



**NOAA
FISHERIES**

Southeast Regional Efforts to Build a Foundation for the Fishery Ecosystem Plan

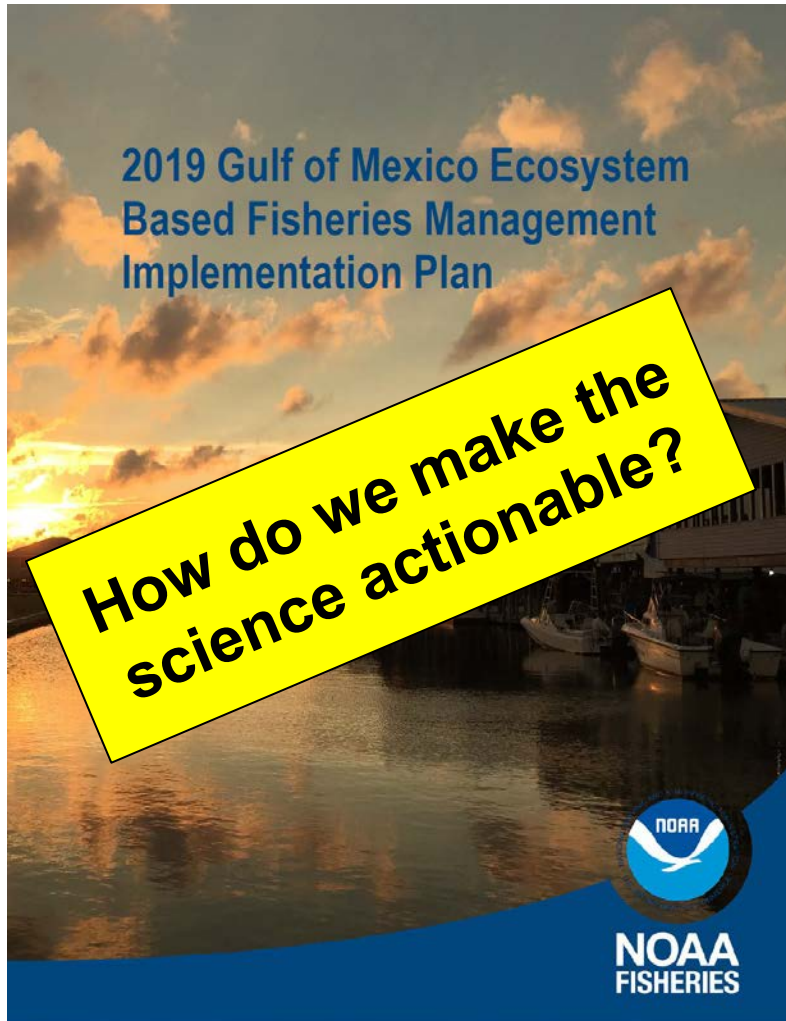
Mandy Karnauskas

Gulf Council Meeting
August 27, 2020



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Where we left off...the EBFM Road Map

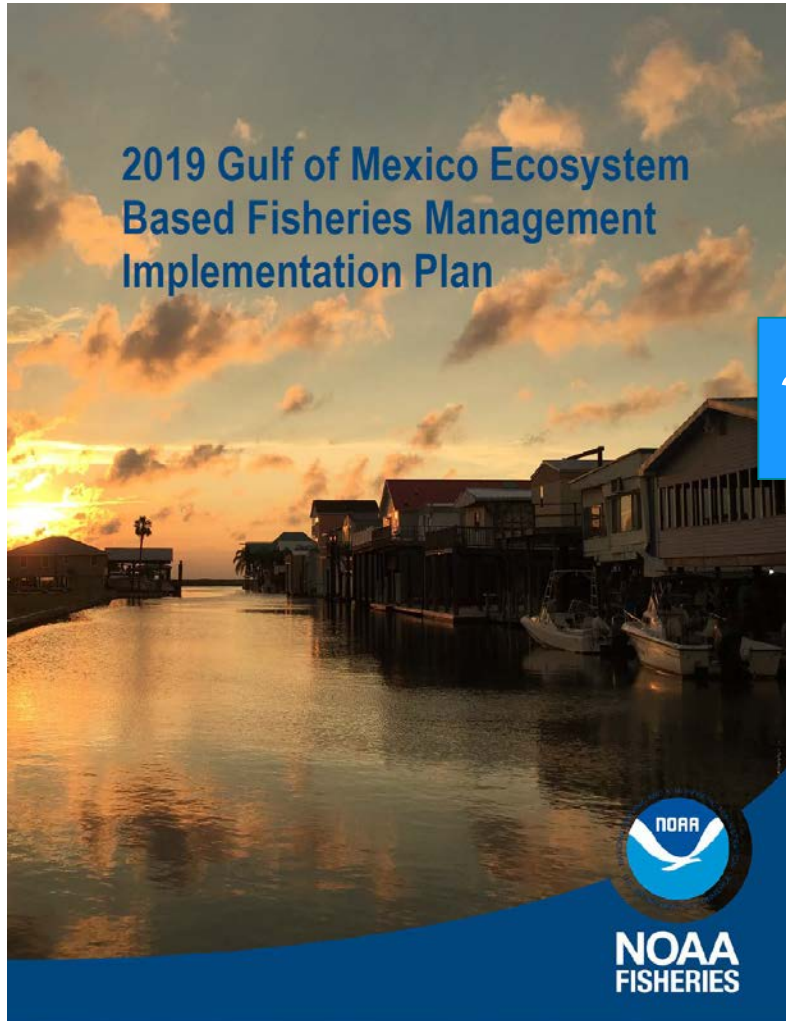


Overall objective was to motivate a dialogue on how EBFM can be effectively applied in the Gulf of Mexico, taking into account stakeholder views, regional capacity, and the current state of the science.

Science theme areas:

- Advancing stock assessments
- Tracking ecosystem trends
- Climate change
- Habitat considerations
- Multi-species interactions
- Spatial scales and connectivity
- Human dimensions

Where we left off...the EBFM Road Map



???

What is our destination?



A Fishery Ecosystem Plan (FEP) outlines the social, ecological, institutional or economic objectives for the region, and provides a decision framework for meeting these objectives

EBFM and FEPs

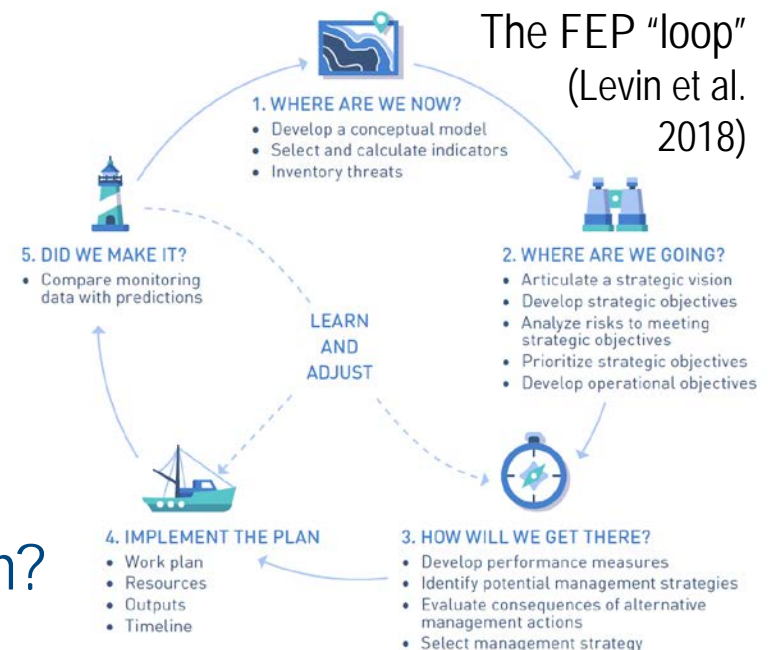
EBFM is “a systematic approach to fisheries management...that contributes to the resilience and sustainability of the ecosystem; recognizes the physical, biological, economic, and social interactions among the affected fishery-related components of the ecosystem, including humans; and seeks to optimize benefits among a diverse set of societal goals” (NOAA 2017)

FEP provides a statement of those goals, and a framework for addressing them

Today:

1 - We have a good foundation for an FEP

2 - How can we put the foundation in action?



FEP foundations – historical context



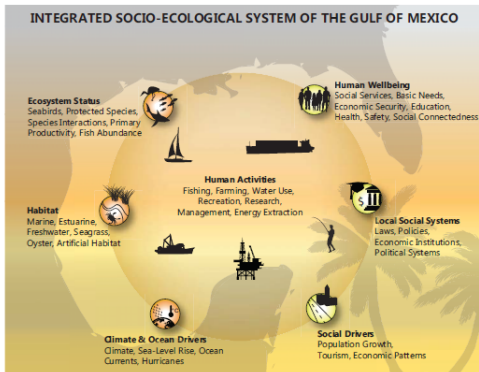
FEP foundations – ecosystem status & trends



NOAA Technical Memorandum NMFS-SEFSC-706

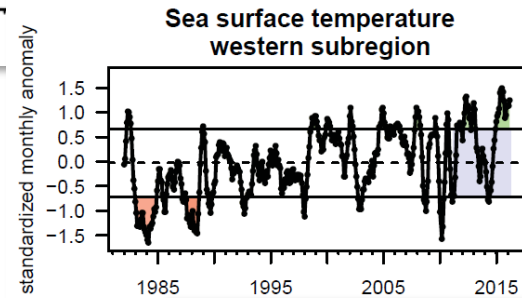
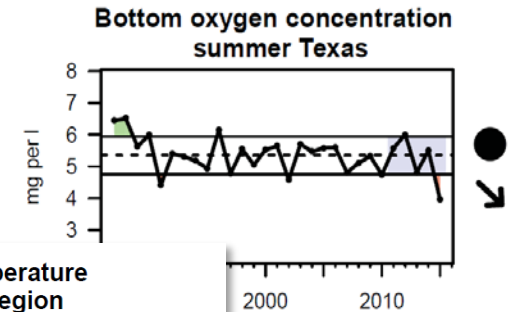
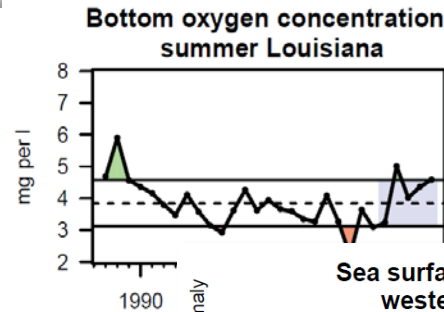
2017 ECOSYSTEM STATUS REPORT UPDATE FOR THE GULF OF MEXICO

Mandy Karnauskas, Christopher R. Kelble, Seann Regan, Charline Quenée, Rebecca Allee, Michael Jepson, Amy Freitag, J. Kevin Craig, Cristina Carollo, Leticia Barbero, Neda Trifonova, David Hanisko, and Glenn Zapfe

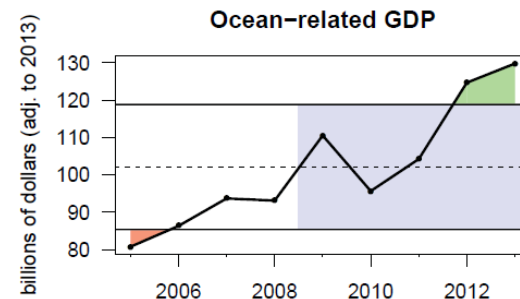
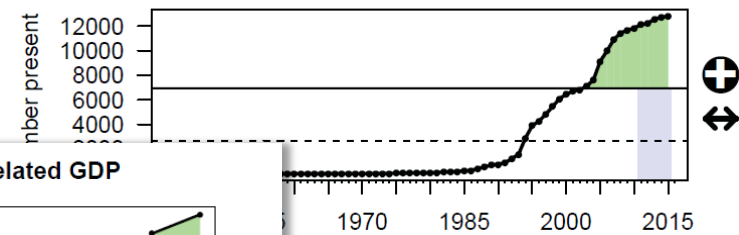


U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Southeast Fisheries Science Center
75 Virginia Beach Drive
Miami, Florida 33149

March 2017



Artificial reefs



FEP foundations – system conceptualization

Participatory system
dynamics modeling
EBFM scoping workshops

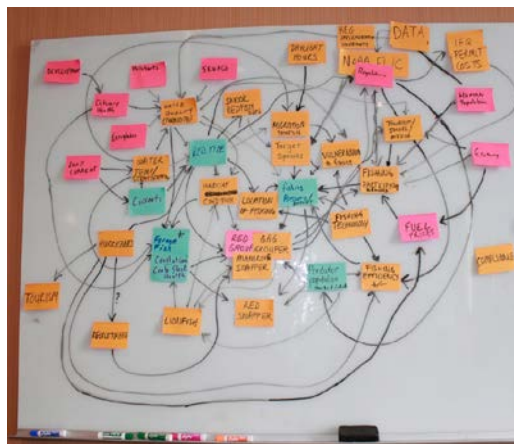
What exactly is the
“ecosystem” we are trying to
manage?

Goal: To increase
information flow between
scientists, managers, and
stakeholders in support of
improved stock assessment
and EBFM

Focus: West Florida
snapper-group complex



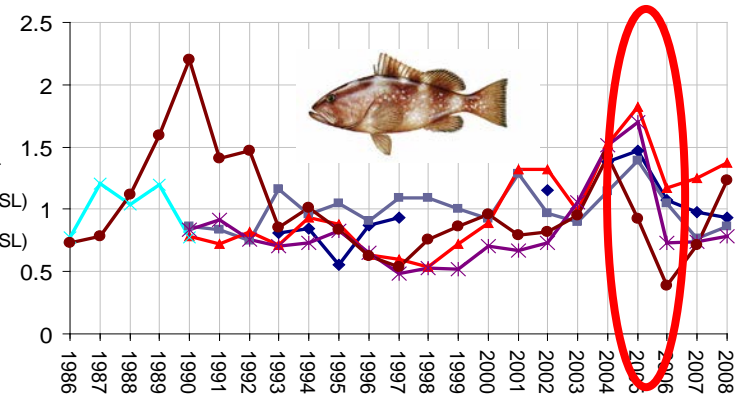
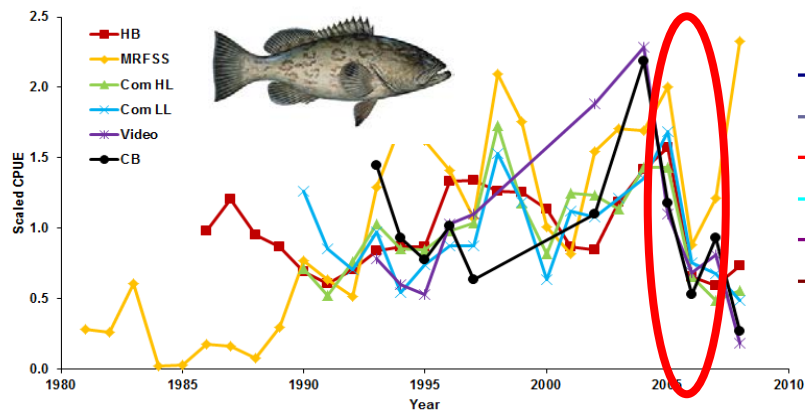
Themes from participatory workshops



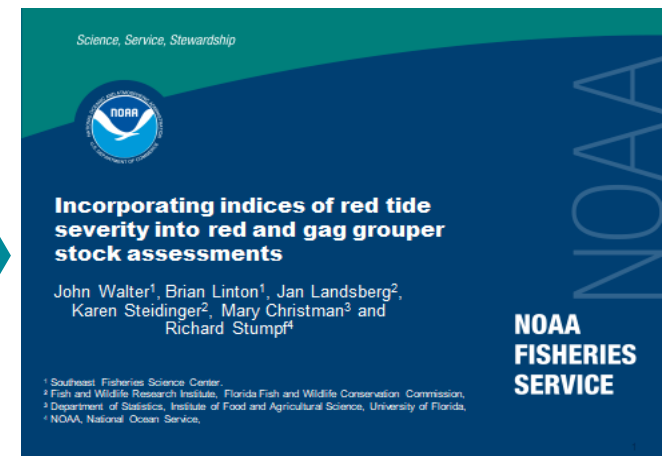
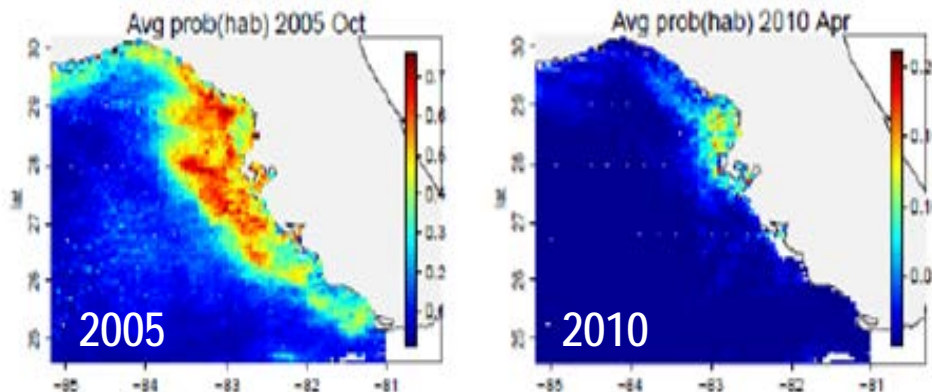
Factors affecting fisheries	Major concerns	Stakeholder values
<p>Water quality and habitat</p> <p>Bait and forage fish</p> <p>Invasive species</p> <p>Predator populations</p> <p>Practicality of regulations</p> <p>Accountability</p> <p>Technology / effort / participation</p>	<p>Water quality</p> <p>Target fish populations</p> <p>Forage populations</p> <p>Economic impacts</p> <p>Accountability</p> <p>Perverse incentives</p> <p>Opportunities for input</p>	<p>Water quality and habitat</p> <p>Abundant fish populations</p> <p>Tourism</p> <p>Working water fronts</p> <p>Presence of fishing community</p> <p>Fishing heritage</p>

A major concern: water quality / red tide

Red and Gag grouper abundance indices declined 50% from 2005-2006



Index of red tide based on satellite data and cell counts



Led to expanded red tide research: ecosystem impacts, management strategies, episodic events



Contents lists available at ScienceDirect

Ecological Modelling

journal homepage: www.elsevier.com/locate/ecolmodel

Effects of *Karenia brevis* harmful algal blooms on fish community structure on the West Florida Shelf

A.M. Gray DiLeone^{a,*}, C.H. Ainsworth^b

^a National Marine Fisheries Service, Southeast Regional Office, 263 13th Ave S. St. Petersburg, FL, 33701, USA

^b University of South Florida College of Marine Science, 140 7th St. Petersburg, 33701 FL, USA



Estuarine, Coastal and Shelf Science

Volume 168, 5 January 2016, Pages 40–49



Environmental conditions and catch rates of predatory fishes associated with a mass mortality on the West Florida Shelf

W.B. Driggers III^{a,*,}, M.D. Campbell^a, A.J. Debose^a, K.M. Hannan^a, M.D. Hendon^a, T.L. Martin^b, C.C. Nichols^b

Show more



Ecological Modelling

Volume 340, 24 November 2016, Pages 86–105



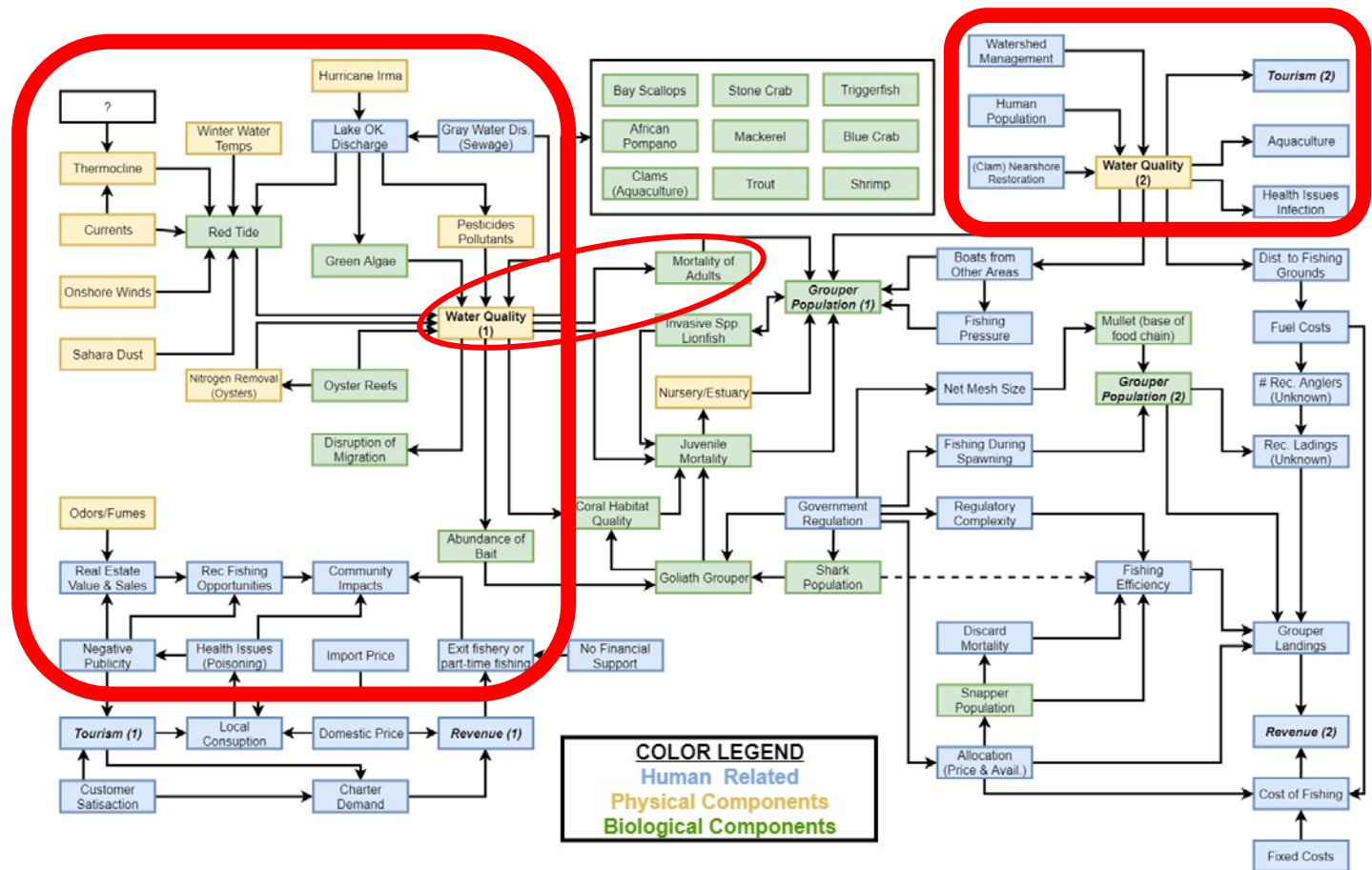
Management strategy evaluation using the individual-based, multispecies modeling approach OSMOSE

Arnaud Grüss^{a,*,}, William J. Harford^{b,*,}, Michael J. Schirripa^{c,*,}, Laure Velez^{d,*,}, Skyler R. Sagarese^{c,*,}, Yunne-Jai Shin^{d,*,}, Philippe Verley^{d,*,}

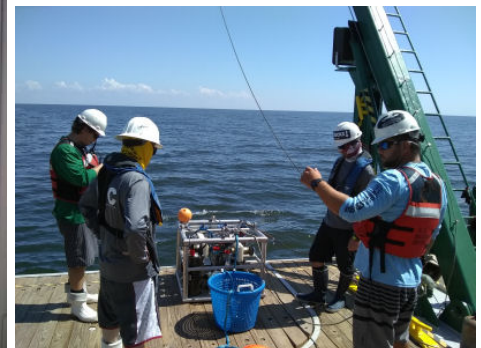
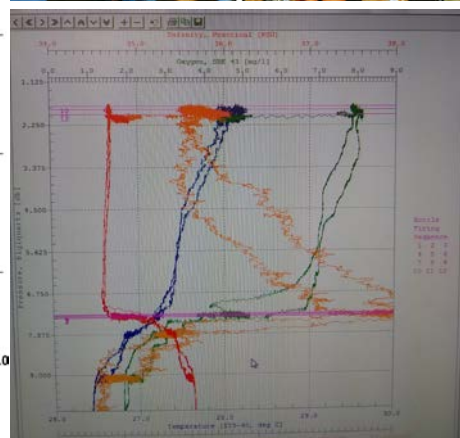
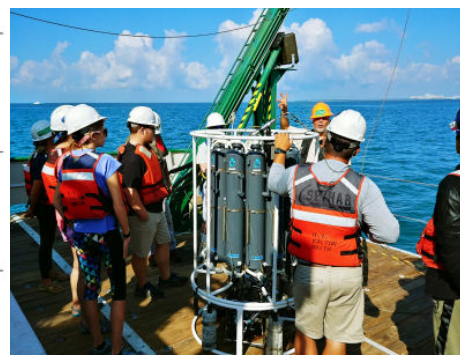
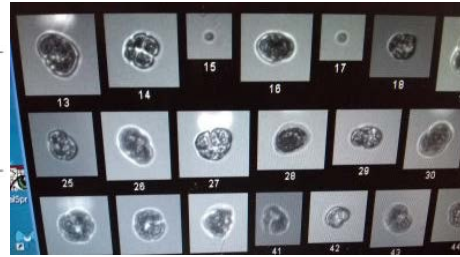
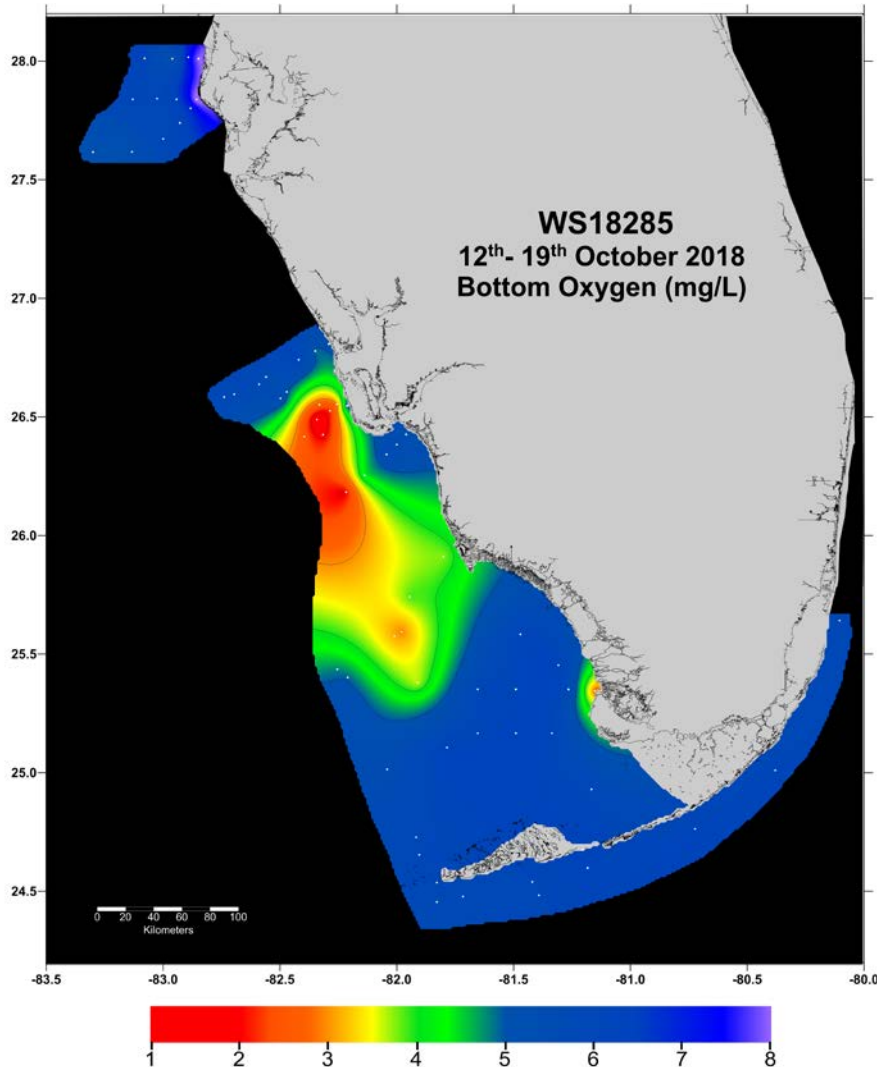
Addressing red tide from EBFM perspective

Red tide affects target fish stocks, but also prey base, habitat, aquaculture, publicity, tourism, seafood demand, real estate, health...

Red tide
and its
direct
impacts on
ecosystem



Understanding ecological impacts of red tide



Understanding human impacts of red tide



- 62 oral histories
- snowball sampling method
- commercial and for-hire fishermen

Goals:

- How has red tide varied in time and space historically? (**used in SEDAR 61 red grouper*)
- What have been the impacts of red tides on fish populations, habitats and humans?
- How have fishermen and coastal communities adapted to red tide? (***of interest to Council?*)

Improving resilience in the face of stressors

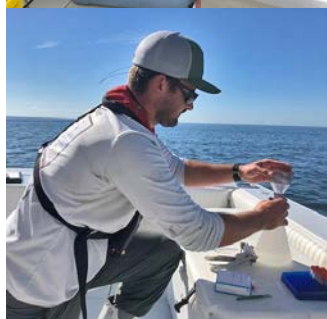
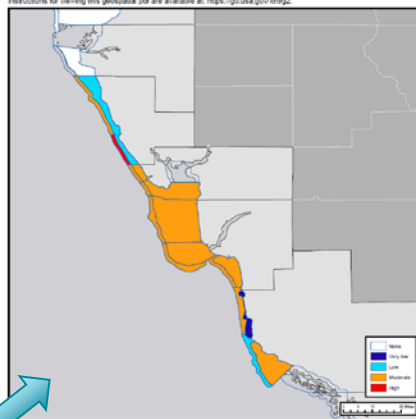
Coordinated monitoring effort



Gulf of Mexico Harmful Algal Bloom Bulletin

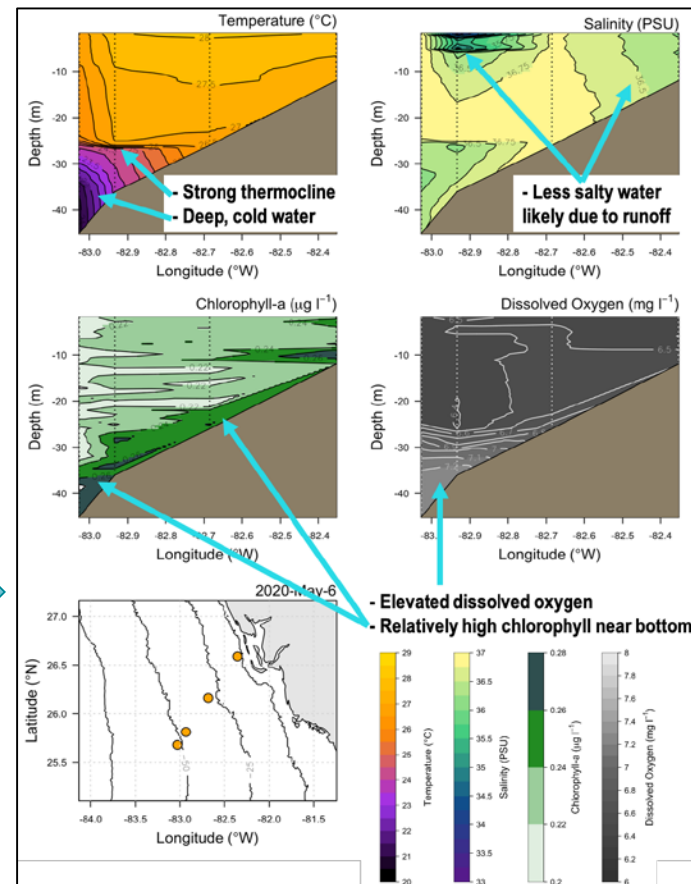
Monday, November 18, 2019
NOAA National Ocean Service
NOAA Satellite and Information Service
NOAA National Weather Service

Instructions for viewing this geospatial pdf are available at: <https://gis.usda.gov/efg2/>



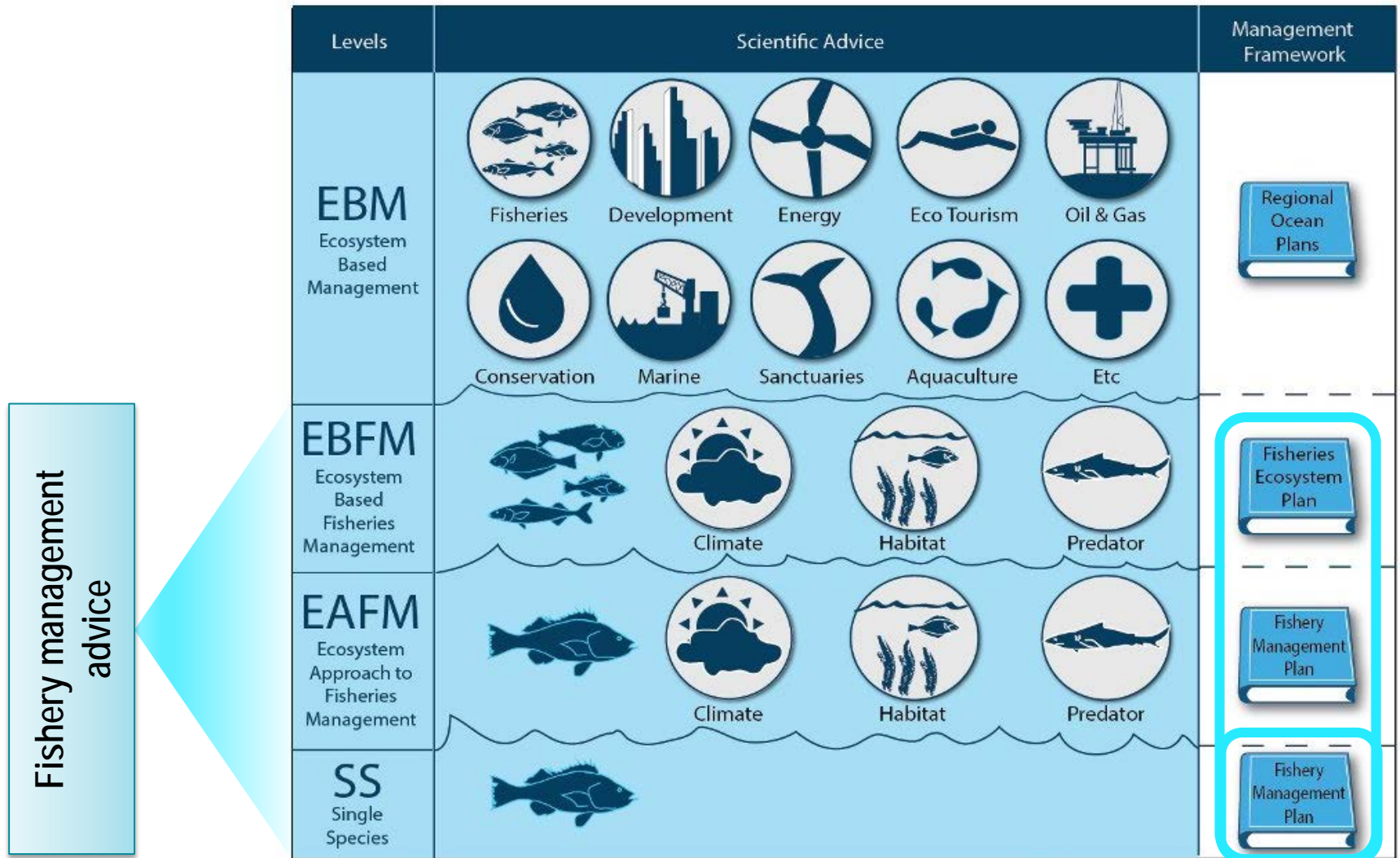
Seasonal
forecast?

Real-time conditions online



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What's the end goal?

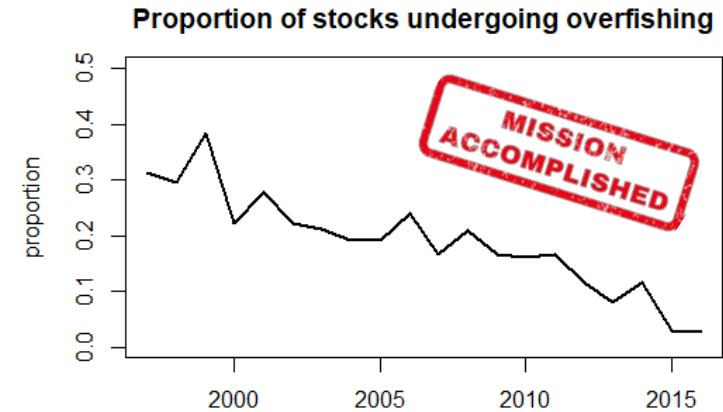


What's the end goal?

- Are stocks overfished and are we overfishing?

What stakeholders are asking us now:

- How can we mitigate the impacts of poor water quality on fish stocks?
- What are the impacts of increasing predator populations, loss of bait fish, and invasive species on our target species?
- How can we ensure regulations don't introduce perverse incentives and how do we reduce discarding rates?
- How can we improve accountability and increase access?
- How can we maintain coastal livelihoods despite repeated shocks (hurricanes, oil spills, red tides, COVID, etc...)?



How can we work together to address these questions?

Thank you



Thank you to our many collaborators and funding sources on red tide and water quality research.

We appreciate all of the Gulf coast community members, fishermen, and other representatives of the fishing industry who took the time to share their knowledge and perspectives.



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