SEACAR Subject Matter Expert Meeting Notes Summary
Virtual Workshop, April 29–30, 2020

Overview

More than 40 coastal and aquatic Subject Matter Experts from across the state of Florida convened for a two-day, virtual workshop for the Statewide Ecosystem Assessment of Coastal and Aquatic Resources (SEACAR) program. The goals of this meeting were to: (1) review preliminary analyses for each RCP priority habitat, and provide edits and suggested changes to the analyses; (2) identify priority cross-habitat analyses and points of contact for each; (3) review the technical report structure, and provide key messages for each RCP priority habitat. Experts divided into teams based on habitat expertise to make progress toward these goals. Moving forward, habitat teams will consult with the University of Maryland Center for Environmental Science to perform all identified analyses on selected indicators and author content for the SEACAR Technical Report.

SEACAR Overview and Progress to Date

- Overview of SEACAR:
    - Goals: evaluate status/trends of ecological indicators; use existing data; develop a decision support tool
    - Geographic scope: RCP estuarine managed areas
    - Timeline: 5-year project
    - Teams: Partner team, DEP Steering team, Data team
    - Indicators and indicator selection criteria
        - Show statewide/site-specific trends over time
    - Habitats: Submerged Aquatic Vegetation (SAV), Water Column (& Nekton), Coral Reef, Oyster Reef, Coastal Wetlands
    - Final products: Technical report & database, Assessment report & interactive website, Assessment summary
    - Data Discovery Interface: 239 data programs included; analyses conducted with this data
- Review of January 2020 SME meeting in St. Petersburg, FL
- Progress since January 2020

Data Discovery Interface Review

- SEACAR Database: Intends to integrate data for all indicators/habitats in one place; Allows for future expansion; Meet metadata standards; Link to existing databases
- Data can be uploaded in any format; Data downloads are in standardized format
- If you are logged in as an SME, you can view status of data upload/formatting in the task list on monitoring program list
    - If you are a program manager and you want access to edit the DDI, contact Cheryl Clark for login credentials as a "Program editor"
        - Program editor instructions available on SharePoint

Preliminary Data Analyses

- Preliminary analyses for: Oyster Reef, Water Column, and Coastal Wetlands
- Oyster Reef
  - Density changes over time, by region/statewide
    - 3 types of analyses:
      - Linear models and scatterplots to identify general trends)
      - Notched box plots to compare regions/seasons
      - Mixed effect model, Fit model
  - Summary:
    - Long term trends: no significant trend statewide
    - NE: significant increasing trend in density over time
    - Regional difference by season:
      - Summer density: NE > SE
      - Fall, Winter, Spring density: SW > NE
    - Trends when analyzing seasons independently
      - NE: Summer density increases over time, statistically significant
    - Main message: for density, we need more sampling statewide and more years of data to get long term trends
  - Comments:
    - Katie May plans to explore non-linear relationships
    - Assumptions, residuals, auto-correlations were considered in these models
    - There are data on oyster settlement, which can be added
- Water Column
  - Discrete water column data
  - Linear models ran for all regions for which data is available
  - Dissolved Oxygen
    - Years: 1978–2019; Used annual averages
    - Statewide: significant increasing trend
    - NE: significant increasing trend
    - NW: increasing trend, insignificant
    - SE: significant increasing trend
    - SW: significant decreasing trend
  - Salinity
    - Statewide: no significant trend
  - Total Suspended Solids (TSS)
    - Outlier yearly averages in 2006, 2007
  - Comments:
    - Katie May plans to compare/look for correlations among all water column parameters
    - Use monthly averages, not annual
    - Sites do change over time because of sampling inconsistencies. Some sites are over/under represented currently, however this will be standardized in the future.
- Coastal Wetlands
  - Species composition and acreage
  - Used statewide maps of landcover: WMD Land Use/Land Cover Maps (1990s), FWC/ FNAIs Cooperative Land Cover (CLC) maps (2019)

- o Comments:
  - ▪ Overall trend statewide? Salt marsh had an increase of about 1%, mangroves had an increase in about 4%. However, don't put too much stock in this for the whole state: some could be attributed to just mapping changes, and this only samples APs.

Confidence Level Ranking
- Every analysis must be assigned a confidence level ranking based on Evidence and Agreement
- Confidence levels are: very low < low < medium < high < very high
- Based on Intergovernmental Panel for Climate Change (IPCC) standards
- Confidence level ranking "worksheets" were designed to lead these discussions
  - o Worksheets are specific to each habitat/indicator; available on SharePoint
- Breakout 1 objective: for each preliminary analysis for your habitat, work through the Excel worksheet and assign a confidence level ranking. Provide suggested edits to improve the analyses. Identify anything that may be missing.

Report Back from Breakout 1
- SAV, Corals, Nekton combined group
  - o Should confidence level ranking worksheets be anonymous? No.
  - o Corals: For diadema, use presence/absence analysis
  - o SAV: Begin braun-blanquet (BB) percent coverage at the AP level, and then sum up to the region level
  - o Nekton: Species abundance—should start with 40 species, not every single one listed
- Water Column
  - o Dissolved Oxygen (DO) Statewide confidence level = medium
  - o Need more summary statistics and program metadata to know for sure if data used are appropriate/comparable, etc.
- Oysters
  - o Confidence level = low
  - o Need to go back through the data and check standardization
  - o Note: Oysters Percent live is a requested analysis
- Coastal Wetlands
  - o Confidence in 2019 maps = high
  - o Trends may not accurately reflect what is happening across the state because of changes in methodology
  - o To take this to the "next level," make a figure showing all land cover categories by proportion. If this is done, this may show more information at the mapping level

Cross habitat analyses

- Review previously suggested cross habitat analyses
- These are "wish list" analyses, but helpful to have them
- Most habitats have Water Column cross habitat analysis ideas
- Breakout 2 objective: create a "wish list" of cross habitat analyses to run.

Report Back from Breakout 2

- Nekton
  - Recruitment; Habitat use; Spawning aggregation (in corals data); Shifts in diversity in relation to other parameters
  - Need nekton data from DDI first, see what types/time/habitat range we have, before meeting with other teams
- Oysters
  - Frequency/duration of low/high salinity events; Water clarity; Fish abundance; Fish diversity; Oyster/mangrove interactions; Elevation—presence/absence; Oyster density and SAV percent coverage?; Geographic location of coral and oyster reefs in relation to each other?
- Corals
  - Temperature and pH; Herbivorous fish; SAV and mangroves, freshwater inputs (salinity as proxy); Coral loss and change in nekton species
- SAV
  - Changes in SAV with wetland loss over time; Faunal species and abundance?; Water Column parameters: Clarity. Salinity. DO. TN. TP. pH. Color, turbidity, chl (instead of Kd)
- Coastal Wetlands
  - Salinity; temperature; Air temp if data are available; DO; chl; Nutrients with salt marsh; Percent of salt marsh below high water; Oyster reefs size, shape, location, nutrient data in relation to salt marshes
  - Consider elevation when looking at species composition
- Water Column
  - Other habitat teams have suggestions for cross habitat analyses with Water Column
  - Basic parameters can be looked at for every region

Technical Report Structure and Themes

- Multiple SEACAR products will include varying levels of detail and address different audiences
  - Technical report/database—scientific community, most detail
  - Assessment report/interactive website—managers, moderate detail
  - Assessment summary—high level, most summarized
- Need to begin generating content for Technical/Assessment reports
  - Why this matters—high level ideas about why certain indicators/sites are being assessed. Answer the question: "Why do we care?"
  - Success stories—can be related/unrelated to SEACAR indicators and objectives. Want to use these stories to highlight important things happening in regions/habitats around the state. Provide more context for the reports.

- Breakout 3 objective: brainstorm content for "why this matters" for each region and/or specific indicators; list ideas for potential success stories for your habitat; identify POC for these sections

Report Back from Breakout 3

- Oysters
    - Why does this matter? Monitoring is necessary, habitat loss statewide, timing/delivery of freshwater, bioaccumulation of pollutants, etc.
    - Success stories
        - "Shuck and Share" example in report needs to be updated
        - Statewide—OIMMP report is a good start
- SAV
    - Why does this matter? Monitoring helps influence management, decision-making, policy changes, etc.; Important to know if we are gaining/losing seagrass; Are we achieving targets?; Analyses are only possible with funding; Tracking changes over time
    - Success stories
        - Tampa Bay increasing seagrass coverage from 1950s imagery and met their targets
        - Restoration project in Palm Beach County, built lagoons that naturally recruited seagrass
        - Seagrass protection prop-scarring rule for protection areas and AP signage
        - Seagrass nurseries in IRL and determining genotypes/genetic diversity
        - Removing derelict crab traps from Steinhatchee
- Water Column
    - Why does this matter? Water quality/clarity parameters are the pulse of all the other habitats; Affects biological/physical/chemical processes; Important to tourism, economy; We monitor to avoid huge failures. Need to know what a system looks like *before* an event happens
    - Success stories
        - Terra Ceia, Pinellas County, Cockroach Bay—monitoring program is robust in this area, they've been making improvements in N over time
        - Charlotte Harbor water quality—monitoring since the 1990s, assessing long-term impact of red tide on the harbor
- Nekton
    - Why does this matter? We monitor in order to manage the stocks; Essential fish habitat; habitat restoration; Monitor trends in response to perturbations
    - Success stories
        - Mainly focus on management (proactive action where stocks came back)
        - Snook populations were knocked back (50–60%), the Commission put into place a moratorium and bought back populations
        - Red drum in 1980s—open again to recreational fishing in 4 years
        - Gag grouper—size effects, shift in size limits?
        - FWC FIM biologists helped to design juvenile habitats at restoration sites
- Corals
    - Why does this matter? Long-term monitoring is important for documenting trends over time, allows us to quantify impact from specific events; Stony coral disease outbreak
    - Success stories

- Florida aquarium diadema rearing project
- Mission Iconic Reefs initiative
- We're lucky to have multiple long-term datasets
- Only lost one coral species completely (pillar coral)
- Florida aquarium successfully spawning corals in captivity
- Partners working together to respond to Stony Coral disease—funding research, implementing antibiotic treatments, etc.
- Coastal Wetlands
  - Why does this matter? Habitat for juvenile fish; Protection from erosion, storm surge; Nutrient reduction; Carbon storage; Resilience; Species diversity/composition; Habitat loss to dredging/sea level rise; Invasives; threatened & endangered species; Ecosystem services; Mangroves encroaching into salt marsh; Community benefits: Economically; Tourism; Fishing; Money saved due to storm/flooding resistance; Offsets for carbon
  - Success stories
    - CHIMMP effort includes multiple agencies contributing
    - Citizen science and volunteer efforts
    - Swift Mud Rock Pond
    - Indian River Lagoon —reconnection of impounded wetlands
    - Living shorelines: Restorations in Tampa Bay, Biscayne Bay, Indian River Lagoon
    - Critical coastal habitat assessment

SEACAR Next Steps

- This meeting's recording and all meeting materials will be available on SharePoint
- Finalize status/trends analyses (now until August 2020)
- Populate Technical Report (now until August 2020)
  - Once populated, Technical Report document will go out for extensive review
  - Finalize Technical Report by end of 2020
- Launch interactive web application and mapping tool
- Hold regular regional stakeholder meetings
- Evaluate decision support tool needs and commence tool development
- Communicate relevant statuses and trends of coastal resources to local and state decision makers

Workshop Group Photos