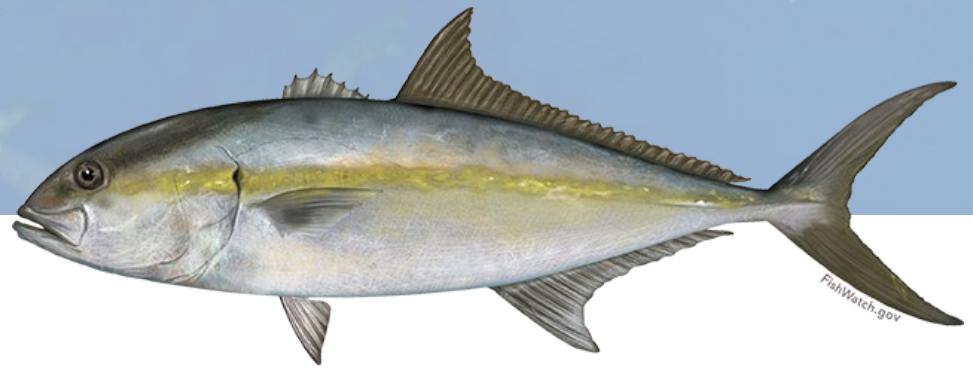
Tab A, No. 8

Assessing the influence of *Sargassum* habitat on greater amberjack recruitment in the Gulf of Mexico



August 25, 2021

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Fisheries Oceanography and Ecology
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University of South Florida, Optical Oceanography Laboratory

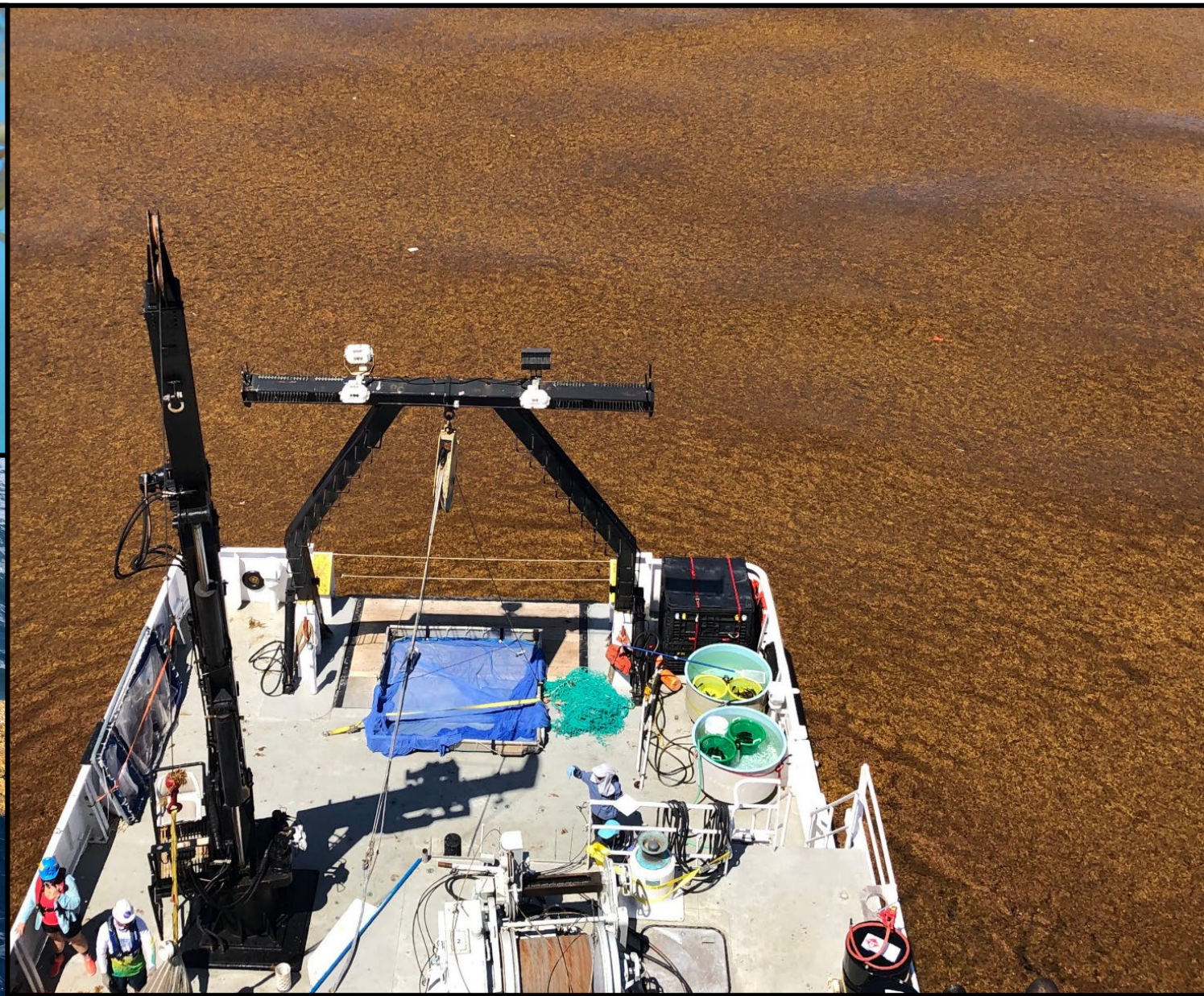
Acknowledgments

Gulf of Mexico Fishery Management Council

Josh Kilborn, University of South Florida

SEFSC SEDAR team – Gulf of Mexico greater amberjack

Sargassum – essential fish habitat



Sargassum – essential fish habitat

Greater amberjack (*Seriola dumerili*) - *Sargassum* nursery habitat


https://www.fisheries.noaa.gov/species/greater-amberjack

Adults

Structured bottom habitat (reefs, wrecks)

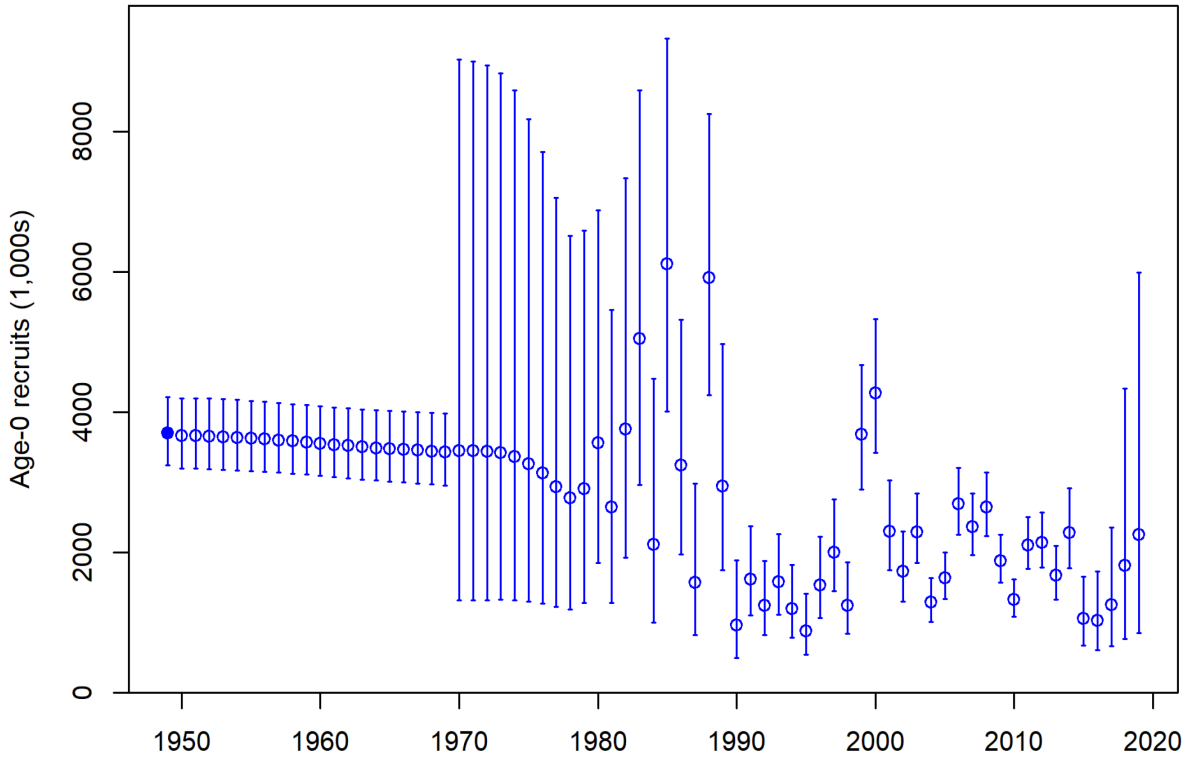
Juveniles

Pelagic *Sargassum*

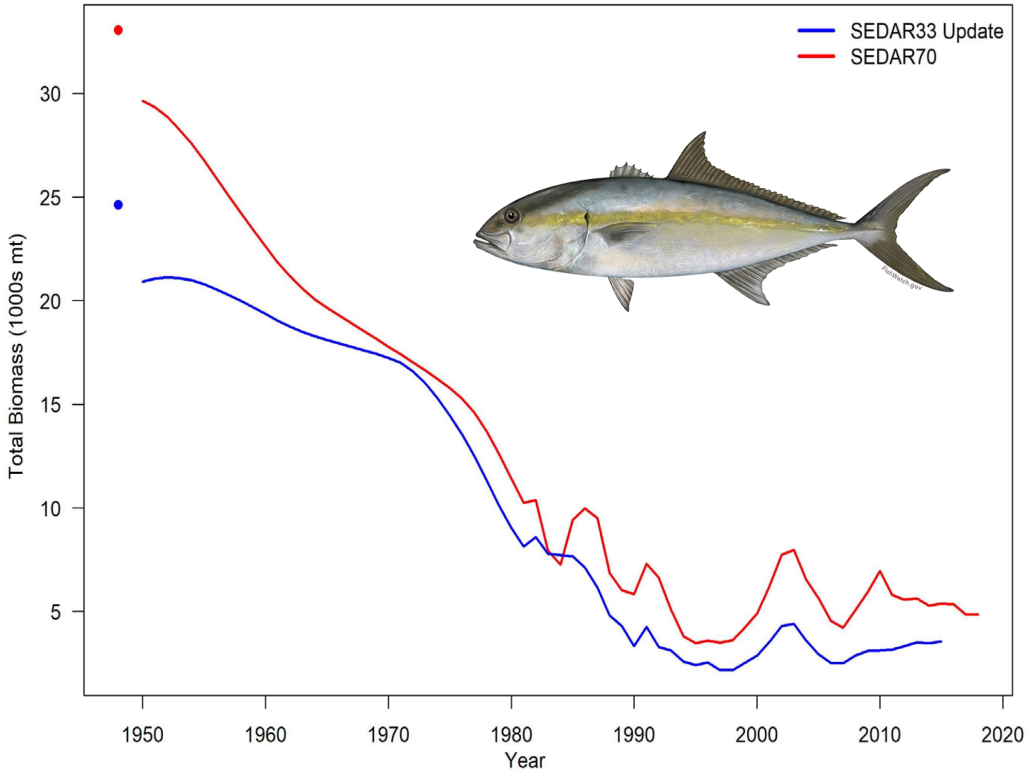
Wells and Rooker (2004)

Gulf of Mexico greater amberjack – overfished and undergoing overfishing

Recruitment



Biomass



SEDAR 70 (2020)

Can *Sargassum* habitat availability inform population assessments of managed species?

Does *Sargassum* area coverage predict greater amberjack recruitment or abundance?

Are other early life indicators (larval abundance) associated with *Sargassum* or recruitment?

Habitat and early life history time series

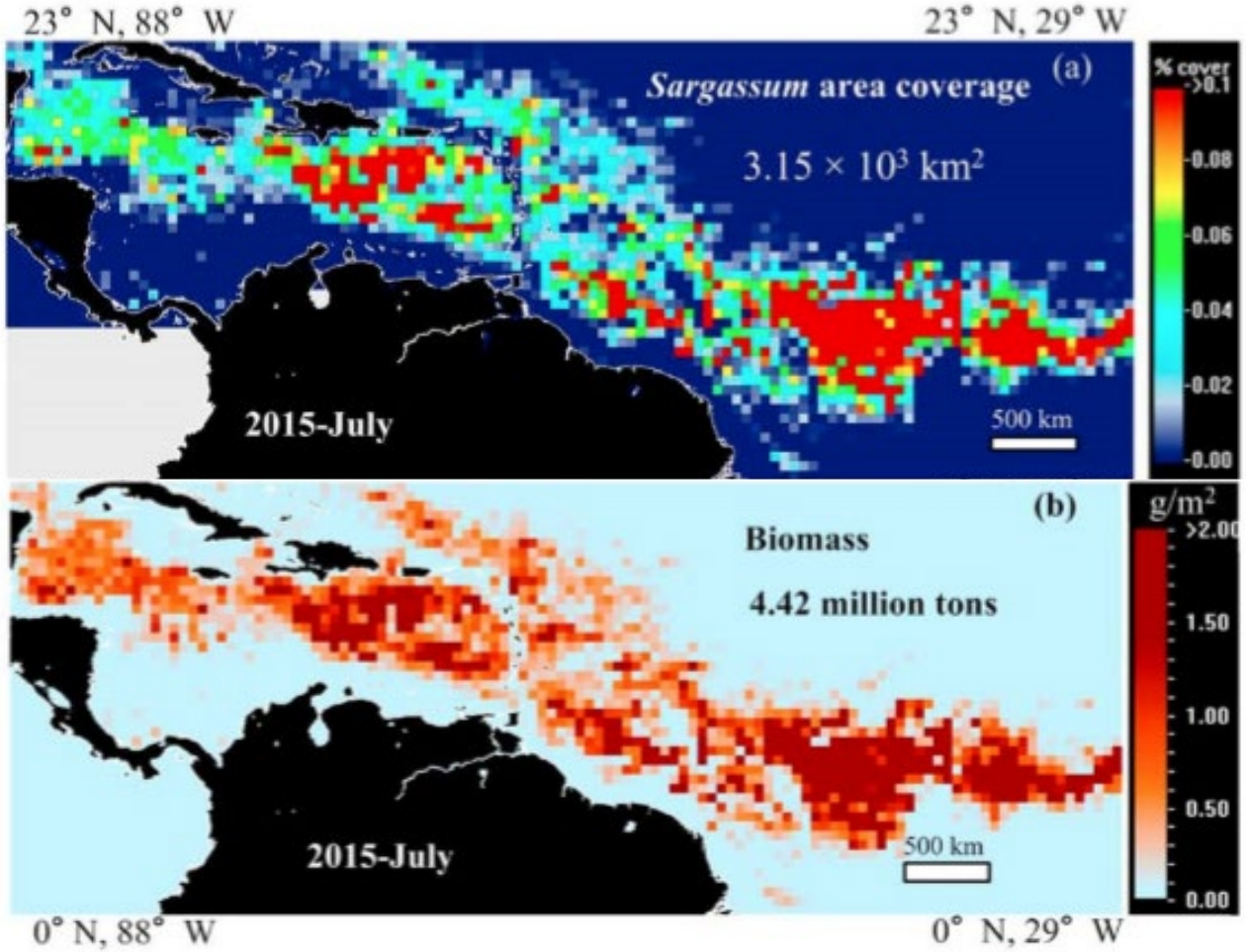
Sargassum abundance indices

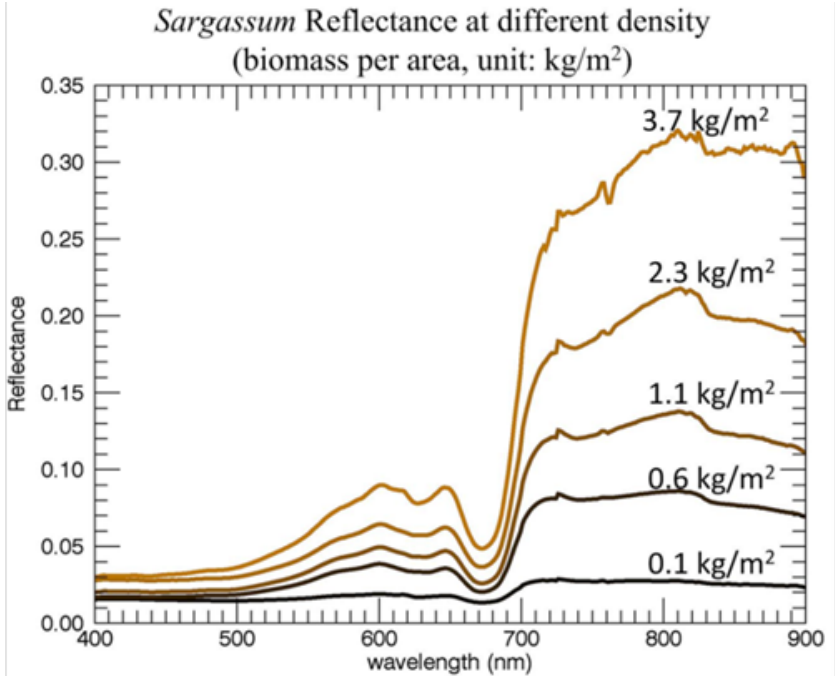
Larval abundance indices

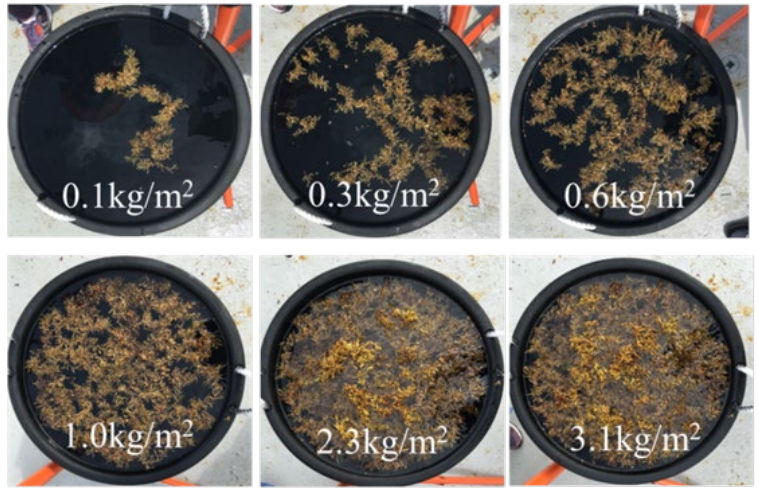
SEDAR 33 Update (2016) - Greater amberjack

- Age-0 recruits, fishery-dependent and fishery-independent abundance indices

Sargassum habitat indices - Remotely sensed



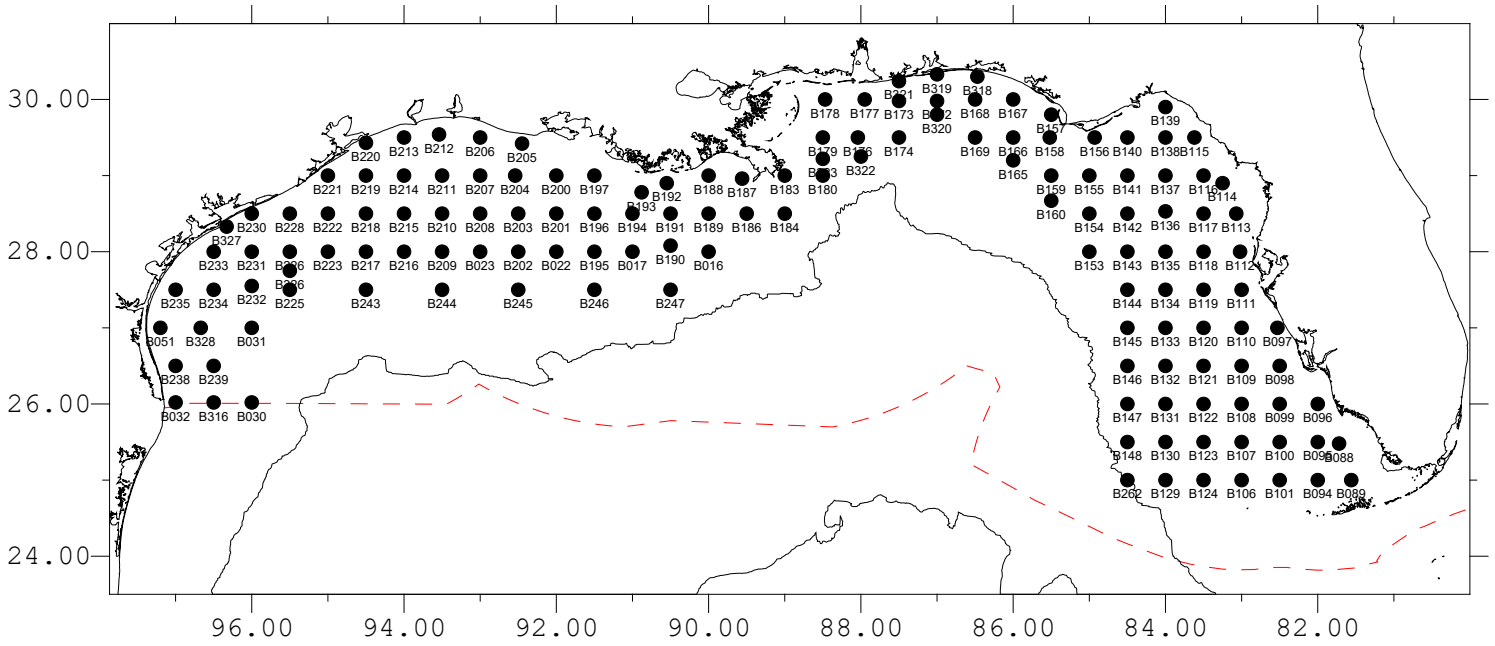




Wang et al. (2018) Fig. 3 (modified), supplement

Sargassum habitat indices - Vessel based

RESTORE SCIENCE PROGRAM



SEAMAP ichthyoplankton surveys (2003-2019)

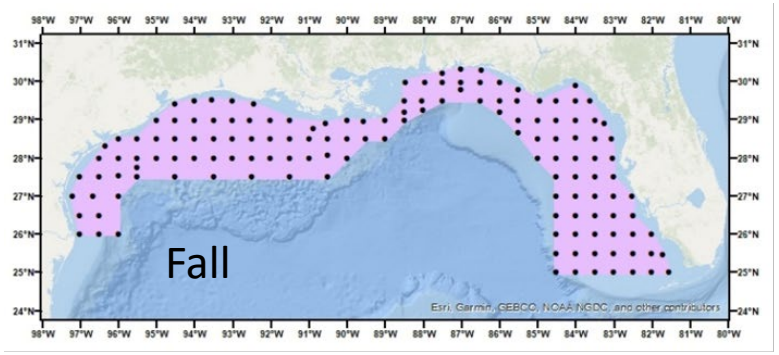
1 x 2 m neuston, 0.950 um mesh

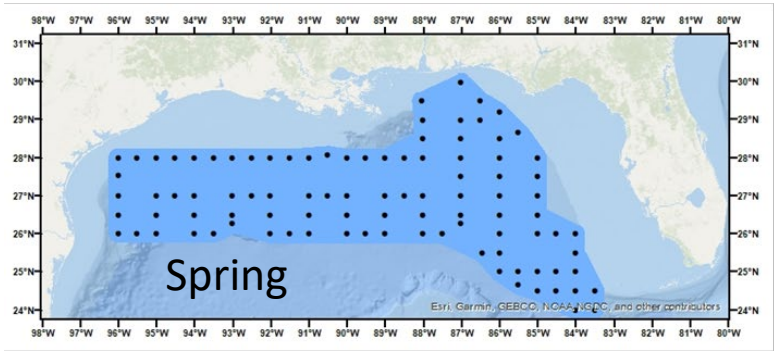
Delta lognormal model (Lo et al. 1992)

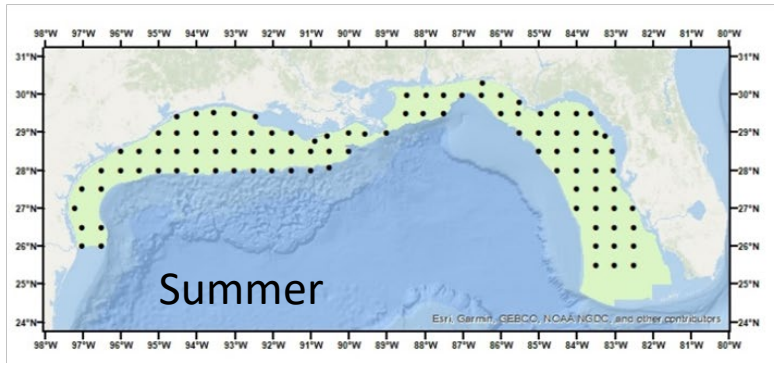
Zapfe, M. Wang et al. (in prep)

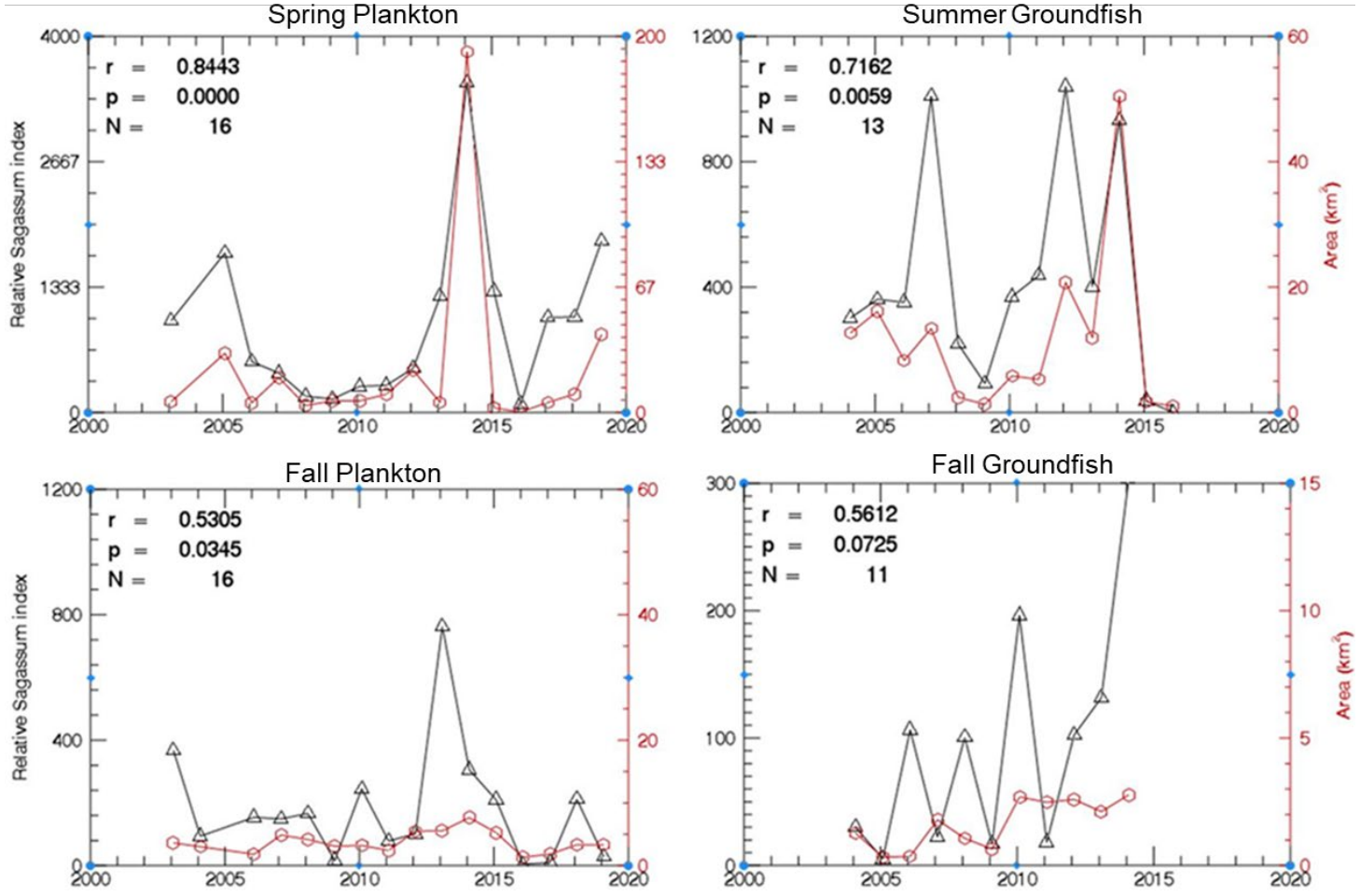
Sargassum habitat indices - Survey-scale agreement

RESTORE SCIENCE PROGRAM



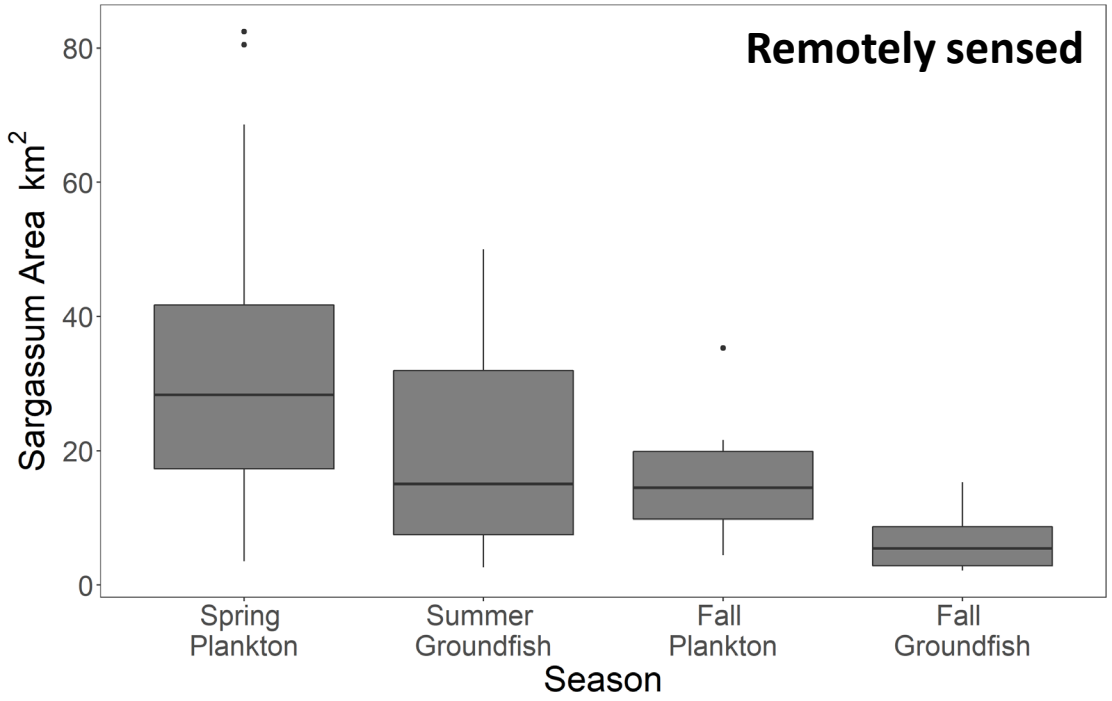


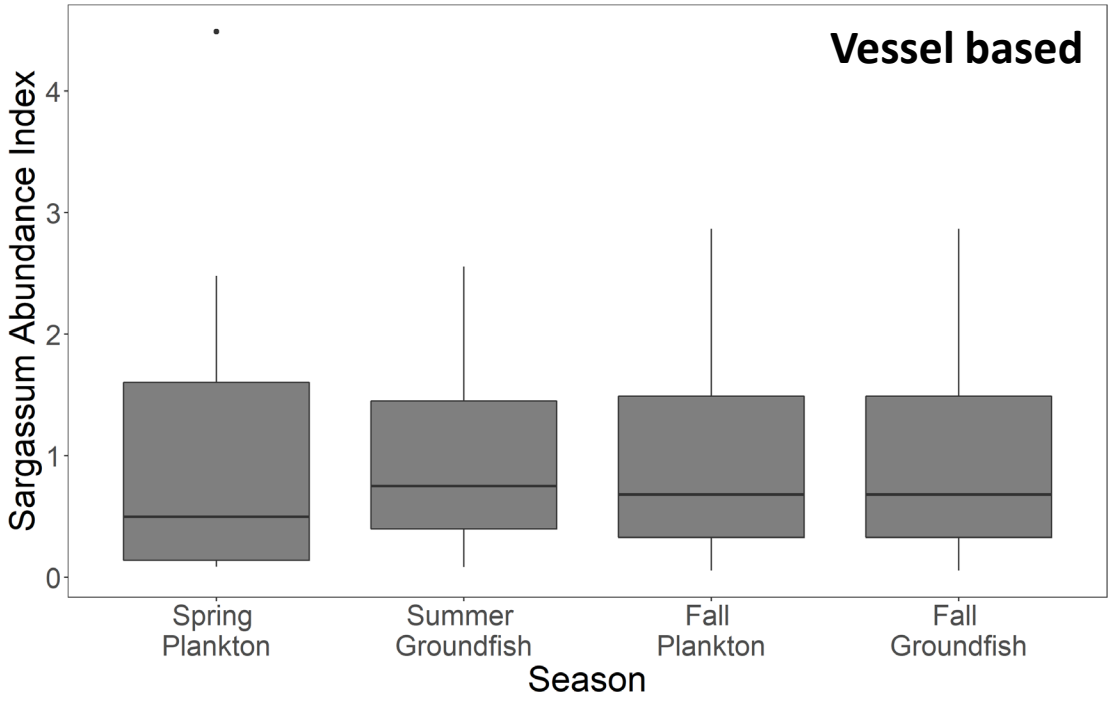


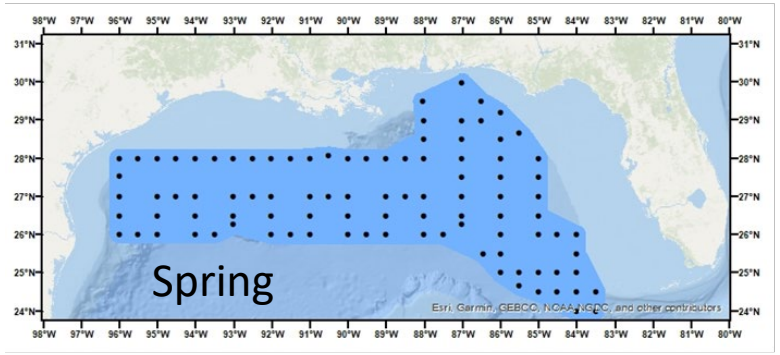


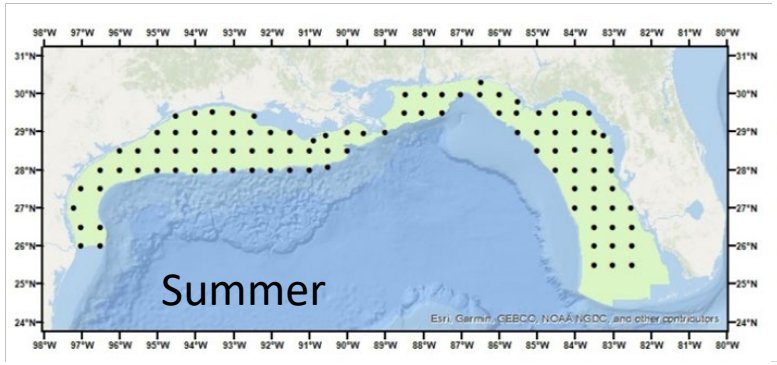
Zapfe, M. Wang et al. (in prep)

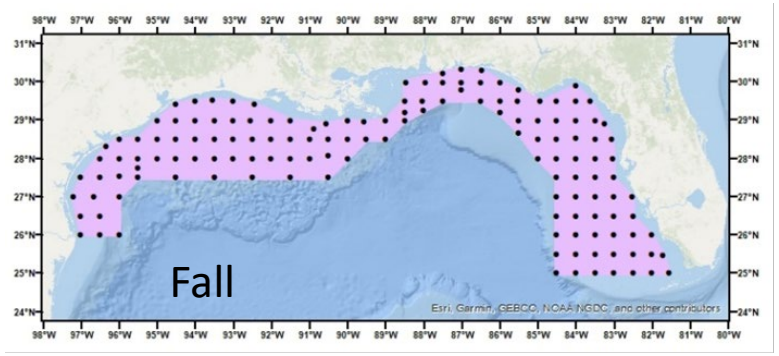
Seasonal/survey variation in *Sargassum* habitat indices



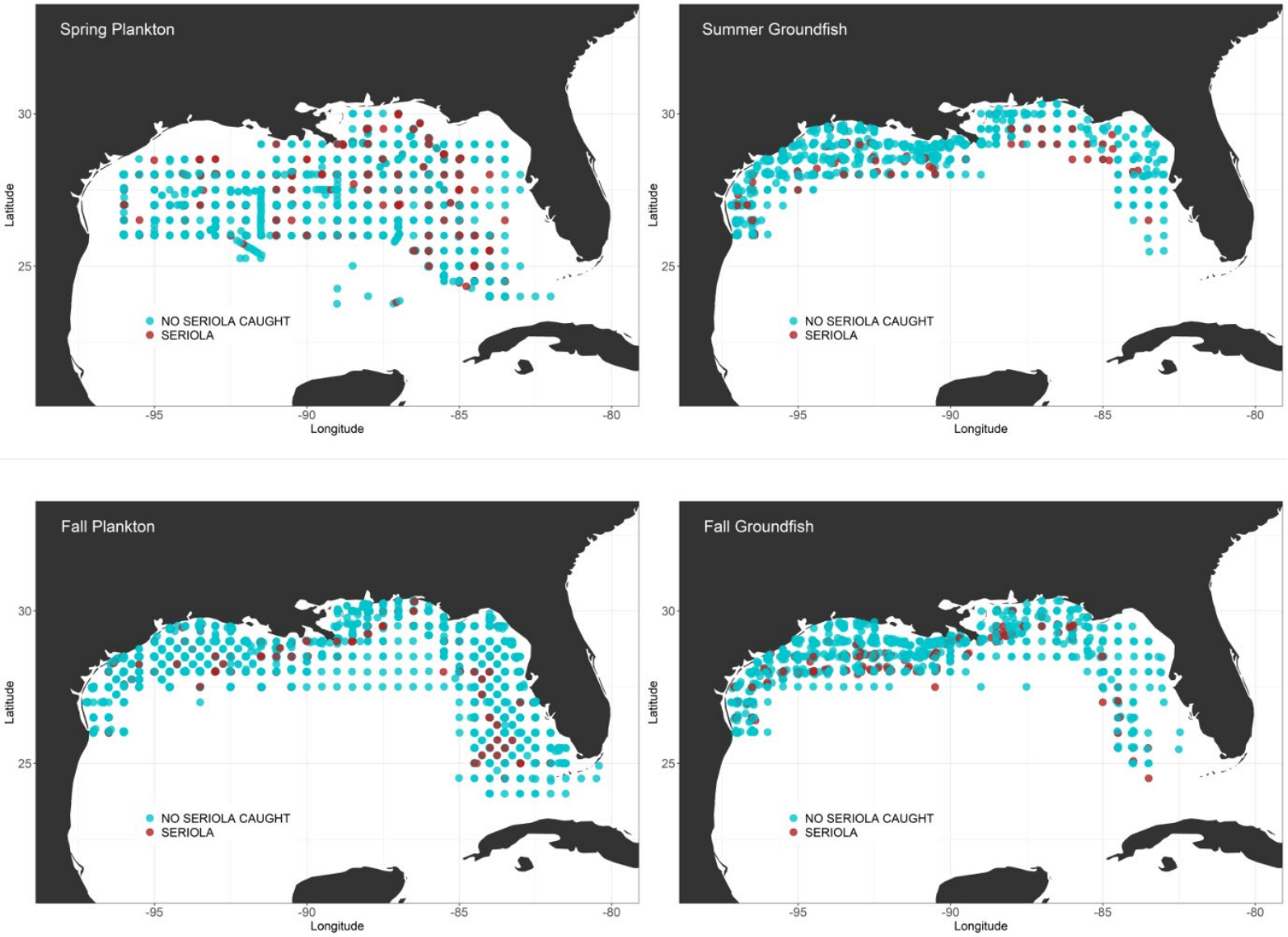




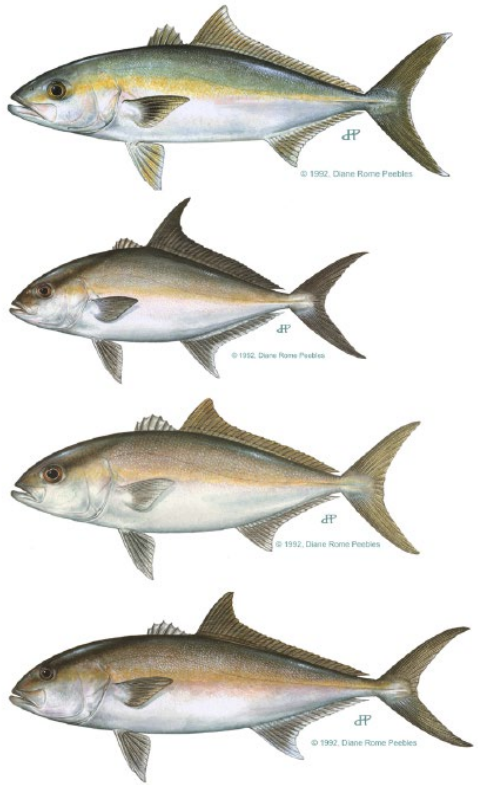




Larval abundance index - genus level



Seriola spp.



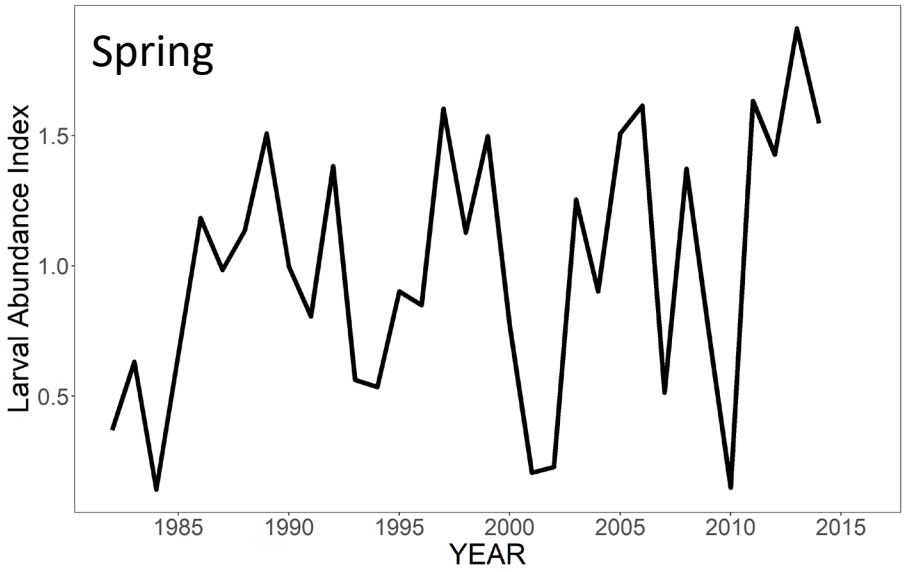
Banded Rudderfish

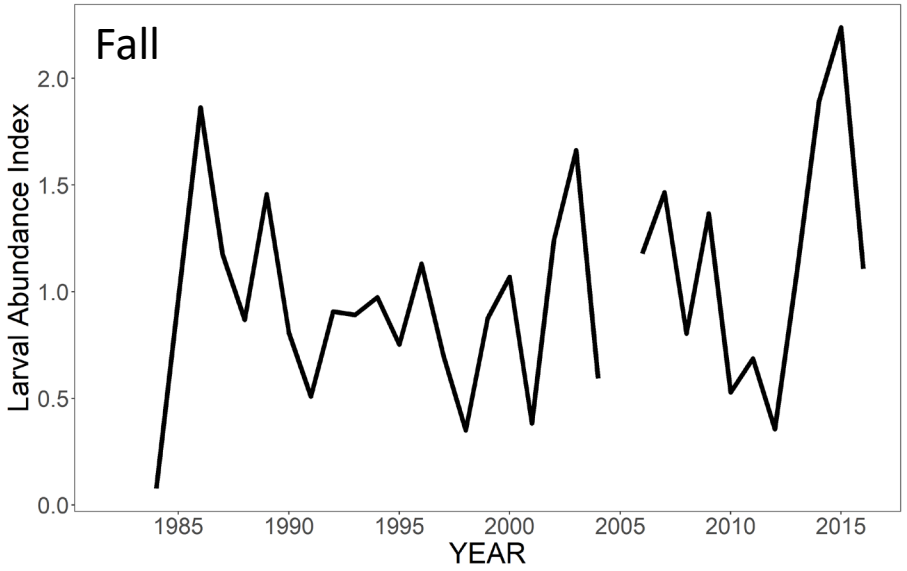
Almaco Jack

Lesser Amberjack

Greater Amberjack

Larval abundance index – *Seriola spp.*





SEAMAP ichthyoplankton surveys

Neuston net (1982-2016)

Delta lognormal model (Lo et al. 1992)

Binomial – presence/absence

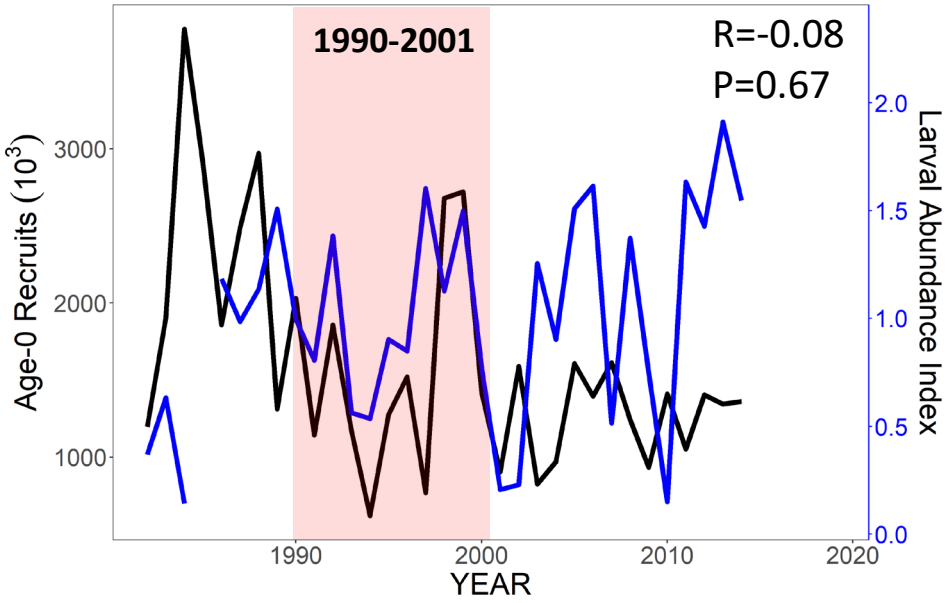
Lognormal – positive abundance

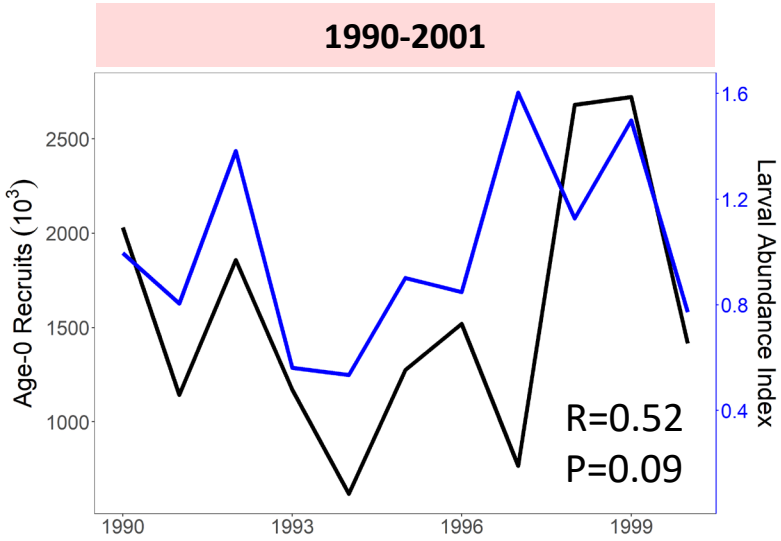
Submodels

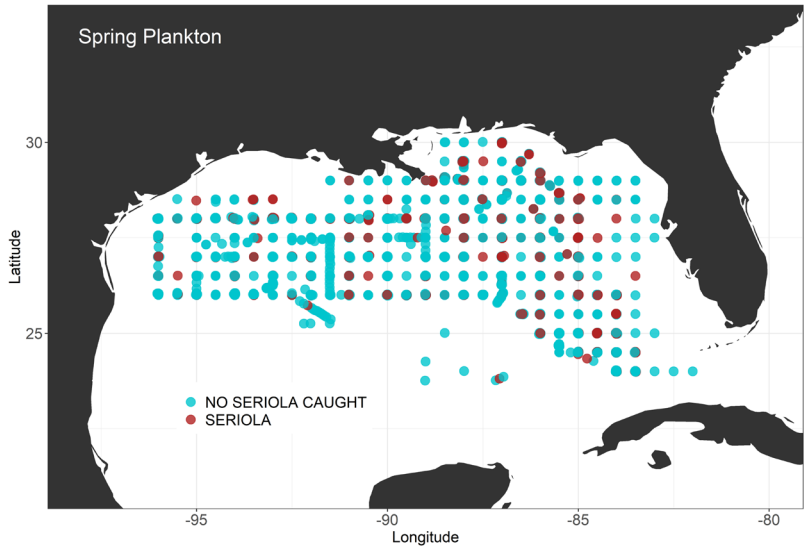
Year, month, time of day, region

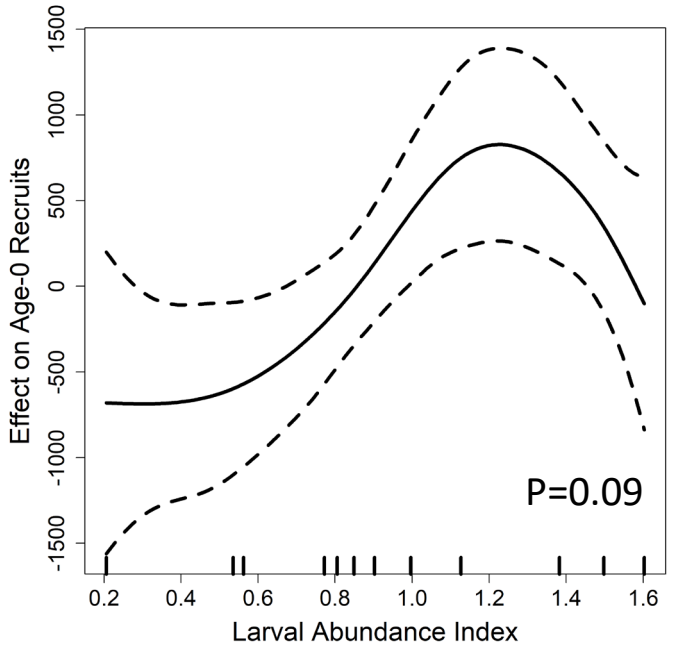
Model Selection	**Binomial**	**Lognormal**
Spring	Year, Month, Region	Year, Month, Region
Fall	Year	Year, Time of Day

Spring: larval-recruit

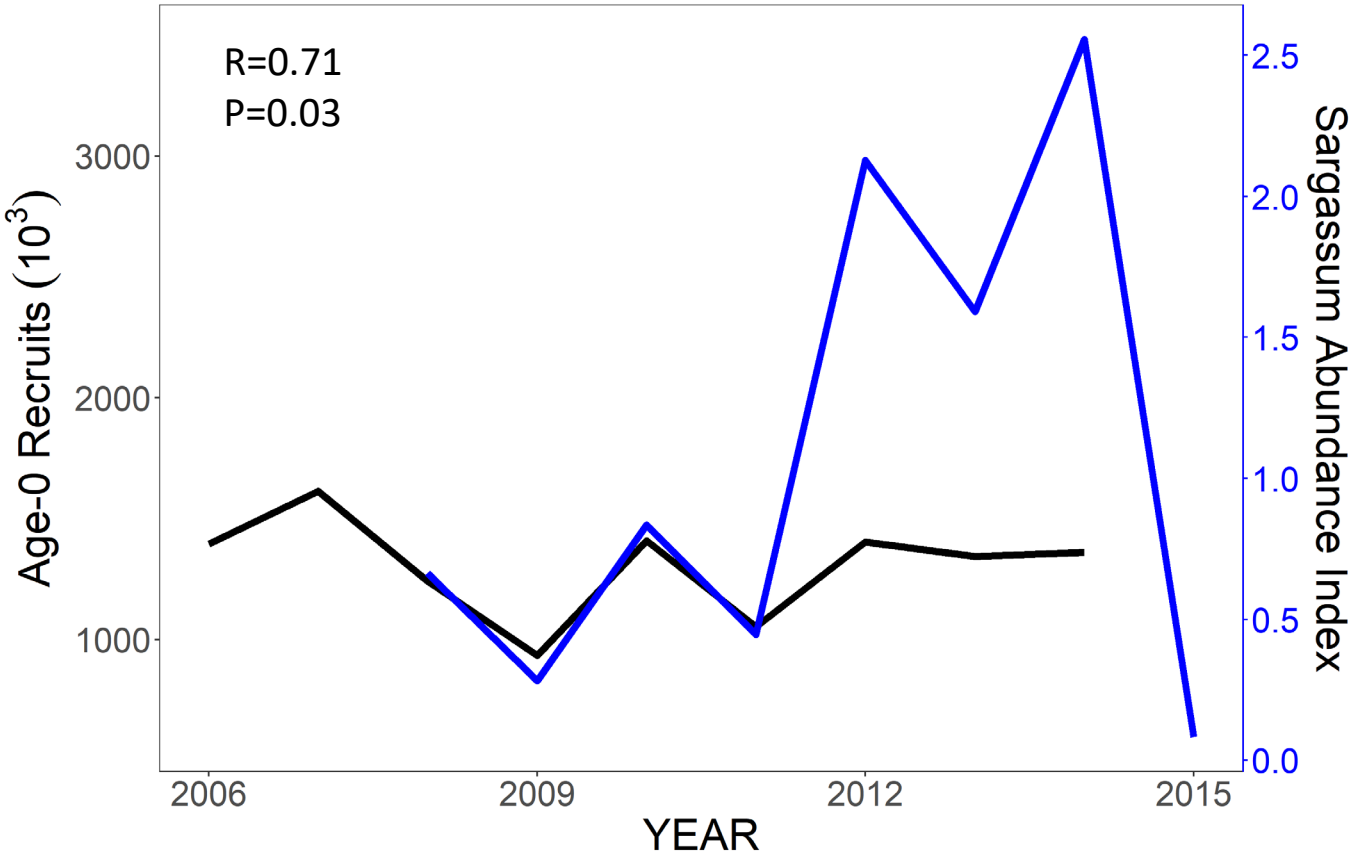


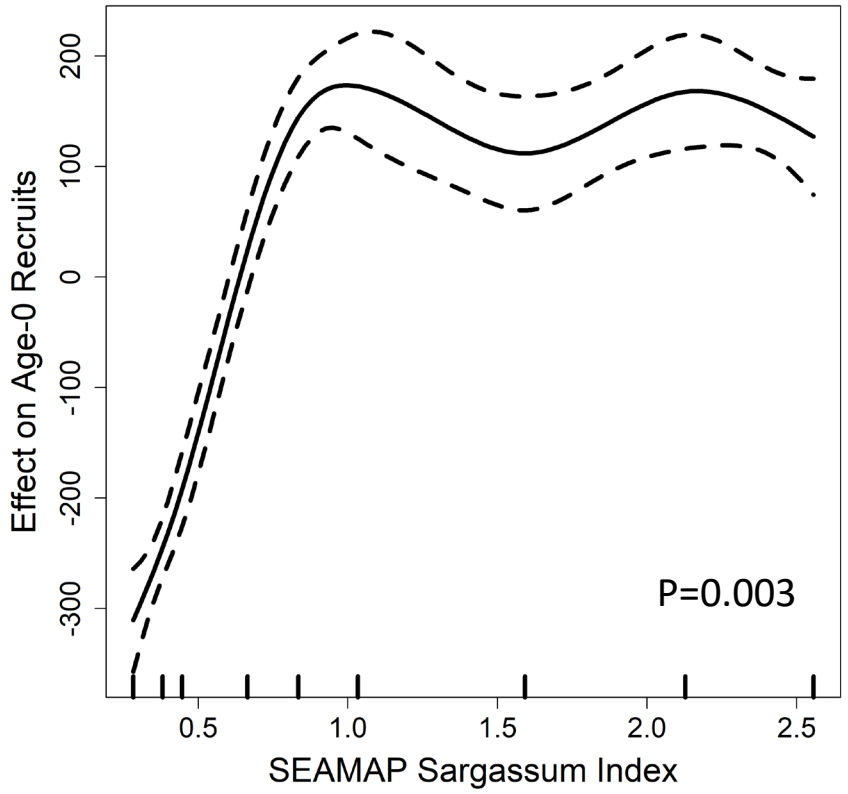


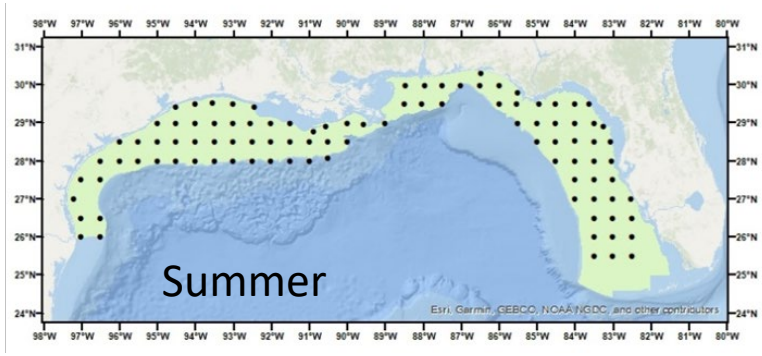




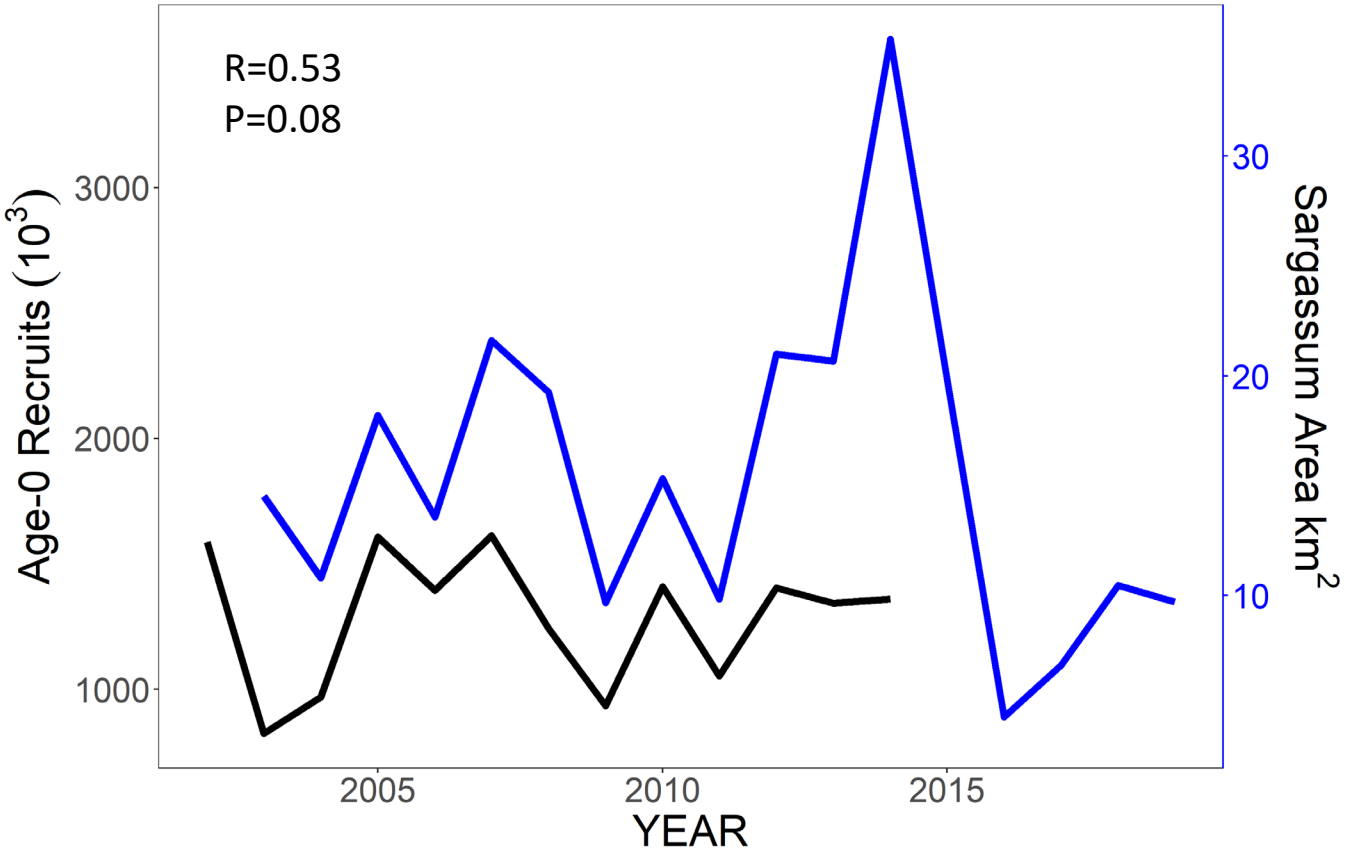
Summer: Vessel based *Sargassum*-recruit

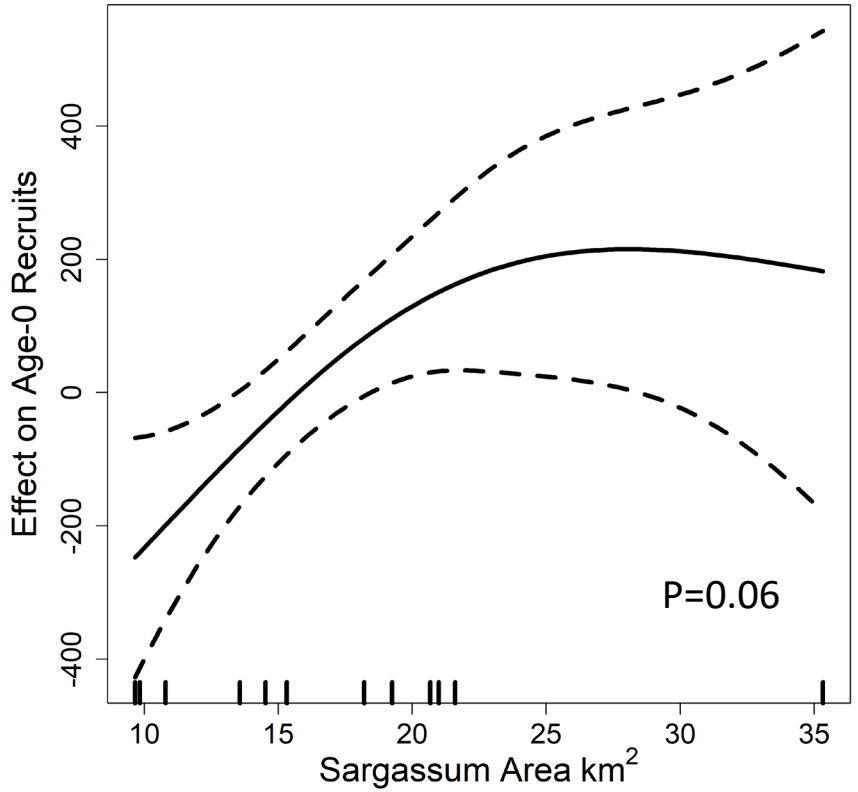


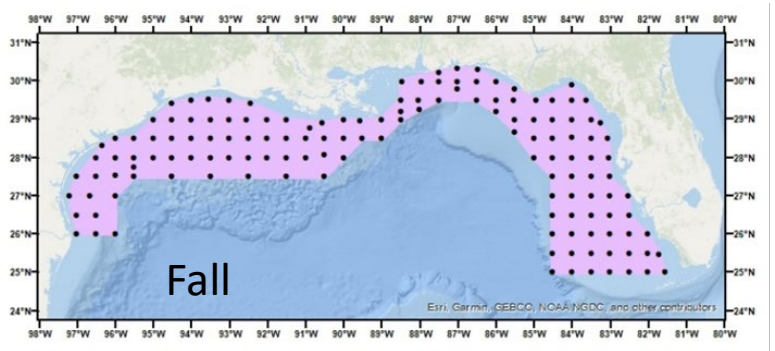




Fall: Remotely sensed *Sargassum*-recruit





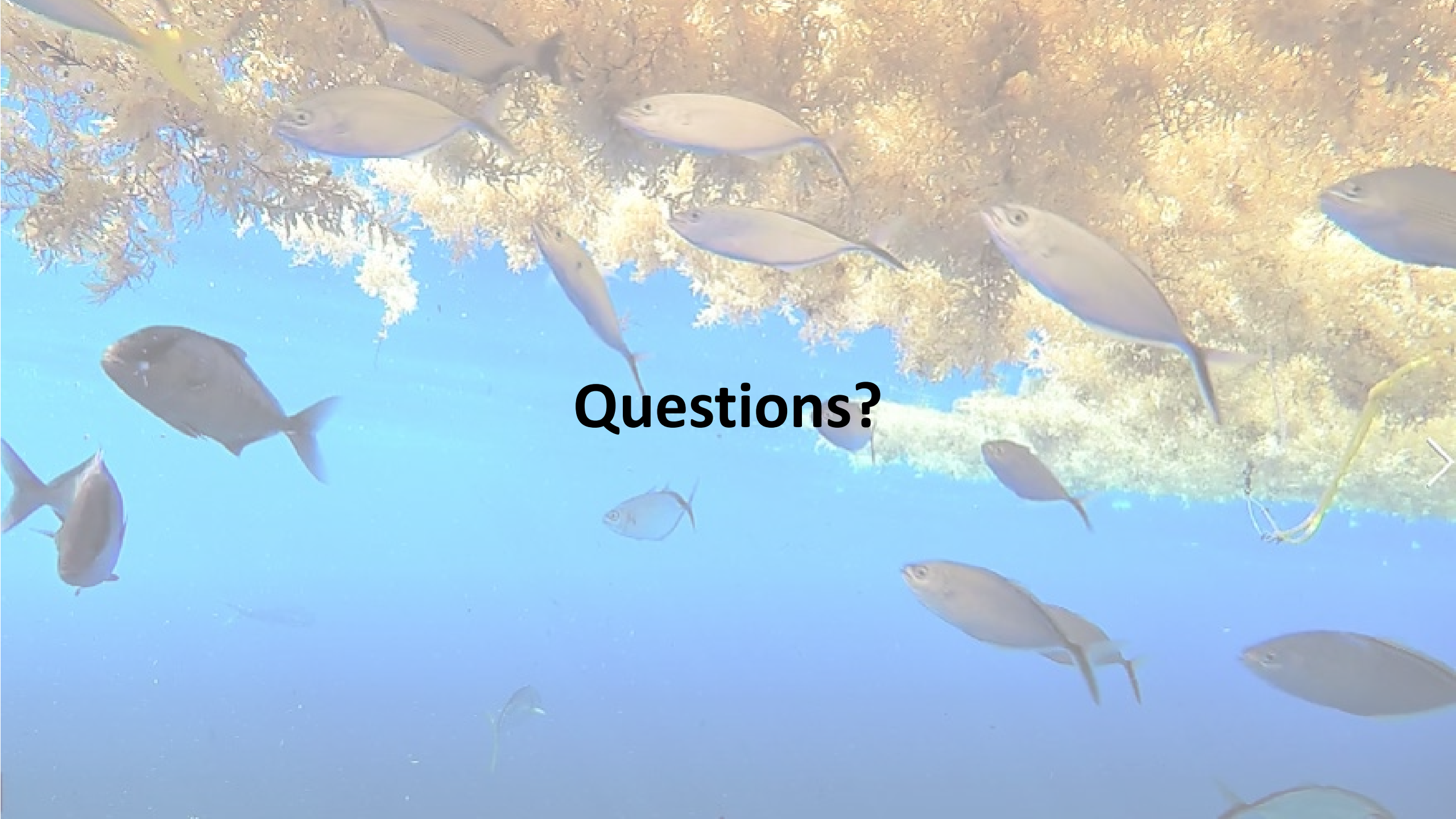


Summary and conclusions

- Greater amberjack recruitment positively correlated with Summer and Fall *Sargassum* indices
- Spring *Sargassum* indices not significantly correlated with recruitment, despite large area coverage of *Sargassum*
- Timing and location of habitat availability may be important

Summary and conclusions

- Relative abundance indices were rarely correlated with *Sargassum* habitat availability
- Potential for larval indices to inform stock assessments, despite poor taxonomic resolution
- Relationships highly variable and strength of associations often weak
- Complex nature of using habitat to predict abundance


Questions?