

A photograph of four men on the deck of a fishing boat. In the foreground, there are large orange floats and green fishing nets. The men are standing and talking. In the background, a yellow forklift and other boat equipment are visible under a clear sky.

Using Fishermen's Ecological Knowledge to identify climate driven distribution shifts in flatfish and investigate their potential impact on population assessments

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photo: NOAA NEFSC, Heather Soulen

Acknowledgements

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NOAA FISHERIES
Northeast Fisheries Science Center

Project Goals

Provide critical information for stock assessment models



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Understand bias in fishery independent surveys stemming from changes in population availability



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Identify changes in annual movement patterns, habitat use, and accessibility of fishery-independent surveys to flatfish habitats



The process

- 1) Identify issues with fishermen
- 2) Gather existing scientific information
- 3) Bring together fishermen and information for real-time analysis
- 4) Conduct field evaluation
- 5) Produce information, diagnostics, and tools for improving stock assessments

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Evaluate biases in surveys and fishers' observations transparently and collaboratively with fishermen

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Use conversations and workshops with fishermen to define and test hypotheses of potential bias

American plaice

VPA assessment model:
fishery-independent surveys
fishery landings



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fishery landings

Status:
Not overfished,
overfishing not occurring



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Why focus on plaice?
-- Upcoming assessment in 2022
-- Retrospective patterns
-- Discrepancies between NEFSC
and MADMF surveys
-- Unrealistic catchability estimates
-- Important fisheries target



Example: Changes in inshore movement patterns

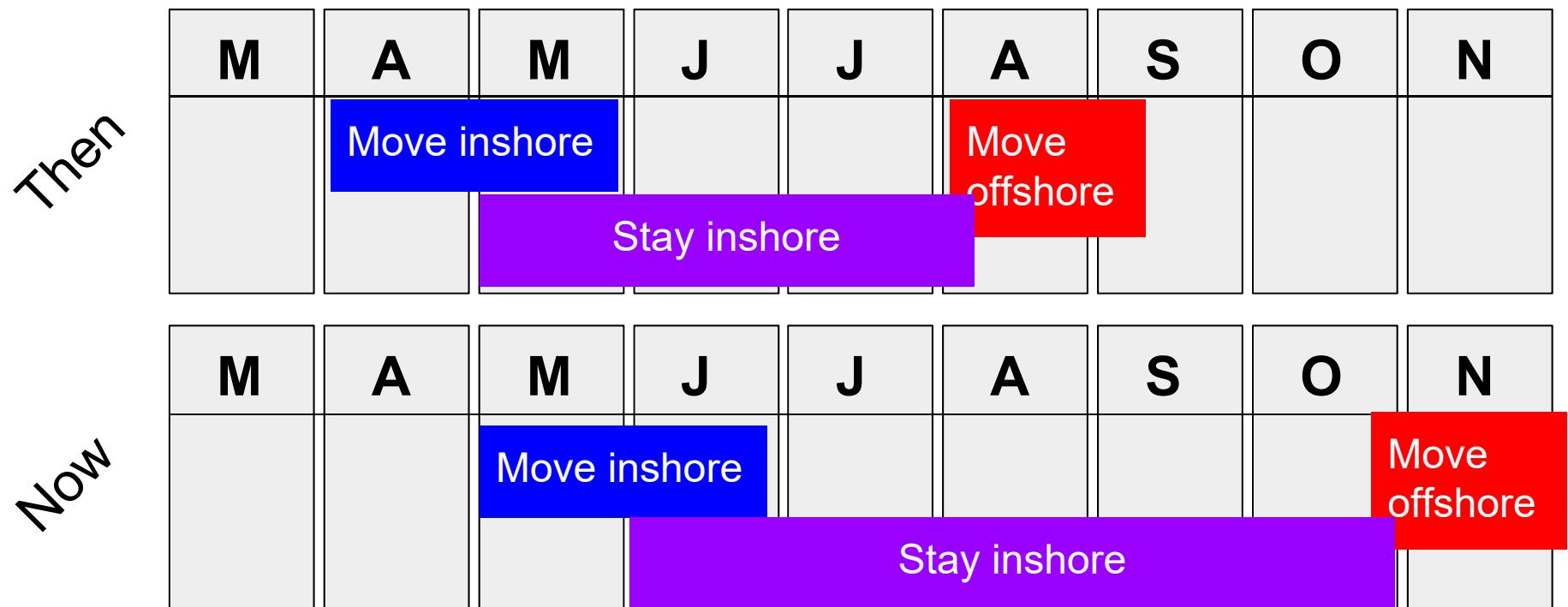
Plaice used to move inshore between April and May, and move offshore by August.

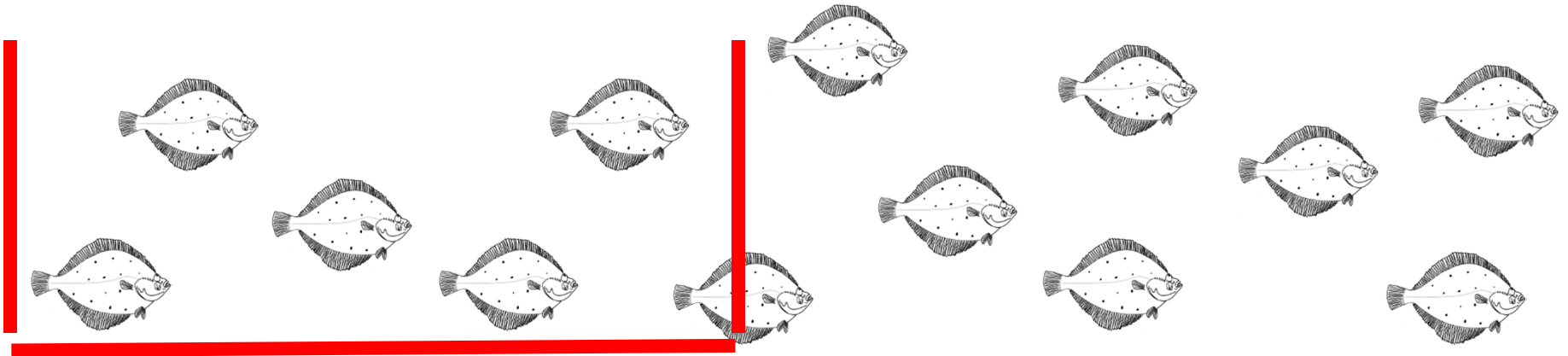
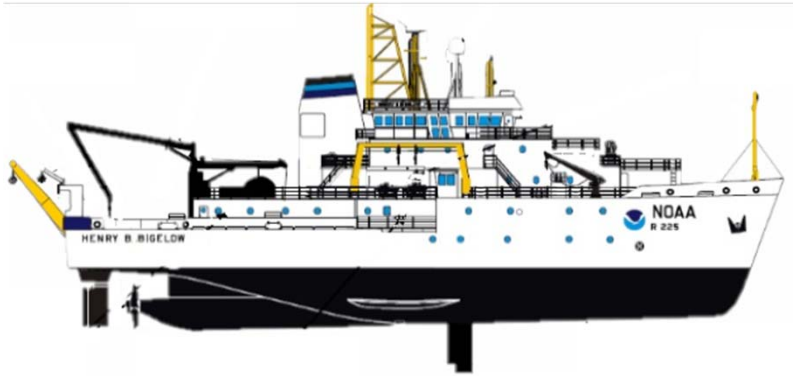
Then	M	A	M	J	J	A	S	O	N
		Move inshore				Move offshore			
			Stay inshore						

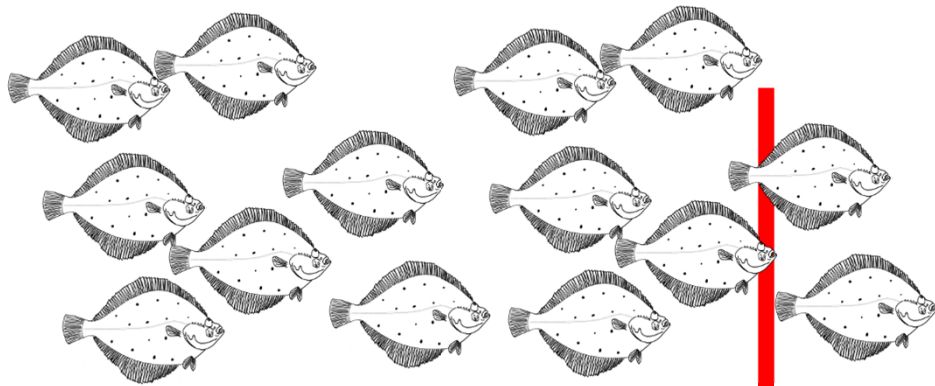
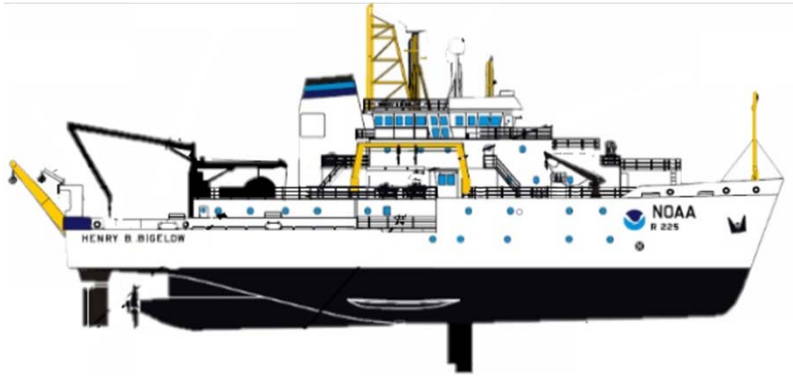
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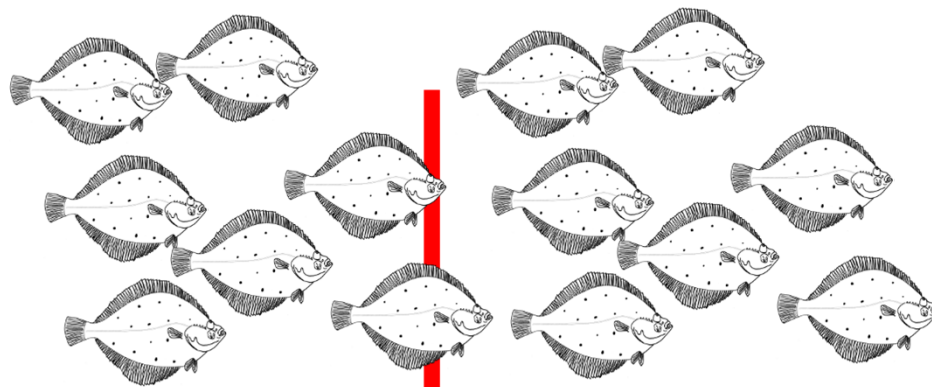
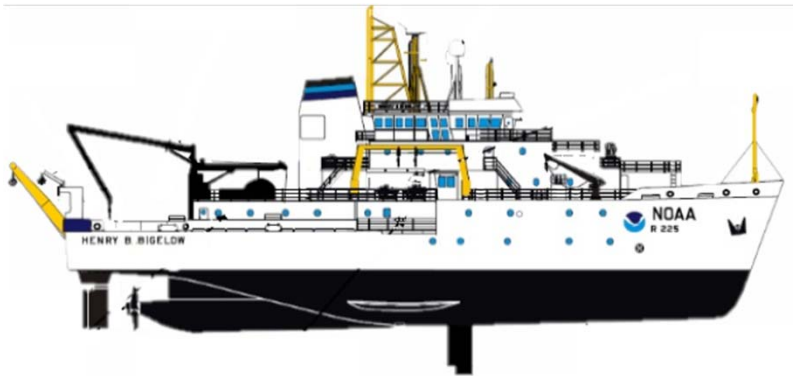
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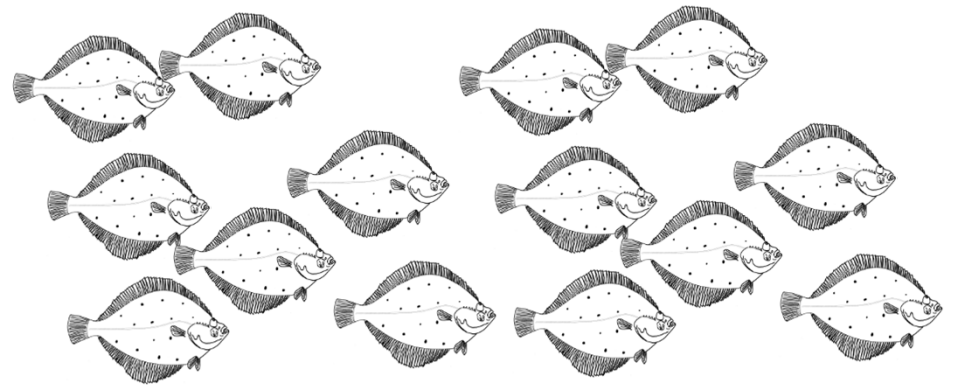
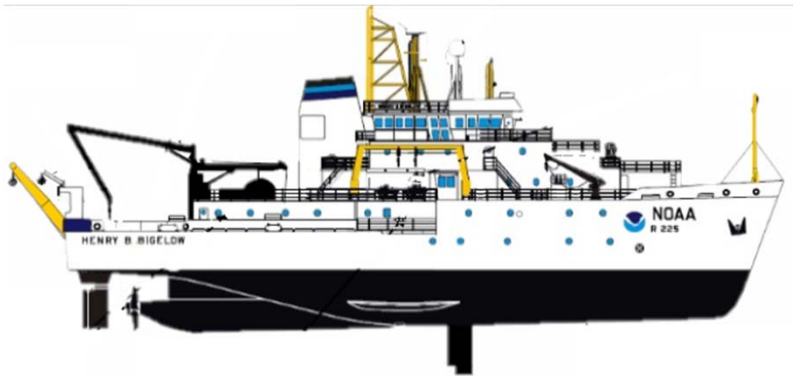
Now, they do not come in until May and June, and stay in until November.











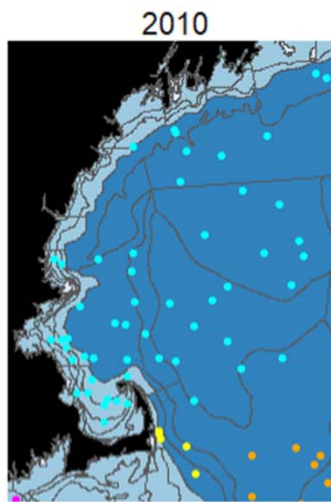
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			Stay inshore						
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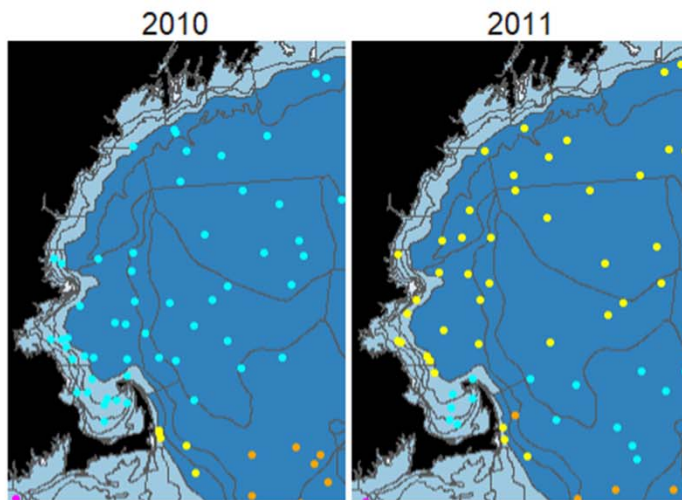
NEFSC spring sampling stations



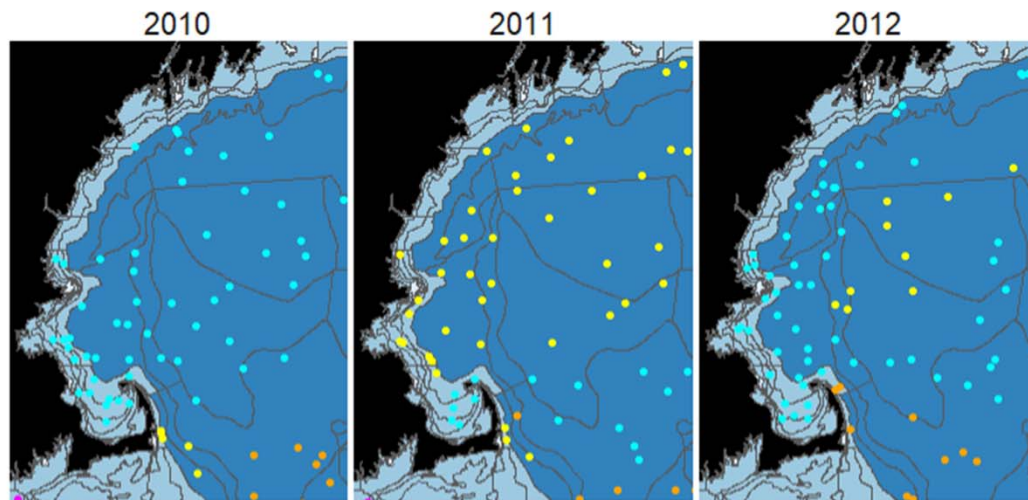
■ end of March
■ beginning of April
■ end of April
■ beginning of May
■ end of May
■ beginning of June

■ no stratum
■ inshore
■ offshore

NEFSC spring sampling stations



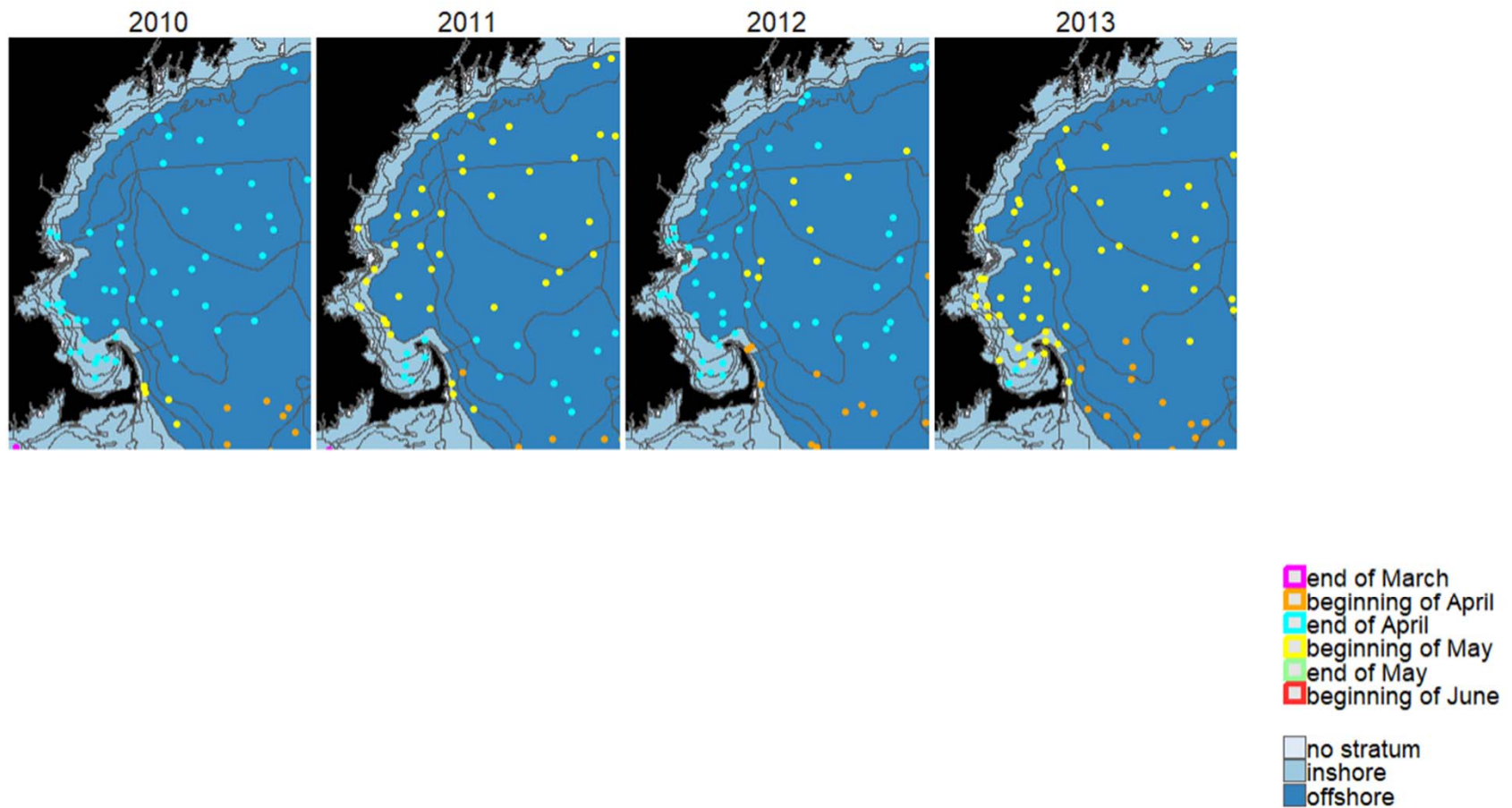
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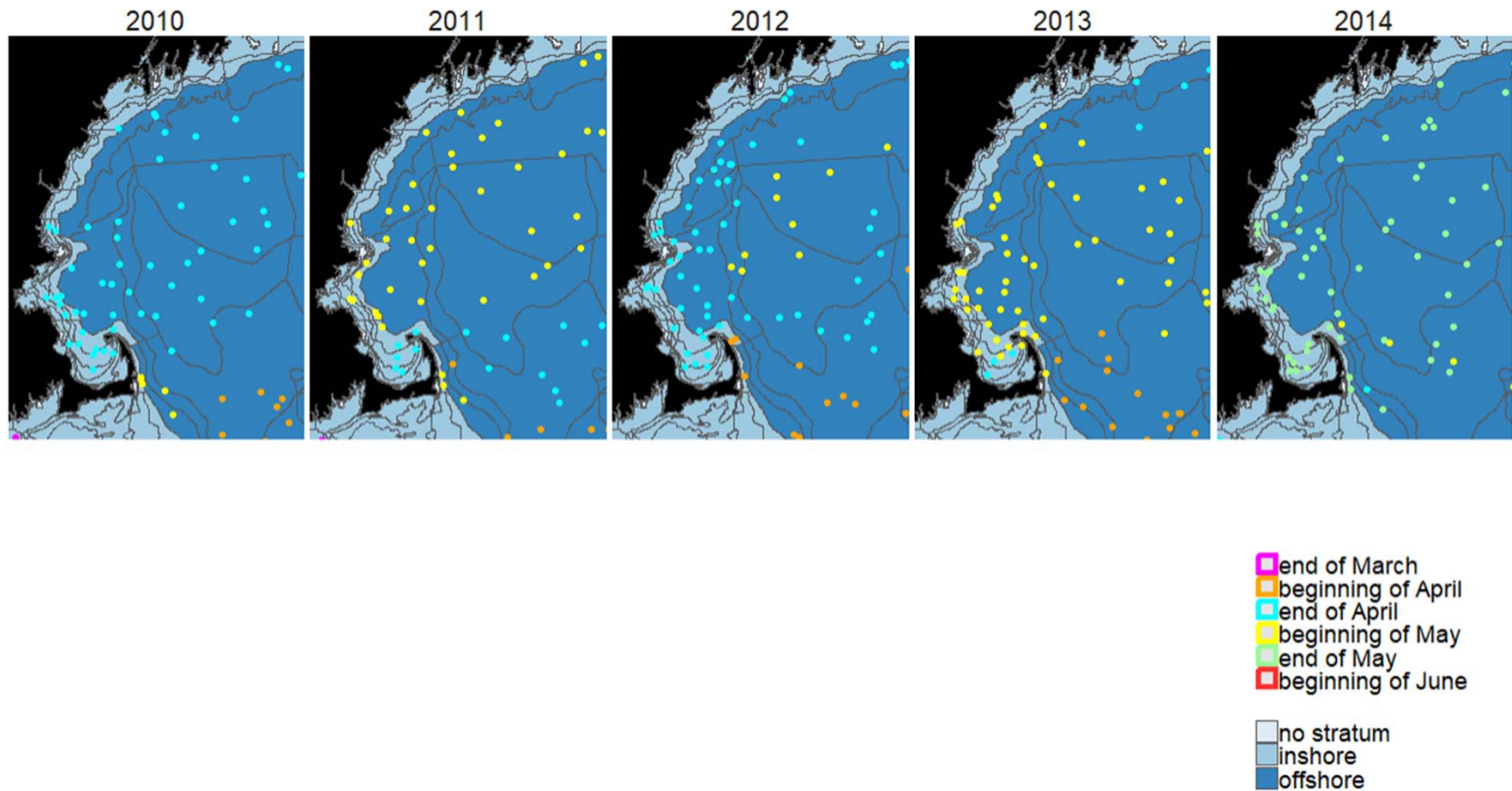
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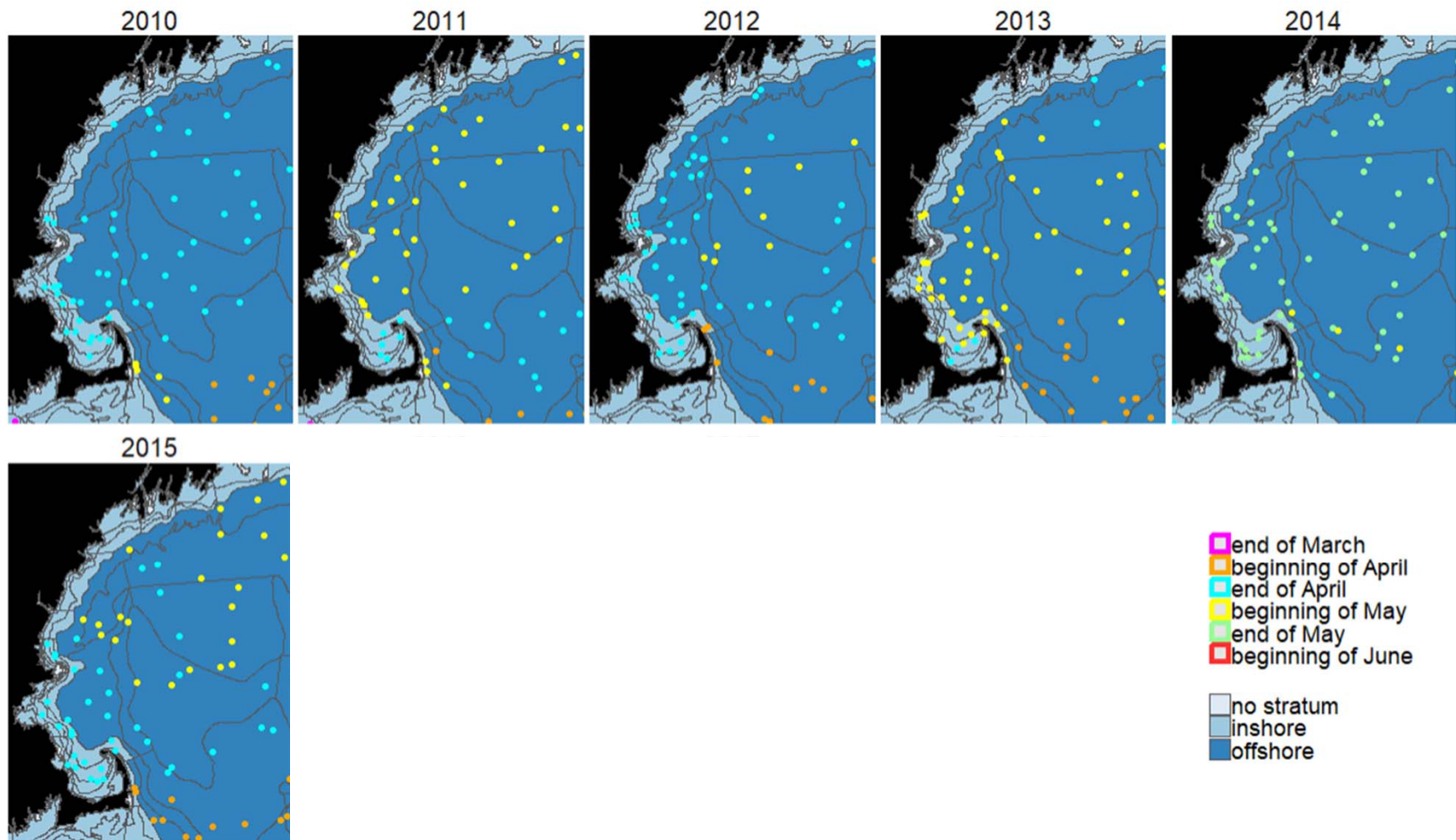
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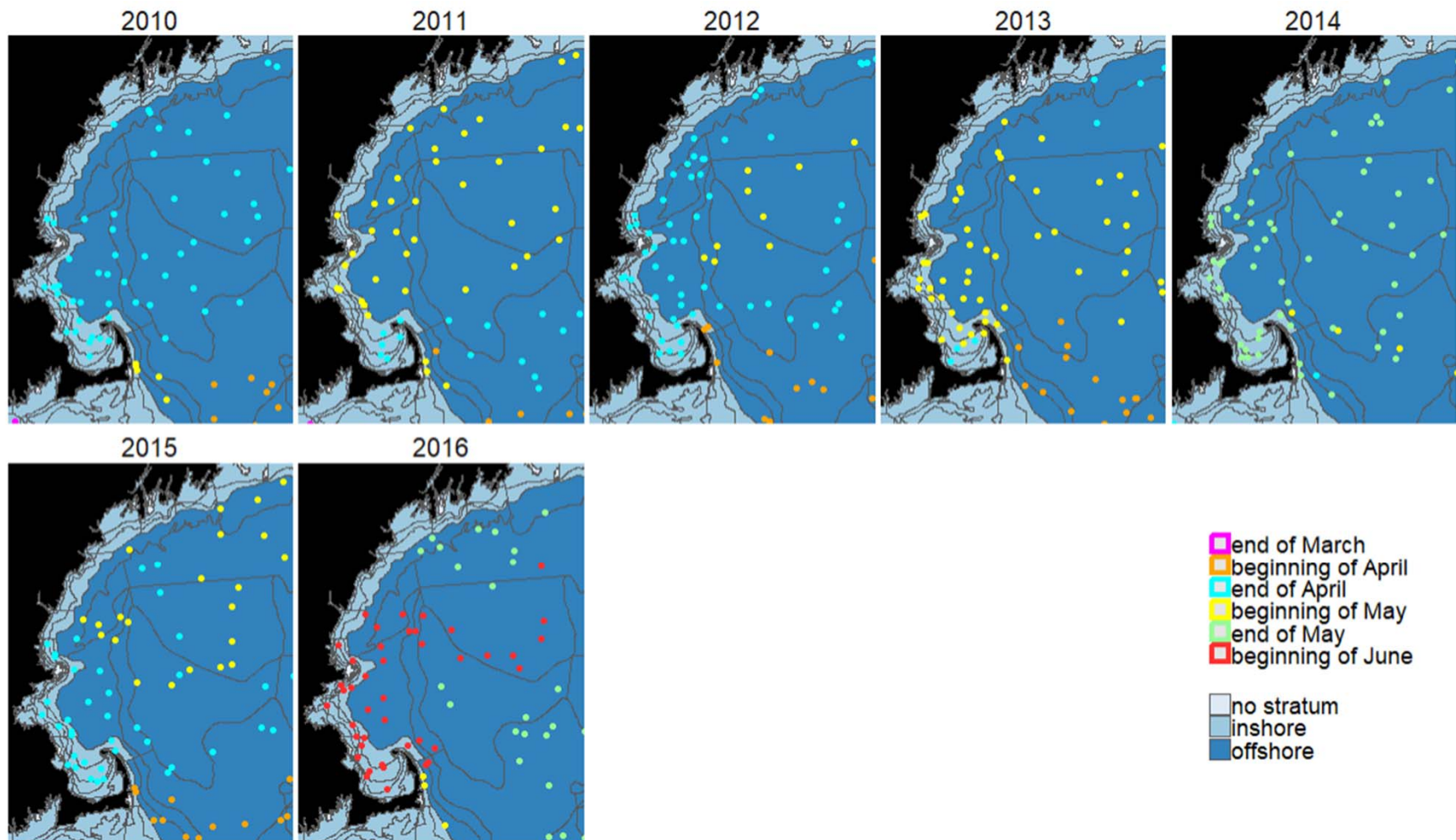
NEFSC spring sampling stations



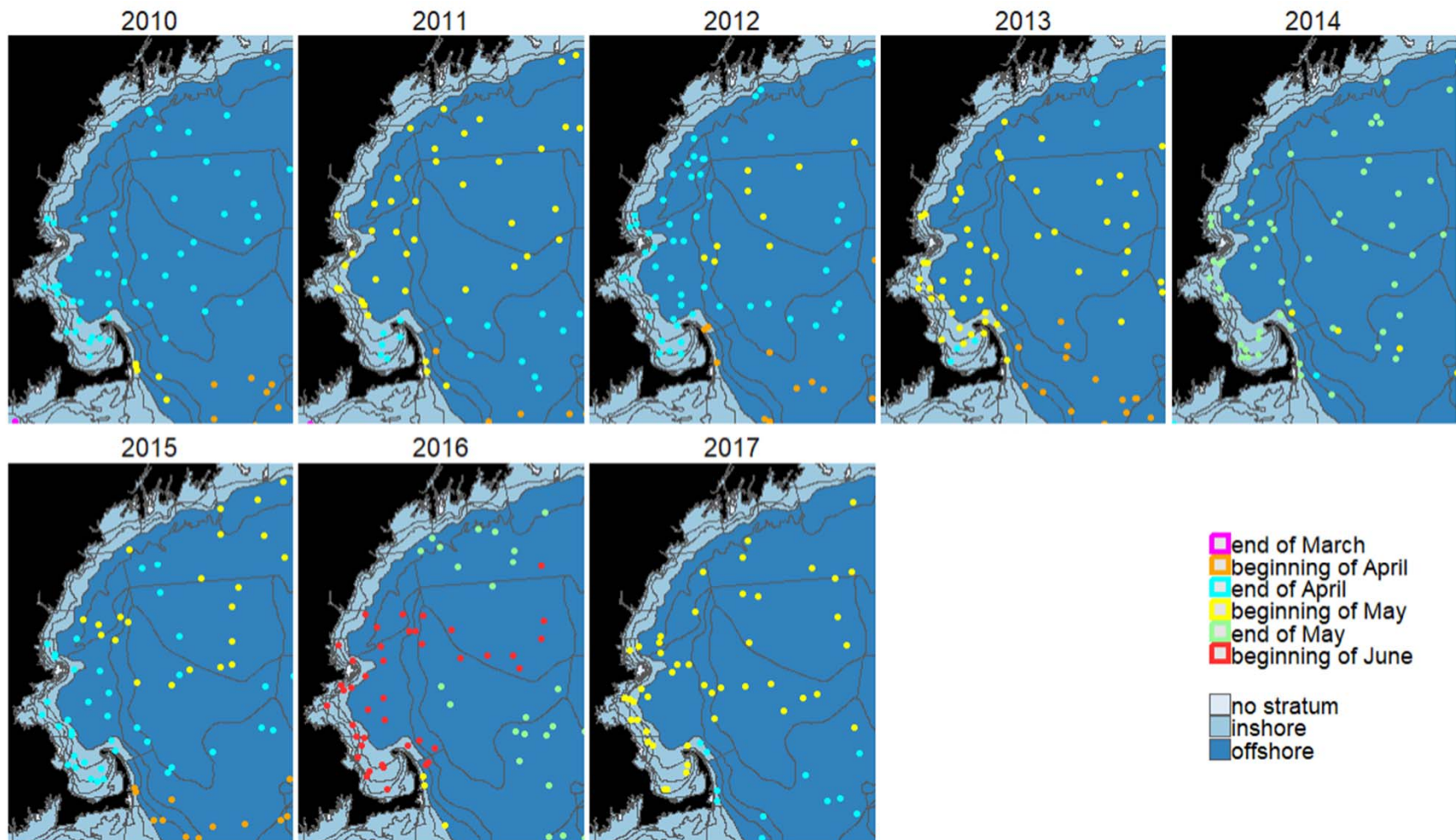
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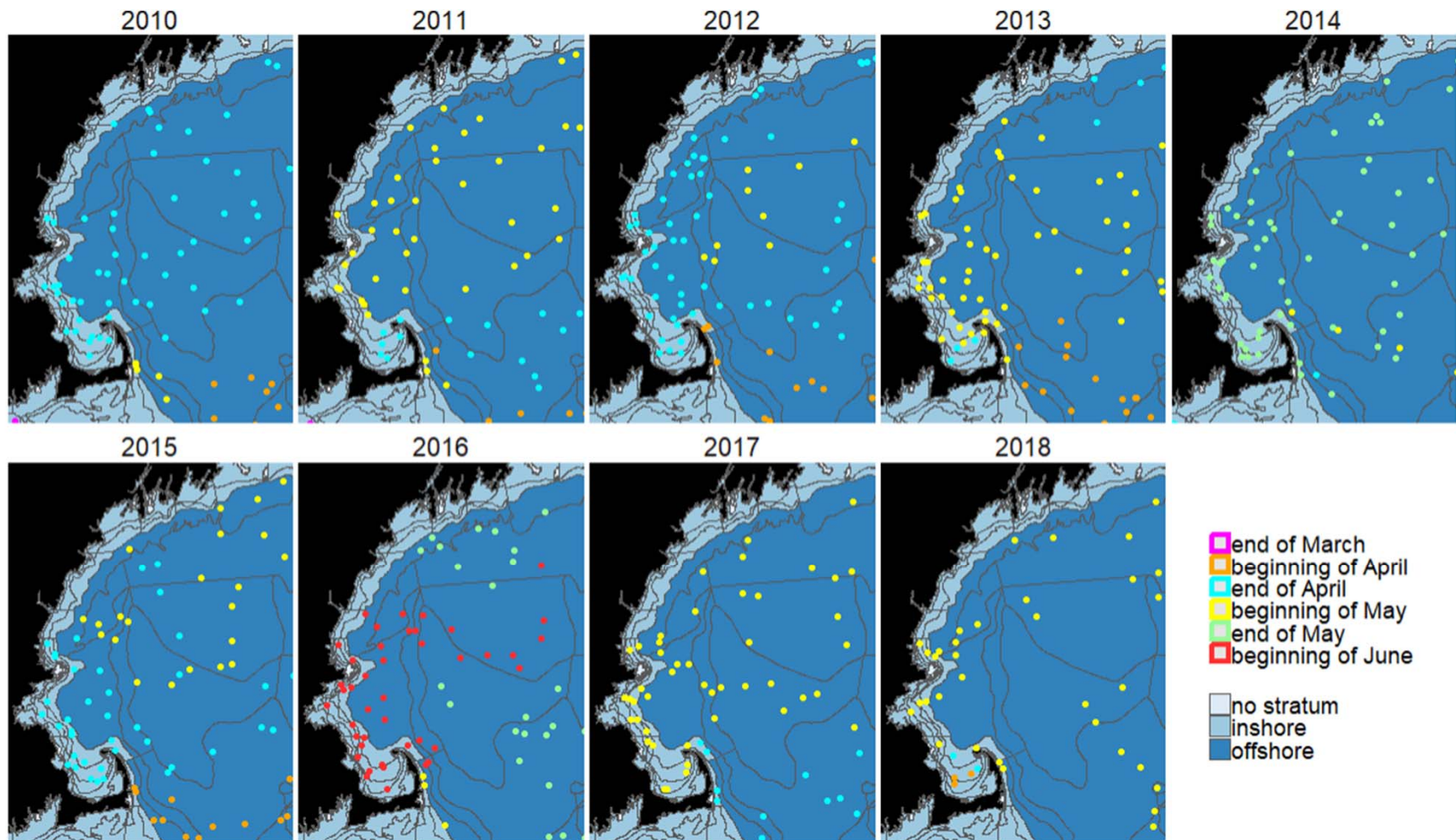
NEFSC spring sampling stations



NEFSC spring sampling stations



NEFSC fall sampling stations



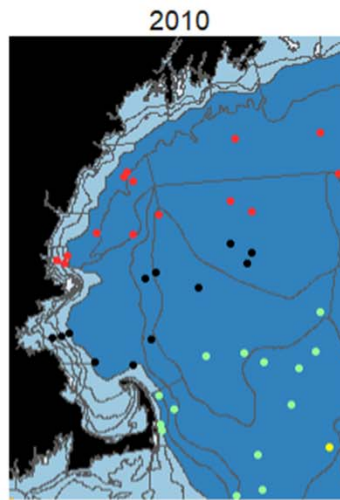
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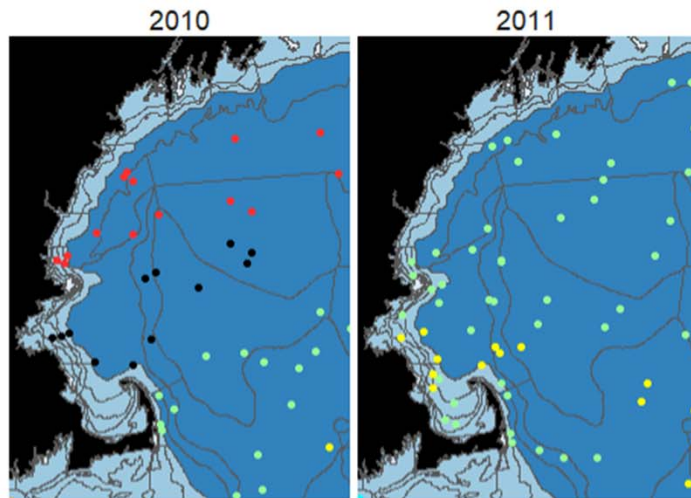
NEFSC fall sampling stations



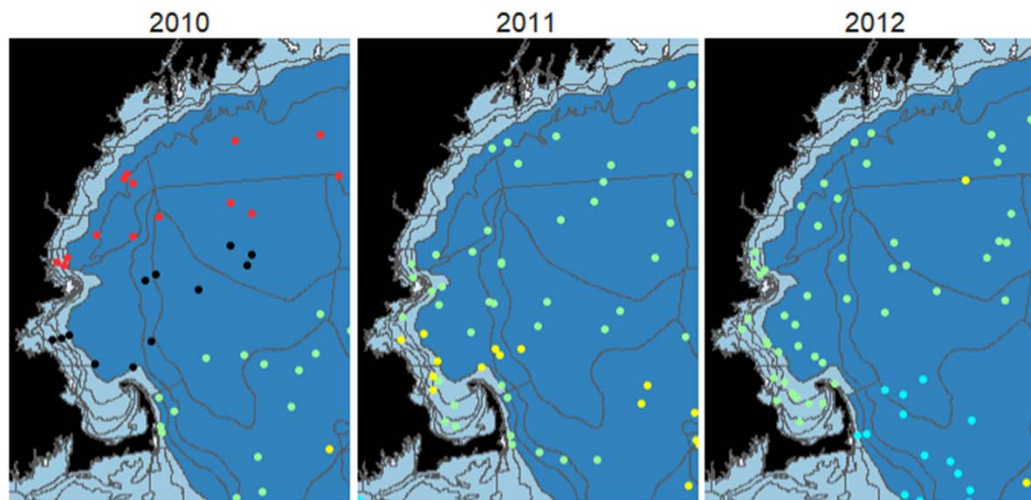
no stratum
inshore
offshore

beginning of September
end of September
beginning of October
end of October
beginning of November
end of November
beginning of December

NEFSC fall sampling stations



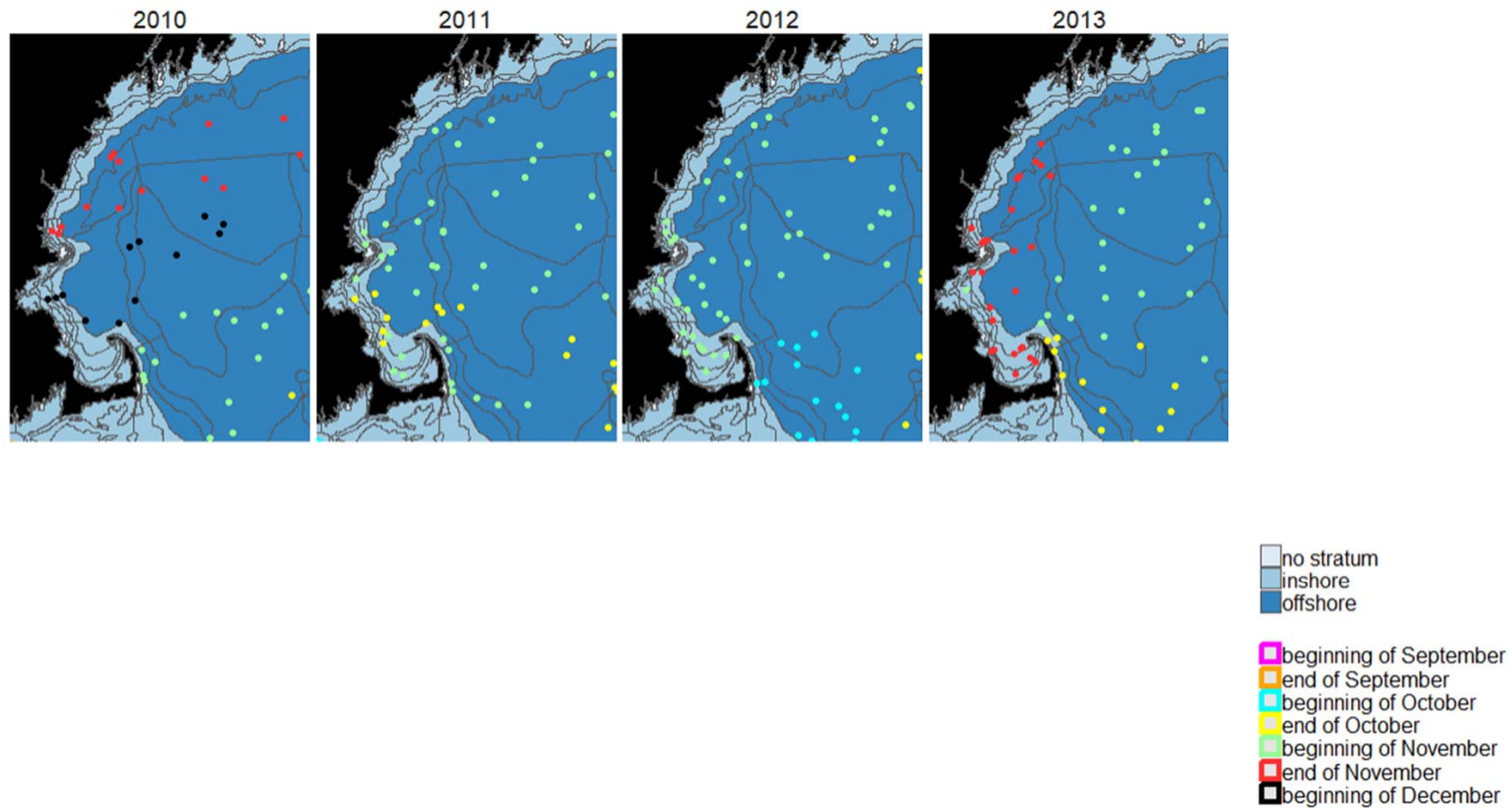
NEFSC fall sampling stations



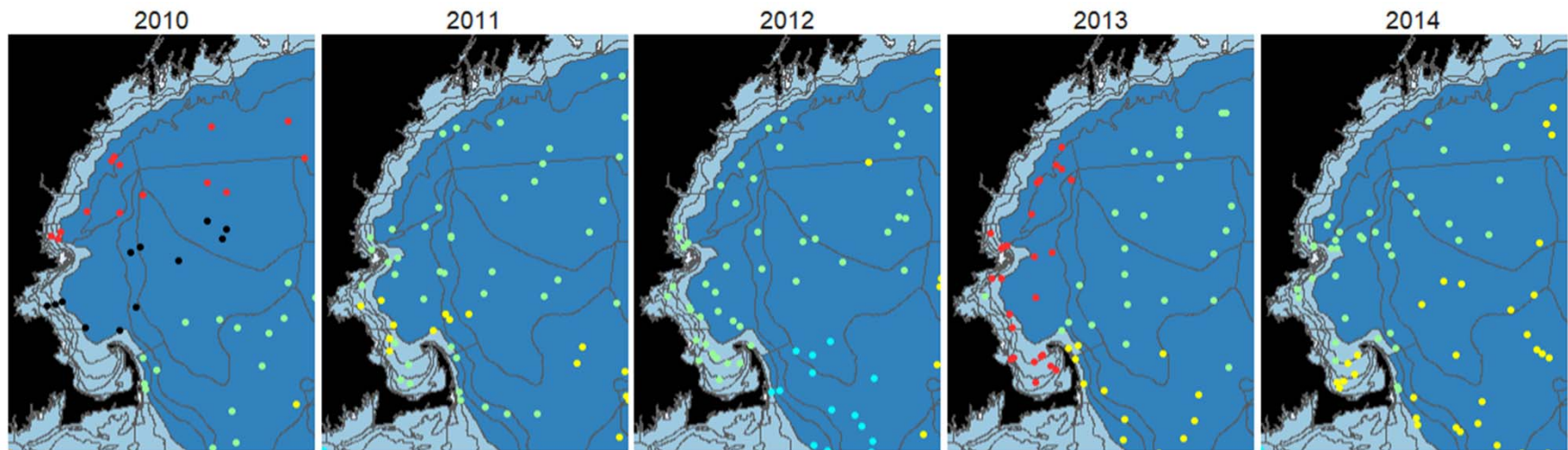
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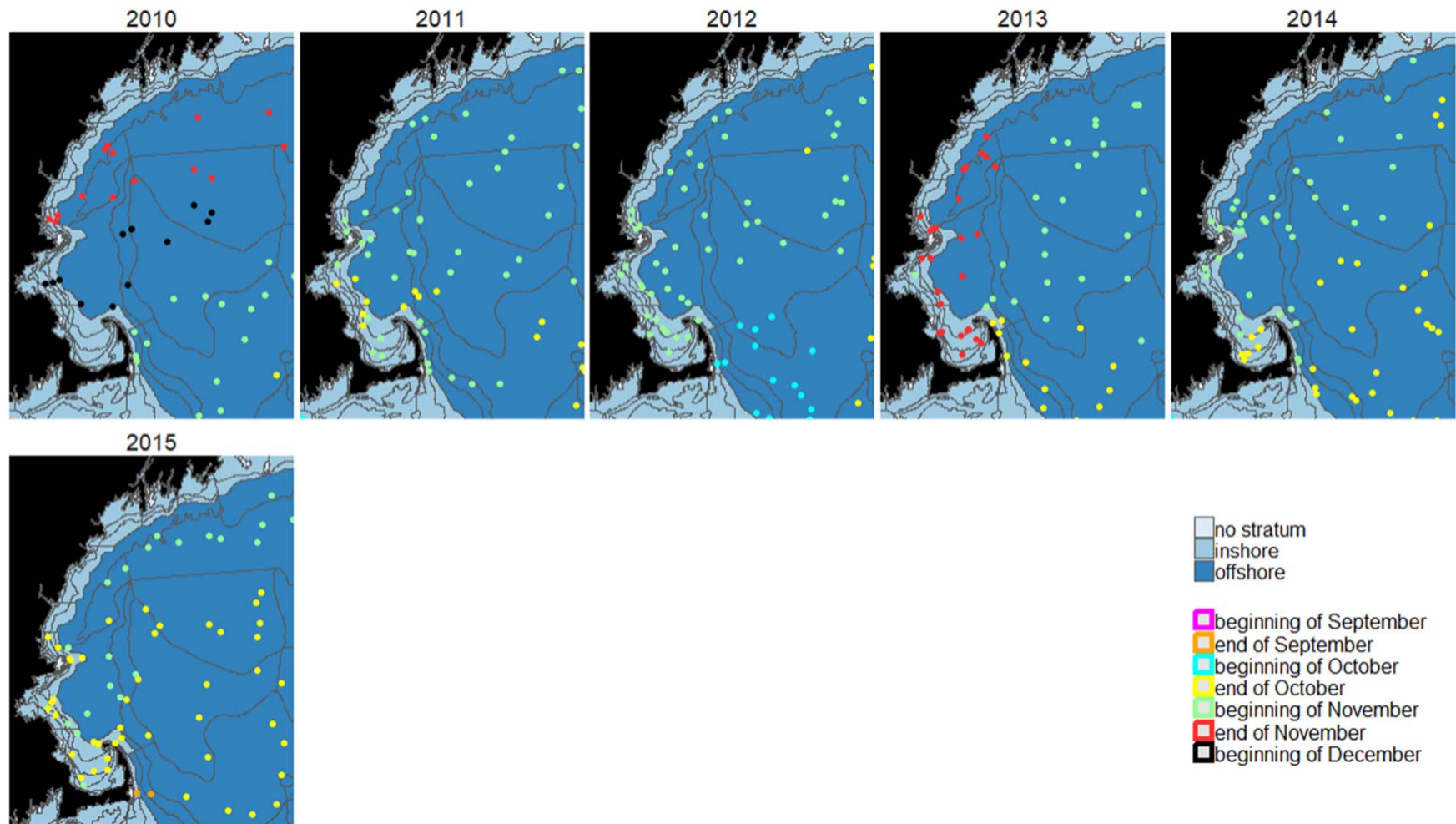
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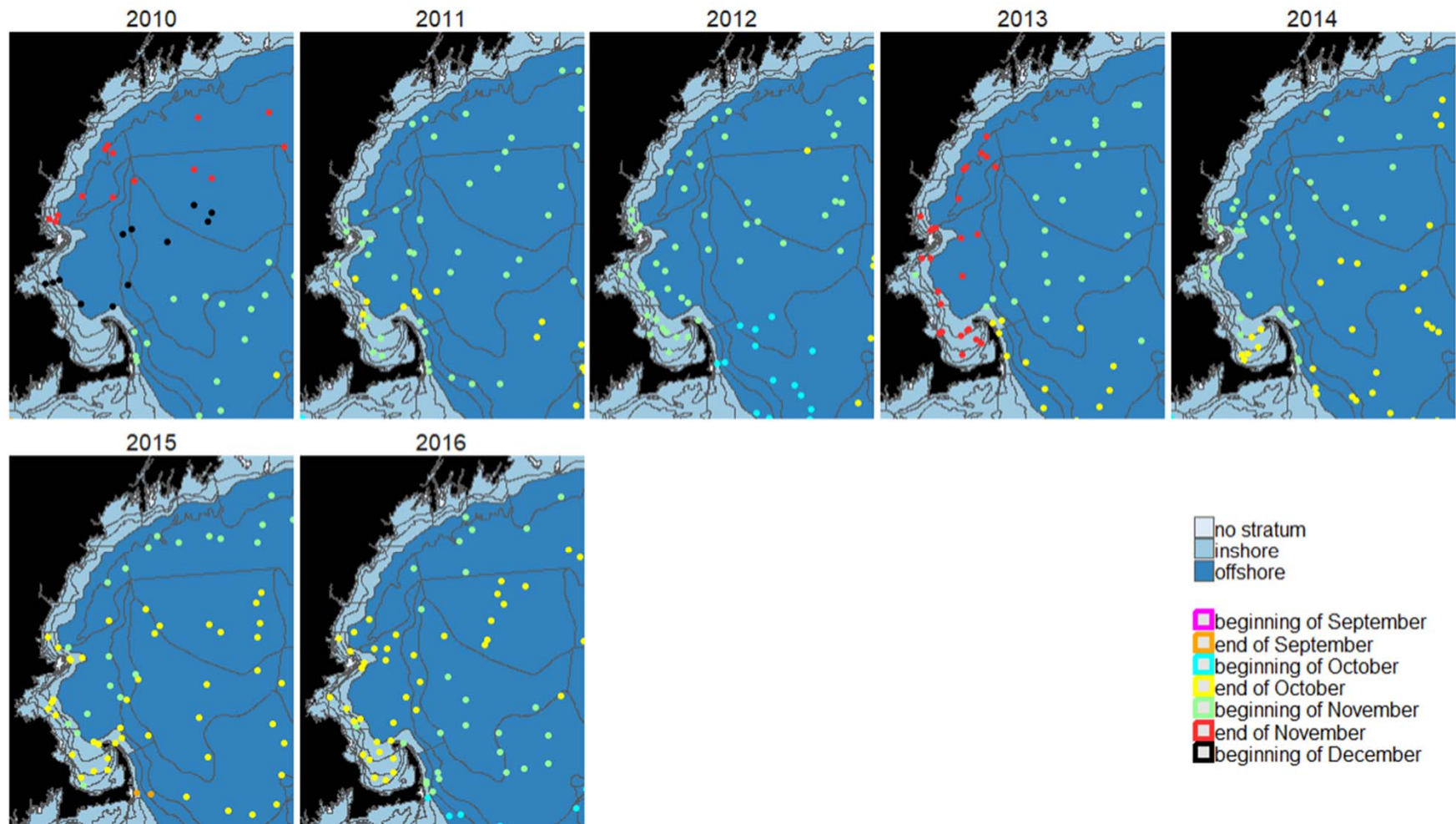
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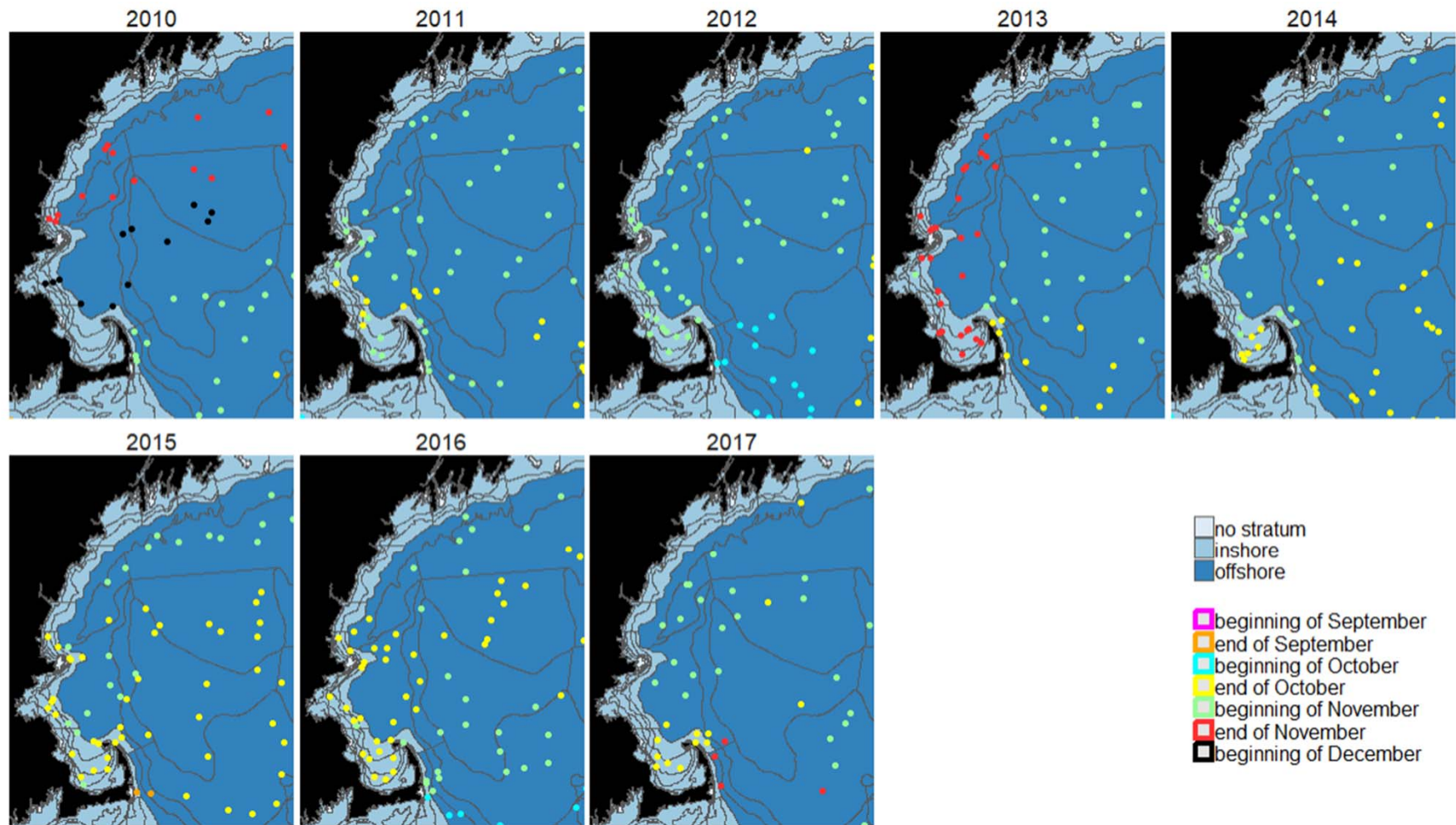
NEFSC fall sampling stations



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Fishermen's observations

Fish moving inshore later and staying later
-- Plaice, winter flounder

Fishermen's observations

Fish moving inshore later and staying later

-- Plaice, winter flounder

Fish found deeper

-- Plaice, grey sole, winter flounder, yellowtail flounder

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Increase in lobster pots, decreased accessibility to fishing grounds

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Landings affected by complex targeting decisions