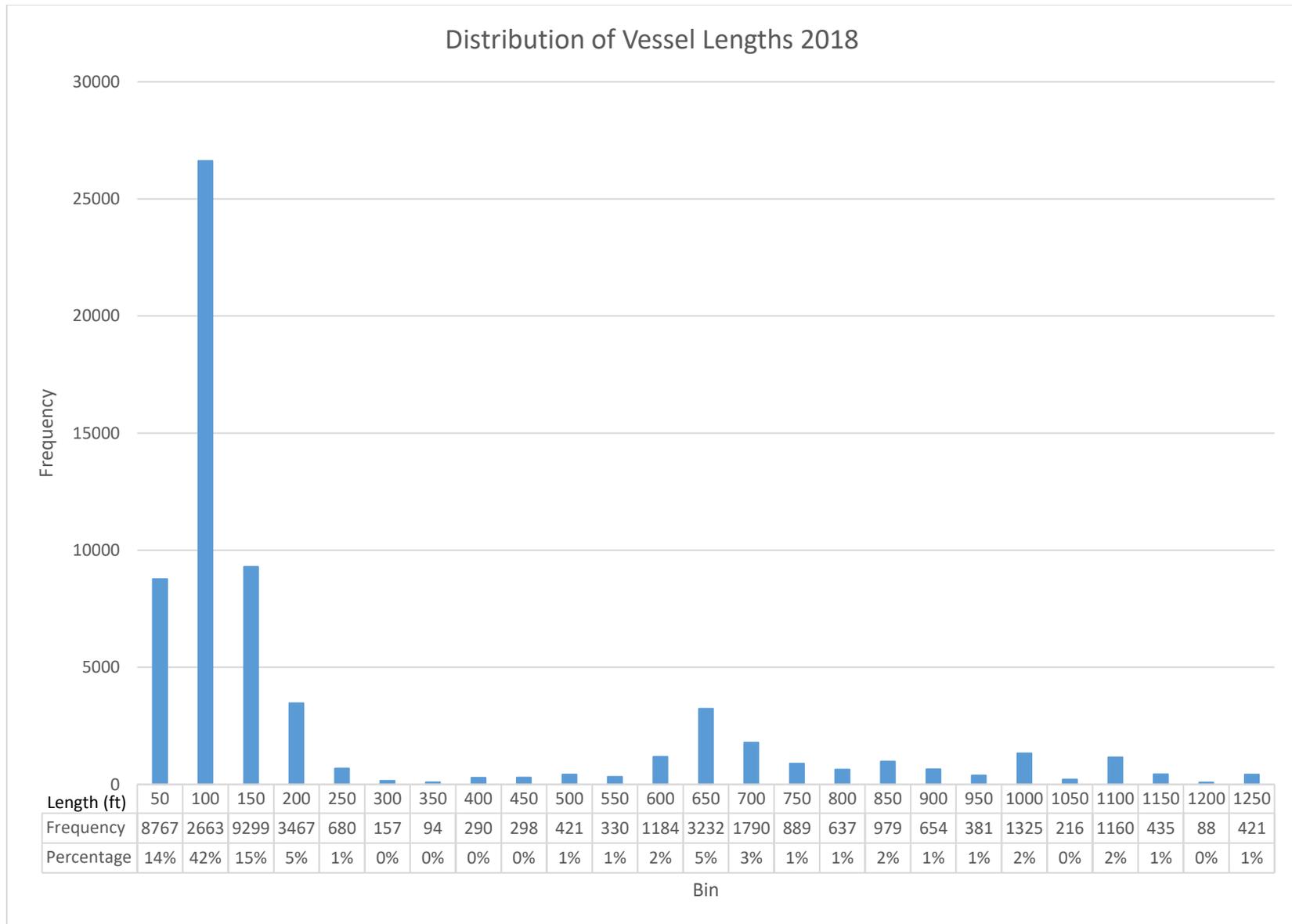| Length (ft)	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250
Frequency	7180	3340	9941	3269	321	152	77	257	208	425	282	1145	3442	1444	684	536	1205	582	428	1435	142	1082	431	73	32
Percentage	11%	49%	15%	5%	0%	0%	0%	0%	0%	1%	0%	2%	5%	2%	1%	1%	2%	1%	1%	2%	0%	2%	1%	0%	0%

Figure 16: Distribution of Vessel Lengths in 2017

19

Distribution of Vessel Lengths 2018

Length (ft)	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	8767	2663	9299	3467	680	157	94	290	298	421	330	1184	3232	1790	889	637	979	654	381	1325	216	1160	435	88	421
Percentage	14%	42%	15%	5%	1%	0%	0%	0%	0%	1%	1%	2%	5%	3%	1%	1%	2%	1%	1%	2%	0%	2%	1%	0%	1%

Figure 17: Distribution of Vessel Lengths in 2018

Distribution of Vessel Lengths 2019

Length (ft)	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	9879	2669	8733	2714	898	542	144	344	267	614	285	1408	3599	1901	973	560	1151	655	515	1251	265	1096	391	205	505
Percentage	15%	41%	13%	4%	1%	1%	0%	1%	0%	1%	0%	2%	5%	3%	1%	1%	2%	1%	1%	2%	0%	2%	1%	0%	1%
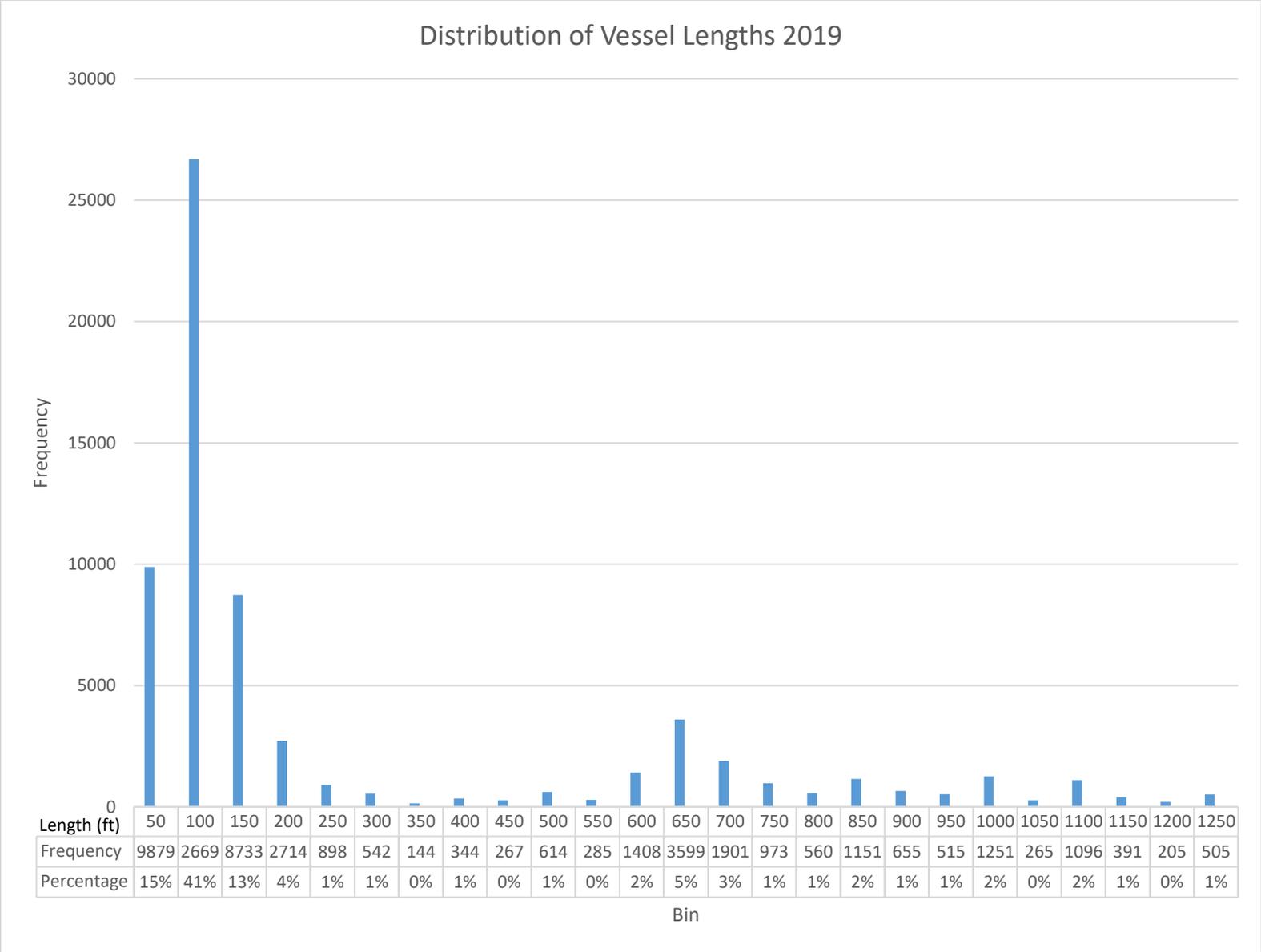
Figure 18: Distribution of Vessel Lengths in 2019

Vessel Draft Distributions

The reported drafts are displayed in Figure 19, Figure 20, and Figure 21. They remained consistent between 2018 and 2019 in the NNYB study area. However, these draft distributions only report the draft values that were present in the data set. Approximately 70% of the vessels were missing draft values. This is expected because it is a user defined input and optional for many vessels. There were several thousand fewer draft values reported in 2017 than the other two years, which may explain the difference between this distribution and the other two. Bins are defined the same way as for length, 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).

Distribution of Vessel Drafts 2017

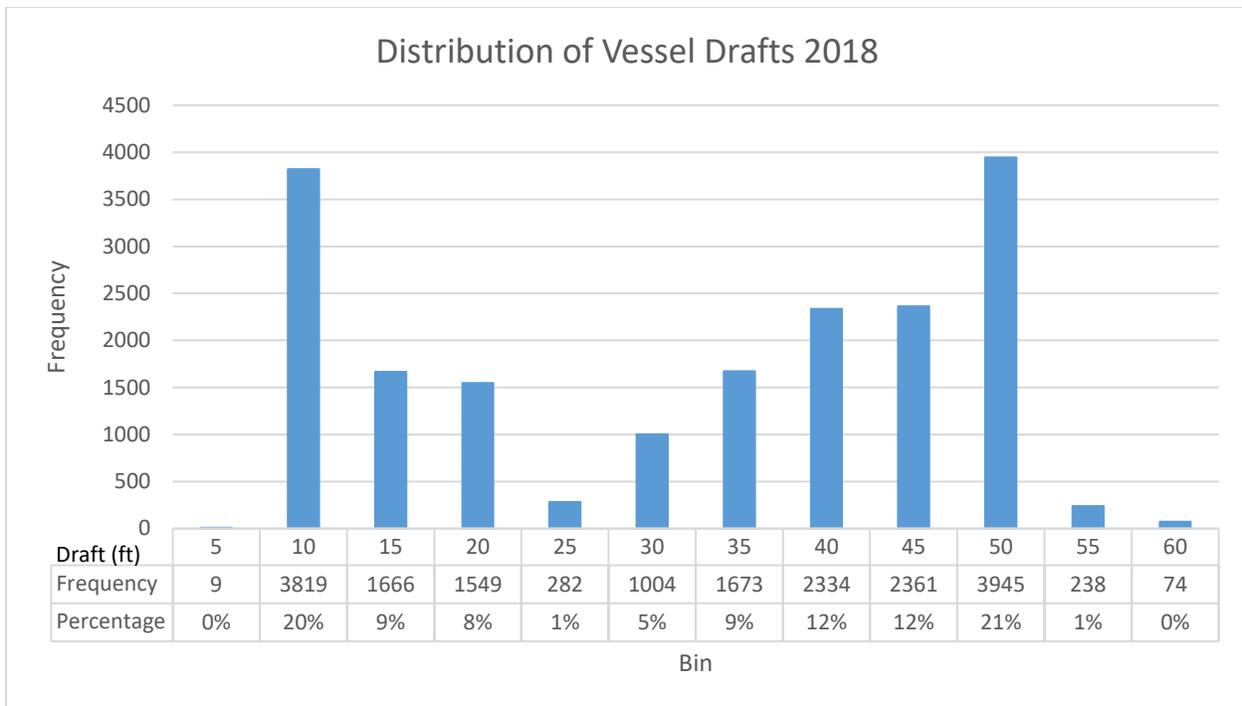| Draft (ft)	5	10	15	20	25	30	35	40	45	50	55	60
Frequency	25	754	672	444	322	1278	2786	1280	1781	2773	88	60
Percentage	0%	6%	5%	4%	3%	10%	23%	10%	15%	23%	1%	0%
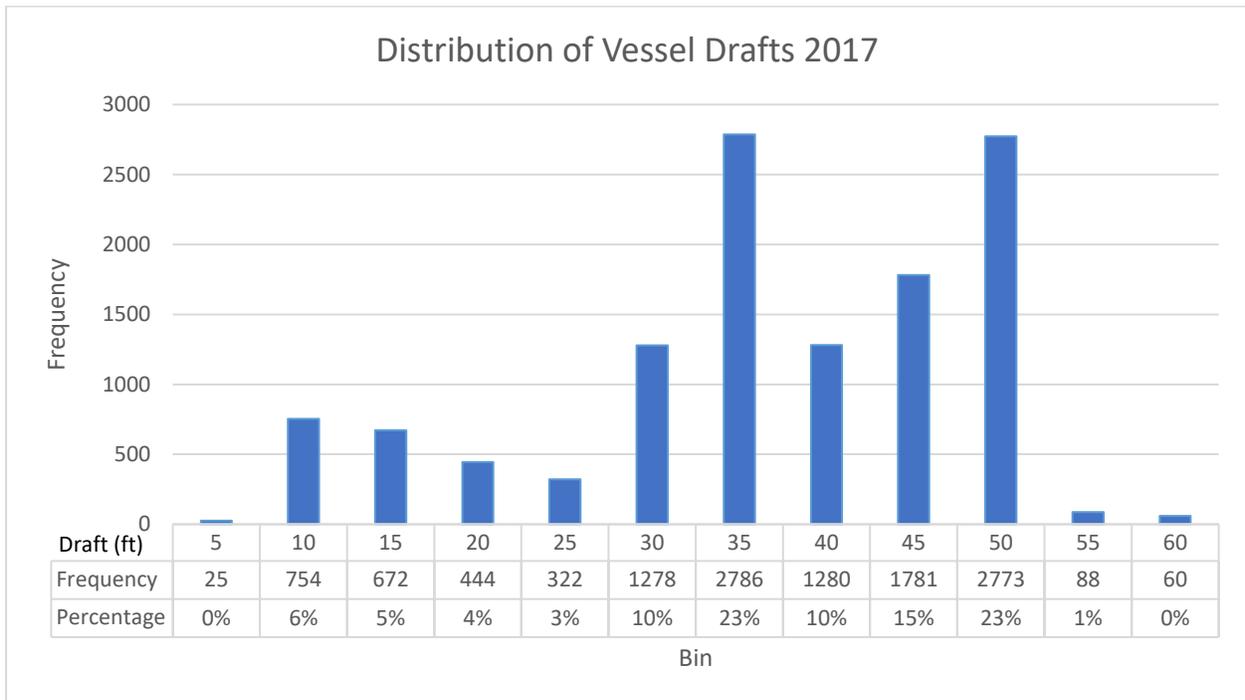
Figure 19: Distribution of Vessel Drafts in 2017

Distribution of Vessel Drafts 2018

Draft (ft)	5	10	15	20	25	30	35	40	45	50	55	60
Frequency	9	3819	1666	1549	282	1004	1673	2334	2361	3945	238	74
Percentage	0%	20%	9%	8%	1%	5%	9%	12%	12%	21%	1%	0%

Figure 20: Distribution of Vessel Drafts in 2018

Distribution of Vessel Drafts 2019

Draft (ft)	5	10	15	20	25	30	35	40	45	50	55	60
Frequency	64	2961	1338	1929	261	943	1578	2467	1994	3631	233	194
Percentage	0%	17%	8%	11%	1%	5%	9%	14%	11%	21%	1%	1%
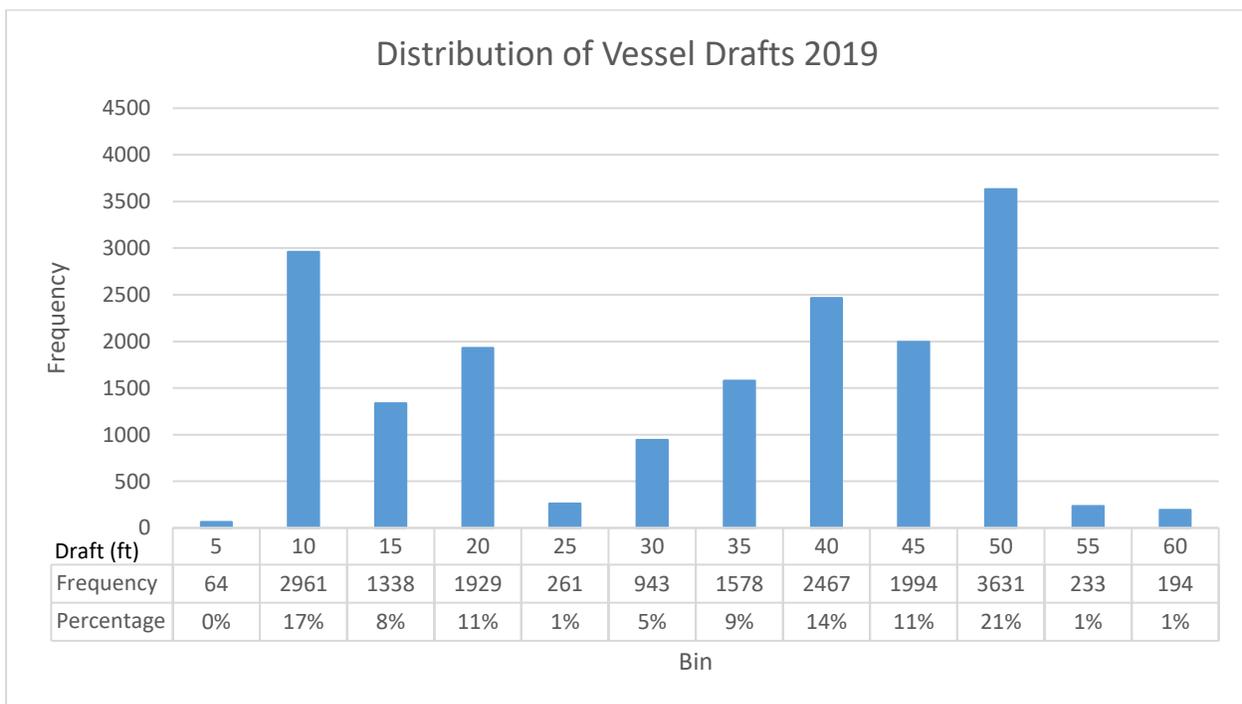
Figure 21: Distribution of Vessel Drafts in 2019

Traffic Densities

The traffic density charts are organized by year and type, as listed in Table 3. Observations from these densities about each vessel type are below. Even though only the study area as previously defined was considered in this analysis, these densities show a larger area to assist in visualization of the traffic adjoining the study area to the south.

	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 3: Traffic Density Labels

All Vessels

The highest traffic density is in the traffic lanes, and along the coast near Long Island Sound and the New Jersey Shore. This remains consistent from 2017-2019 (Charts A.1-A.3).

Cargo and Tanker

Consistent with the passage line analysis and as expected, cargo ships and tankers transit mainly in the designated traffic lanes. See Charts B.1-B.3 and H.1-H.3.

Fishing

Between 2017, 2018, and 2019, fishing vessels consistently transit near the shore of Long Island Sound (Charts C.1-C.3). There are also more fishing vessels near the NOAA buoy ODAS "44017," north of the Nantucket to Ambrose lane. Traffic crosses this lane as well. A concentrated fishing effort is also found between the Barnegat to Ambrose and Ambrose to Hudson Canyon lanes, with traffic crossing the Ambrose to Hudson Canyon lane.

In general, the fishing traffic varies from year to year. Fishing vessels make many short trips that vary in location based on the season and best catch at the time, which partially accounts for the variation. In 2017 and 2018, there are more patches of high density fishing traffic near the center of the study area, while in 2019 there appears to be less traffic overall.

Not Available

In 2017, 2018, and 2019, the traffic pattern for each year is similar to what is visible in the All Vessels densities for the same years (Charts D.1, D.2, D.3, A.1, A.2, and A.3). While we cannot determine the exact vessel types represented, they are probably a mixture of all vessel types based on this information.

Other

Often, "Other" includes research and survey vessels that do not match more specific AIS ship types. These vessels remain near shore and do not usually transit into the traffic lanes. In 2018, the yellow triangle showing mid-level traffic density between the Hudson Canyon to Ambrose and Ambrose to Nantucket lanes is caused by surveys conducted around wind lease areas in this location (Chart E.2).

Passenger

Passenger ships in the traffic lanes, mostly cruise ships, transit on consistent routes, as visible in all years of data (Charts F.1-F.3). There is also heavy passenger vessel traffic near the NJ shore, consisting of many small passenger vessels that conduct day trips. Additionally, there are hotspots along the coast of New York and New Jersey at locations with larger marinas, passenger boarding zones, or inlets to more protected waters.

Pleasure Craft / Sailing

Pleasure craft noticeably do not transit in the traffic lanes; they are concentrated near the shore as seen in Charts G.1-G.3 and as noted in the passage line analysis. While many of these boats pass through the traffic lanes, generally higher density traffic that is offshore is concentrated outside the lanes. Similar to passenger ships, hotspots can be seen along the shoreline either at large marinas or entrance or exit points from more protected bays near NY and NJ.

Tug / Tow

Tug / tow vessels, consistent with the passage line analysis, are concentrated near the shore (Charts I.1-I.3). There is also an area near the Ambrose to Barnegat traffic lane (shown in Figure 22 for 2019) with a consistently high concentration of tug and tow vessels using the designated dumping site.
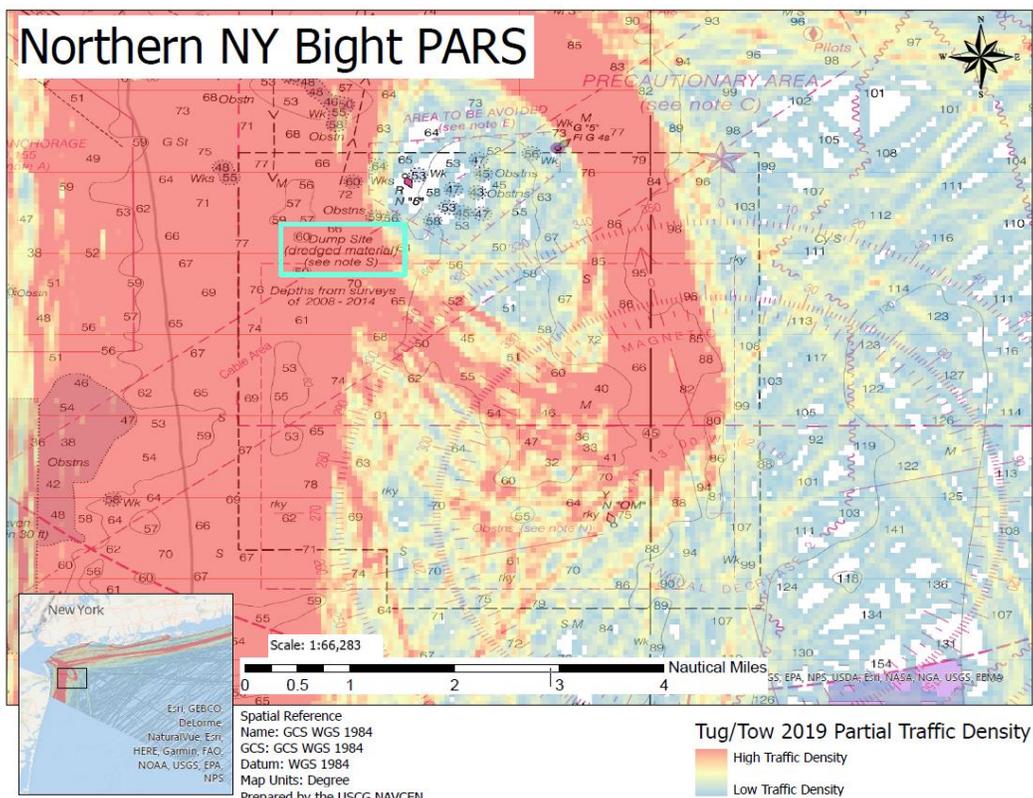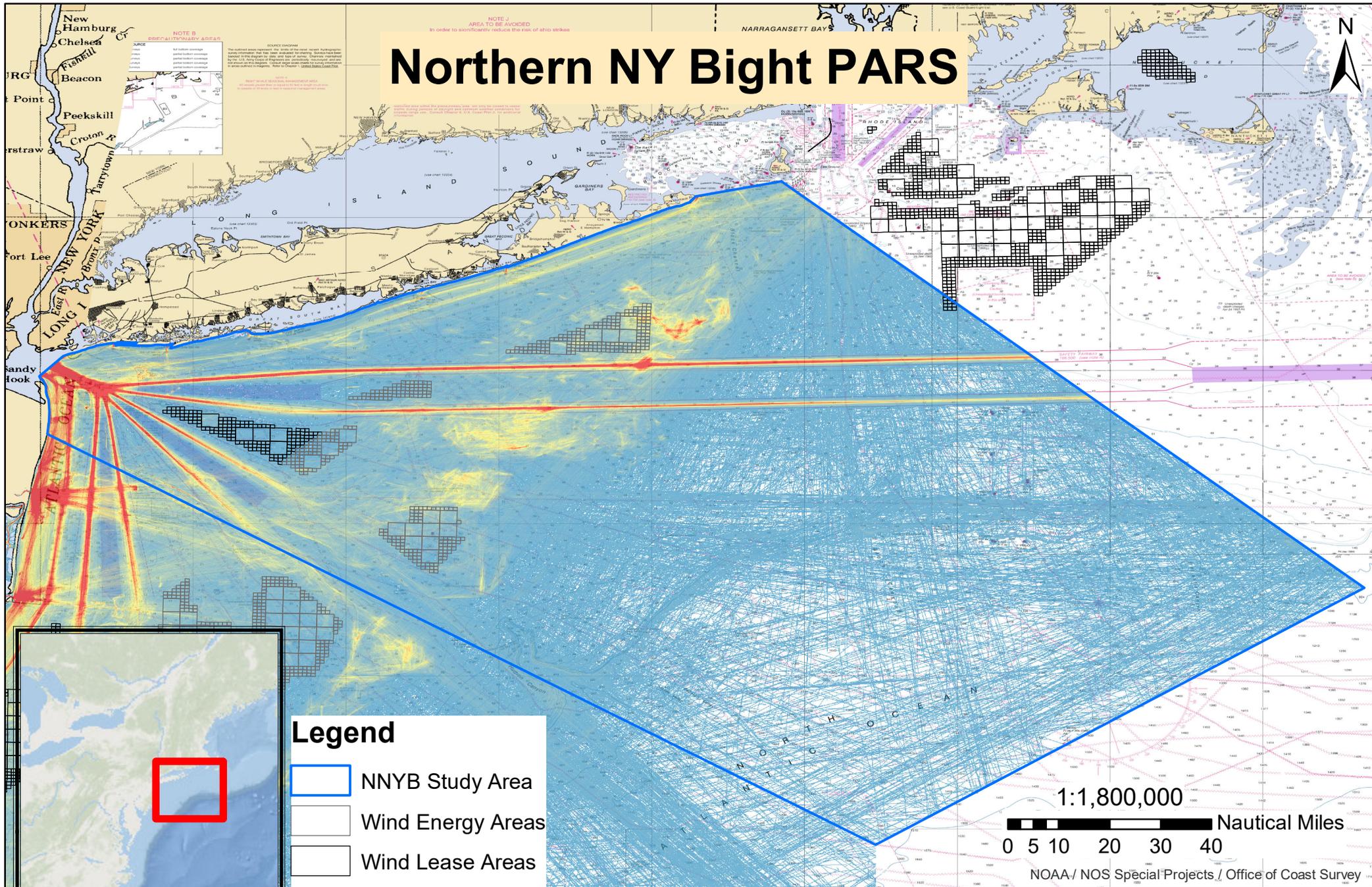

Figure 22: Tug/Tow Vessel Partial Traffic Density

Northern NY Bight PARS

Legend

— NNYB Study Area

— Wind Energy Areas

— Wind Lease Areas

All Vessels 2017

Value

High Traffic Density

Low Traffic Density

Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

1:1,800,000

Nautical Miles

0 5 10 20 30 40

NOAA / NOS Special Projects / Office of Coast Survey

NOAA Chart 12300
Data Source: NAIS
Prepared by the USCG Navigation Center

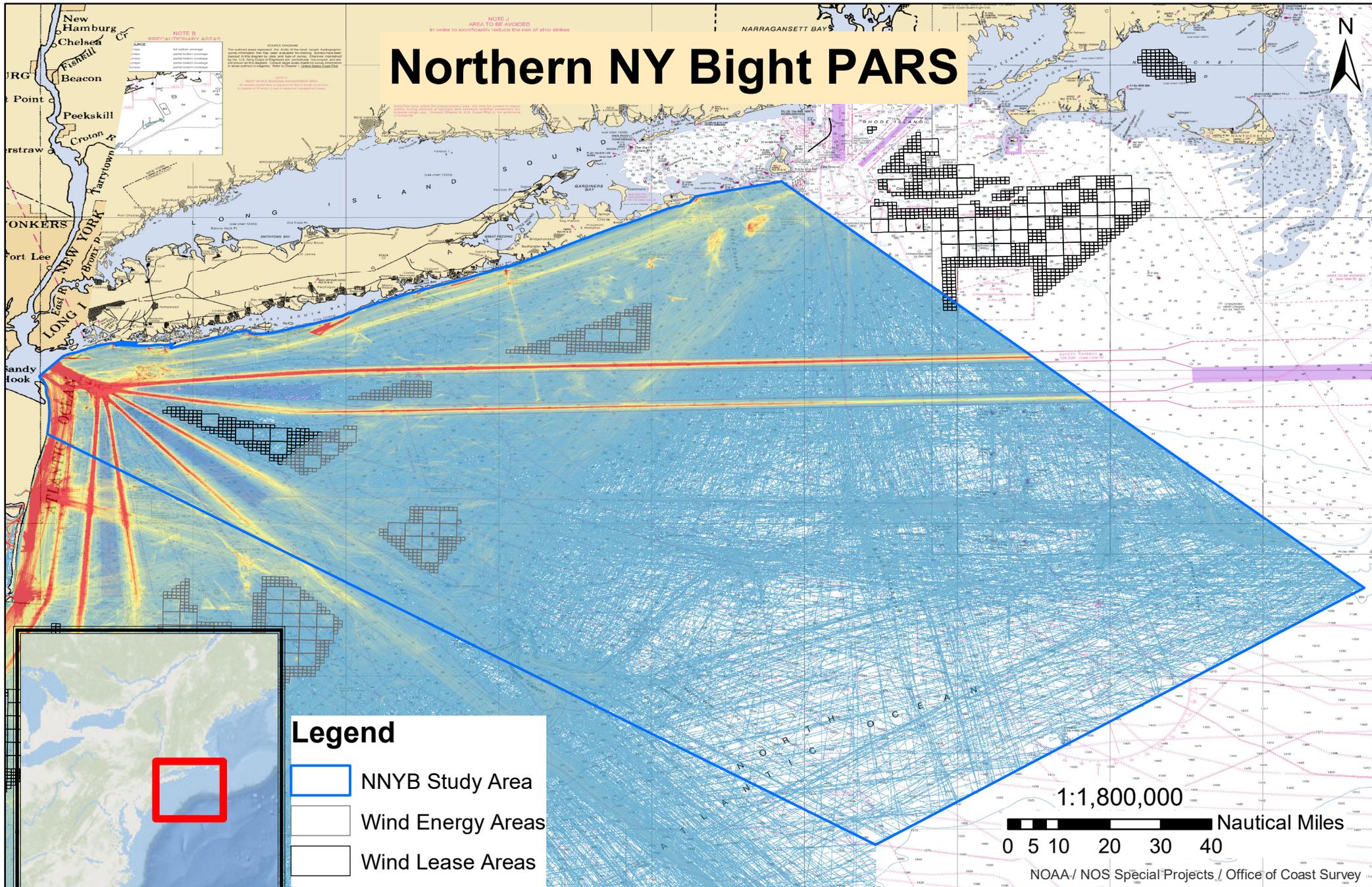Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree

A.1

Northern NY Bight PARS

Legend

—— NNYB Study Area

▢ Wind Energy Areas

☐ Wind Lease Areas

All Vessels 2018

Value

█ High Traffic Density

█ Low Traffic Density

Esri, Garmin, GEBCO, NOAA
NGDC, and other contributors

1:1,800,000
Nautical Miles
0 5 10   20   30   40

NOAA / NOS Special Projects / Office of Coast Survey

NOAA Chart 12300
Data Source: NAIS
Prepared by the USCG Navigation Center

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree

A.2

Northern NY Bight PARS

N

NOTE J
AREA TO BE AVOIDED
In order to significantly reduce the risk of ship strikes

Legend

NNYB Study Area

Wind Energy Areas

Wind Lease Areas

All Vessels 2019

Value

High Traffic Density

Low Traffic Density

Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

NOAA Chart 12300
Data Source: NAIS
Prepared by the USCG Navigation Center

1:1,800,000   **Nautical Miles**
0 5 10   20   30   40

NOAA / NOS Special Projects / Office of Coast Survey

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree

A.3

Northern NY Bight PARS
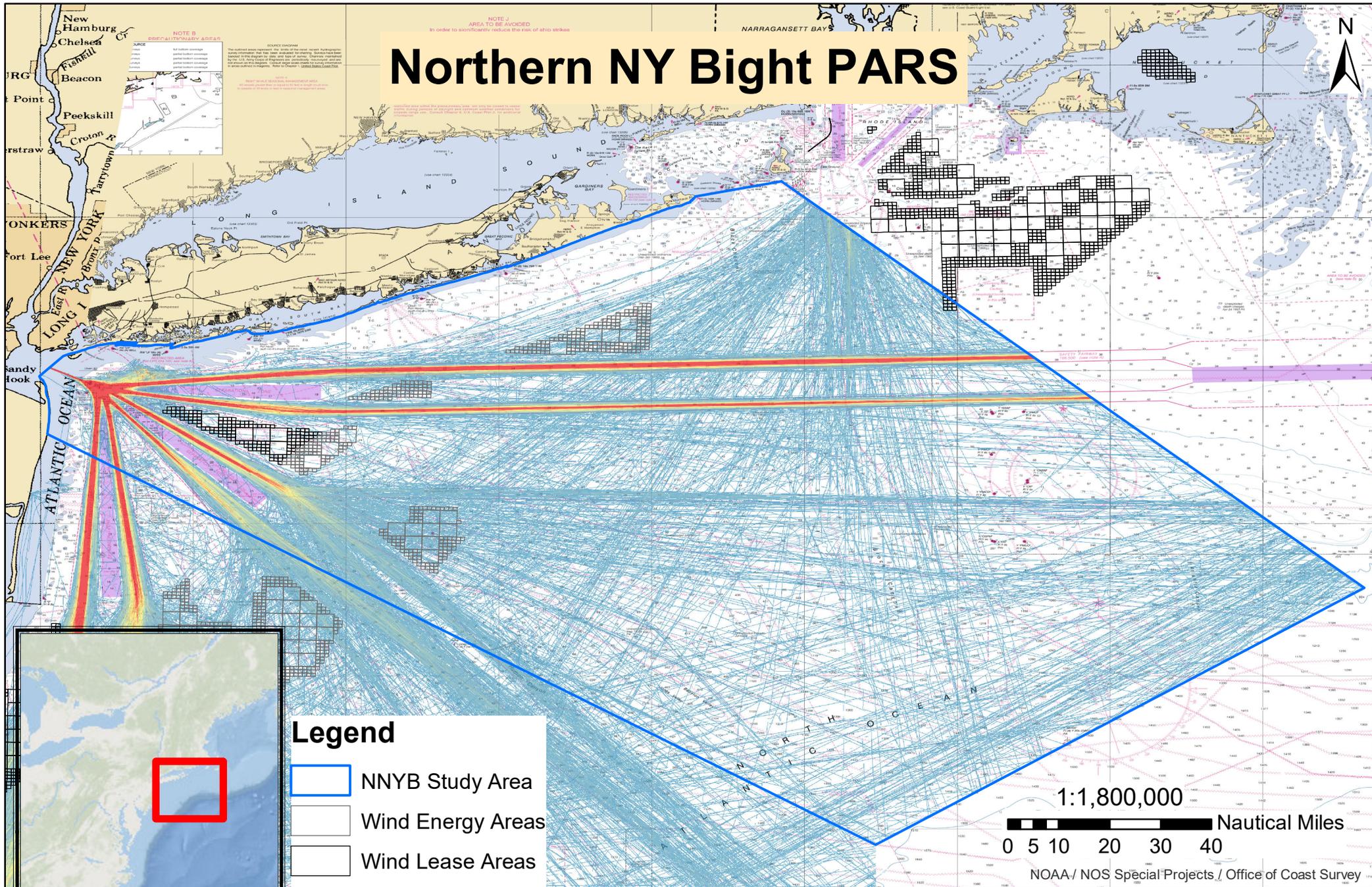
Legend

— NNYB Study Area
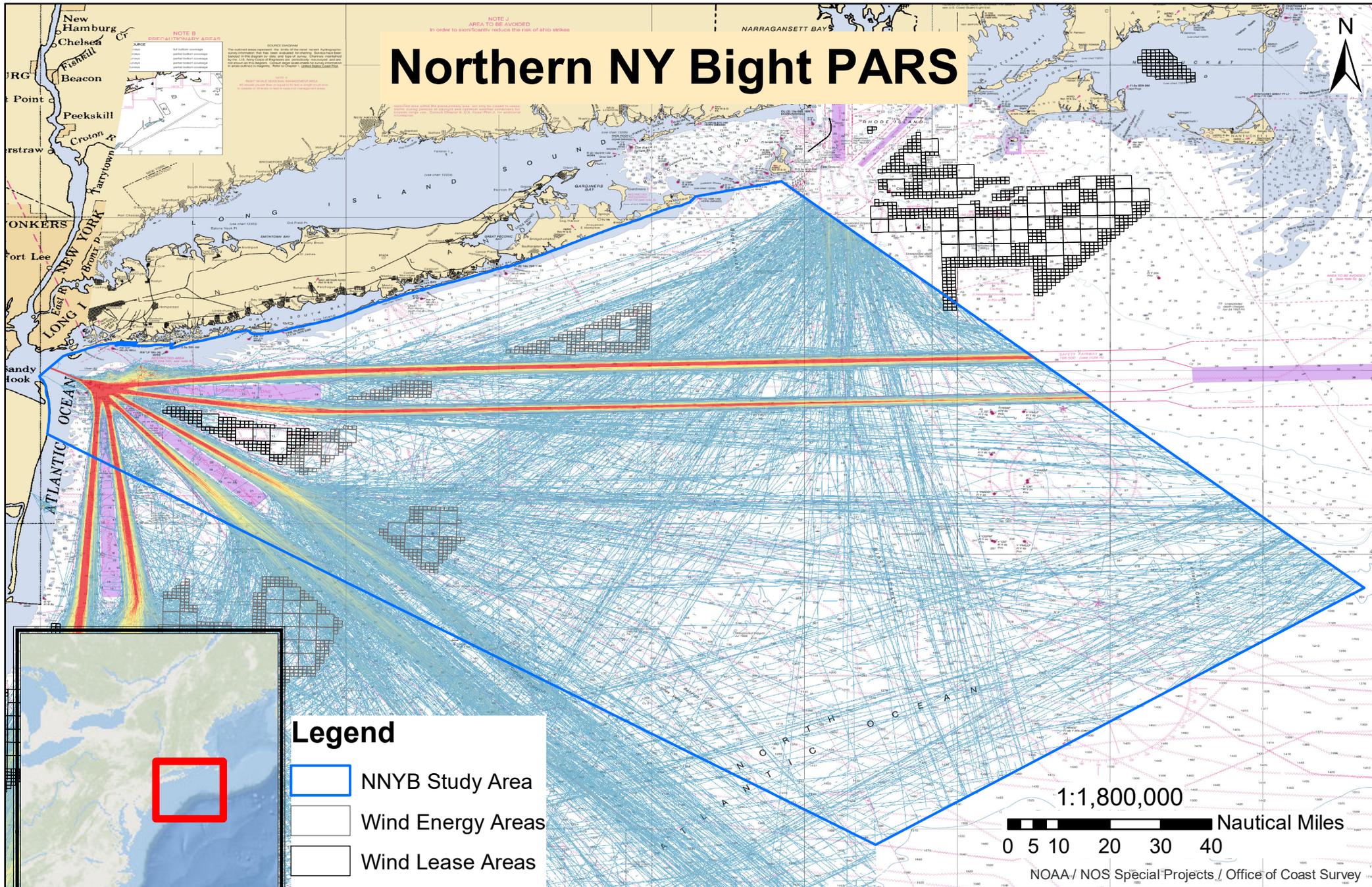
☐ Wind Energy Areas

☐ Wind Lease Areas

Cargo 2017

Value

High Traffic Density

Low Traffic Density

Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

1:1,800,000

Nautical Miles

0 5 10 20   30   40

NOAA / NOS Special Projects / Office of Coast Survey

NOAA Chart 12300
Data Source: NAIS
Prepared by the USCG Navigation Center

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree

B.1

Northern NY Bight PARS

N

Legend

─── NNYB Study Area
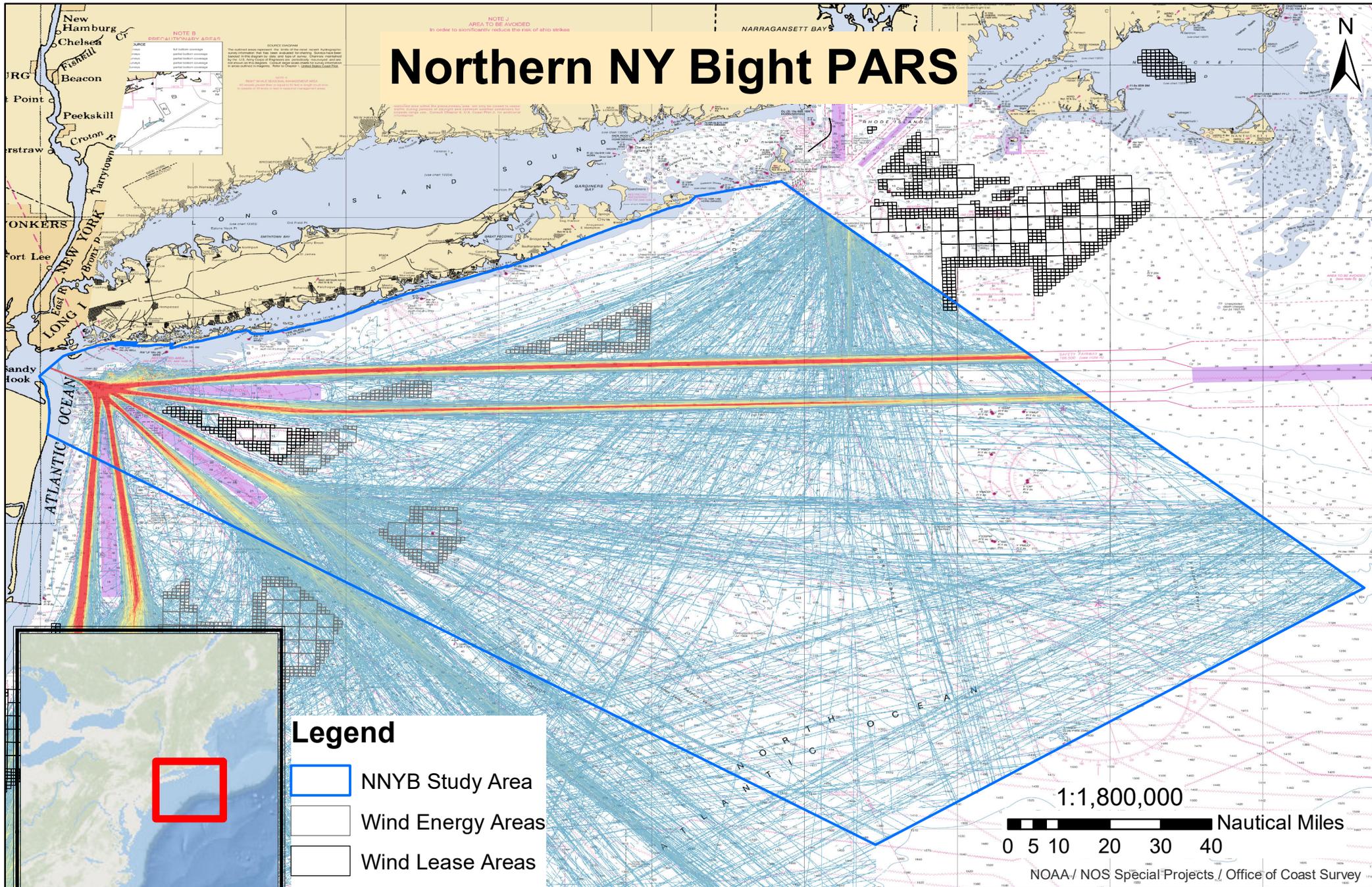
▨ Wind Energy Areas

☐ Wind Lease Areas

Cargo 2018

Value

─ High Traffic Density

─

─ Low Traffic Density

Esri, Garmin, GEBCO, NOAA
NGDC, and other contributors

1:1,800,000

▬▬▬▬▬ Nautical Miles

0 5 10   20   30   40

NOAA / NOS Special Projects / Office of Coast Survey

NOAA Chart 12300
Data Source: NAIS
Prepared by the USCG Navigation Center

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree

B.2

Northern NY Bight PARS

Legend

━━━ NNYB Study Area

▢ Wind Energy Areas

▢ Wind Lease Areas

Cargo 2019

Value

High Traffic Density

Low Traffic Density

1:1,800,000

Nautical Miles
0 5 10 20 30 40

NOAA / NOS Special Projects / Office of Coast Survey

Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

NOAA Chart 12300
Data Source: NAIS
Prepared by the USCG Navigation Center

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree

B.3