Spiny Dogfish Fishery Information Document

August 2019

This Fishery Information Document provides a brief overview of the biology, stock condition, management system, and fishery performance for spiny dogfish (*Squalus acanthias*) with an emphasis on 2018. Data sources for Fishery Information Documents are generally from unpublished National Marine Fisheries Service (NMFS) survey, dealer, vessel trip report (VTR), permit, and Marine Recreational Information Program (MRIP) databases and should be considered preliminary. For more resources, including previous Fishery Information Documents, please visit http://www.mafmc.org/dogfish.

Key Facts

- 2017 and 2018 fishing year landings were similar, about 17 million pounds.
- The current 2019 quota of 20.5 million pounds is 19% higher than 2018 landings.
- The 2020 quota would increase to 23.2 million pounds under previously-adopted multi-year specifications (and then to 27.4 million pounds in 2021) if no changes are recommended by the Scientific and Statistical Committee (SSC) or the Council.
- The Spiny Dogfish data update provided by the NMFS Science Center shows that the index that drives the assessment was up in 2019 from 2018. Because a 3-year average is used and the new 2019 value is lower than the 2016 value that drops out of the 3-year average (now 2017, 2018, and 2019), the 3-year average does fall compared to the previous calculation, to the lowest point since the stock was rebuilt.
- In 2020 the very low 2017 index value (the lowest in the time series) will no longer be part of the 3-year average and the 3-year average may increase unless there is a new all-time low for the 2020 index value.
- Based on input from the Advisory Panel, most tables and figures in this document are now done by fishing year (May 1- April 30) rather than calendar year, so some tables and figures may appear different than previous years' versions of this document.

Basic Biology

Spiny dogfish is a coastal shark with populations on the continental shelves of northern and southern temperate zones throughout the world. It is the most abundant shark in the western north Atlantic and ranges from Labrador to Florida, but is most abundant from Nova Scotia to Cape Hatteras, North Carolina. Its major migrations on the northwest Atlantic shelf are north and south, but it also migrates inshore and offshore seasonally in response to changes in water temperature. Spiny dogfish have a long life, late maturation, a long gestation period, and relatively low fecundity, making them generally vulnerable to depletion. Fish, squid, and

ctenophores dominate the stomach contents of spiny dogfish collected during the Northeast Fisheries Science Center (NEFSC) bottom trawl surveys, but spiny dogfish are opportunistic and have been found to consume a wide variety of prey. More detailed life history information can be found in the essential fish habitat (EFH) source document for spiny dogfish at: http://www.nefsc.noaa.gov/publications/tm/tm203/tm203.pdf. [1]

Status of the Stock

Based on the current biomass reference point and an assessment update considering data through spring of 2018 (available at http://www.mafmc.org/ssc-meetings/2018/sept-11), the spiny dogfish stock is not overfished or experiencing overfishing. The 2018 biomass was 67% of the target. Fishing mortality in 2017, the most recent year available, was 83% of the overfishing threshold. A benchmark assessment is scheduled for 2022. The spiny dogfish spawning stock biomass estimate timeseries is provided in Figure 1. [2]

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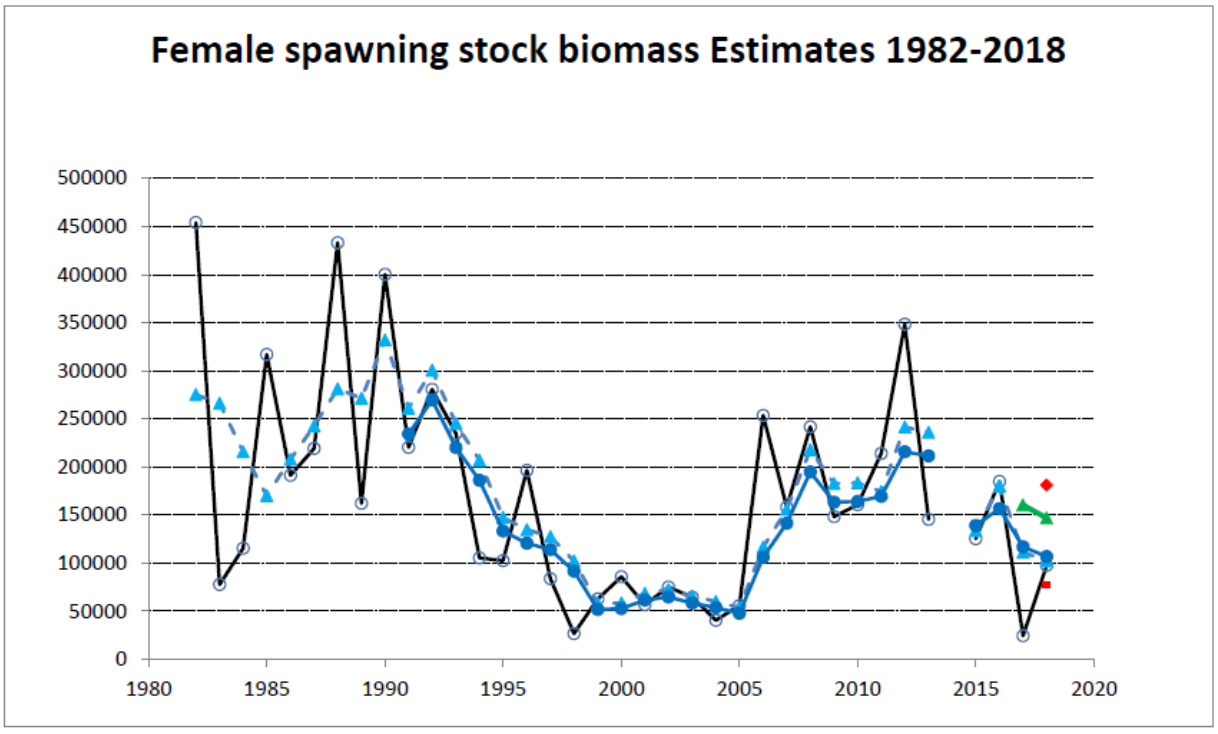

Figure 1. Stochastic SSB estimates for 1991 to 2018. Year refers to the terminal year in the three point moving average. The open circles are the yearly swept area SSB estimates, the blue triangles are the 3-year moving average of the swept area estimates, and the **closed blue circles are the stochastic SSB estimates**. The green triangles are the stochastic estimates not including 2017 and not adjusted with a Kalman filter, and the red diamond (no 2017) and square (with 2017) are the stochastic estimates adjusted with a Kalman filter (not used in last update). [2]

Management System and Fishery Performance

Management

The Council established management of spiny dogfish in 2000 and the management unit includes all federal East Coast waters.

Access to the fishery is not limited, but a federal permit must be obtained to fish in federal waters and there are various permit conditions (e.g. trip limit and reporting). There is a federal trip limit of 6,000 pounds. Some states mirror the federal trip limit, but states can set their own trip limits. The annual quota has been allocated to state shares through the Atlantic States Marine Fisheries Commission (http://www.asmfc.org/species/spiny-dogfish).

Spiny Dogfish three-year specifications were adopted by the Council in October 2018 for May 1, 2019 through April 30, 2022 (the 2019-2021 fishing years). Quotas for these fishing years are 20.5 million pounds (2019), 23.2 million pounds (2020), and 27.4 million pounds (2021).

Recreational landings are a minimal component of fishing mortality, and dead recreational discards comprise a relatively low portion of discard mortality.

Commercial Fishery

Figure 2 and Table 1 illustrate spiny dogfish landings for the 2000-2018 fishing years relative to the quotas in those years. Additional landings are available in the NMFS Science Center data update. Landings have been substantially less than quotas since 2012. The Advisory Panel has previously noted that the fishery is subject to strong market constraints given weak demand.

Figure 3 provides inflation-adjusted spiny dogfish ex-vessel prices in 2018 dollars. A downward trend is evident.

Figure 4 illustrates landings from the 2019 and 2018 fishing years relative to the current quota.

Tables 2-4 provide information on landings in the 2016-2018 fishing years by state, month, and gear type. Database errors for 2017 landings identified during the 2018 Advisory Panel meeting have been corrected.

Figure 5 illustrates the size of identifiable spiny dogfish trips in the 2018 fishing year. The procedure to group dealer records by vessel trip is somewhat approximate, so Figure 5 is an approximation of trips. While the trips cannot be organized by month in this particular analysis, the trips on the far left side are at the beginning of the fishing year (May 1, 2018), and the trips on the far right side of Figure 5 are near the end of the fishing year (April 30, 2019).

Table 5 provides information on the numbers of participating vessels that have at least one federal permit. State-only vessels are not included, but the table should still illustrate trends in participation.

Location of catch information is provided in the NMFS Science Center data update, and is reproduced in Figure 6 below for the 2016-2018 calendar years.

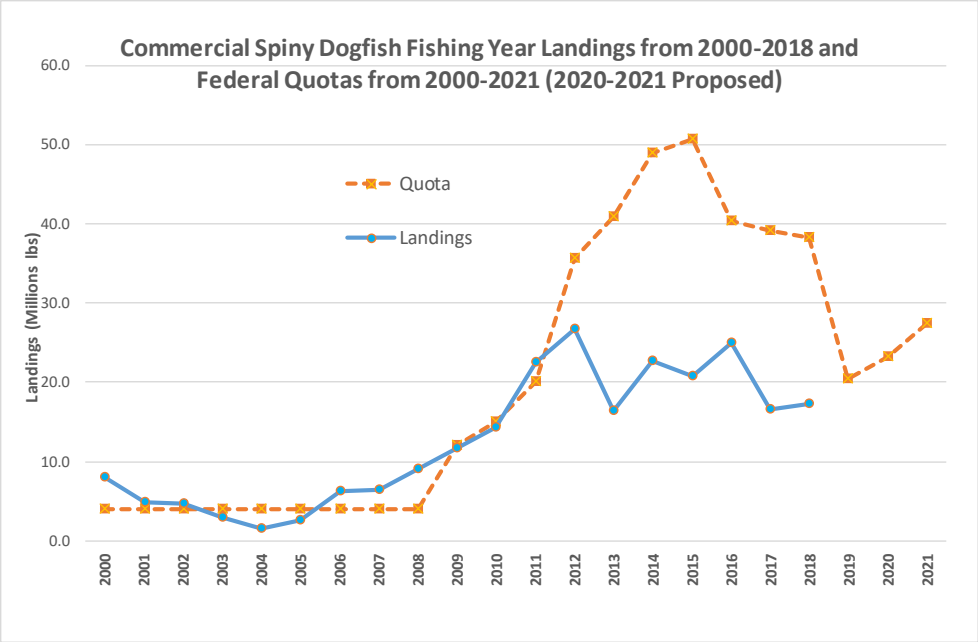

Figure 2. Annual spiny dogfish landings and federal quotas since 2000. [4]

Table 1. Commercial spiny dogfish fishing year landings from 2000-2018 and federal quotas from 2000-2021 (2020-2021 Proposed)[4]

Fishing year	Quota (M lb)	Landings (M lb)
2000	4.0	8.0
2001	4.0	4.9
2002	4.0	4.7
2003	4.0	3.0
2004	4.0	1.5
2005	4.0	2.5
2006	4.0	6.3
2007	4.0	6.4
2008	4.0	9.0
2009	12.0	11.7
2010	15.0	14.2
2011	20.0	22.5
2012	35.7	26.8
2013	40.8	16.3
2014	49.0	22.8
2015	50.6	20.8
2016	40.4	25.0
2017	39.1	16.5
2018	38.2	17.2
2019	20.5	
2020	23.2	
2021	27.4	

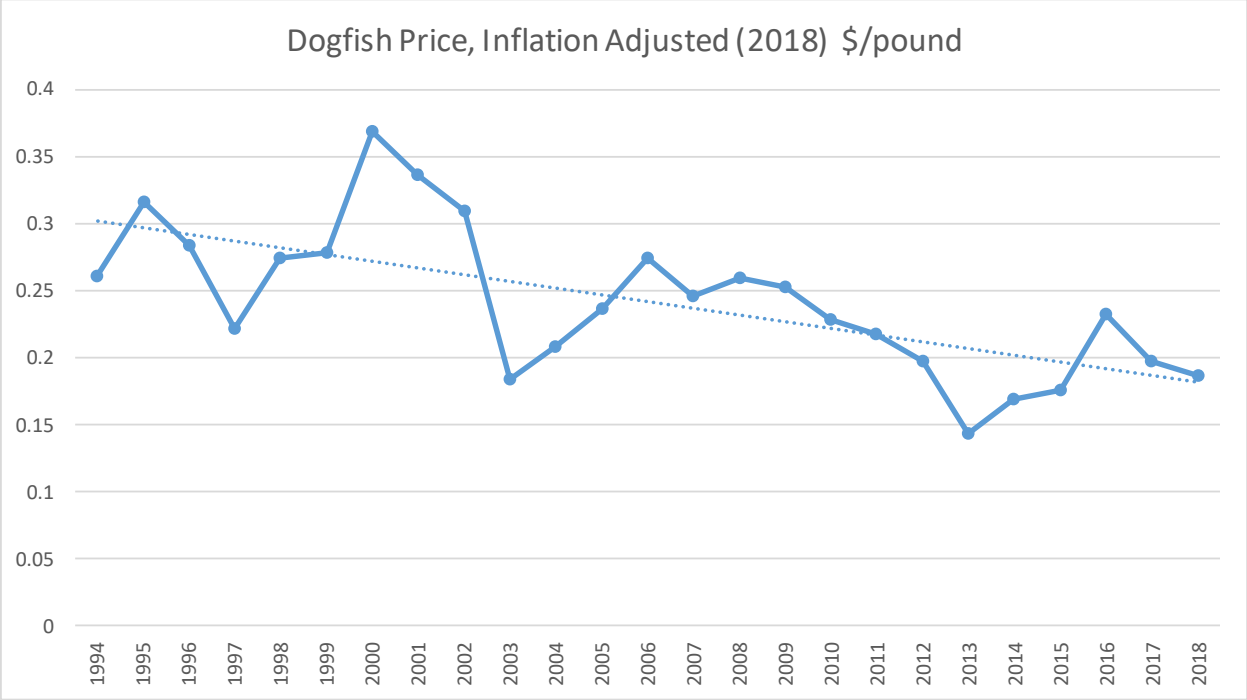

Figure 3. Price of spiny dogfish ($/live pound) (adjusted to 2018 "real" dollars using the producer price index (PPI), 1994-2018 fishing years. Source: NMFS unpublished dealer data. [4]

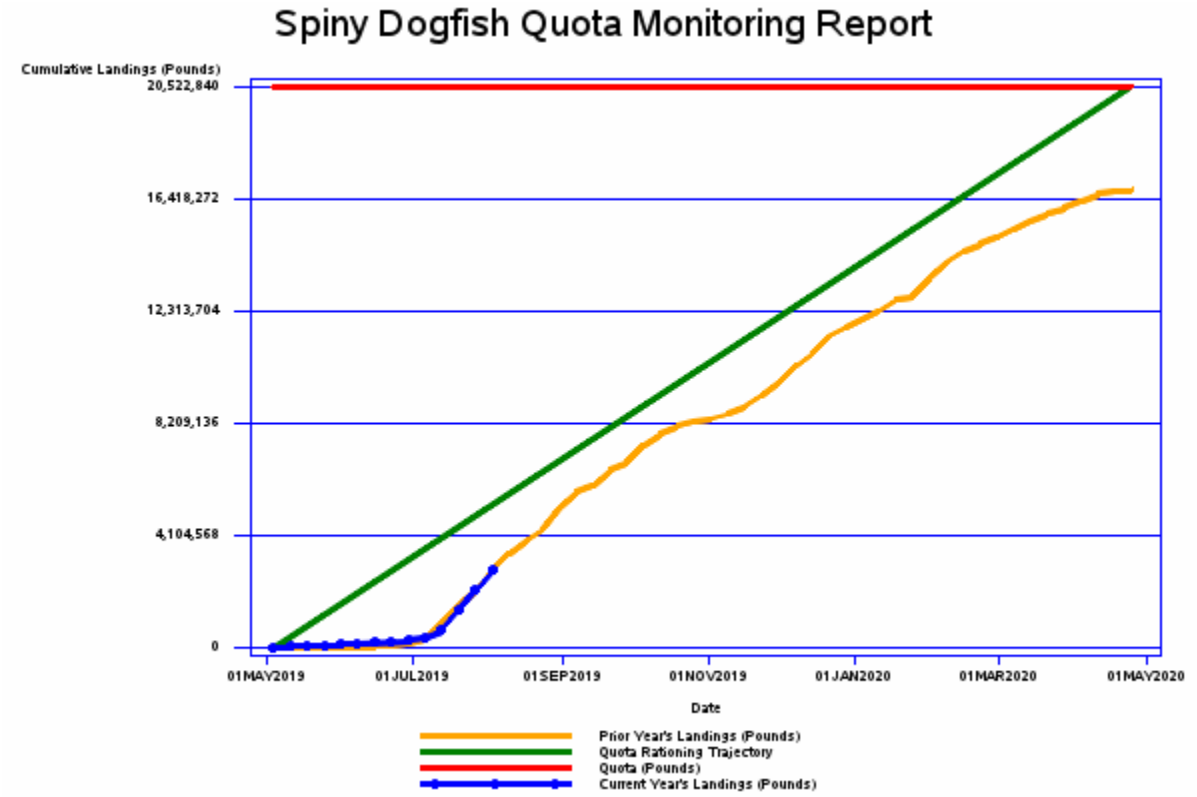

Figure 4. Preliminary Spiny dogfish landings; the 2019 fishing year is in blue through August 3, 2019, and the 2018 fishing year is in yellow-orange. Source: https://www.greateratlantic.fisheries.noaa.gov/aps/monitoring/spinydogfish.html. [4]

Table 2. Commercial Spiny Dogfish landings (live weight – millions of pounds) by state for 2016-2018 fishing years. Source: NMFS unpublished dealer data. [4]

YEAR	MA	MD	NC	NH	NJ	RI	VA	Other	Total
2016	14.3	2.4	0.4	0.8	2.9	0.6	3.6	0.1	25.0
2017	9.6	0.5	0.7	0.8	1.9	0.3	2.5	0.1	16.5
2018	7.7	0.7	1.4	0.5	1.3	0.2	5.2	0.1	17.2

Table 3. Commercial Spiny Dogfish landings (live weight – millions of pounds) by month for 2016-2018 fishing years. Source: NMFS unpublished dealer data. [4]

fishyear	May	June	July	August	September	October	November	December	January	February	March	April
2016	0.3	1.1	3.8	5.0	3.2	2.1	2.0	1.7	1.4	1.3	1.6	1.5
2017	0.2	0.4	3.7	3.3	1.5	1.6	1.1	1.7	0.7	0.9	0.9	0.5
2018	0.0	0.1	2.3	2.7	1.8	1.5	1.3	2.5	1.6	1.7	1.1	0.7

Table 4. Commercial Spiny Dogfish landings (live weight – millions of pounds) by gear for 2016-2018 fishing years. Source: NMFS unpublished dealer data. [4]

fishyear	Sink Gill Net	Bottom Longline	Bottom Trawl	Other Gillnet	Other/Unknown	Total
2016	15.2	6.5	1.2	0.8	1.3	25.0
2017	9.7	4.2	0.8	1.0	0.8	16.5
2018	10.3	3.9	0.4	1.6	0.9	17.2

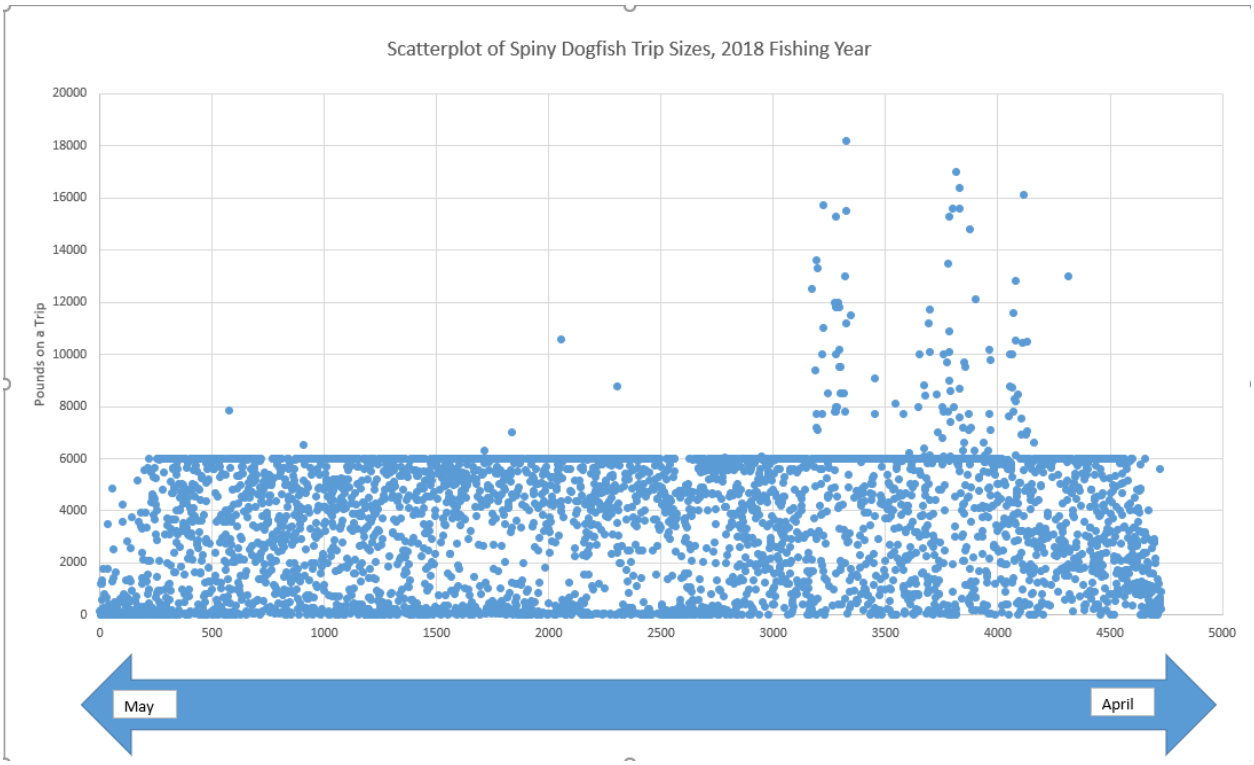

Figure 5. Scatterplot of spiny dogfish trips, 2018 fishing year. Trips toward the left occur early in the fishing year (starts May 1, 2018); Trips toward the right occur late in the fishing year (ends April 30, 2019). Vessels above the 6,000 federal trip limit had a federal permit, but probably did not have a federal permit for spiny dogfish at the time of the trip, which would limit them to 6,000 pounds. [4]

Table 5. Participation by fishing year of federally-permitted vessels. State-only vessels are not included. [4]

YEAR	Vessels 200,000+	Vessels 100,000 - 199,999	Vessels 50,000 - 99,999	Vessels 10,000 - 49,999	Total with at least 10,000 pounds landings
2000	16	10	8	43	77
2001	4	12	10	33	59
2002	2	14	8	31	55
2003	4	5	3	17	29
2004	0	0	0	42	42
2005	0	0	1	67	68
2006	0	4	11	114	129
2007	1	2	21	72	96
2008	0	5	20	119	144
2009	0	11	42	166	219
2010	0	26	54	124	204
2011	1	48	73	135	257
2012	25	55	56	146	282
2013	10	27	45	87	169
2014	27	38	38	81	184
2015	31	33	36	59	159
2016	52	26	14	45	137
2017	28	27	24	32	111
2018	28	26	20	36	110

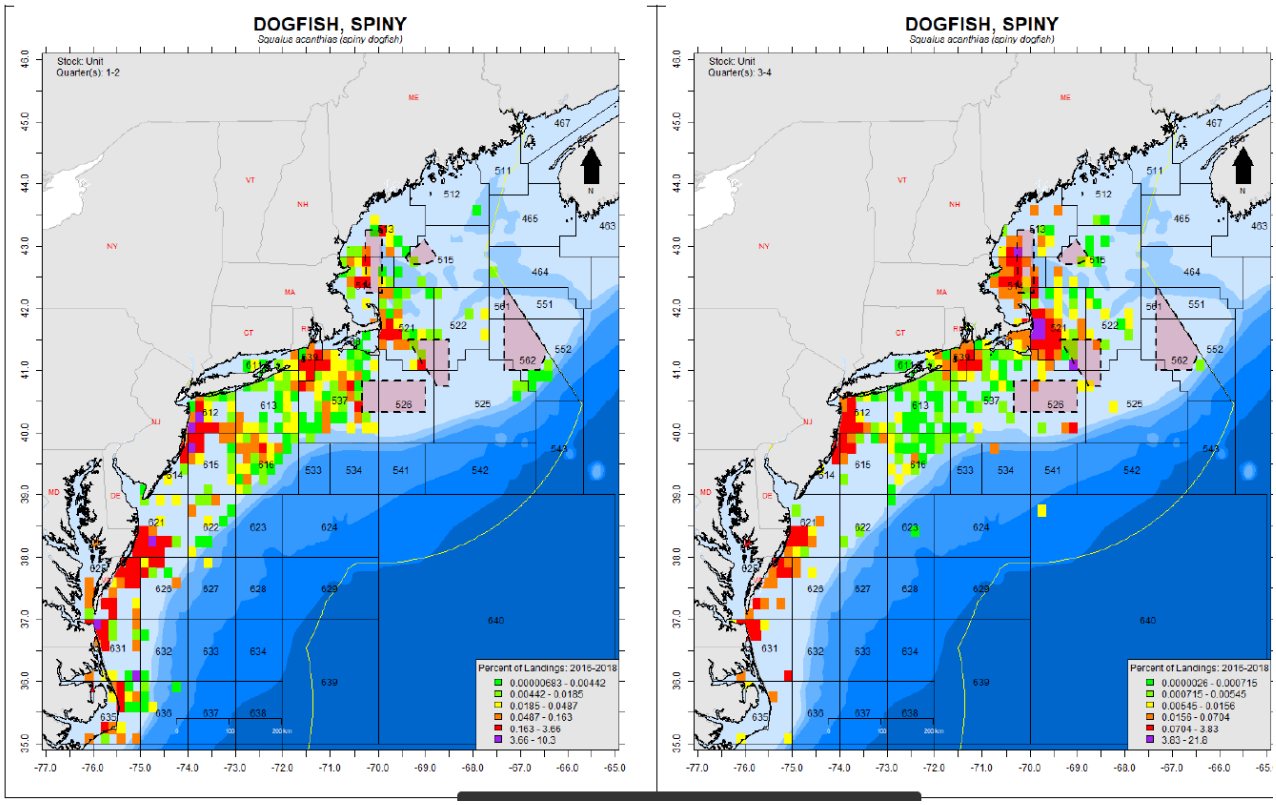

Figure 6. These maps represent commercial spiny dogfish landing densities for 2016-2018 calendar years. Landings are from Dealer reports. Data have been restricted to dealer trips matched to a Vessel Trip Report (VTR) (ALEVEL=A) to ensure area information is as accurate as possible. Landings from quarters 1 and 2 are on the left (67.24% of total landings reported for these quarters) and landings from quarters 3 and 4 are in the right panel (85.78% of total landings reported for these quarters). Groundfish closed areas (dashed borders), and the Exclusive Economic Zone (offshore yellow line) have been overlaid. Data queried on July 22, 2019. [4]

References

[1] Stehlik, Linda. 2007. Essential Fish Habitat source document: Spiny Dogfish, *Squalus acanthias*, Life History and Habitat Characteristics. NOAA Technical Memorandum NMFS-NE-203; 52 p. Available at https://www.nefsc.noaa.gov/publications/tm/tm203/tm203.pdf.

[2] NEFSC 2018. Spiny Dogfish Assessment Update. Available at http://www.mafmc.org/ssc-meetings/2018/sept-11.

[3] NEFSC 2019. Spiny Dogfish Data Update. Available at http://www.mafmc.org/ssc-meetings/2019/september-9-11.

[4] Unpublished NMFS dealer and/or Vessel Trip Report data.