
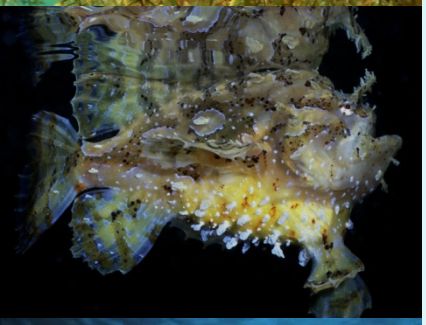

Aspects of life in the sea for Anguillid eels-the importance of the Sargasso Sea

Professor Howard Roe
Sargasso Sea Commission

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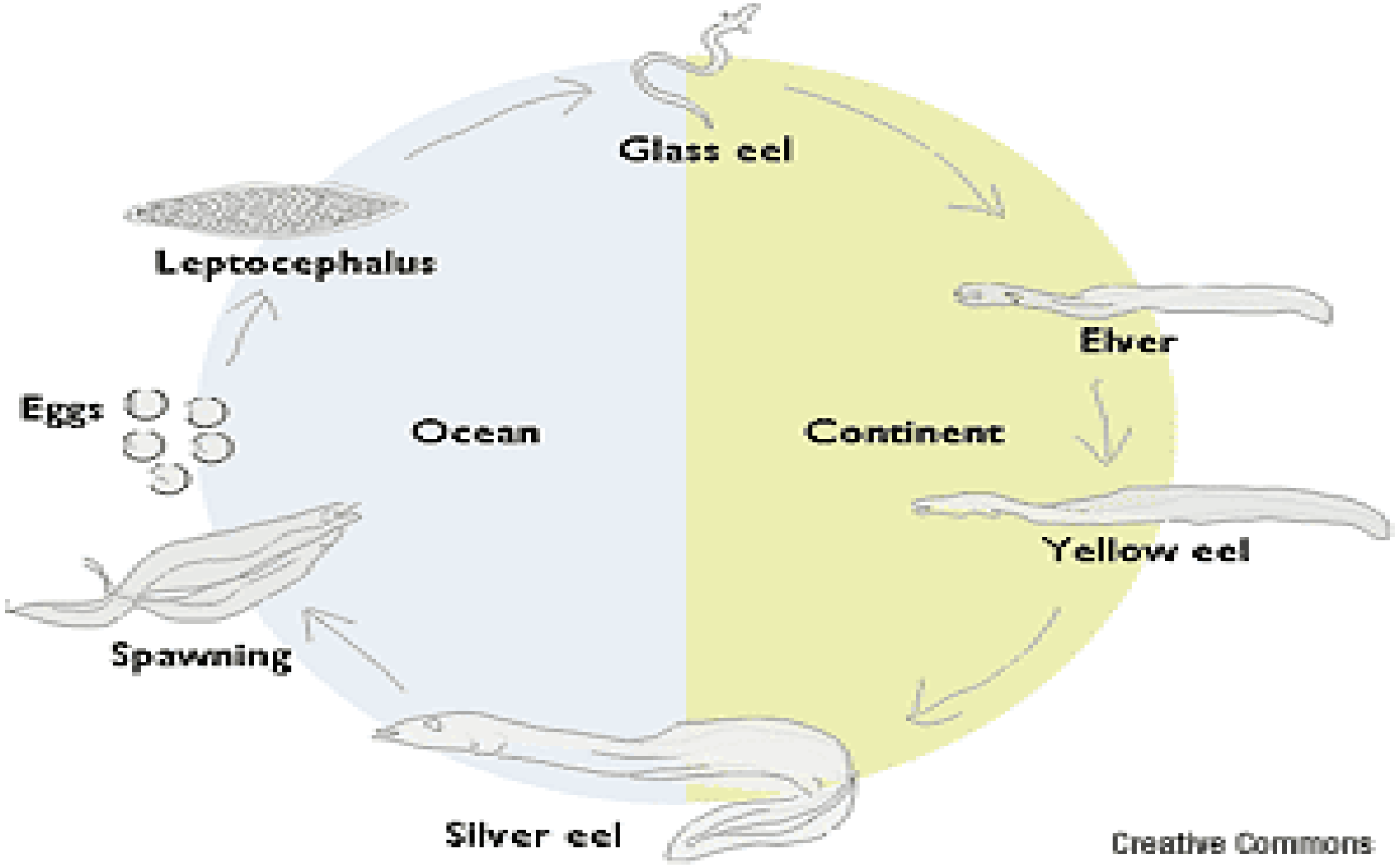
Eel Life Cycle



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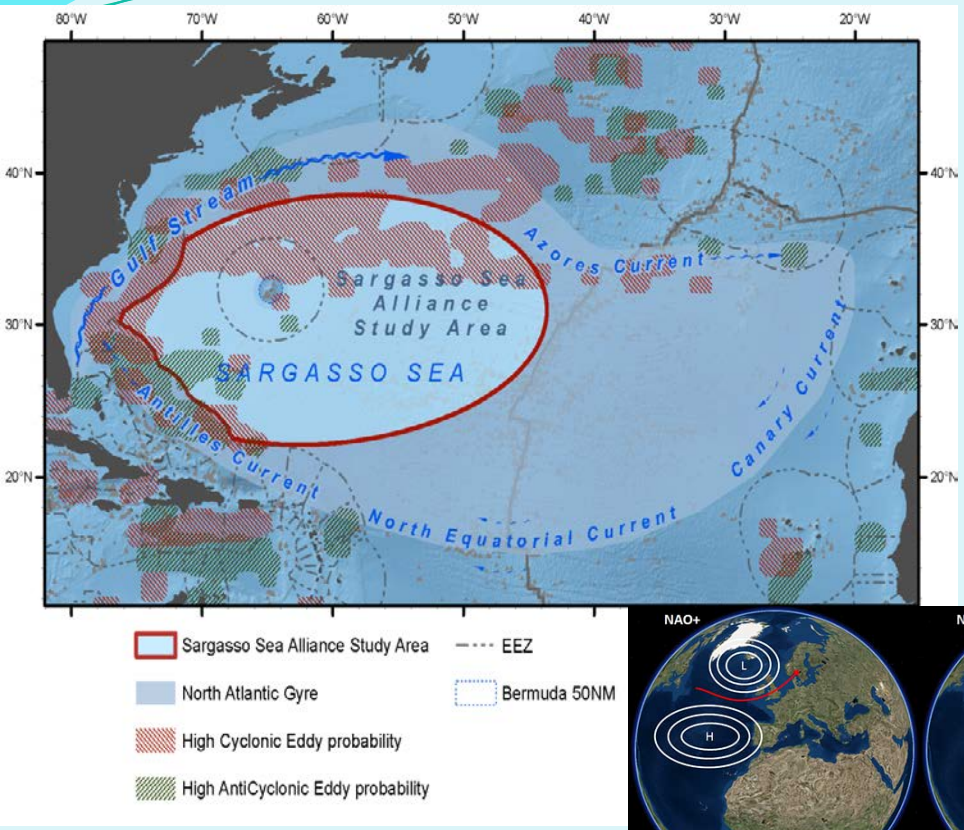
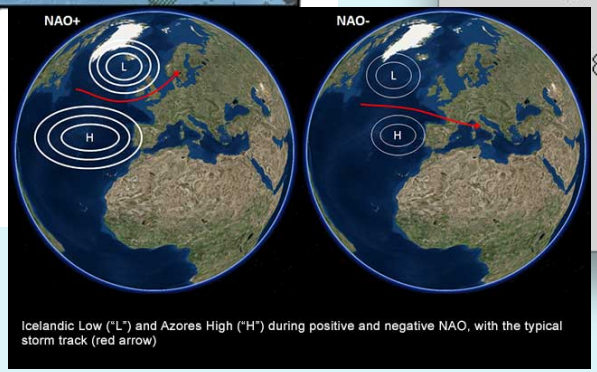
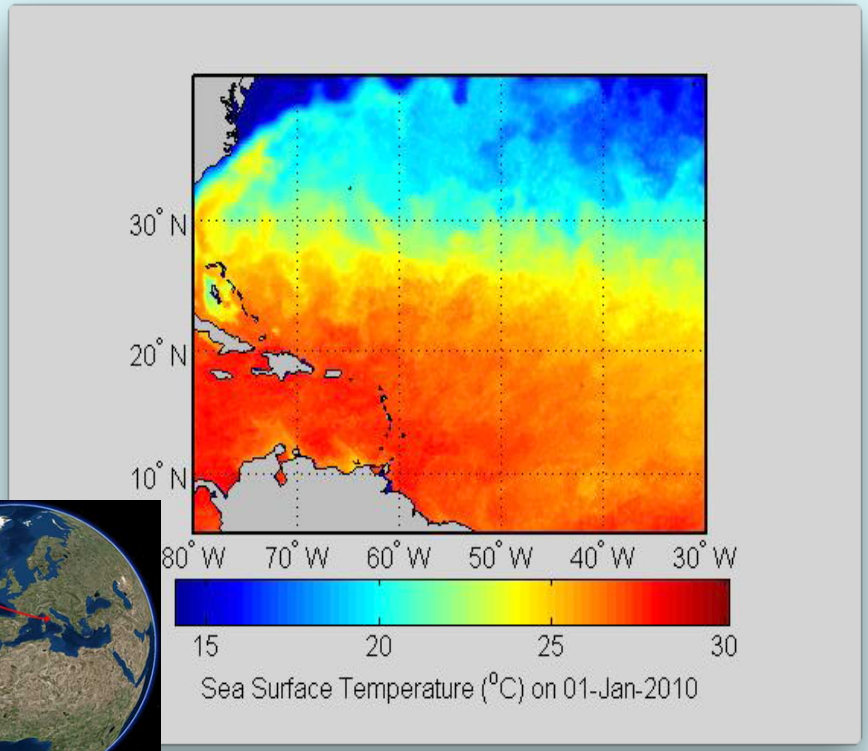




Icelandic Low ("L") and Azores High ("H") during positive and negative NAO, with the typical storm track (red arrow)



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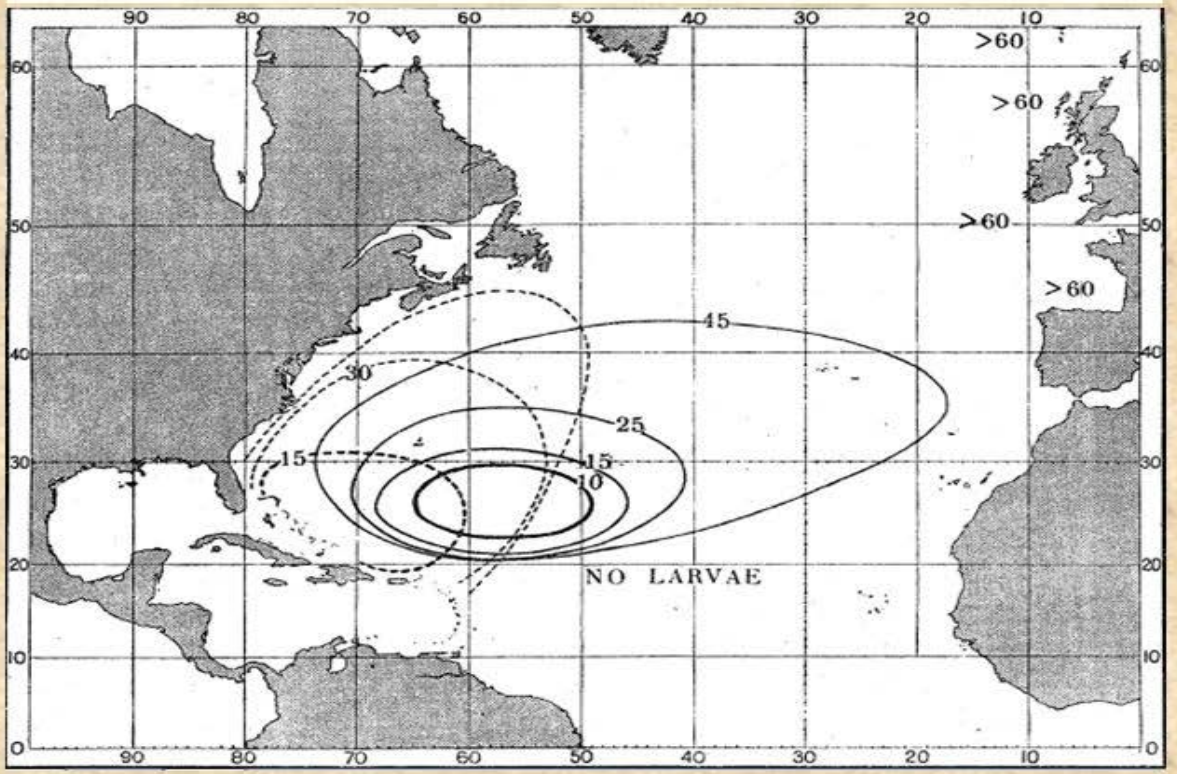
Johannes Schmidt
(1877-1933)
first identification of the eel's spawning grounds (1904-1923)

How Schmidt solved the problem: larvae grow in size as ocean currents carry them eastwards from the spawning grounds in the Sargasso Sea



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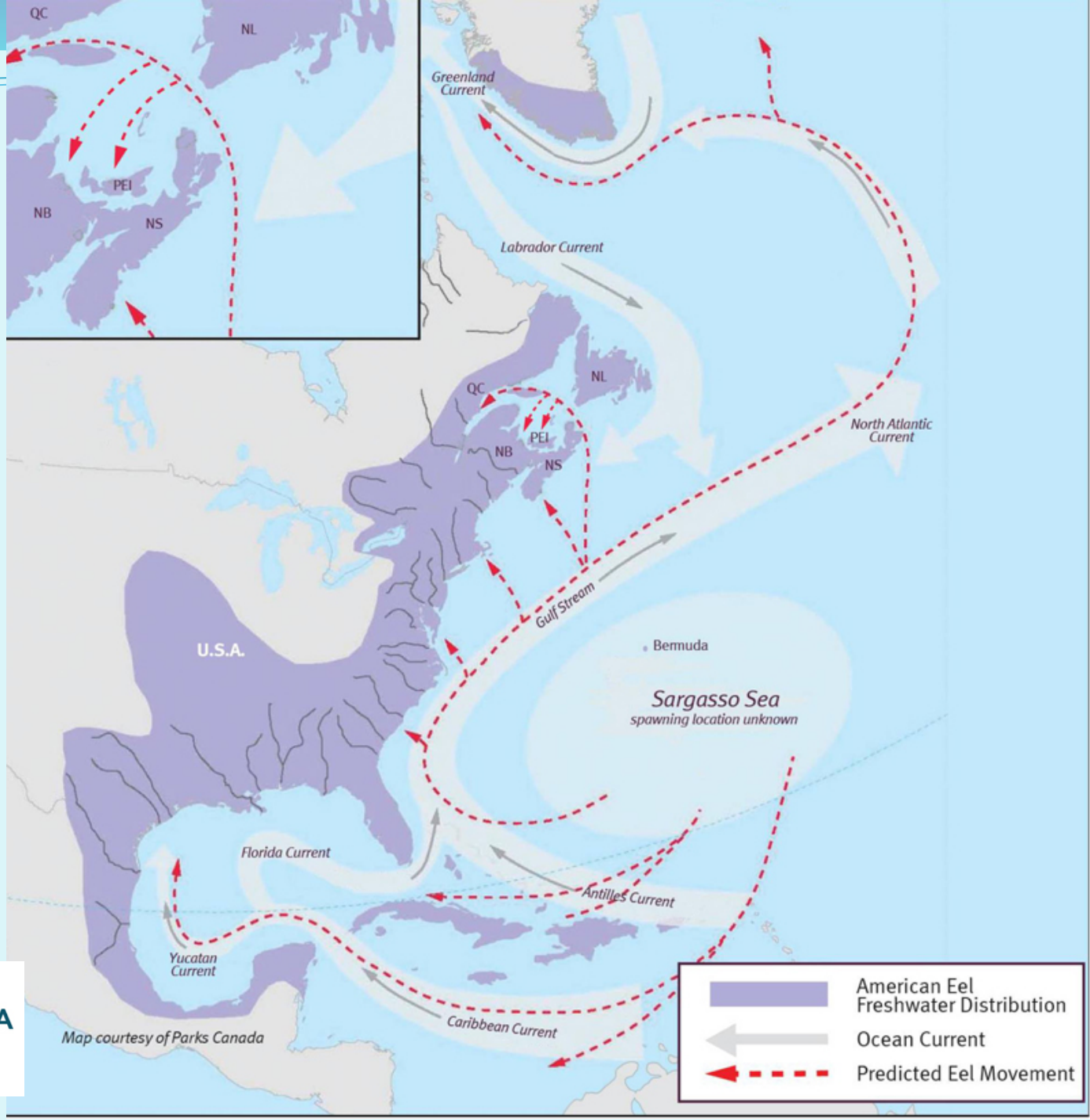
Distribution of *A. rostrata*

Fisheries and Oceans Canada 2016



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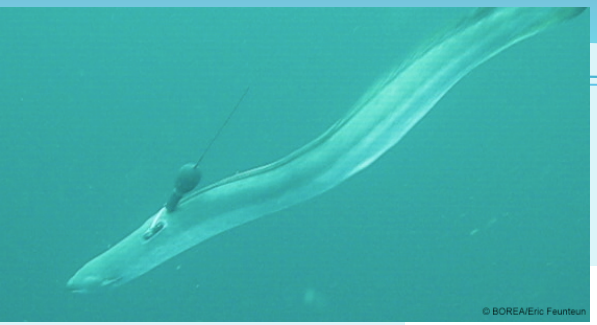
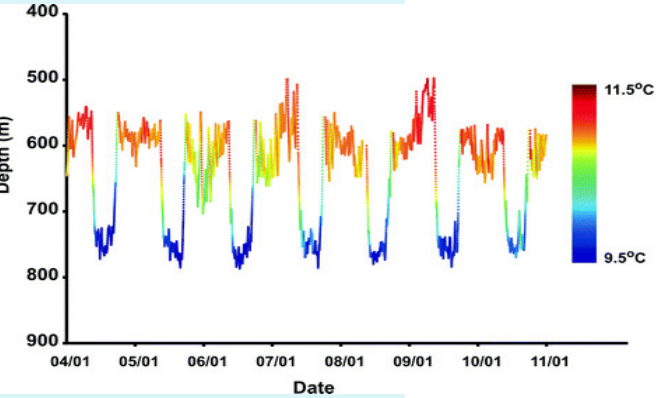
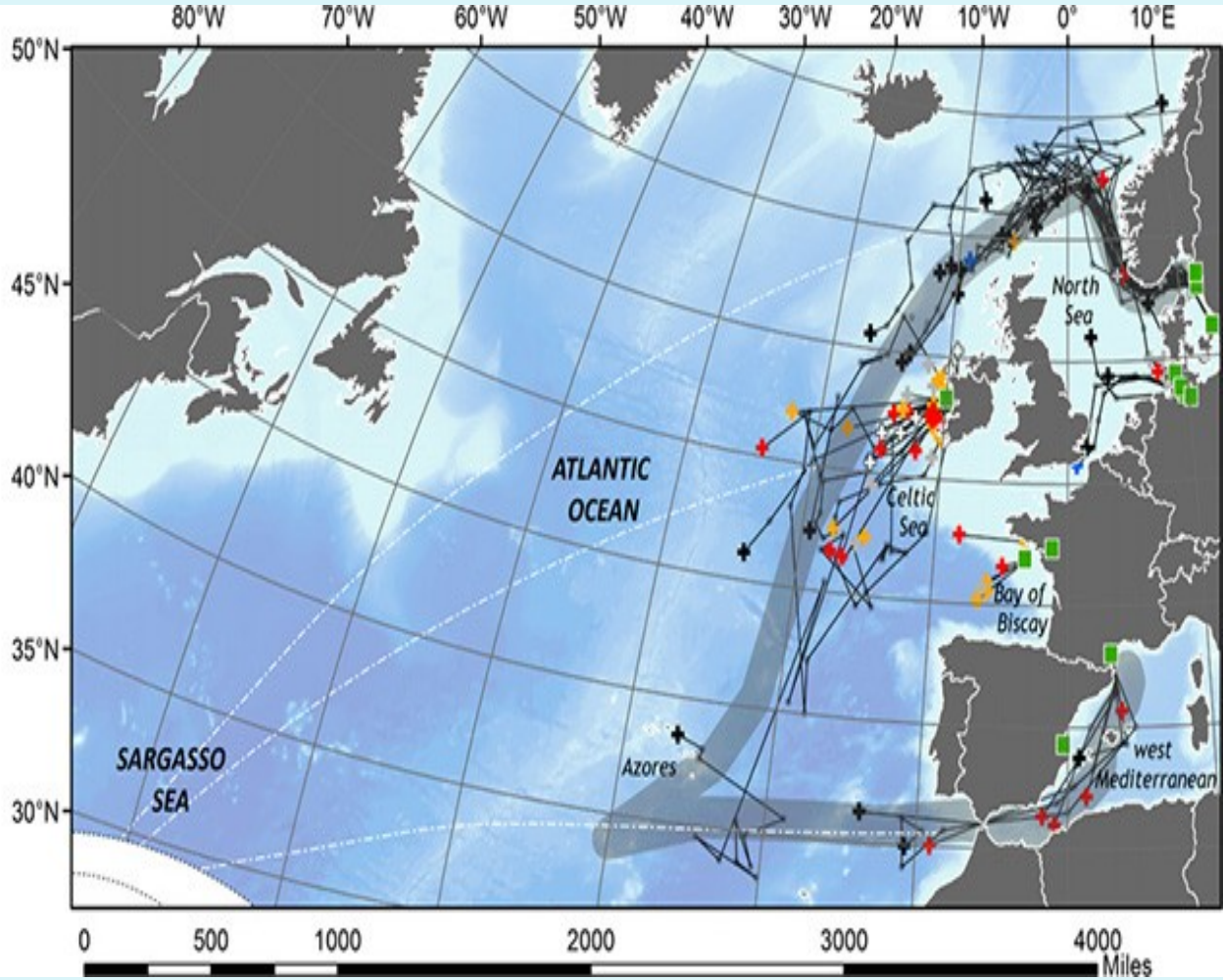
Anguilla anguilla Migration





K.Aarestrup et al 2009 Sci 325(5948)1660



D Righton et al 2016 Sci Adv 1(10)

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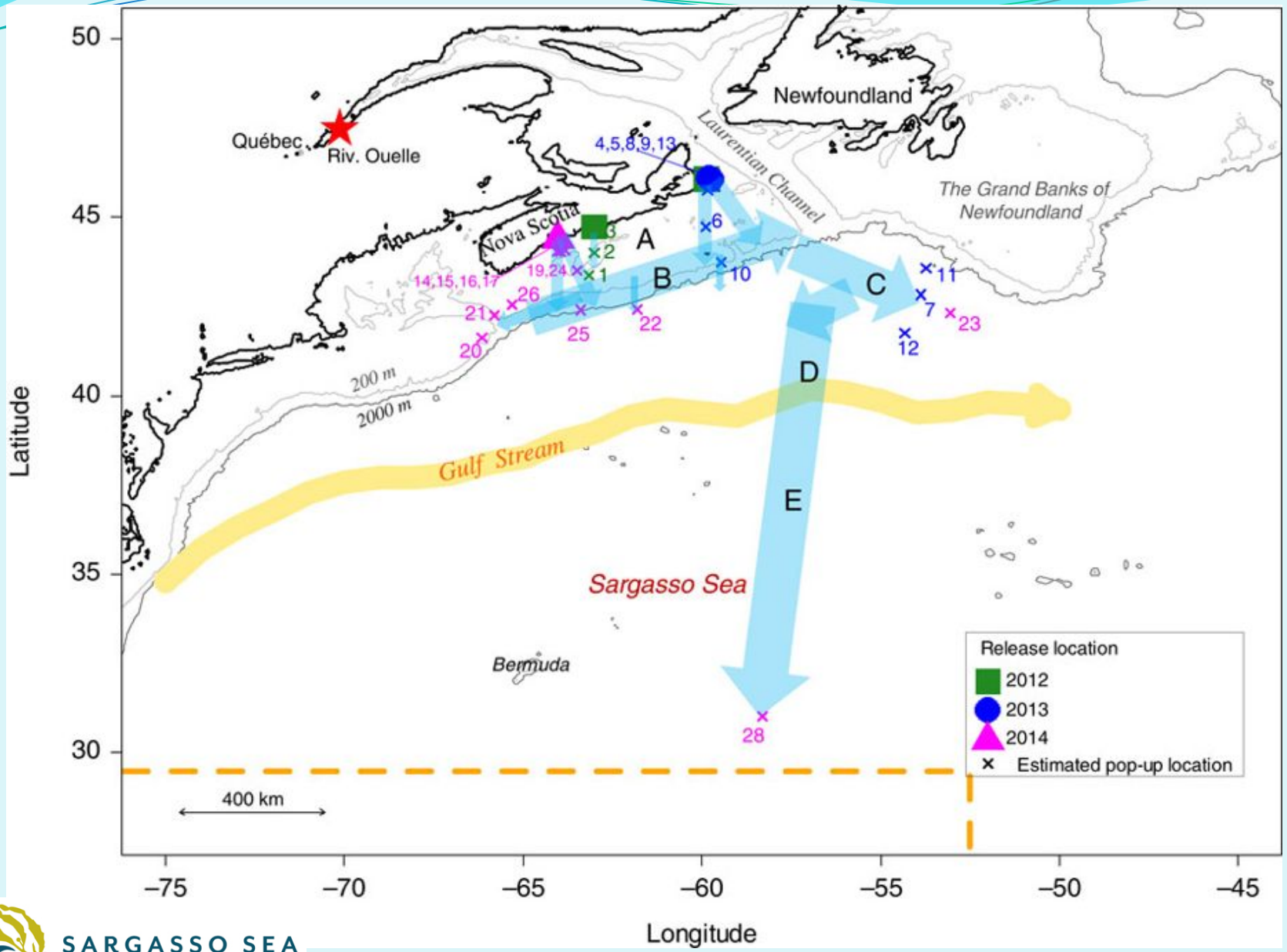
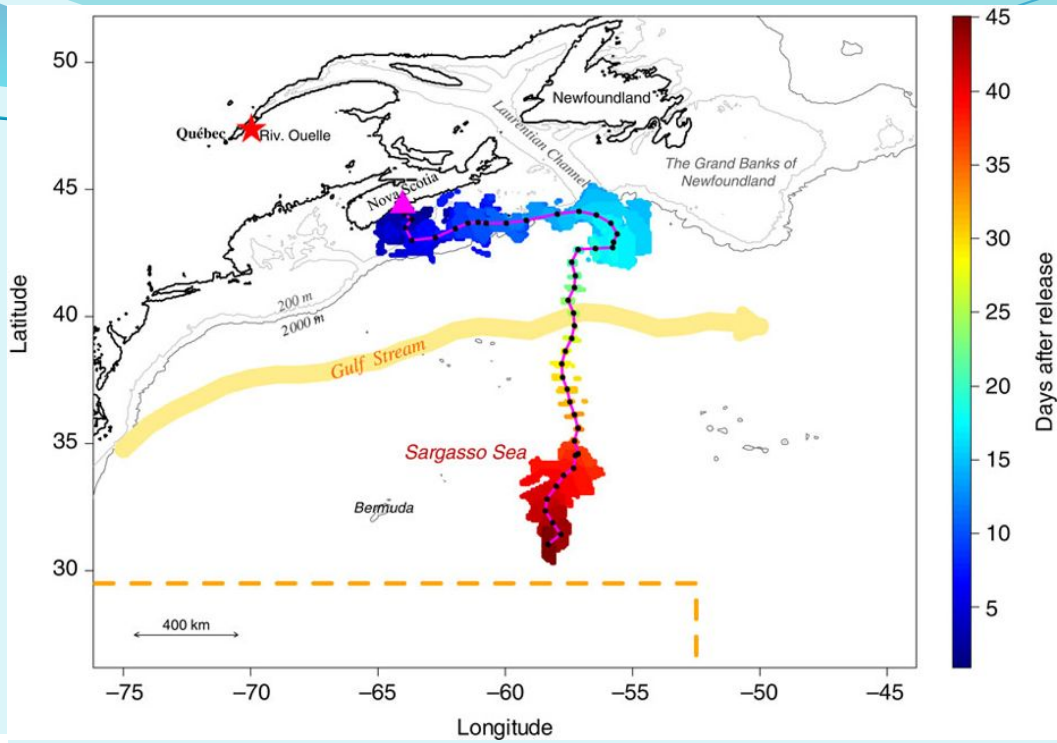
Anguilla rostrata migrations

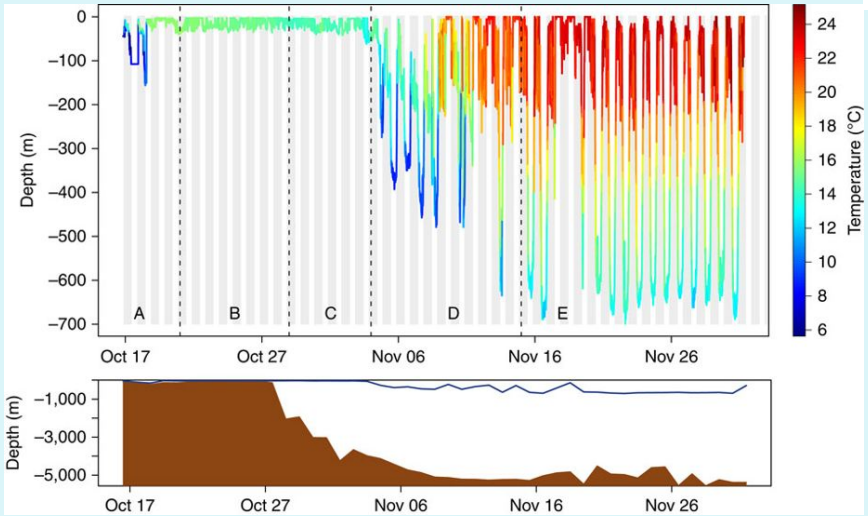


SARGASSO SEA COMMISSION

Beguer-Pon et al 2015 Nature Communications 6(8705)

Migration of *A. rostrata* number 28

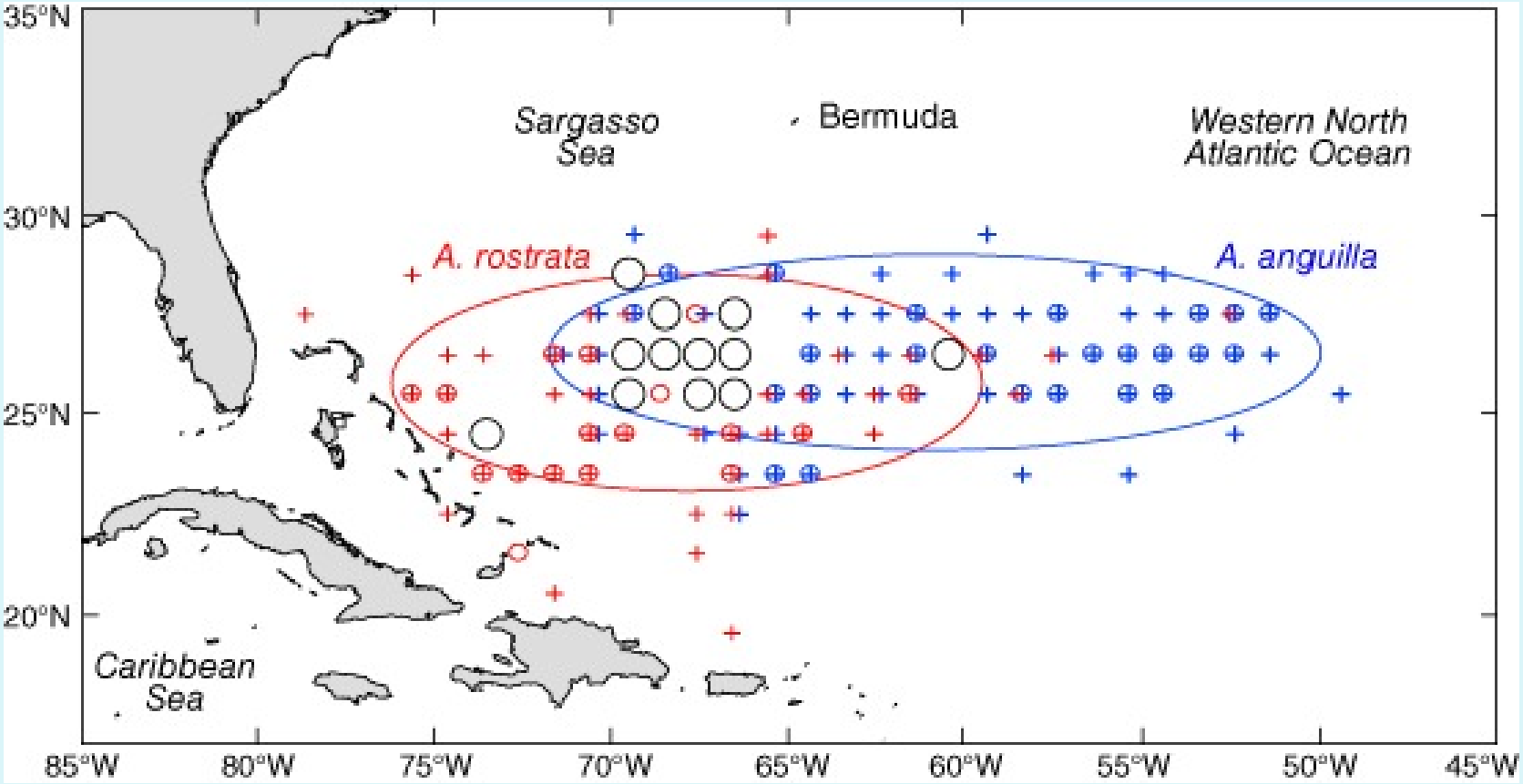




SARGASSO SEA COMMISSION

Beguer-Pon et al 2015 Nature Communications 6(8705)

Locations where small larvae 0-5.9 mm (small circles) and 6.0-10.9 mm (crosses) of *A rostrata* (red) and *A anguilla* (blue) were collected, pooled into 1° areas. Large circles show where < 6mm long larvae of both species were collected. Ovals show estimates of the primary spawning areas of both species.



Miller, M.J. et al 2015 Biol Rev Camb Philos Soc 90(4):1035-64

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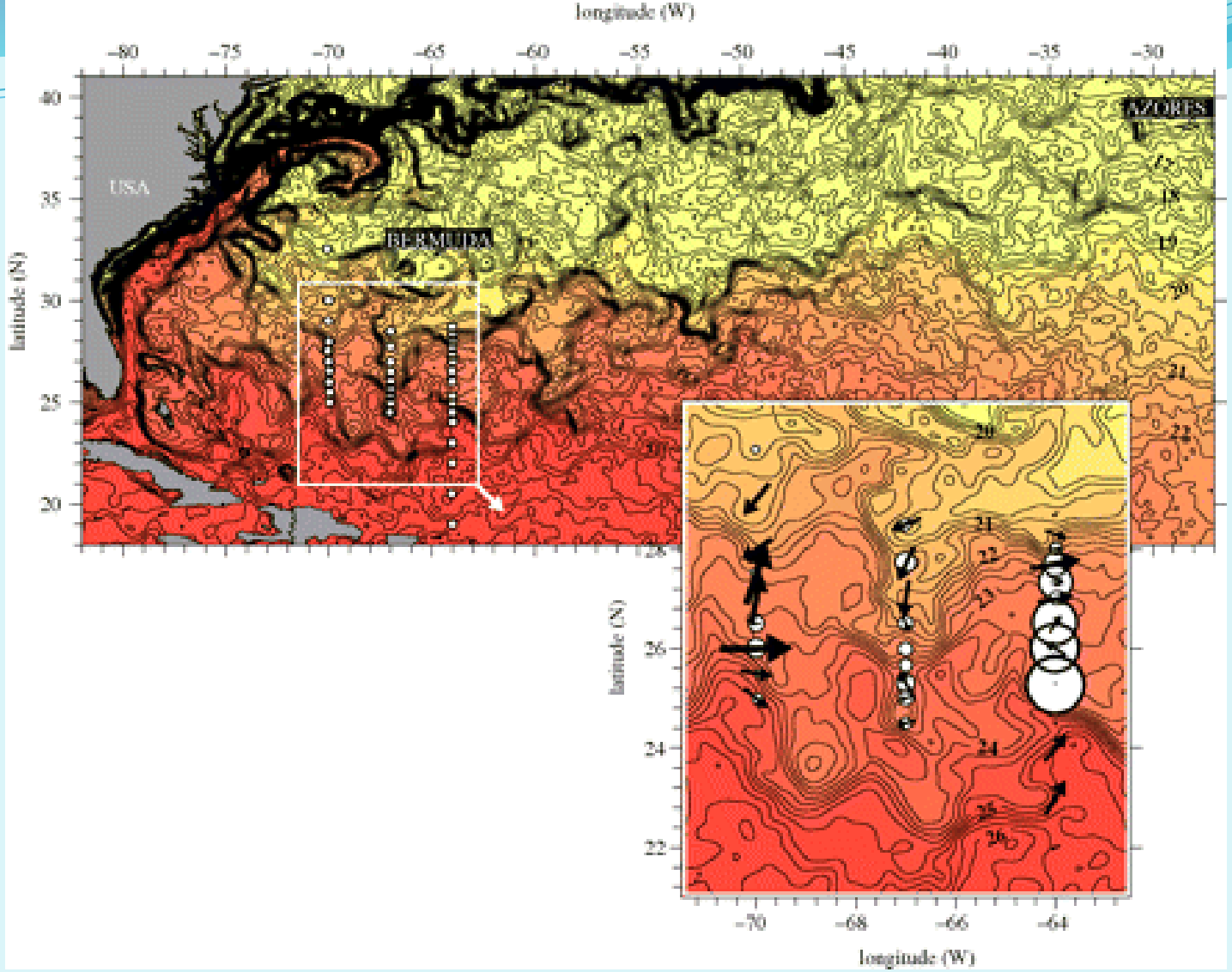
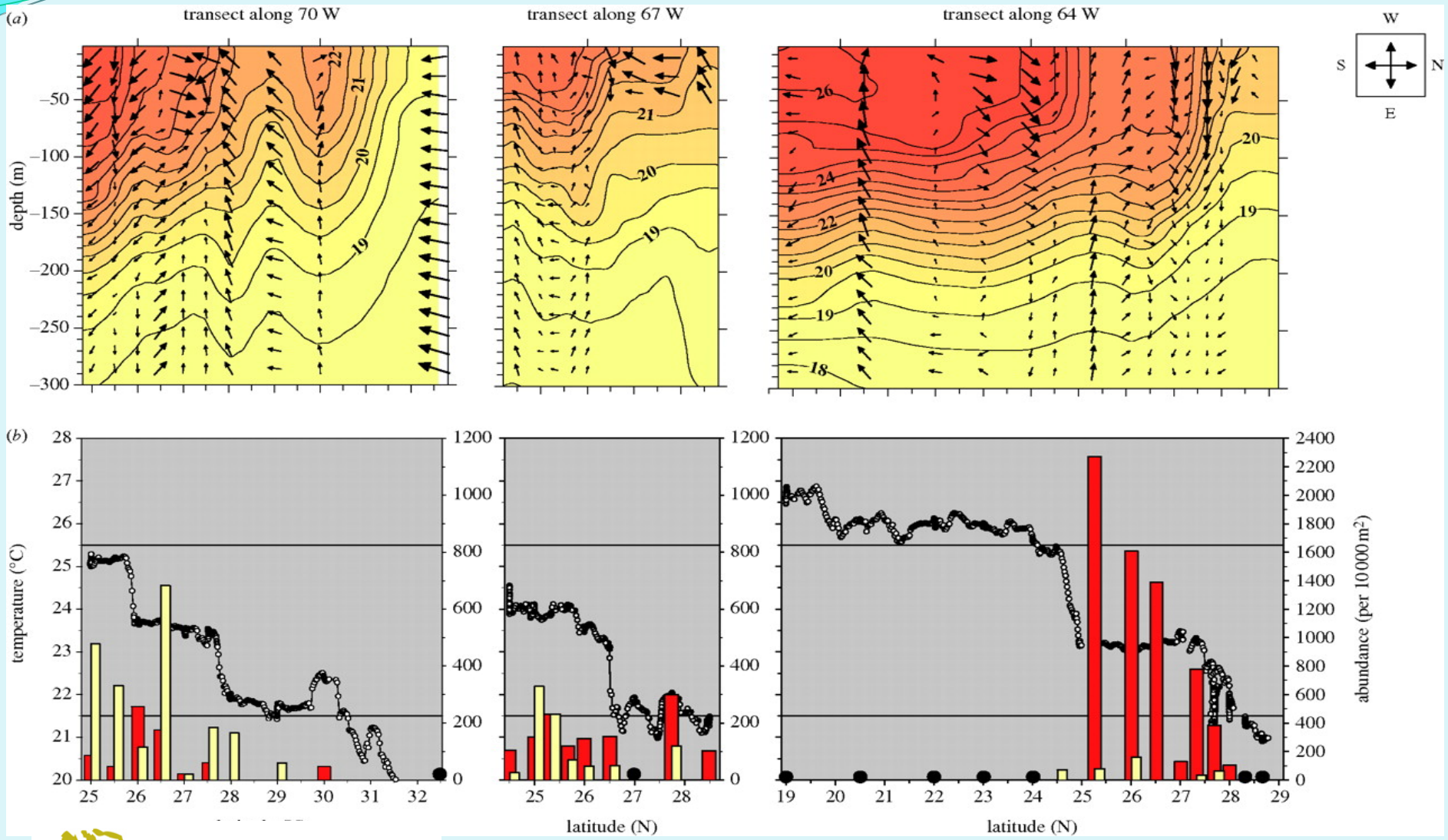
Sargasso Sea; sea surface temperatures, sampling positions and abundance of *A.anguilla*



P.Munk et al 2010 Proc Biol Sci 277(1700):3593-3599

SARGASSO SEA COMMISSION

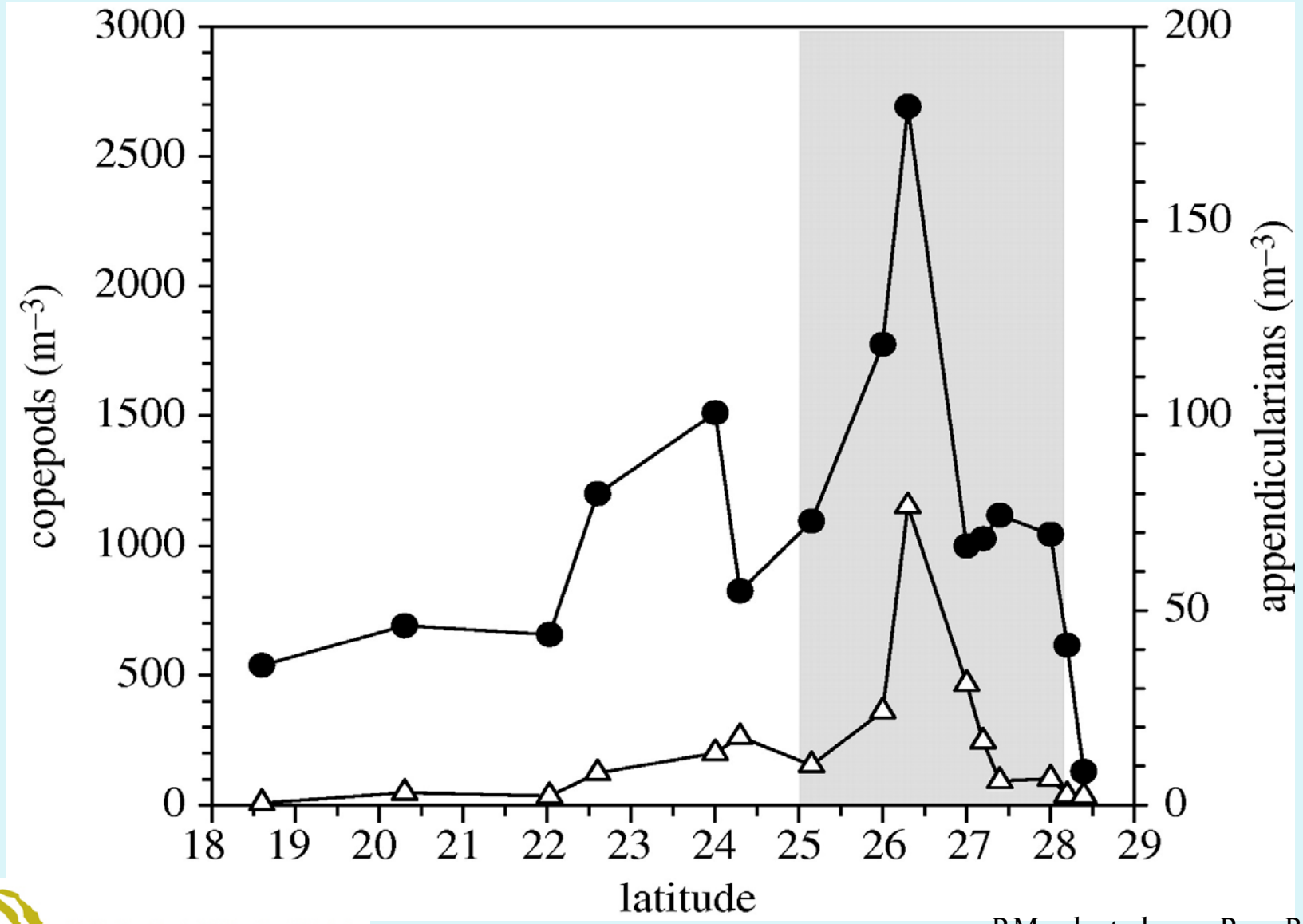
Hydrography and abundances of eel larvae along transects. Red bars=*A.anguilla*; Yellow bars = *A.rostrata*



SARGASSO SEA COMMISSION

P.Munk et al 2010 Proc Biol Sci 277(1700

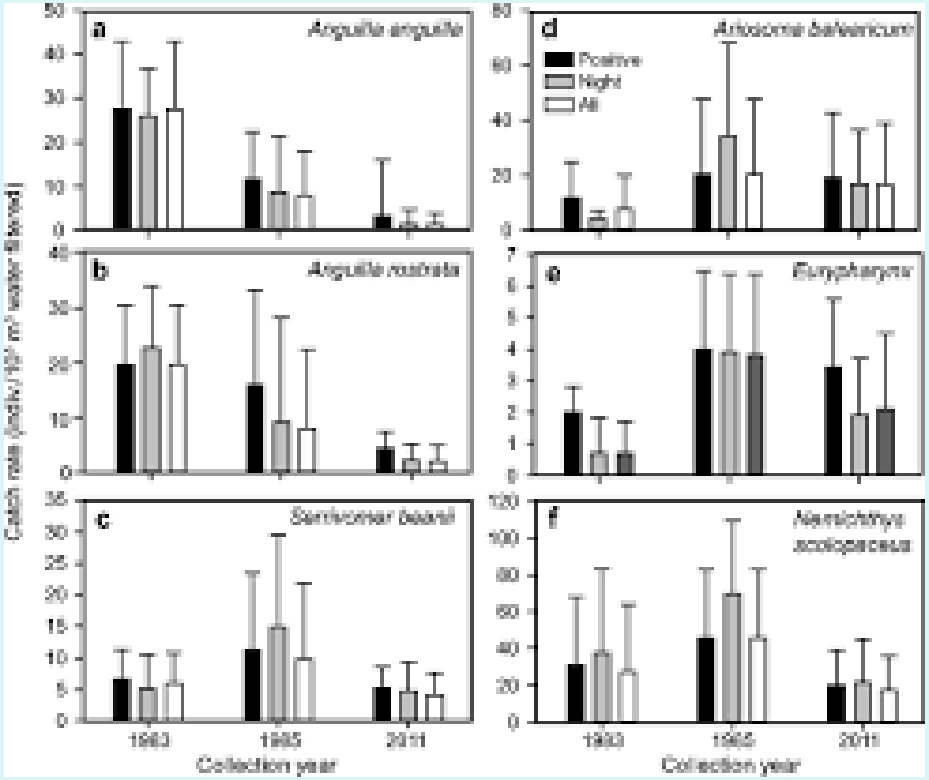
Abundance of plankton in vicinity of frontal zone

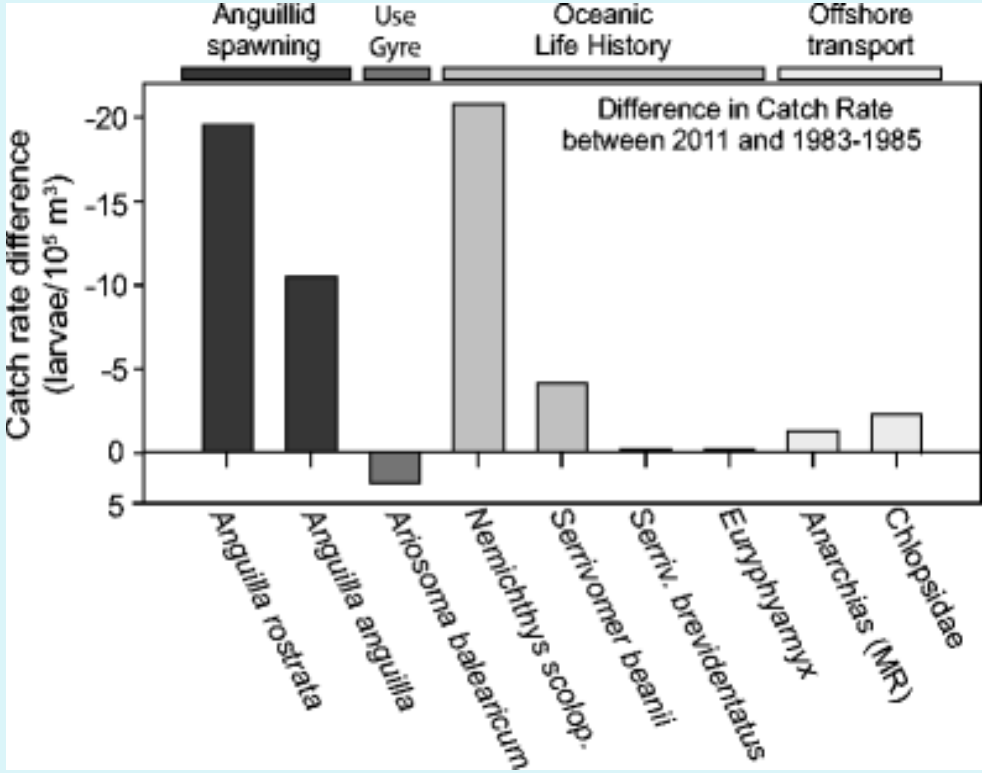


SARGASSO SEA COMMISSION

P.Munk et al 2010 Proc Biol Sci 277(1700)

Reduction in catches of eel larvae in Sargasso Sea





R.Hanel et al 2014 Naturwissenschaften 101(12):1041-54

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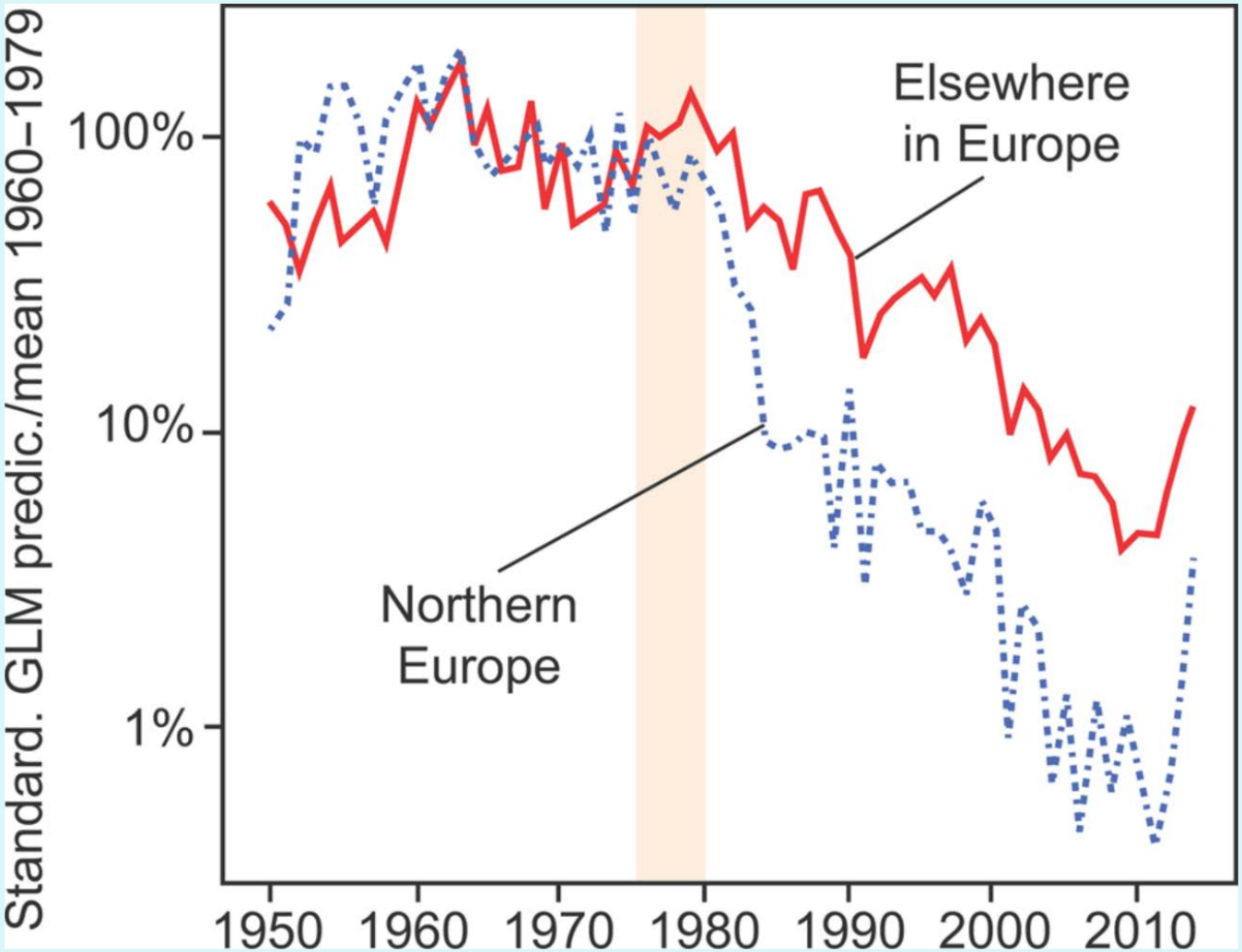
A.anguilla Changes in glass eel recruitment



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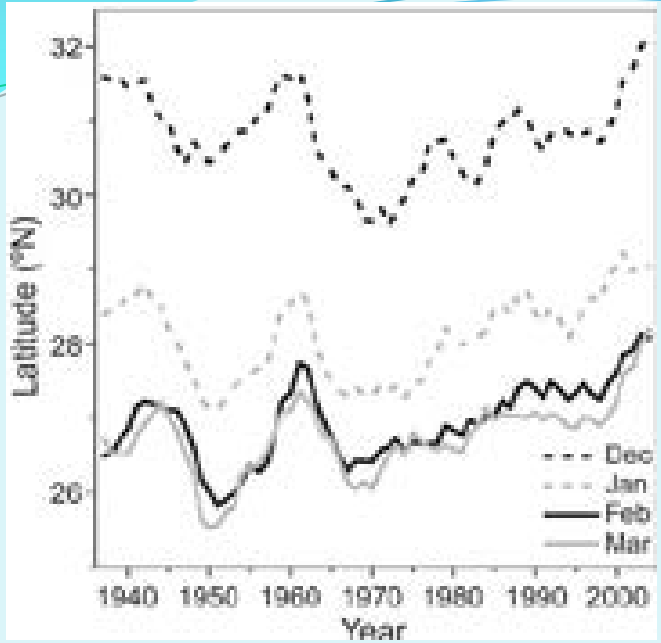
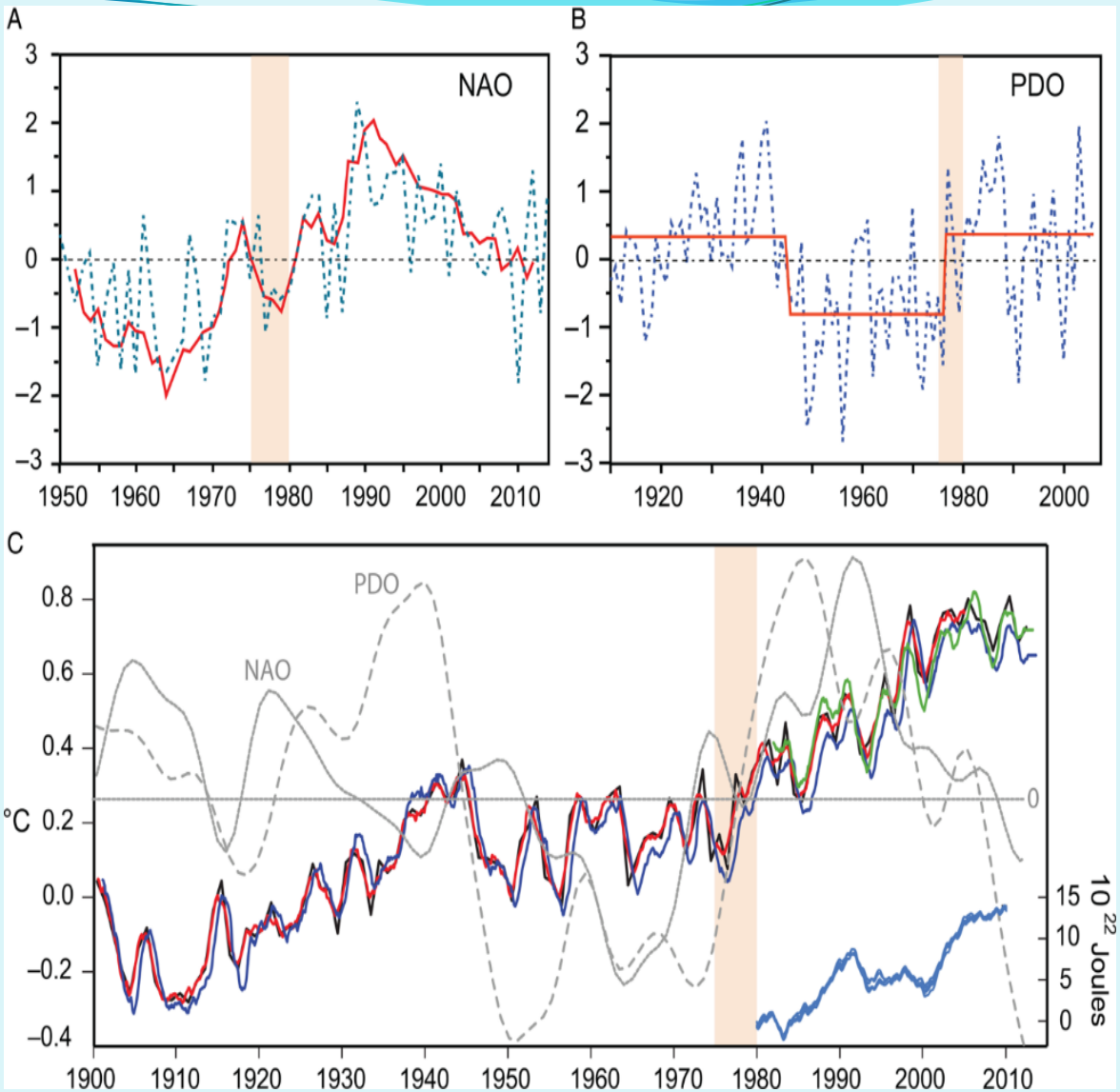
M.J.Miller et al 2016 ICES J Mar Sci 73(1) 43-56

Changes in the ocean and atmosphere



Friedland et al 2007 ICES J Mar Sci 64(3);519-530



M.J.Miller et al 2016 ICES J Mar Sci 73(1):43-56

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“Eels could disappear from French rivers due to black market trade”

“Europol estimates that glass eel traffickers earn > £32m per annum from illegal exports to Asia” *Daily Telegraph Nov 2018*

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"There's so much cocaine in London's sewage water that its getting eels belted!" Pedestrian TV Jan 2019

"Eels in Thames left hyperactive due to high levels of cocaine in water " Evening Standard Jan 2019

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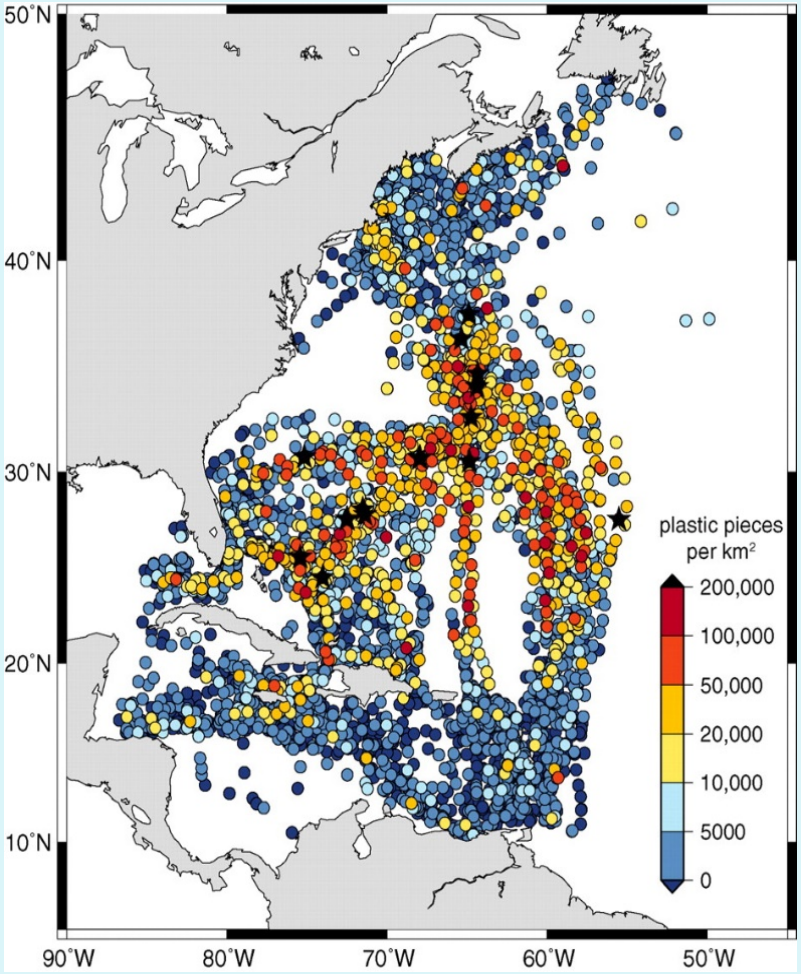
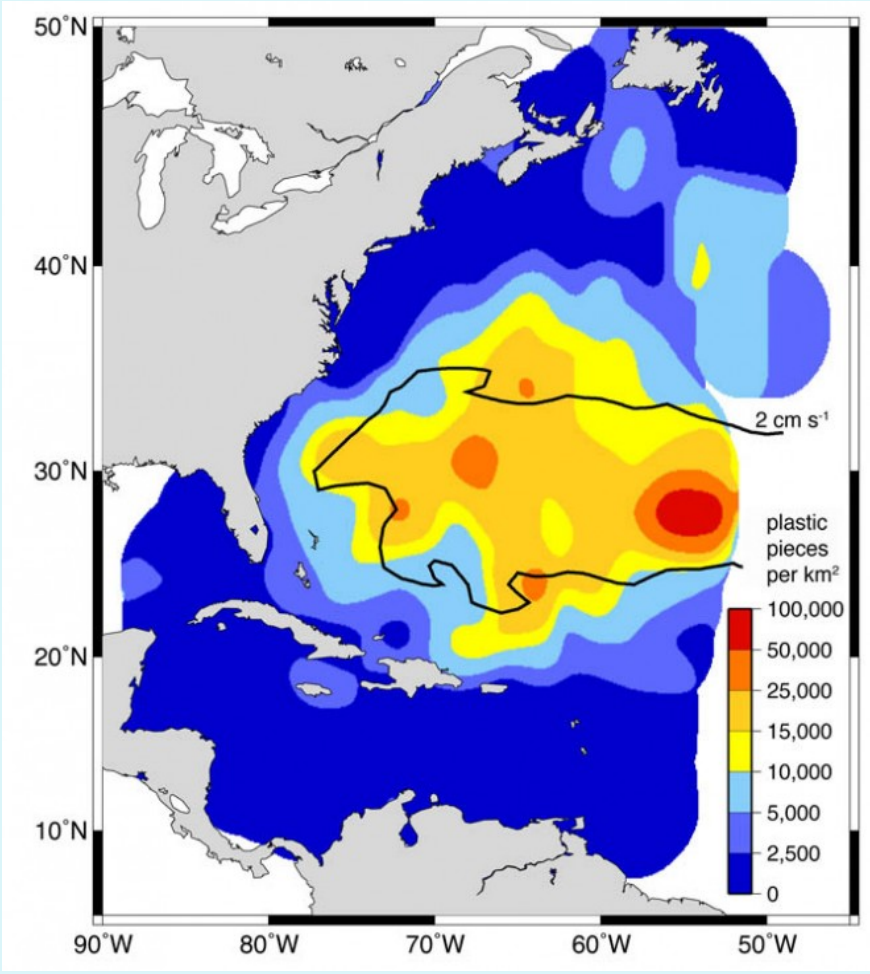
Distribution of plastic marine debris collected in 6136 surface plankton net tows on annually repeated cruise tracks from 1986 to 2008 in the western North Atlantic Ocean and Caribbean Sea.



Average plastic concentration(colour shading, units of pieces km-2)computed in 0.5º bins and smoothed with a 700km width Gaussian filter



Kara Lavender Law et al.
Science 2010;329:1185-118

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“Eel migration that has puzzled ecologists since Aristotle about to be solved”

Daily Telegraph 18.2.2019

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Conclusions

- The Sargasso Sea is internationally recognised as an Ecologically and Biologically Significant Area
- Recent research has enhanced our understanding of the marine life of both *A anguilla* and *A rostrata* but much still remains to be discovered.
- It is overwhelmingly important as the sole spawning site for both *A anguilla* and *A rostrata*
- Within the Sargasso Sea the seasonal Subtropical Convergence is particularly important for spawning, for development and for the potential return transport of Anguillid leptocephali
- Global warming and changes in ocean/atmosphere interactions have likely adversely impacted spawning and subsequent recruitment success of Anguillid eels.
- The Sargasso Sea is additionally threatened by a range of real and potential threats, which could in turn adversely impact Anguillid eels

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What can we do in the marine sphere to promote spawning success and subsequent recruitment of *A anguilla and A rostrata*?

- Support international efforts to manage and conserve the open ocean in ABNJ; the Sargasso Sea is a specific example in this ongoing UN debate

- Promote international recognition for the seasonal importance of the Subtropical Convergence Zone in the Sargasso Sea

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