An Overview of the U.S. South Atlantic Ecosystem Status Report

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Outline

- What is an Ecosystem Status Report (ESR)?
- Overview of the U.S. South Atlantic ESR
- Uses of ESRs to support management

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What is an Ecosystem Status Report?

Definition:

- Synthesis of scientific information on a range of ecosystem components, including human communities (i.e., one-stop shopping for ecosystem information)

- Core component of NOAA EBFM Road Map, regional EBFM Implementation Plans, Climate Science Strategy (NCSS), and Integrated Ecosystem Assessments (IEA)

Objectives:

1. Provide a broad-level overview of the current state of an ecosystem with respect to recent and historical trends using a suite of indicators (quantitative time series, regional scale)

2. Transfer knowledge to managers to provide context and information for decision-making

3. Facilitate communication and information exchange between scientists, managers, and stakeholder

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Where are ESRs being done?

Eastern Bering Sea (late 1980s, annual)

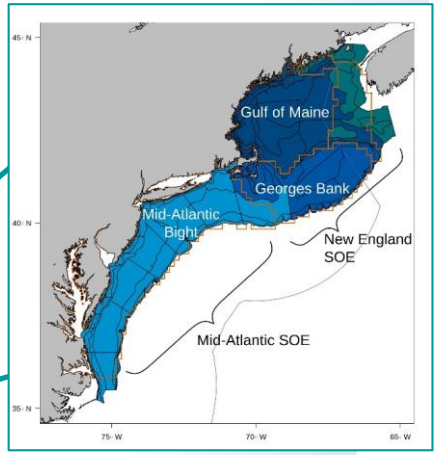
Gulf of Alaska (1993, annual)

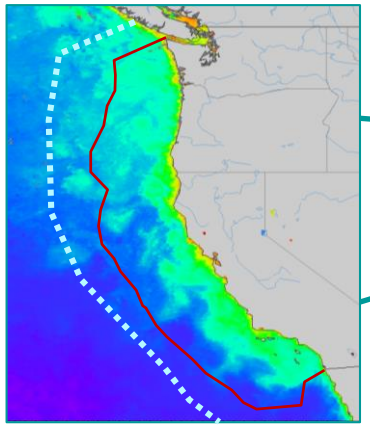
Aleutian Islands (2016, biennial)

Arctic Ocean (in progress)

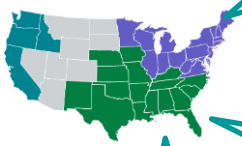
New England (2009, annual)

Mid-Atlantic (2009, annual)

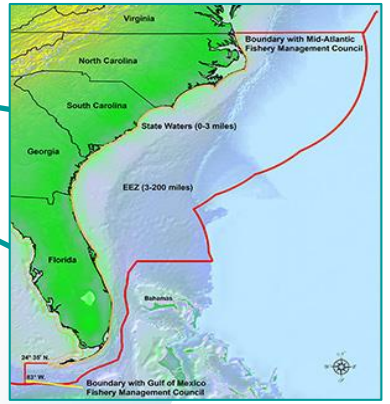




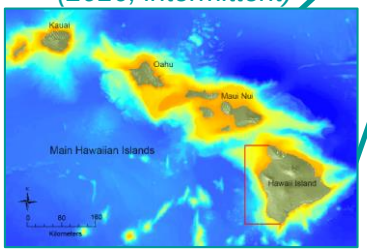
California Current (2012, annual)

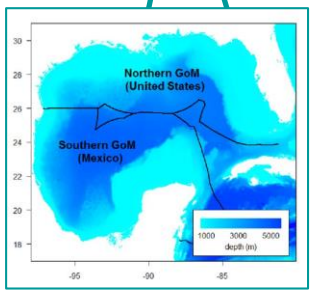


South Atlantic (2021, TBD)



West Hawai'i (2016, intermittent)





Gulf of Mexico (2013, 2017 intermittent)

Caribbean Sea (in progress)

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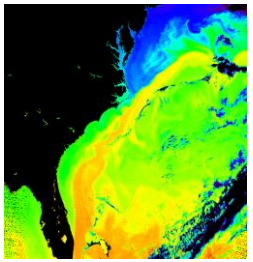
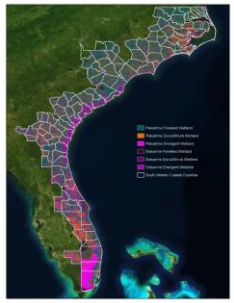
Ecosystem Indicator Categories

- Climate drivers *(AMO, NA Tripole, NAO)*
- Physical & chemical pressures *(SST, acidification, SLR)*
- Habitat state *(wetland, seagrass, oyster cover)*
- Lower trophic levels *(primary/secondary productivity)*
- Upper trophic levels *(fish abundance/diversity)*
- Ecosystem services *(landings, revenues, protected species)*
- Human dimensions

(popn trends, fishing effort, economic & social indicators)



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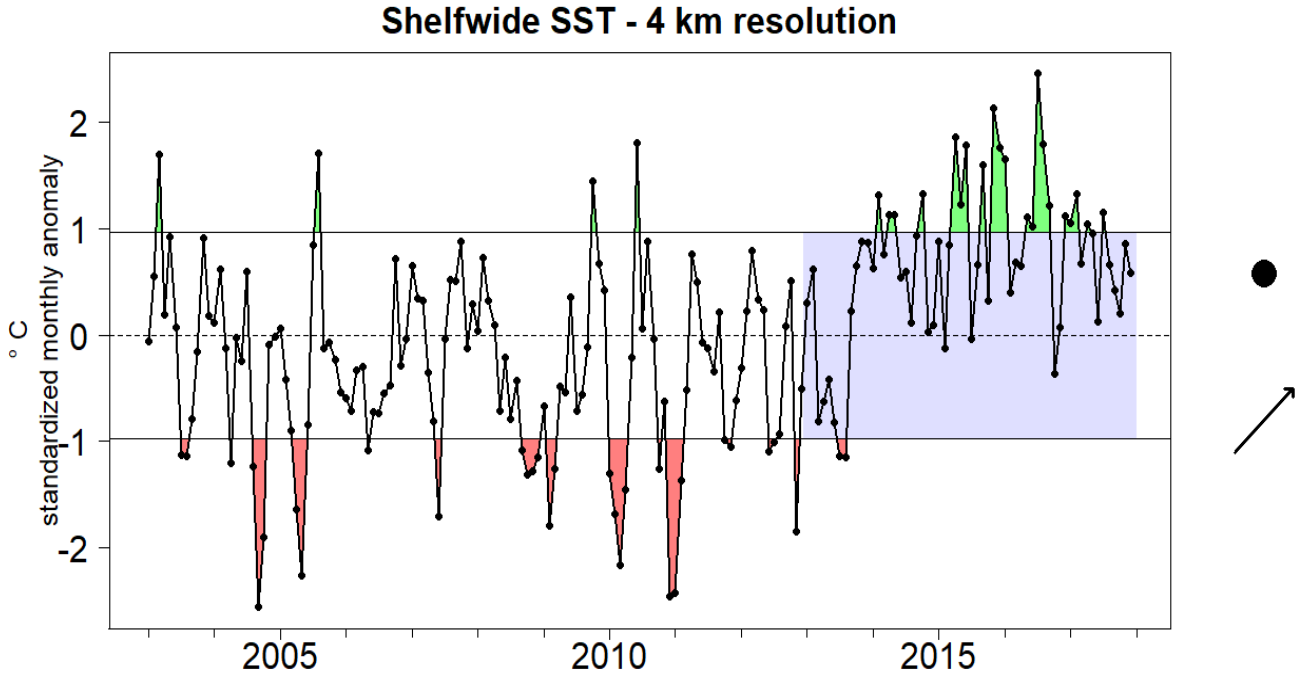
An Example of an Ecosystem Indicator

4.1 Sea surface temperature



Two regionally-averaged monthly sea surface temperature (SST) time series were developed from satellite products with different temporal durations and spatial resolutions (Fig. 4.1). The spatial domain was 22.5° to 36.0 ºN latitude and 82º to 74.5 ºW longitude. The 1º resolution NOAA Reynolds OI SST data were averaged monthly over this domain from December 1981 to December 2018. The 4 km resolution MODIS SST datawere averaged monthly from June 2002 to December 2018.

SST shows a strong seasonal signal with the highest temperatures in the summer months (Jun-Aug) and the coolest temperatures in the winter months (Dec-Feb). Standardized monthly anomalies show periods of relatively low winter temperature from the mid-2000s to the early-2010s, and considerable increases in temperature since 2014 (Fig. 4.1). Warm temperatures similar to those in recent years also occurred in the early- and late-1980s (Fig. 4.1 bottom panel). There has been an upward trend in SST over the last five years.

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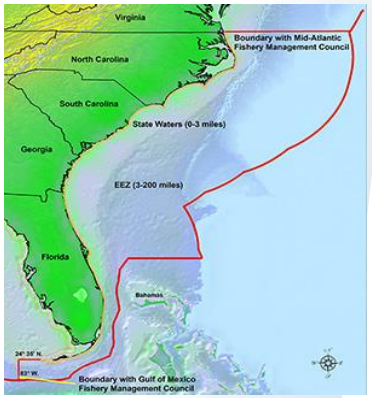
Contributors to U.S. South Atlantic ESR



- Southeast Fisheries Science Center
  - *Beaufort Laboratory*
  - *Miami Laboratory*
  - *Pascagoula Laboratory*
- Southeast Regional Office
- National Ocean Service (NOS)
- Atlantic Oceanographic and Meterological Laboratory (AOML)
- Gulf Integrated Ecosystem Assessment (IEA)
- National Center for Atmospheric Research (NCAR)
- US Geological Survey (USGS)
- NOAA Integrated Drought Information Center
- NOAA National Center for Environmental Information
- Atlantic Coastal Cooperative Statistics Program
- State agencies:
  - *Florida Fish and Wildlife Conservation Commission*
  - *Florida Department of Environmental Protection*
  - *North Carolina Division of Marine Fisheries*
  - *North Carolina Wildlife Resources Commission*
  - *Georgia Department of Natural Resources*
  - *South Carolina Department of Natural Resources*
- Universities:
  - *North Carolina State University*
  - *Duke University*
  - *University of North Carolina-Chapel Hill*
  - *University of Delaware*
  - *University of Georgia*

57 individuals from 23 organizations have contributed to the report

5 editors from 3 agencies (NMFS, NOS, AOML) oversee report development

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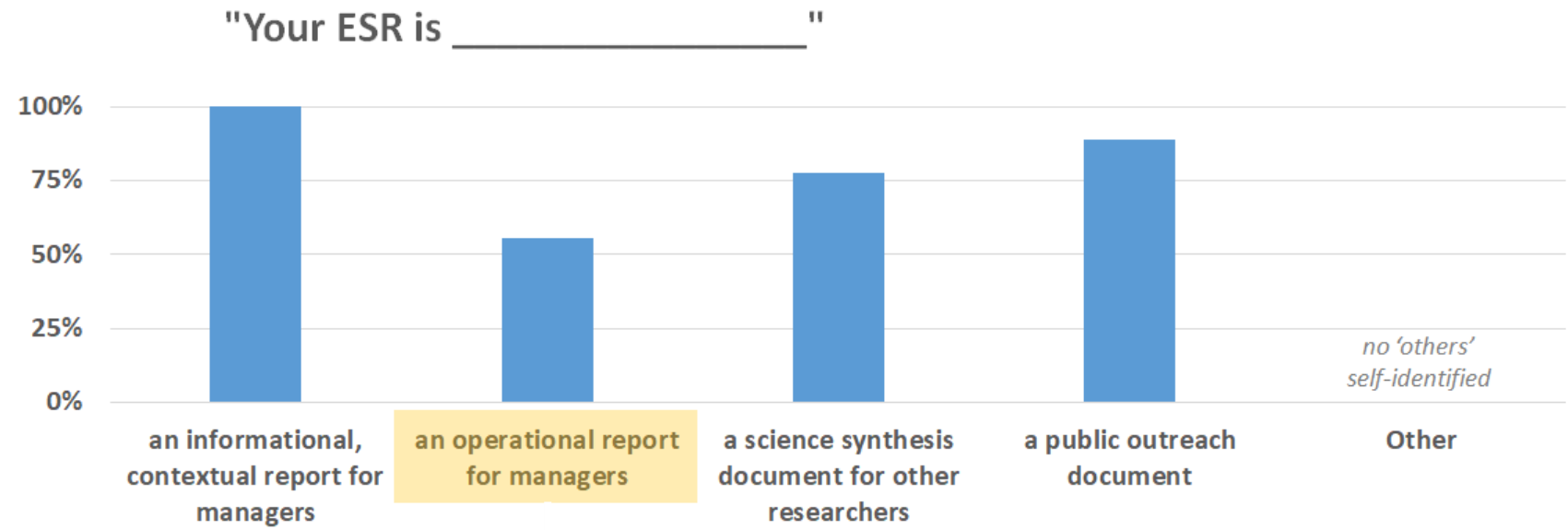
Survey of How ESRs Are Used Across Regions

ESRs are serving multiple roles for end-users



- The 3 Alaska ESRs are used to inform risk tables and the discussion of whether reductions from max ABC are warranted
- Mid-Atlantic ESR is used by MAFMC in ecosystem risk assessment, which is used to scope potential MSE projects, including recent risk assessment around allocation of summer flounder
- West Hawai'i ESR is being used in the State 30 x 30 process of effectively managing 30% of coastal waters by 2030

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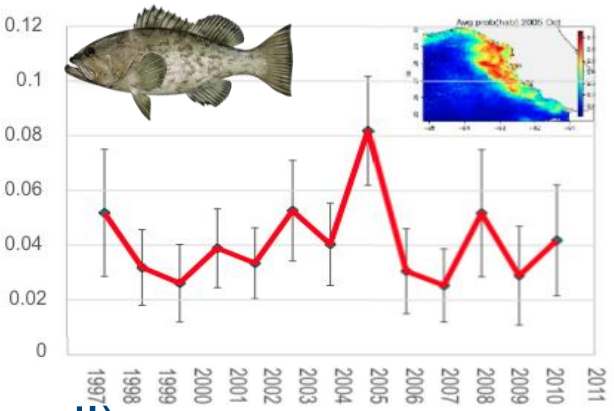
Some Current Uses of Ecosystem Reporting

- Ecosystem-level risk assessment
  - Mid-Atlantic EAFM annual updates
  - Climate scenario planning

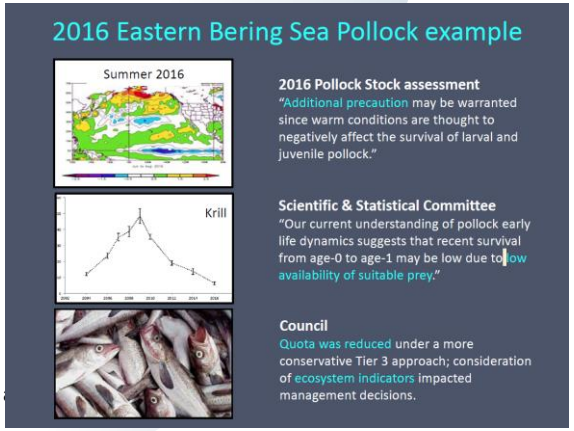

TABLE 3 | Species level risk analysis results; l – low risk (green), lm – low-moderate risk (yellow), mh – moderate to high risk (orange), h – high risk (red).

Species	Assess	Fstatus	Bstatus	FW1Pred	FW1Prey	FW2Prey	Climate	DistShift	EstHabitat
Ocean quahog	l	l	l	l	l	l	h	mh	l
Surfclam	l	l	l	l	l	l	mh	mh	l
Summer flounder	l	h	lm	l	l	l	lm	mh	h
Scup	l	l	l	l	l	l	lm	mh	h
Black sea bass	l	l	l	l	l	l	mh	mh	h
Atl. mackerel	l	h	h	l	l	l	lm	mh	l
Butterfish	l	l	l	l	l	l	l	h	l
Longfin squid	lm	lm	lm	l	l	lm	l	mh	l
Shortfin squid	lm	lm	lm	l	l	lm	l	h	l
Golden tilefish	l	l	lm	l	l	l	mh	l	l
Blueline tilefish	h	h	mh	l	l	l	mh	l	l
Bluefish	l	l	lm	l	l	l	l	mh	h
Spiny dogfish	lm	l	lm	l	l	l	l	h	l
Monkfish	h	lm	lm	l	l	l	l	mh	l
Unmanaged forage	na	na	na	l	lm	lm	na	na	na
Deepsea corals	na	na	na	l	l	l	na	na	na

- Part of stock assessment models (‘front end’)
  - Gulf of Mexico groupers (red tides)



- Inform single species decision making (‘back end’)
  - Bering Sea pollock ABC adjustment



- Rebuilding plans and reference points
  - Has the capacity of the ecosystem to support fisheries changed?

Thank you!

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