2020-21 Red Tide Assessment

Brendan Turley[1], Mandy Karnauskas[2], Chris Kelble[3]

[1]University of Miami, [2]NOAA/SEFSC, [3]NOAA/AOML

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Acknowledgments

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Takeaways

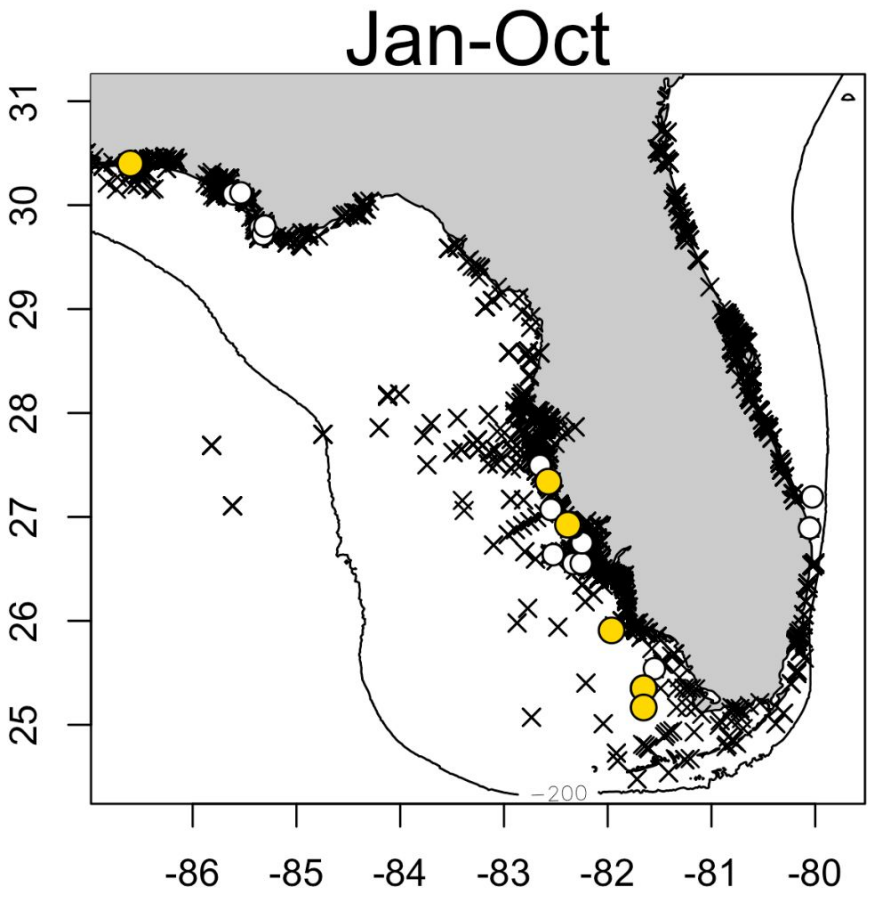
1. This environmental assessment is consistent with Chagaris et al. ecosystem model results reported at September SSC and December ETC

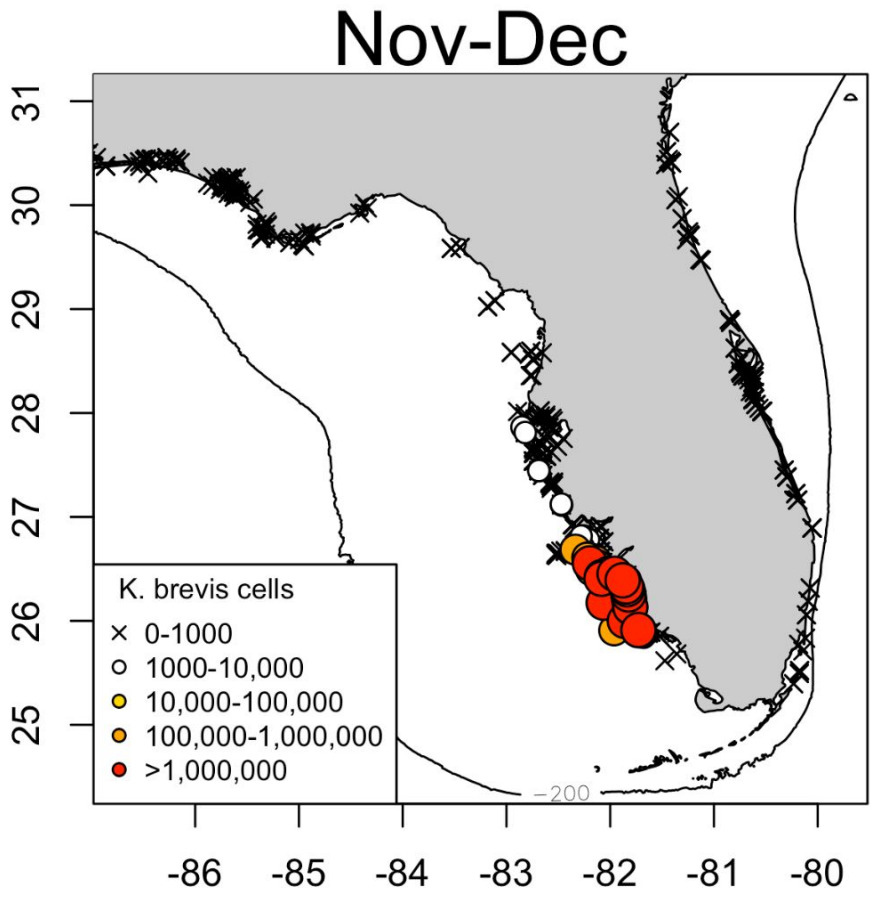
2. Limited subsurface data from mid-shelf shows no anomalous conditions

3. Localized hypoxia off SWFL persisted Aug-Oct; consistent with previous HAB-hypoxia events

What do we know?

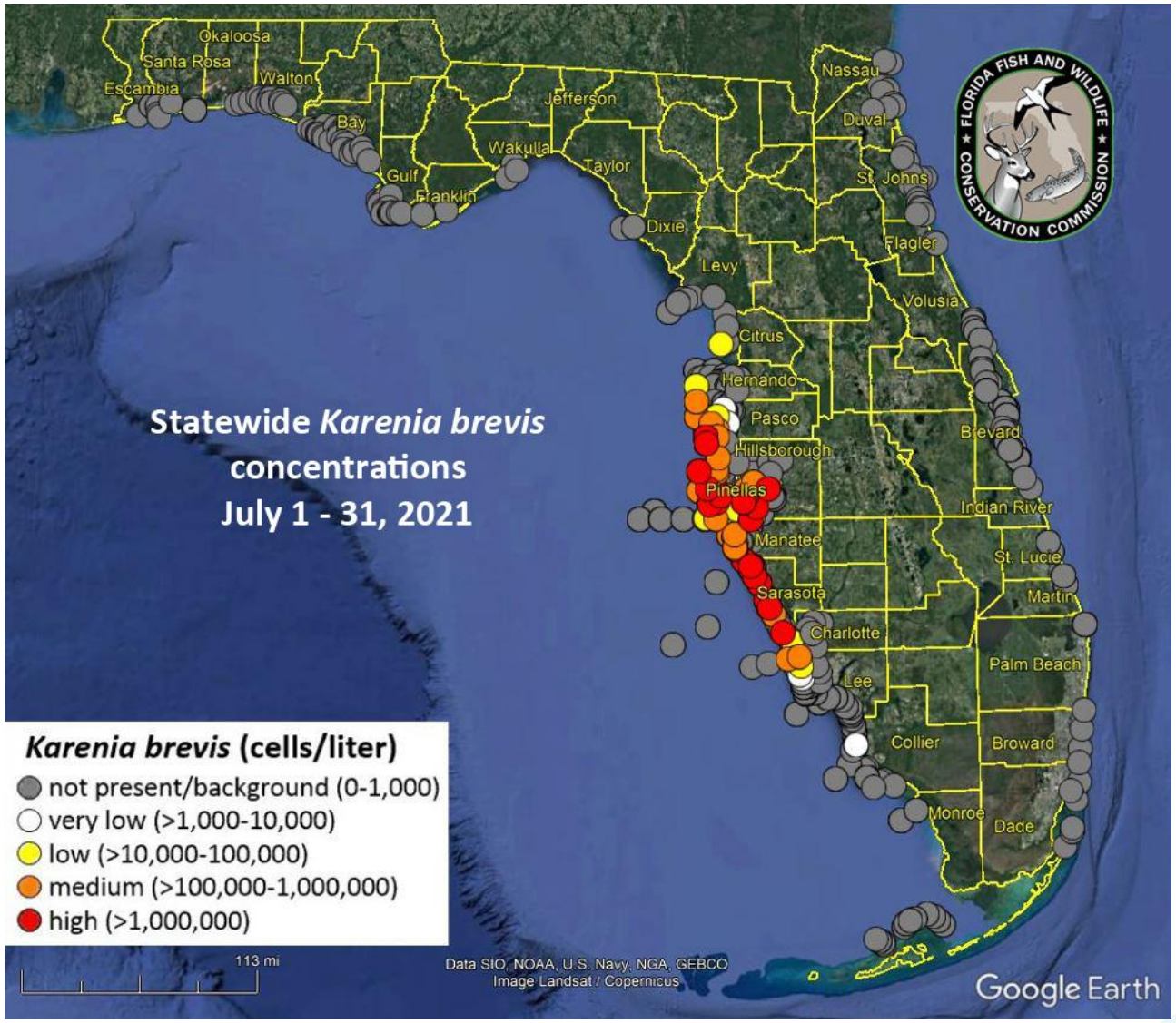
- 2020 was a quiet year
- Blooms began late Nov
- Persisted over winter into 2021
- Blooms usually die down early winter with passage of cold fronts





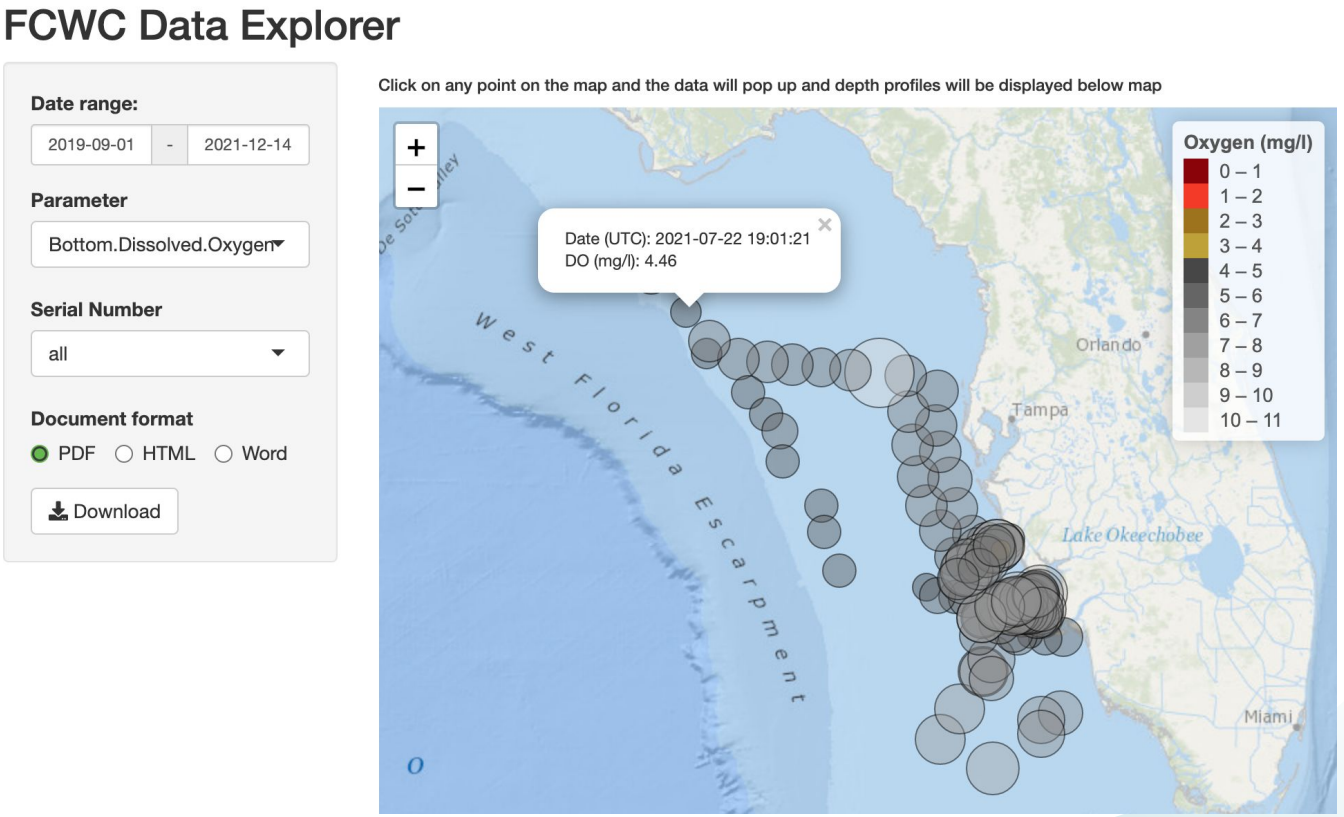
What do we know?

- By March-April: blooms creeped up to Tampa Bay
- Late March-early April: Piney Point discharges into TB
    - Diatom blooms
- June: high concentrations of *Karenia brevis* in TB
- Up to this point, there was a lack of mid-shelf, subsurface data



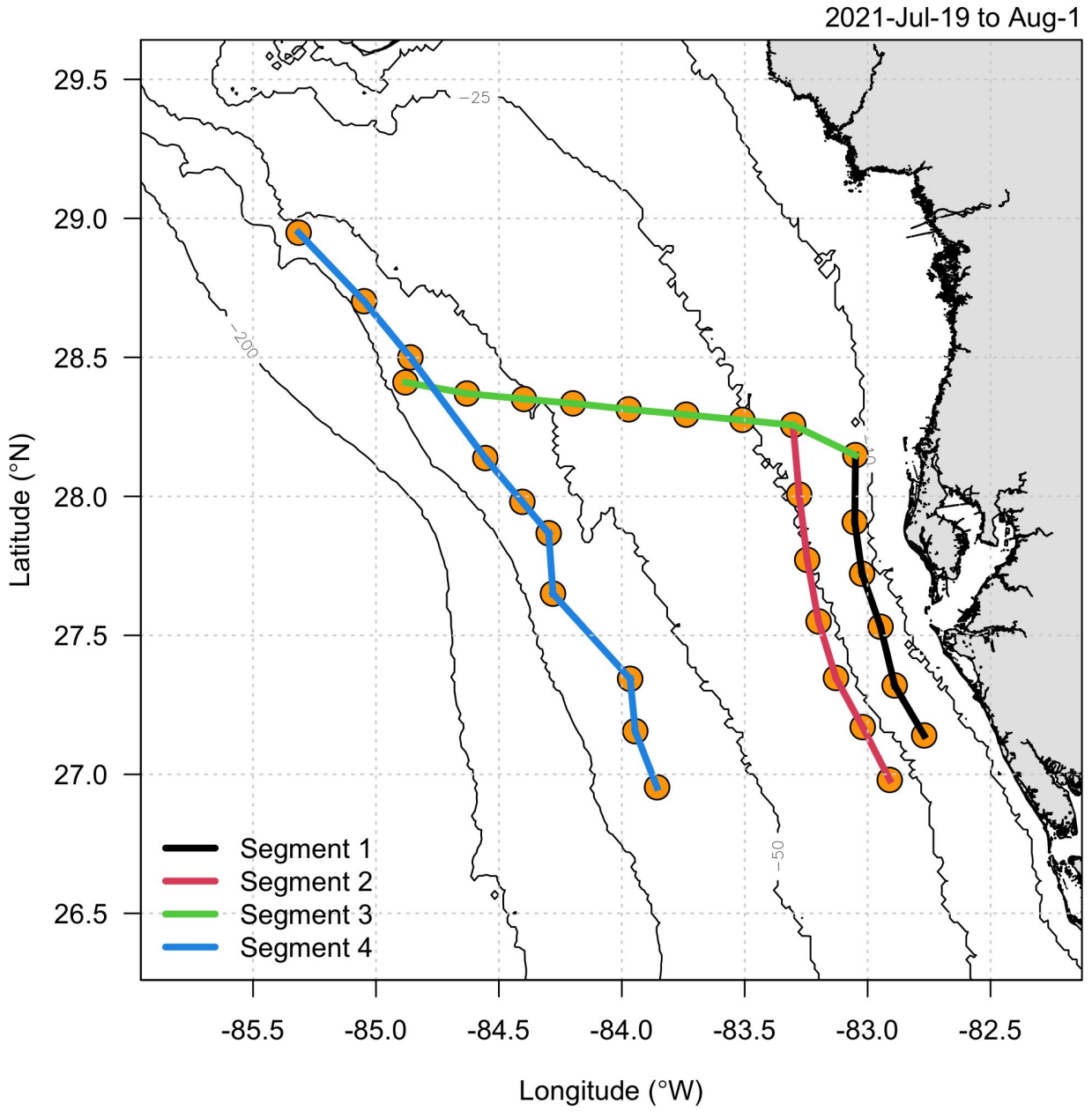
FCWC-NOAA collaborative research

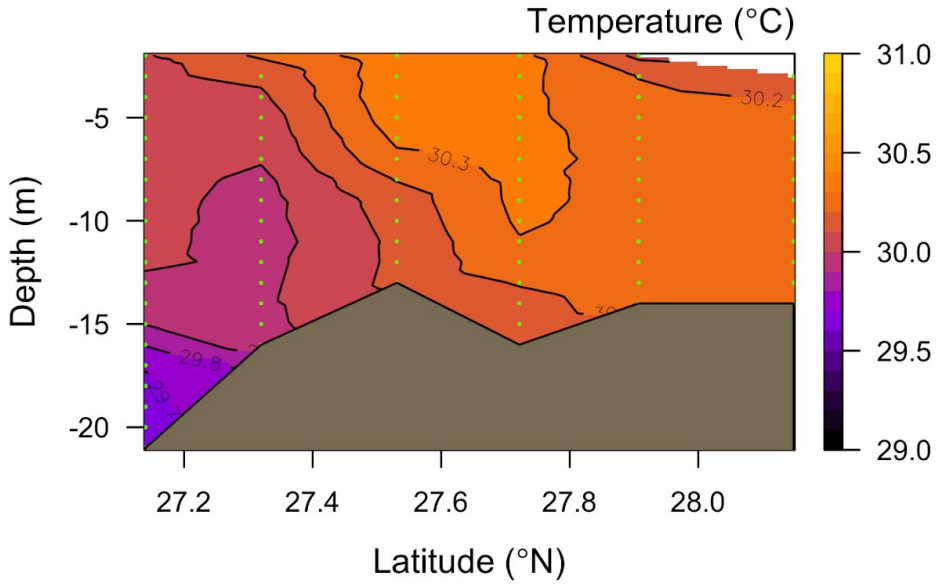
- Florida Commercial Watermen's Conservation (FCWC) non-profit based in Matlacha, FL
  - https://floridawatermen.org/
- Volunteer based water quality sampling
- Started late 2018 in response to bad red tide
- 5 AquaTroll handheld units
- Online dashboard:
  - https://oceandata.shinyapps.io/fcwc-data-explorer/

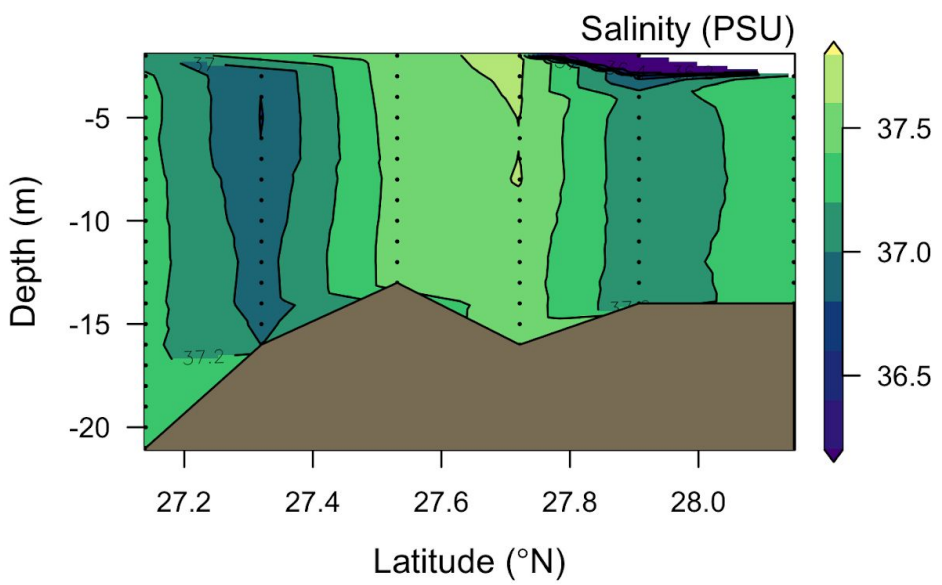


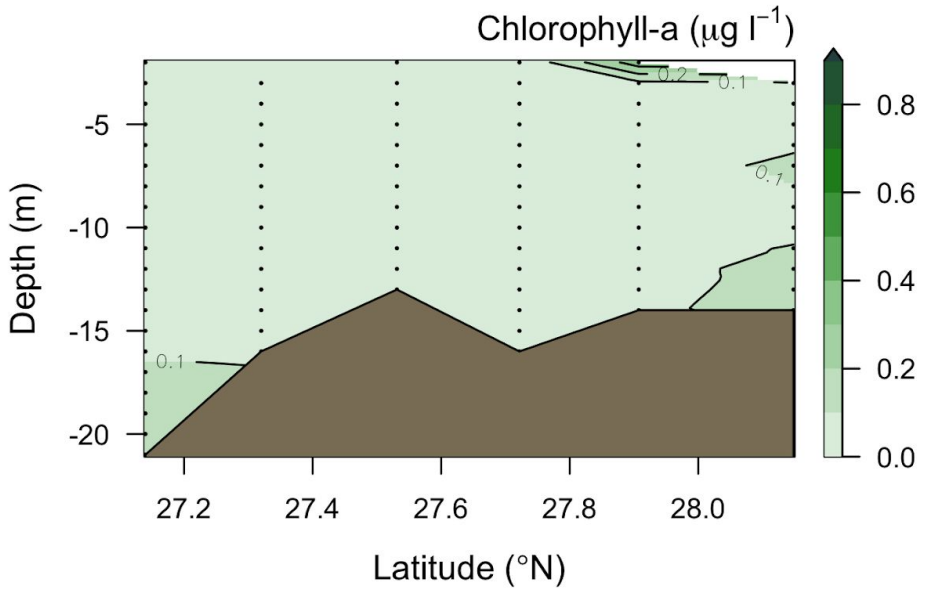
July-Aug FCWC Monitoring

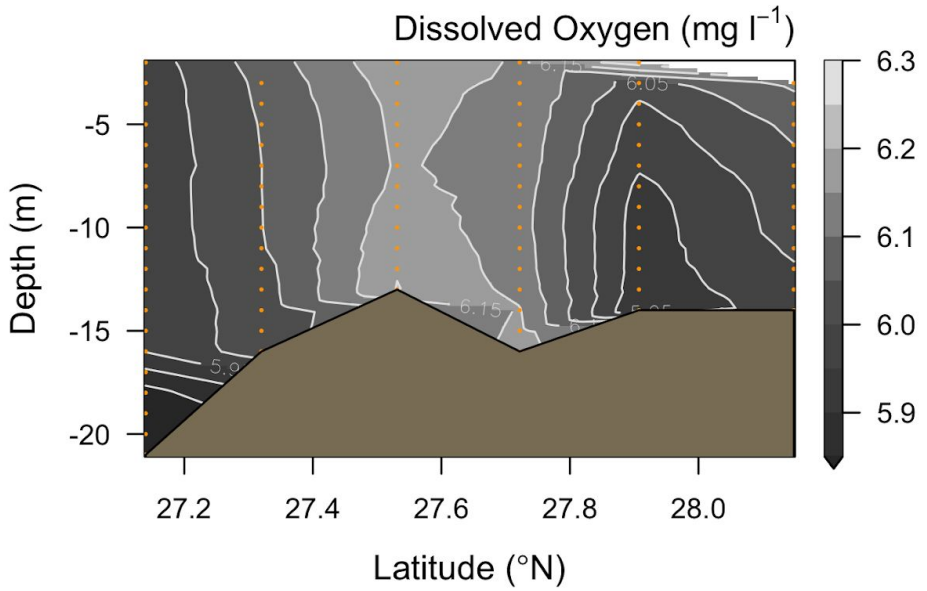
- **At the time, no water quality information in areas of grouper habitat**
- Commercial bottom longliner conducted water quality sampling
    - No fish kills
    - Blue water off St. Pete
    - Water offshore looked fine
- Fishing good but south 27.8 Latitude gag stopped biting
- Local ecological knowledge (LEK) has been valuable to understand effects of previous red tides







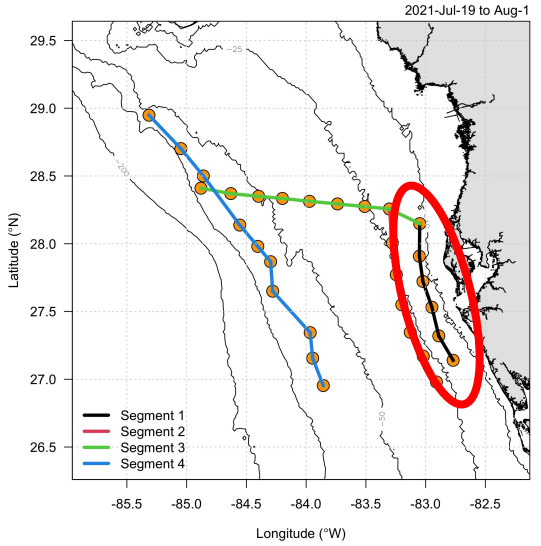




FCWC sampling

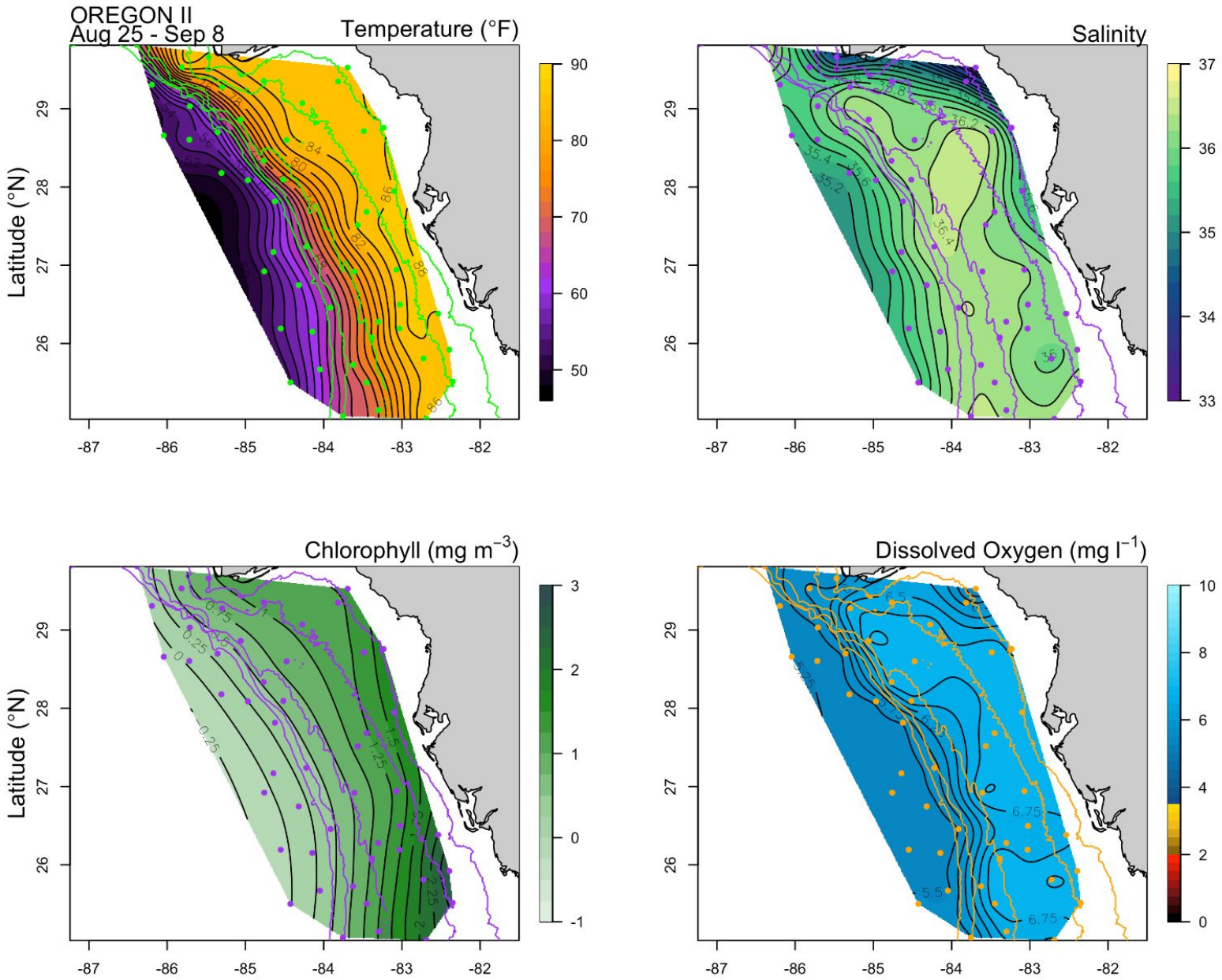
Segment 1
July 19

No unusual conditions in other segments



NOAA-NMFS surveys

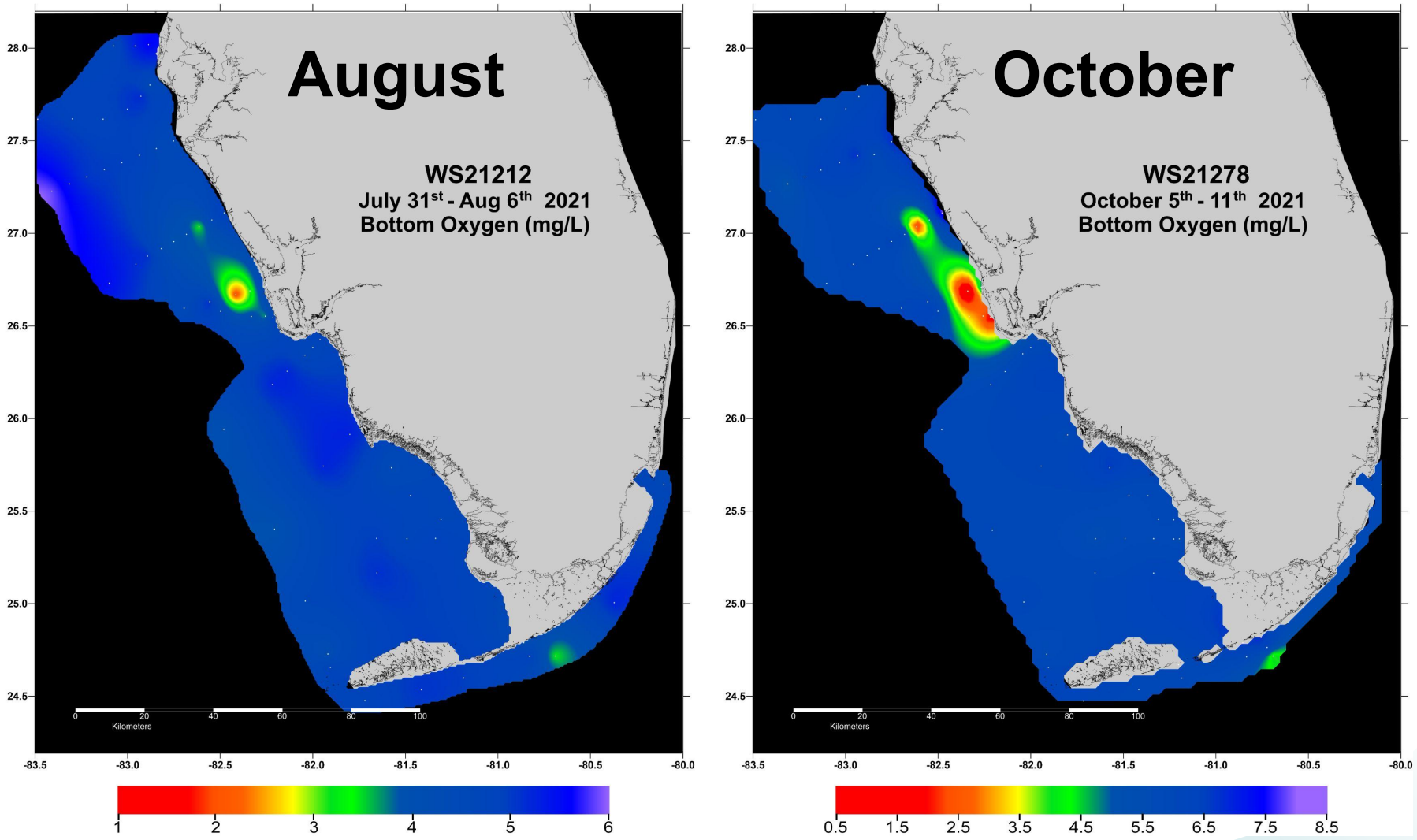
- Aug 25 - Sep 8
- No unusual conditions
- Bottom temperature, salinity, chlorophyll, and dissolved oxygen
- Survey coverage does not extend nearshore
  - blindspot FCWC monitoring partially fills



Quarterly NOAA-AOML cruises

R/V Walton Smith found **hypoxia** (low oxygen) ~2 months apart in same area

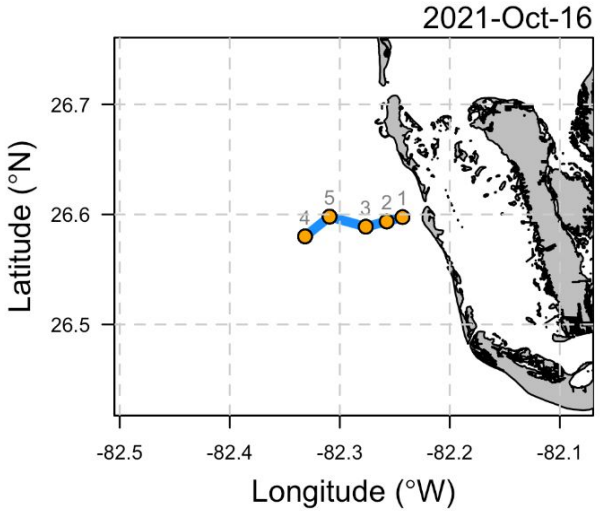
Stone crab season opens Oct 15; cruise timed to provide early warning

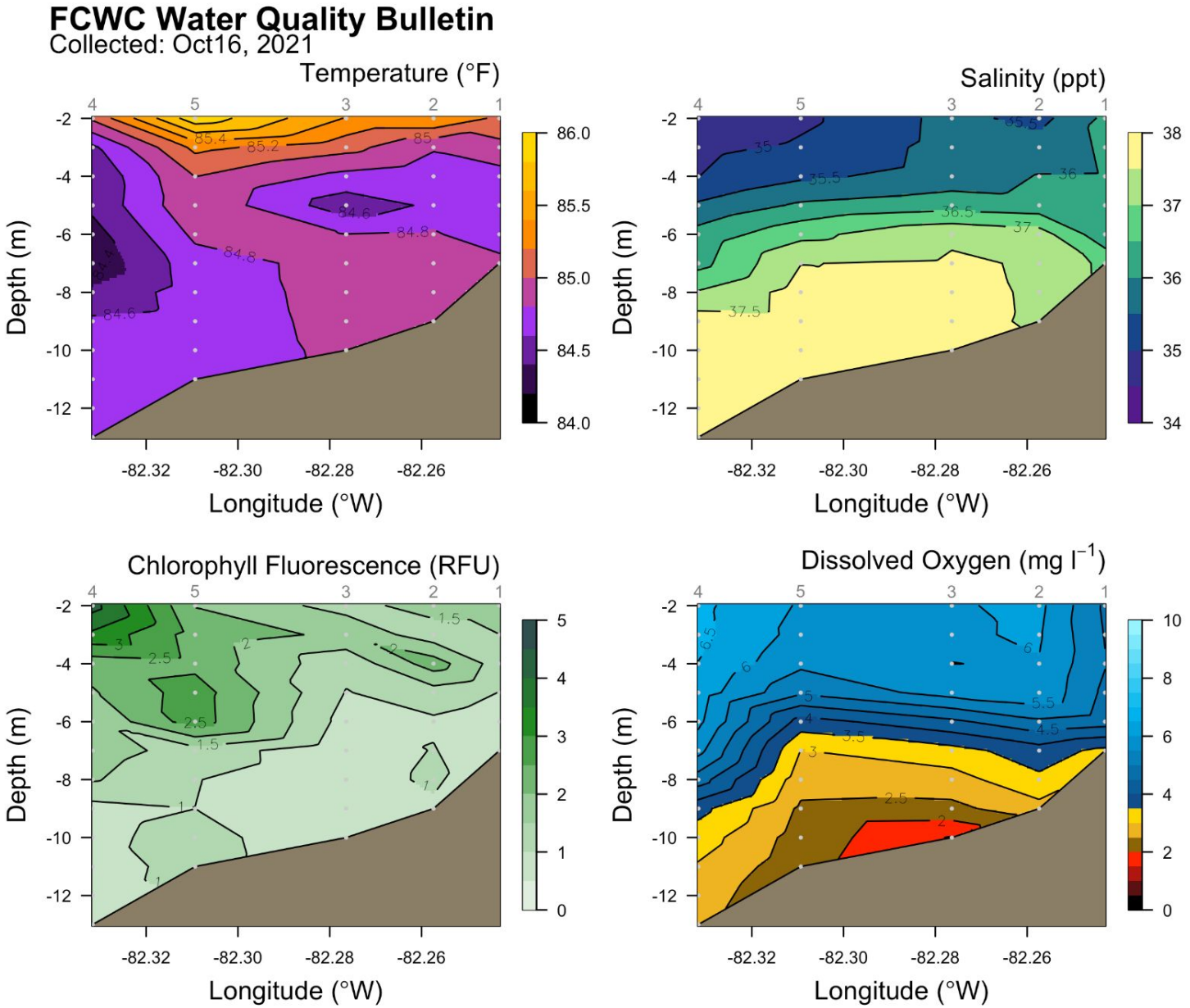


October FCWC monitoring

Hypoxia same location as Walton Smith

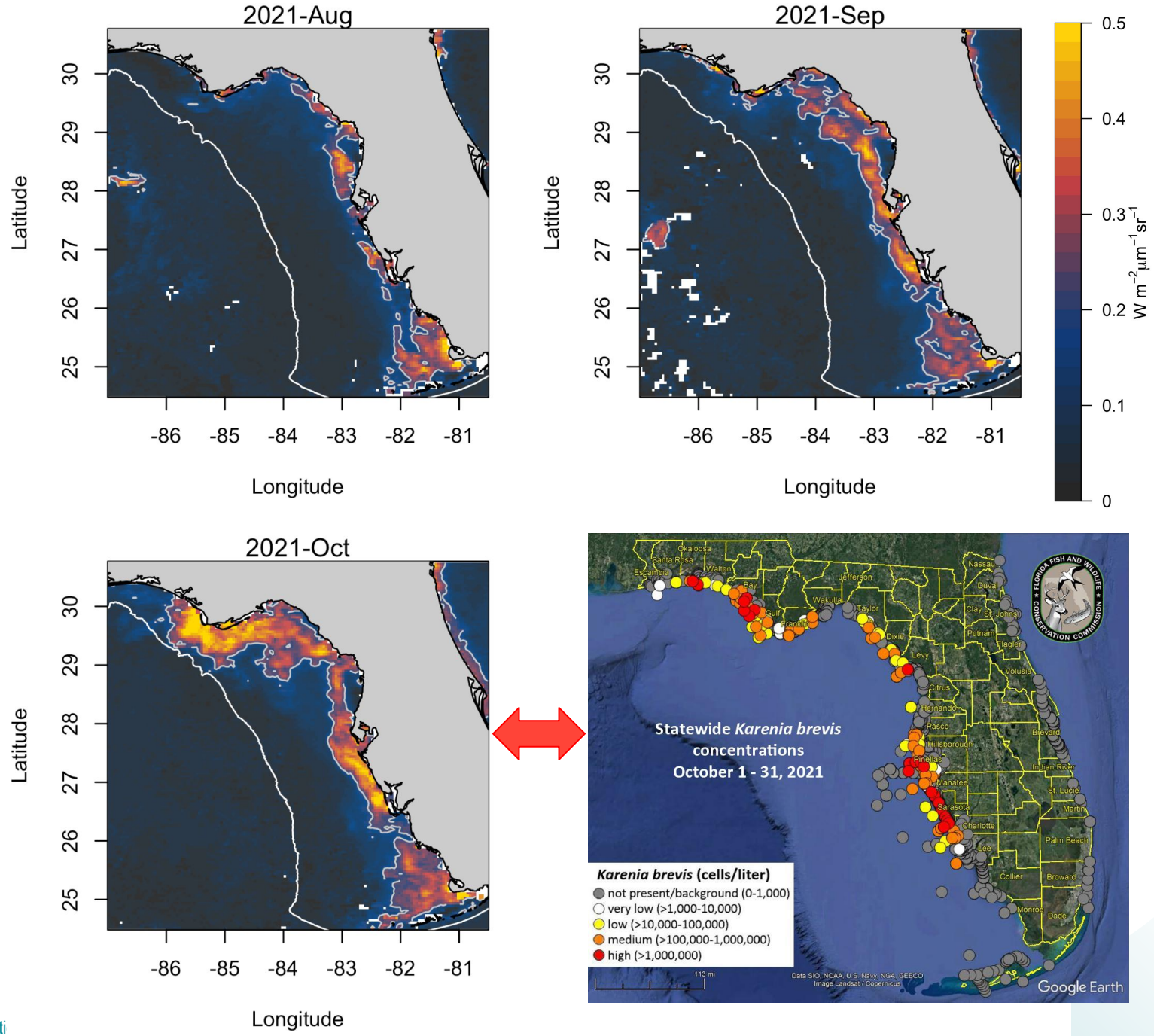
Information provided to industry - limited distribution





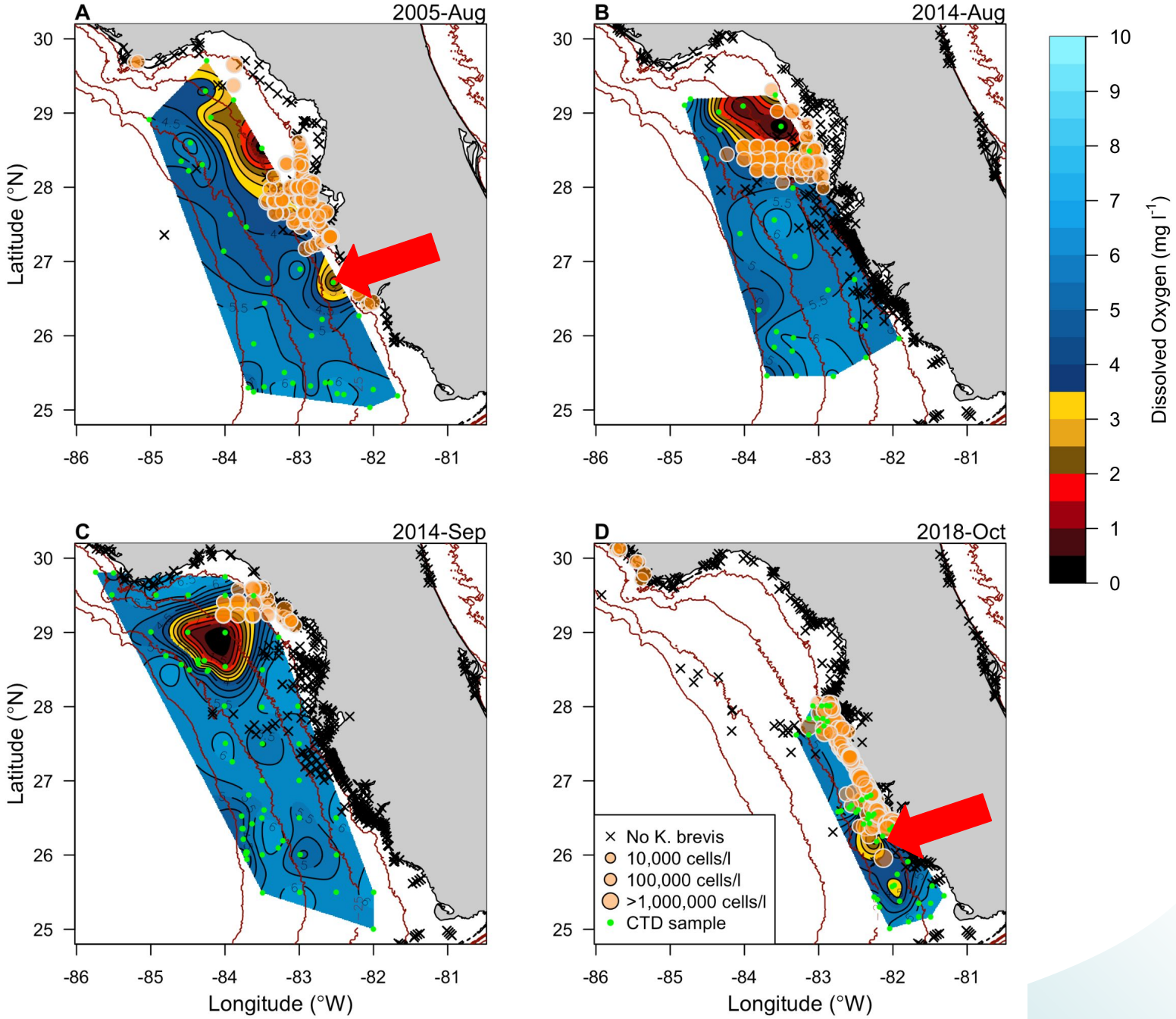
What do we know?

- Sept-Oct: Spread to panhandle
  - MODIS satellite nFLH modified method used by Vilas et al. 2021
- Oct: Hypoxia observed SWFL
  - LEK reports of dead bottom and no stone crabs SWFL
- Dec: no bloom activity
  - SWFL hypoxia gone



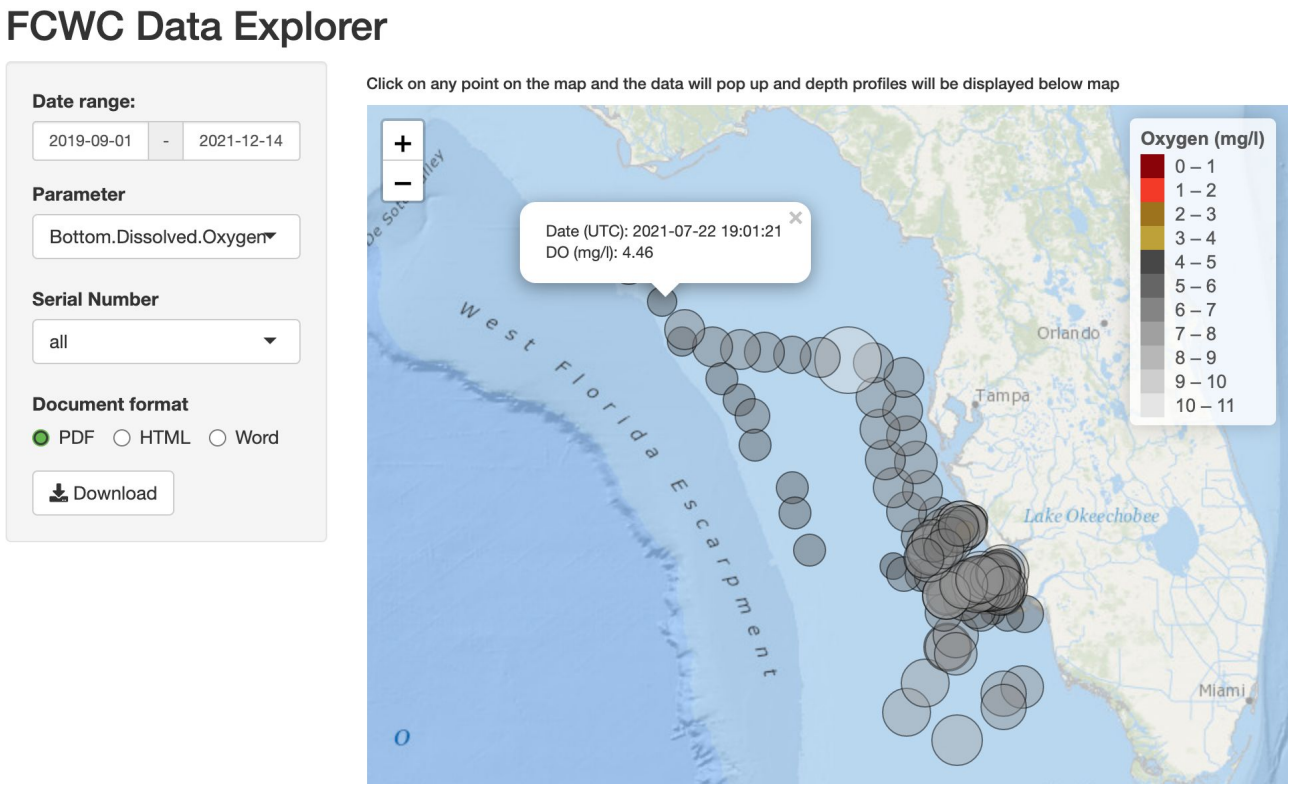
Red tide – hypoxia connection

- Hypoxia forms when red tides persist over summer
  - 2005, 2014, 2018, 2021
- Areas of concern
  - Big Bend
  - Sanibel Island



Future Plans

- Expand fishermen water quality monitoring
- Update dashboard with conditions
- Integrate additional NOAA and FWC environmental data
- Improved red tide tracking with satellites
- Seasonal hypoxia forecast
- Refine communication strategy to inform fishermen (beyond the grapevine)



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