Habitat Committee and Advisory Panel

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NEFMC Staff

NEFMC Habitat CTE and AP
September 11, 2025
Wakefield, MA and via Zoom

New England
Fishery Management Council

Agenda

9:00 am	Welcome and review agenda (Melissa Smith)
9:10 am	2025 EFH Framework (Michelle Bachman, Julian Garrison)
11:40 am	Sensitive Habitat Viewer Demonstration (Kaitlyn Shaw, Sabria Pereira)
12:00 pm	Lunch Break
1:00 pm	Dedicated Habitat Research Area Review (Council staff)
1:30 pm	Ocean Planning (Jenny Couture, Sydney Gustafson, Carolina Coccoli, Chris Schillaci)
2:00 pm	Work Planning (Michelle Bachman, Jenny Couture)
2:30 pm	Other business (Melissa Smith)
3:00 pm	Adjourn

Recap: EFH Five-Year Review

- 2025 January Council (Portsmouth, NH) - Habitat Committee Report
  - Council reviewed and endorsed EFH Five-Year Review
  - Materials: NEFMC EFH Review Summary Report + NEFMC/MAFMC EFH Component Reports

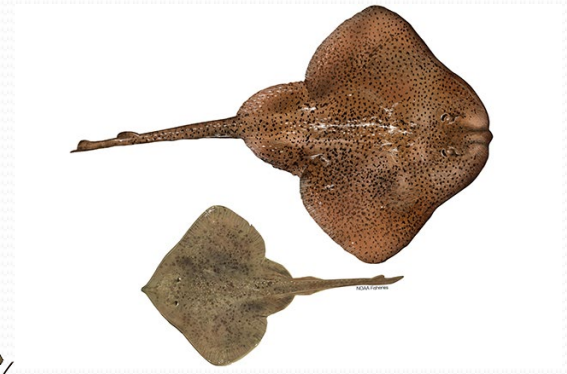
  Regulations require review of EFH components every five years: (1) EFH designation, (2) impacts of fishing on EFH, (3) impacts of non-MSA fishing on EFH, (4) non-fishing impacts to EFH, (5) cumulative effects of activities on EFH, (6) minimizing the adverse effects of fishing on EFH, (7) prey species, (8) designation of Habitat Areas of Particular Concern, and (9) EFH-related research needs. The review addressed these components and developed innovative model-based methods for describing and identifying fish habitat in both state and federal waters.
- All EFH review reports and current EFH information available at https://www.nefmc.org/library/essential-fish-habitat-efh-information

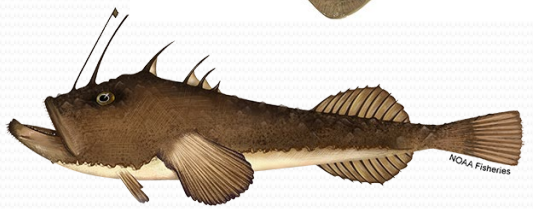
EFH Framework Initiation (April 2025)

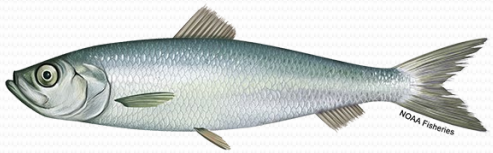
Meeting materials at link

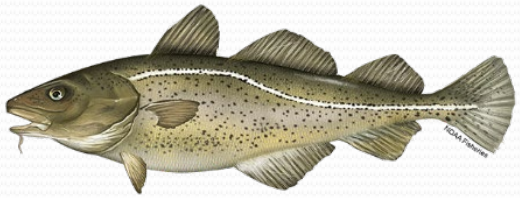
That the Council initiates the 2025 EFH Framework to the Atlantic herring, Northeast Multispecies, Monkfish, and Skate Fishery Management Plans, with the following problem statement and objective:

- **Problem statement:** During the EFH 5-year technical review completed in January 2025, the Council recognized the need to **update EFH designations for its managed species based on recent species distribution and abundance data and species distribution model outputs. The current designations are based on data through 2005 and may not reflect current habitat use by Council-managed species.**
- **Objective:** Revise EFH text descriptions and maps for all life history stages of Atlantic herring, monkfish, Atlantic cod, smooth skate, thorny skate, barndoor skate, little skate, winter skate, clearnose skate, and rosette skate.

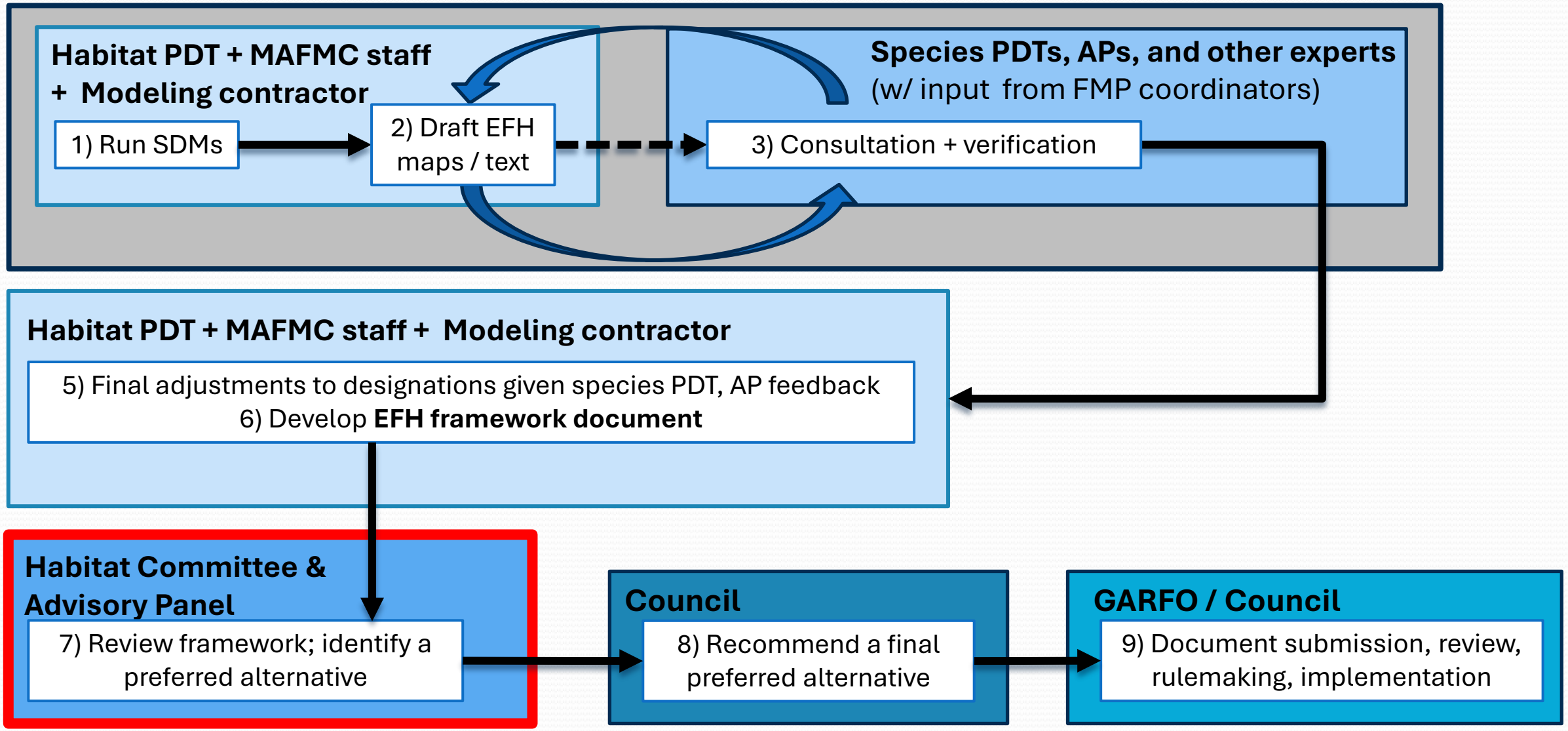




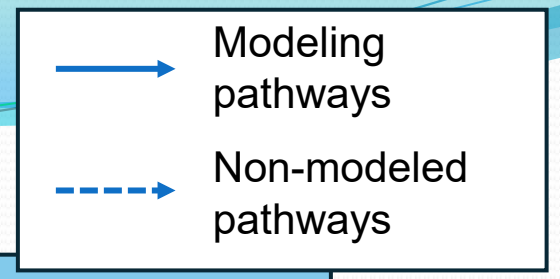




Workflow for EFH Framework



EFH designation methods flowchart



- ***For details, see the following:***
  - *EFH Designation Methods Report (will update soon to reflect recent adjustments)*
  - *SDM methods, generally: Hui et al. (2023) https://doi.org/10.1111/2041-210X.14184*

***Occupied Habitat:**

- *Laman et al. (2022) – definition*
- *NPFMC (2023) – applied concept to their EFH Review*

With sufficient data:

Offshore and selected inshore fishery-independent survey data

Environmental covariates

Species Distribution Models (SDMs)*

SDM Outputs: Top 75% predicted density quantiles
*Constrained to Occupied Habitat** (areas > 5% encounter probability)*

Inshore fishery-independent survey data (all available inshore surveys

Depth, temperature, salinity data

Inshore occurrence (areas > 5% occurrence)

Overlay estuarine and coastal zones w/ suitable conditions

Add 3 km buffer along coast

Revised EFH Designations

Verification with experts, literature, and other datasets

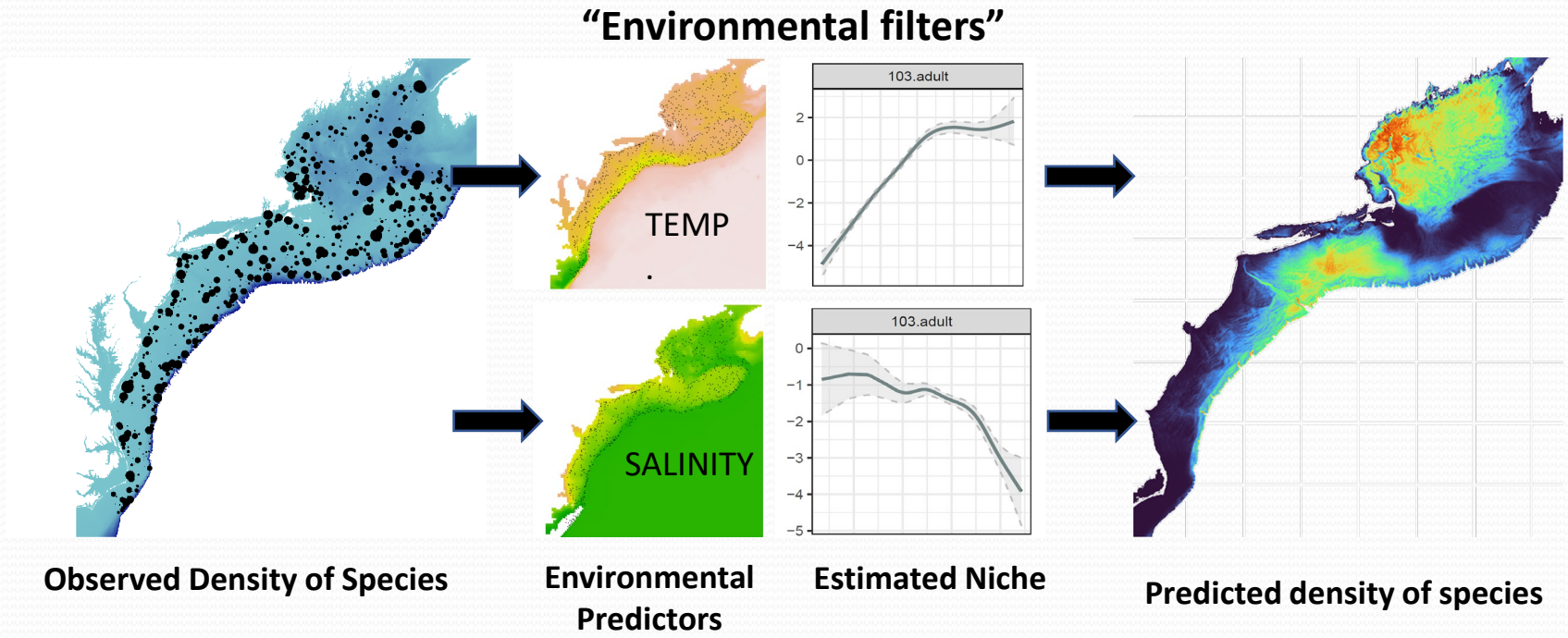
EFH maps

EFH text descriptions

Data-poor species (not this framework):
Alternate data processing and/or literature review

Modeling pathway (inshore to offshore areas)

Species Distribution Models (SDMs) estimate the habitat "niche" of organisms by relating observed densities to **environmental variables**

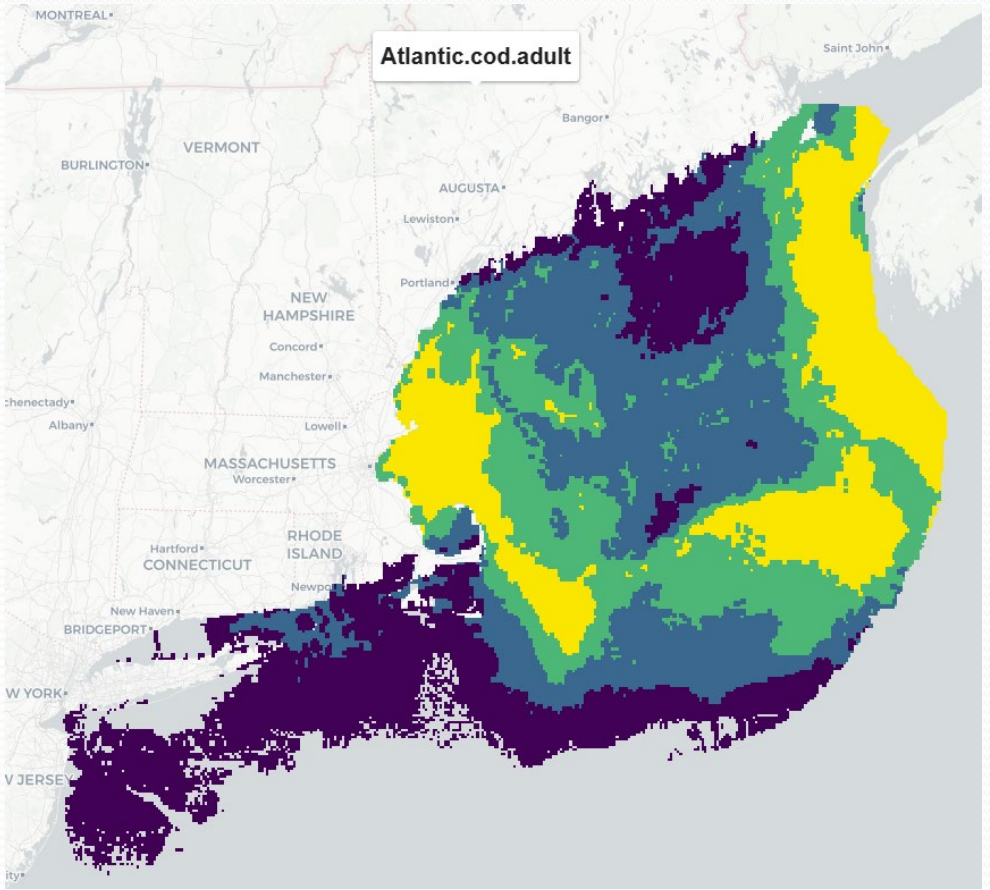


- SDMs were developed for most species managed by NEFMC and MAFMC including all 10 species in this action
- Joint SDMs
- Rely on abundance data from NEFSC, NEAMAP, ME-NH, MA trawl surveys (2000-2019)
- Possible to predict species density beyond sampled area → being careful about these inferences, e.g., in low salinity habitats

Terminology for SDM density quantiles

- *Quantiles bin the mean density predictions*

- Top 95% = general distribution area
- **Top 75% = principal habitat area (EFH)**
- Top 50% = core habitat
- Top 25% = hotspots



-- Terminology is aligned with North Pacific region; they also do model-based EFH

-- Started EFH work here assuming we would use 95% / general distribution area as EFH; after consultation recommend 75% / principal area as EFH

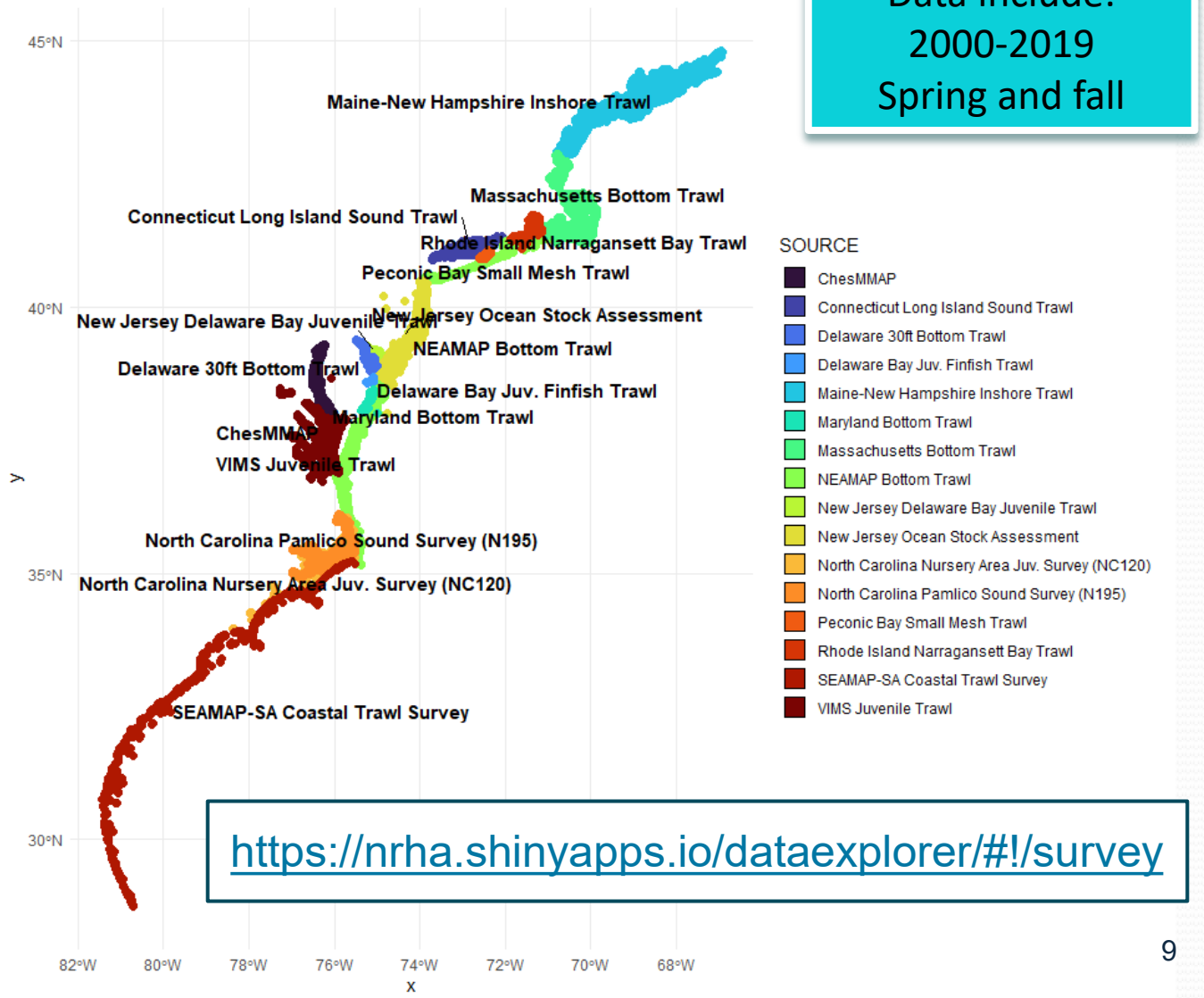
Non-modeling pathway (estuaries and inshore areas)

Assemble fish survey data (classify juveniles vs. adults by length)

Inshore Surveys:

- NEAMAP Bottom Trawl
- Maine-New Hampshire Inshore Trawl
- Massachusetts Bottom Trawl
- Rhode Island Narragansett Bay Trawl
- Connecticut Long Island Sound Trawl
- New Jersey Delaware Bay Juvenile Trawl
- New Jersey Ocean Stock Assessment
- Delaware 30ft Bottom Trawl
- Delaware Bay Juv. Finfish Trawl
- Maryland Bottom Trawl
- North Carolina Nursery Area Juv. Survey (NC120)
- North Carolina Pamlico Sound Survey (N195)
- SEAMAP-SA Coastal Trawl Survey
- ChesMMAP
- VIMS Juvenile Finfish Trawl Survey

Data include:
2000-2019
Spring and fall



https://nrha.shinyapps.io/dataexplorer/#!/survey

Non-modeling pathway (estuaries and inshore)

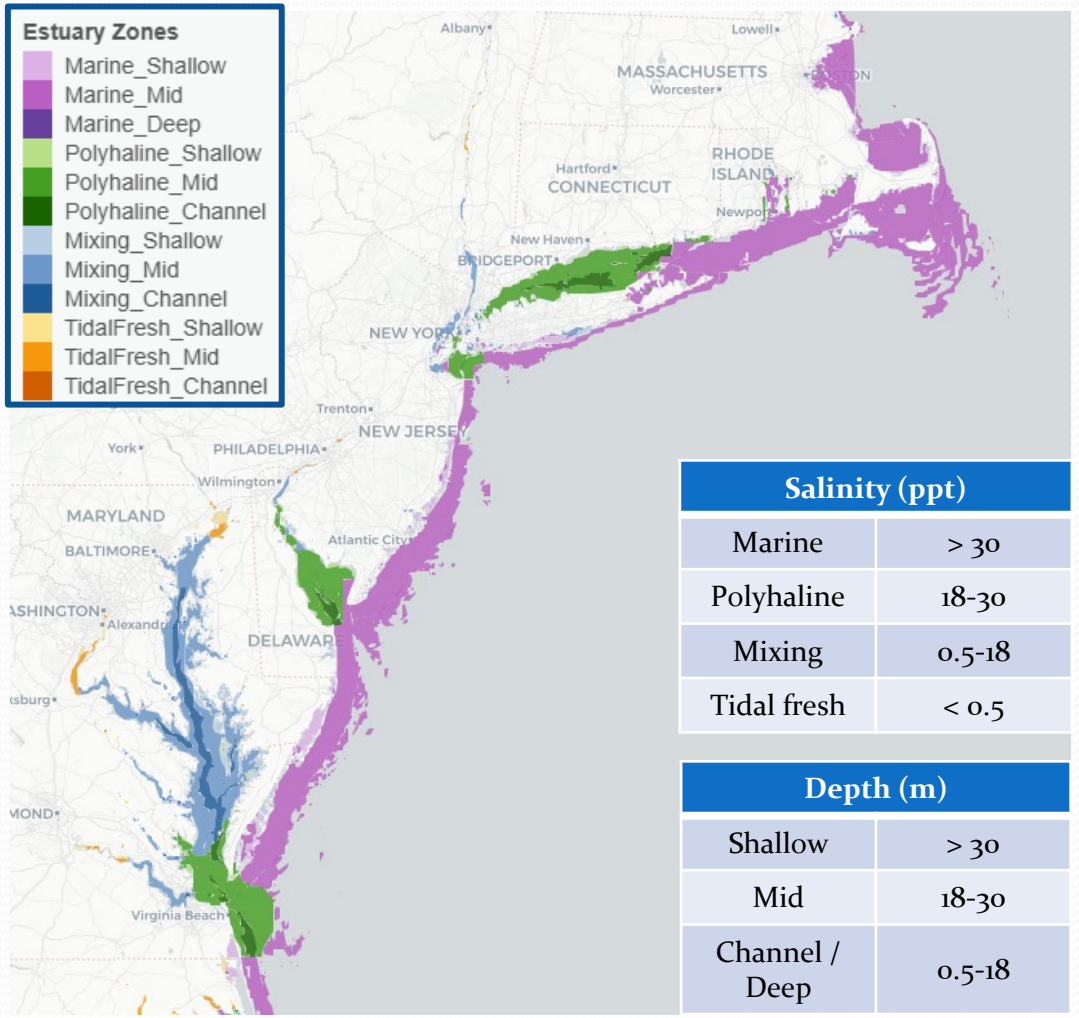
Create estuarine and inshore habitat zones

1. Set up a 0.01 degree (~1km) grid including estuaries and coastal areas to 20 meters
2. Determine average salinity and depth in each grid using best available data
3. Group grids into zones → see figure at right

Determine if a zone is EFH

- Does the species / lifestage occur in the zone based on survey data? → **If yes**, entire zone is EFH
  - **If no** → Are habitat conditions in the zone suitable for the species / lifestage?
    - → **If yes** is the zone within spatial range of modeled EFH area?
      - **If yes** → Zone is EFH
        - **If no** → Zone is not EFH

Estuarine and Inshore Depth and Salinity Zones

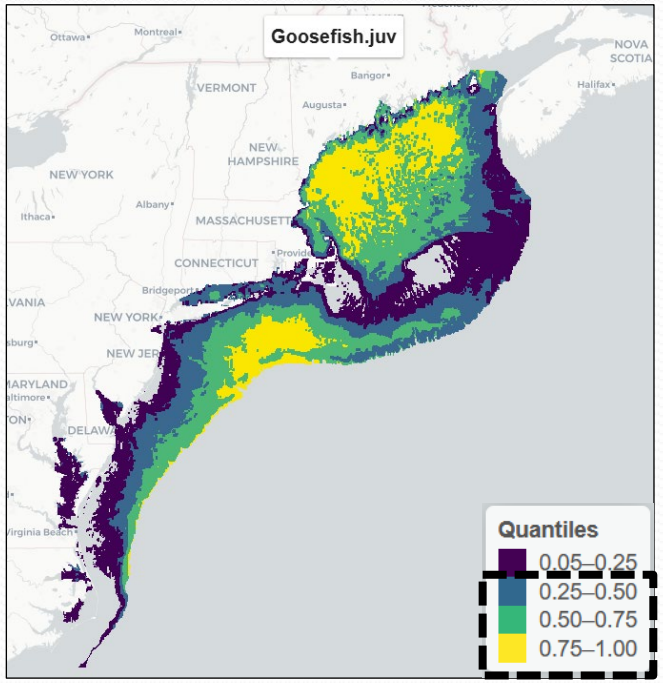


Salinity (ppt)	
Marine	> 30
Polyhaline	18-30
Mixing	0.5-18
Tidal fresh	< 0.5

Depth (m)	
Shallow	> 30
Mid	18-30
Channel / Deep	0.5-18

Combine model-based and estuarine/inshore areas to create EFH map

Model-based area (top 75% density)



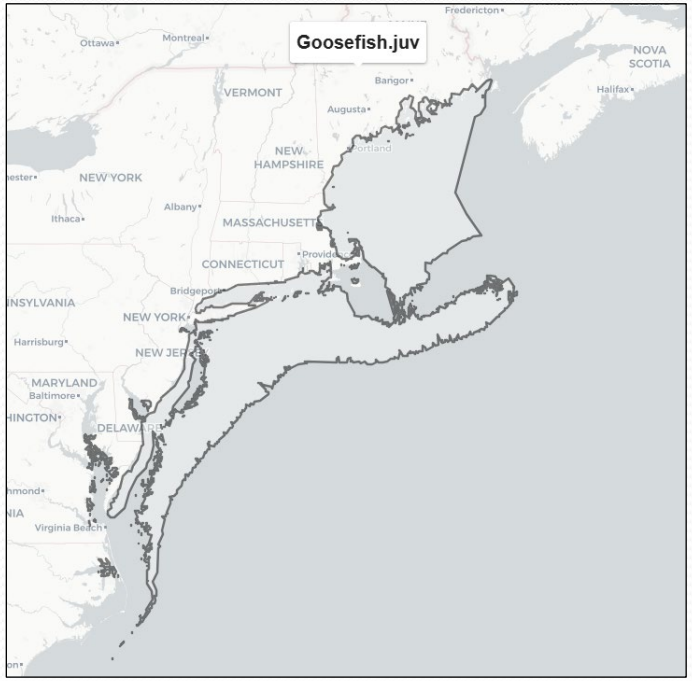
Derived from predicted density

+

Inshore zones with occurrence or appropriate habitat conditions

=

Combined to form principal habitat area = EFH



https://nrha.shinyapps.io/EFH_demo/

Summary of map updates by species

Species	Model-based maps for juveniles and adults	Egg and larval maps (based on juvenile and adult model outputs)
Atlantic herring	Separate juvenile & adult	Eggs, use adult fall distribution Larvae, use union of adult and juvenile map
Atlantic cod	Separate juvenile & adult	Eggs and larvae, use union of adult and juvenile map
Monkfish	Separate juvenile & adult	Eggs and larvae, use union of adult and juvenile map
Clearnose, little, and winter skate	Separate juvenile & adult	Eggs, use adult map No larval maps for skates
Barndoor*, smooth*, rosette and thorny skate	Combined juvenile & adult	Eggs, use combined map No larval maps for skates

** In process of running combined juvenile/adult barndoor skate and smooth skate models; for now, maps are shown as the union of juvenile and adult model outputs*

Text description updates

- Text builds on OHA2 descriptions
- Information to be included for each life stage:
  - **Spatial distribution**, referencing updated EFH maps
  - **Habitat characteristics**, including any specific associations (e.g., substrates), ranges (depth, salinity, temperature), and other important model smooth terms
  - Key information about **variation in habitat use** (e.g., seasonal, geographic, oceanographic, life history, etc.)
- Information sources:
  - **Literature review**, focusing on seasonal or spatial gaps in maps (seminal OR recent literature)
  - **Consultation** w/ species PDTs, APs, industry, and other experts

Environmental ranges – Depth / Temp / Salinity

- Identify upper and lower thresholds within which X% of unique occurrences in tows fall:
  - Depth: 75% quantile + full range, noting continental slope usage if applicable
  - Temp + Salinity: 95% quantile

- Model language after EFH source documents, verify with literature:
  - e.g. "*Juveniles are most commonly found in depths of 44-203 meters but can range from 10-340 meters, while on the continental slope they can be found to a maximum depth of 1000 meters.*"

- Species + life stage-specific; includes both inshore and offshore survey observations

- If life stage known to use intertidal habitats, explicit reference in text: e.g, "…range from intertidal habitats out to 201 meters depth."

Outreach process

Date	Group / Species
May 28	Groundfish PDT – cod
May 29	Skates and Monkfish PDTs
June 10	Groundfish AP / RAP – cod
June 18	Herring PDT
July 7	Eric Schneider – skates
July 10	Ben Martens – cod
July 10	Addie Binstock, Matt Cieri, Micah Dean, Jon Deroba - herring
Other feedback via correspondence	

- *Questions document*
  - *Intended to guide input and fill in gaps (spatiotemporal, habitat conditions, sources, etc.)*
- *Detailed EFH primers* for each FMP (based on 95% maps)*
  - *Cod, Herring, Monkfish, Skates*
- *Simplified EFH primers* (based on 75% maps)*
  - *Cod, Herring, Monkfish, Skates*
- *Open to feedback on ways to improve upon this process for next year*

**Note: primers do not have the most updated maps/text but are provided as snapshots in the outreach process*

Overall ideas and feedback on designations

- **Interest in distinction between general distribution area (95%) and core habitat concept (50%)** – easier to focus input on core areas; expected to resonate better with fishermen, scientists familiar with species
  - Some concerns with implying hierarchy of habitat importance
- Importance of **conveying why EFH designations are so broad** / general (both in the past and going forward) to serve consultation process
  - Also consider EFH applications beyond MSA / Council / consultations contexts
- Interest in **examining most recent years** of data / model outputs especially for monkfish and herring
- Consider how to represent **persistent vs transient habitat use**
- Consider how to **account for long recovery times** for human-disturbed, but heavily used habitats
- Consider examining **survey results with different gears / in specific areas or years** to address gaps
- Importance of **balancing desire for consistency** in methods across FMPs **vs species-specific nuances**
  - Also consider how to incorporate quantitative and qualitative information from stakeholders and other experts into designation revisions: Text only? Modeled vs non-modeled footprints?
  - How to do so in an unbiased way?

EFH Designation Alternatives

- Alternative 1 / No Action: Current EFH designations as updated in Omnibus EFH Amendment 2
  - Rely on inshore and offshore survey data through ~ 2005
  - Data summarized by estuary / embayment and ten-minute square
  - Includes adjacent areas with suitable depths, temperatures
  - Includes continental slope depth ranges
- Alternative 2: Updated EFH designations
  - Relies on inshore and offshore survey data from 2000-2019
  - Combines model-based and non-modeled workflows
  - Updated text that relies on model outputs and survey data for environmental ranges

Updated EFH Map and Text – Atlantic cod

https://nrha.shinyapps.io/EFH_demo/

Egg and larval EFH map (union of juvenile and adult maps)

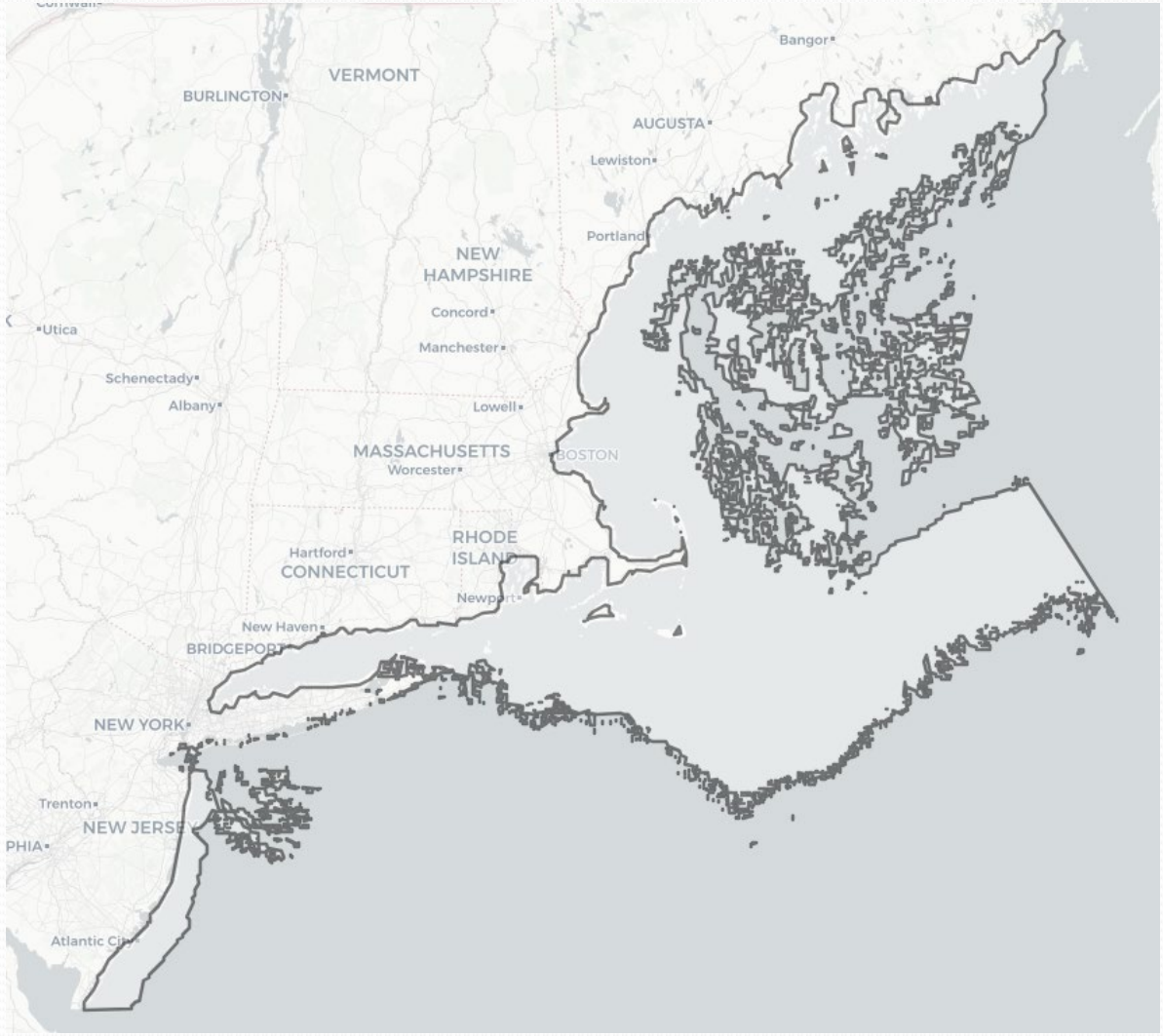
Eggs: Essential fish habitat (EFH) for cod eggs includes pelagic habitats in the Gulf of Maine, on Georges Bank, and in the Mid-Atlantic region. Atlantic cod eggs are buoyant and may be transported away from seasonal spawning grounds prior to hatching (McBride and Smedbol, 2022). Incubation time generally ranges between 1-3 weeks but is temperature-dependent and thus varies seasonally. See adult designation for description of spawning grounds.

Larvae: Essential fish habitat (EFH) for cod larvae includes pelagic habitats in the Gulf of Maine, on Georges Bank, and in the Mid-Atlantic region. Cod larvae are pelagic planktivores that undergo diel vertical migrations and thus may be transported away from spawning grounds. Larvae transition to benthic life as they grow (at ~3-5 cm TL), and this settlement time varies between spawning groups due to seasonal and regional variation in temperature (e.g., ~90 days for spring spawners vs ~150 days for winter spawners in the Gulf of Maine). Larval distributions are broadly consistent with the known major spawning grounds (McBride and Smedbol, 2022).

Updated EFH Map and Text – Atlantic cod

https://nrha.shinyapps.io/EFH_demo/

Juvenile EFH map

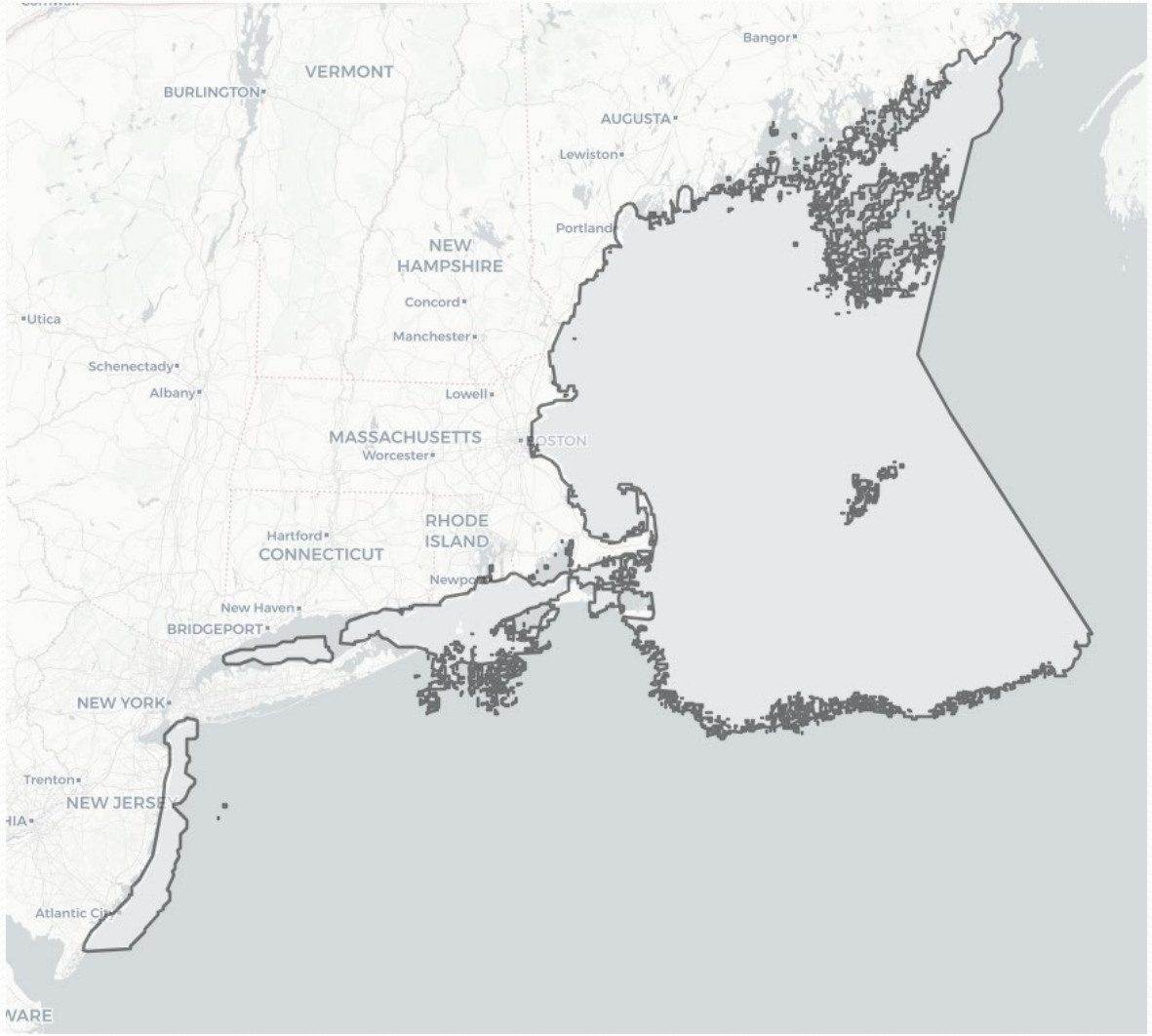


Juveniles: Essential fish habitat (EFH) for juvenile cod (TL < 35 cm) consists of the principal EFH area (defined as the top 75% model predicted density quantiles joined to suitable areas derived from inshore catches). Juvenile cod EFH includes intertidal and sub-tidal benthic habitats in the Gulf of Maine, on Georges Bank, and nearshore areas in Southern New England off the coast of Rhode Island and south of Cape Cod. Juveniles are most commonly found between 14-100 meters depth but can range from intertidal habitats out to 201 meters. They are commonly found in bottom temperatures between 3-14°C, and salinities between 26-35 ppt. Recently settled juveniles appear to prefer depths < 30 meters and temperatures < 9°C (McBride and Smedbol, 2022), especially in the range of 5.6-6.9°C (Lankowicz et al., 2025). Structurally-complex habitats, including eelgrass, mixed sand and gravel, and rocky habitats (gravel pavements, cobble, and boulder) with and without attached macroalgae and emergent epifauna, are essential habitats for juvenile cod. In inshore waters, young-of-the-year juveniles prefer gravel and cobble habitats and eelgrass beds after settlement, but in the absence of predators also utilize adjacent un-vegetated sandy habitats for feeding. Survival rates for young-of-the-year cod are higher in more structured rocky habitats than in flat sand or eelgrass; growth rates are higher in eelgrass. Older juveniles move into deeper water and are associated with gravel, cobble, and boulder habitats, particularly those with attached organisms. Gravel is a preferred substrate for young-of-the-year juveniles on Georges Bank and they have also been observed along the small boulders and cobble margins of rocky reefs in the Gulf of Maine.

Updated EFH Map and Text – Atlantic cod

https://nrha.shinyapps.io/EFH_demo/

Adult EFH map



Adults: Essential fish habitat (EFH) for adult cod (TL ≥ 35 cm) consists of the principal EFH area (defined as the top 75% model predicted density quantiles joined to suitable areas derived from inshore catches). EFH for adults includes sub-tidal benthic habitats in the Gulf of Maine, on Georges Bank, and nearshore areas in Southern New England off the coast of Rhode Island. Adults are most commonly found between 37-177 meters depth but can range from 9-291 meters. They are commonly found in bottom temperatures between 3-13° (but especially 5.6-6.9°C, see Lankowicz et al., 2025) and salinities between 31-36 ppt. Structurally complex hard bottom habitats composed of gravel, cobble, and boulder substrates with and without emergent epifauna and macroalgae are essential habitats for adult cod. Adult cod are also found on sandy substrates and frequent deeper slopes of ledges along shore. Studies have noted four primary spawning areas in the western Gulf of Maine, along the Northern Edge of Georges Bank, west of the Great South Channel and on Nantucket Shoals, and southwest of Cape Cod on Cox Ledge (Caiger et al., 2020; McBride and Smedbol, 2022; and references therein). The exact timing of seasonal spawning activity varies among these locations. South of Cape Cod, spawning occurs in nearshore areas and on the continental shelf, usually in depths less than 70 meters.

Updated EFH Map and Text – Atlantic herring

https://nrha.shinyapps.io/EFH_demo/

Egg map will be based on fall adults

Larval EFH map will be the union of juvenile and adult maps

Eggs: Essential fish habitat (EFH) for herring eggs is based off the fall distribution of adults, and includes inshore and offshore benthic habitats in the Gulf of Maine and on Georges Bank in depths of 5 – 110 meters, but particularly within depths of 20-50 meters (NEFMC 2019; Dean, 2024). Eggs adhere to the bottom, forming egg "beds" that may be many layers deep. Egg habitat often includes areas with strong bottom currents and a variety of substrates such as coarse sand, pebbles, cobbles, boulders and/or macroalgae, but not muddy bottoms. Given that herring eggs are demersal and adhesive, the distribution of fall-spawning adult herring should be reasonable as a proxy for egg EFH (Dean, 2024).

Larvae: Essential fish habitat (EFH) for herring larvae includes inshore and offshore pelagic habitats in the Gulf of Maine, on Georges Bank, and in the upper Mid-Atlantic Bight. Atlantic herring have a very long larval stage, lasting 4-8 months, and are transported long distances to inshore and estuarine waters where they metamorphose into early-stage juveniles ("brit") in the spring.

Updated EFH Map and Text – Atlantic herring

https://nrha.shinyapps.io/EFH_demo/

Juvenile EFH map

Juveniles: Essential fish habitat (EFH) for juvenile herring (TL < 25 cm) consists of the principal EFH area (defined as the top 75% model predicted density quantiles joined to suitable areas derived from inshore catches). Juvenile herring EFH includes intertidal and sub-tidal pelagic habitats as far north as the Eastern Gulf of Maine and as far south as Cape Hatteras. Juveniles are most commonly found between 13-149 meters depth but can range from intertidal habitats out to 265 meters. Juvenile herring tend to avoid the deeper basins and are distributed more inshore than adults. One- and two-year old juveniles form large schools and make limited seasonal inshore-offshore migrations. Juveniles are also commonly found in water temperatures between 2-21°C and salinities between 14-34 ppt (Table in Appendix B). Older juveniles are usually found in water temperatures of 3 to 15°C in the northern part of their range and as high as 22°C in the Mid-Atlantic. Young-of-the-year juveniles can tolerate low salinities, but older juveniles avoid brackish water. EFH for juvenile herring includes areas with fine sediments and lower tidal energy.

Updated EFH Map and Text – Atlantic herring

https://nrha.shinyapps.io/EFH_demo/

Adult EFH map

Adults: Essential fish habitat (EFH) for adult herring (TL ≥ 25 cm) consists of the principal EFH area (defined as the top 75% model predicted density quantiles joined to suitable areas derived from inshore catches). Adult herring EFH includes sub-tidal pelagic habitats as far north as the Eastern Gulf of Maine and as far south as Cape Hatteras. Adults are most commonly found between 14-175 meters depth (especially in depths ~100 m) but can range from 6-295 meters depth. They are commonly found in water temperatures between 2-16°C, and salinities between 17-34 ppt but generally avoid water temperatures above 10°C and low salinities. During the summer and fall spawning season, adults make extensive seasonal migrations to nearshore spawning grounds on Georges Bank and Gulf of Maine, with specific locations including Jeffreys Ledge, Stellwagen Bank, Nantucket Shoals, Penobscot Bay, and other locations along the Maine coast (NEFMC 2019; Sherwood et al., 2019; Dean, 2024). Spawning takes place on the bottom generally in depths of 5-110 meters (Dean, 2024) and on a variety of substrates including coarse sand, pebbles, cobbles, boulders and/or macroalgae, but not muddy bottoms. Herring spawning occurs in areas with strong bottom currents, relatively high temperatures (10-15°C), and high salinities (NEFMC 2019; Sherwood et al. 2019). Spawning primarily begins in the fall or early winter and lasts approximately six weeks; however, the onset of spawning varies latitudinally (e.g., ASMFC 2019; NEFMC 2019), and there exists a less abundant spring spawning contingent (Wuenschel, 2024). After spawning, herring return to their overwintering areas in southern New England and the Mid-Atlantic region.

Updated EFH Map and Text – Monkfish

https://nrha.shinyapps.io/EFH_demo/

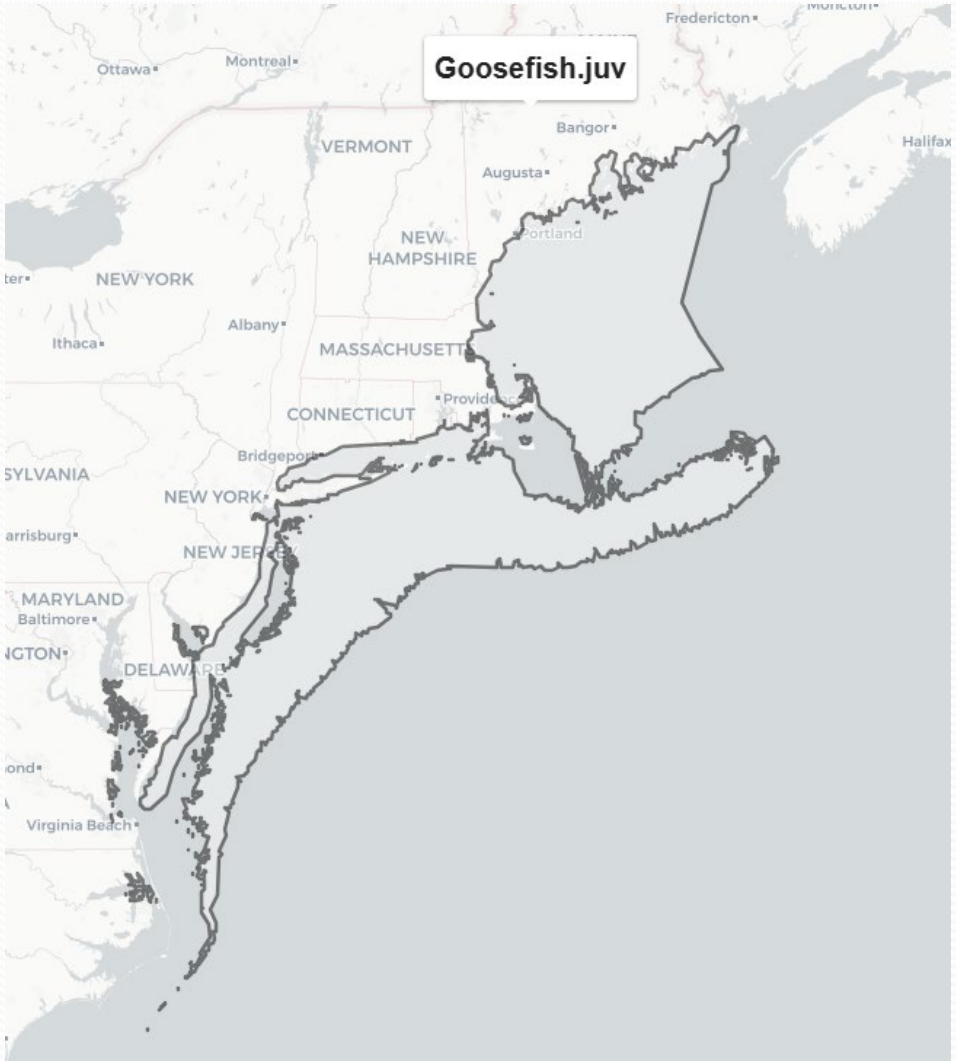
Egg and larval EFH map (union of juvenile and adult maps)

Eggs and Larvae: Essential fish habitat (EFH) for monkfish eggs and larvae is based off the distribution of juveniles as a proxy and includes pelagic habitats in inshore areas, and on the continental shelf and slope throughout the Northeast region. Monkfish eggs are shed in very large buoyant mucoidal egg "veils" and hatching time ranges between 7 days (at 15°C) and 21 days (at 5°C; Steimle et al., 1999; Collette and Klein-MacPhee, 2002). Monkfish larvae are more abundant in the Mid-Atlantic region and occur over a wide depth range, from the surf zone to depths of 1000 to 1500 meters on the continental slope. One study noted that larvae in the Mid-Atlantic were predominantly found in deep water along the shelf edge in April but move across the shelf from May-July (Richards et al., 2008).

Updated EFH Map and Text – Monkfish

https://nrha.shinyapps.io/EFH_demo/

Juvenile EFH map



Juveniles: Essential fish habitat (EFH) for juvenile monkfish (TL < 37 cm) consists of the principal EFH area (defined as the top 75% model predicted density quantiles joined to suitable areas derived from inshore catches). Juvenile monkfish EFH includes sub-tidal benthic habitats in the Gulf of Maine, Southern New England, the southern edge of Georges Bank, and the Mid-Atlantic. The EFH footprint extends as far south as Cape Hatteras but does not include Nantucket Shoals or the shallowest portions of Georges Bank (i.e., < 50 m depth). Juveniles are most commonly found in depths of 44-203 meters but can range from 10-340 meters, while on the continental slope they can be found to a maximum depth of 1000 meters. Juveniles are also commonly found in bottom temperatures between 3-15°C, consistent with ranges reported in the literature (e.g., Steimle et al., 1999; Richards et al., 2008; Siemann et al., 2018), and in marine waters between 31-36 ppt. A variety of habitats are essential for juvenile monkfish, including hard sand, pebbles, gravel, broken shells, and soft mud; they also seek shelter among rocks with attached algae. Juveniles collected on mud bottom next to rock-ledge and boulder fields in the western Gulf of Maine were in better condition than juveniles collected on isolated mud bottom, indicating that feeding conditions in these edge habitats are better. Young-of-the-year juveniles have been collected primarily on the central portion of the shelf in the Mid-Atlantic, but also in shallow nearshore waters off eastern Long Island, up the Hudson Canyon shelf valley, and around the perimeter of Georges Bank.

Updated EFH Map and Text – Monkfish

https://nrha.shinyapps.io/EFH_demo/

Adult EFH map

Adults: Essential fish habitat (EFH) for adult monkfish (TL ≥ 37 cm) consists of the principal EFH area (defined as the top 75% model predicted density quantiles joined to suitable areas derived from inshore catches). Adult monkfish EFH includes sub-tidal benthic habitats on Georges Bank, the Gulf of Maine, Southern New England, and the Mid-Atlantic as far south as Cape Hatteras. Adults are most commonly found in depths of 42-223 meters but can range from 9-360 meters, while on the continental slope they can be found to a maximum depth of 1000 meters. Adults are also commonly found in bottom temperatures between 4-15°C, consistent with ranges reported in the literature (e.g., Steimle et al., 1999; Richards et al., 2008; Siemann et al., 2018), and in marine waters between 31-36 ppt. The EFH source document notes that adult monkfish can be found in waters as warm as 24°C (Steimle et al. 1999). EFH for adult monkfish is composed of hard sand, pebbles, gravel, broken shells, and soft mud. They seem to prefer soft sediments (fine sand and mud) over sand and gravel, and, like juveniles, utilize the edges of rocky areas for feeding. Monkfish have a protracted reproductive season spanning January to August, though most spawning occurs between February and April (Johnson et al., 2008). Spawning locations are not well understood, though one study suggests monkfish in the Gulf of Maine spawn in shallow water (< 50 m), while those in the Mid-Atlantic spawn in both shallow (< 50 m) and deep (> 200 m) water (Richards et al., 2008).

Updated EFH Map and Text – Barndoor skate

https://nrha.shinyapps.io/EFH_demo/

Egg, juvenile, and adult EFH map (combines model outputs from juveniles and adults)

Eggs: Essential fish habitat (EFH) for barndoor skate eggs uses the adult distribution as a proxy. Female barndoor skates deposit leathery capsules, each containing a single egg, on the seabed. The oblong capsules are attached to the substrate via adhesive threads and curved horns that extend from each corner. The seasonality of egg case deposition is not well understood, and the incubation period for skates may be many months to over a year, such that egg cases in various stages of development may be present on the seabed year-round. There is no distinct larval stage as the skates emerge from their egg cases as fully formed juveniles.

Juveniles: Barndoor skates are approximately 18-19 cm at the time of hatching. Essential fish habitat (EFH) for juvenile barndoor skate (TL < 102 cm) consists of the principal EFH area (defined as the top 75% model-predicted density quantiles joined to suitable areas derived from inshore catches). Juvenile barndoor skate EFH includes benthic habitats on the continental shelf, primarily on Georges Bank and in Southern New England, but extends as far north as the Gulf of Maine and as far south as Chesapeake Bay. Compared to adults, juvenile EFH extends further inshore; juveniles are most commonly found between 58-208 meters depth but can range from 27-358 meters, while on the continental slope they can be found to a maximum depth of 750 meters. Juveniles are also commonly found in bottom temperatures between 4-17°C and in marine waters between 32-36 ppt. Essential fish habitat for juvenile barndoor skates occurs on mud, sand, and gravel substrates.

Updated EFH Map and Text – Barndoor skate

https://nrha.shinyapps.io/EFH_demo/

Egg, juvenile, and adult EFH map (combines model outputs from juveniles and adults) – same map as previous slide

Adults: Essential fish habitat (EFH) for adult barndoor skate (TL ≥ 102 cm) consists of the principal EFH area (defined as the top 75% model-predicted density quantiles joined to suitable areas derived from inshore catches). Adult barndoor skate EFH includes benthic habitats on the continental shelf, primarily on Georges Bank and in Southern New England, though the footprint extends into the Gulf of Maine and as far south as Cape Hatteras. Adults are most commonly found between 61-248 meters depth but can range from 32-361 meters, while on the continental slope they can be found to a maximum depth of 750 meters. Juveniles are also commonly found in bottom temperatures between 5-16°C and in marine waters between 32-36 ppt. Essential fish habitat for adult barndoor skates occurs on mud, sand, and gravel substrates.

Updated EFH Map and Text – Clearnose skate

https://nrha.shinyapps.io/EFH_demo/

Egg and adult EFH map (based on adult data)

Eggs: Essential fish habitat (EFH) for clearnose skate eggs uses the adult distribution as a proxy. Female clearnose skate deposit leathery capsules, each containing a single egg, on the seabed. The oblong capsules are attached to the substrate via adhesive threads and curved horns that extend from each corner. Clearnose skate egg case deposition occurs in spring and summer, and the incubation period for clearnose skate is approximately three months, so egg cases in various stages of development may be present on the seabed for much of the year. There is no distinct larval stage as the skates emerge from their egg cases as fully formed juveniles.

Adults: Essential fish habitat (EFH) for adult clearnose skates (TL ≥ 59 cm) consists of the principal EFH area (defined as the top 75% model-predicted density quantiles joined to suitable areas derived from inshore catches). Adult clearnose skate EFH includes sub-tidal benthic habitats in coastal and inner continental shelf waters from Rhode Island to Cape Hatteras, though they are more commonly found in the southern portions of their range. Inshore habitat includes Narragansett Bay, Long Island Sound, Delaware Bay, polyhaline portions of the Delaware River, and the mouth of Chesapeake Bay. Adults are most commonly found between 9-36 meters depth but can range from 5-207 meters. Juveniles are also commonly found in bottom temperatures between 6-24°C and in polyhaline and marine waters between 27-36 ppt. Adult EFH occurs primarily on mud and sand, but also on gravelly and rocky bottom.

Updated EFH Map and Text – Clearnose skate

https://nrha.shinyapps.io/EFH_demo/

Juvenile EFH map

Juveniles: Essential fish habitat (EFH) for juvenile clearnose skate (TL < 59 cm) consists of the principal EFH area (defined as the top 75% model-predicted density quantiles joined to suitable areas derived from inshore catches). Juvenile clearnose skate EFH includes sub-tidal benthic habitats in coastal and inner continental shelf waters from Rhode Island to Cape Hatteras, though they are more commonly found in the southern portions of their range. The inshore portions of the EFH footprint includes marine (≥ 30 ppt) and polyhaline (18-30 ppt) portions of Narragansett Bay, Long Island Sound, Delaware Bay, and Chesapeake Bay; in Chesapeake Bay, the designation also includes mixing zones (0.5-18 ppt). Juveniles are most commonly found between 8-26 meters depth but can range from 4-133 meters. Juveniles are also commonly found in bottom temperatures between 8-28°C and in polyhaline and marine waters between 22-36 ppt. Juvenile EFH occurs primarily in areas with mud and sand, but also on gravelly and rocky bottom.

Updated EFH Map and Text – Little skate

https://nrha.shinyapps.io/EFH_demo/

Egg and adult EFH map (based on adult data)

Eggs: Essential fish habitat (EFH) for little skate eggs uses the adult distribution as a proxy. Female little skate deposit leathery capsules, each containing a single egg, on the seabed. The oblong capsules are attached to the substrate via adhesive threads and curved horns that extend from each corner. The seasonality of egg case deposition is not well understood, and the incubation period for little skates may be around 6 months, such that egg cases in various stages of development may be present on the seabed year-round. There is no distinct larval stage as the skates emerge from their egg cases as fully formed juveniles.

Adults: Essential Fish Habitat (EFH) for adult little skates (TL ≥ 44 cm) consists of the principal EFH area (defined as the top 75% model-predicted density quantile joined to suitable areas derived from inshore catches). Adult little skate EFH includes intertidal and sub-tidal benthic habitats in the Gulf of Maine, on offshore banks and ledges in the Gulf of Maine, throughout Georges Bank, and in the Mid-Atlantic region as far south as Cape Hatteras. Adults are most commonly found between 12-82 meters depth but can range from intertidal shoreline habitats to 214 meters depth. Juveniles are also commonly found in bottom temperatures between 3-21°C and in polyhaline and marine waters between 29-36 ppt. Adult EFH occurs primarily on sand and gravel substrates, but they are also found on mud.

Updated EFH Map and Text – Little skate

https://nrha.shinyapps.io/EFH_demo/

Juvenile EFH map

Juveniles: Little skates are approximately 9-10 cm at the time of hatching. Essential Fish Habitat (EFH) for juvenile little skates (TL < 44 cm) consists of the principal EFH area (defined as the top 75% model-predicted density quantile joined to suitable areas derived from inshore catches). Juvenile little skate EFH includes intertidal and sub-tidal benthic habitats in the Gulf of Maine, including on offshore ledges and banks, throughout Georges Bank, and in the Mid-Atlantic region as far south as Chesapeake Bay. Juveniles are most commonly found between 11-74 meters depth but can range from intertidal shoreline habitats to 220 meters depth. Juveniles are also commonly found in bottom temperatures between 3-20°C and in marine waters between 28-36 ppt. Juvenile EFH occurs primarily on sand and gravel substrates, but they are also found on mud.

Updated EFH Map and Text – Rosette skate

https://nrha.shinyapps.io/EFH_demo/

Egg, juvenile, and adult EFH map (based on combined juvenile / adult model)

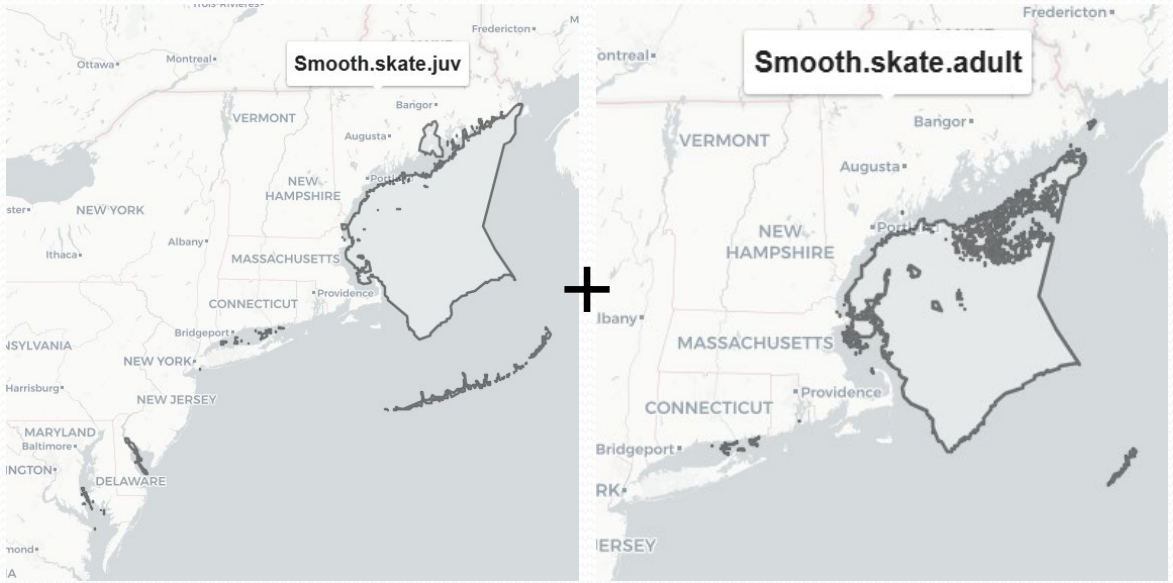
Eggs: Essential fish habitat (EFH) for rosette skate eggs uses the adult distribution as a proxy. Female rosette skate deposit leathery capsules, each containing a single egg, on the seabed. The oblong capsules are attached to the substrate via adhesive threads and curved horns that extend from each corner. The seasonality of egg case deposition is not well understood, and the incubation period for skates may be many months to over a year, such that egg cases in various stages of development may be present on the seabed year-round. There is no distinct larval stage as the skates emerge from their egg cases as fully formed juveniles.

Juveniles and Adults: Essential Fish Habitat (EFH) for adult (TL ≥ 39 cm) and juvenile (TL < 39 cm) rosette skate consists of the principal EFH area (defined as the top 75% model-predicted density quantile joined to suitable areas derived from inshore catches). The combined EFH footprint includes benthic habitats along the outer continental shelf in Southern New England and the Mid-Atlantic, ranging from the southern edge of Georges Bank down to Cape Hatteras. Juveniles are most commonly found between 75-229 meters depth (but can range between 27-338 meters depth) and in bottom temperatures between 7-18°C. Adult rosette skates are most commonly found between 81-210 meters depth (but can range from 54-299 meters) and in bottom temperatures between 7-15°C. These depth ranges for juveniles and adults are consistent with those reported in the EFH Source Document for rosette skates (Packer et al. 2003). Juveniles and adults are both commonly found in marine waters between 32-36 ppt. EFH for rosette skates occurs on soft substrates such as mud and sand.

Updated EFH Map and Text – Smooth skate

https://nrha.shinyapps.io/EFH_demo/

Egg, juvenile, and adult EFH map (combines model outputs from juveniles and adults)



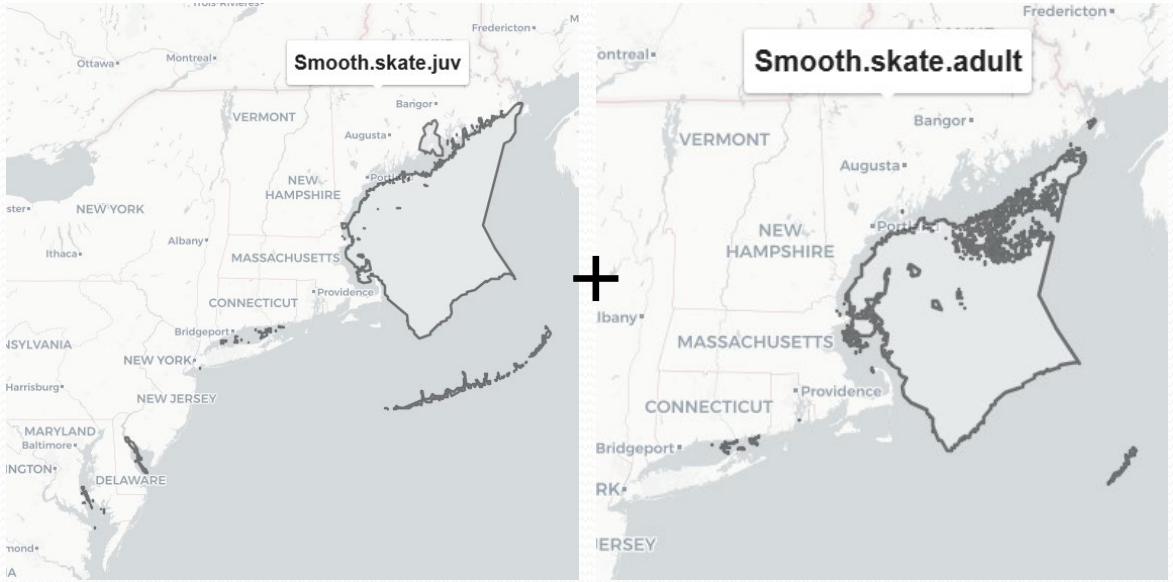
Eggs: EFH for smooth skate eggs uses the adult distribution as a proxy. Female smooth skate deposit leathery capsules, each containing a single egg, on the seabed. The oblong capsules are attached to the substrate via adhesive threads and curved horns that extend from each corner. The seasonality of egg case deposition is not well understood, and the incubation period for skates may be many months to over a year, such that egg cases in various stages of development may be present on the seabed year-round. There is no distinct larval stage as the skates emerge from their egg cases as fully formed juveniles.

Juveniles: EFH for juvenile smooth skates (TL < 55 cm) c consists of the principal EFH area (defined as the top 75% model-predicted density quantile joined to suitable areas derived from inshore catches). Juvenile smooth skate EFH includes benthic habitats in the Gulf of Maine as well as marine and polyhaline zones in bays and estuaries along the Maine coast. Juveniles are most commonly found between 103-237 meters depth but can range from 39-355 meters depth, and as shallow as 4 m in inshore waters. Juveniles are also commonly found in bottom temperatures between 4-12°C and in marine waters between 32-36 ppt. EFH for juvenile smooth skates occurs mostly on soft mud in deeper areas, but also on sand, broken shells, gravel, and pebbles on offshore banks in the Gulf of Maine.

Updated EFH Map and Text – Smooth skate

https://nrha.shinyapps.io/EFH_demo/

Egg, juvenile, and adult EFH map (combines model outputs from juveniles and adults) – same map as previous slide

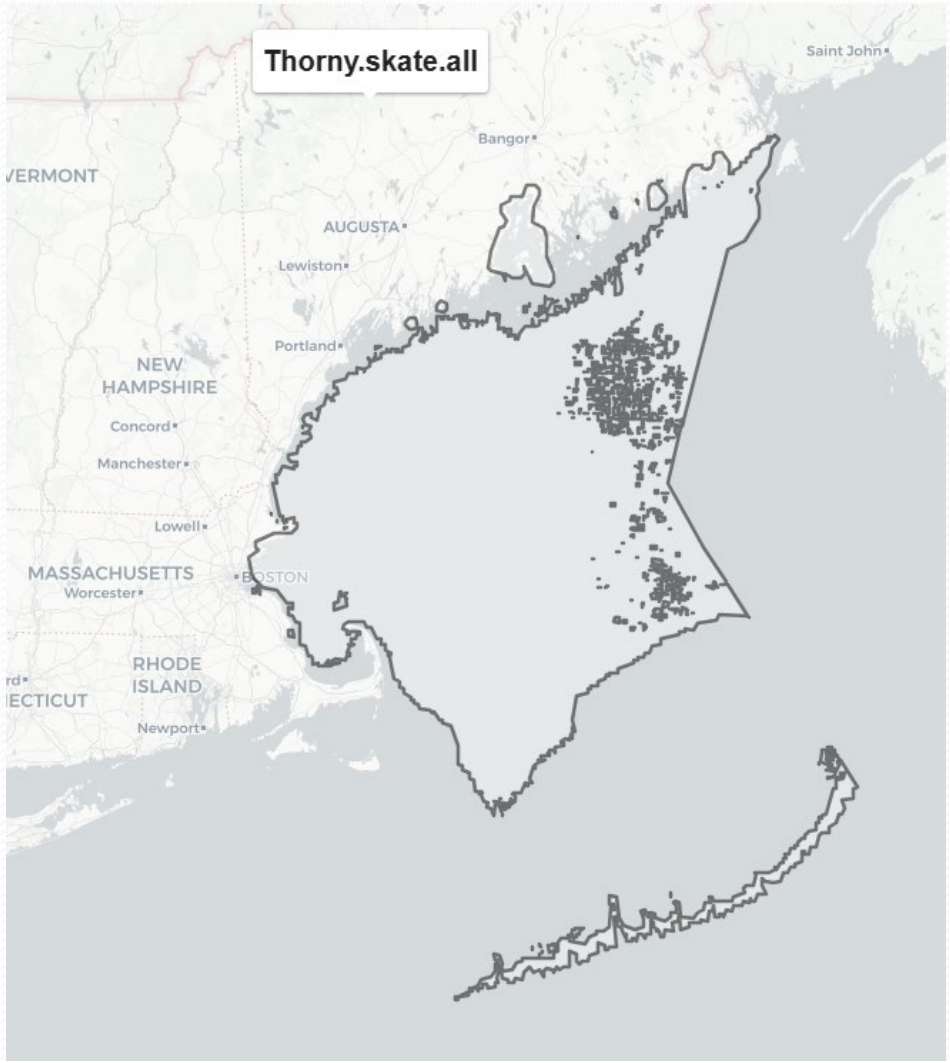


Adults: EFH for adult smooth skates (TL ≥ 55 cm) consists of the principal EFH area (defined as the top 75% model-predicted density quantile joined to suitable areas derived from inshore catches). Adult smooth skate EFH includes benthic habitats in polyhaline and marine waters in the Gulf of Maine. Adults are most commonly found between 115-266 meters depth but can range from 54-361 meters depth (Appendix B, Table X). Juveniles are also commonly found in bottom temperatures between 4-11°C and in marine waters between 32-36 ppt. EFH for adult smooth skates occurs mostly on soft mud (e.g., silt and clay) in deeper areas, but also on sand, broken shells, gravel, and pebbles on offshore banks in the Gulf of Maine.

Updated EFH Map and Text – Thorny skate

https://nrha.shinyapps.io/EFH_demo/

Egg, juvenile, and adult EFH map (based on combined juvenile / adult model)



Eggs: Essential fish habitat (EFH) for thorny skate eggs uses the adult distribution as a proxy. Female thorny skate deposit leathery capsules, each containing a single egg, on the seabed. The oblong capsules are attached to the substrate via adhesive threads and curved horns that extend from each corner. The seasonality of egg case deposition is not well understood, and the incubation period for skates may be many months to over a year, such that egg cases in various stages of development may be present on the seabed year-round. There is no distinct larval stage as the skates emerge from their egg cases as fully formed juveniles.

Juveniles and adults: EFH for adult (TL ≥ 77 cm) and juvenile (TL < 77 cm) thorny skate consists of the principal EFH area (defined as the top 75% model-predicted density quantile joined to suitable areas derived from inshore catches). The combined EFH footprint includes benthic habitats in polyhaline and marine waters in the Gulf of Maine. Juveniles are most commonly found between 66-214 meters depth (but can range from 30-353 meters depth), in bottom temperatures between 3-12°C, and in marine waters between 31-36 ppt. Adults are most commonly found between 83-213 meters depth (but can range from 37-361 meters depth), in bottom temperatures between 3-11°C, and in marine waters between 32-36 ppt. EFH for juvenile and adult thorny skates is found on a wide variety of bottom types, including sand, gravel, broken shells, pebbles, and soft mud.

Updated EFH Map and Text – Winter skate

https://nrha.shinyapps.io/EFH_demo/

Egg and adult EFH map (based on adult data)

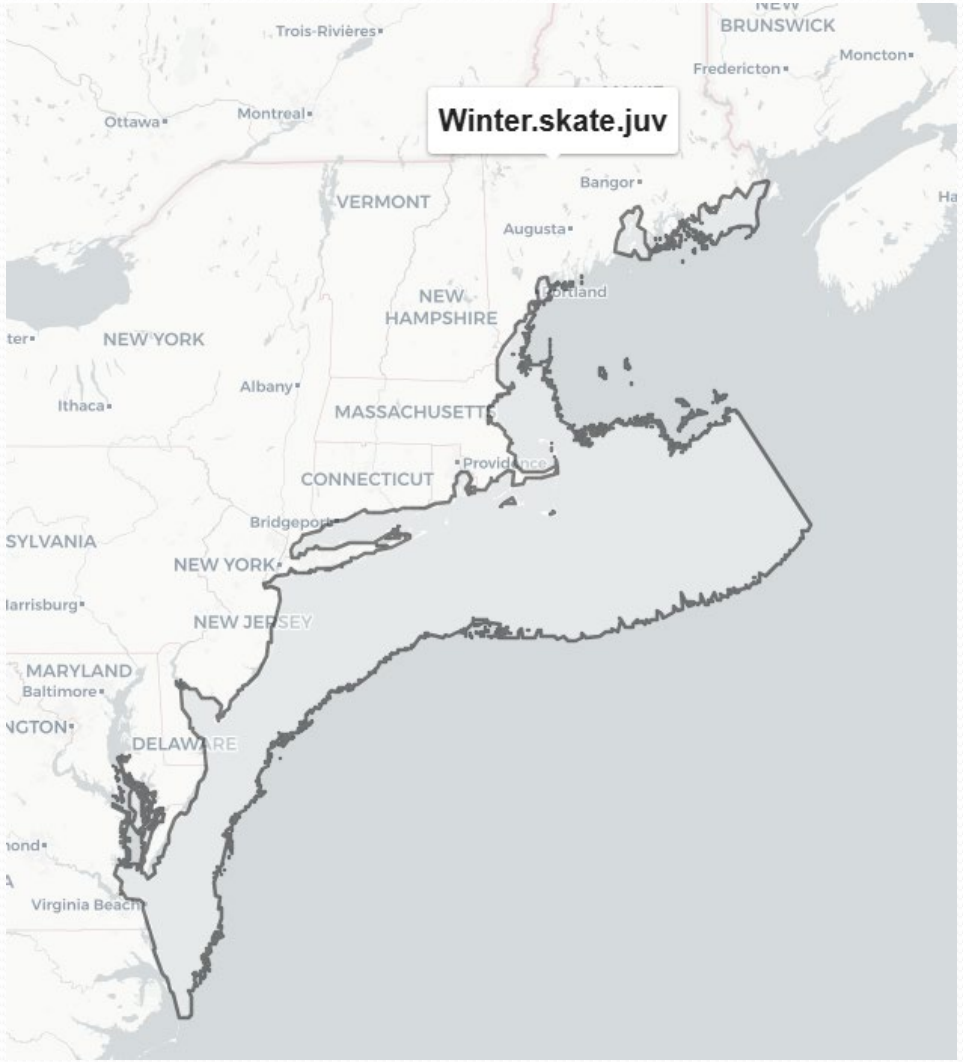
Eggs: EFH for winter skate eggs uses the adult distribution as a proxy. Female winter skate deposit leathery capsules, each containing a single egg, on the seabed. The oblong capsules are attached to the substrate via adhesive threads and curved horns that extend from each corner. The seasonality of egg case deposition is not well understood, and the incubation period for skates may be many months to over a year, such that egg cases in various stages of development may be present on the seabed year-round. There is no distinct larval stage as the skates emerge from their egg cases as fully formed juveniles.

Adults: EFH for adult winter skate (TL ≥ 75 cm) consists of the principal EFH area (defined as the top 75% model-predicted density quantile joined to suitable areas derived from inshore catches). Adult winter skate EFH includes sub-tidal benthic habitats in marine and polyhaline waters in the southwestern Gulf of Maine, Southern New England, Mid-Atlantic, and on Georges Bank. The designation extends from the shoreline to the continental shelf break, ranging as far north as York, ME and as far south as Albemarle Sound, NC. Adults are most commonly found between 12-87 meters depth but can range from 6-242 meters depth. Adults are also commonly found in bottom temperatures between 3-18°C and in polyhaline and marine waters between 27-36 ppt. Essential fish habitat for adult winter skates occurs on sand and gravel substrates, but they are also found on mud.

Updated EFH Map and Text – Winter skate

https://nrha.shinyapps.io/EFH_demo/

Juvenile EFH map



Juveniles: EFH for juvenile winter skate (TL < 75 cm) consists of the principal EFH area (defined as the top 75% model-predicted density quantile joined to suitable areas derived from inshore catches). Juvenile winter skate EFH includes sub-tidal benthic habitats in coastal marine and polyhaline waters in the Gulf of Maine, Southern New England, Mid-Atlantic, and on Georges Bank, ranging as far north as eastern Maine and as far south as Cape Hatteras. Juveniles are most commonly found between 10-77 meters depth but can range from 6-227 meters depth. Juveniles are also commonly found in bottom temperatures between 3-20°C and in polyhaline and marine waters between 28-36 ppt. Essential fish habitat for juvenile winter skates occurs on sand and gravel substrates, but they are also found on mud.

Impacts summary

- Action is solely administrative – EFH designations do not directly affect distribution of fishing / use of fishing gears
- Updated designations ensure use of best, current scientific information
- Qualitatively considered effects on managed species, physical habitat, protected species, human communities
- Indirect positive effects on species, habitat conservation through consultation mechanism and Council actions resulting from updated designations
- HAPC are a subset of EFH; juvenile Atlantic cod EFH continues to align with three cod-specific Habitat Areas of Particular Concern

Fishing Effects Evaluation

- Considered fishing gear effects on habitat at regional, sub-regional scales during EFH Five-Year Review
- Evaluation uses Fishing Effects Model, which estimates combined impacts across major types of bottom tending gears, and by individual gears (trawl, scallop dredge, clam dredge, longline, gillnet, trap)
- Model estimates monthly effects; summarized as annual averages
- Recent, regionwide estimate combining all gears = 10% habitat disturbance
- What are estimated fishing effects within individual EFH areas?
  - → Plan to summarize recent average percent disturbance within each mapped EFH area
  - → Indicates species / areas to focus on when revising spatial management areas, in the future

Committee / Advisory Panel Discussion

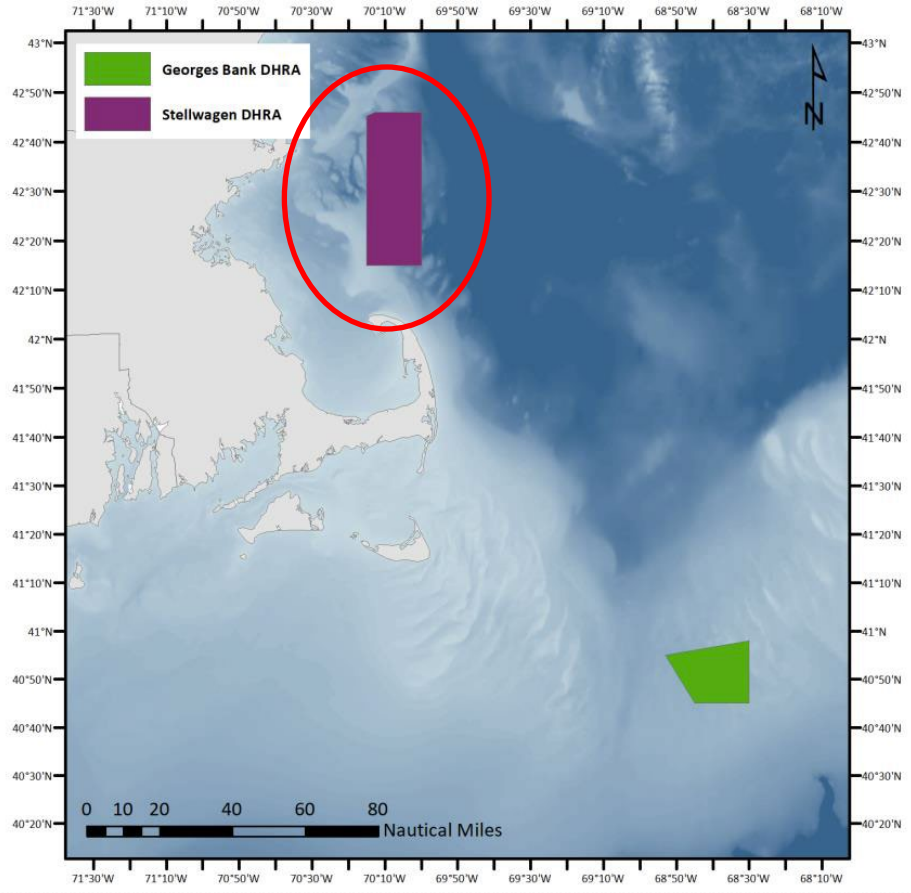
- Questions about EFH designation methods and approach?
- Questions or feedback about specific designations (maps or text)?
- Recommendation for preferred alternative

Three-Year Dedicated Habitat Research Area Evaluation

- The two Dedicated Habitat Research Areas established via OHA2 have a 3-year sunset provision that allows for administrative removal by GARFO Regional Administrator
- In 2022, Council recommended retaining both the Stellwagen and Georges Bank DHRAs
- Three years later, it is again time to review use of these areas and consider continued retention
- Can also take opportunity to discuss use of other habitat research areas that do not fall under this provision

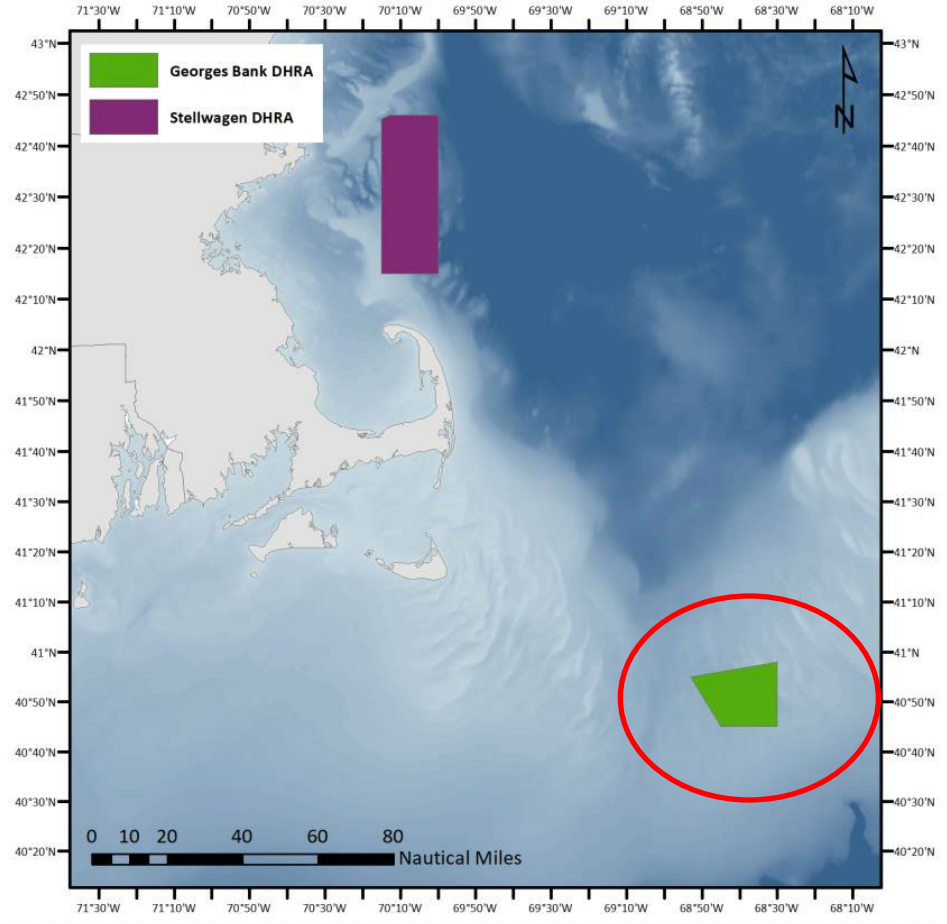
Stellwagen DHRA

- Closed to bottom trawls, dredges, sink gillnets, bottom longlines (exceptions for approved research fishing)
- Per OHA2 purpose was to:
  - Facilitate study of (1) fishing gear impacts on benthic habitats, (2) habitat recovery, (3) effects of natural vs. anthropogenic disturbance on fish habitats, and (4) effects of fishing and habitat type on the productivity of managed resources
  - Focus research efforts on this location and facilitate the permitting process
- Area contains a wide array of habitat types and species, and there are numerous baseline studies of the area to build on
- Stellwagen Bank in general is a highly productive area, and a better understanding as to why this is could improve fisheries management in the western Gulf of Maine



Georges Bank DHRA

- Closed to bottom trawls and dredges (exceptions for approved research fishing)
- Per OHA2, purpose was to:
  - Facilitate study of (1) fishing gear impacts on benthic habitats, (2) habitat recovery, (3) effects of natural vs. anthropogenic disturbance on fish habitats, and (4) effects of fishing and habitat type on the productivity of managed resources especially the relationships between scallop distribution, abundance, growth, and seabed type
  - Focus research efforts on this location and facilitate the permitting process



DHRA Review Process

Notice will include a request for information about other research areas without the sunset provision, to keep GARFO/Council informed:

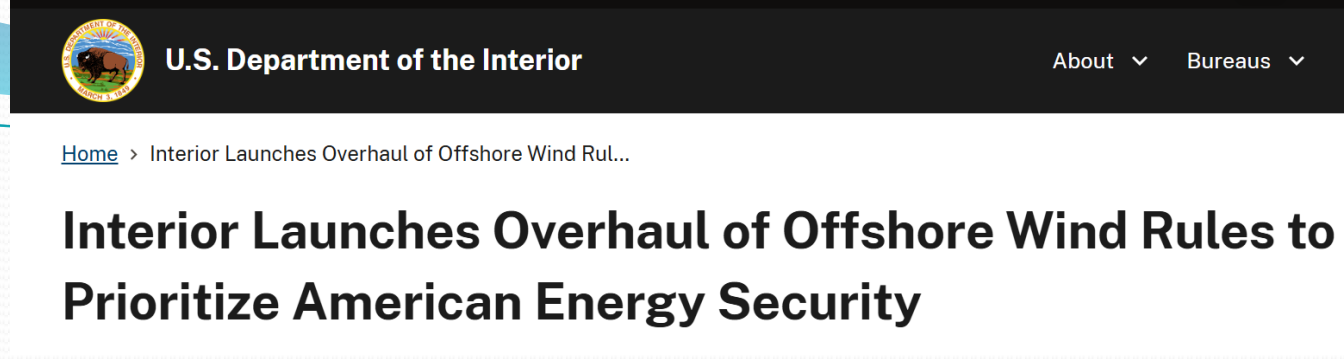
- ***Rose & Crown** and **Davis Bank,** Nantucket Shoals*
- ***Jordan Basin,** Gulf of Maine*

GARFO publishes request for information notice to solicit information on research occurring in the **Stellwagen** and **Georges Bank** DHRAs	September 2025
GARFO prepares a report summarizing findings and provides report to the Council	October or November 2025
Committee reviews report and makes recommendation to Council about whether to retain or sunset **Georges Bank** and/or **Stellwagen** DHRAs	*If desired – between report issuance and Council meeting*
Council recommends whether to retain or sunset **Georges Bank** and/or **Stellwagen** DHRAs, transmits recommendation to GARFO	December 2025 or January 2026
GARFO publishes notice with decision, based on Council recommendation	Following Council meeting

Committee / Advisory Panel Discussion

- Do the Committee / Advisory Panel wish to meet to review NOAA's report and discuss these DHRAs, or
- Discuss via correspondence, or
- Allow Council to review the report and make a recommendation?

BOEM Updates

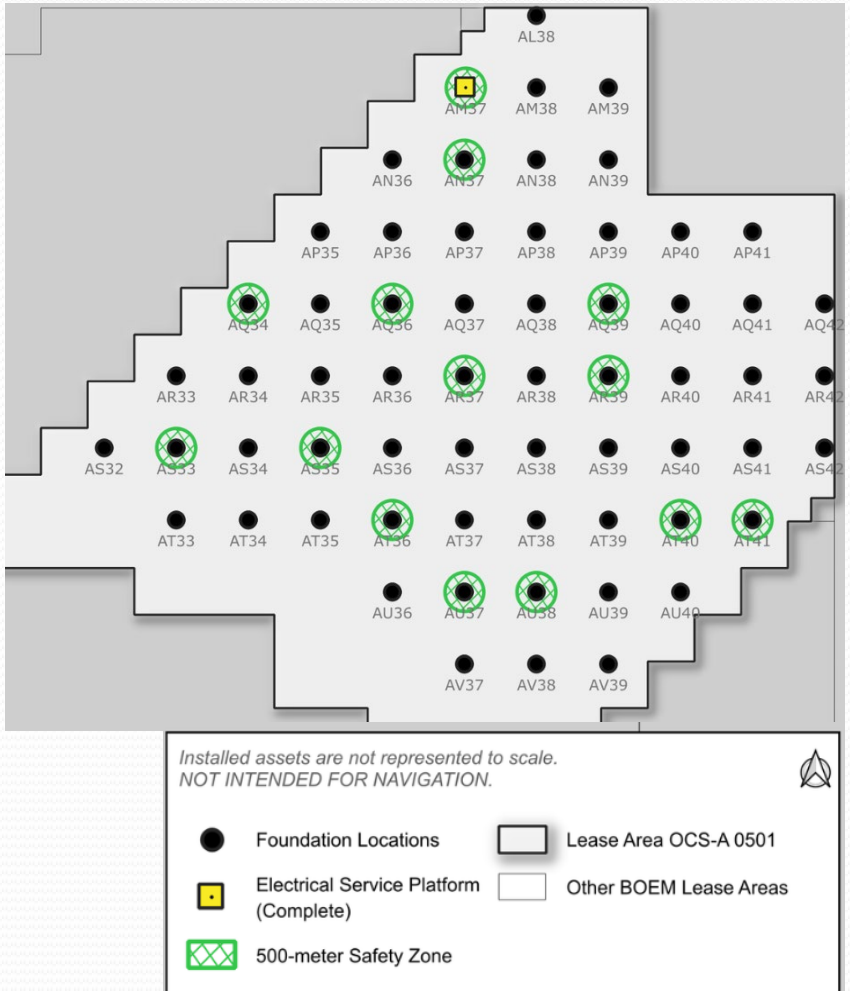


- Federal review of offshore wind - NOAA Headquarters review of current/proposed offshore wind projects is still ongoing (one of the 2025 EO's)
  - Dept. of Interior signaled federal permits could be revoked for projects that are being litigated (even if under construction)
- BOEM rescinded designated wind energy areas on the Outer Continental Shelf (7/30)
  - *Why?* "Ending Preferential Treatment for Unreliable, Foreign Controlled Energy Sources in Department Decision-Making" & per Presidential Memorandum of Jan. 20, 2025
  - *Result?* De-designating > 3.5 million acres of unleased federal waters previously targeted for OSW development across the Gulf, Gulf of Maine, New York Bight, California, Oregon, and the Central Atlantic
- BOEM rescinds offshore renewable energy leasing schedule (8/4); prior regulation required the Secretary of the Interior to publish a 5-year schedule of anticipated offshore renewable energy lease sales at least every 2 years
- Oil / gas leasing – Council comment against this type of activity in New England

Offshore wind project updates

- South Fork Wind: complete
- Vineyard Wind 1: still working on blade removal and installation (from July 2024 blade incident), projected to be complete by end of 2025 – some pieces of broken blade will likely remain at ocean bottom (next to scour protection), unclear about monitoring at this site
- Sunrise Wind: construction ongoing
- Empire Wind: permits rescinded in April but then project was un-paused with construction well underway this summer
- Uncertainty regarding Power Purchase Agreements (PPAs) with various planned projects (for SNE and Mid-Atlantic projects)

Project Status: Operational



Federal permitting status 8/26

Status

Complete

Title

Atlantic Shores South

Coastal Virginia Offshore Wind Commercial Project

Empire Wind Energy Project

Maryland Offshore Wind Project

New England Wind

Revolution Wind Farm Project

South Fork Wind Farm and South Fork Export Cable

Sunrise Wind Farm

Vineyard Wind

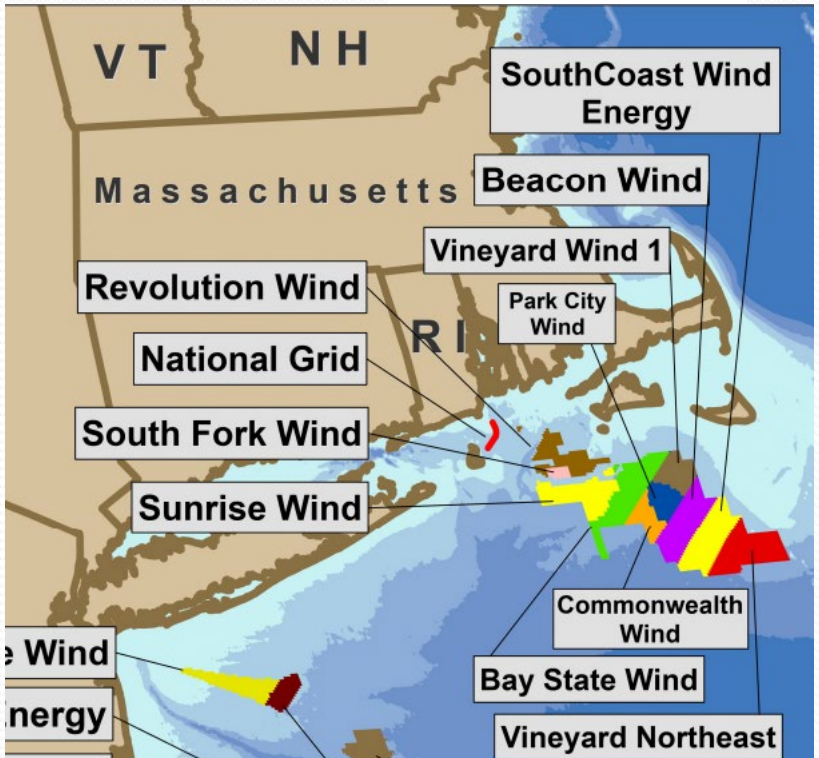
Status

Planned

Title

Bay State Wind Project

Bluepoint Wind 1



Status

In Progress

Title

Attentive Energy Two Offshore Wind Project

Kitty Hawk South Offshore Wind Project

Skipjack Wind Farm

SouthCoast Wind Energy LLC (SouthCoast Wind)

Vineyard Mid-Atlantic Offshore Wind Project

Vineyard Northeast

Status

Paused

Title

Atlantic Shores North

Beacon Wind

Ocean Wind 1 Project

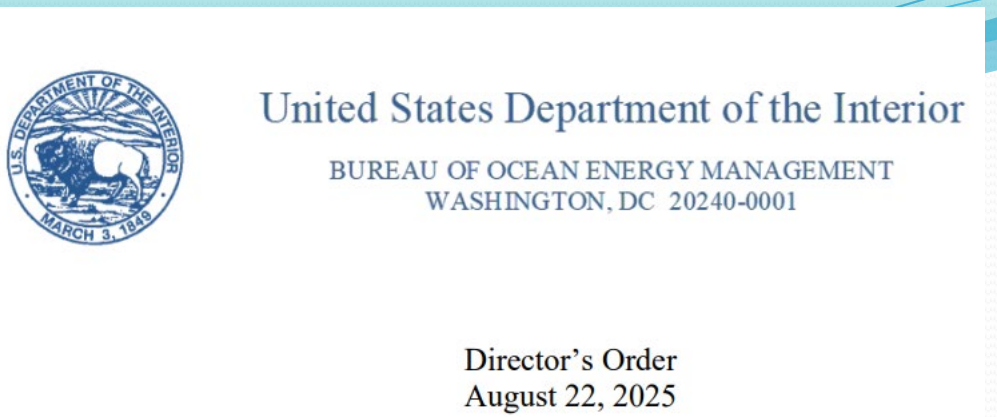
Status

Cancelled

Title

Kitty Hawk North Wind Project

!! Revolution Wind !!


United States Department of the Interior

BUREAU OF OCEAN ENERGY MANAGEMENT
WASHINGTON, DC 20240-0001

Director's Order
August 22, 2025

- Aug. 22: Stop work order issued by Trump Administration
  - "Concerns related to protection of national security interests in the US"
  - "Concerns related to …prevention of interference with reasonable uses of the exclusive economic zone, the high seas, and the territorial seas"
  - May not resume activities until BOEM has completed a review of the project
  - Able to still "respond to emergency situations; to prevent impacts to health, safety and the environment; or to comply with the conditions of approval" → limited vessels remain in the lease area
  - Orsted still aiming for project completion by next year
  - CT evaluating legal options to protect the state's interests
- 80% project completion; 70% of turbines have been installed (65 turbine project), 17 of which are sending power to the grid
- Recently Orsted stated the company needed to raise an additional $9.4B to complete Revolution Wind and Sunrise Wind due to adverse US market

SouthCoast Wind !!

- 8/29: Interior Dept. requested to remand permit for the project
- 2.4 GW project 23 miles south of Nantucket
- BOEM issued permit in Dec. 2024; unable to secure USACE, EPA, & NOAA permits before Trump administration
- Negotiations over terms of MA & RI state contracts (power purchase agreements) stalled

Transportation Department !!

- 8/29: Dept. of Transportations plans to cut $679 million in funding for 12 ports designed to support offshore-wind related projects/facilities
  - This includes $34 million allocated to Salem, MA (intended use: New England Wind projects)
- https://subscriber.politicopro.com/article/eenews/2025/08/29/transportation-department-retracts-679m-in-offshore-wind-funding-ee-00536048

New England Wind !!

- Trump administration will move by Oct. 10 to vacate previous federal approval for Avangrid project
  - New England Wind 1 & 2 = 2.6 GW, expected to be operational in 2029
  - https://www.nationalfisherman.com/northeast/trump-administration-moves-to-block-avangrid-s-new-england-wind-project?utm_source=marketo&utm_medium=email&utm_campaign=newsletter&utm_content=newsletter&mkt_tok=NzU2LUZXSi0wNjEAAAGctfBvMh9kpB2Rbx2GGReURGR4y94dJ4UXGc-8Q8fw1j6H45WegOW93GSXpa3sNkII7eH1jgsPt6yw7VYN1qPCQELhlt6Uj9VVav8zKNeDDi1FuSsT

Misc. Updates !!

- Trump administration truncated window to receive $$ tax credits (redefined start of construction); imposed 50% tariffs on wind turbine imports; mandated review of projects by many agencies incl. Dept. of Justice
- Overall: more reviews of impacts by more agencies with goal to remand permits & withdraw prior approvals where appropriate for projects with pending litigation
- Federal actions against wind energy summarized here
- Contracted fishermen for safety vessel work have lost $$

NMFS-related Updates

- NEFSC Regional Standards for Offshore Wind Project-Level Monitoring draft
  - Research team presented on their work during June Council mtg and sent draft on 7/25 for Council feedback on draft monitoring standards by fall 2025
  - **Council staff plan**: joint letter with MAFMC focused on higher level feedback by end of Oct.
  - **Initial reactions**: unclear project purpose, inability to enforce data collection/standards, unclear who will do the work/analyze data, unrealistic standards → did not develop standards based on develop/stakeholder input, etc.

- Benthic habitat monitoring guidelines – *being developed* – want to make sure the data from developer's benthic surveys is useful; iterative process with input from Council staff (now) & developers/other stakeholder groups (future) before finalizing; balancing work/effort/$ developers currently spend on surveys and changes that could be made to improve data quality/utility

Offshore wind-related

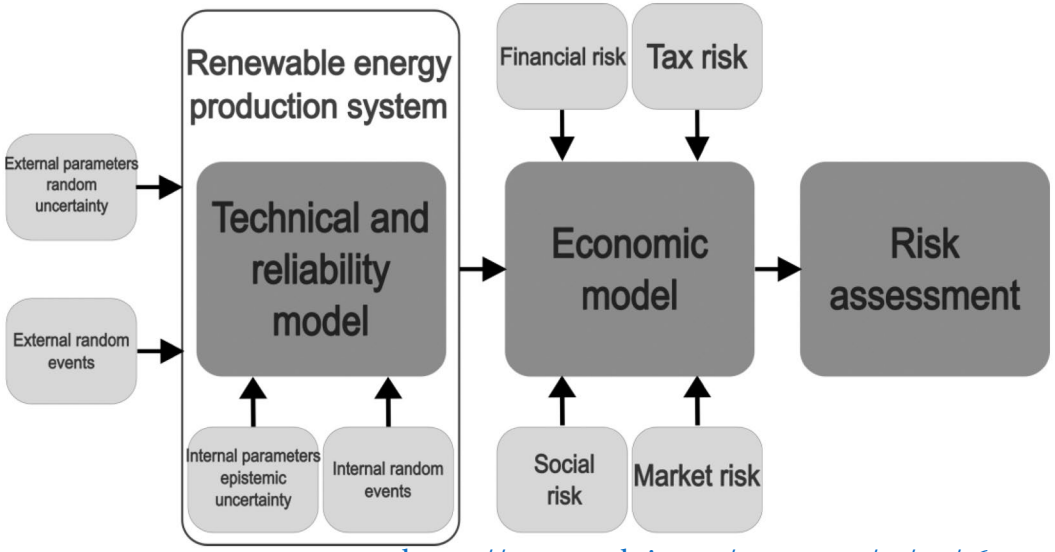
Fisheries Compensation Program

Fisheries Compensation Program
for Atlantic Coast Offshore Wind

ROSA
Responsible Offshore

- Compensation plan still being developed (11 states initiative; Regional Fund Administrator) – concerns related to eligibility criteria (not accounting for annual variability, influences of management, etc.)
- Boulder relocation – work still ongoing, workshop held by MA Fisheries Working Group in May
- ROSA: recently announced >$3 million for regional offshore wind fisheries research (10 projects)

Various developers/groups note uncertainty in 2025: soaring costs, high interest rates, supply chain delays, local opposition



https://www.mdpi.com/2071-1050/15/24/16912

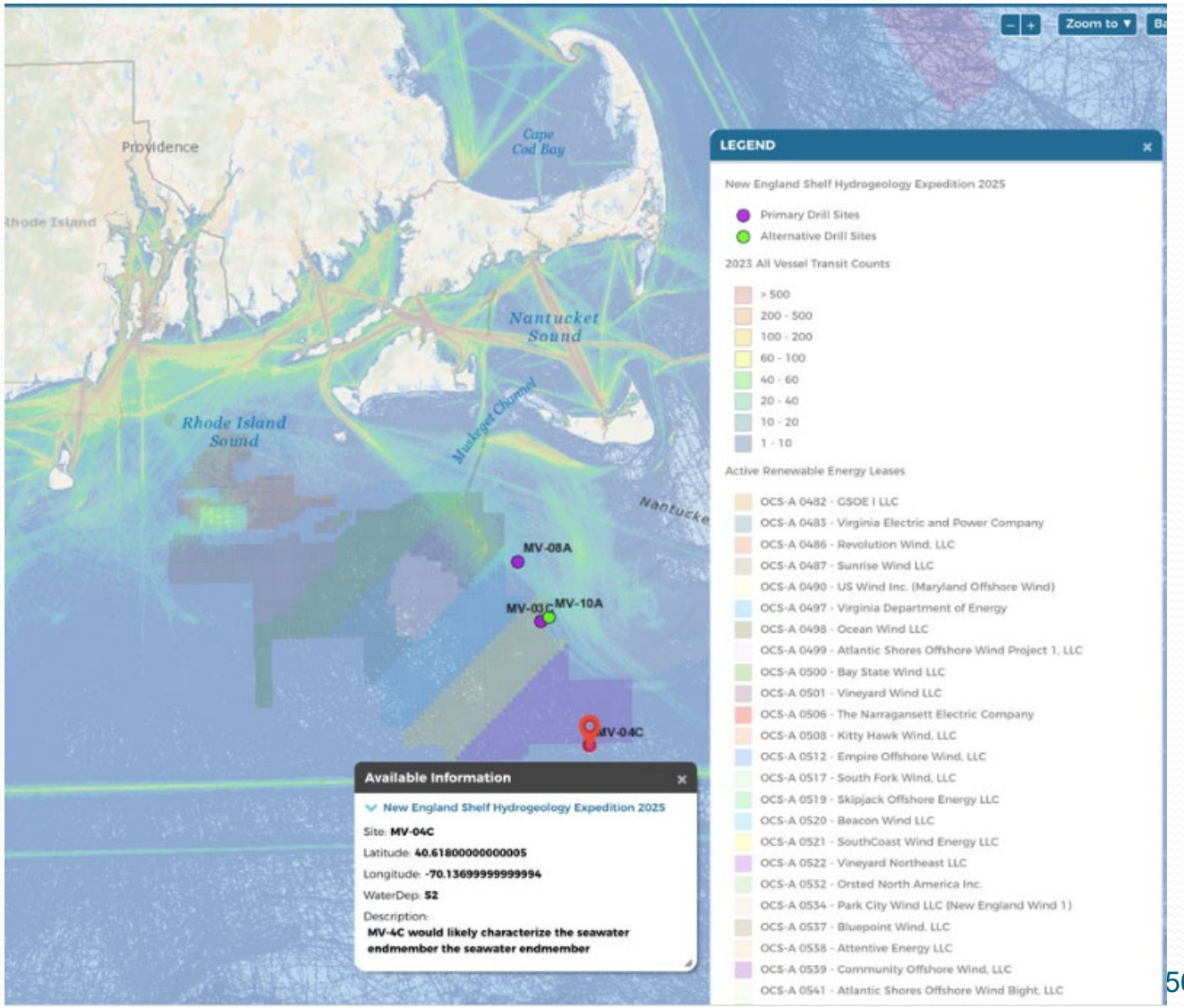
Miscellaneous projects:

- **New England Shelf Hydrogeology project (Expedition 501):** 90-day max operations offshore off Nantucket (May – Aug.), coring and in situ sampling of sub-seafloor sediments and fluids from a specialized platform.
  - Specifics: three locations (and one alternate), each with two bore holes, based on acoustic work used to determine siting location
  - Why? Looking for fresh/"freshened" water about 500m under the seafloor to understand the extent of the last glaciation event and how far Nantucket's groundwater travels offshore
  - Potential concerns:
    - Not intended to explore sources of oil, gas, or minerals
    - Overlaps with areas that are heavily fished; main issue is that the sensors are tethered to a cord (that rise above seafloor 2-4m) so will be torn up by fishing gear; sensors planned to be in place for up to 2 years; not concerned about damage to fishing gear
  - Overall: generally went smoothly, some issues with glauconite, able to successfully core & complete exploration

New England shelf hydrogeology project

Final update sent on 8/1

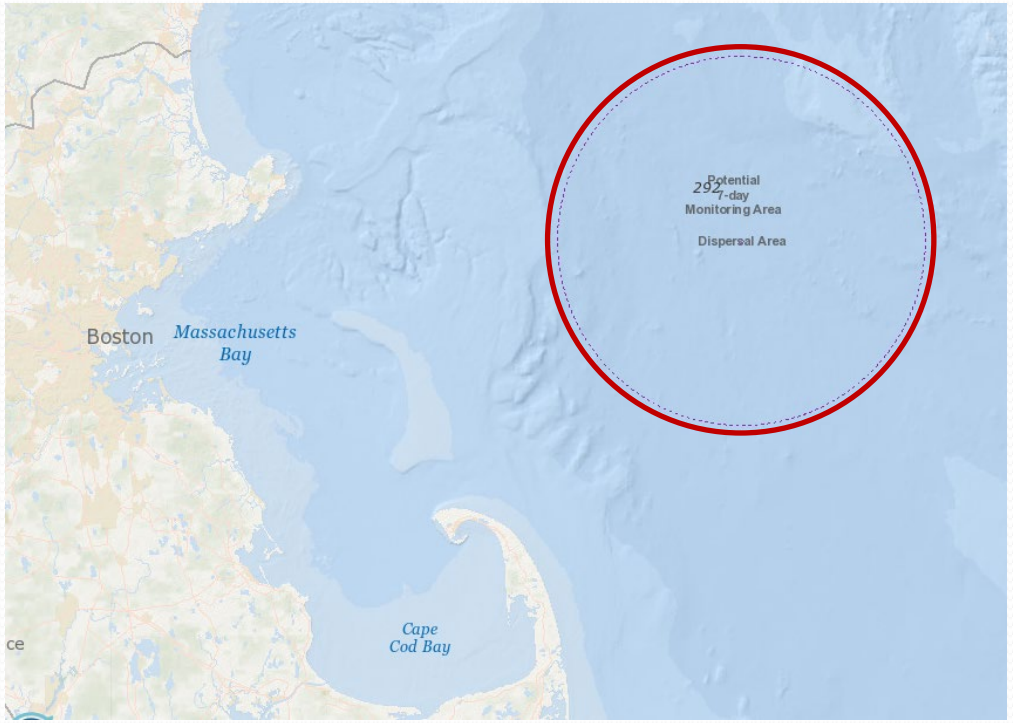
- 93 operational days. 74 days at sea. 718 cores. 3 Sites. 6 Holes. 9 pump tests. 61 scientists and ESO team members at sea. 122 transfers on and off the L/B Robert.
- Project completed by 7/31/2025



https://www.northeastoceandata.org/public-comment-opportunity-new-england-shelf-hydrogeology-expedition/

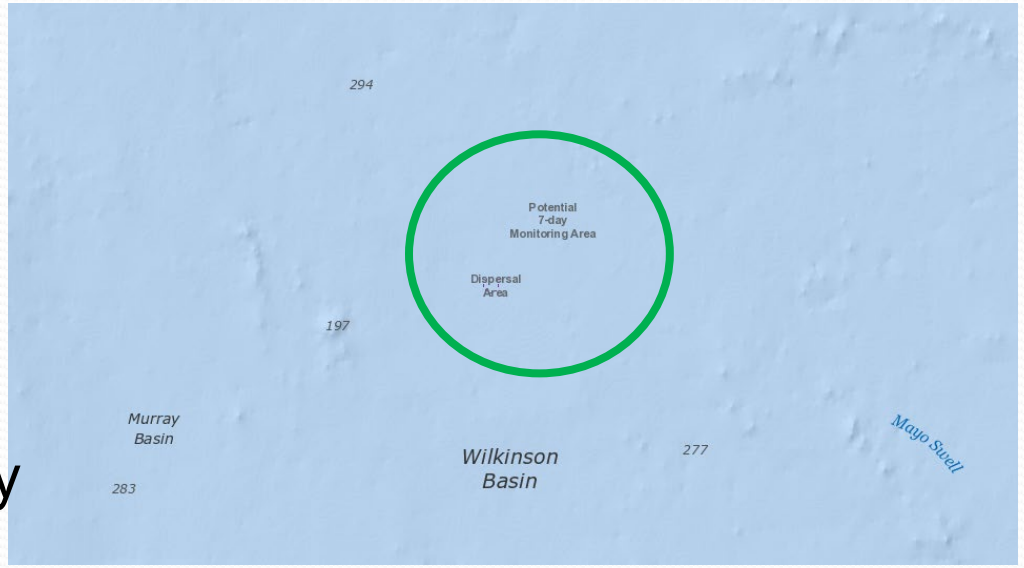
WHOI's Locking Ocean Carbon in the Northeast Shelf and Slope (LOC-NESS) Project:

- EPA granted research permit for field trial in the Gulf of Maine summer 2025 → requires monitoring
- Prior involvement/review by EPA, NOAA, US Fish and Wildlife, etc. with many outreach events incl. with Council
- Recently conducted a simulation of the project at a Naval facility → improved confidence of research
- Project goal: marine carbon dioxide removal to de-acidify surface water
- Specifics:
  - Slowly add up to 17,000 gallons of alkalinity (highly purified sodium hydroxide)
  - Expect solution will dilute in ~12 seconds and reach a pH of 9



As of 8/17 – field trial in GOM complete!

- Stakeholders present during experiment: EPA, NOAA NEFSC, MA DMF, fishing industry, protected species observers
- Completed dispersal w/o observations of protected species and shipboard data confirming hypothesis of no significant environmental impacts
- Early data show: successfully enhanced alkalinity of surface ocean → small increase in pH and driving CO2 from the atmosphere into the seawater path that was tracked through time
- Next steps: digging into data in coming months; planning to share results as analysis proceeds including presenting at fishing industry events
- Goal: provide independent, transparent research that helps determine whether OAE could safely play a role in climate response



For more info: Maine Coast Dock Talk podcast episode

Maine Research Array: Wind Energy Area Surveys

- Scheduled for Oct. 1 – Dec. 31, 2025 time period
- Survey schedules here
- Surveys by Maine DMR, Univ. of Maine, Bigelow Lab, and GMRI
- Active acoustic surveys, plankton and larval lobster surveys, deployment of a passive acoustic receiver, deployment of acoustic telemetry receivers, tagging of highly migratory species

Survey Type	Survey Goal	Frequency	Survey Equipment	Vessel
Active acoustic survey	Monitor abundance of pelagic fish and invertebrates	Up to 2 days/month	Hull-mounted Simrad EK80 echosounder system	R/V Merlin, 37' converted offshore tuna harpoon vessel
Plankton and larval lobster survey	Monitor abundance of zooplankton and abundance and larval stage distribution of lobsters	Up to 2 days/month	Seabird 55 Rosette, SBE 25plus CTD, dual ring net, and neuston net	R/V Bowditch, 48' catamaran, or R/V Maine, 42.3' converted marine patrol vessel
Servicing of a passive acoustic receiver	Monitor baleen whale presence	One day during the three-month period	A bottom mounted SoundTrap ST600 HF acoustic recorder with a VR2AR acoustic release/receiver	Vessel to be determined
Retrieval of acoustic telemetry receivers and tagging of highly migratory species	Monitor highly migratory species abundance and movement	One day during the three-month period for receiver retrieval and up to one day per week for tagging	Bottom mounted VR2AR acoustic release/receivers; passive acoustic telemetry tags, popup satellite archival transmitting tags, and mark-and-recapture tags; fishing with rod and reel	Vessel to be determined

Questions? Other updates?

2025 Priorities and Activities

- Complete EFH Five-Year Review
- Revise EFH designations
- Habitat impacts of management actions
- Develop habitat and fishery comments on non-fishing activities
- Contribution to habitat science and management partnerships
- Collaborate on offshore wind science issues

2026 Work Planning

- Continue to revise EFH designations
- Continue to advance Fishing Effects Model analyses
- Integrate habitat information into Council initiatives
- Communication, information sharing of habitat products
- Collaborate with habitat, ocean planning partners on science and management issues
- Maintain expertise on habitat and ocean planning science and research

→ *See staff memo for details*

2026 EFH Framework Recommendation

Fishery Management Plan	Species
Small Mesh FMP (3 species)	Red hake, silver hake, and offshore hake*;
Groundfish FMP (12 species)	Acadian redfish, American plaice, Atlantic halibut*, Atlantic wolffish**, haddock, ocean pout, pollock, white hake, windowpane flounder, winter flounder, witch flounder, yellowtail flounder;
Atlantic Sea Scallop FMP	Atlantic sea scallop***

*Offshore hake and Atlantic halibut are somewhat data limited, with sufficient observations to model juveniles and adults in combination but not to run life stage-specific models.
**It is likely possible to fit a species distribution model for Atlantic wolffish, but this will almost certainly require a simplified modeling framework.
***EFH will rely on a scallop-specific vs. joint species distribution model, which is already under development.
Underline = newly added to 2026 list, previous recommendation was to complete these species in 2027

Committee and Advisory Panel Discussion

- Any questions?
- Is there agreement with the suggested work areas for 2026, including the 2026 EFH Framework?
- Are there other issues or activities that we should be planning for?

Extra slides - Index

- Ancillary information (tables / figures)
  - Depth ranges (slides 67-68)
  - Temperature / Salinity ranges (slides 69-70)
  - Monthly density / 20-year trends / Smooth terms:
    - Cod (slides 71-73)
    - Herring (slides 74-76)
    - Monkfish (slides 77-79)
    - Barndoor (slides 80-82)
    - Clearnose (slides 83-85)
    - Little (slides 86-88)
    - Rosette (slides 89-91)
    - Smooth (slides 92-94)
    - Thorny (slides 95-97)
    - Winter (slides 98-100)

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Ancillary Information

** Multi-species separated by demersal vs pelagic*

	Element	Description	Vehicle for sharing
Multi-species*	Species covariance matrices	Graph matrix: Illustrate relationships / shared responses between species and lifestages	Framework ➔ Appendix?
	Variance partitioning	Graphs: Illustrate relative importance of environmental variables and other terms for each species/lifestage	Framework ➔ Appendix
	Model diagnostics / performance metrics	Graphs / Tables: Evaluate fit and predictive capacity of models – describe up front	Framework ➔ Appendix GitHub / other repositories
Species-specific	Smooth terms	Graphs: Illustrate (relative) responses and relationships to environmental predictors	Framework ➔ Appendix
	20-year mean predicted density	Aggregate or monthly maps: Illustrate predicted distributions, including seasonal (spring vs fall) differences	Framework Appendix?
	20-year density quantile	Aggregate or monthly maps: illustrate relative importance of areas within EFH footprint (trimmed to top 95% of occupied habitat area)	Framework ➔ Maps / Appendix EFH Demo R Shiny App
	20-year trend of predicted density	Aggregate or monthly maps: illustrate increases or decreases in species predicted density via linear regression slopes	Framework ➔ Appendix
	20-year CV of predicted density	Aggregate or monthly maps: illustrate temporal variance in density predictions across model spatial domain	Framework ➔ Appendix
	10-fold cross validation	Measure of uncertainty	Framework ➔ Appendix
	Performance metrics	Measure of uncertainty	Framework ➔ Appendix
	Environmental ranges	Tables: provide lower and upper thresholds where species most commonly found in survey data (depth, temperature, salinity)	Framework ➔ Appendix

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Depth ranges:

Species	Life stage	Full* (m)	75% (m)
Atlantic cod	Adult	9-291	37-177
	Juvenile	7-201	14-100
Atlantic herring	Adult	6-295	14-175
	Juvenile	4-265	13-149
Monkfish	Adult	9-360	42-223
	Juvenile	10-340	44-203
Barndoor skate	Adult	32-361	61-248
	Juvenile	27-358	58-208
Clearnose skate	Adult	5-207	9-36
	Juvenile	4-133	8-26

**Full ranges use 99% percentile to exclude extreme outliers*

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Depth ranges (cont.):

Species	Life stage	Full* (m)	75% (m)
Little skate	Adult	6-214	12-82
	Juvenile	6-220	11-74
Rosette skate	Adult	54-299	81-210
	Juvenile	27-338	75-229
Smooth skate	Adult	54-361	115-266
	Juvenile	39-355	103-237
Thorny skate	Adult	37-361	83-213
	Juvenile	30-353	66-214
Winter skate	Adult	6-242	12-87
	Juvenile	6-227	10-77

**Full ranges use 99% percentile to exclude extreme outliers*

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95% of unique occurrences fall within these ranges

Temperature and Salinity ranges:

Species	Life stage	Temp (°C)	Salinity (ppt)
Atlantic cod	Adult	3-13	31-36
	Juvenile	3-14	26-35
Atlantic herring*	Adult	2-16	17-34
	Juvenile	2-21	14-34
Monkfish	Adult	4-15	31-36
	Juvenile	3-15	31-36
Barndoor skate	Adult	5-16	32-36
	Juvenile	4-17	32-36
Clearnose skate	Adult	6-24	27-36
	Juvenile	8-28	22-36

**Herring ranges use surface temp and salinity to match SDMs*

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95% of unique occurrences fall within these ranges

Tempeature and Salinity ranges (cont.):

Species	Life stage	Temp (°C)	Salinity (ppt)
Little skate	Adult	3-21	29-36
	Juvenile	3-20	28-36
Rosette skate	Adult	7-15	32-36
	Juvenile	7-18	32-36
Smooth skate	Adult	4-11	32-36
	Juvenile	4-12	32-36
Thorny skate	Adult	3-11	32-36
	Juvenile	3-12	31-36
Winter skate	Adult	3-18	27-36
	Juvenile	3-20	28-36

20-year mean predicted density by month

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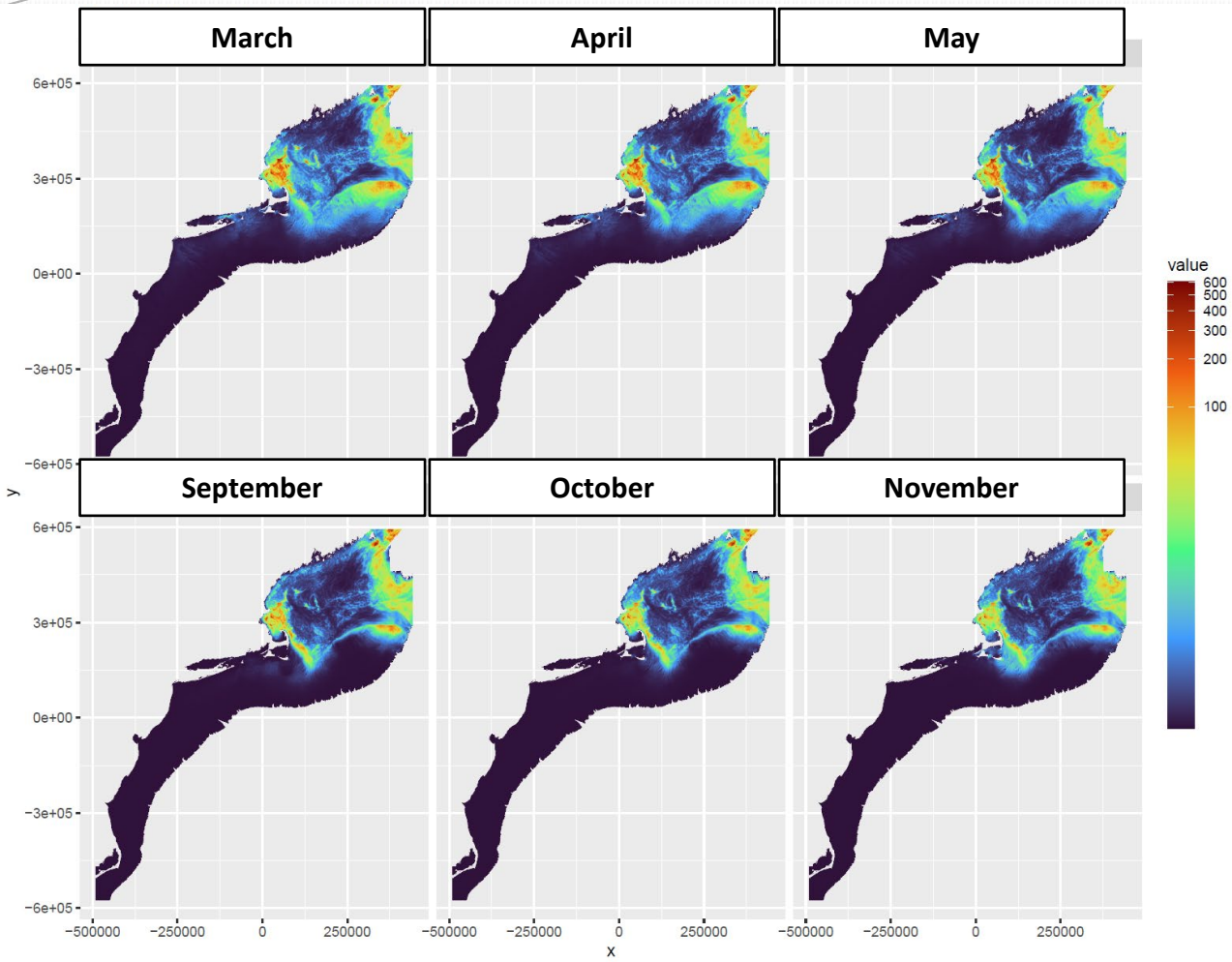
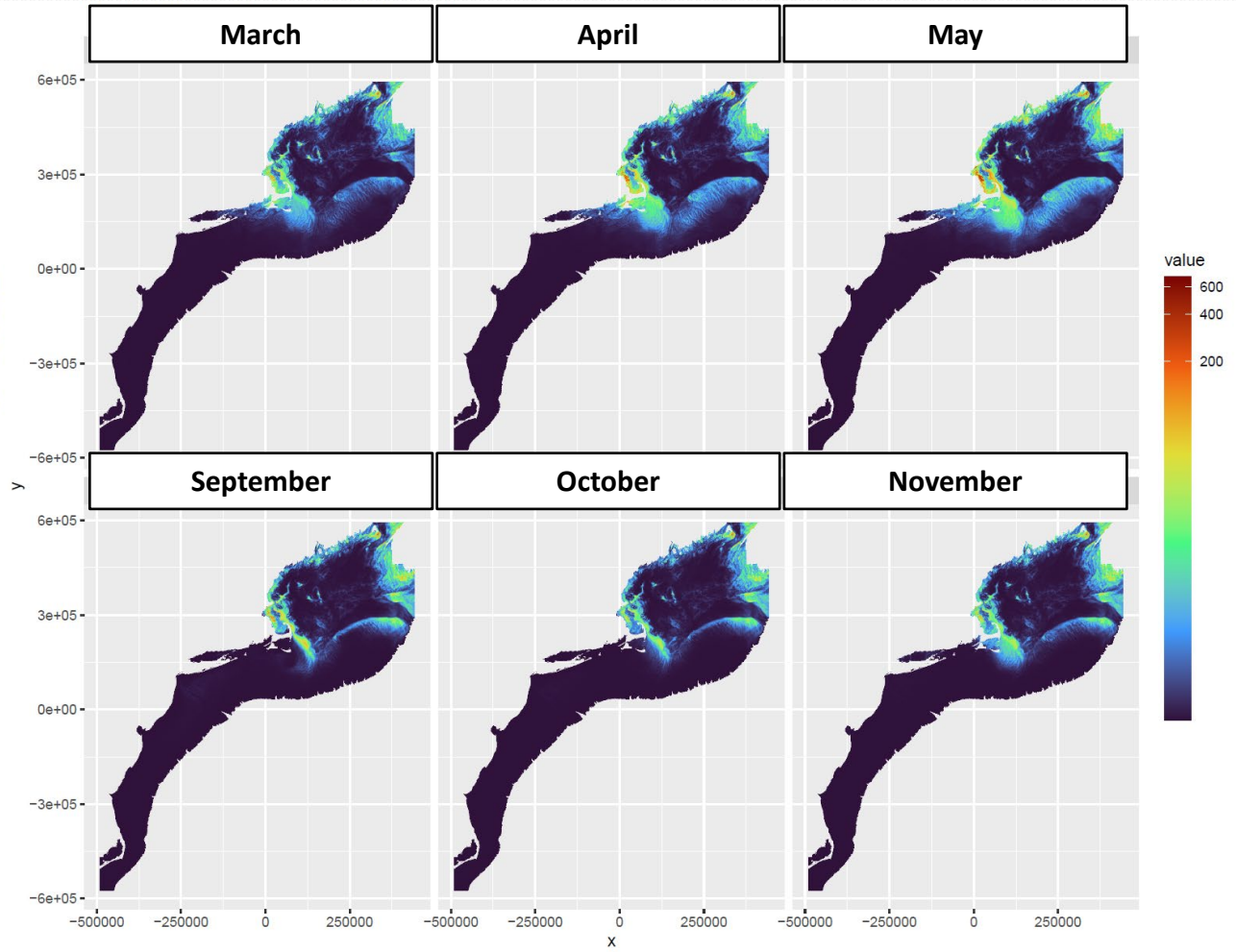


Atlantic cod - adult



Atlantic cod - juvenile

20-year trend by month

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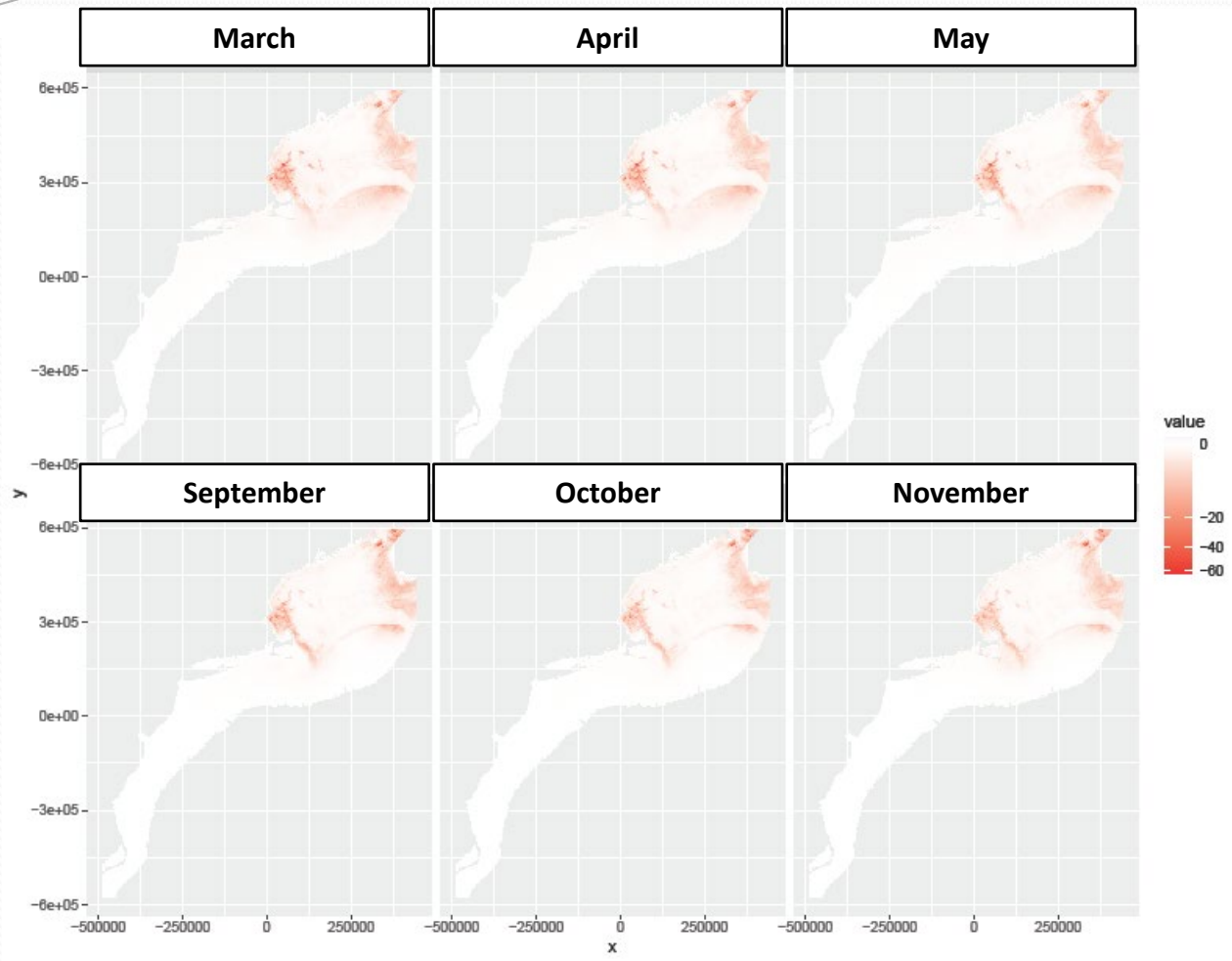
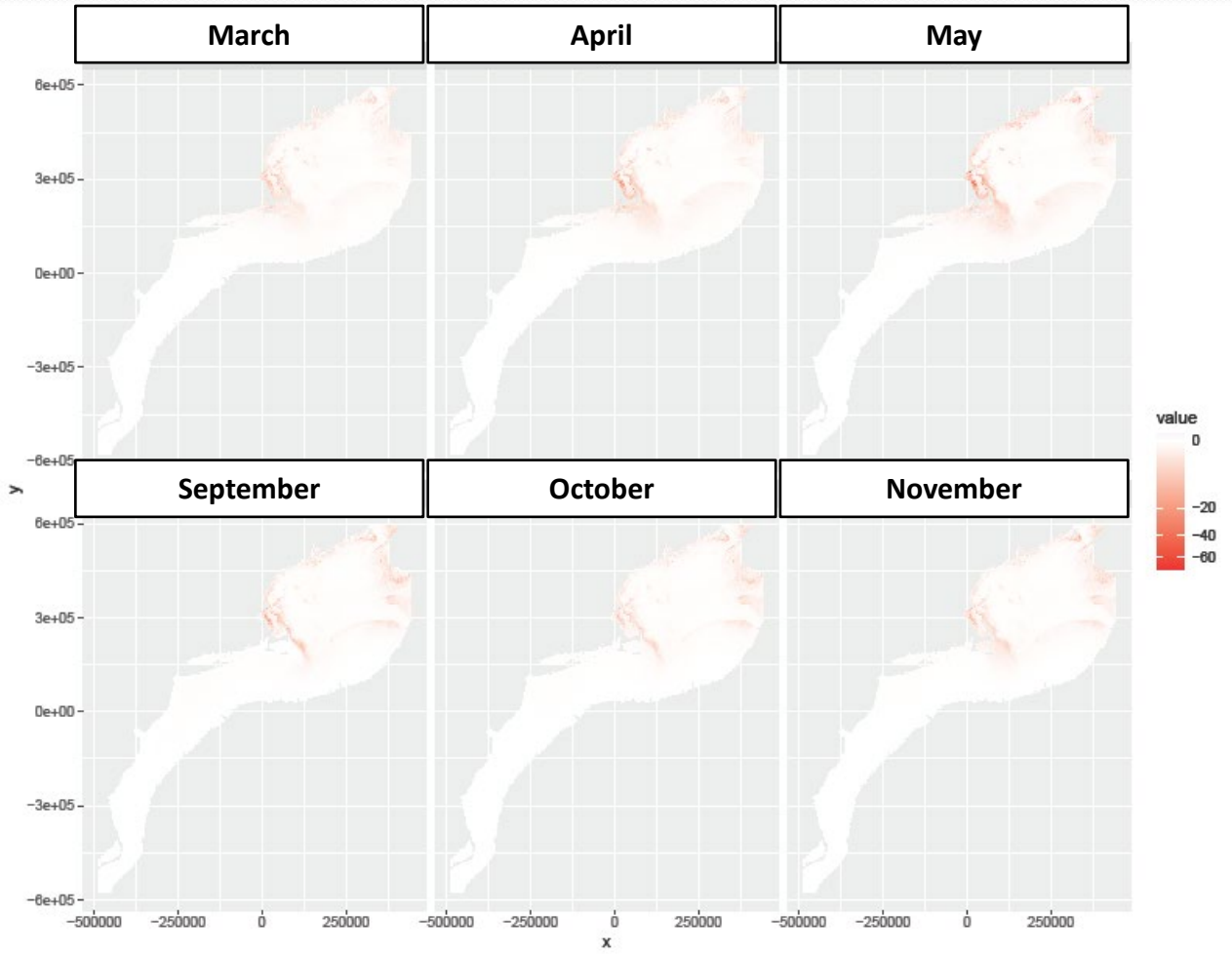


Atlantic cod - adult



Atlantic cod - juvenile

Smooth terms

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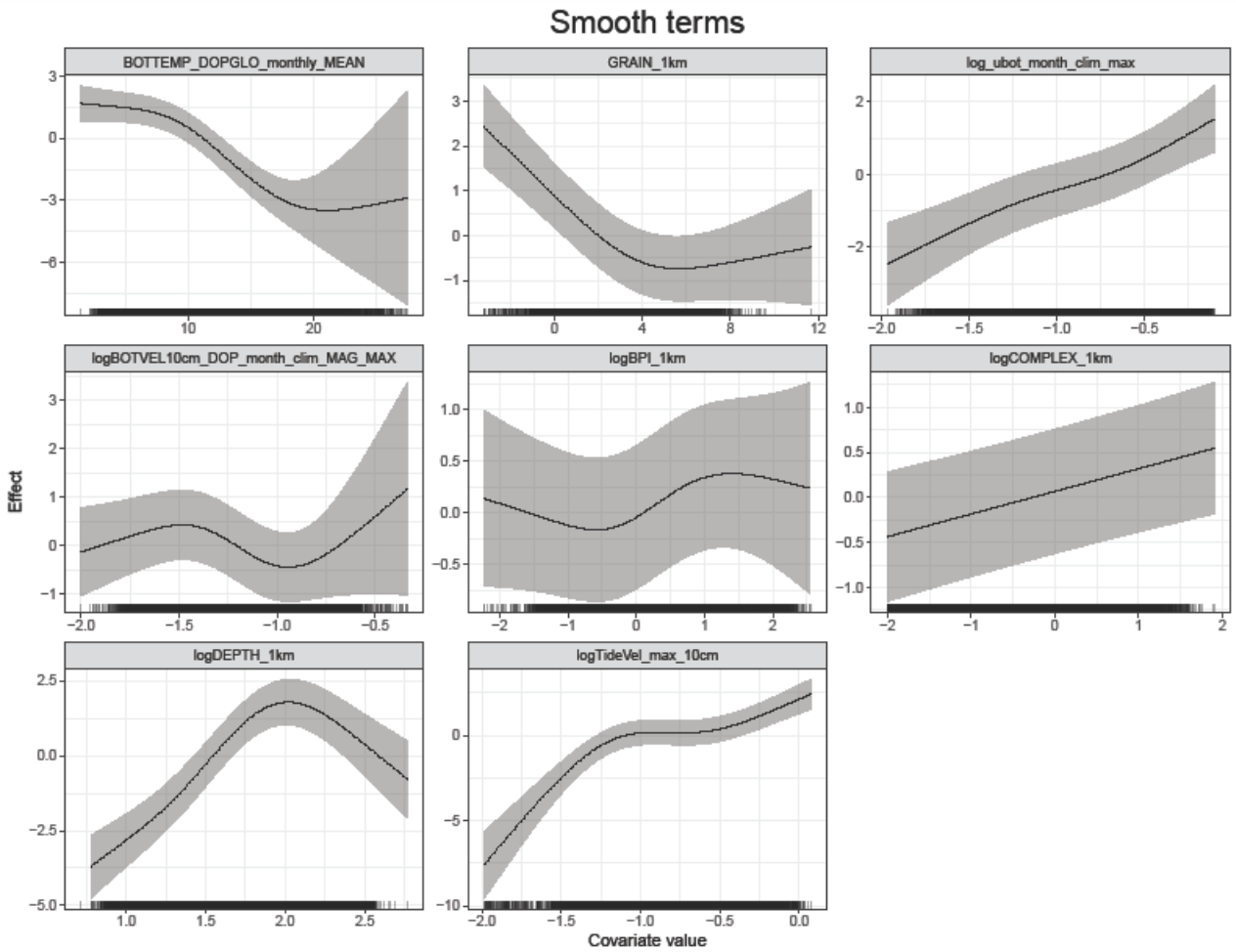
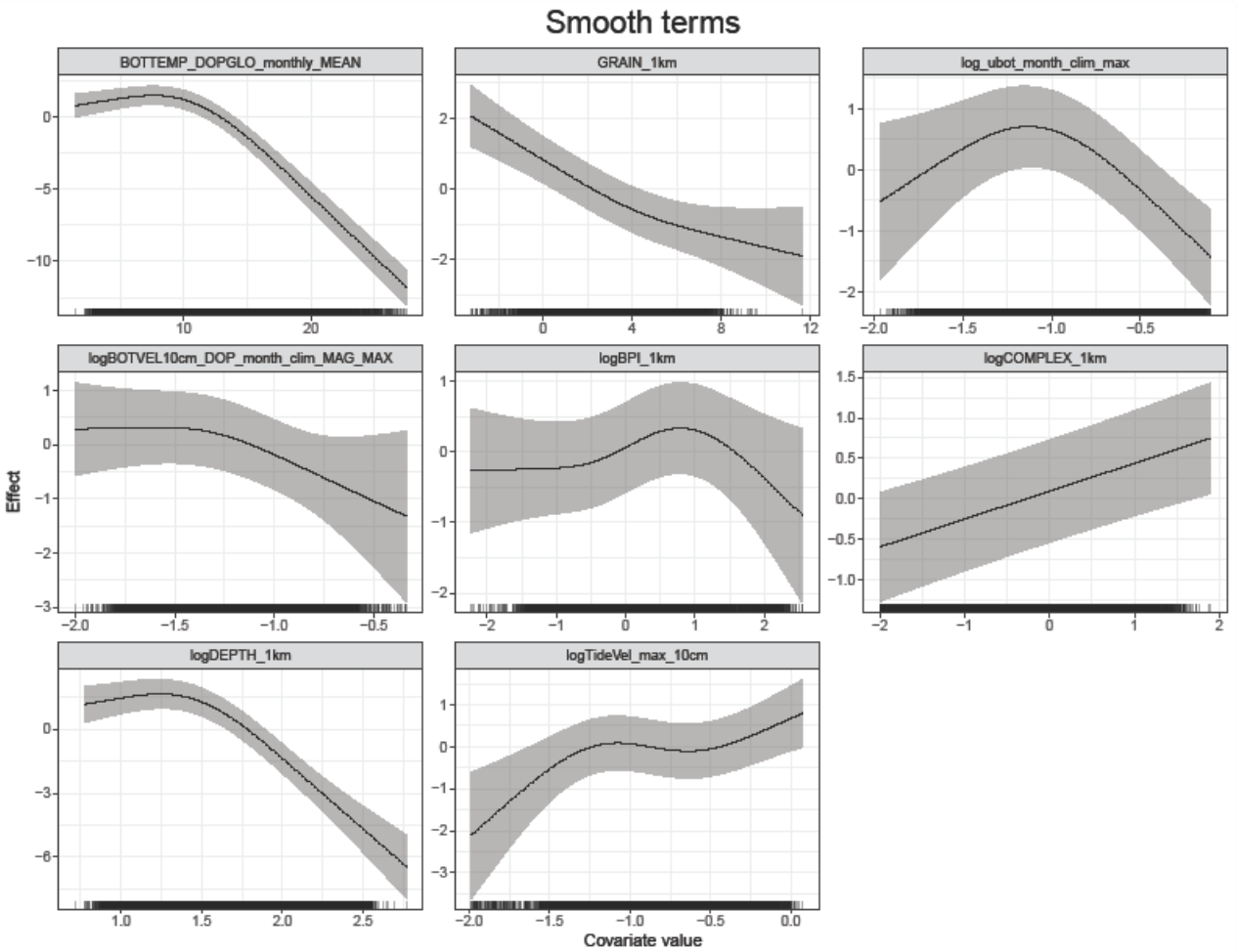


Atlantic cod - adult



Atlantic cod - juvenile

Note: Scale of y-axes differs between plots

20-year mean predicted density by month

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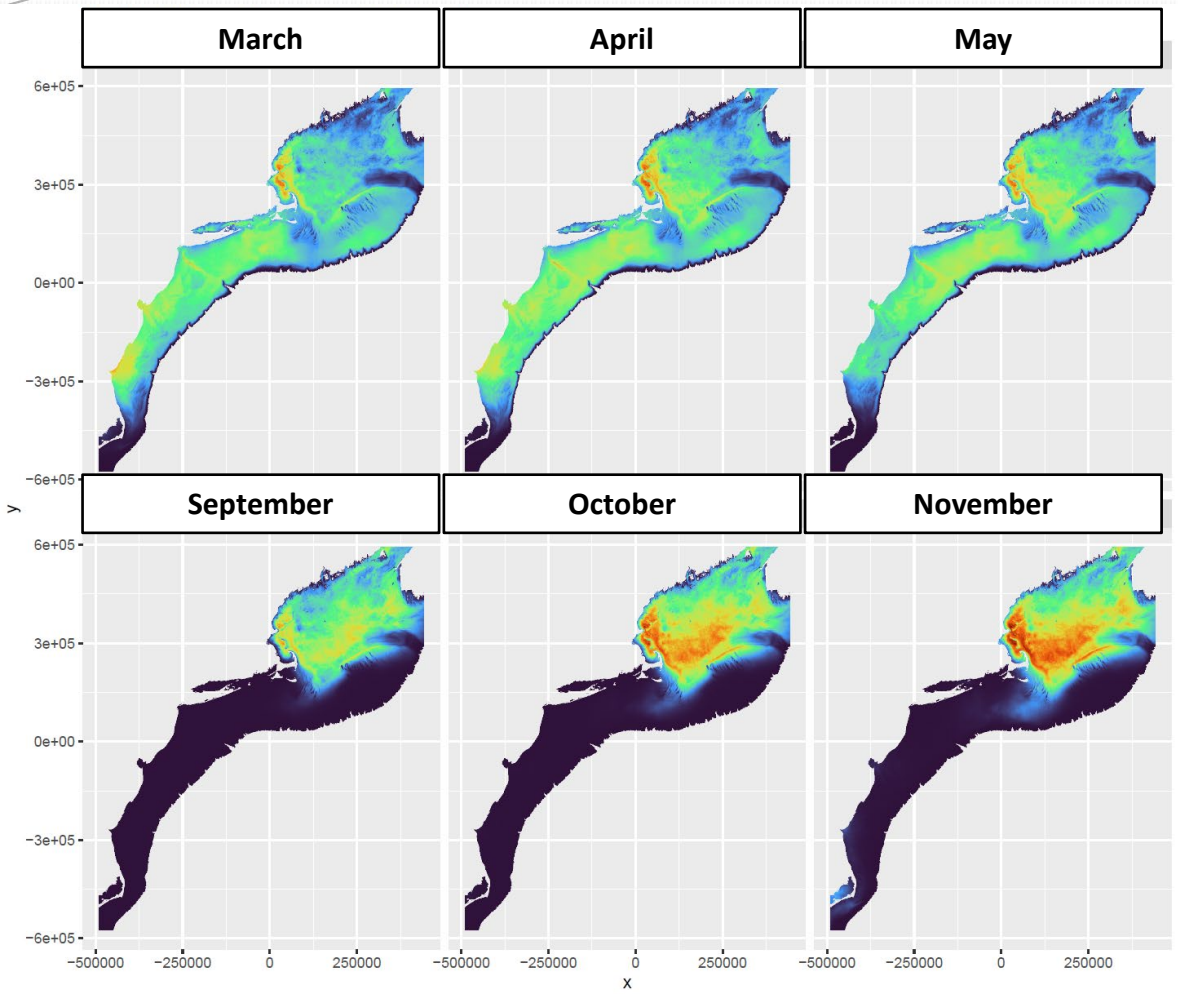

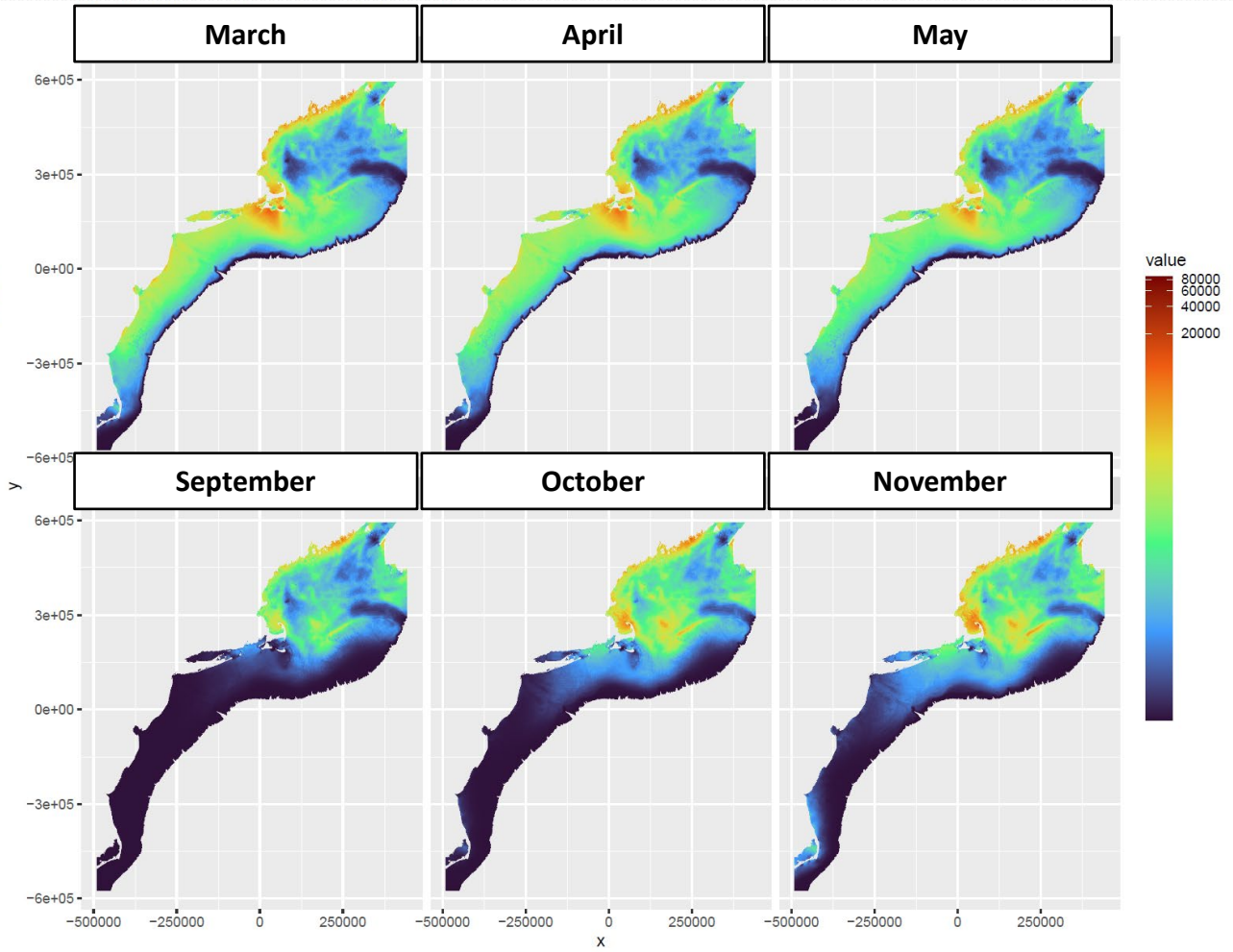

Egg/Larval proxies:
Fall adult distribution

Atlantic herring - adult

Atlantic herring - juvenile

20-year trend by month

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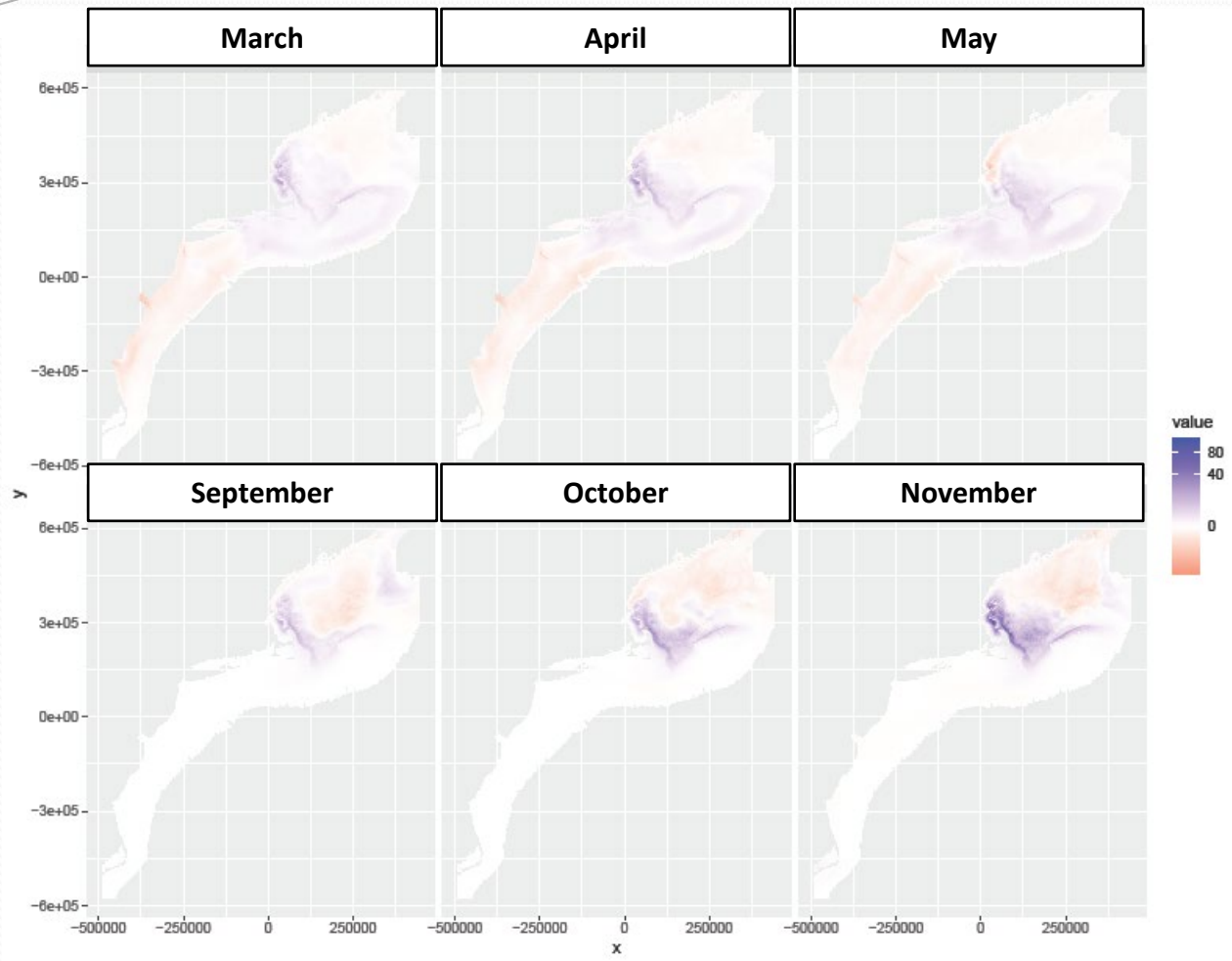
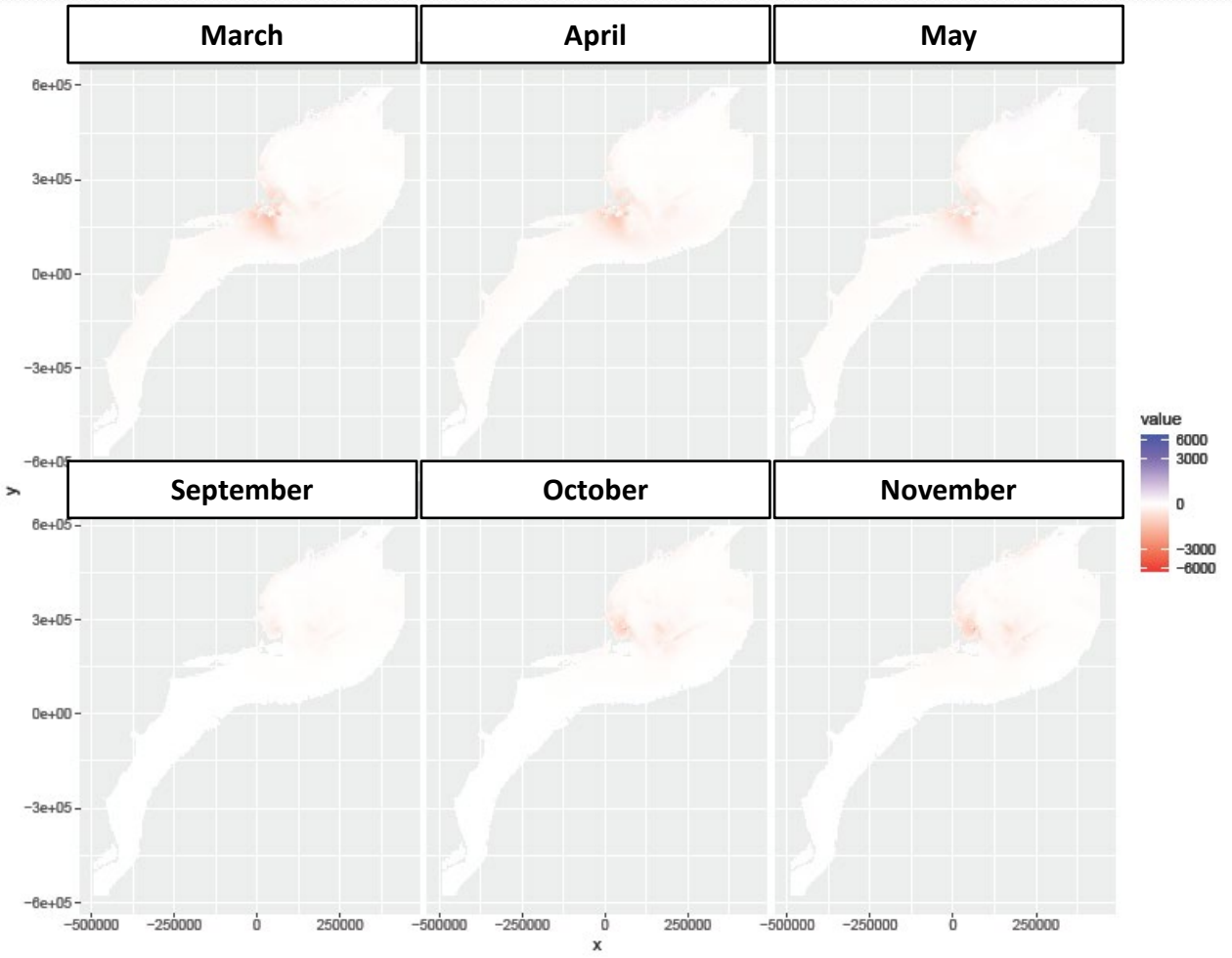


Atlantic herring - adult



Atlantic herring - juvenile

Smooth terms

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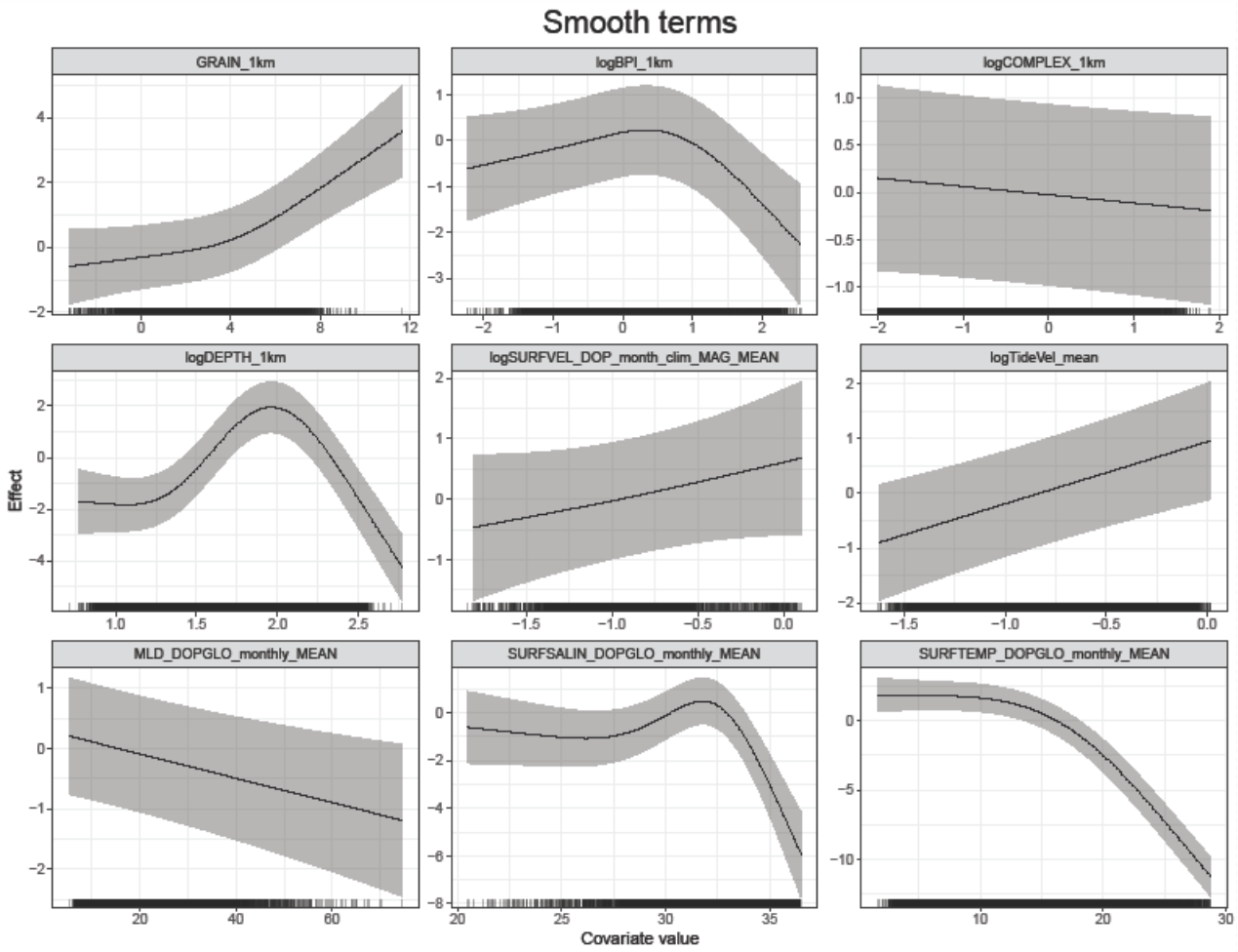
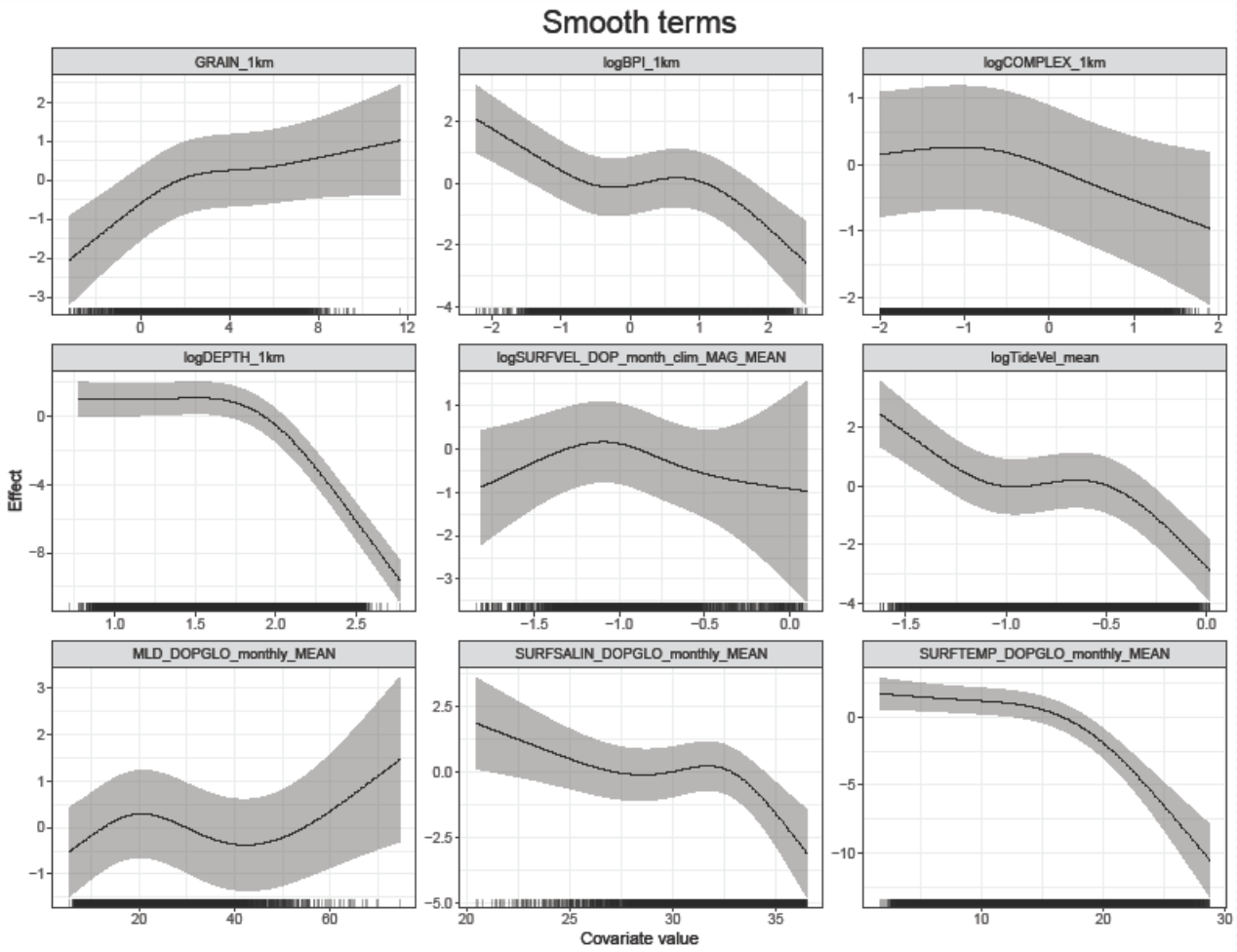


Atlantic herring - adult



Atlantic herring - juvenile

Note: Scale of y-axes differs between plots

20-year mean predicted density by month

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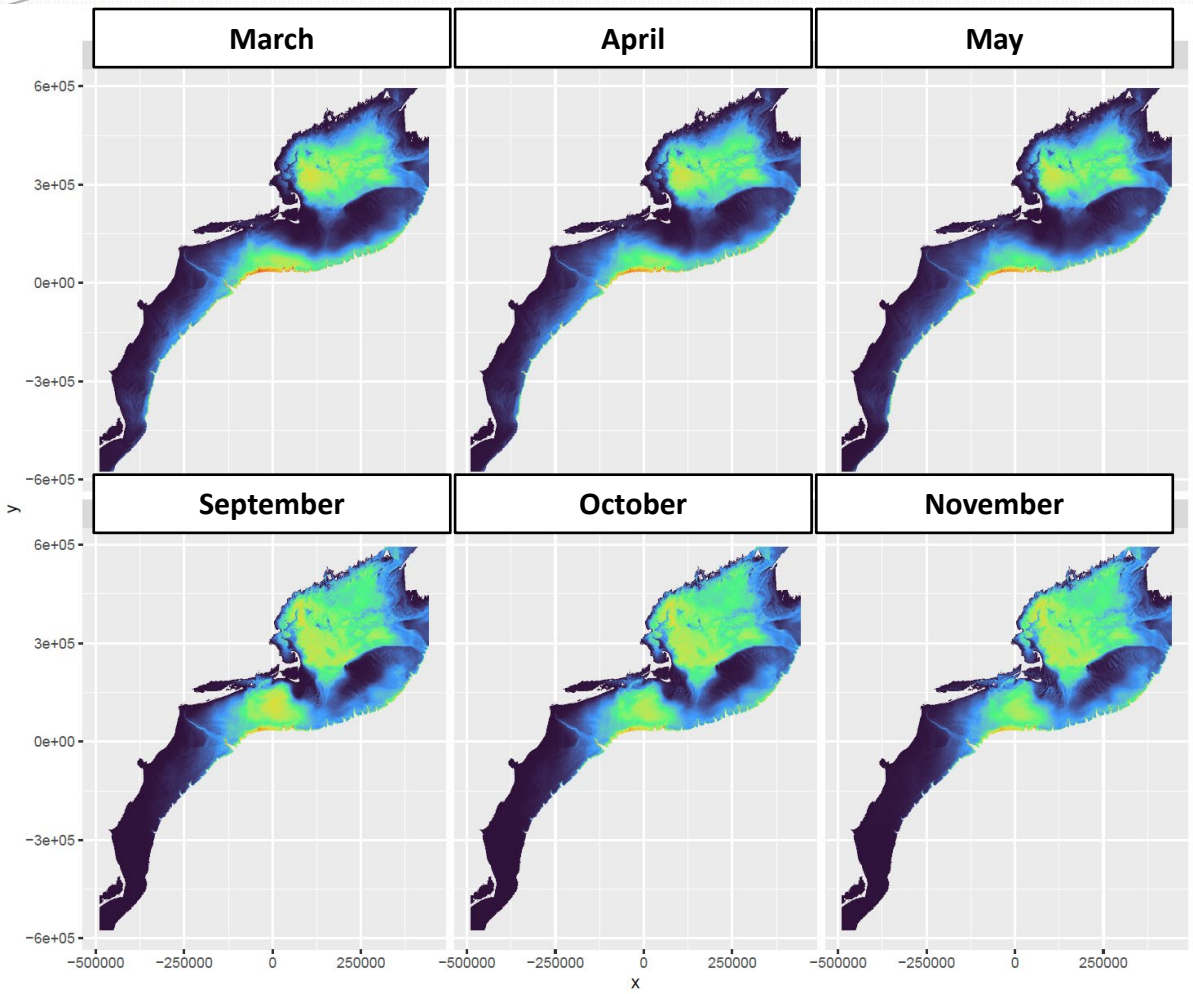
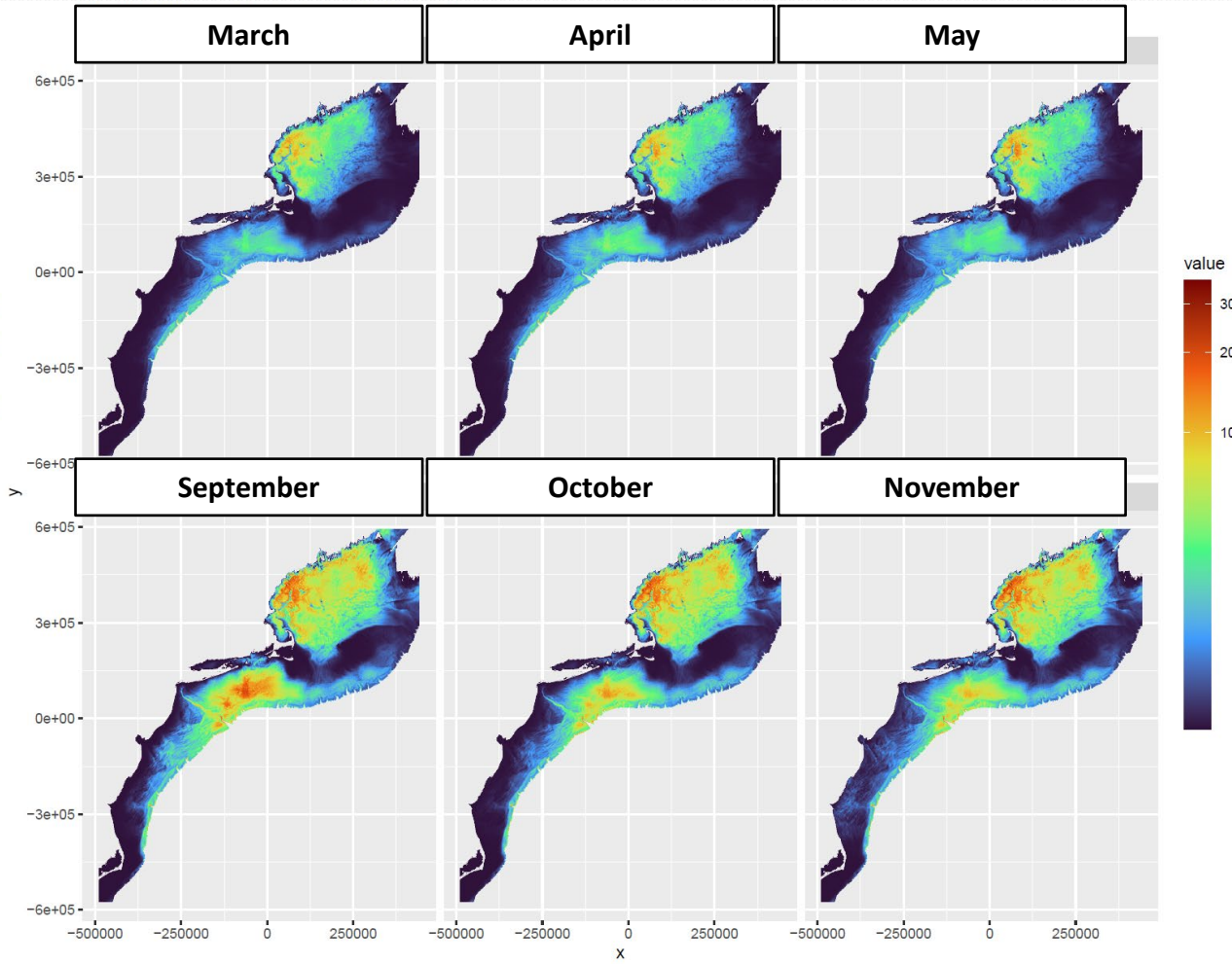


Monkfish - adult



Monkfish - juvenile

20-year trend by month

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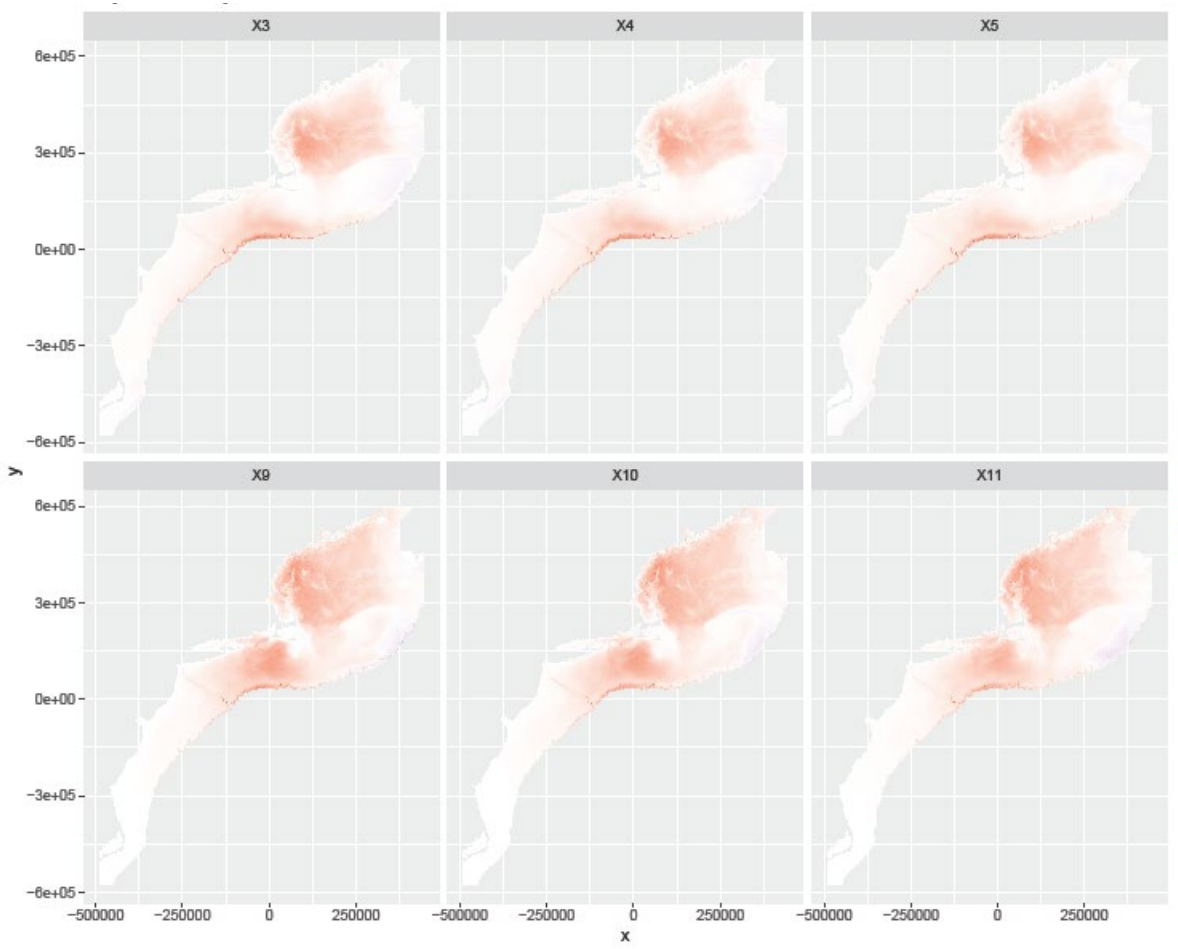
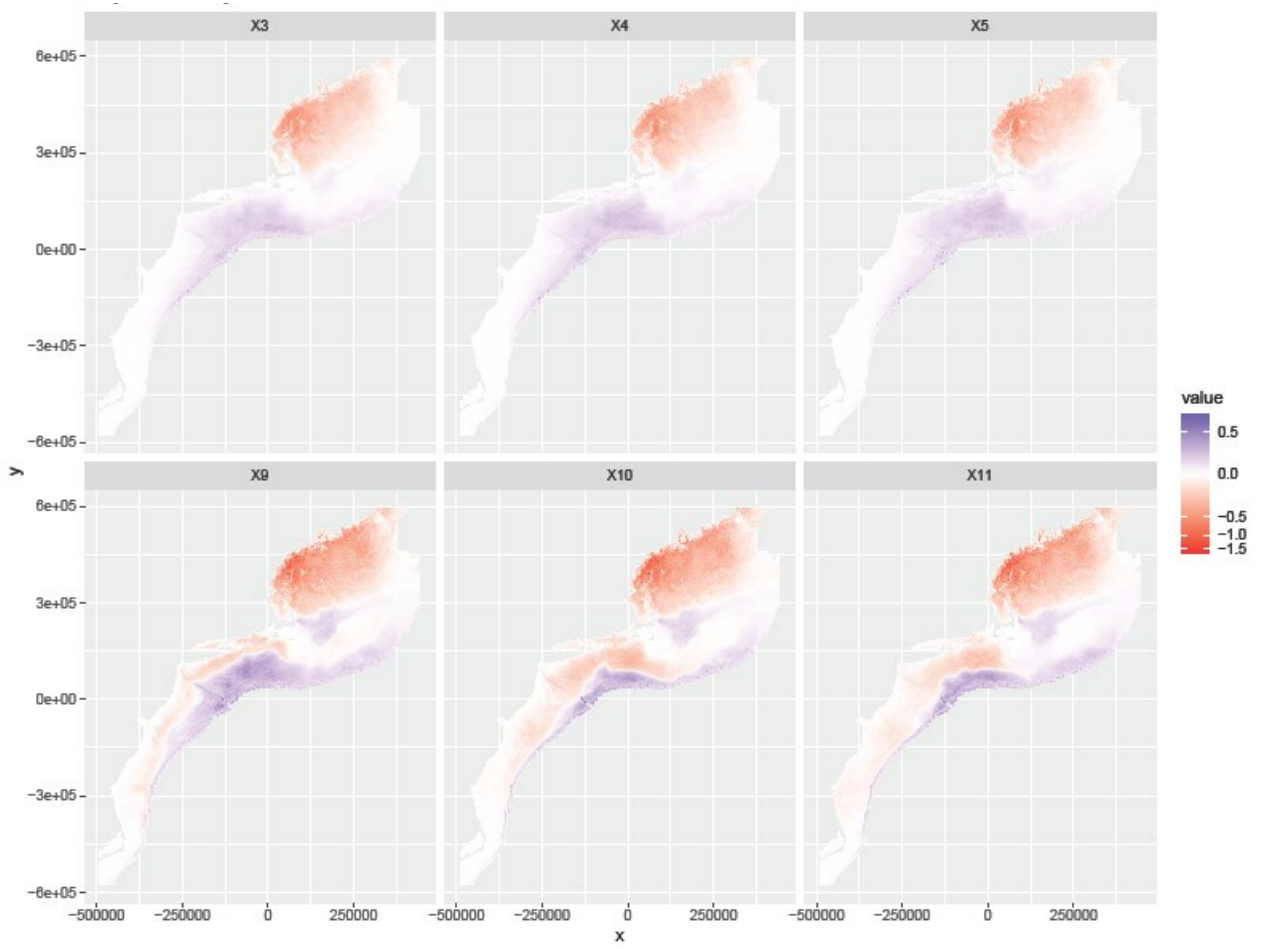


Monkfish - adult



Monkfish - juvenile

Smooth terms

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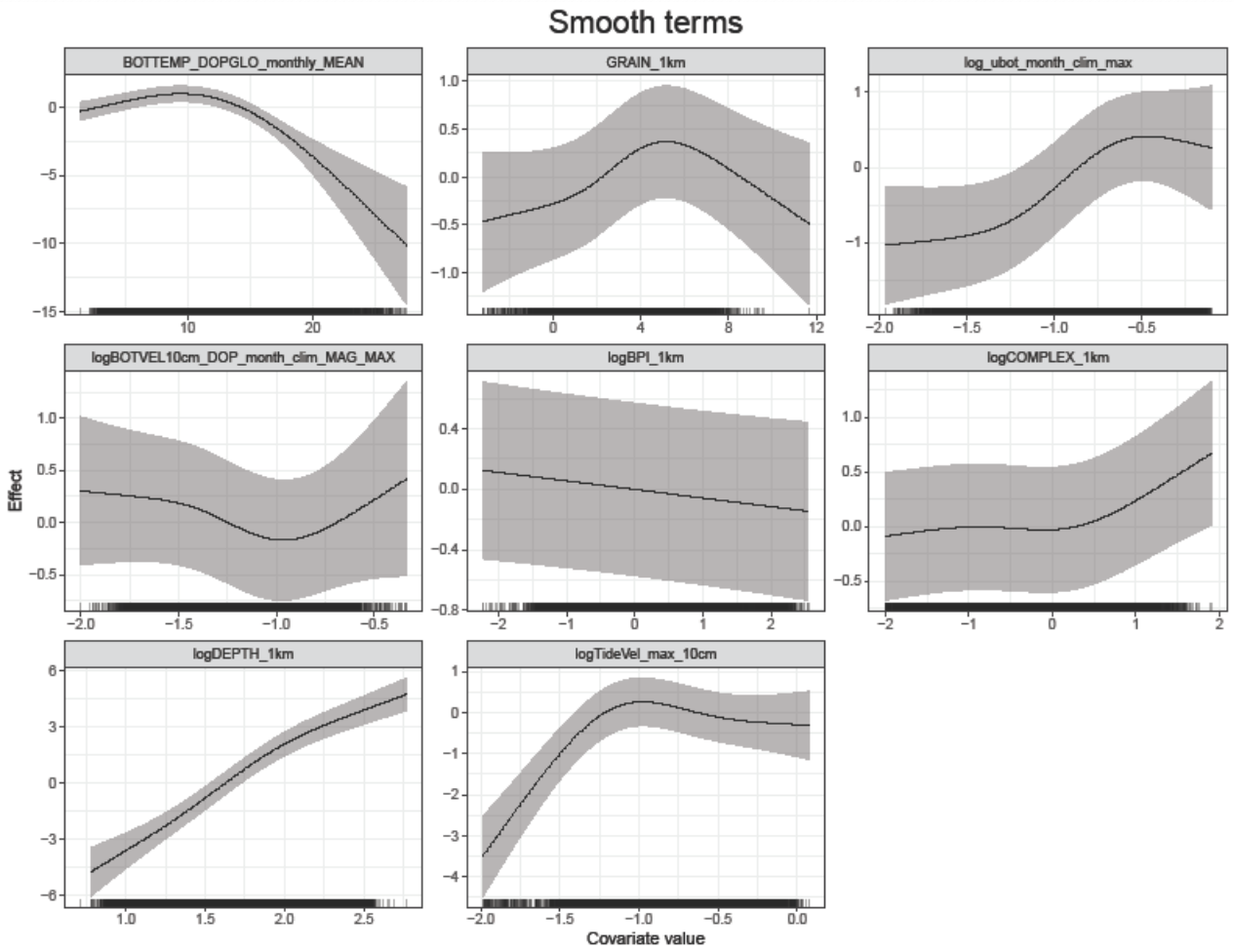
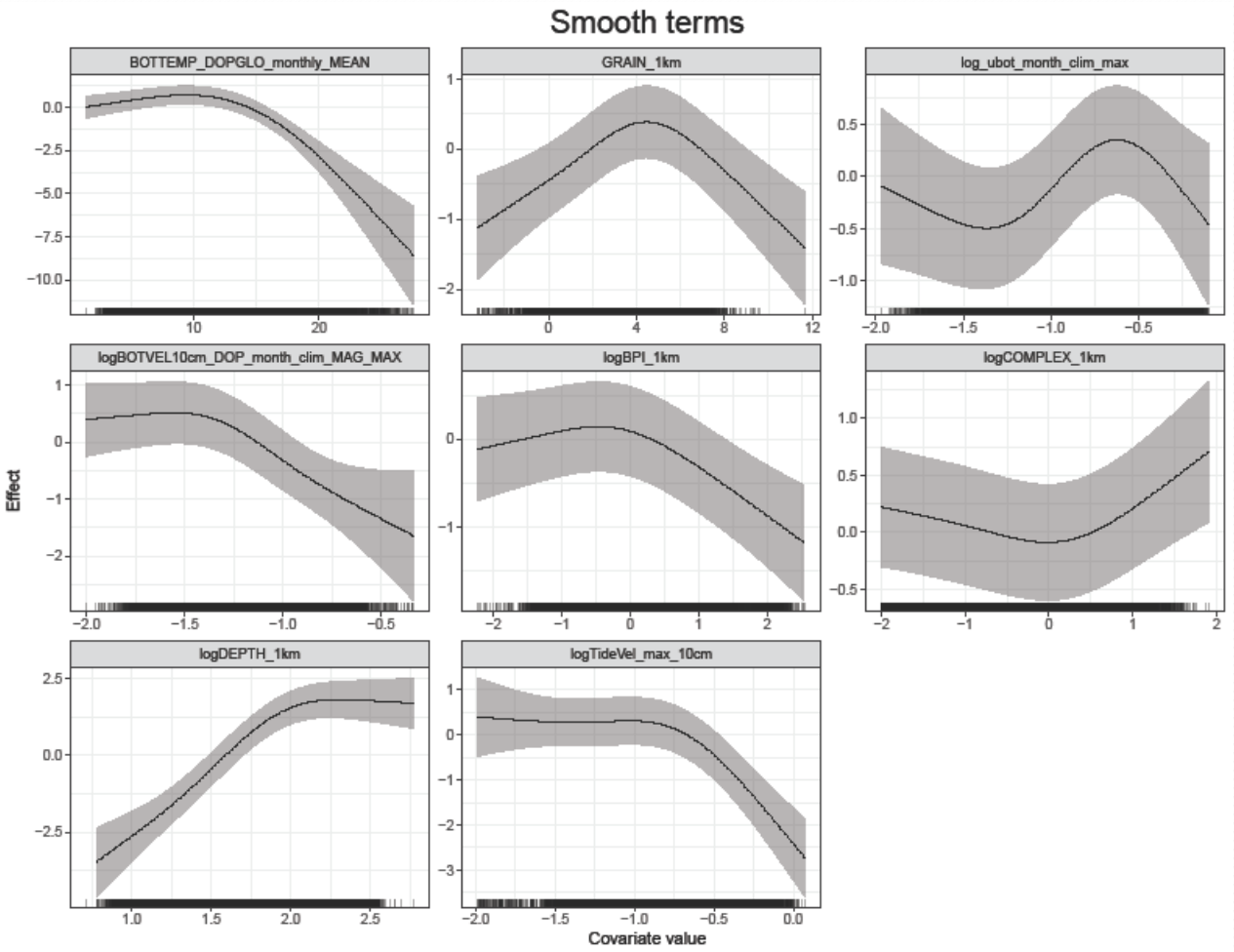


Monkfish - adult



Monkfish - juvenile

Note: Scale of y-axes differs between plots

20-year mean predicted density by month

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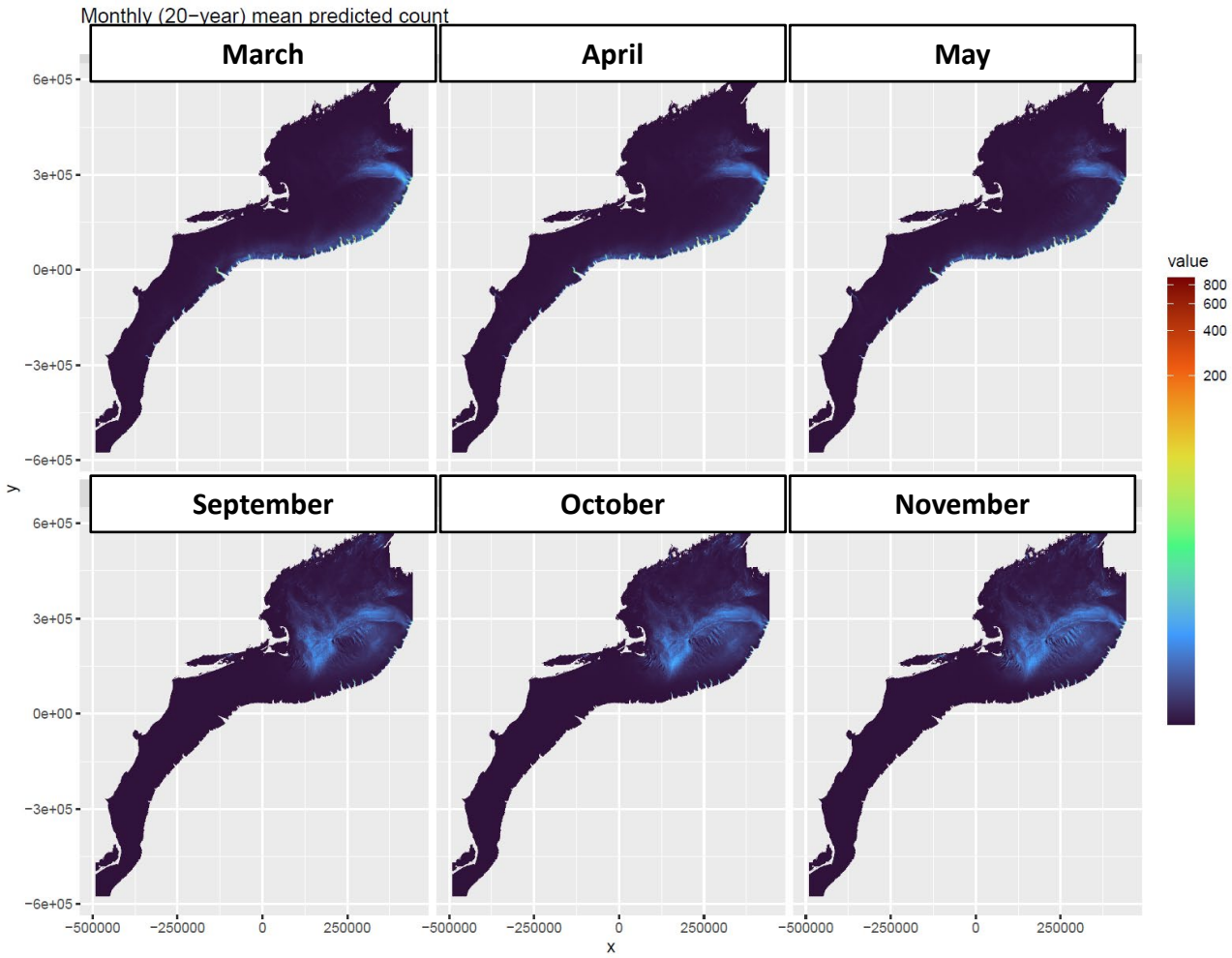
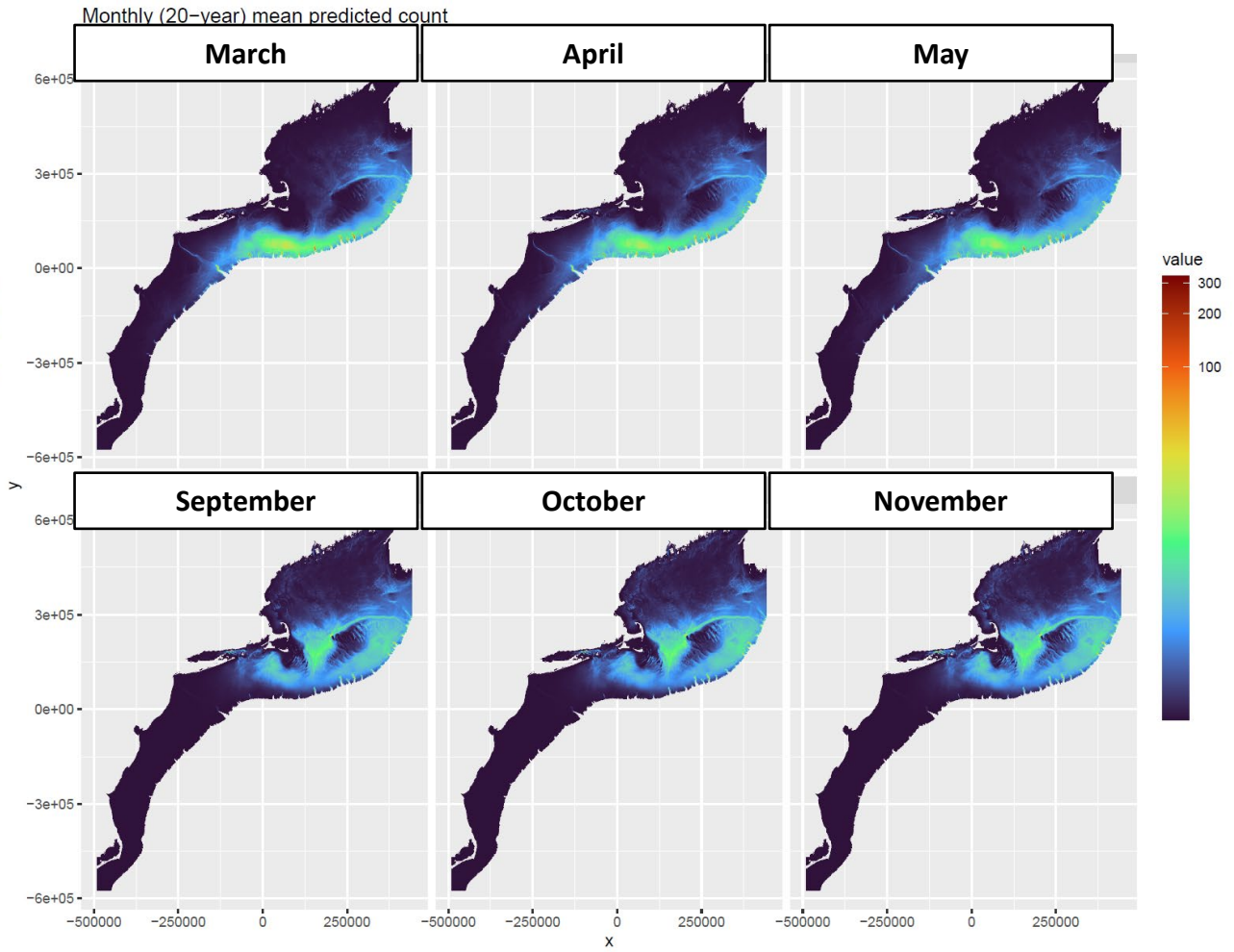


Barndoor skate - adult



Barndoor skate - juvenile

20-year trend by month

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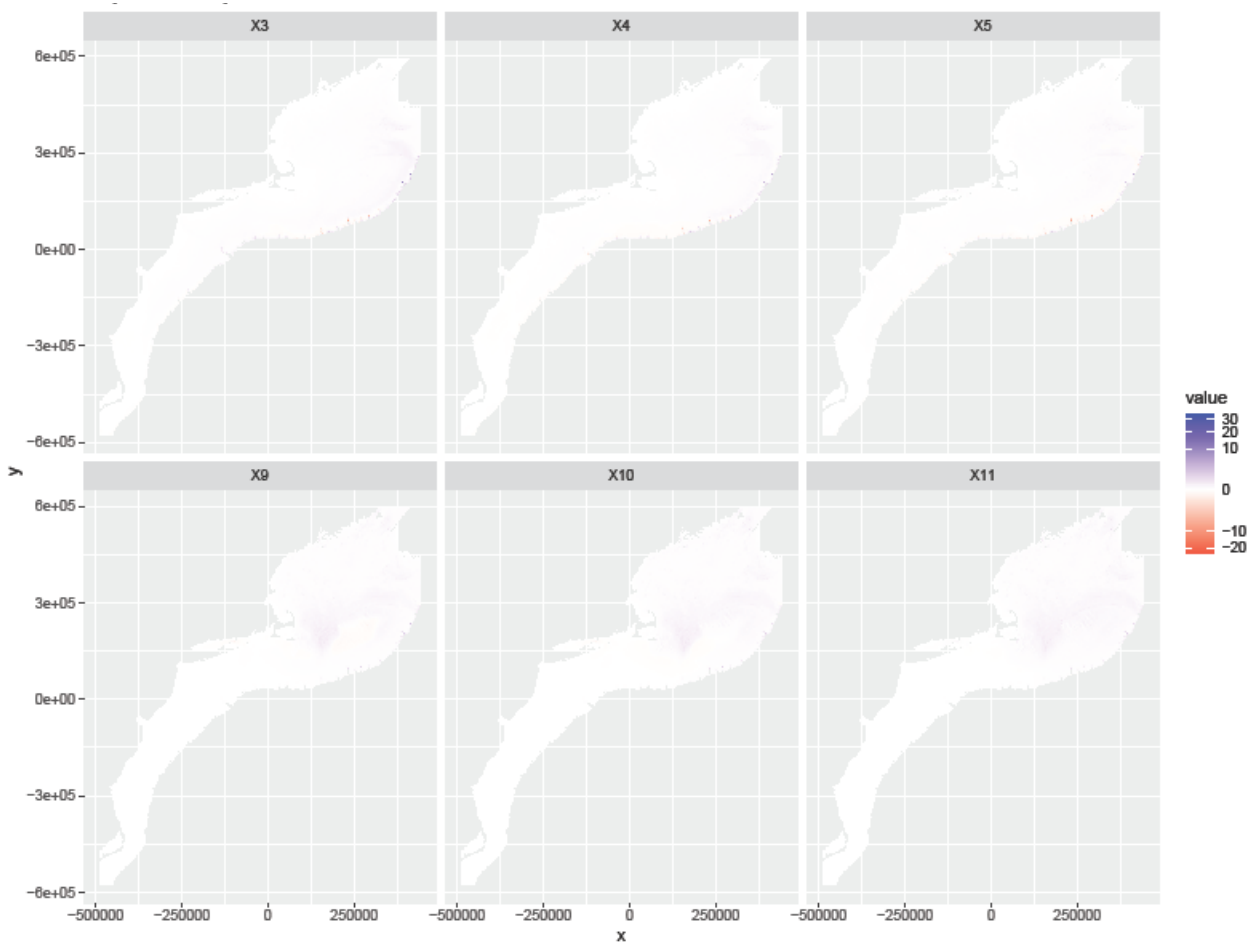
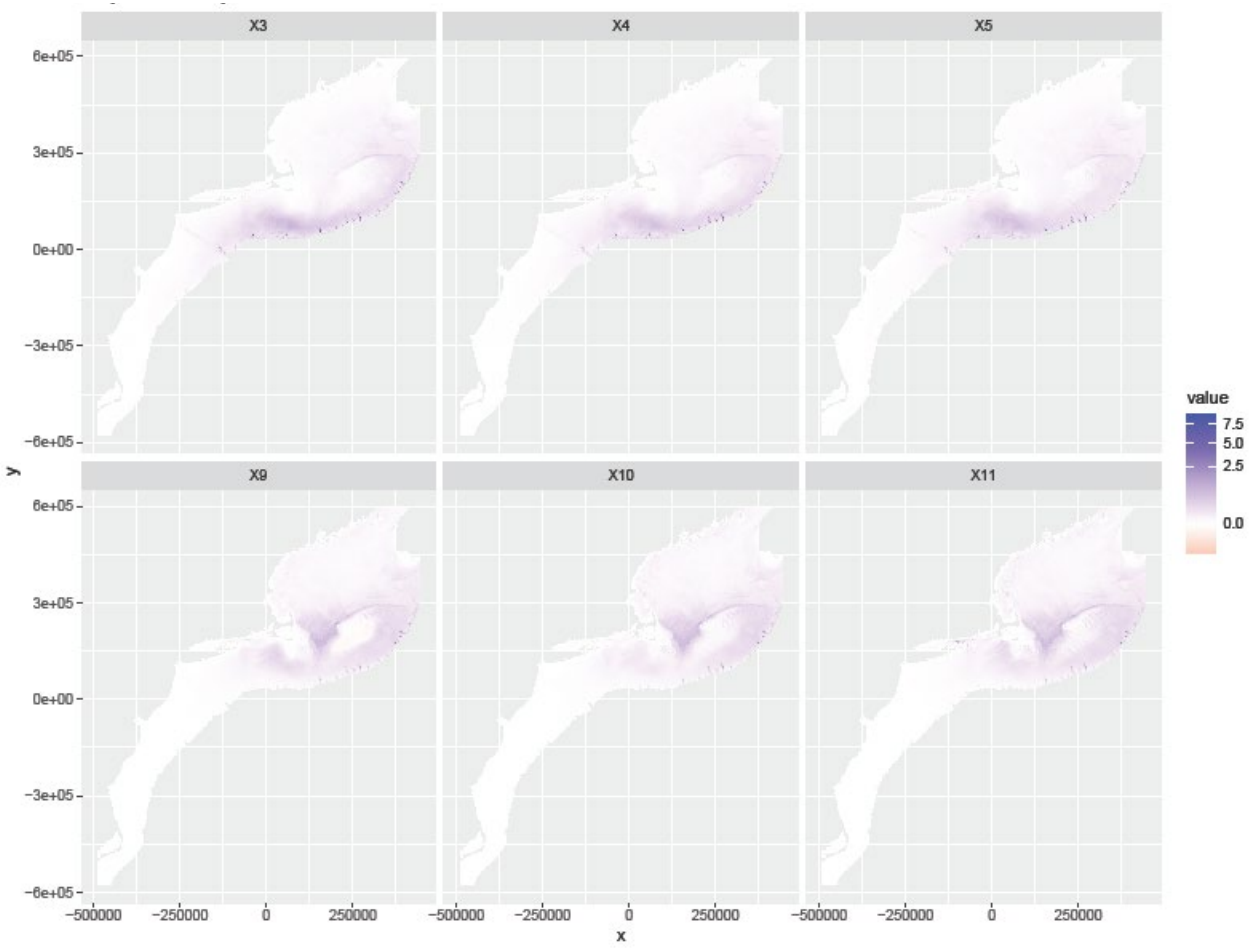


Barndoor skate - adult



Barndoor skate - juvenile

Smooth terms

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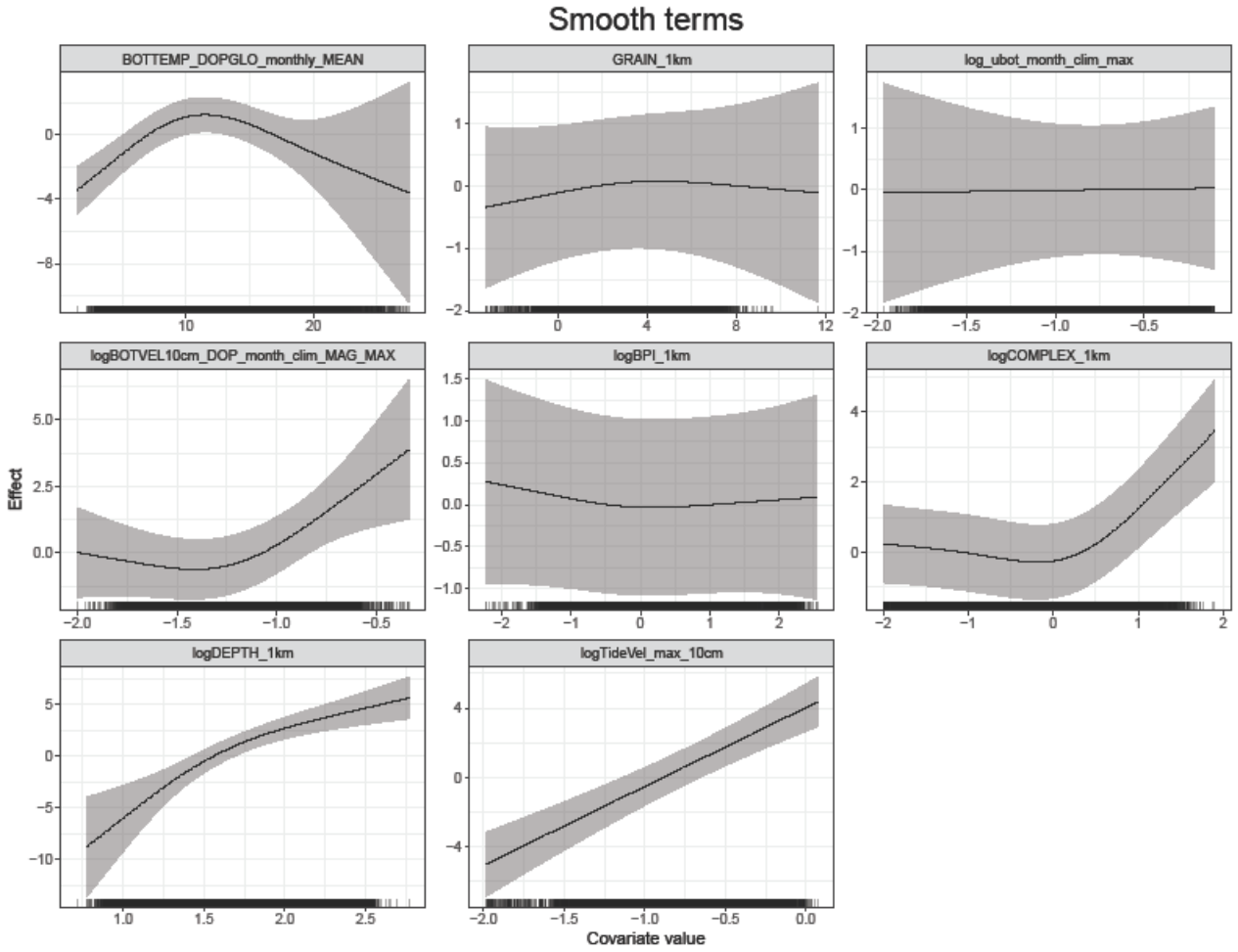
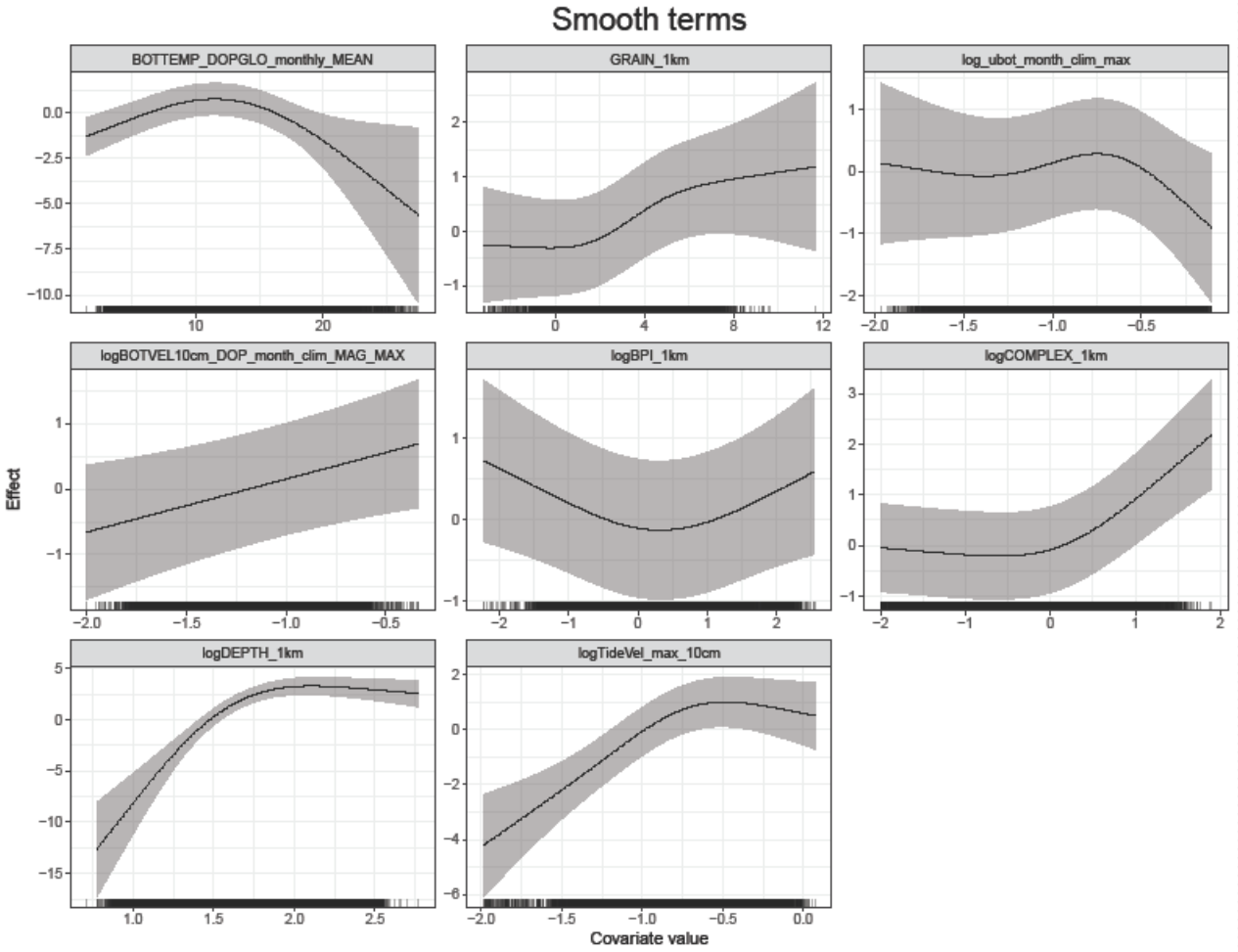


Barndoor skate - adult



Barndoor skate - juvenile

Note: Scale of y-axes differs between plots

20-year mean predicted density by month

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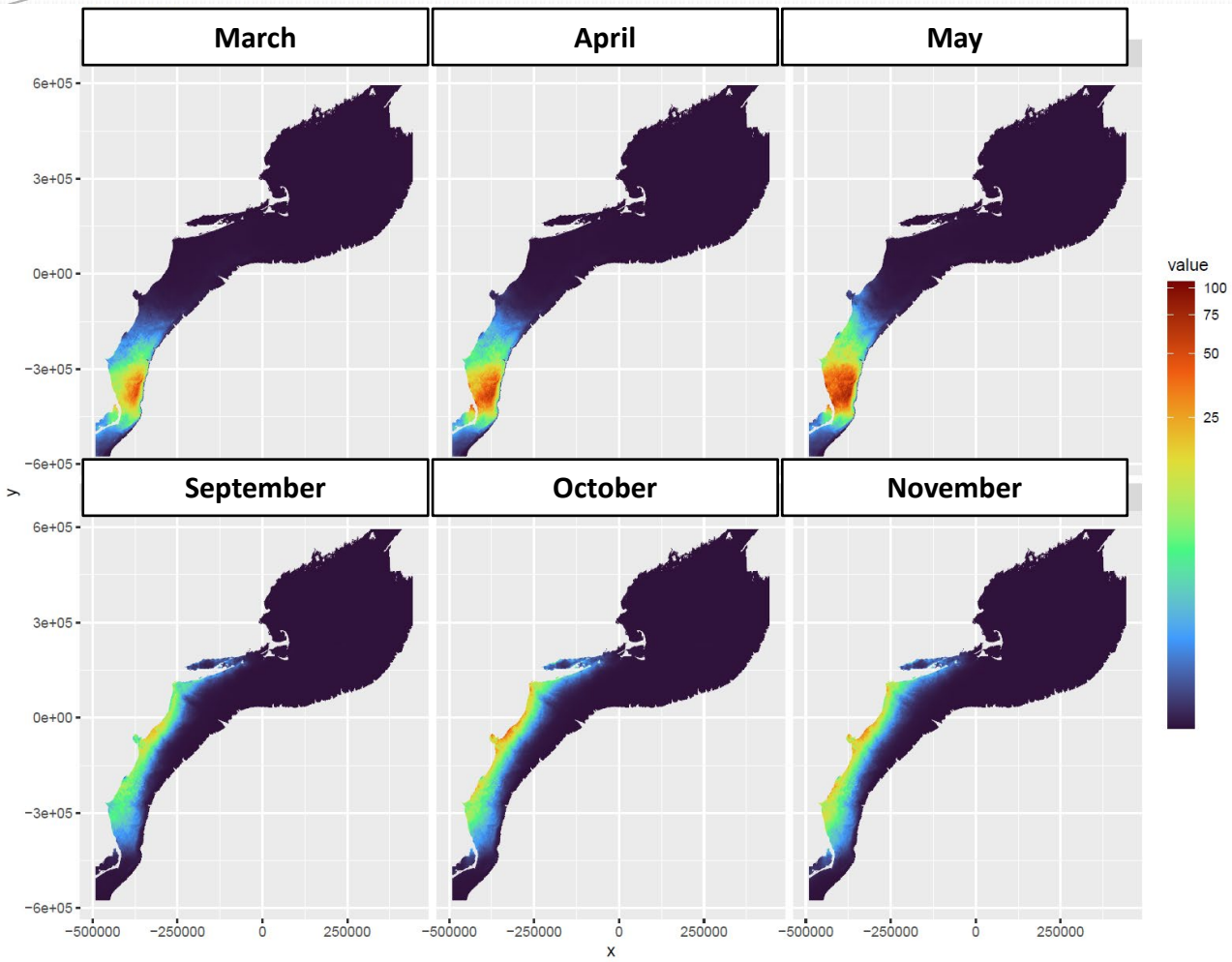
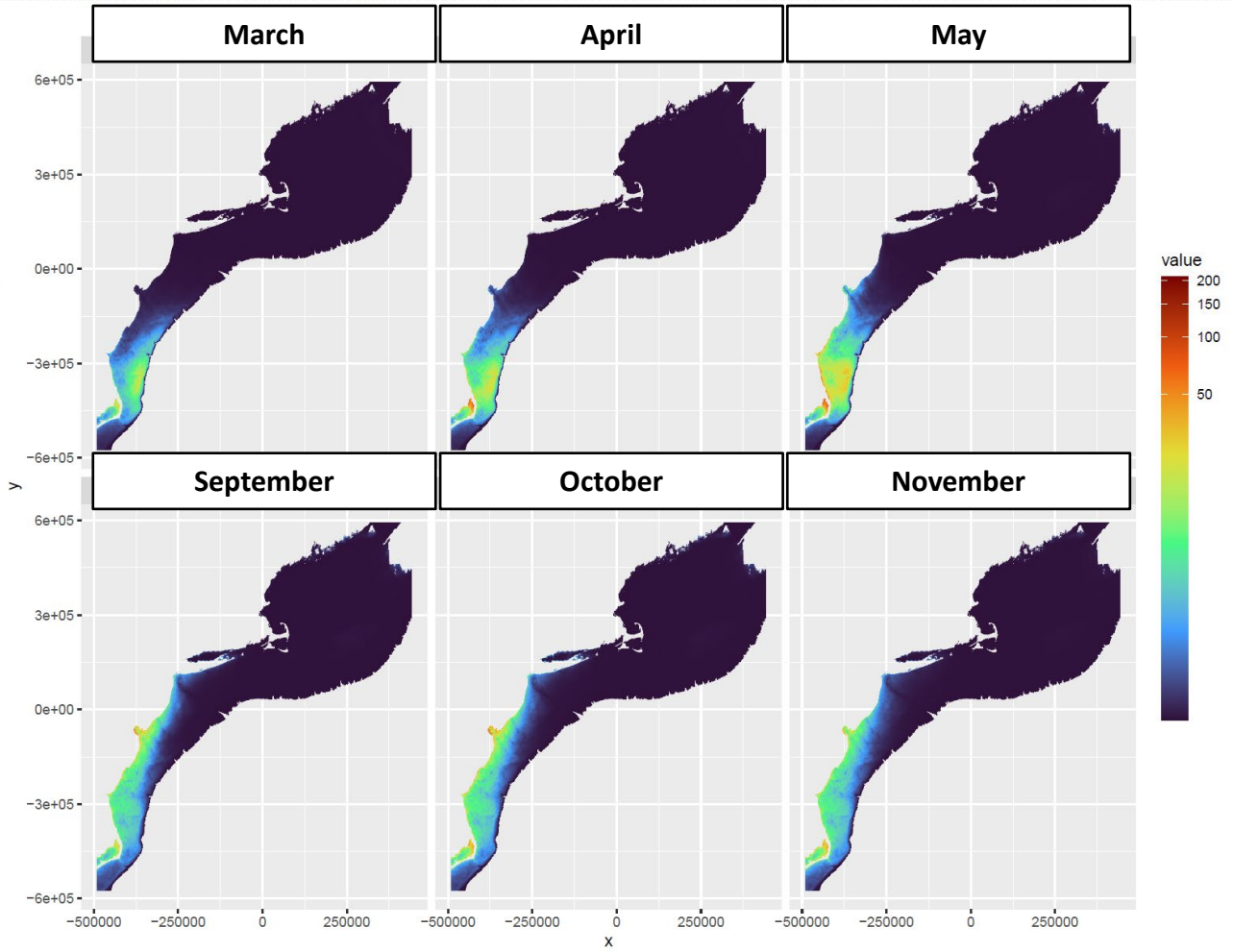


Clearnose skate - adult



Clearnose skate - juvenile

20-year trend by month

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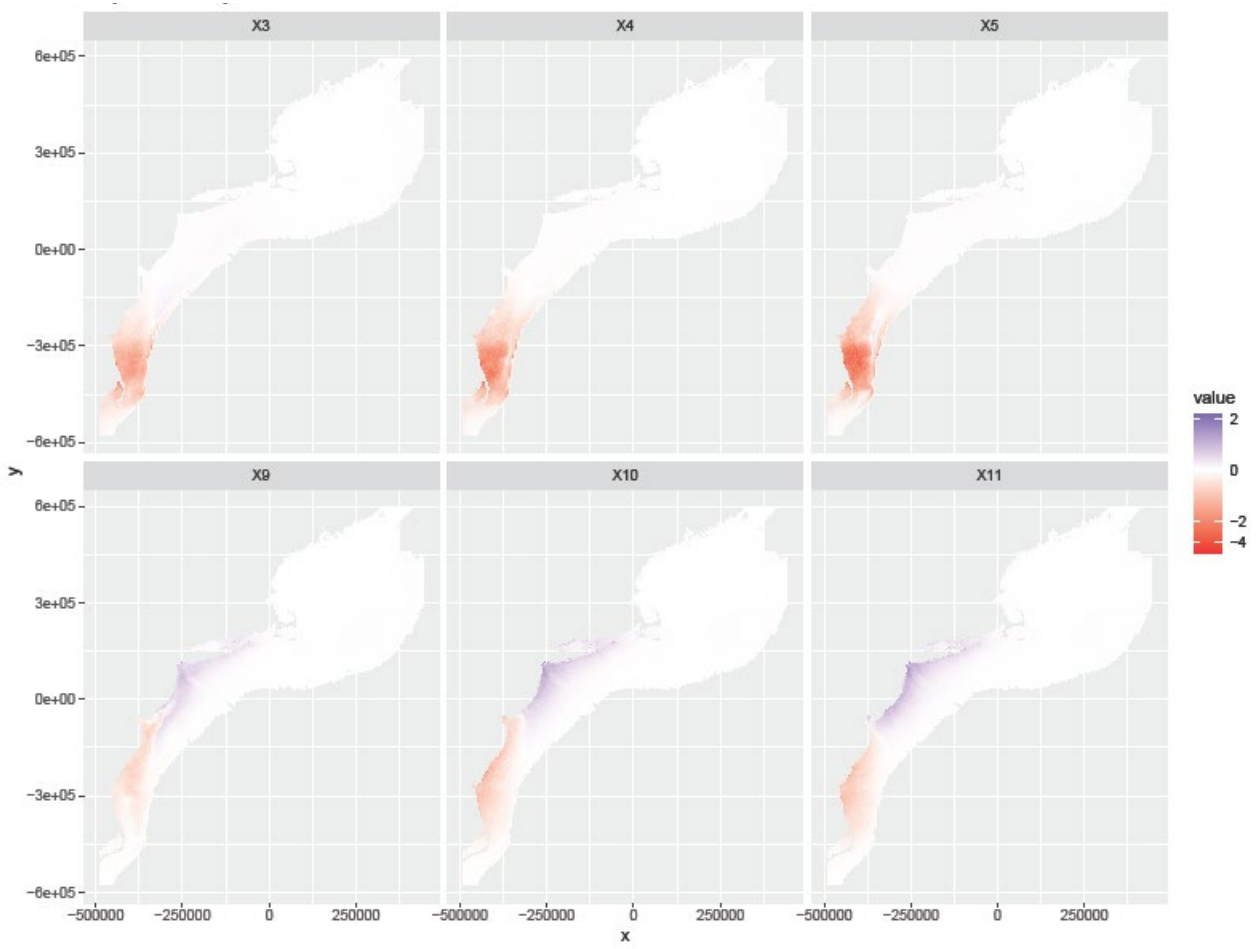
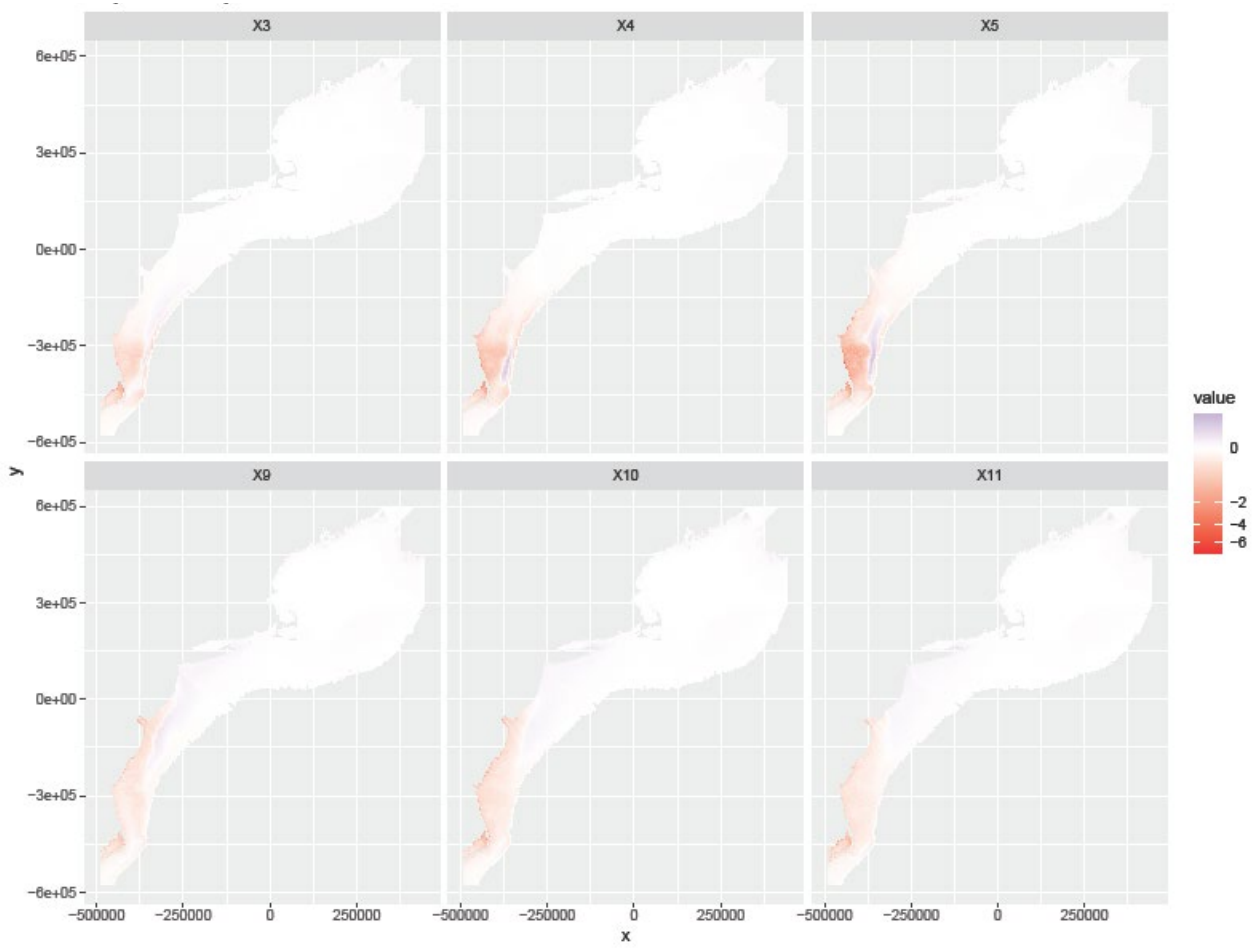


Clearnose skate - adult



Clearnose skate - juvenile

Smooth terms

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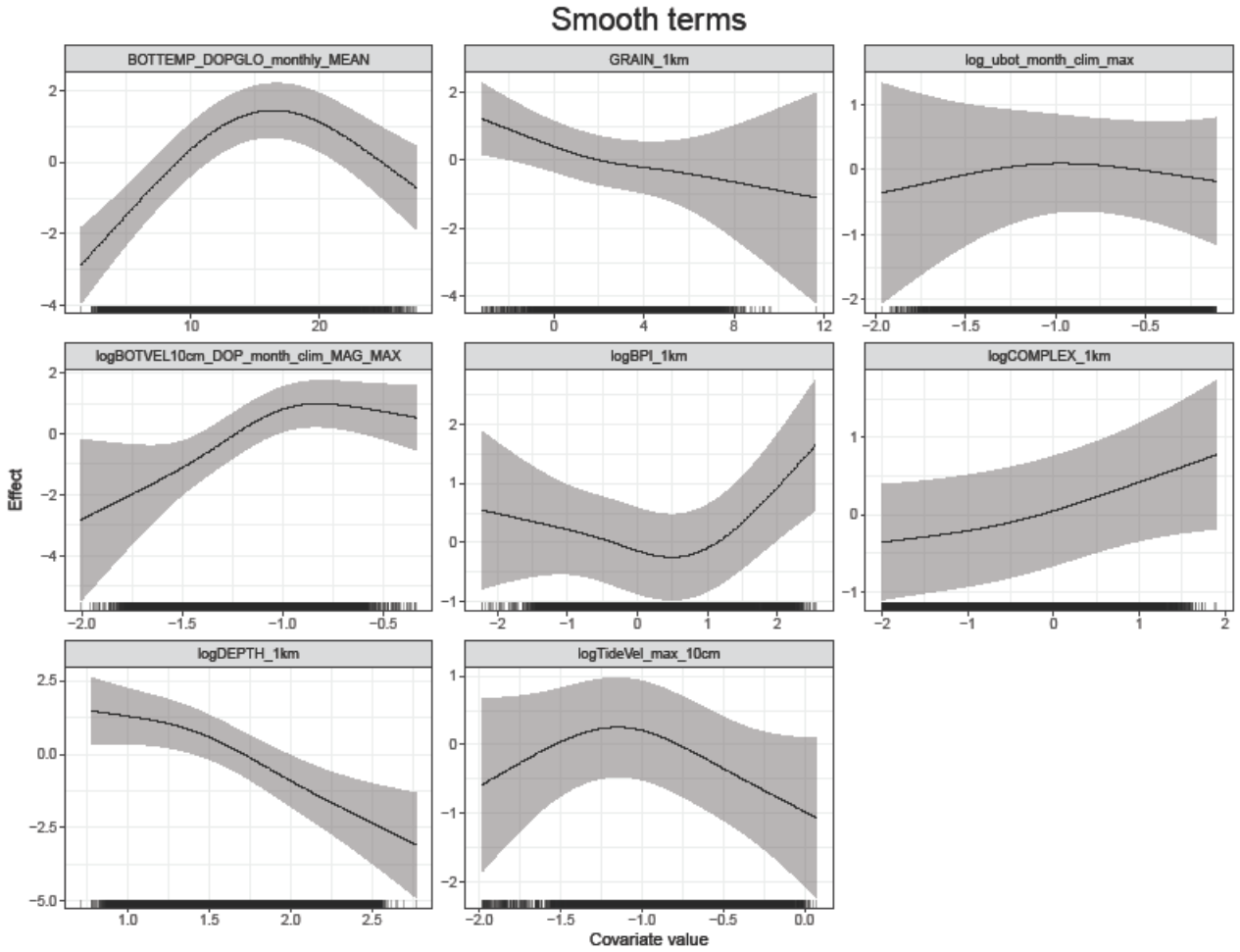
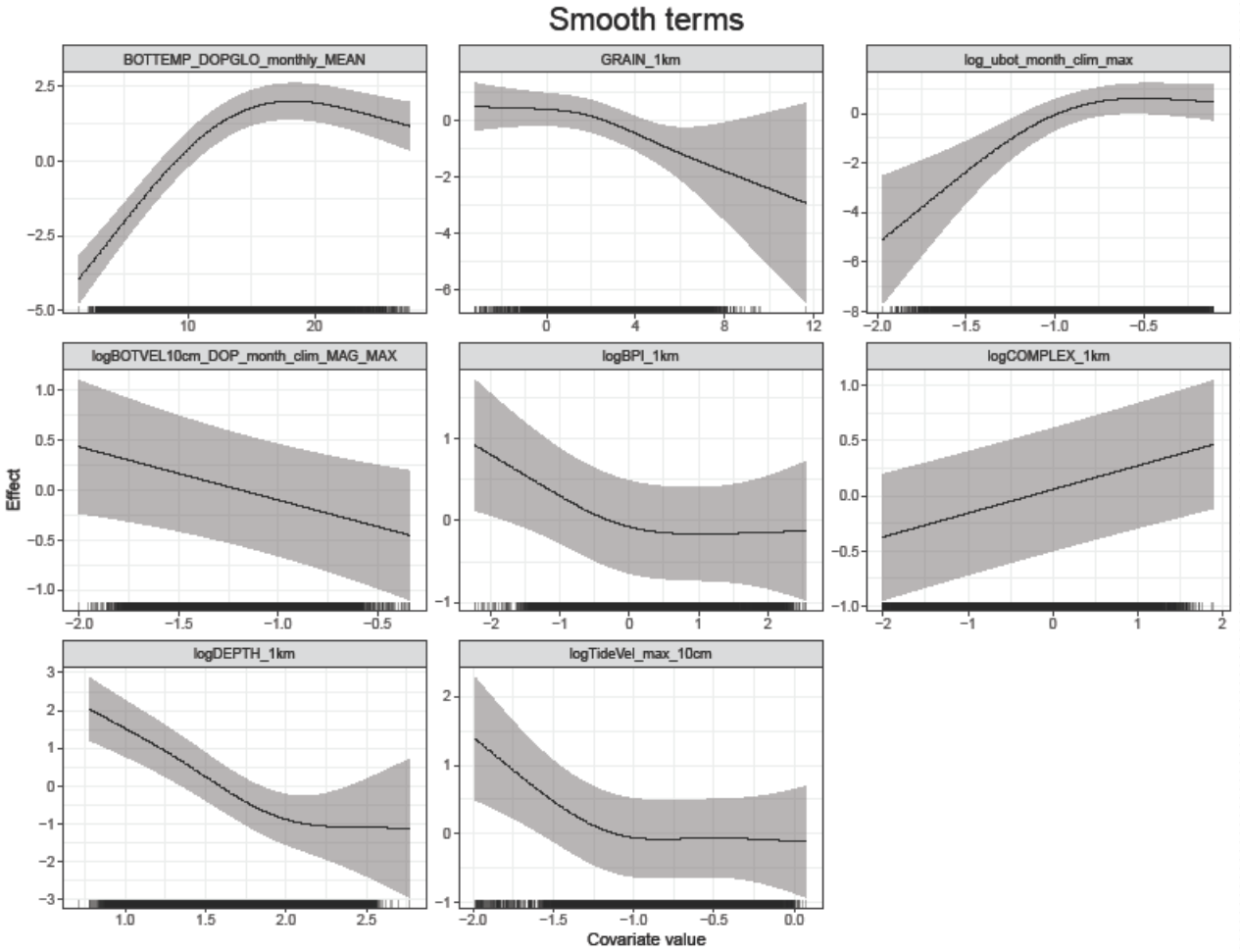


Clearnose skate - adult



Clearnose skate - juvenile

Note: Scale of y-axes differs between plots

20-year mean predicted density by month

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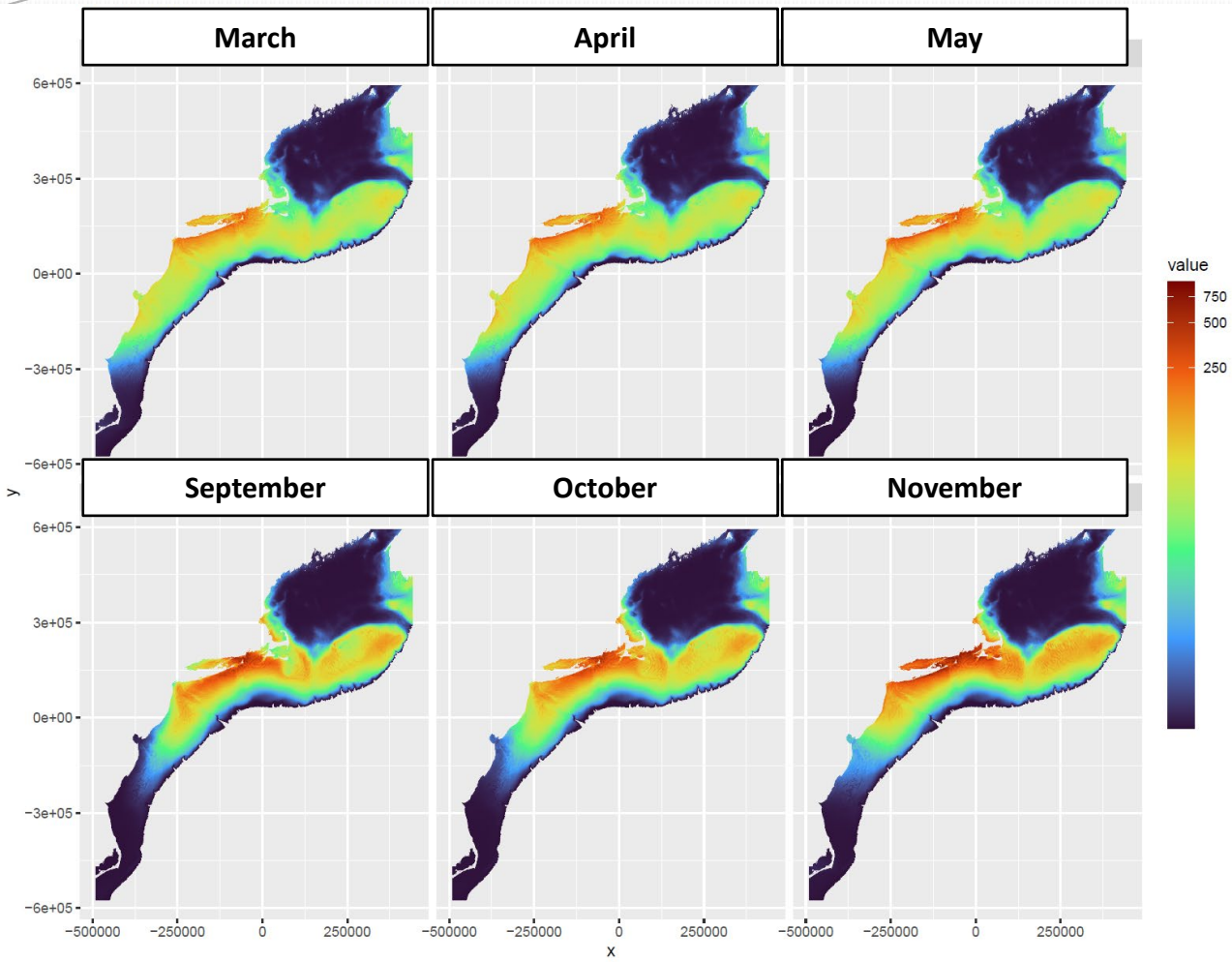
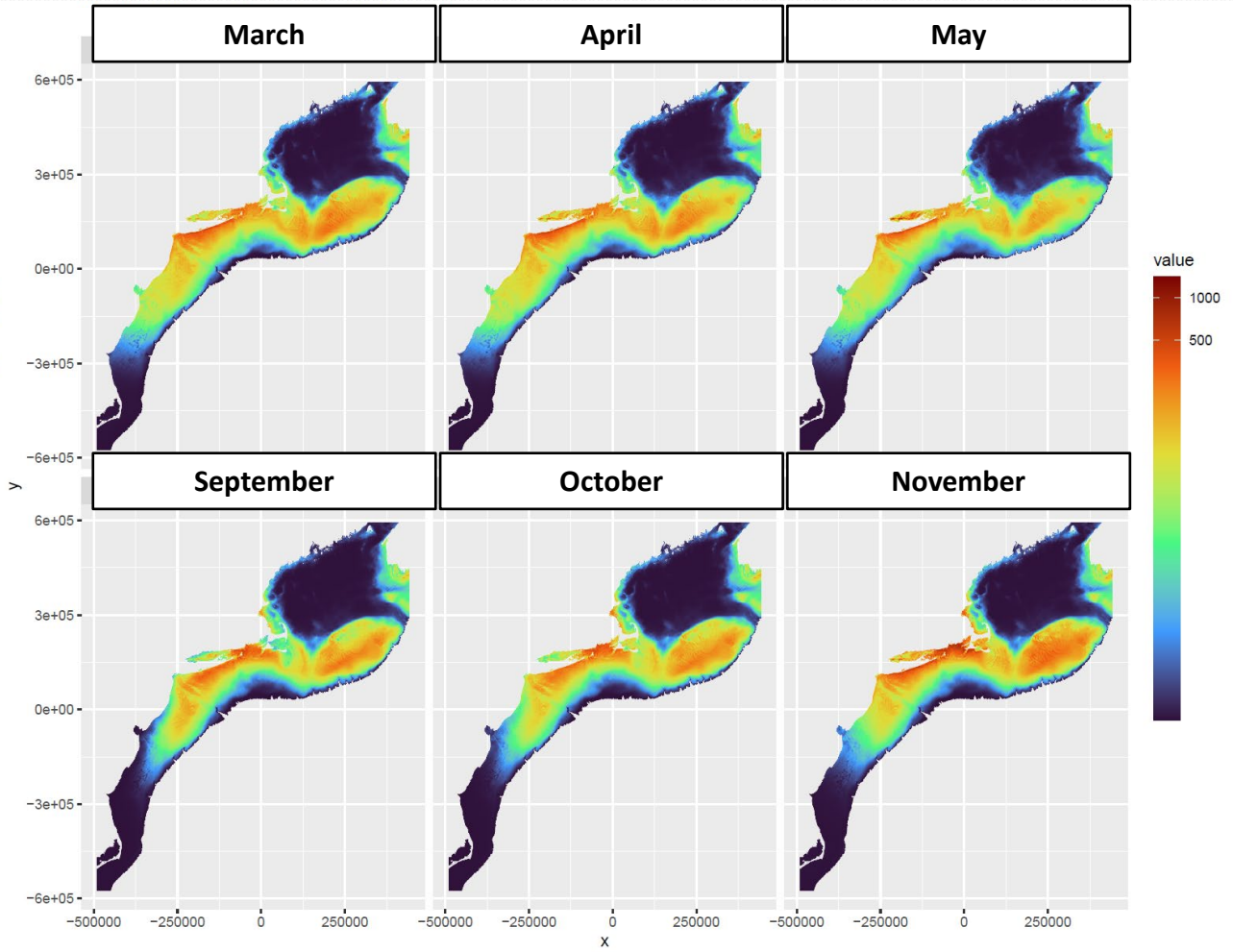


Little skate - adult



Little skate - juvenile

20-year trend by month

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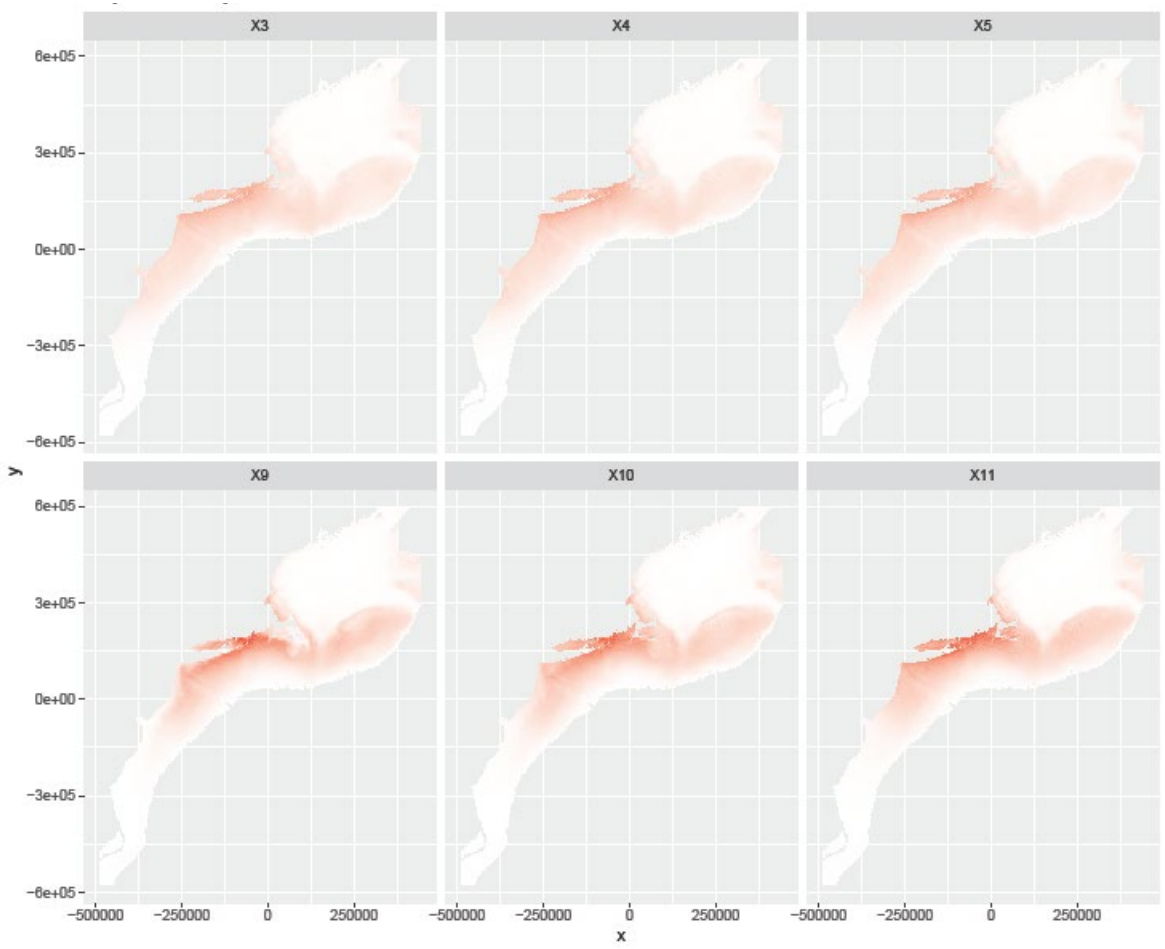
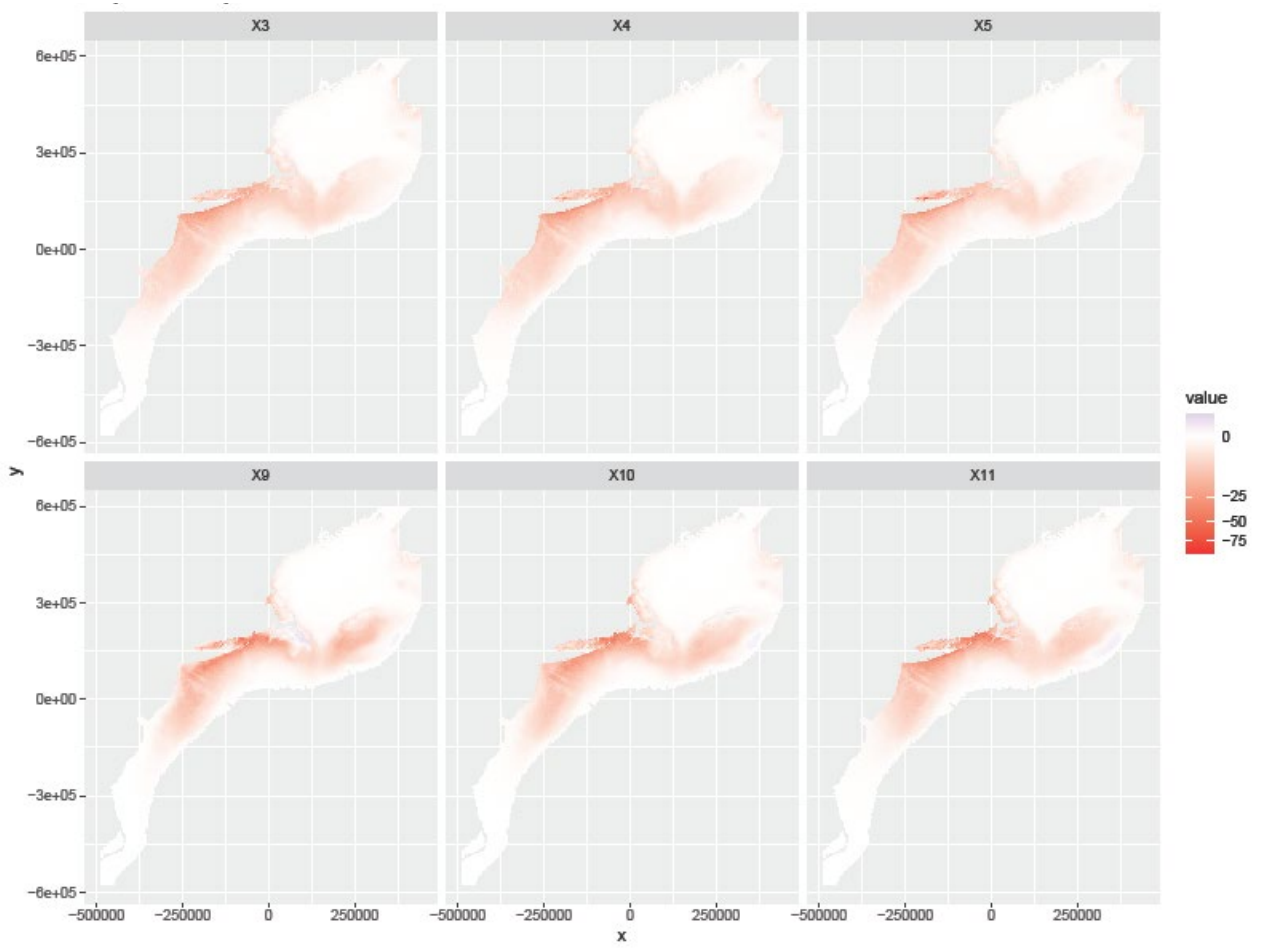


Little skate - adult



Little skate - juvenile

Smooth terms

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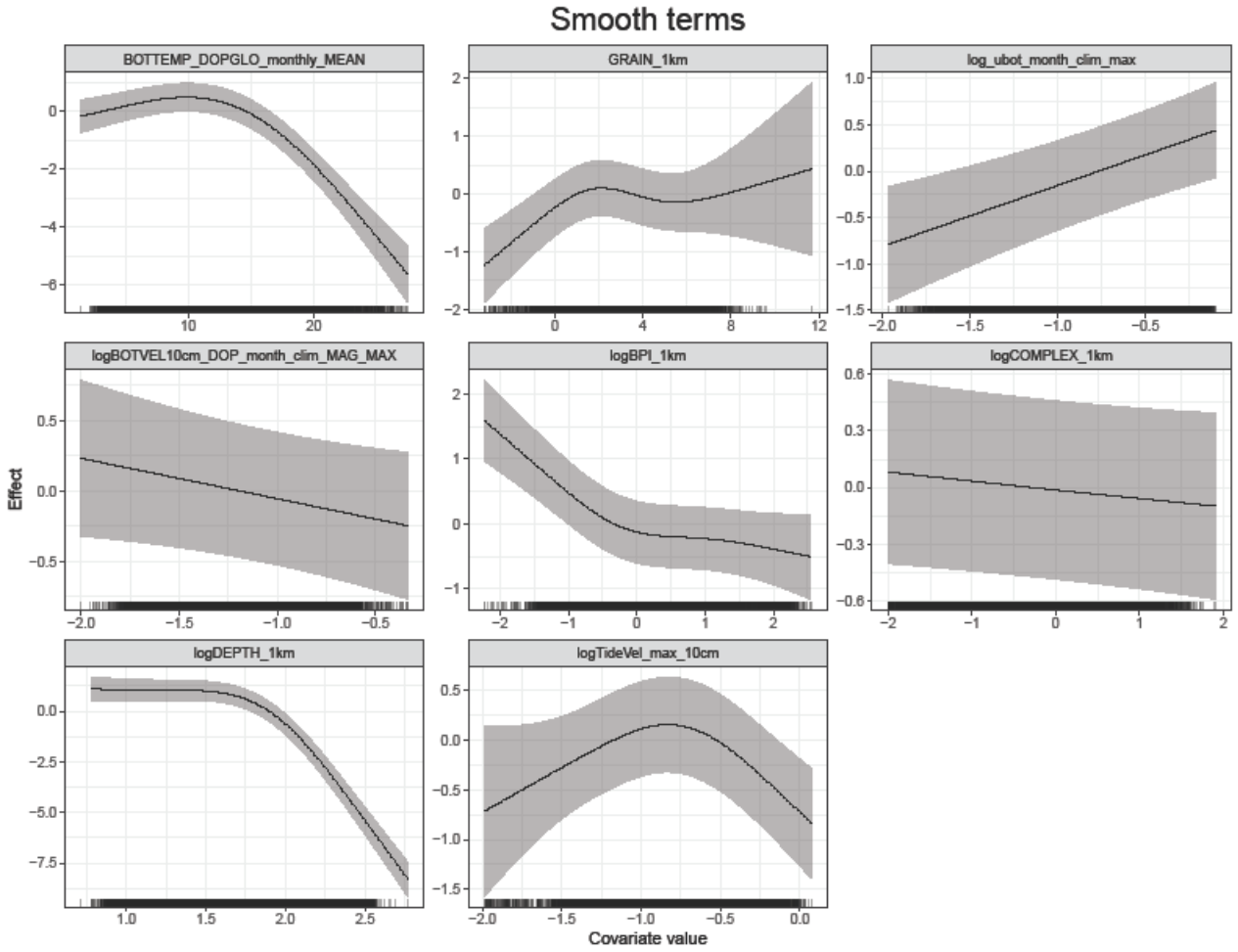
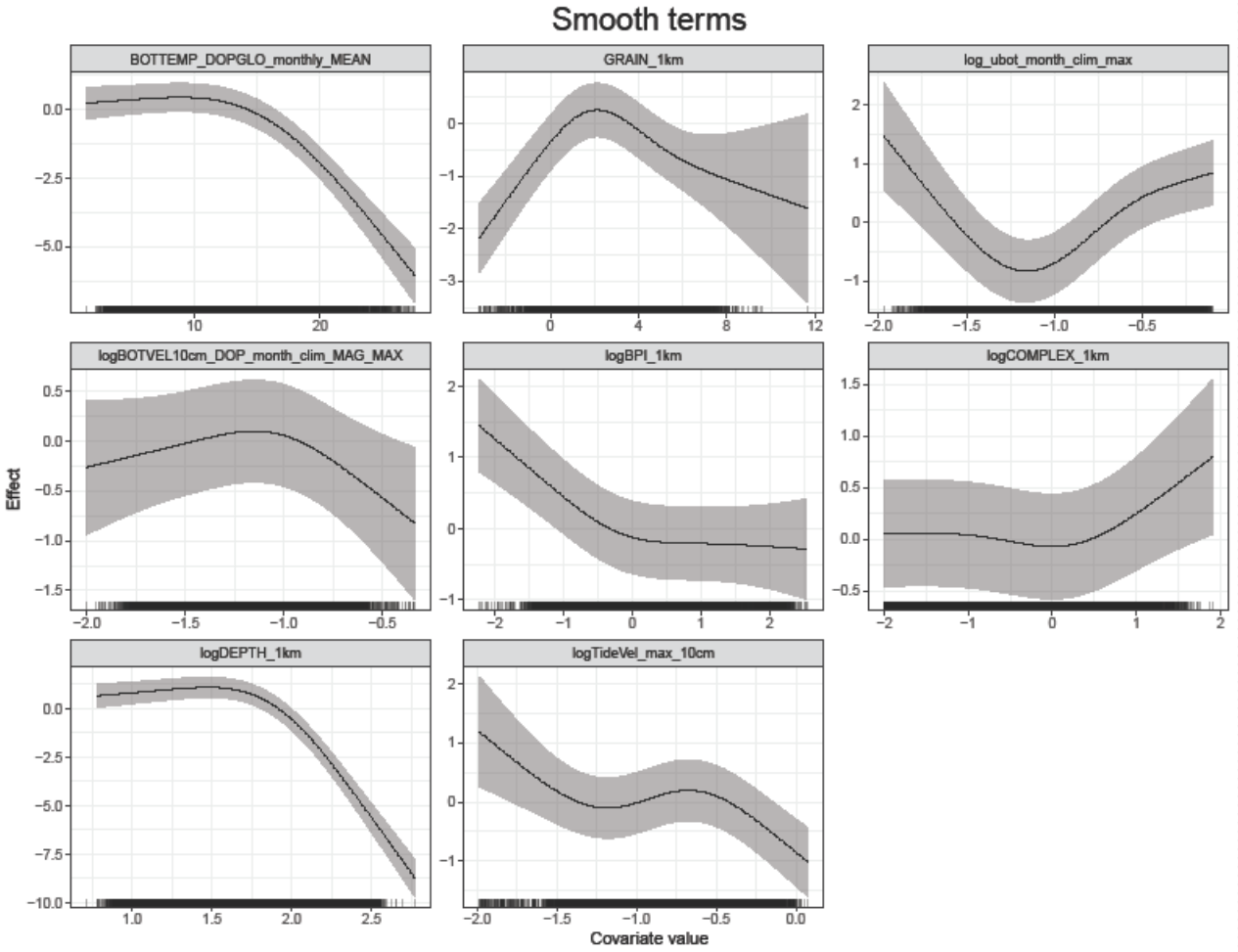


Little skate - adult



Little skate - juvenile

Note: Scale of y-axes differs between plots

20-year mean predicted density by month

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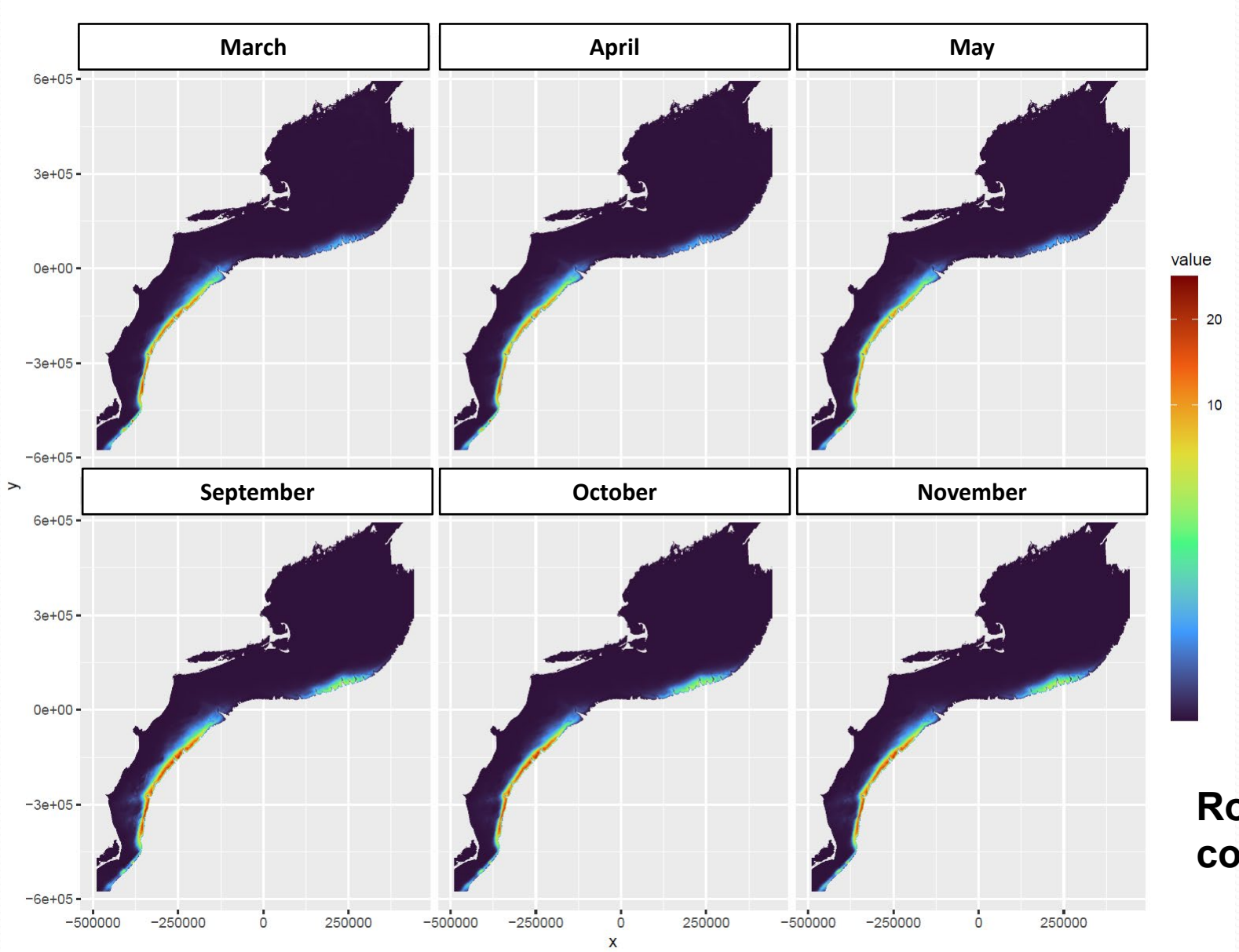

Rosette skate - combined

20-year trend by month

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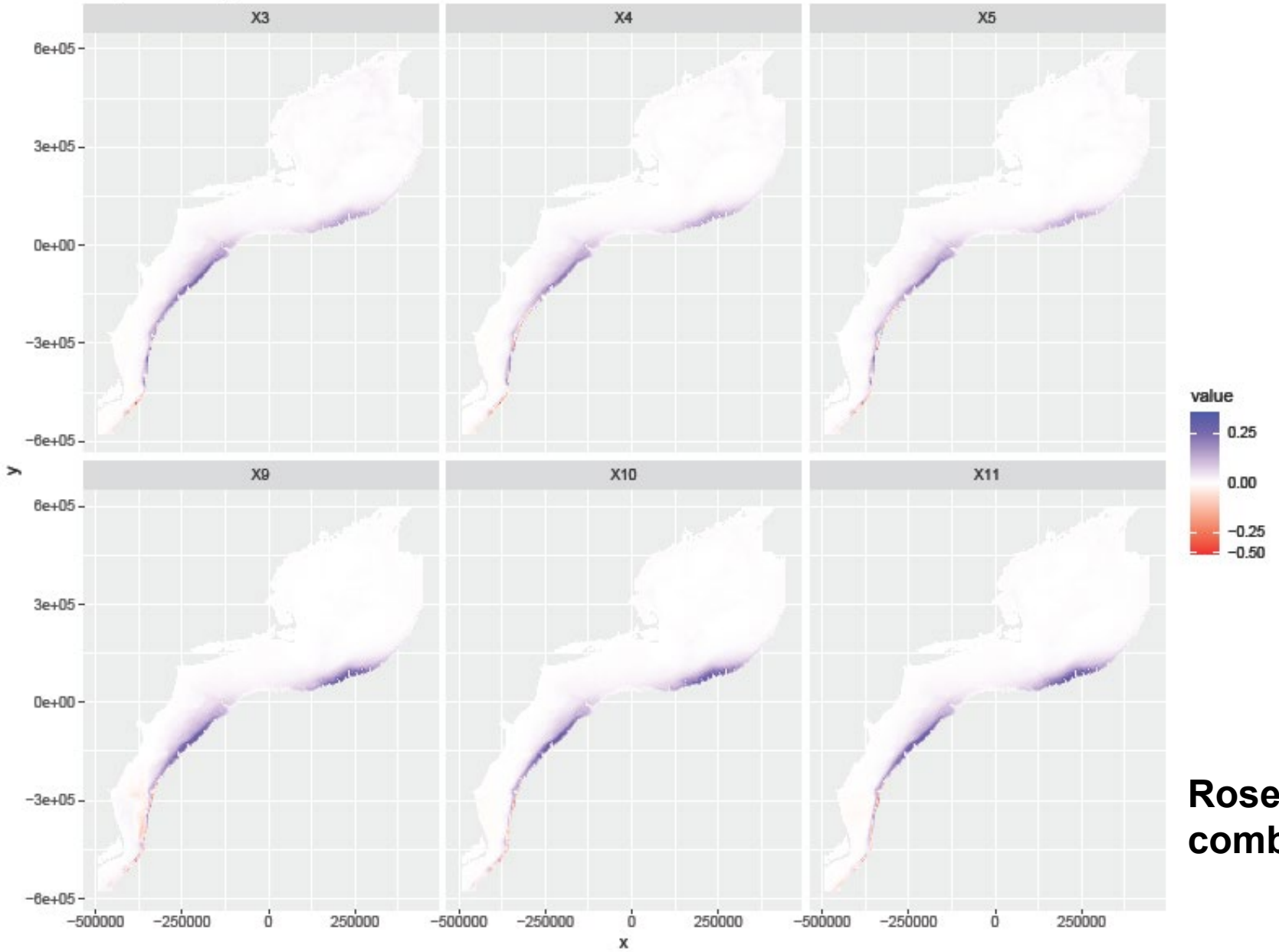

Rosette skate - combined

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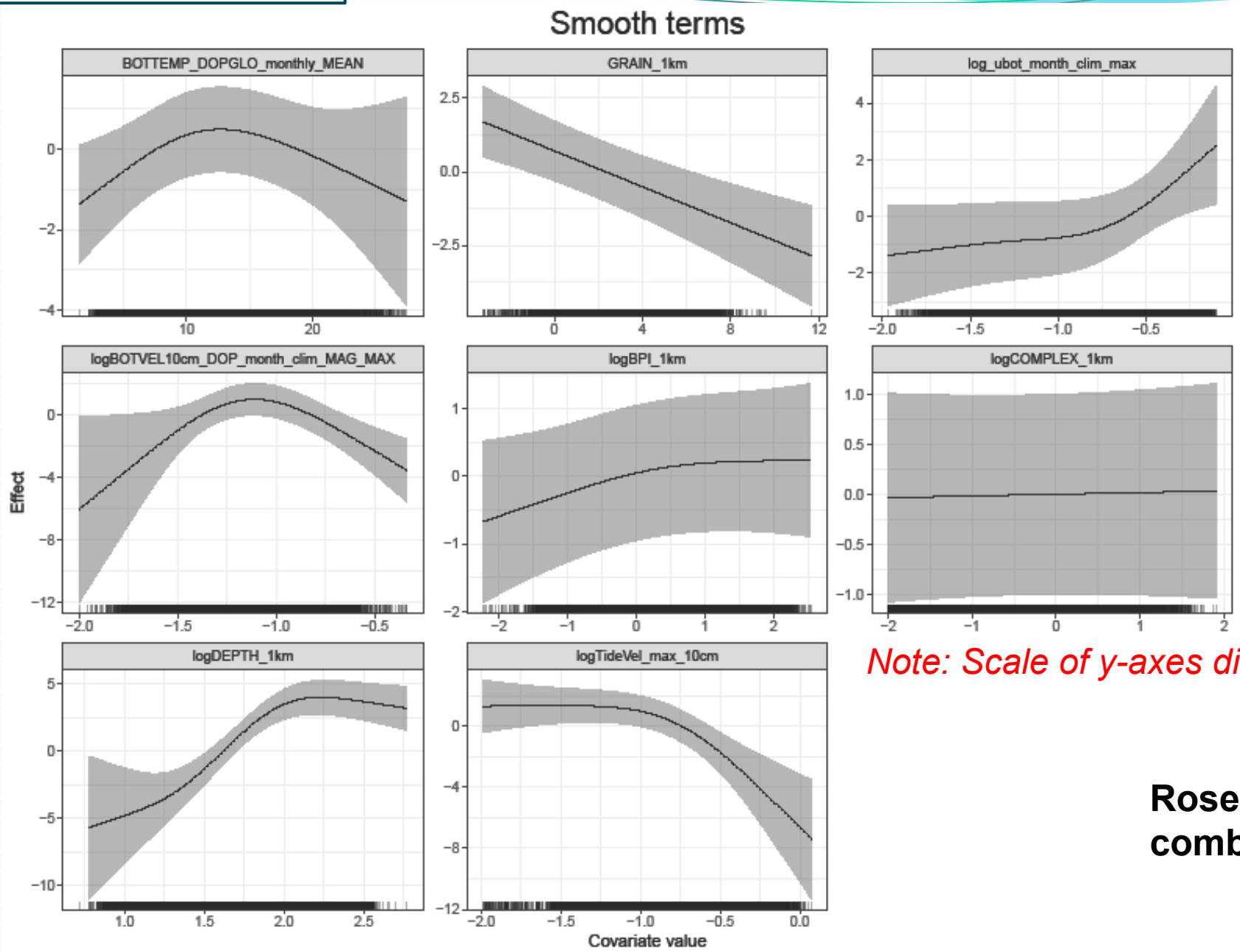

Note: Scale of y-axes differs between plots

Rosette skate - combined

20-year mean predicted density by month

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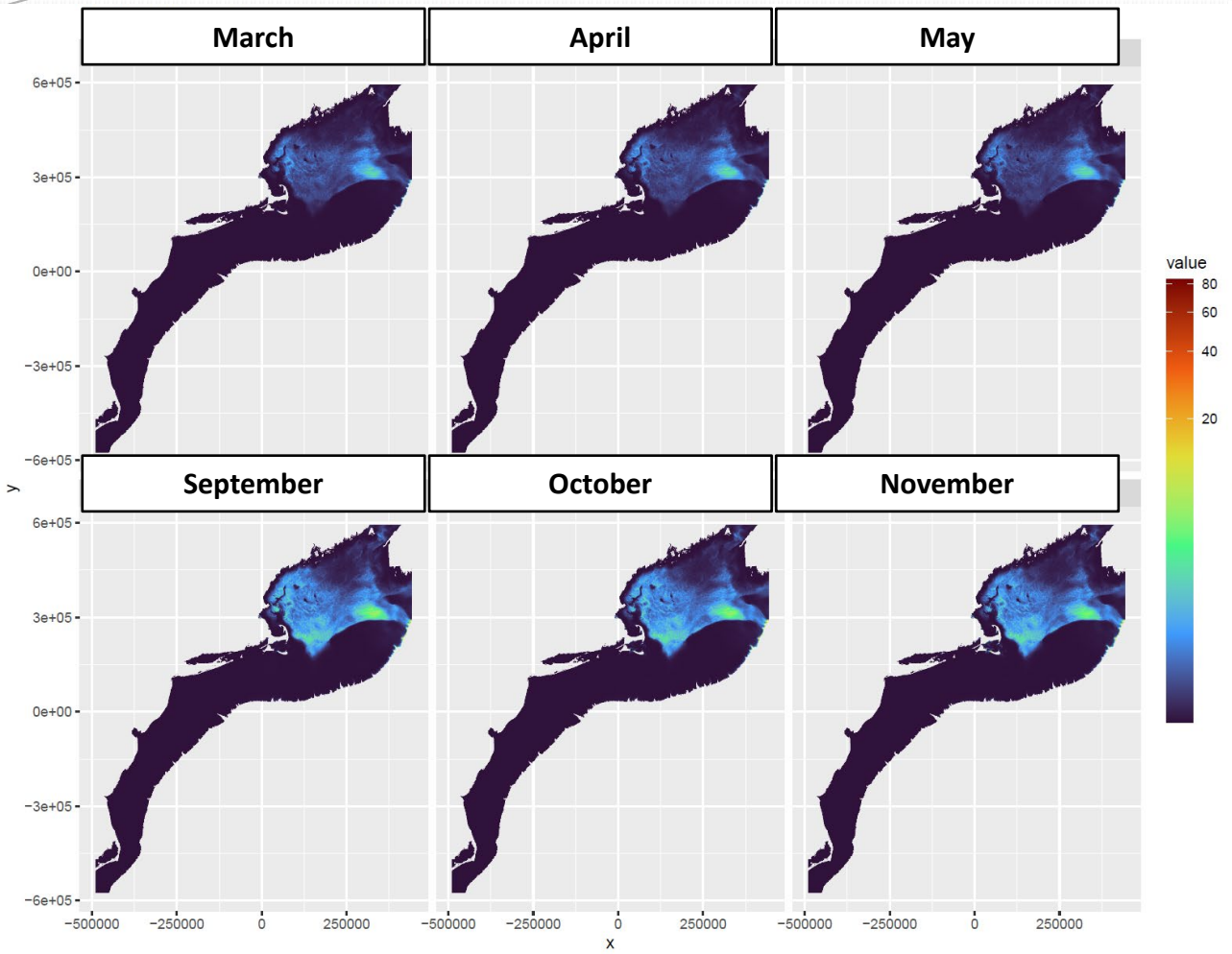
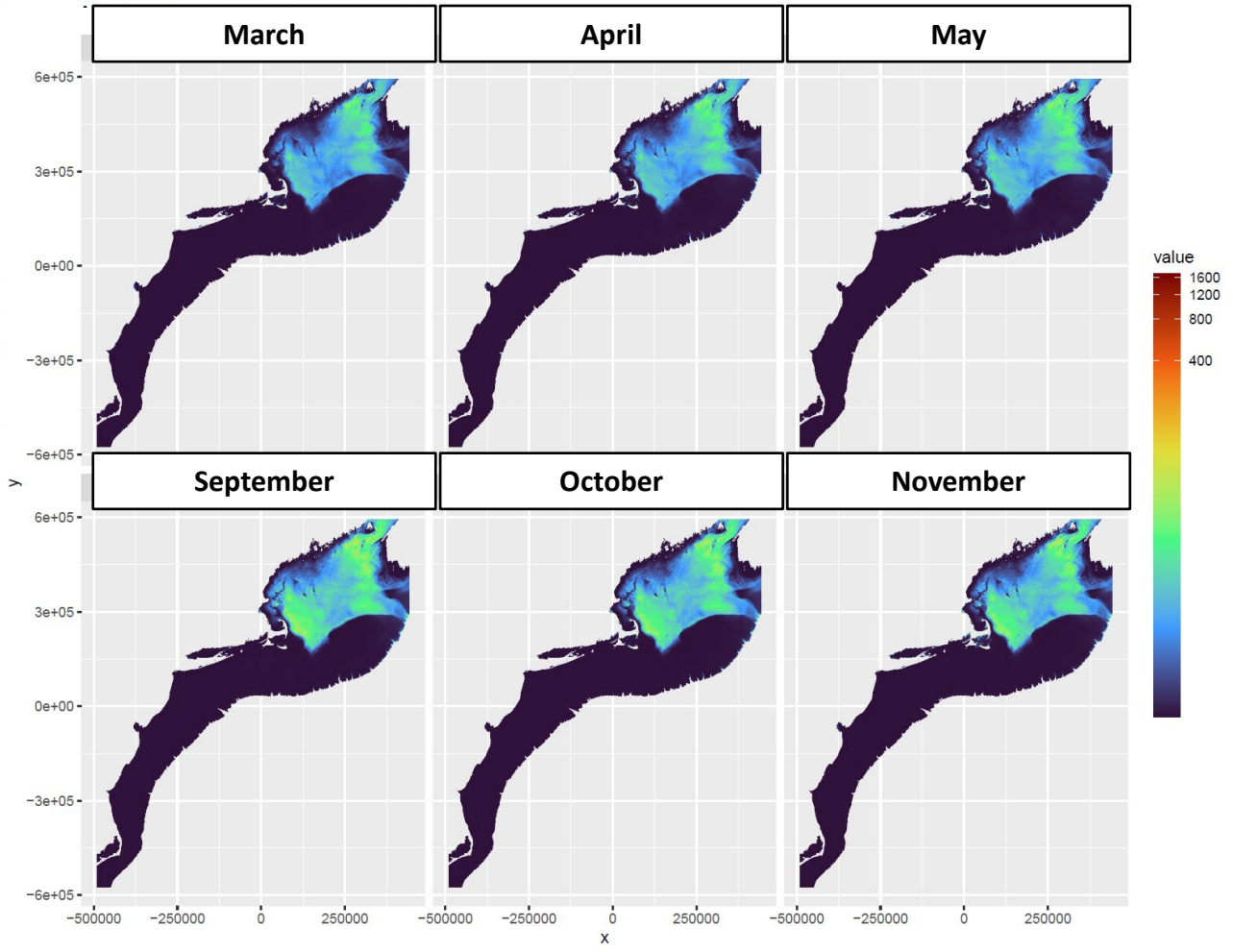


Smooth skate - adult



Smooth skate - juvenile

20-year trend by month

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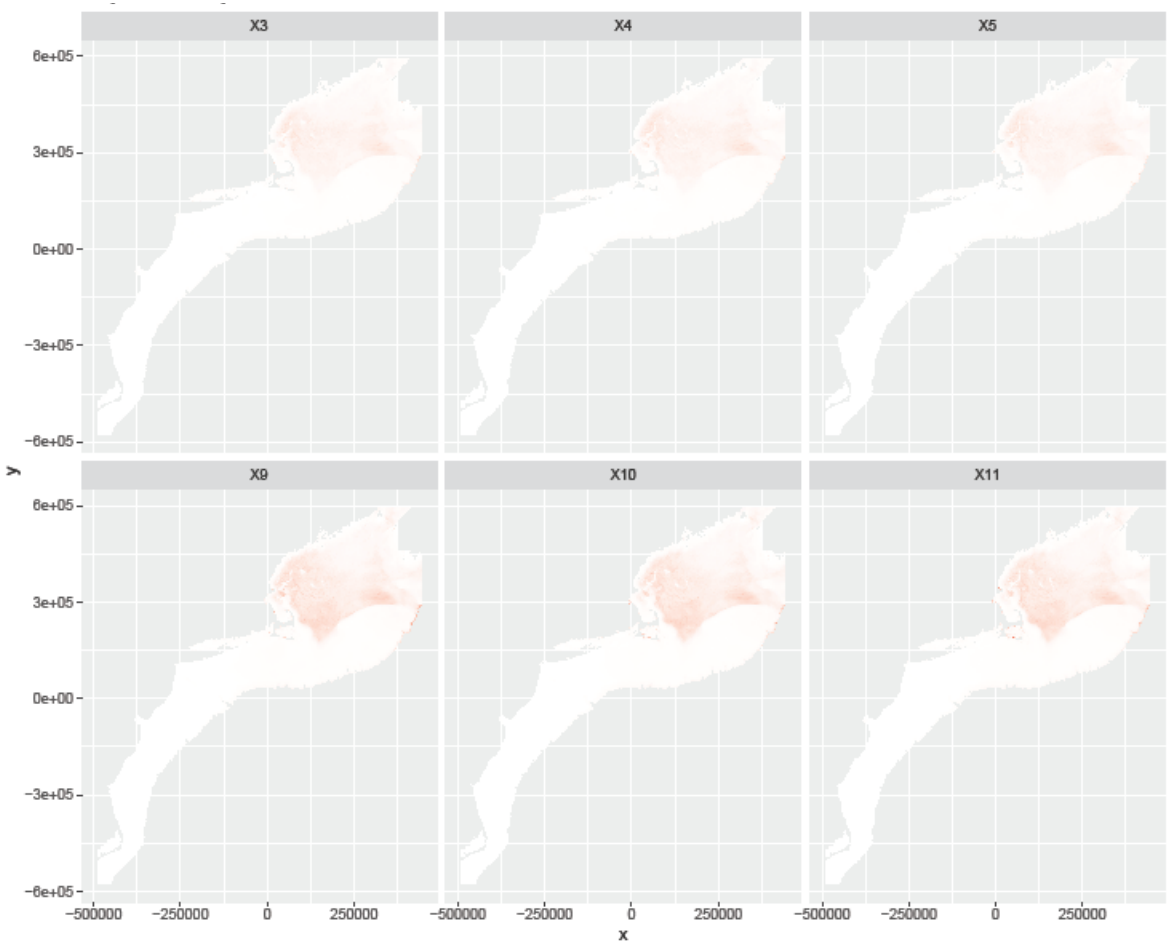
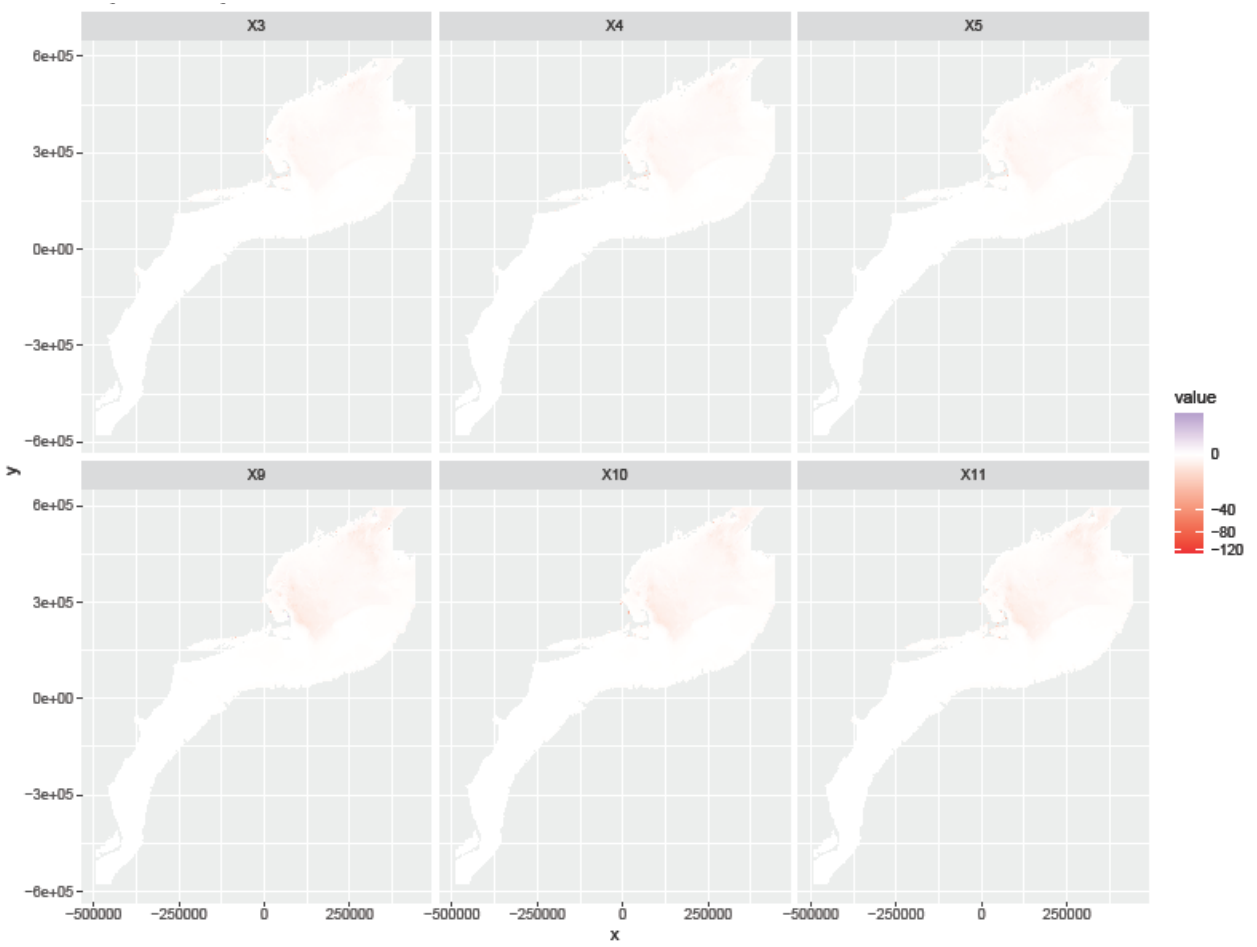


Smooth skate - adult



Smooth skate - juvenile

Smooth terms

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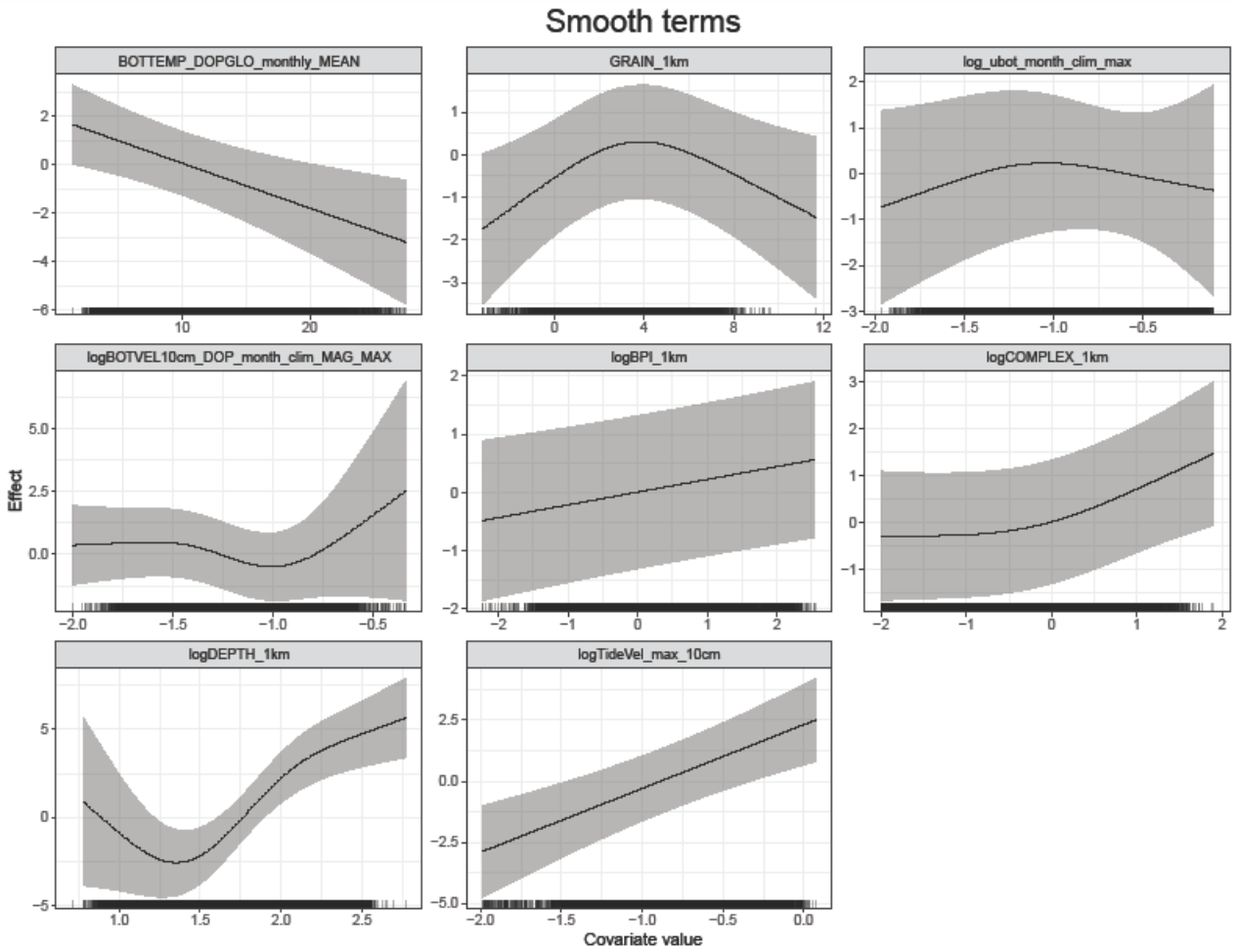

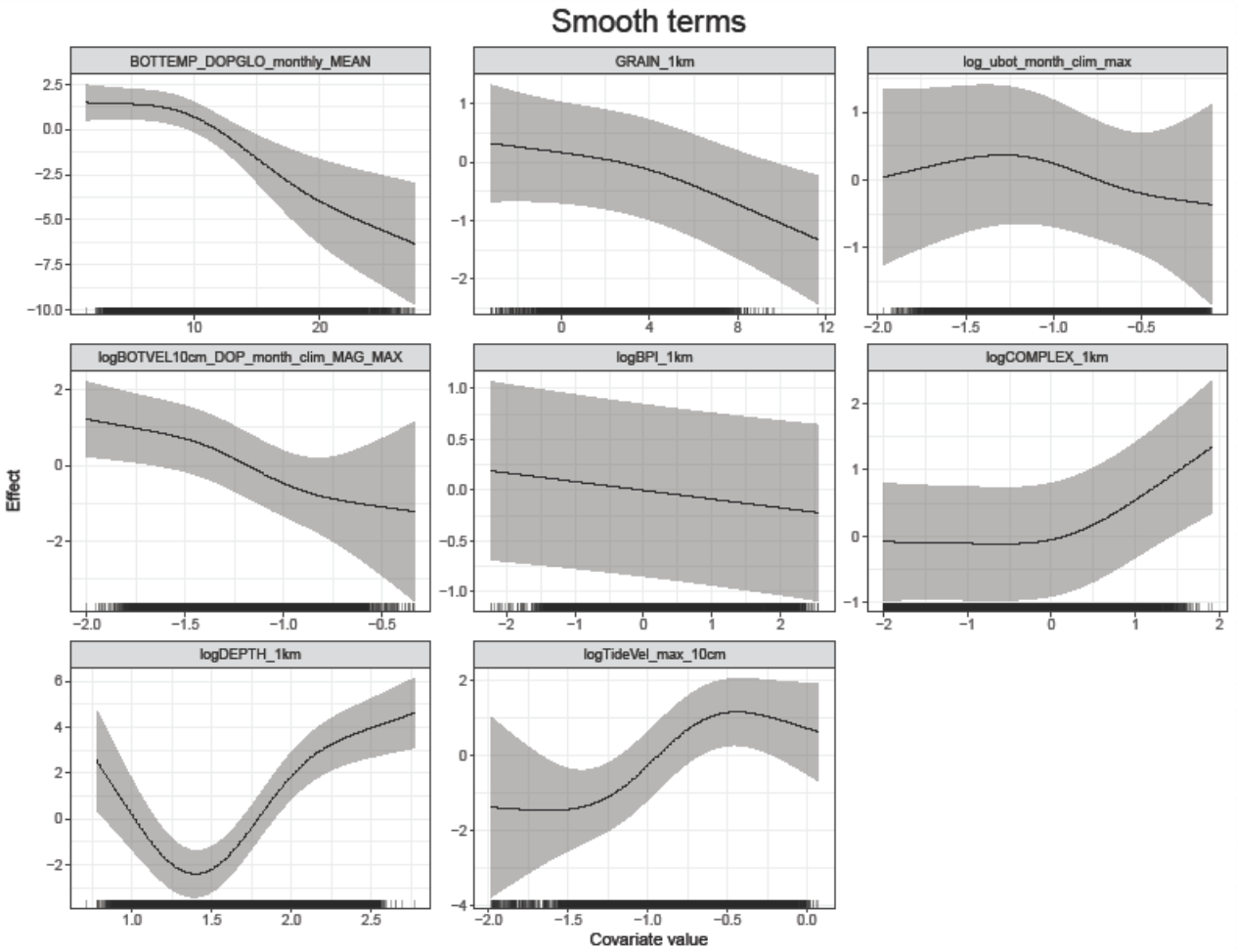

Smooth skate - adult

Smooth skate - juvenile

Note: Scale of y-axes differs between plots

20-year mean predicted density by month

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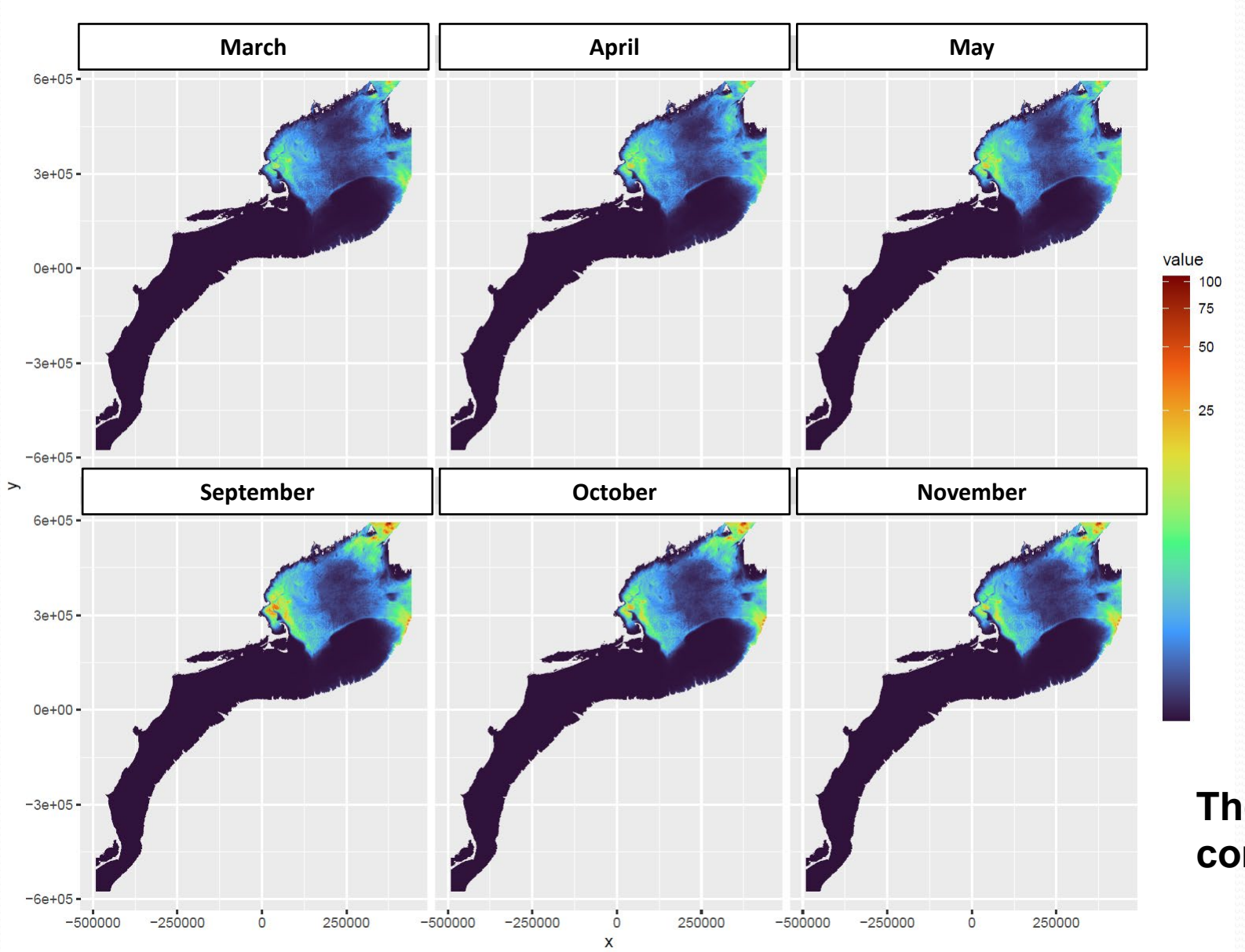

Thorny skate - combined

20-year trend by month

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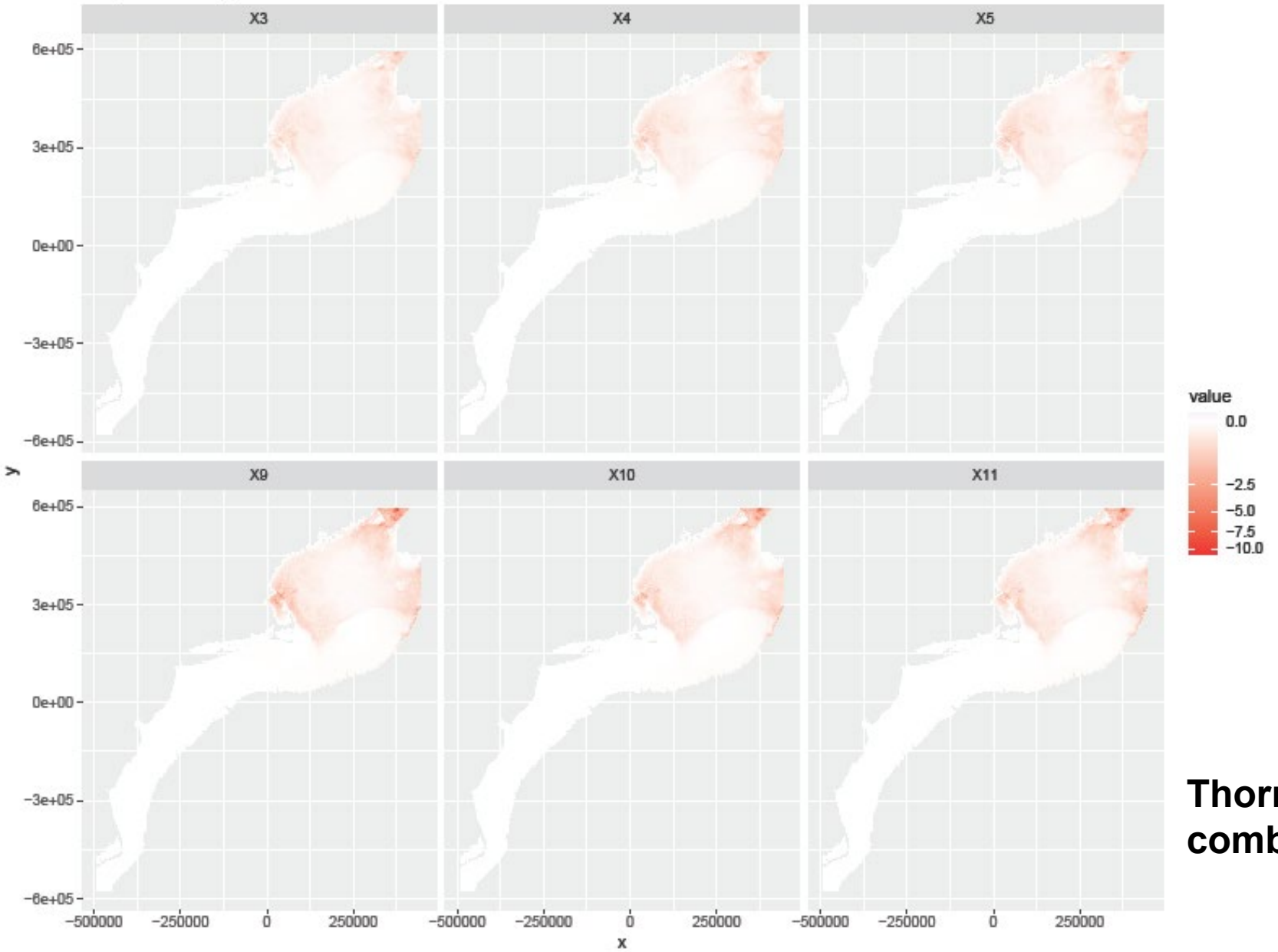

Thorny skate - combined

Smooth terms

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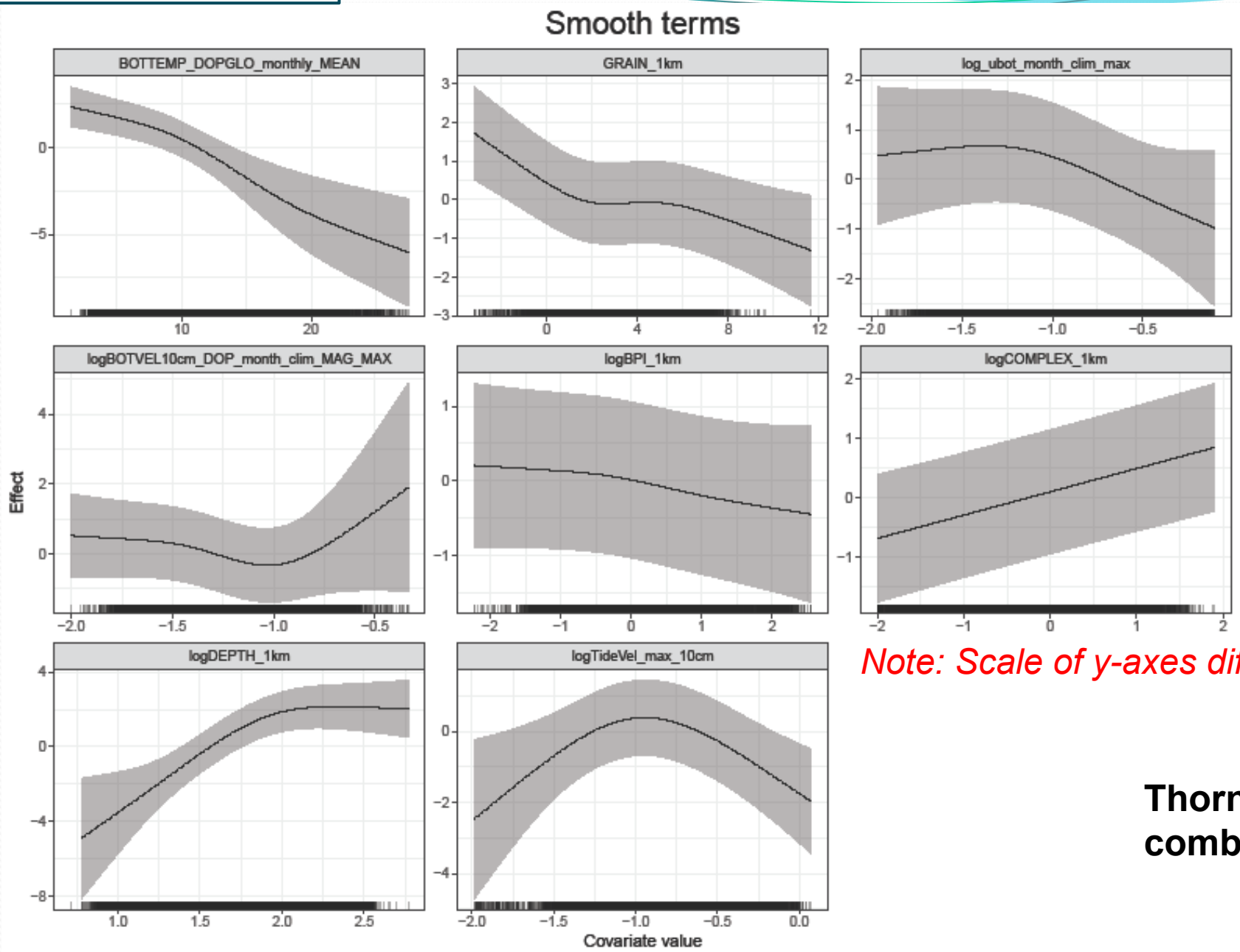

Note: Scale of y-axes differs between plots

Thorny skate - combined

20-year mean predicted density by month

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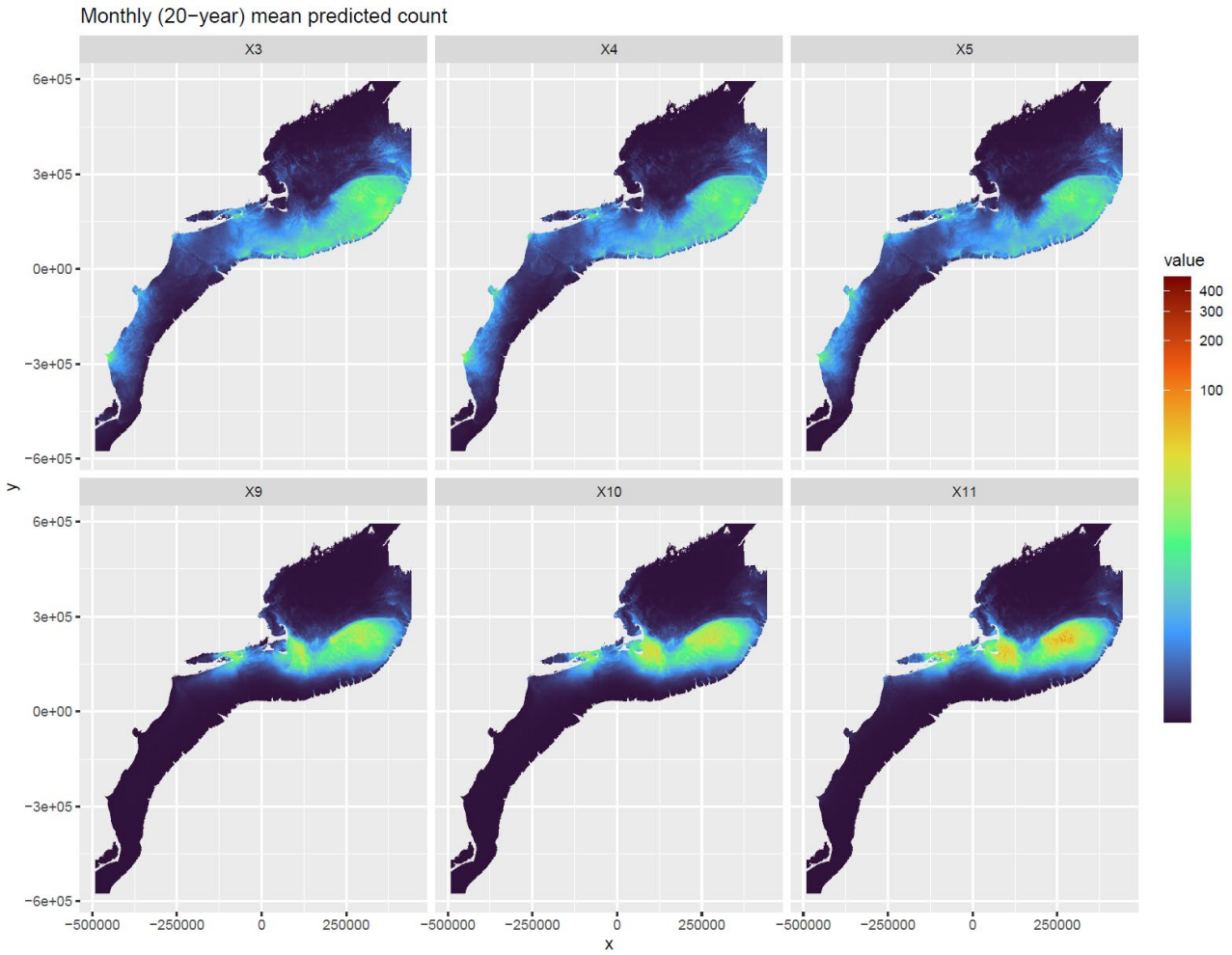
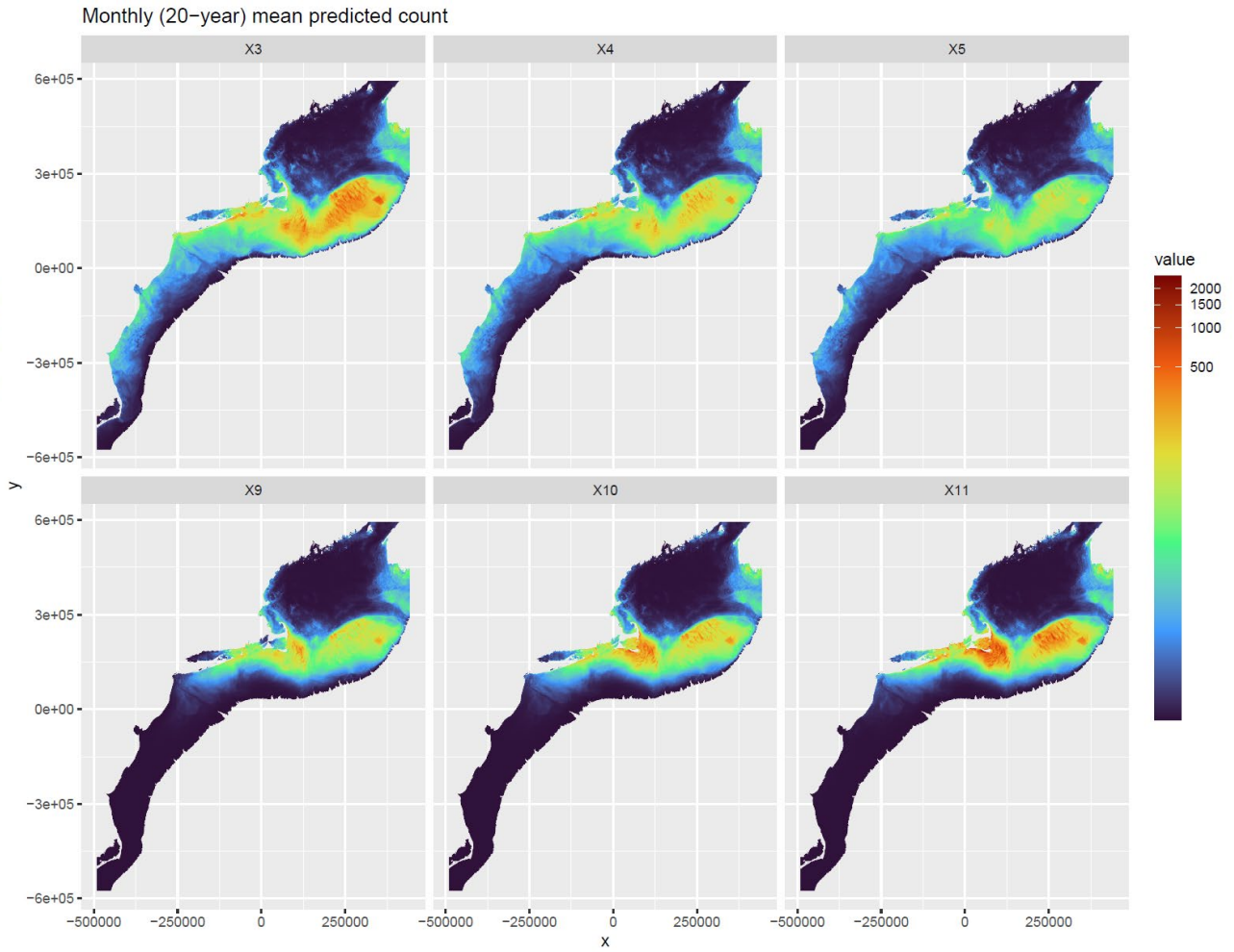


Winter skate - adult



Winter skate - juvenile

20-year trend by month

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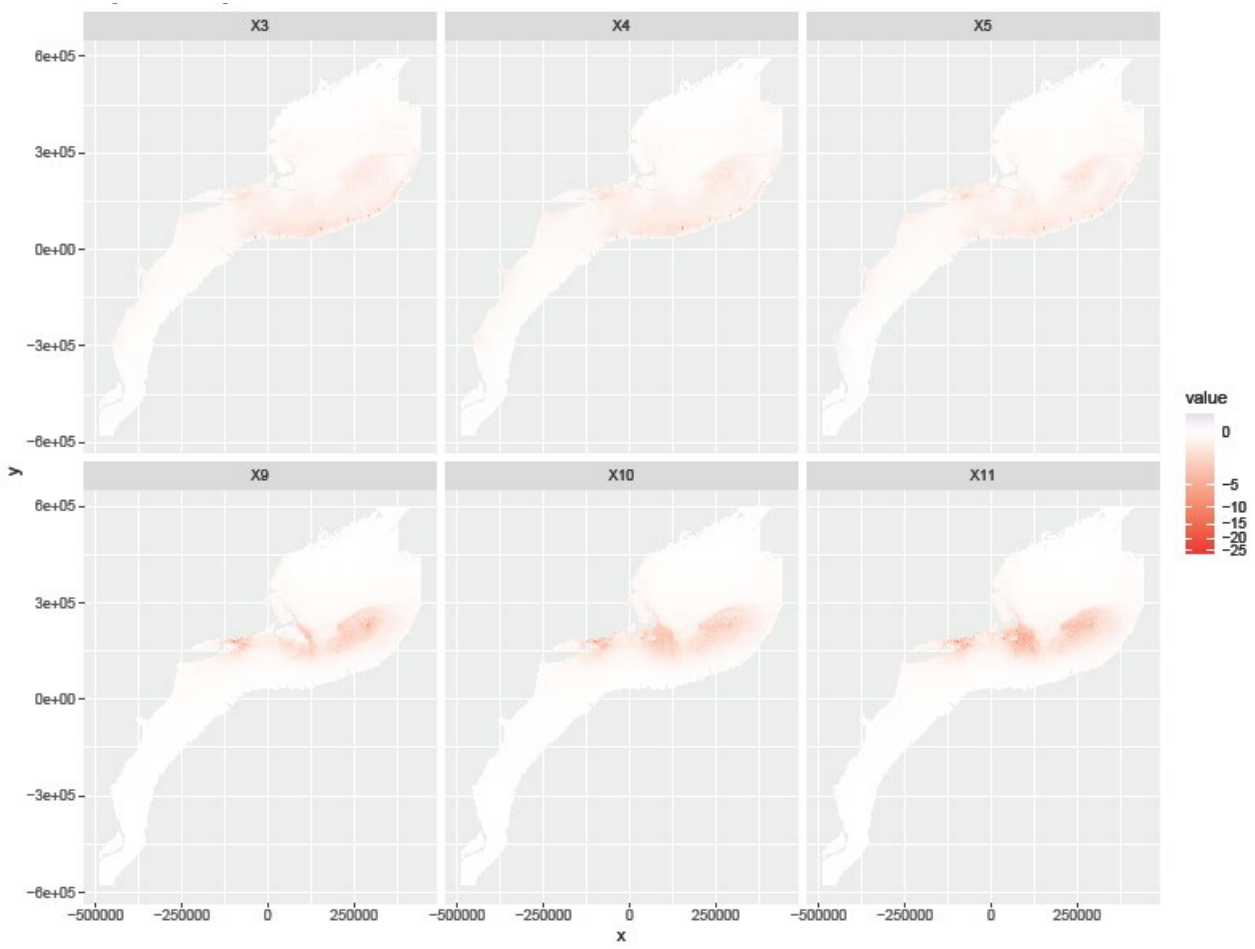
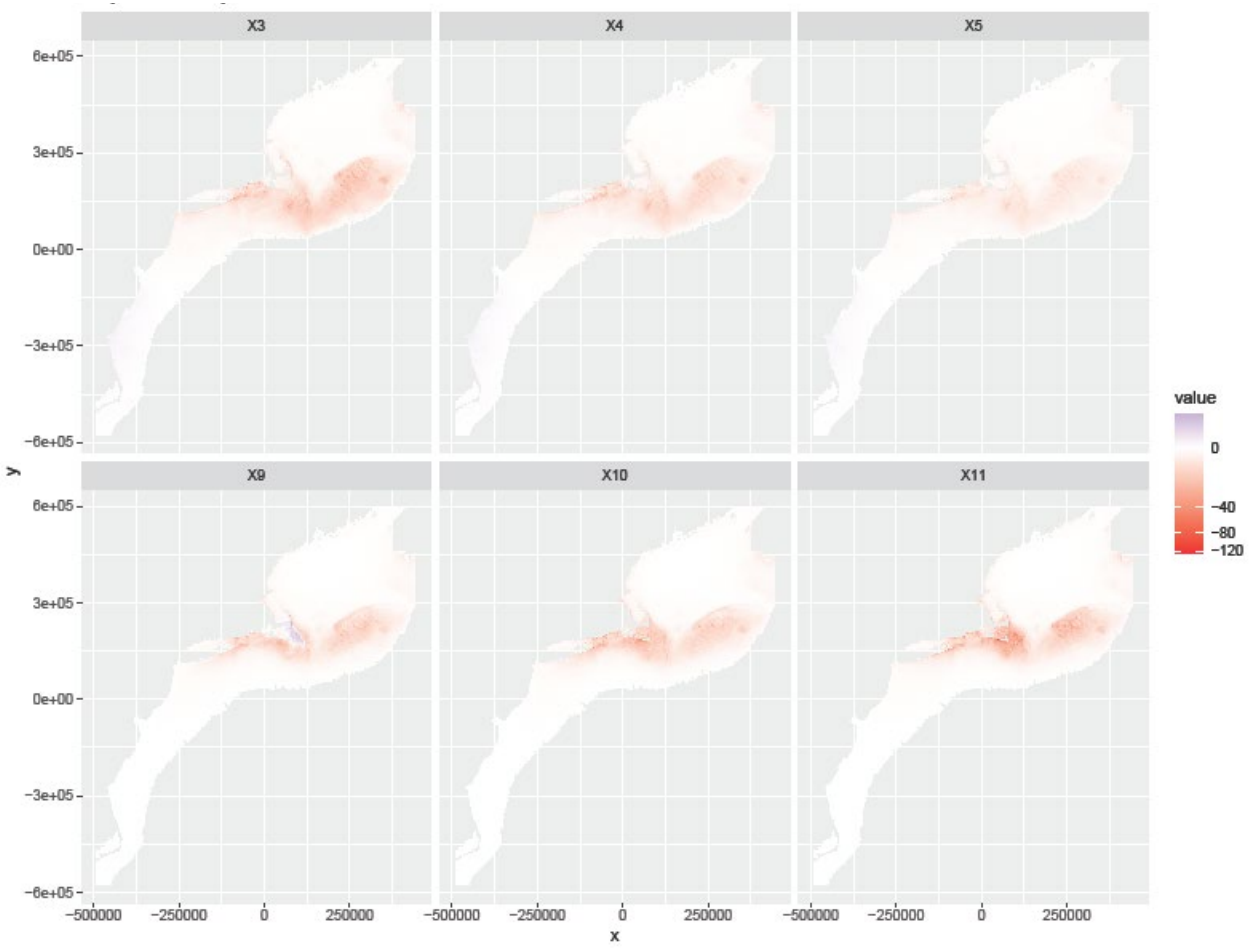


Winter skate - adult



Winter skate - juvenile

Smooth terms

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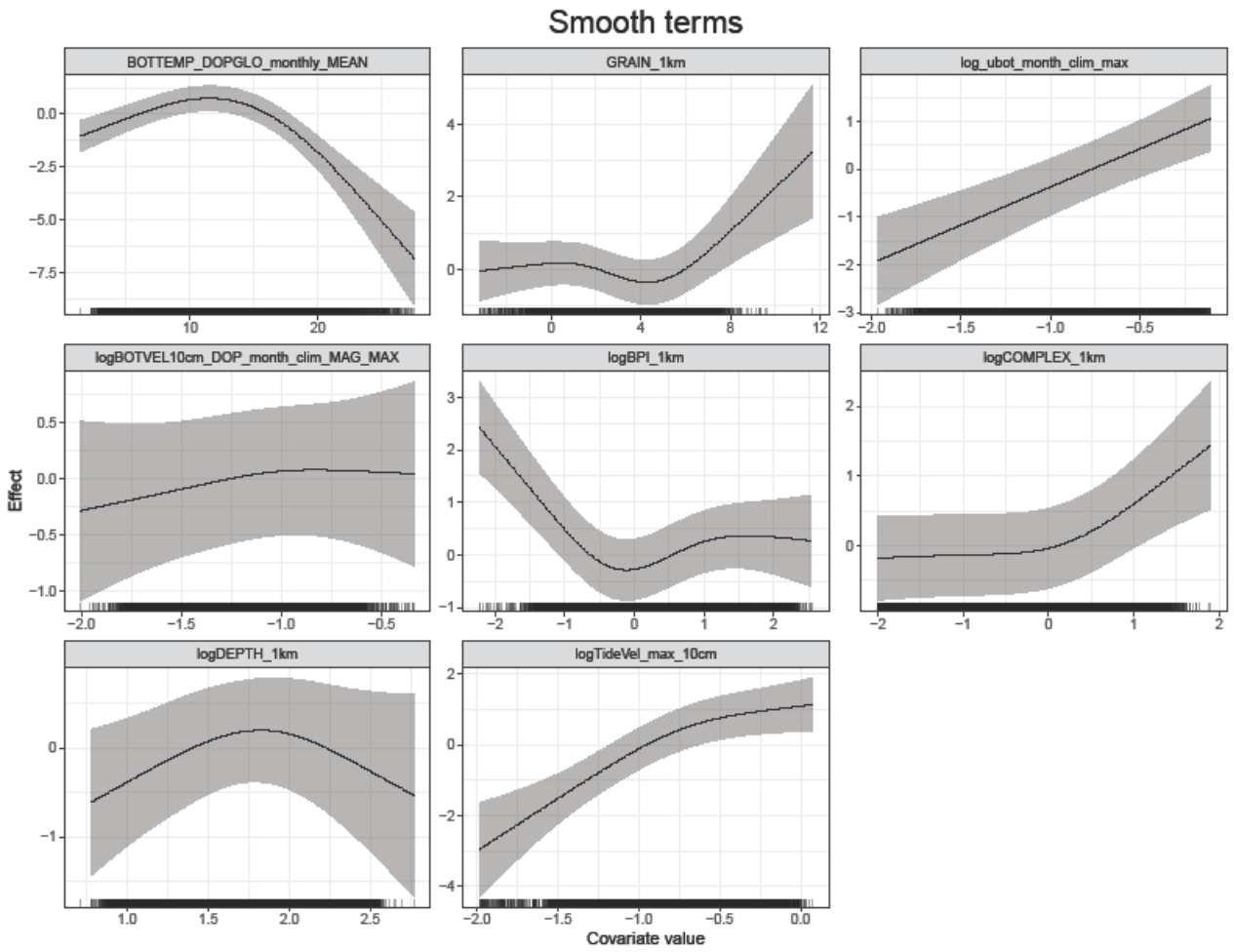
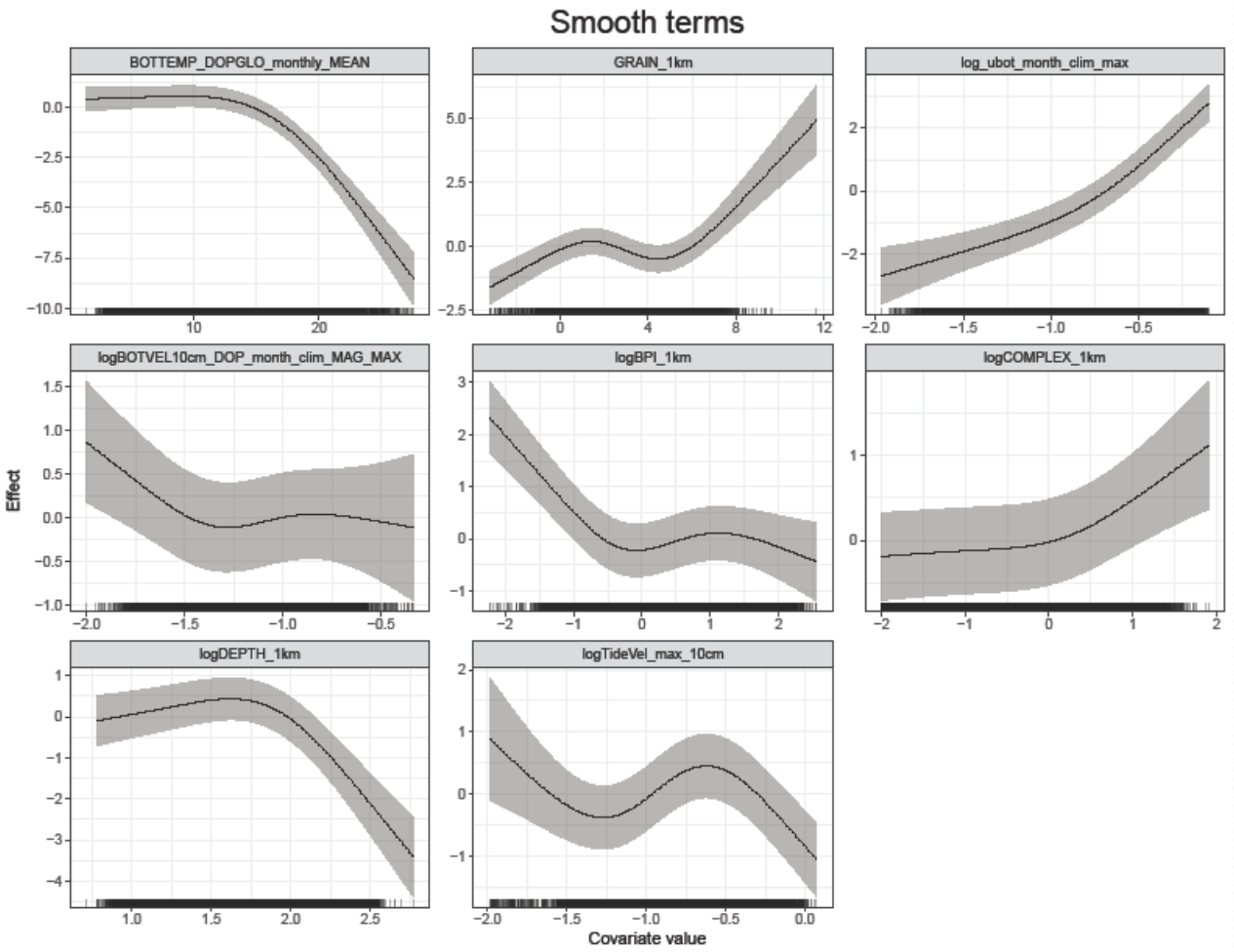


Winter skate - adult



Winter skate - juvenile

Note: Scale of y-axes differs between plots