U.S. Southeast Atlantic Climate & Fishery Issues: Short Context

K. Lindeman, Florida Institute of Technology

Southeast United States

Florida Keys to Carolinas: tropical-temperate transition area; high biological complexity & high natural oceanic variability. Focus here on:

- NCA Climate Trends & Biological Aspects

- Climate Change Vulnerability Assessment (CCVA) options

- Land Use, Coastal Policy and Fisher Socio-economics

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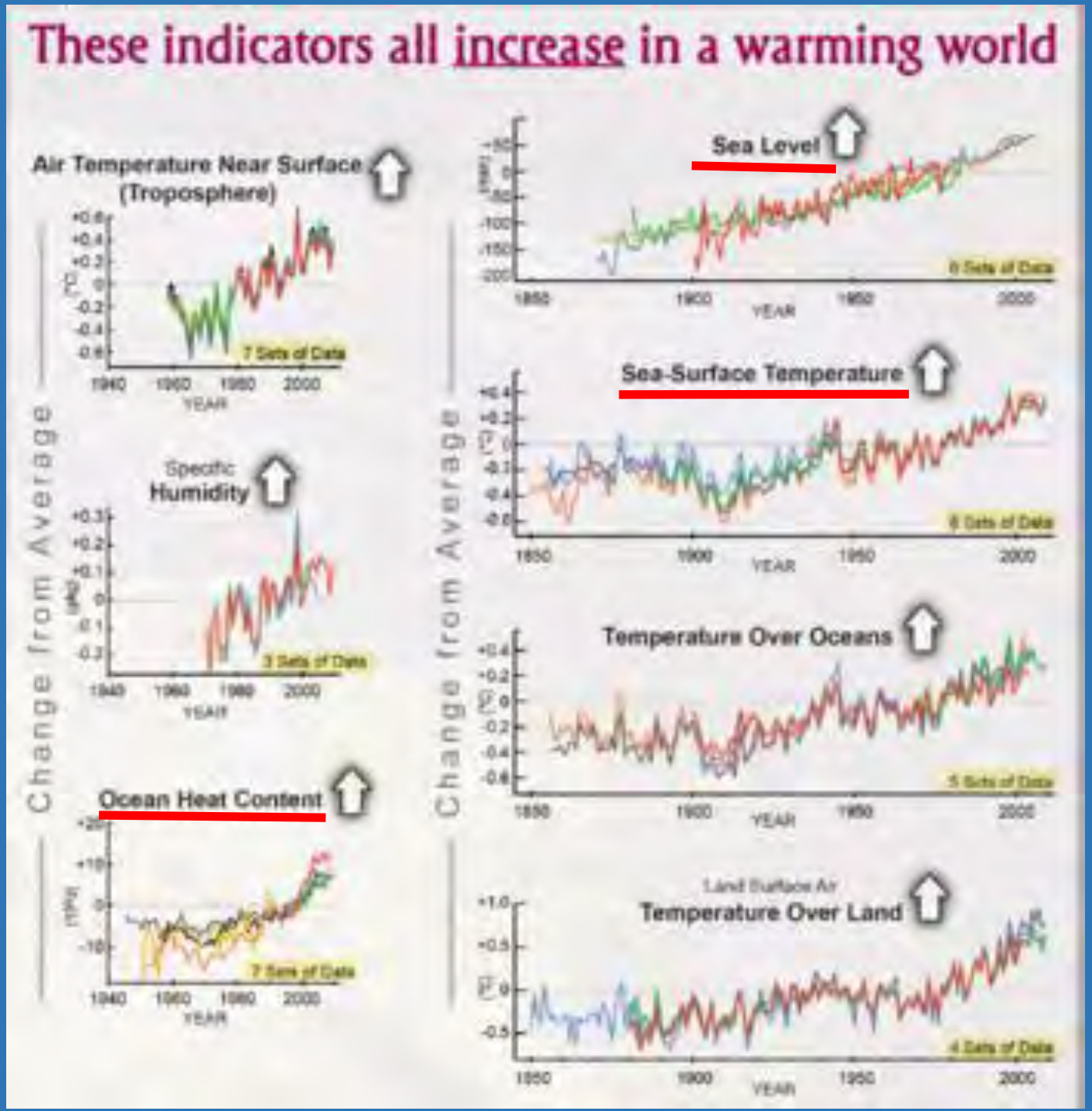
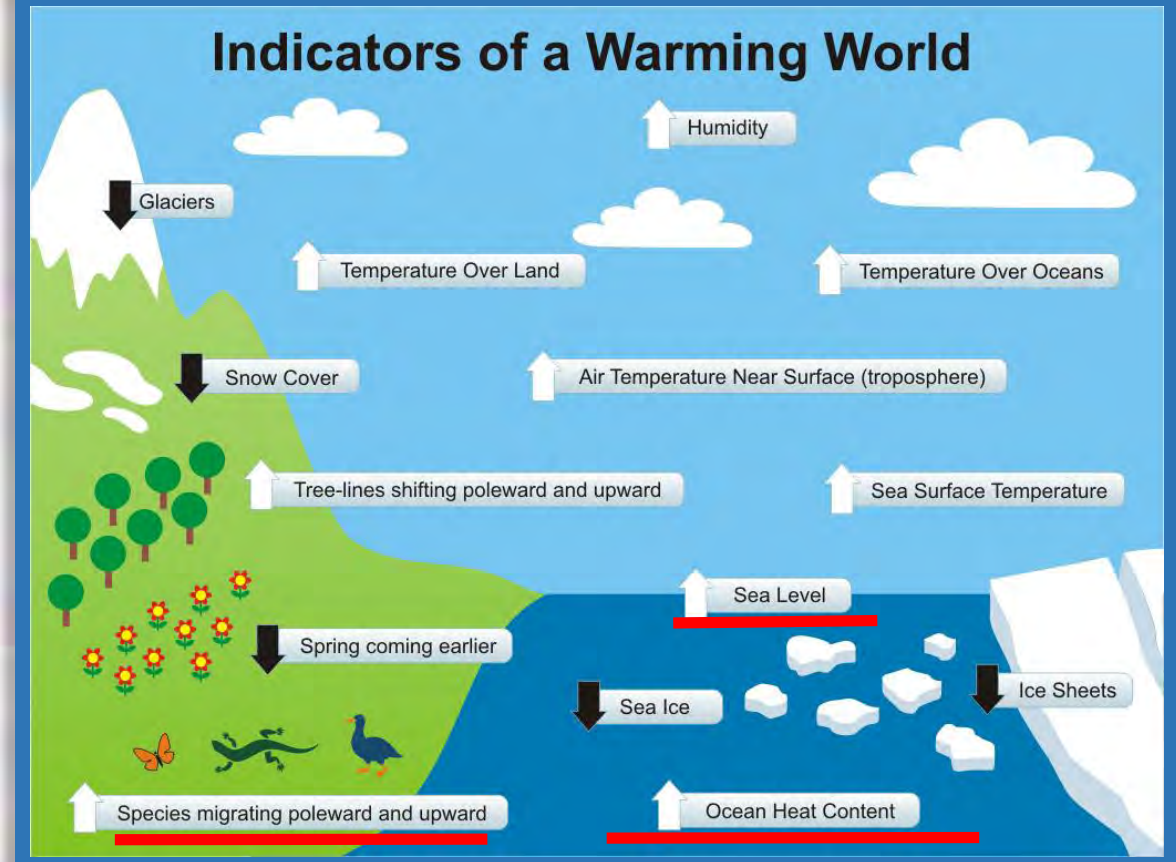
High Tech with a Human Touch™



- **National Climate Assessment (2014)**
  – with regional sections.
- Nat. Climatic Data Ctr, NOAA (2012)
- Kennedy (2012)



Biology and Fisheries, multiple climate drivers.
Prominent questions include (all have varying timelines):

- How will Essential Fish Habitats be affected?
- How will habitat corridors (for juveniles, spawning) be affected?

- How will corals and other invertebrates be affected?
- How will food webs be affected?

- How will spawning aggregations be affected?
- How will effort and catches be affected?

- Emerging synergies in responses...

Biology and Fisheries, issues include:

Planktonic Connectivity

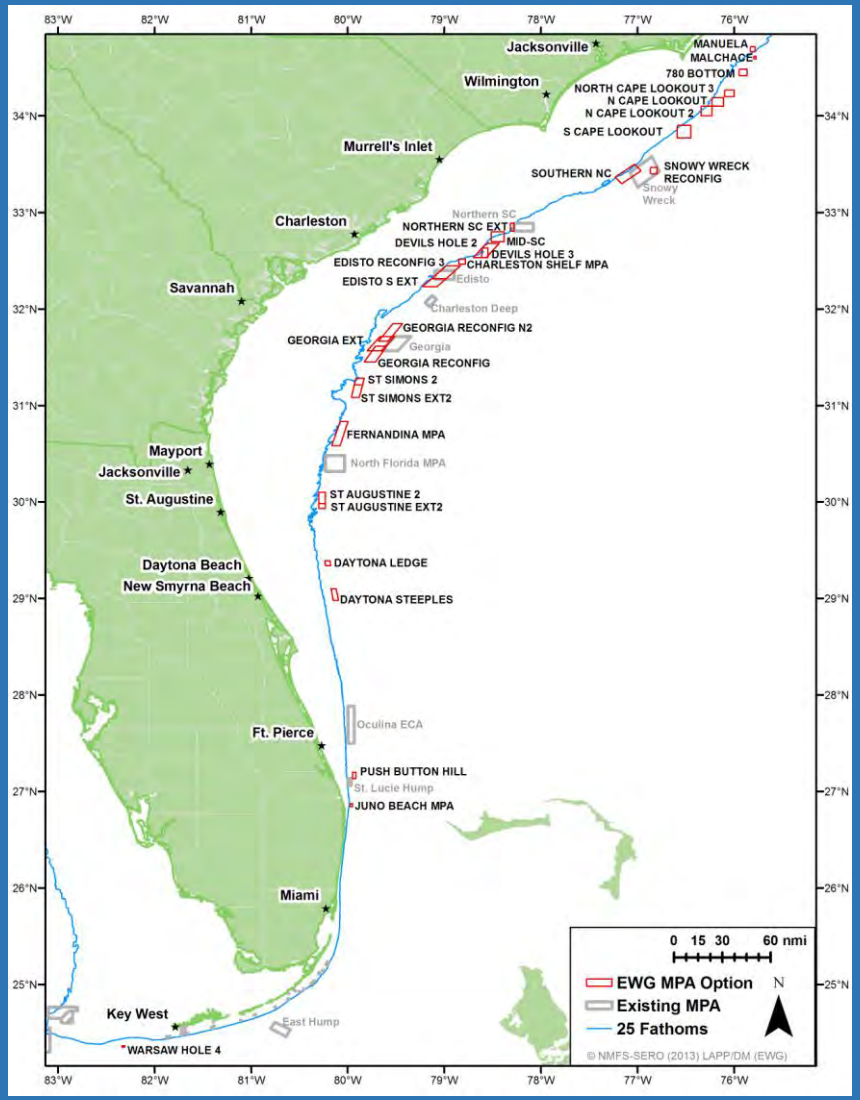
- Spawning site information; traditional knowledge
- Existing MPAs (e.g. Amend. 14 MPAs)
- Amendment 36 SG FMP - spawning reserves

Demersal Connectivity

- from nursery areas; EFH-HAPC; spawners

Corals

Acroporids are listed under ESA; Acidification.



MPA alternatives, SAFMC Expert MPA Workgroup (2013)

Near-term Research Opportunities – SAFMC

System Management Plan (SMPs)

Opportunities to program research needs incl CC issues:

- **Amend. 14 MPA System Manag. Plan** – *Dec 2015*
- **Amend 36 Spawnng SMZs Manag. Plan** – *Mar 2016*

Fishery Ecosystem Plan

- 17 chapters – many with potential CC components.

Climate Change Vulnerability Analysis (CCVA)

Processes to assess relative vulnerabilities across species and habitats and other domains to best focus CC adaptation activities.

Multiple CCVA initiatives, a family of methods, including:

- governments (e.g. NOAA, Australian Dept. of Environment)
- IUCN
- FAO - CCVA guide for fisheries and aquaculture
- NGO partnerships

Key Steps for Assessing Vulnerability to Climate Change

Determine objectives and scope

- Identify audience, user requirements, and needed products
- Engage key internal and external stakeholders
- Establish and agree on goals and objectives
- Identify suitable assessment targets
- Determine appropriate spatial and temporal scales
- Select assessment approach based on targets, user needs, and available resources

Gather relevant data and expertise

- Review existing literature on assessment targets and climate impacts
- Reach out to subject experts on target species or systems
- Obtain or develop climatic projections, focusing on ecologically relevant variables and suitable spatial and temporal scales
- Obtain or develop ecological response projections

Assess components of vulnerability

- Evaluate climate sensitivity of assessment targets
- Determine likely exposure of targets to climatic/ecological change
- Consider adaptive capacity of targets that can moderate potential impact
- Estimate overall vulnerability of targets
- Document level of confidence or uncertainty in assessments

Apply assessment in adaptation planning

- Explore why specific targets are vulnerable to inform possible adaptation responses
- Consider how targets might fare under various management and climatic scenarios
- Share assessment results with stakeholders and decision-makers
- Use results to advance development of adaptation strategies and plans

Glick et al. 2011 – used in Open Standards and IUCN planning

CCVA includes:

NOAA/FMCs:
- Species x FMP x habitat x gear type
- existing stressors x new stressors – indices.
- Roles for CCVA in FEP over time?

IUCN CCSG:
- Correlative, Mechanistic, Trait-based (TVA), Mixed (Pacifici et al. 2015 and the literature within)

Open Standards: in prep by Conservation Measures Partnership

- High focus on applications.
- What can be done with a managed species *in-situ*?

Land Use Policy and Fisher Socio-economic Issues include

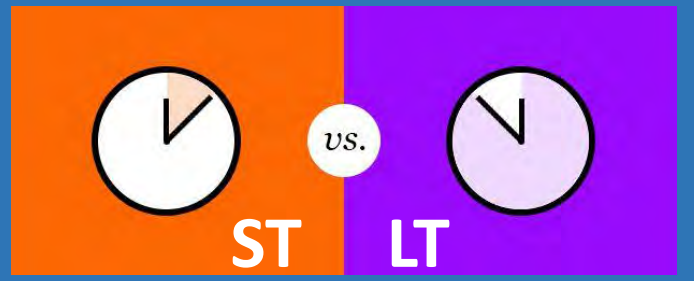
- Future dock-side infrastructure of fishers & post-catch processing.

- Working waterfronts – tropical FMUs; substantial CC planning
    - Key West
    - Miami
    - Jacksonville, etc

- By 2075, where will the harvest infrastructure be in the Fl Keys?
- Will some be floating or hybrid infrastructure?
- Changes to communities and cultures?

- For many, not a perceived short term threat (ST)…

Short- and Long-term Decision Making



- Planning on time scales longer than political elections or mortgages (e.g., >4 to 30 yr) is very challenging – yet fundamentally needed.

- Particularly when economic feedback loops favor ST investments and resource consumption (e.g., high levels of land development, high levels of fish removal) – the LT savings are not fully accounted for.

- With LT climate action decisions, one looks at decades of unrewarded performance (lost ST profits etc) and - LT goal commitment decreases - or never evens starts (Reeve, 2015).

- Virtual Climate Adaptation Library. Search: *sealevelriselibrary* with >1700 reports in 80 subfolders, incl a climate communications library.