NOAA FISHERIES

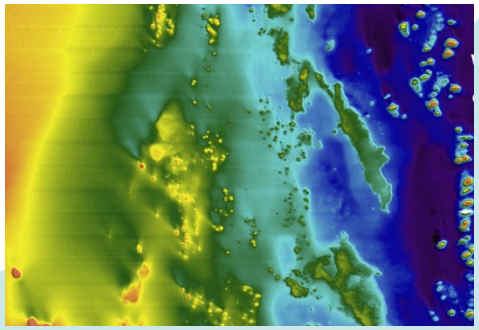
Southeast Fisheries Science Center

2017 Gulf of Mexico Climate Vulnerability Assessment

GMFMC Meeting

October 17-21, 2016

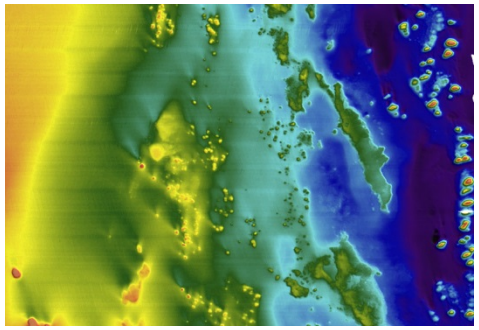


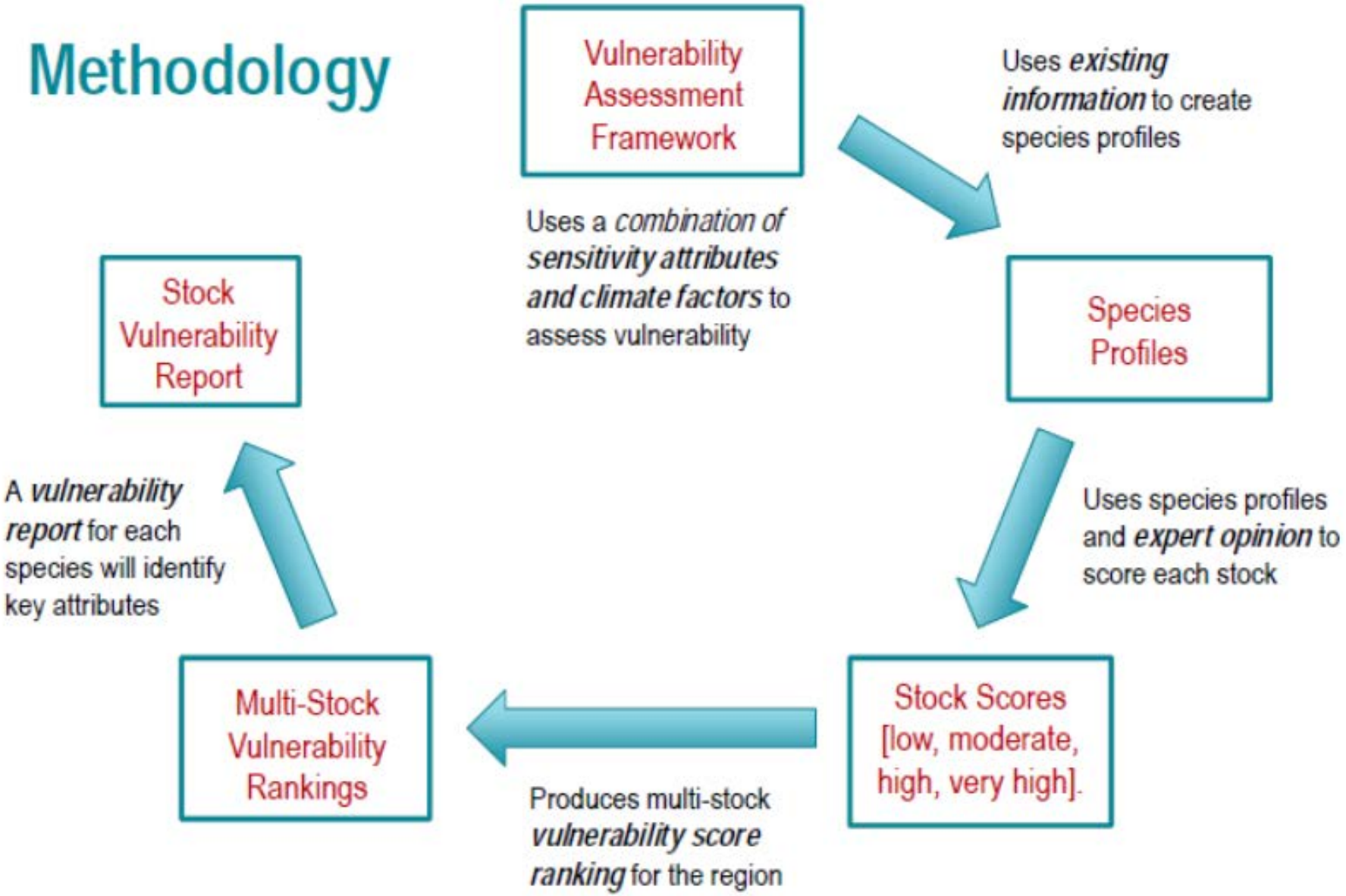
2017 Gulf of Mexico Climate Vulnerability Assessment

- Part of the National Climate Science Strategy and the Gulf of Mexico Climate Science Regional Action Plan.
- Determine which stocks/species will respond with a shift in abundance or productivity to a changing climate.



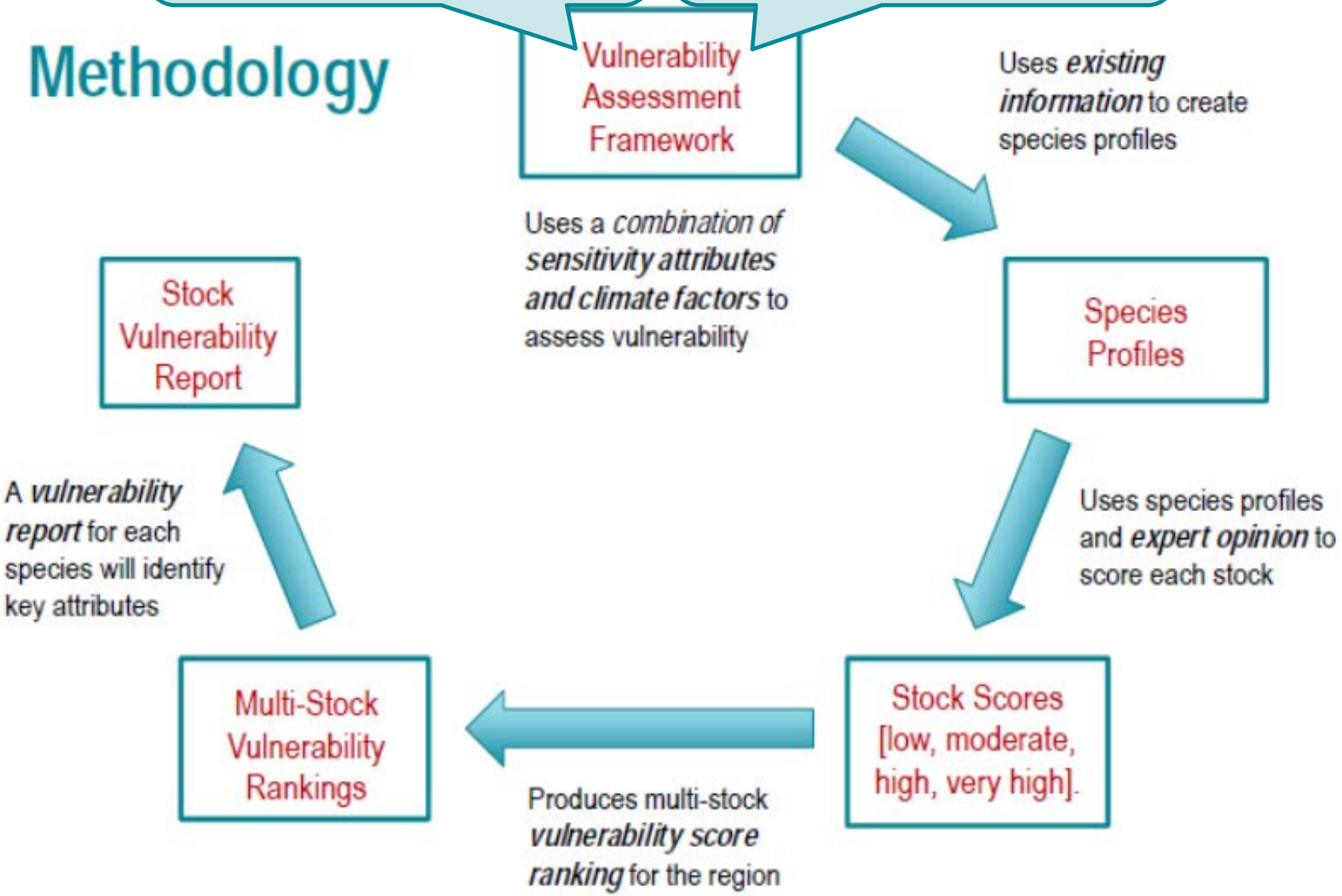
Methodology



Methodology

Example Sensitivity Attributes: Complexity in reproduction, habitat specificity, etc.

Example Climate Factors: Sea surface temperature, salinity, ocean acidification, etc.

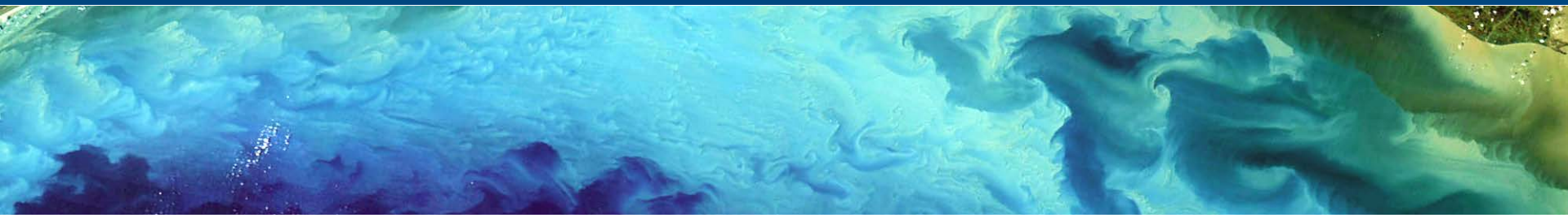


GMFMC has a role to play…

Council input can help us to:

- Prioritize species/stocks to assess.
- Identify important regional climate processes.
- Identify life history data.
- Suggest tangible products that could aid end users such as Council and other stakeholders.
  - What materials would best support management? Ecological Impact Assessments? BiOps? etc.
  - What is the best way to communicate assessment results?

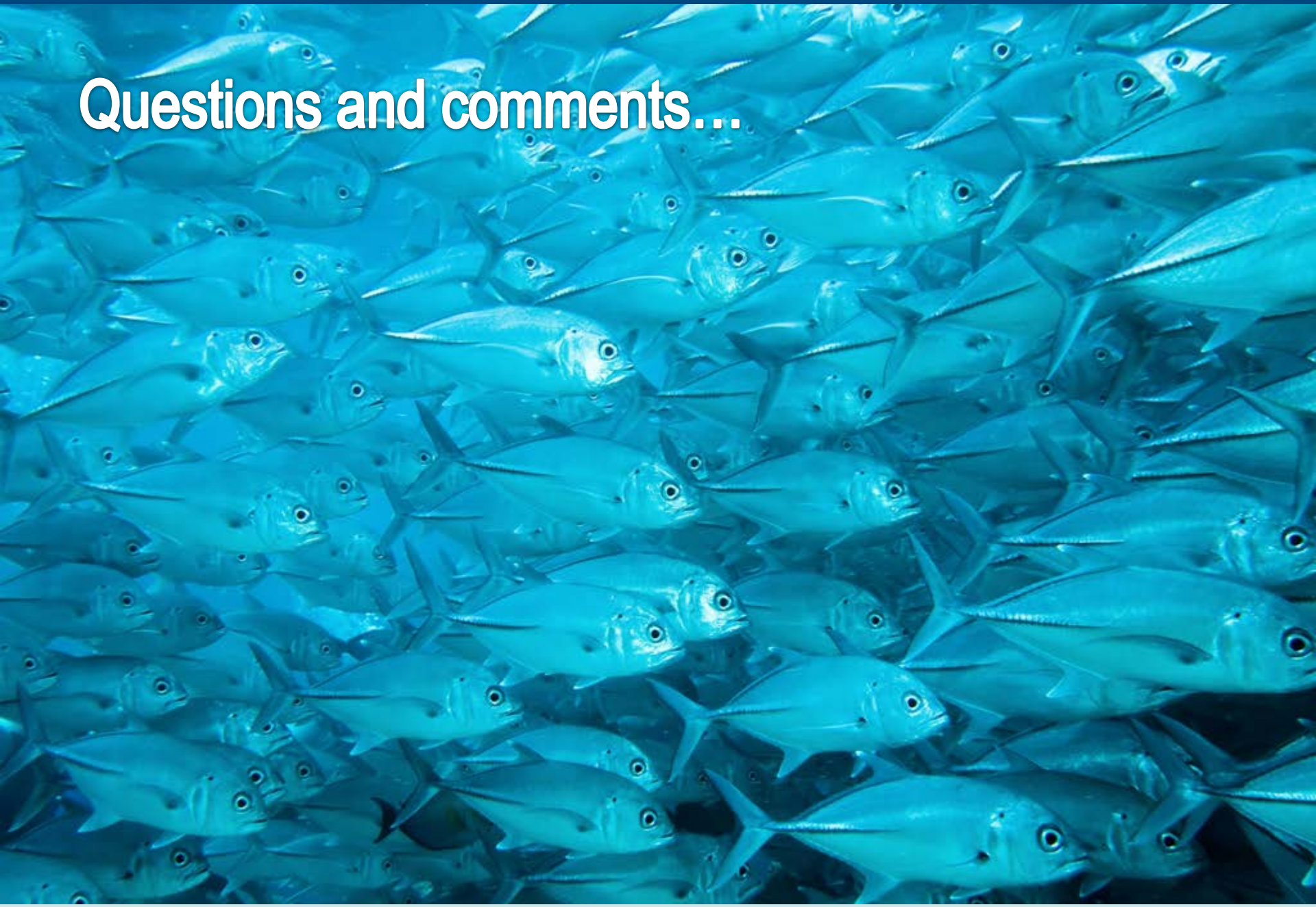


Why conduct CVA?

- Understand climate model projections for the region.
- Identify gaps in ecological knowledge to guide research agendas.
- Establish which stocks might decline or expand to guide management, monitoring, and research decisions.
- Identify communities dependent on vulnerable stocks to build greater economic resilience.

Questions and comments…



EXPOSURE

Sea surface temperature
Air temperature
Salinity
Ocean acidification
Precipitation
Currents
Sea level rise

SENSITIVITY

Complexity in Reproduction
Dispersal of Early Life Stages
Survival and Settlement Requirements
Habitat Specificity
Prey Specificity
Adult Mobility
pH preferences
Thermal preferences
Population Growth Rate
Stock Size/Status

Species Vulnerability

Example Rubric to Aid Scoring for Sensitivities

Goal: To determine if the stock is a prey generalist or a prey specialist.

Relationship to climate change: Understanding how reliant a stock is on specific prey species could predict its ability to persist as the climate changes.

Background: Impacts extend beyond the stock in question to include species within its food web.

How to use expert opinion: Please account for ontogenetic shifts in diet; however, limit your response to the juvenile and adult life stages as larvae are considered elsewhere.

Prey Specificity Bins:

Low:	The stock eats a large variety of prey.
Moderate:	The stock eats a limited number (~3) of prey types (copepods, krill, forage fish, etc).
High:	The stock is partial to a single prey type. It is able to switch to a different prey type, but this may negatively impact fitness.
Very High:	The stock is a specialist, and is unable to switch to alternative prey.

Example: Potential for distribution shift for Northeast stocks