

# FWC's Fisheries Independent Monitoring program:

An approach to understanding environmental disturbance impacts on Florida's Fisheries

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A background image showing a coastal scene. In the foreground, the water is shallow and rippling, reflecting the sky. In the middle ground, several people are wading in the water, handling a large green net. The background shows a clear blue sky and a distant horizon line.

Fisheries Research Overview

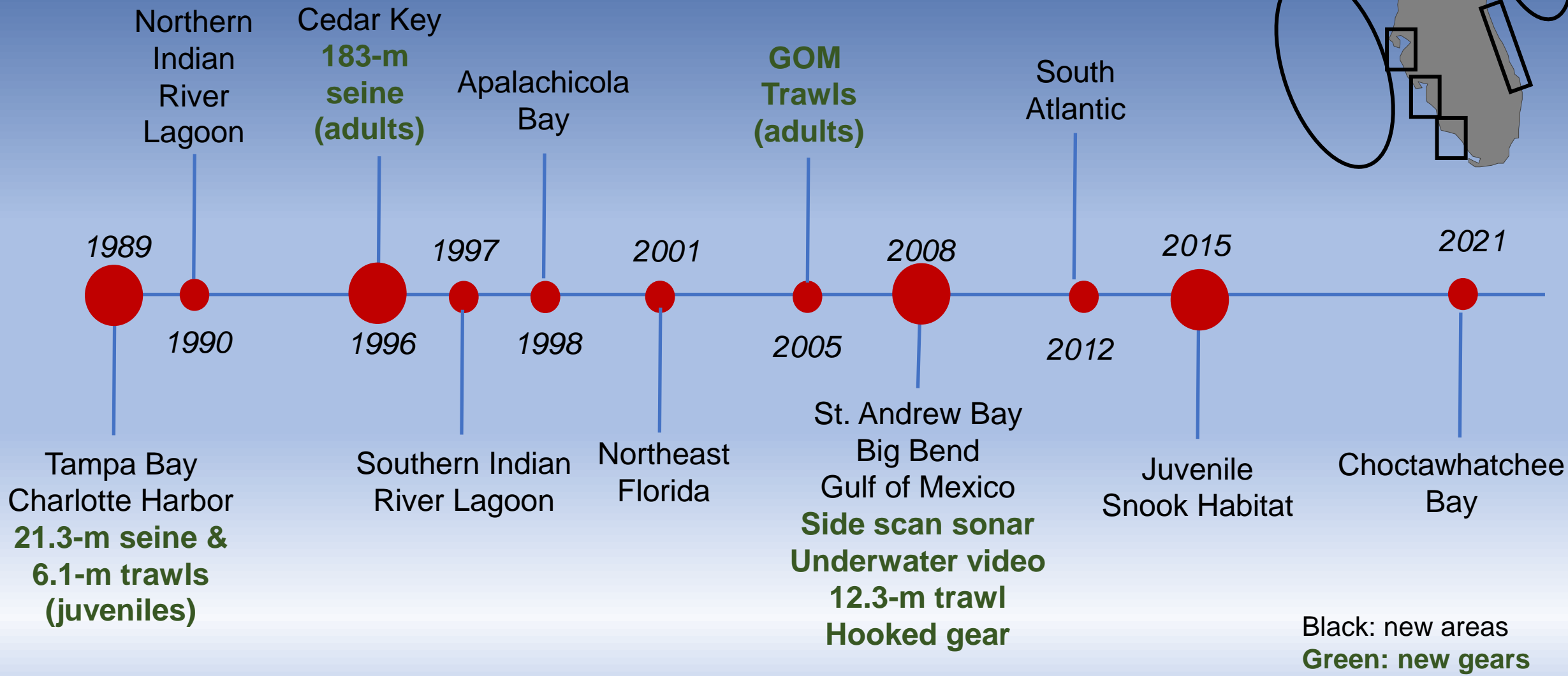
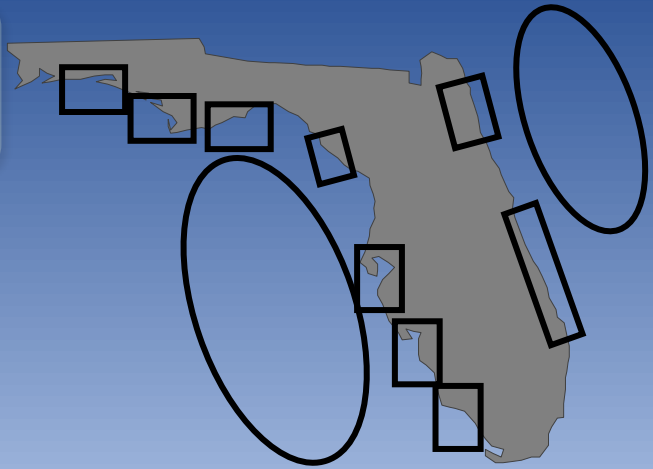
Sampling Methodology

Data Utility

Hurricane Impacts

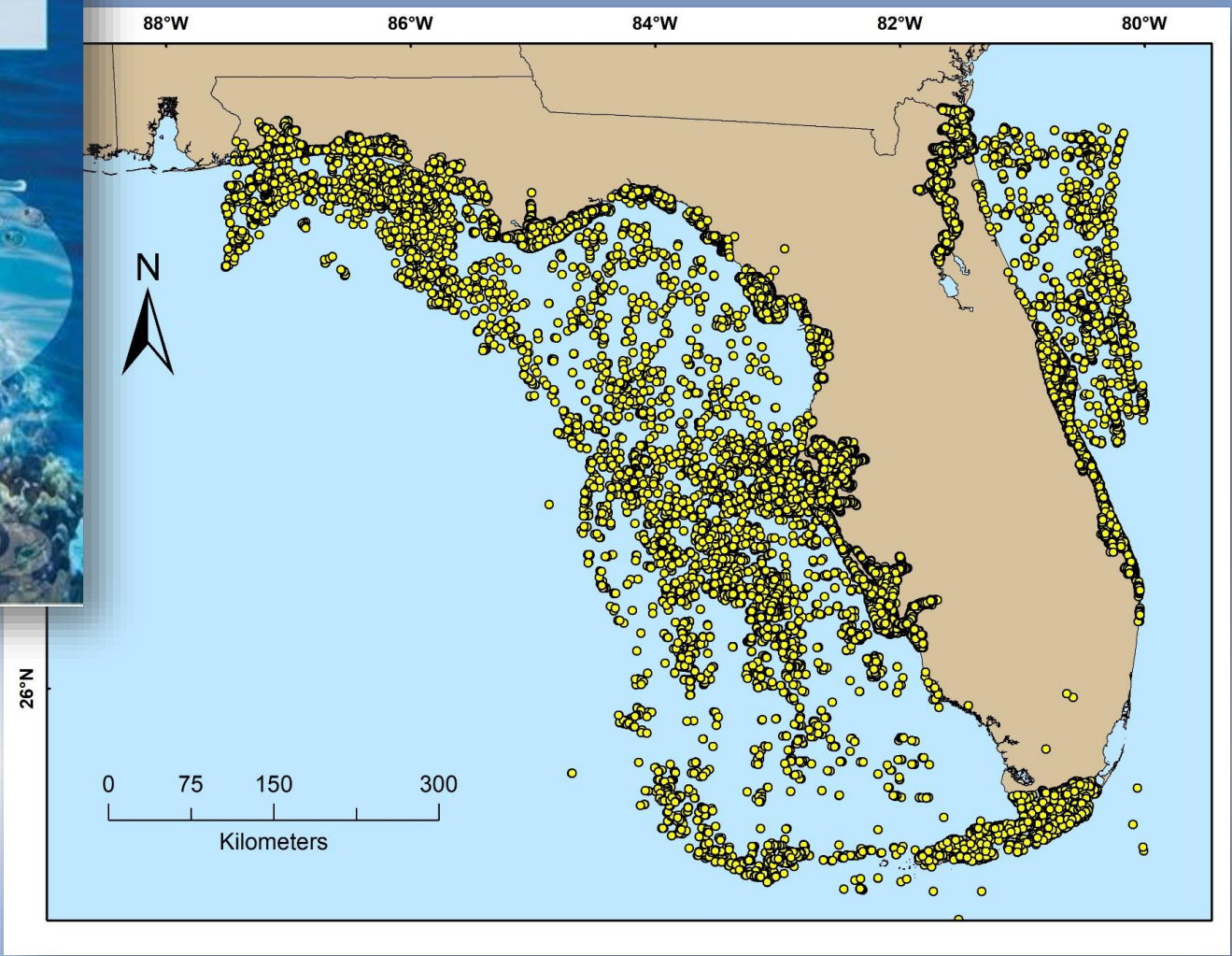
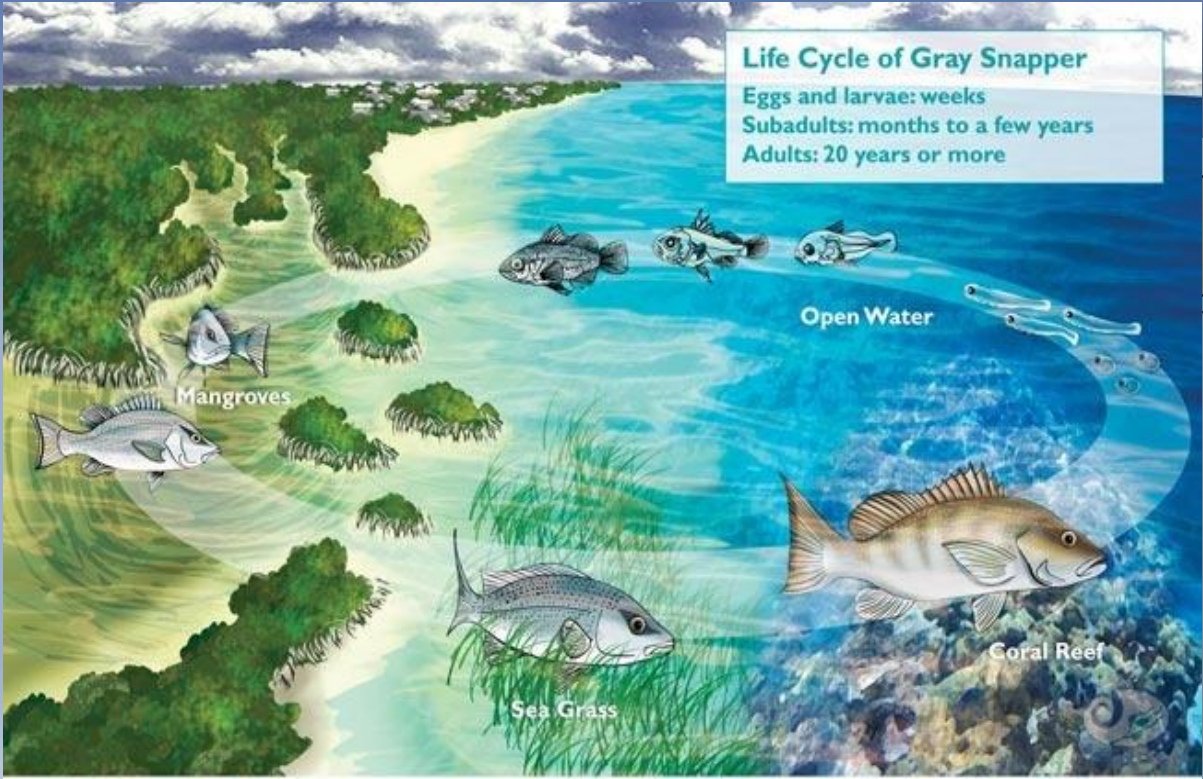
FWC Hurricane Response

# Fisheries Research Overview: FIM Timeline





# Fisheries Research Overview: Scope of Work





# Sampling Methodology: Gear Types



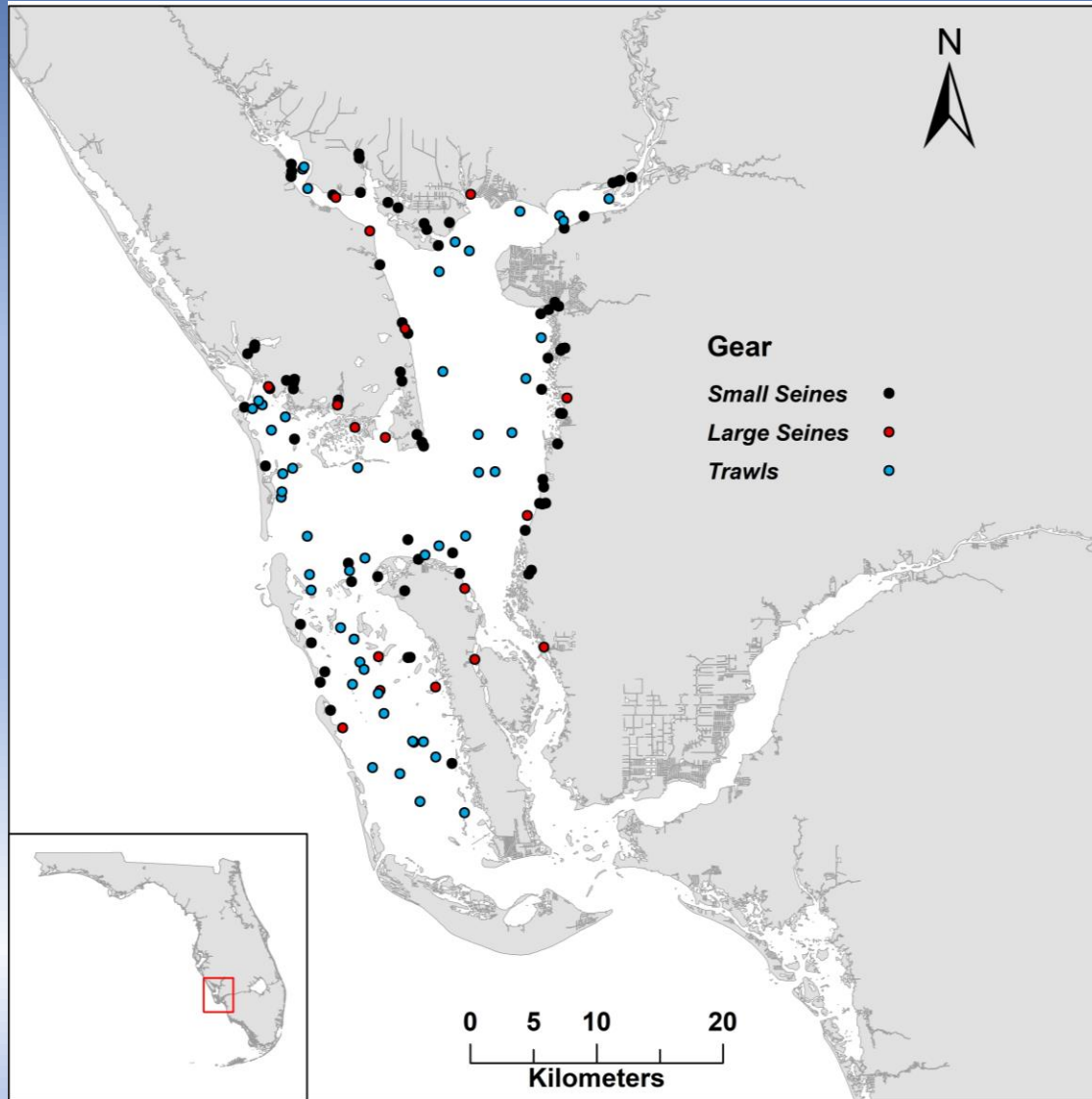
**Inshore**

**Offshore**

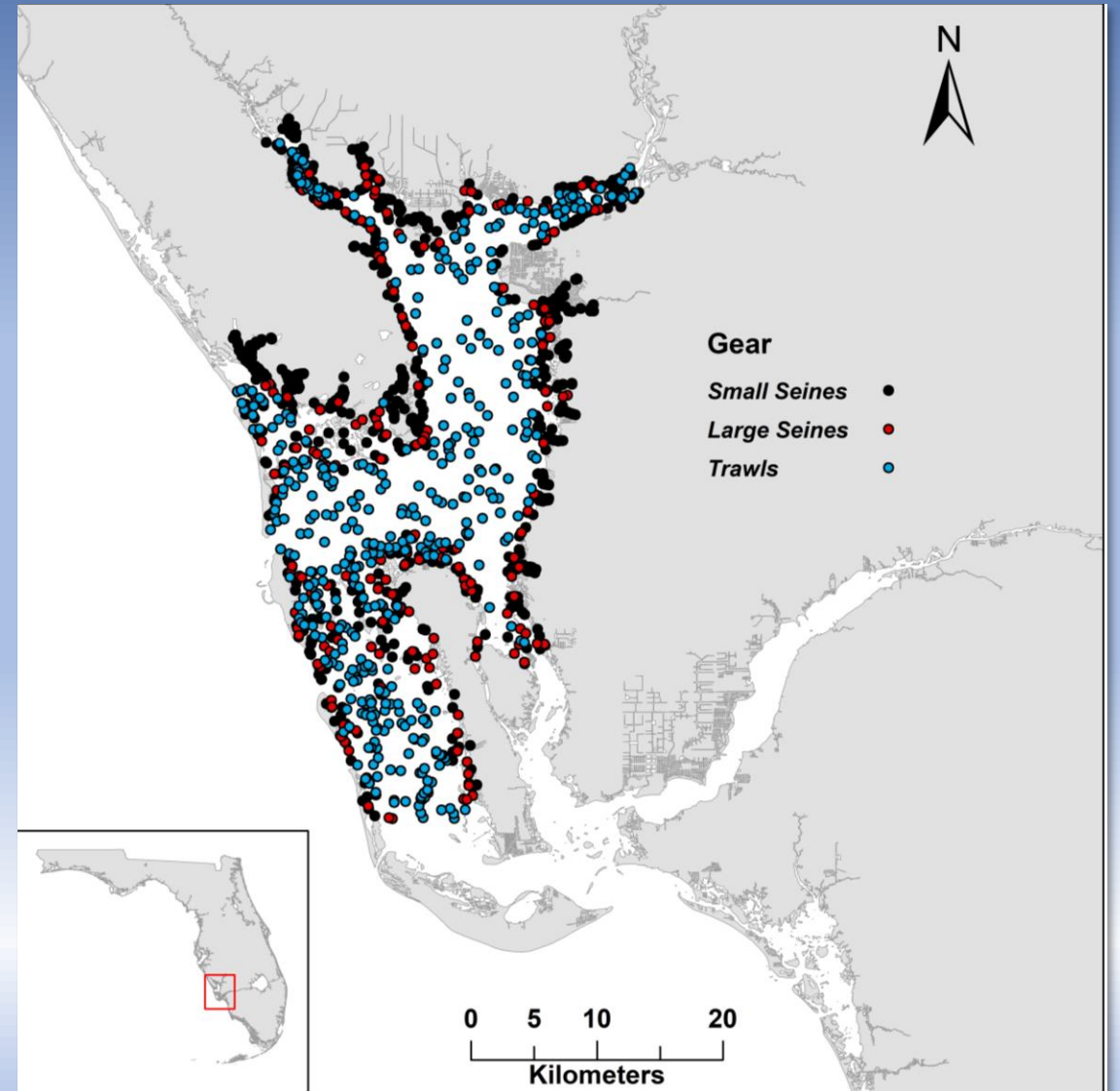




# Sampling Methodology: Effort



Monthly sampling distribution



Cumulative annual effort

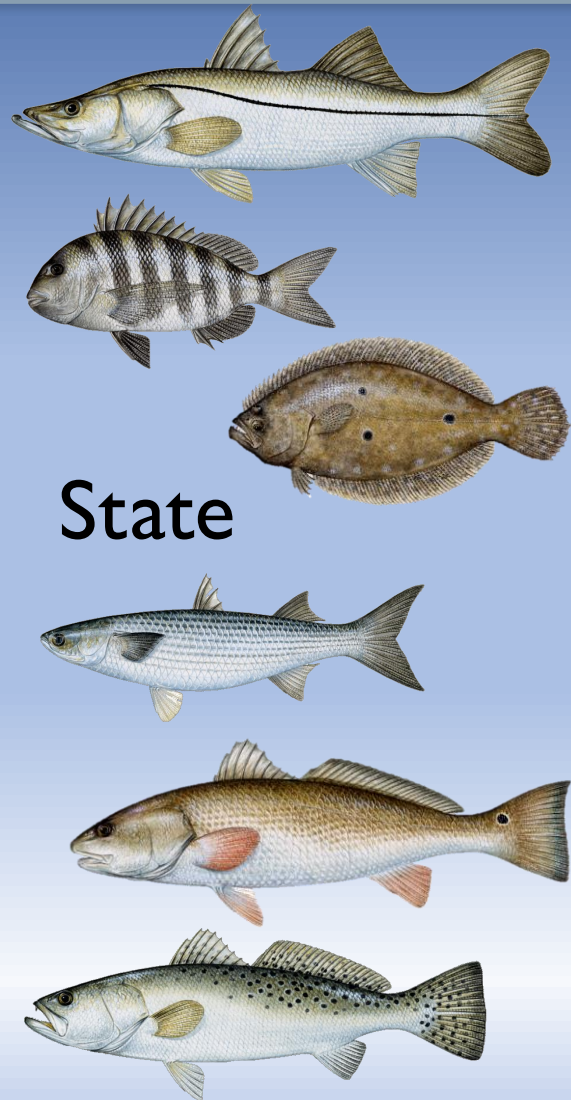
# Sampling Methodology: Data Collection

- Data collected at each sampling site include:
  - Location and temporal information
  - Habitat characteristics (*i.e.*, bottom type, SAV, shore type)
  - Water chemistry (*i.e.*, salinity, temperature, D.O.)
  - Weather (*i.e.*, tide, wind, precipitation)
  - Species specific data
    - Enumerate
    - Measure
    - Collect biological samples

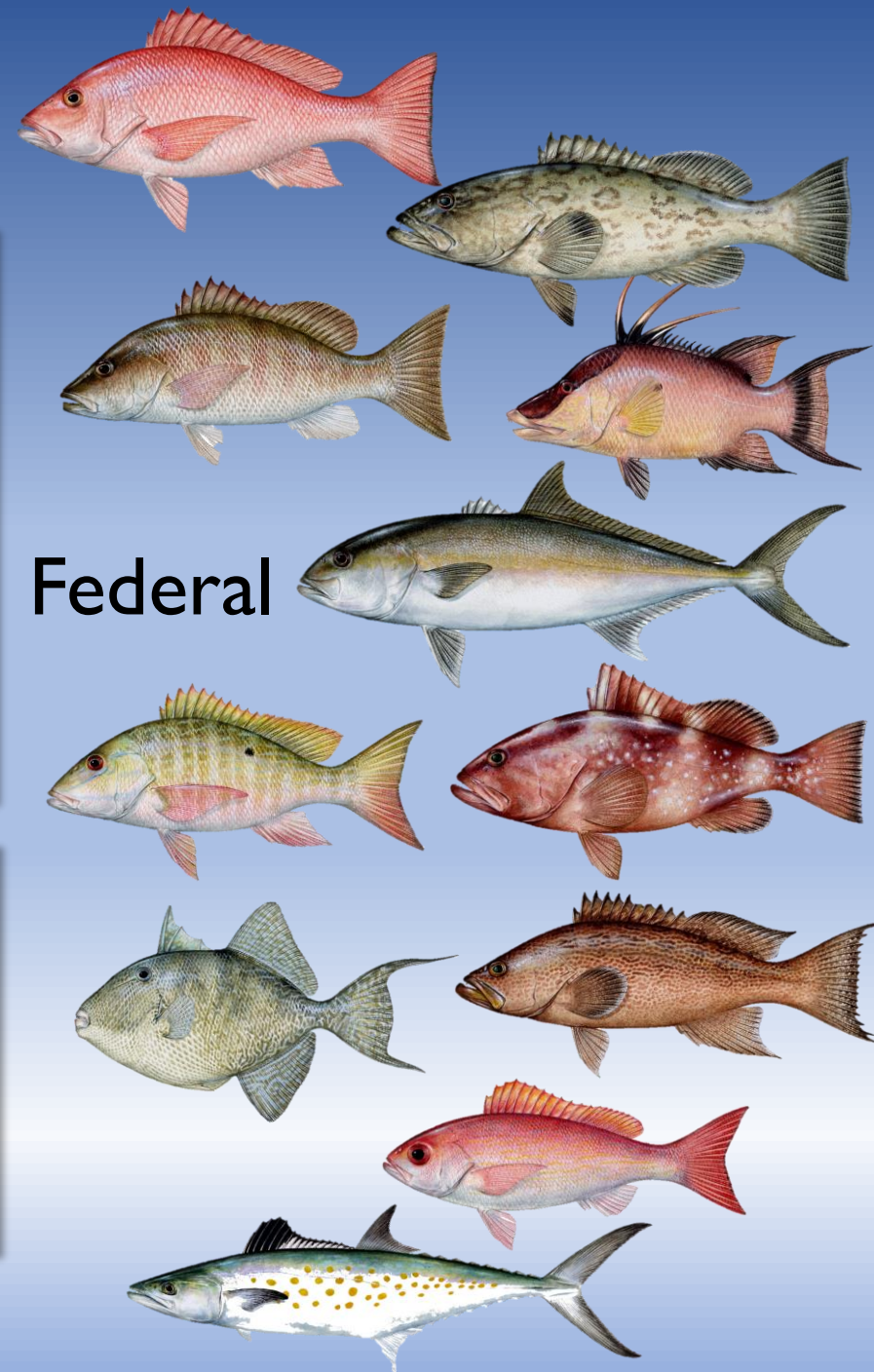
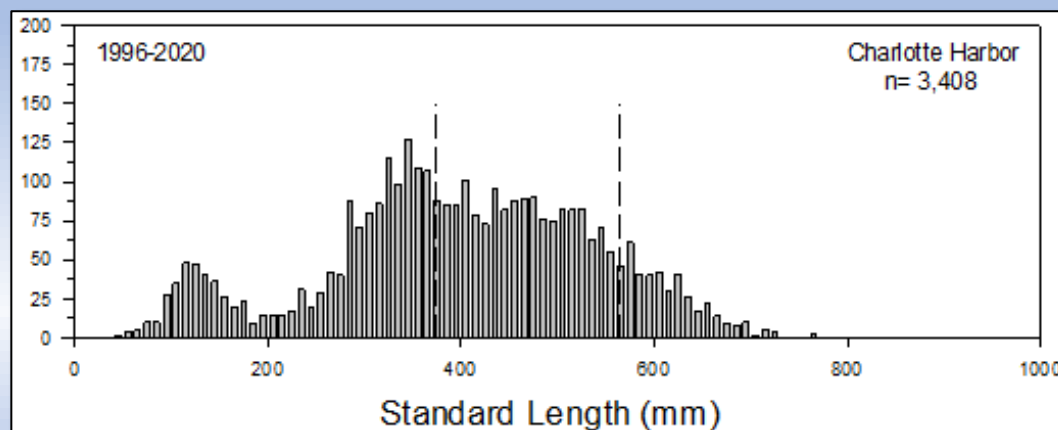
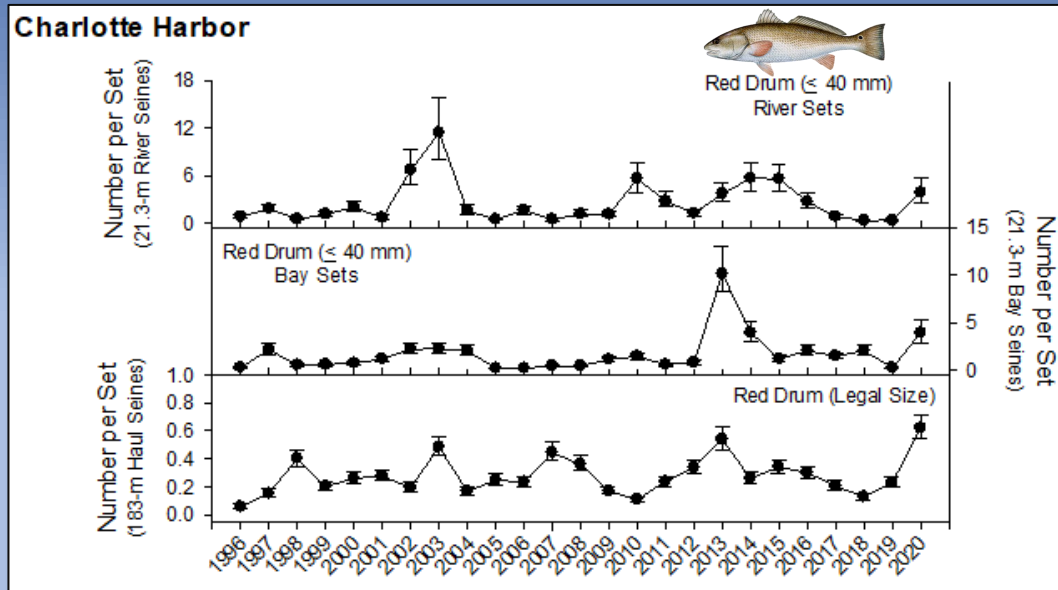




# Data Utility: Inputs to Stock Assessments



State

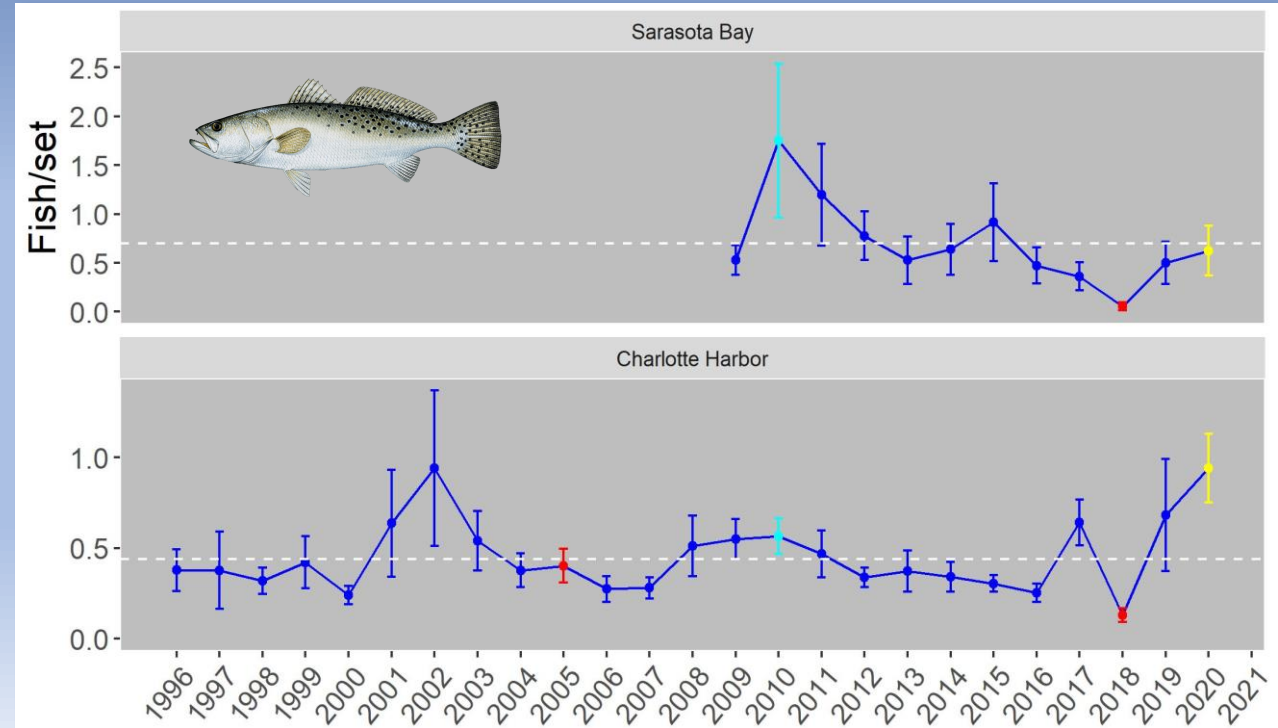


Federal

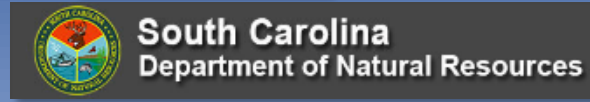


# Data Utility: Varied Applications

- Inputs to stock assessments
- Locate and define essential fish habitat (sport fishes, sawfish)
- Describe life-history parameters
- Assess impacts of restoration projects
- **Assess impacts of environmental disturbances**
  - Red tide
  - Cold weather events
  - Hurricanes...



# Collaborations





# Hurricane Impacts: Preliminary Analyses

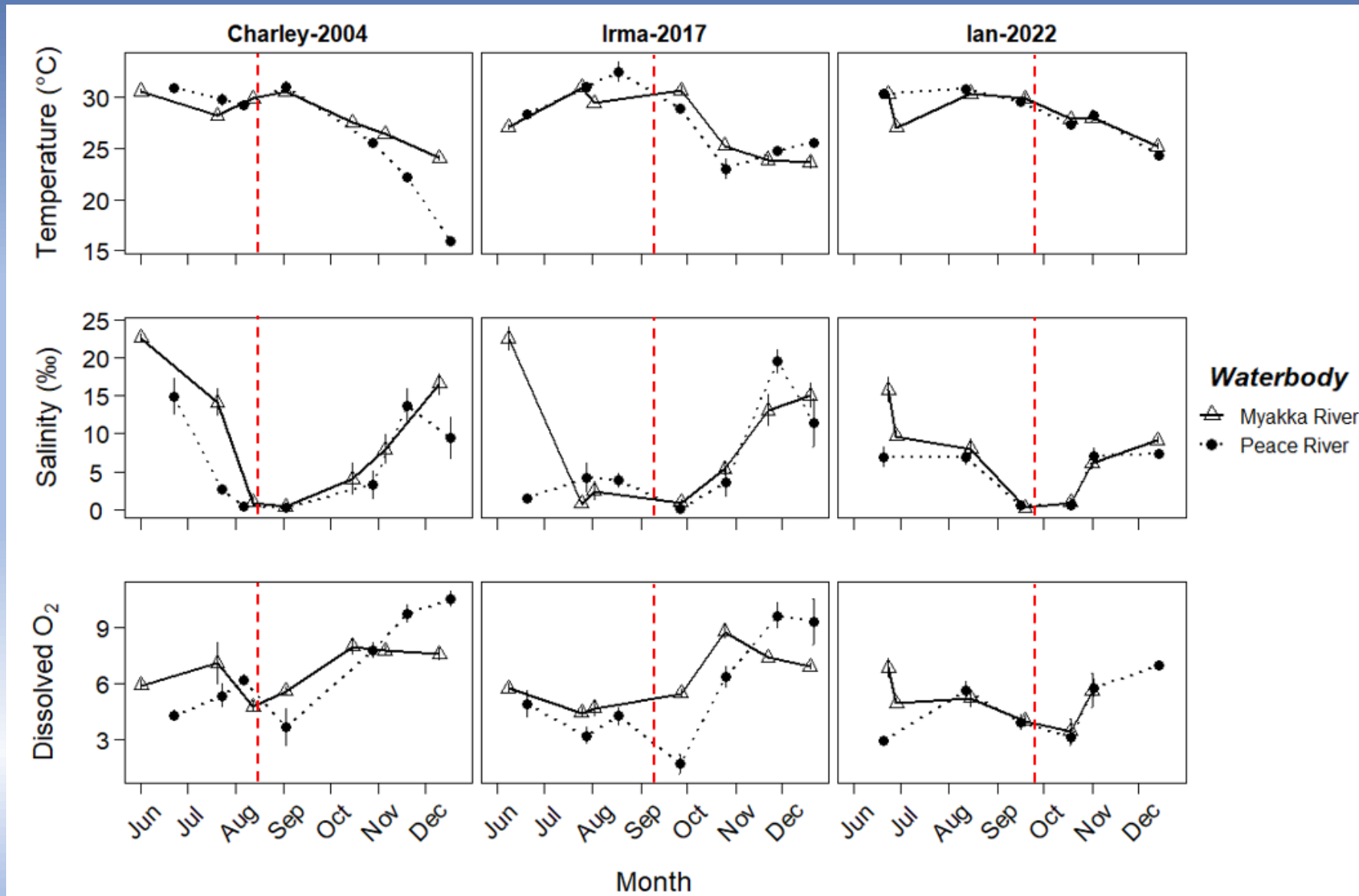
**Research Question:** Do altered hydrologic conditions caused by hurricanes impact fish communities in affected river systems and, if so, how?

- **Study Area:** Peace and Myakka Rivers
- **Data:** FIM SRS 21-m shoreline seine (small bodied fish)
- **Study Periods:** June - November
  - 2004 (hurricane Charley)
  - 2017 (hurricane Irma)
  - 2022 (hurricane Ian)\*
- **Community structure differences:** Multi-Dimensional Scaling (MDS) – Bray-Curtis similarity index
- **Taxa responsible for observed differences:** Similarity Percentage (SIMPER)

\*Data are not yet finalized

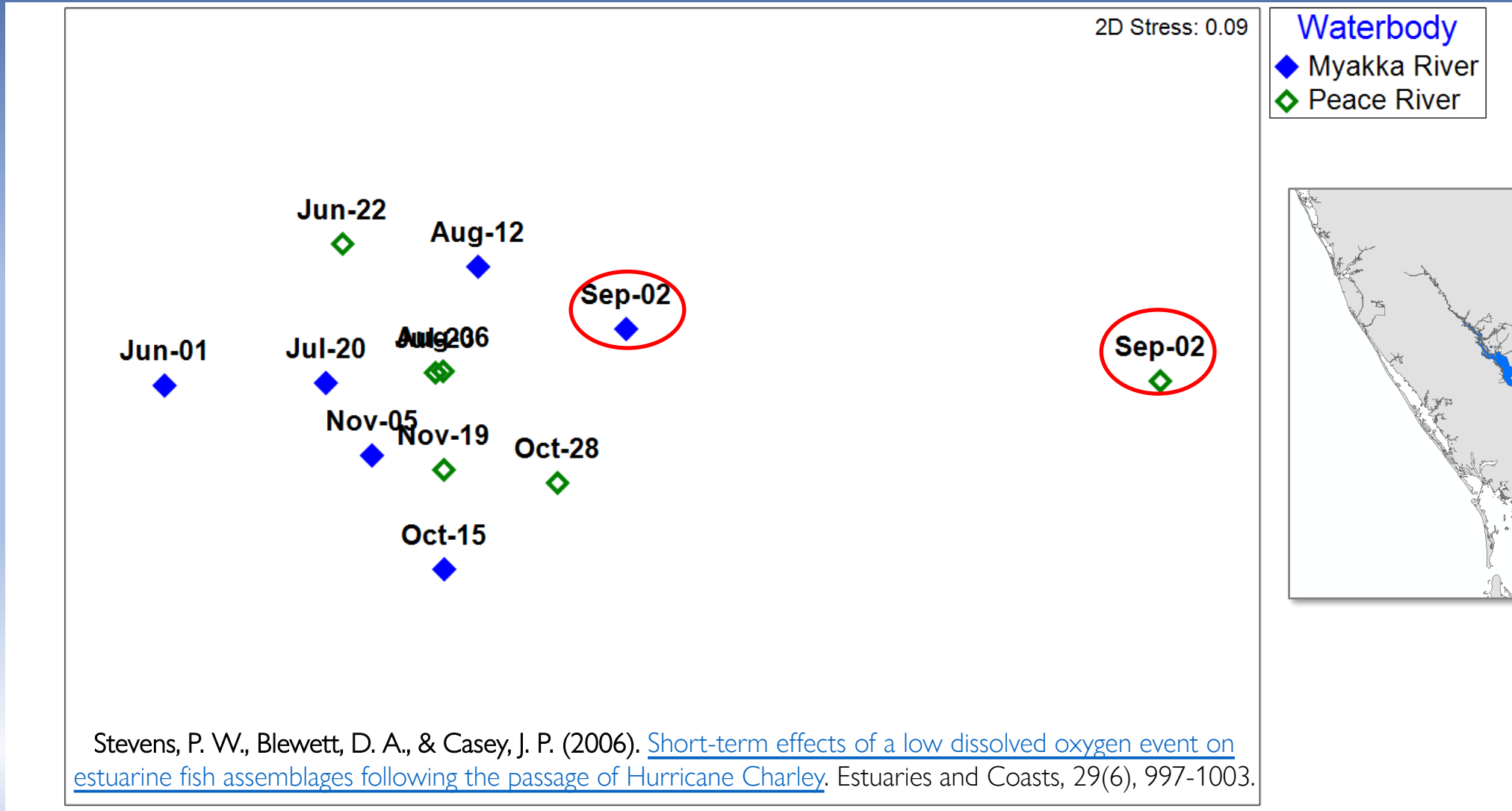


# Hurricane Impacts: Water Quality





# Community Structure: Hurricane Charley (2004) – 21-m seine

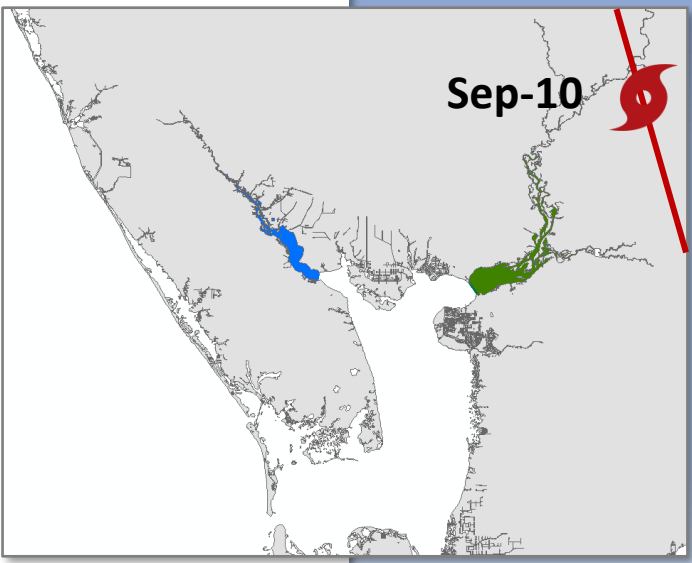
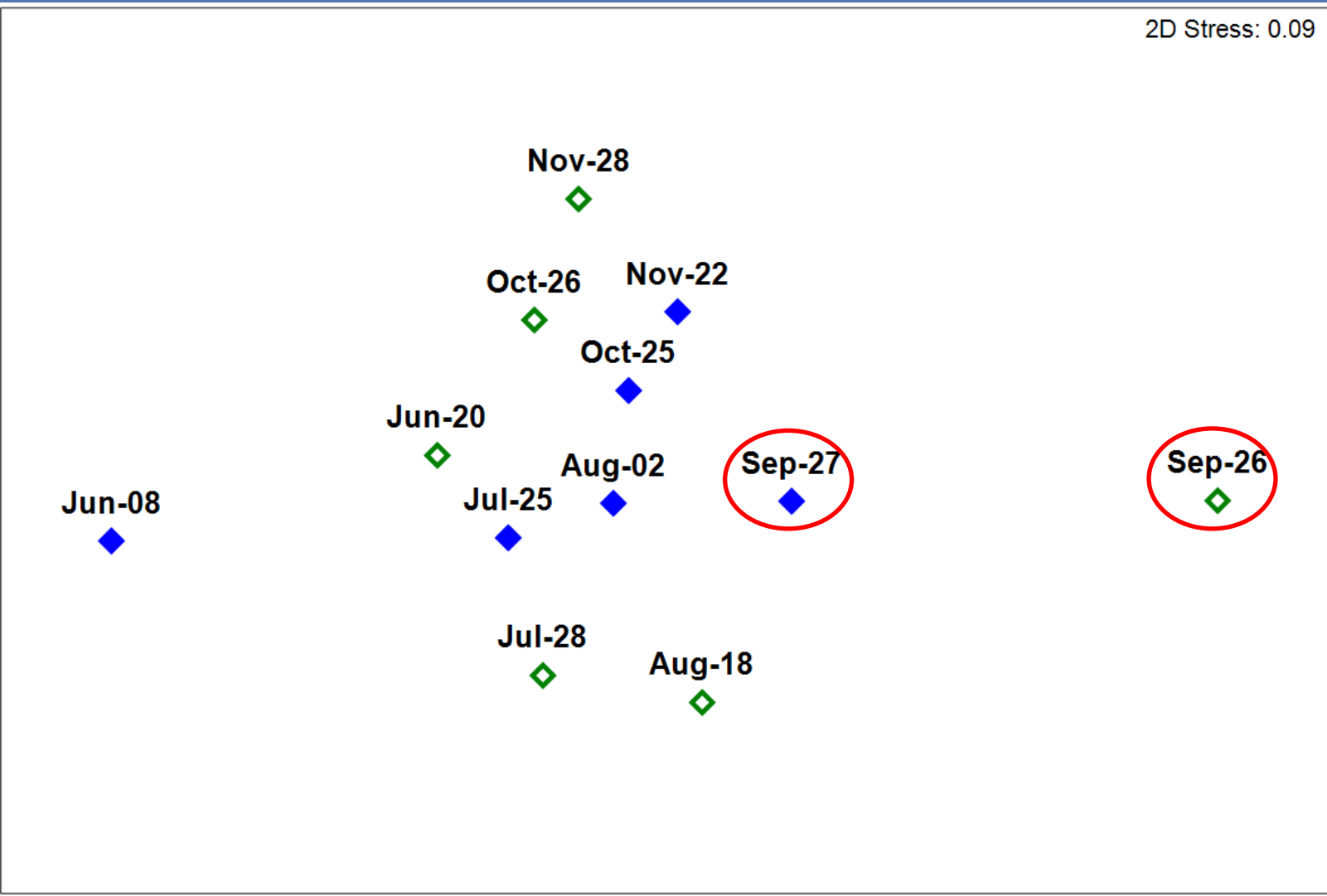


○ = First sampling event post-storm

# Community Structure: Hurricane Irma (2017) – 21-m seine

2D Stress: 0.09

**Waterbody**  
◆ Myakka River  
◇ Peace River



○ = First sampling event post-storm

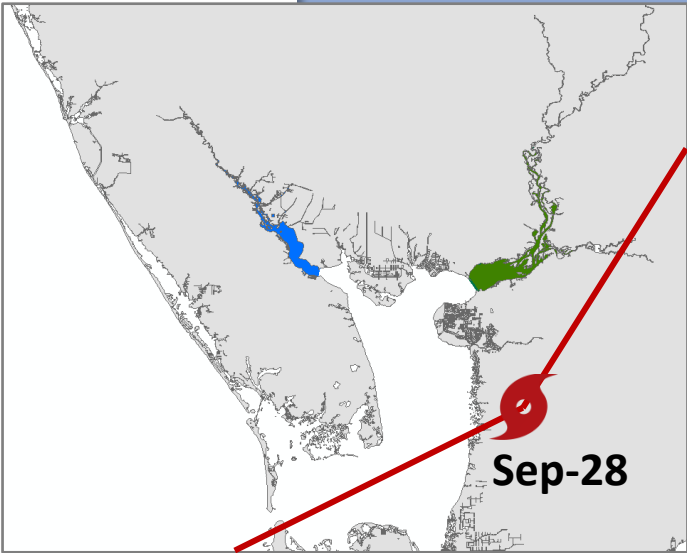
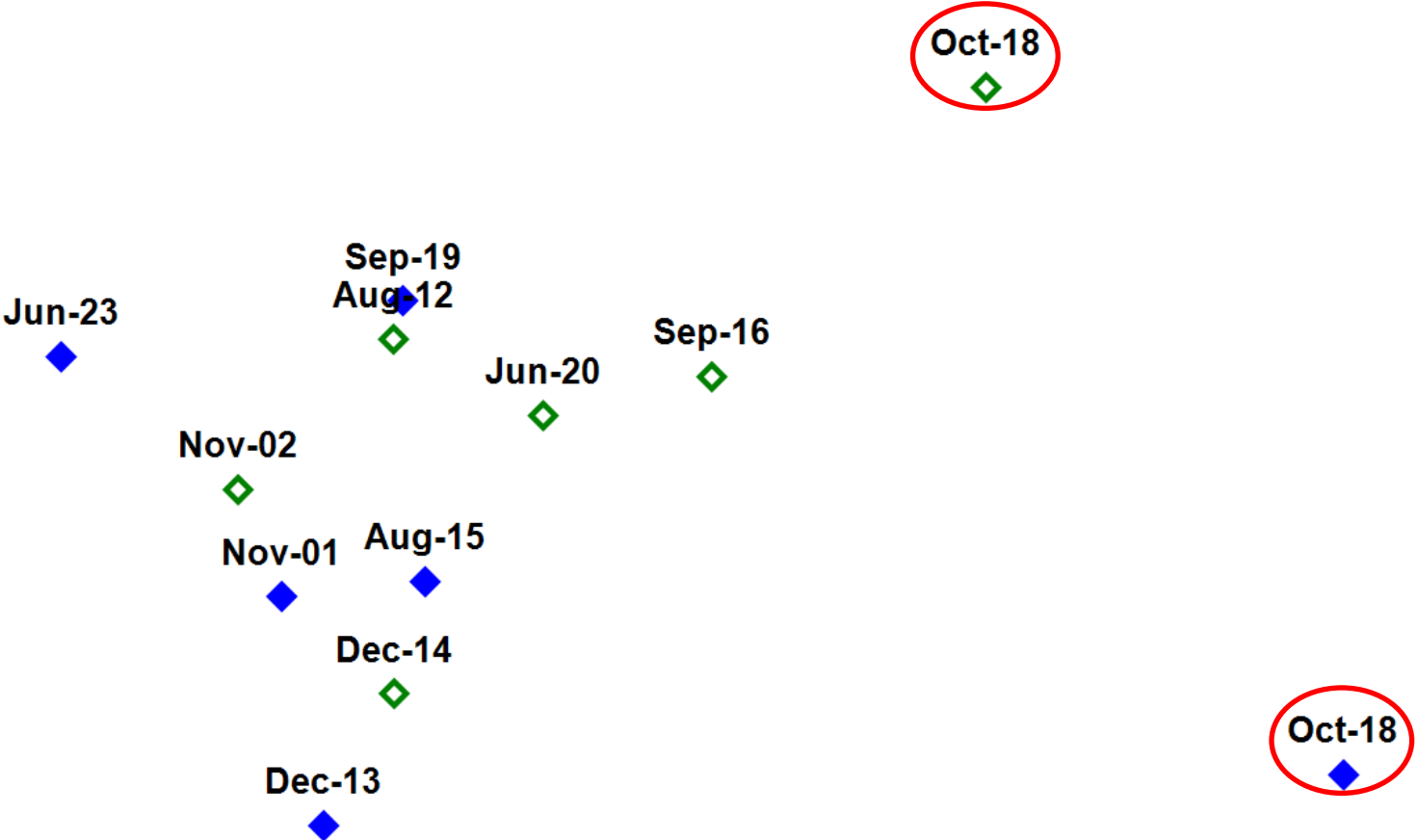


# Community Structure: Hurricane Ian (2022) – 21-m seine

2D Stress: 0.11

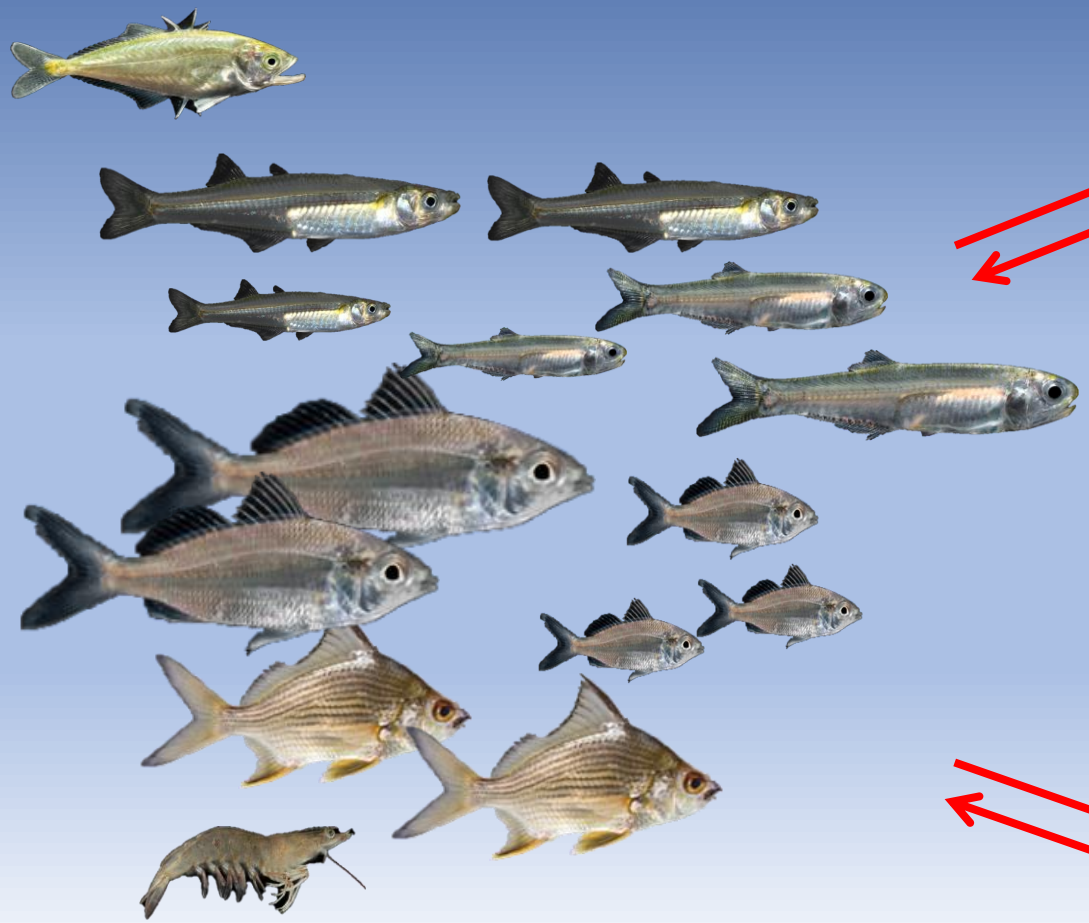
### Waterbody

- ◆ Myakka River
- ◇ Peace River



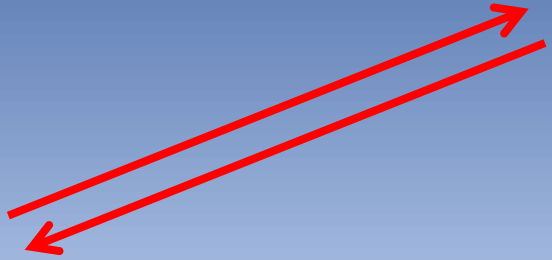
○ = First sampling event post-storm

# Hurricane Impacts: Key Contributors



Typical Myakka and Peace River Shoreline Community

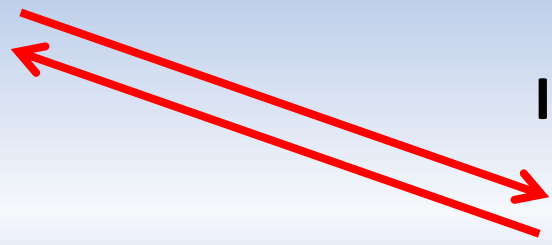
**Charley**



**Irma**



**Ian**





# Hurricane Impacts: Conclusions

- Water Quality
  - Lower DO observed in the **Peace River** following hurricane **Charlie and Irma**
  - Salinity remained depressed much longer for both the **Peace and Myakka** following hurricane **Ian**
- Fish Community Shifts
  - Observed in the **Peace River only** following hurricane **Charlie and Irma**
  - Observed in **both the Peace and Myakka Rivers** following hurricane **Ian**
  - Appeared to **stabilize in <1 month** for **both systems** following **all 3 storm events**
- Further Research
  - Larger scale annual shifts?
  - Species specific impacts?
  - Localized impacts (i.e., coastal creeks)

# FWC Hurricane Response

- The FWC Law Enforcement Division acts in a first responder capacity
- Upland and marine debris cleanup and derelict vessel removal  
[lanDebrisCleanup.com](http://lanDebrisCleanup.com)
- The FWC works to reopen managed public lands as soon as possible to allow for safe use
- The FWC works with individuals who may have lost hunting or fishing access due to hurricane impacts
- FWC staff respond to managed wildlife impacted by storms (e.g., marine mammal strandings)
- FWC staff provide verbal assistance over the phone to the public who may see impacted wildlife in need of rehabilitation (e.g., raccoons, songbirds)
- Resume the mission



**FWC Reporter App**

888-404-FWCC (888-404-3922)



FWC Fish Kill Hotline: 1-800-636-0511  
**2022 Reports**

