

CLIMATE THRESHOLDS FOR COASTAL ECOSYSTEMS

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What is a climate threshold?

- An ecological threshold is the point at which there is an abrupt change in an ecosystem quality, property or phenomenon, or where small changes in an environmental driver produce large responses in the ecosystem. (Groffman et al. 2006)



Shift in ecosystem state

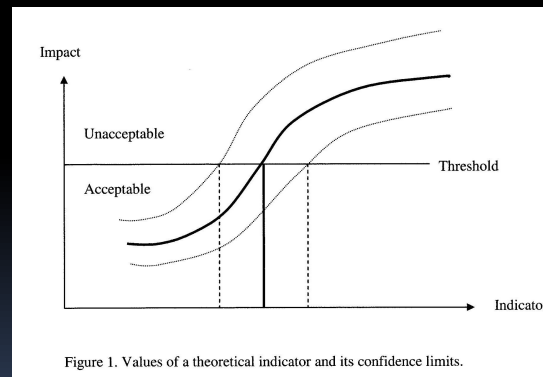
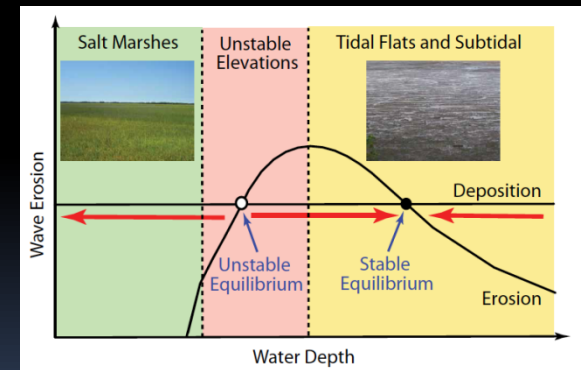


Figure 1. Values of a theoretical indicator and its confidence limits.

Determination of critical envelope

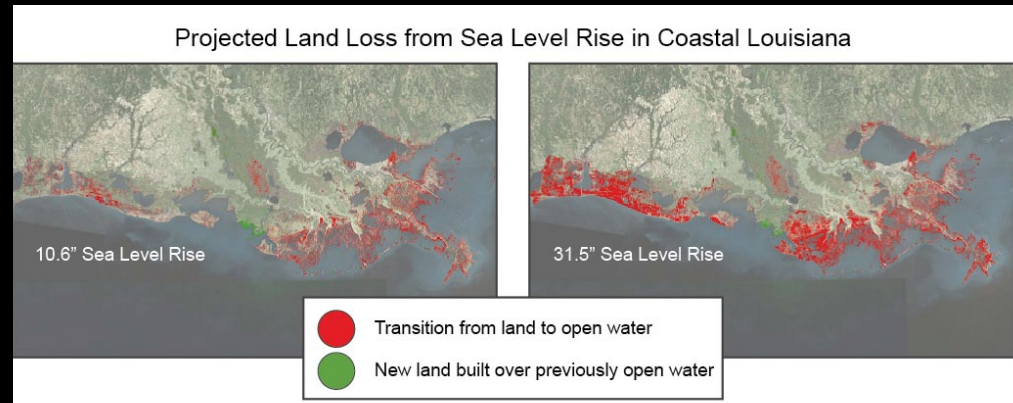


Interacting factors

Reversibility is a key issue

Climate threshold effects?

- Changes from current conditions for species/habitats of interest
- Implications for restoration
 - Both negative and positive
- Need to modify management practices or targets
 - Put on the brakes to avoid



Why climate thresholds?

- **Tipping Points and Climate Threshold Events: a useful ecosystem management concept**
 - Guides monitoring activity and research objectives
 - Identifies management action points
 - Resonates with public, facilitates outreach
- **How we can utilize Tipping Point Research to examine climate impacts**
 - Review and synthesize existing research to identify (seek to avoid) potential tipping points in ecosystems of interest
 - Develop monitoring strategies for Sanctuaries and Reserves (based on indicator species)
 - Identify tipping points and assess management (restoration) strategies in light of future climate conditions

Timeline

- Identified by NOS offices as issue of interest (2012)
- Workshop informed NOS office on thresholds/tipping points and potential applications of theory (2014)
- Follow-up with Science Board requested input on specific thresholds and science products (2015)
- Interactions with OAR/CPO and NMFS (2016)
- Developed prospectus, still requires detail and focus
- How to narrow focus of prospectus to develop RFP?
 - Where RAs come in

What, how, who, when?

- Regional web meetings
 - Separate meetings for each region
- Facilitation to allow web-based input
- Gather regional stakeholders to identify
 - What vulnerability and climate scenario tools are already in use
 - Potentially vulnerable habitats and resources
 - Management issues of most concern related to climate thresholds
- Between 8/22/2016 and 10/10/2016 to incorporate into FY18 RFP planning