

The Influence of Environmental Factors in Shrimp Black Gill: Management and Fishery Adaptation Options?

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GCRC Georgia Coastal Colloquium '22

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PhD Student – Megan Tomamichel



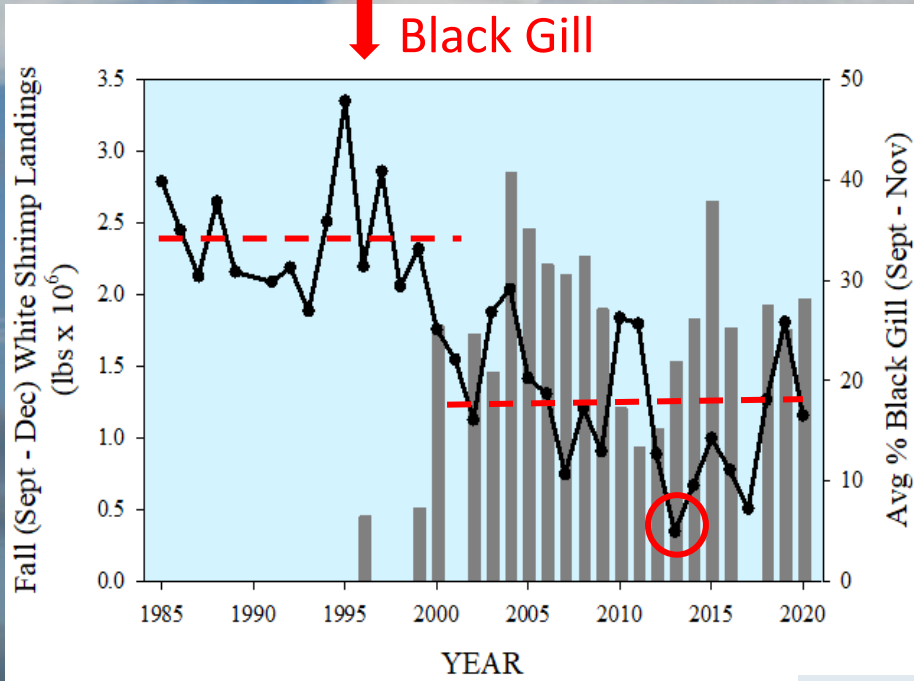
NOAA
FISHERIES



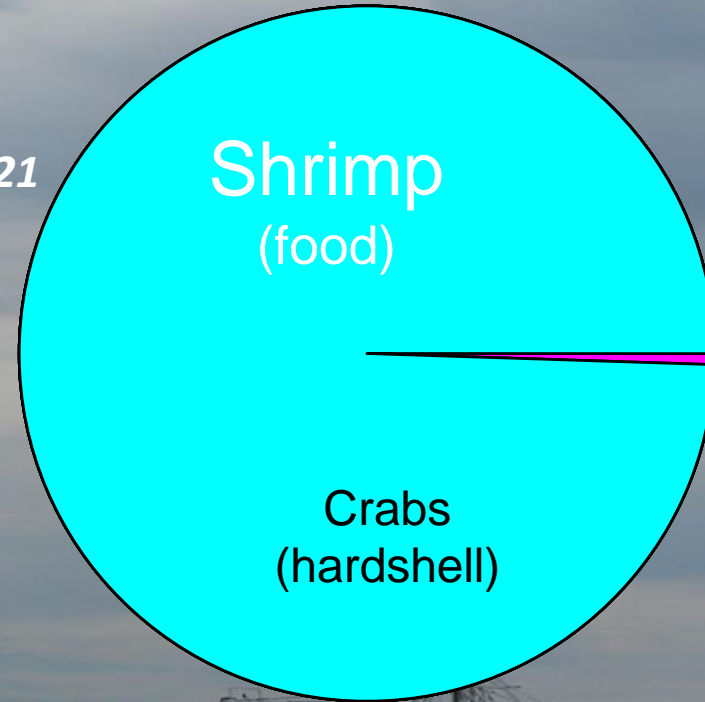
2022 – The Last Annual Stakeholder Cruise
December 15, 2022
frischer@uga.edu or fluech@uga.edu



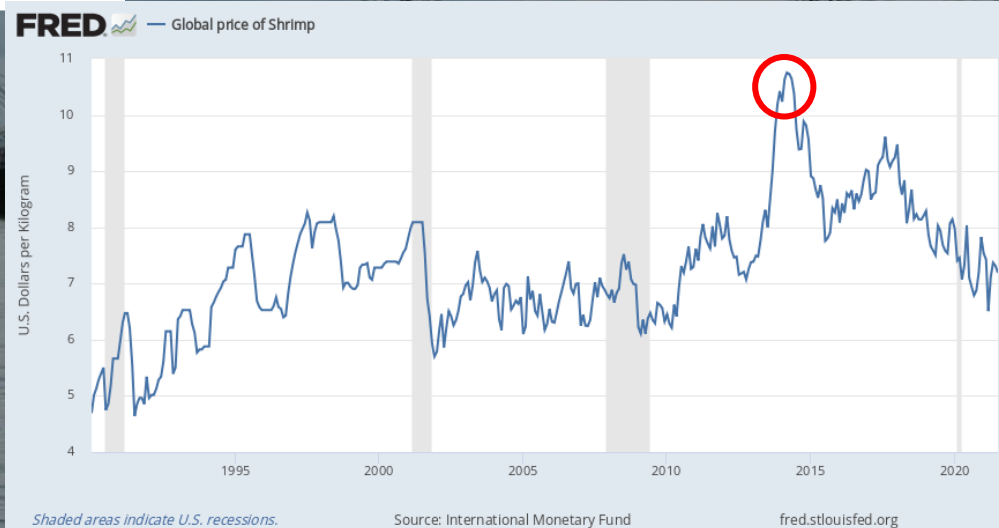
Georgia's Fisheries & Black Gill



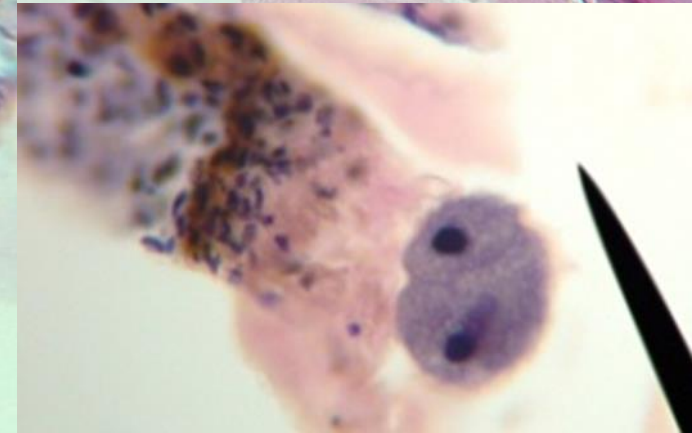
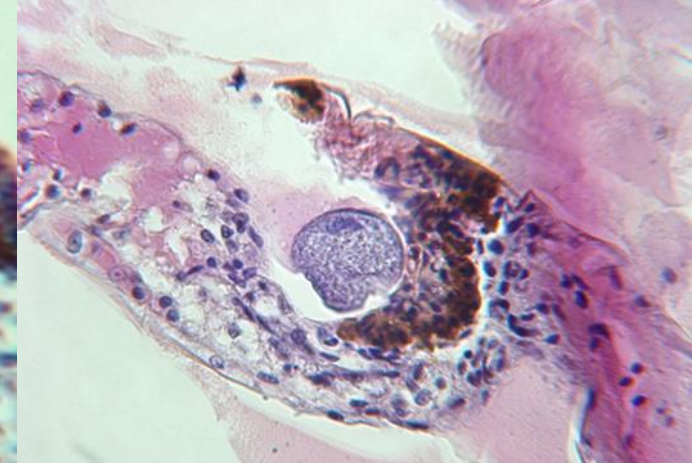
Economic value 2021
\$23,598,968



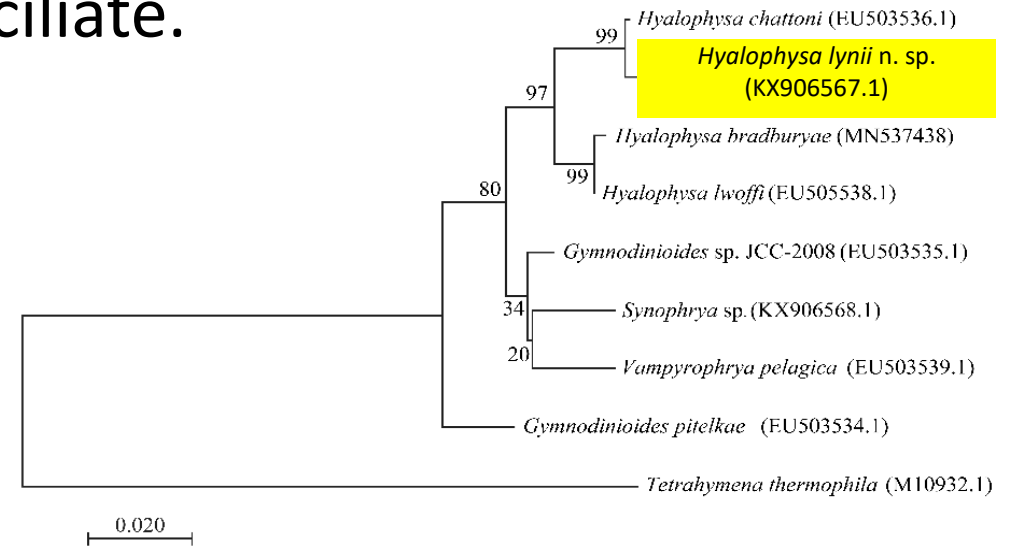
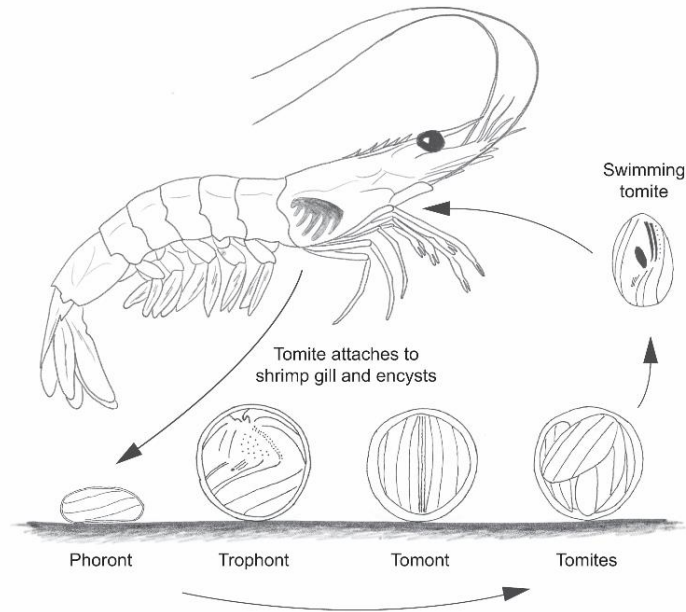
Misc.
Invertebrates
Finfish
Soft shell crabs
Oysters



Black Gill is the Shrimp's Immune Response to an Offending Invader or Toxin



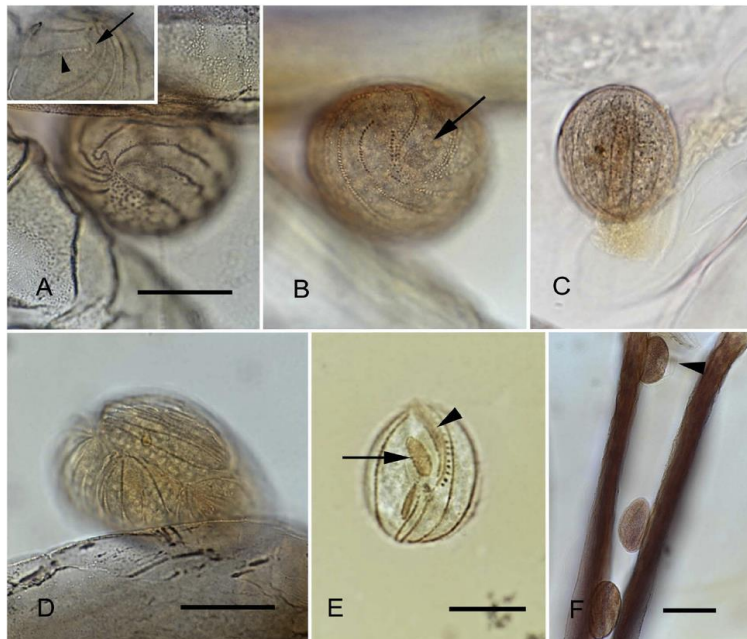
Meet *Hyalophysa lynni* n. sp. A newly described Apostome ciliate.



- Unique life history
- Apostome morphology
- Unique genetic phylogeny
- Pathogenic

Registered new species (ZooBank)

urn:lsid:zoobank.org:pub:AC98F13D-2E16-445D-A027-E7E0A6203BCB. *Hyalophysa lynni* n. sp.: urn:lsid:zoobank.org:act:E9A34F17-6742-4AE9-8363-7289C02FAFF7



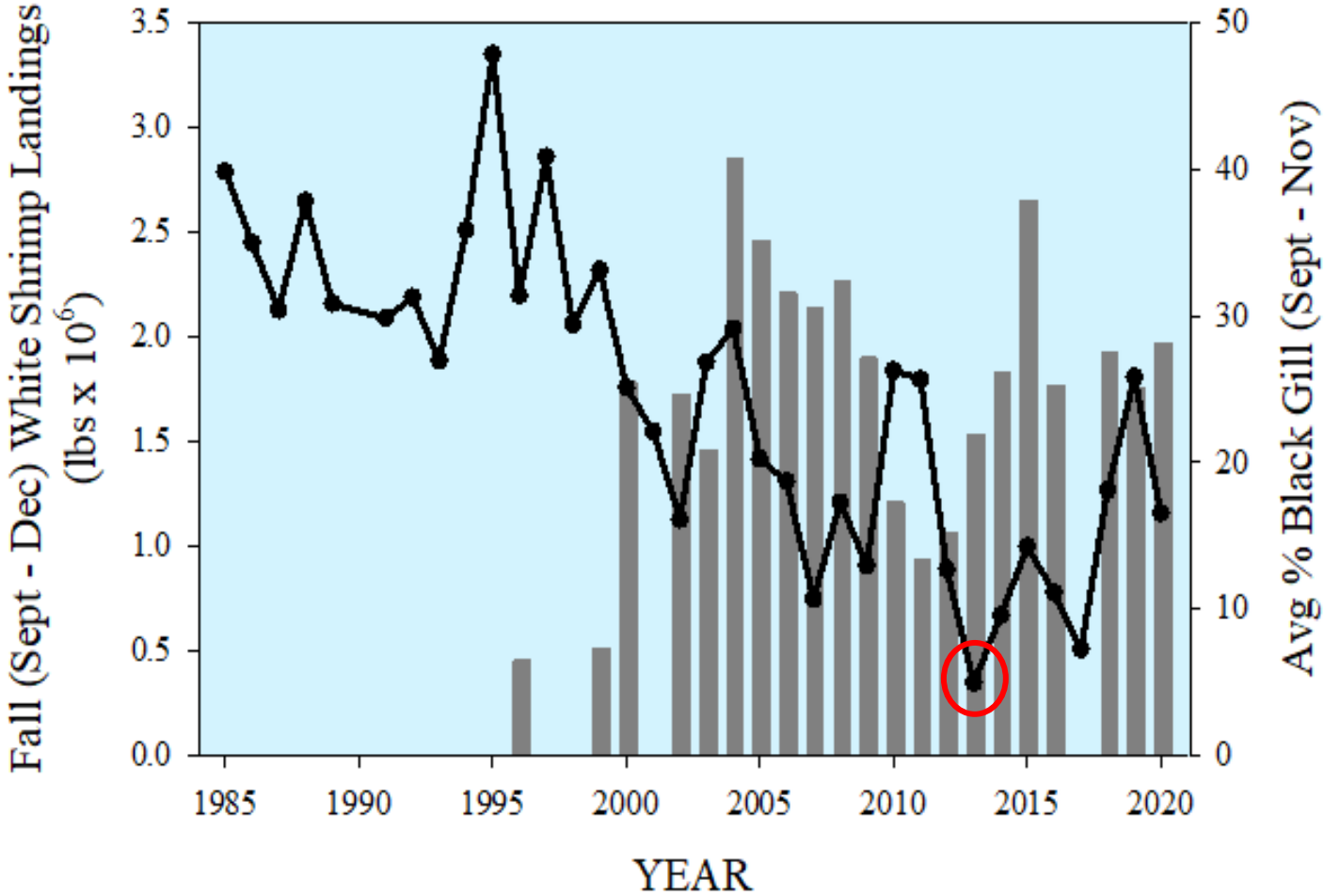
Black Gill is Not Harmful To Humans



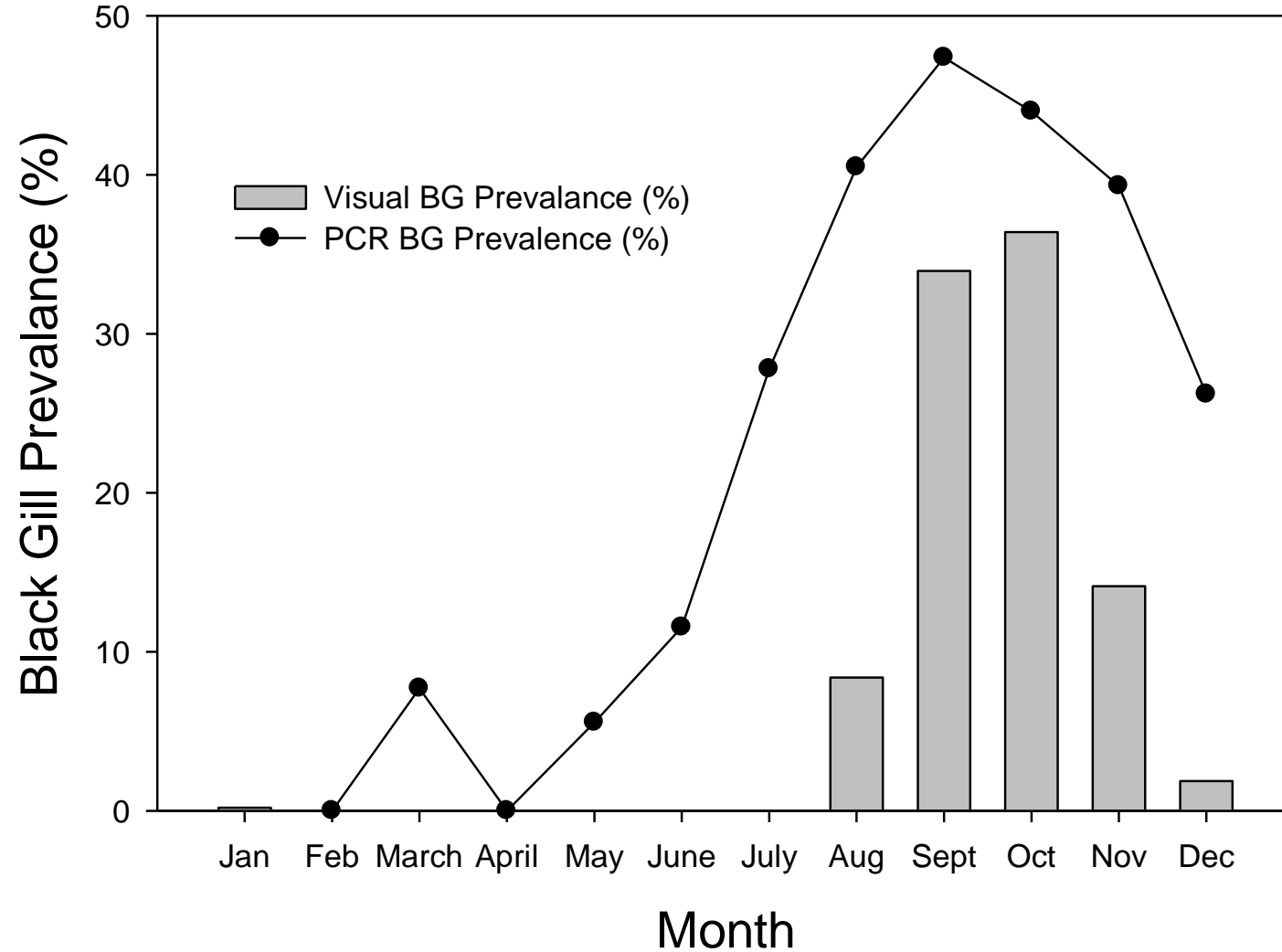
The University of Georgia
GA Legislative Staff Coastal Research Briefing
Shrimp Taste Test (Aug 2016)

If you've eaten local Georgia shrimp since the mid-1990's you've almost certainly eaten shrimp with black gill

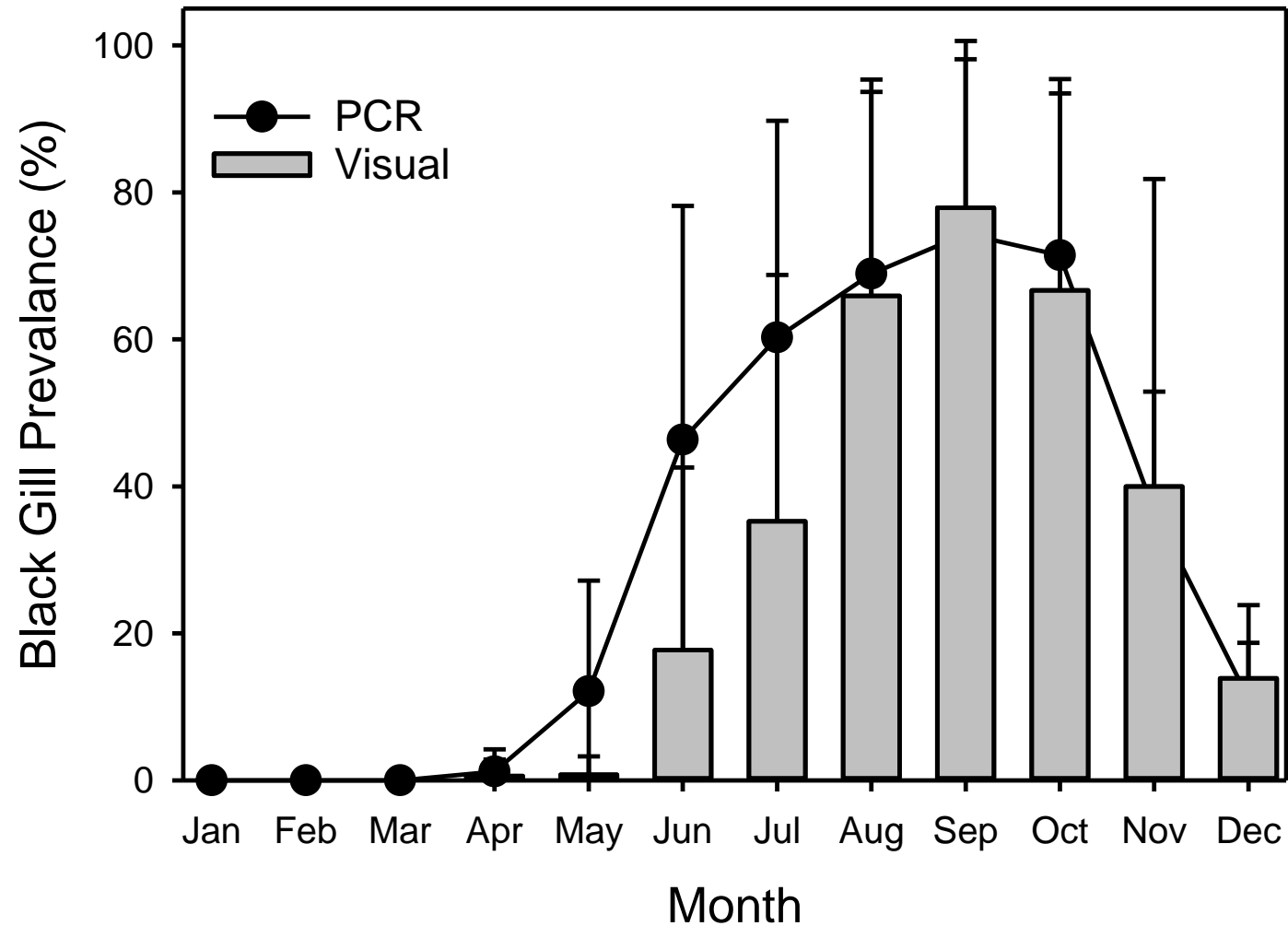
Understanding the causes of this variability may lead to better seasonal forecasts that may help us to manage the fishery to avoid economic catastrophes such as the one that occurred in 2013



Seasonal Occurrence and Detection of Black Gill (2014-2015)



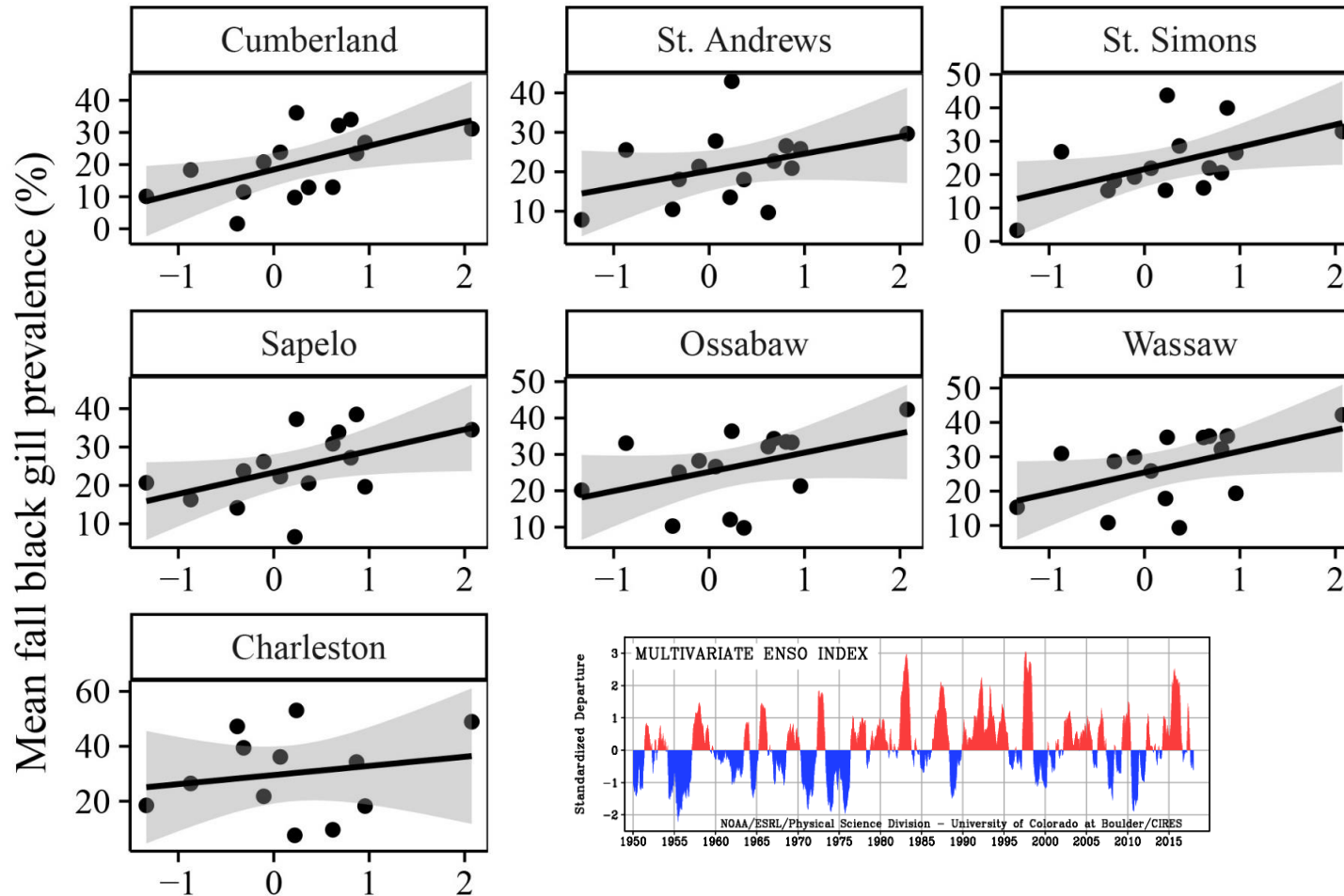
Seasonal Occurrence and Detection of Black Gill (2016-2020)



Recent Changes in
Prevalence and
Intensity of Black
Gill Infections

Environmental Drivers?

Black Gill Prevalence Correlated with Climate Conditions



Cooler/Drier Winter



ENSO



Warmer/Wetter Winter

Kendrick et al (2021)

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NEW GA CRD Project funding from the 2013 Disaster Relief Payout

Data Sets:

- Fishery Independent (GA CRD EMTS program) – CPUE + environmental data (1976 – present, monthly by location and species)
- Fishery Dependent (GA Landings – 1957 – present, monthly, statewide)
- Long-term environmental data (temperature, salinity, oxygen, rainfall, river discharge. Some date back to early 1900's)

Black Gill monitoring:

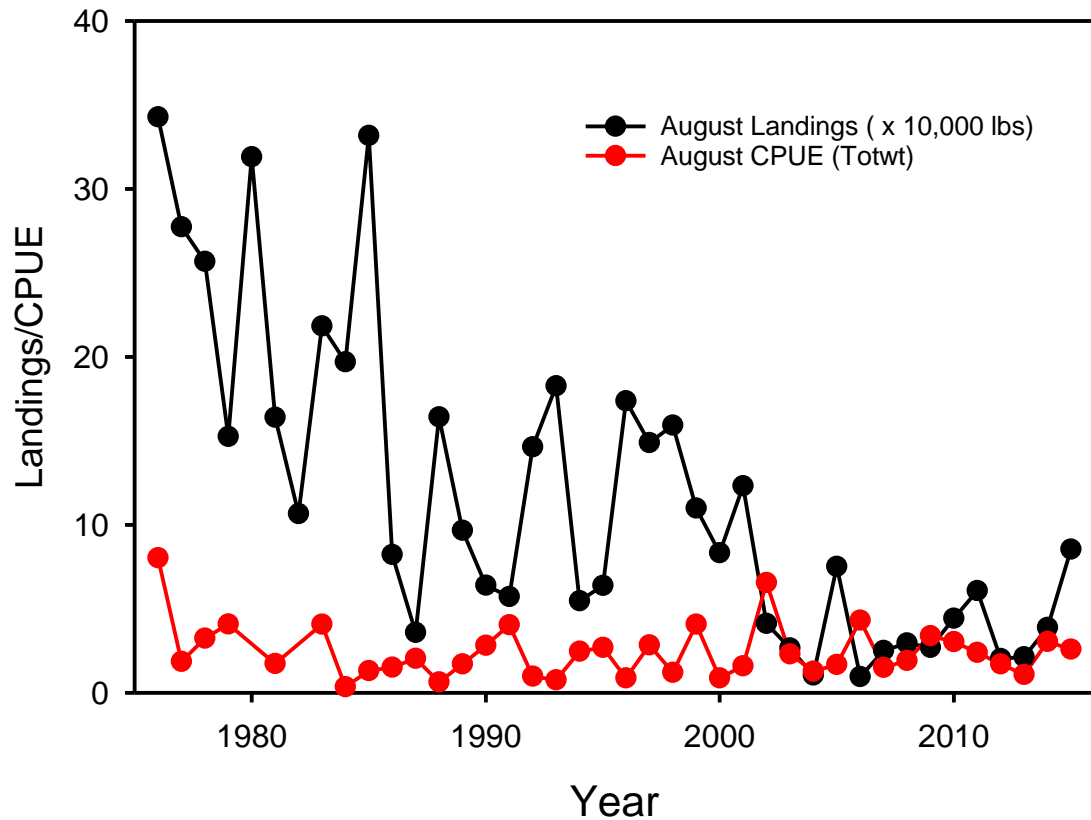
- Visible (GA CRD EMTS program) - 1996 – present, monthly by location
- PCR (MAREX educational trawl program and GA CRD EMTS) - 2014 – 2021, at least monthly

Climate Data:

- Climate indices (e.g. ENSO, AO, PDO, etc)
- Drought indices (e.g. PDI, PHDI, NADM, NCEI, etc)

Understanding The Relationships between the Fishery (Landings), Shrimp Stocks (CPUE), and Environmental Conditions. Forecasting and Adapting Fishery to Ongoing Changes (Black Gill & Climate)

August Landings & CPUE
(1976 - 2015)



August CPUE vs Landings
(1976 - 2015)

