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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



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



Where are ESRs being done?

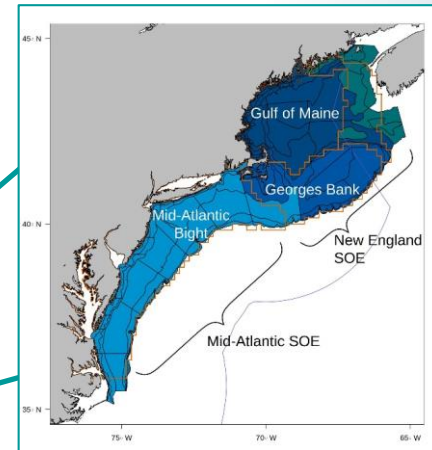


Eastern Bering Sea (late 1980s, annual)

Gulf of Alaska (1993, annual)

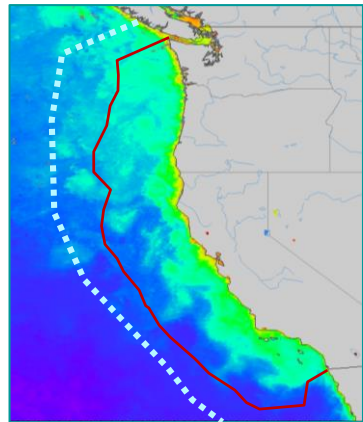
Aleutian Islands (2016, biennial)

Arctic Ocean (in progress)



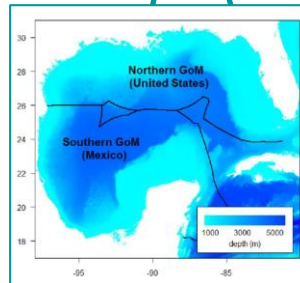
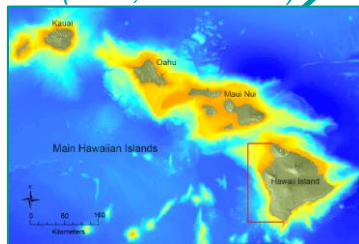
New England (2009, annual)

Mid-Atlantic (2009, annual)



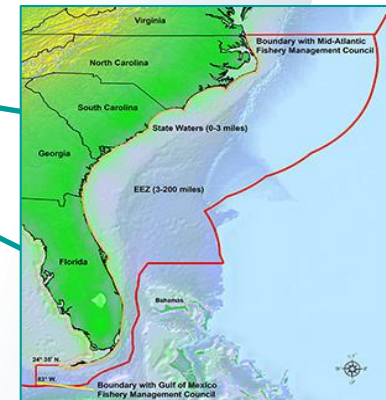
California Current (2012, annual)

West Hawai'i (2016, intermittent)



Gulf of Mexico (2013, 2017 intermittent)

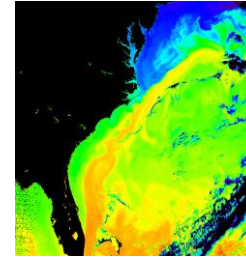
South Atlantic (2021, TBD)



Caribbean Sea (in progress)

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*)



South Atlantic Ecosystem Status Report Table of Contents

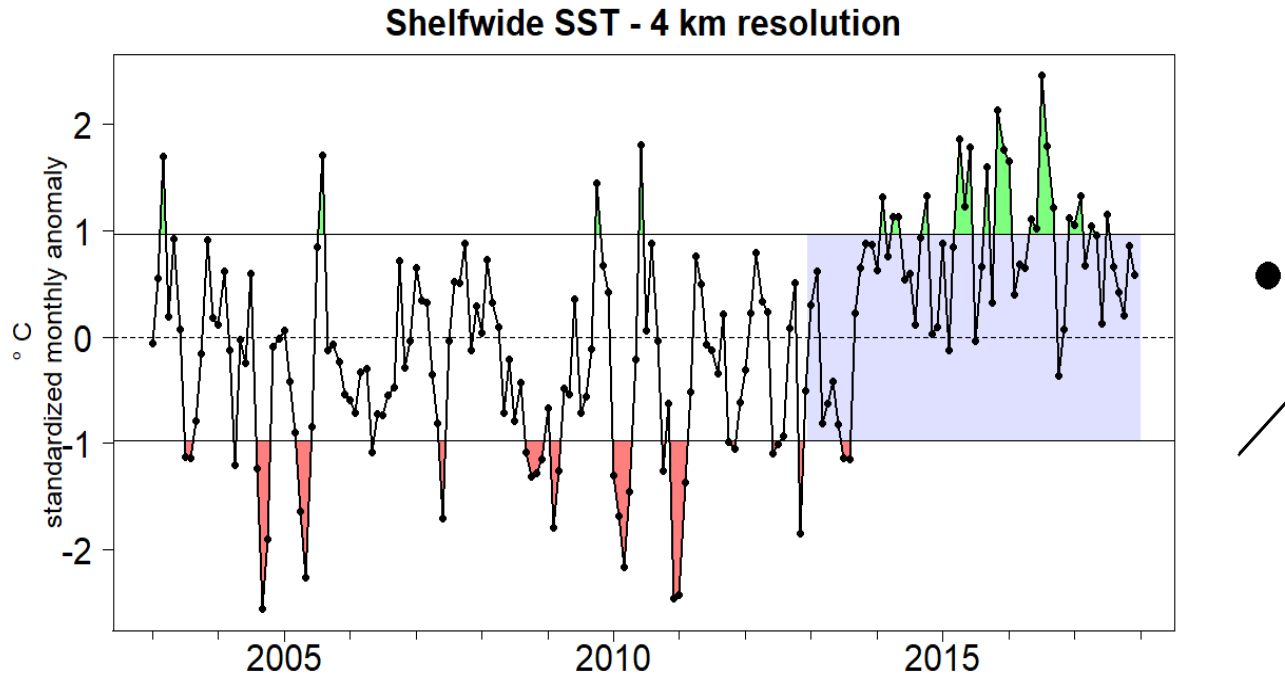
Contents	
1. Highlights	8
2. Introduction	10
2.1 Indicator selection	10
2.2 Notes on interpreting time series figures	11
3. Climate drivers	5
3.1 Atlantic Multidecadal Oscillation (AMO)	5
3.2 North Atlantic Oscillation (NAO)	6
3.3 El Niño Southern Oscillation (ENSO)	7
3.4 North Atlantic Tripole	8
3.5 Atlantic Warm Pool	9
4. Physical and chemical pressures	10
4.1 Sea surface temperature	11
4.2 Bottom temperature	12
4.3 Decadal temperature	12
4.4 Florida Current transport	14
4.5 Gulf Stream position	15
4.6 Upwelling	16
4.7 Coastal salinity	17
4.8 Stream Flow	19
4.9 Nutrient loading	20
4.10 Precipitation and drought	21
4.11 Sea level rise	23
4.12 Storms and hurricanes	24
4.13 Ocean acidification	25
5. Habitat state	27
5.1 Wetlands and Forests	27
5.2 Submerged aquatic vegetation (SAV)	28
5.3 Oyster reefs	29
5.5 Coral bleaching	32
6. Lower trophic level states	33
6.1 Primary productivity	33
6.2 Zooplankton	34
6.3 Ichthyoplankton diversity and abundance	36
6.4 Forage fish abundance	37
7. Upper trophic level states	38
7.1 Nearshore demersal fish diversity and abundance	38
7.2 Offshore hard bottom fish diversity and abundance	39
7.3 Coastal shark diversity and abundance	40
7.4 Coral reef fish diversity and abundance	41
7.5 Mean trophic level	42
7.6 Life history parameters	45
8. Ecosystem services	47
8.1 Biomass of economically important species	47
8.2 Recruitment of economically important species	48
8.3 Commercial landings and revenue	50
8.4 Recreational landings and effort	52
8.5 Estuarine shrimp, crab, and oyster landings	54
8.6 Status of federally managed stocks	55
8.7 Marine bird abundance	57
8.8 Marine mammal strandings	59
8.9 Sea turtle nest counts	61
9. Human dimensions	62
9.1 Human population	62
9.3 Coastal and urban land use	64
9.4 Total ocean economy	66
9.5 Social connectedness	66
9.6 Commercial and recreational fishing engagement	69
10. Integrated human dimensions perspective	77
11. Integrated ecosystem perspective	77
11.1 Methodology	78
11.2 Synthesis Results	78
12. Research REcommendations	88
13. Acknowledgements	89
14. References	90



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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°N latitude and 82° to 74.5°W longitude. The 1° resolution NOAA Reynolds OI SST data were averaged monthly over this domain from December 1981 to December 2018. The 4 km resolution MODIS SST data were 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.

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 Meteorological 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*



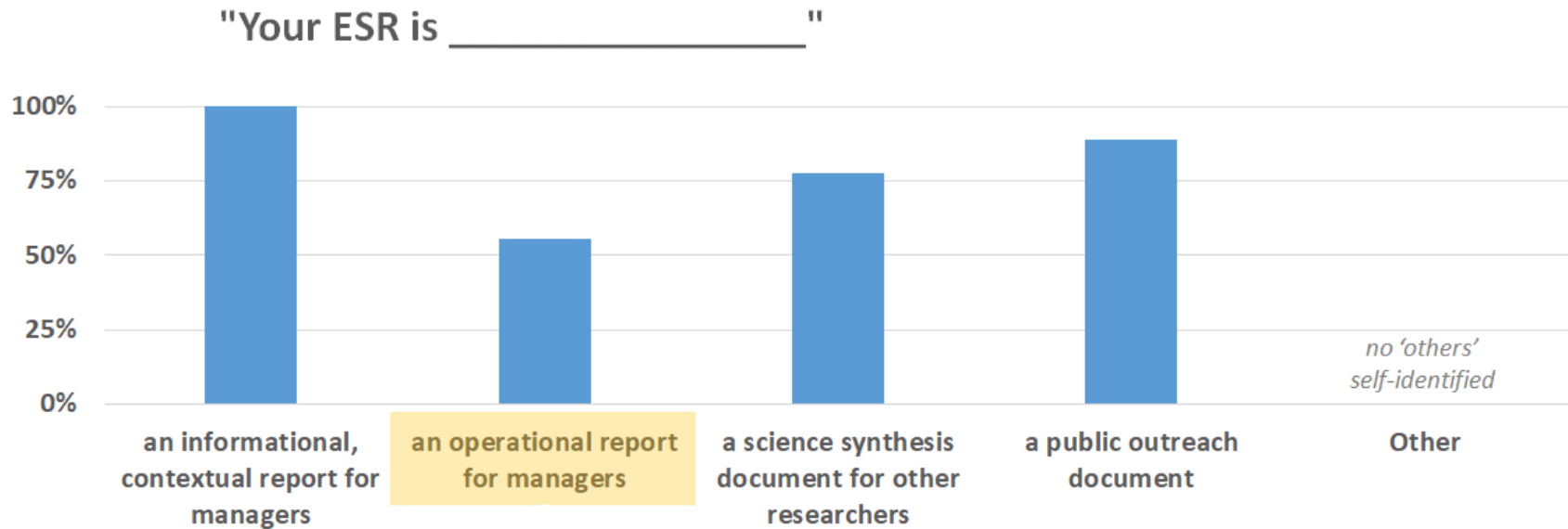
57 individuals from 23 organizations
have contributed to the report

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



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



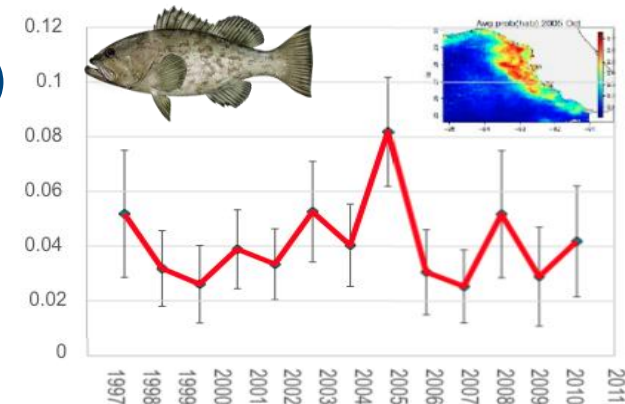
Some Current Uses of Ecosystem Reporting

- 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	Fetatus	Betatus	FW1Pred	FW1Prey	FW2Prey	Climate	DistShift	EstHabitat
Ocean quahog	l	l	l	l	l	l	h	mh	l
Surtclam	l	l	l	l	l	l	mh	mh	l
Summer flounder	l	h	lm	l	l	l	l	l	h
Southern bay anchovy	l	l	l	l	l	l	l	l	l
Black sea bass	l	h	h	l	l	l	l	mh	h
All mackerels	l	l	l	l	l	l	l	l	l
Butterfish	l	l	l	l	l	l	l	l	l
Longfin squid	lm	lm	lm	l	l	l	l	l	l
Shortfin squid	lm	lm	lm	l	l	l	l	l	l
Golden flounder	l	l	l	l	l	l	mh	l	l
Bluefish	h	h	mh	l	l	l	mh	l	l
Bluefish	l	l	l	l	l	l	l	l	l
Spiry dogfish	lm	l	l	l	l	l	l	l	l
Morid fish	h	lm	lm	l	l	l	l	l	l
Unmanaged forage	na	na	na	l	lm	lm	na	na	na
Deep-sea corals	na	na	na	l	l	l	na	na	na

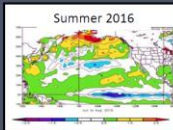
- Part of stock assessment models ('front end')
Gulf of Mexico groupers (red tides)



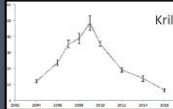
- Inform single species decision making ('back end')
Bering Sea pollock ABC adjustment

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


2016 Eastern Bering Sea Pollock example



Summer 2016



Krill



2016 Pollock Stock assessment
"Additional precaution may be warranted since warm conditions are thought to negatively affect the survival of larval and juvenile pollock."

Scientific & Statistical Committee
"Our current understanding of pollock early life dynamics suggests that recent survival from age-0 to age-1 may be low due to low availability of suitable prey."

Council
Quota was reduced under a more conservative Tier 3 approach; consideration of ecosystem indicators impacted management decisions.

Thank you!



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