



THE CENTER FOR COASTAL SOLUTIONS

**PRESERVING OUR COASTLINE WITH
WORLD-CLASS TECHNOLOGY**

UF | Herbert Wertheim
College of Engineering
UNIVERSITY *of* FLORIDA

My undergraduate/graduate training and early career experiences

SCIENCE WITH CLAIMS OF POLICY RELEVANCE



Role of Crab Herbivory in Die-Off of New England Salt Marshes

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A trophic cascade triggers collapse of a salt-marsh ecosystem with intensive recreational fishing

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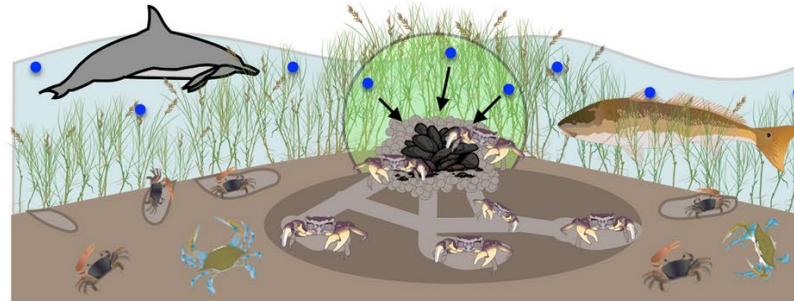


Our scientific recommendation: policies that better constrained recreational fishing are needed to save these salt marshes

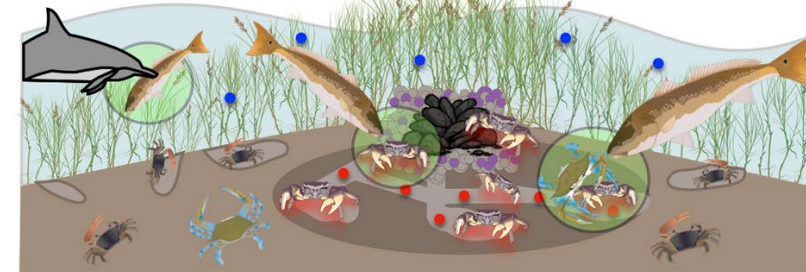
Mussels create mini-Superfund sites in salt marshes; More action should be taken to remediate PCB sources



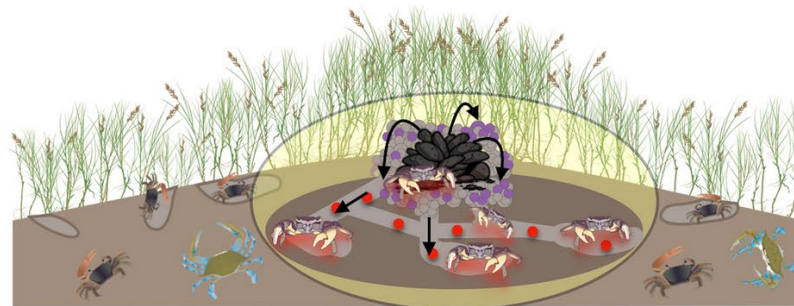
a. Mussels filter feed on PCB-laced particulates from tide waters, a trophic interaction.



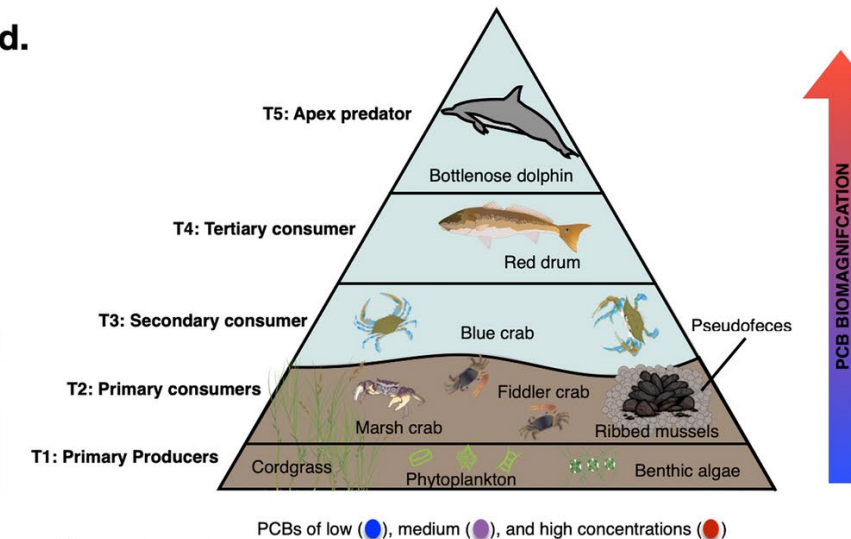
c. Marsh predators consume PCB-enriched marsh crabs, a trophic interaction, thereby driving PCB biomagnification in this coastal food web.



b. Mussels deposit PCB-laced pseudofeces on the marsh surface and burrowing marsh crabs mix them downward, accumulating PCBs from sediments via epidermal/gill absorption, a non-trophic interaction.



d.



Prince, K.D., Crotty, S.M., Cetta, A. et al. Mussels drive polychlorinated biphenyl (PCB) biomagnification in a coastal food web. *Sci Rep* 11, 9180 (2021)

University of Florida Center for Coastal Solutions

CLOSING THE SCIENCE-POLICY GAP TO ACCELERATE PROGRESS



What the CCS team is focusing on:

Advancing knowledge of coastal habitat changes and water quality hazards



**Despite major efforts
to address coastal habitat loss & hazards,**

Environmental crises such as harmful algae blooms and ecosystem die-offs are occurring with increasing frequency and severity.



**These crises are degrading
the natural beauty,**

Endangering the wildlife, harming public health, and threatening the economy of coastal regions, including those in our state.



Our coastlines may become a greater liability than an asset to Florida and beyond.

The Challenge: We have oceans of data... but trickles of insight



Multiple institutions are collecting large volumes and diverse types of environmental data,

However, creating sufficient meaning – i.e. 'intelligence' - from these data remains a grand challenge.



These challenges are amplified by the vast inter-connectivity of watershed and nearshore systems,

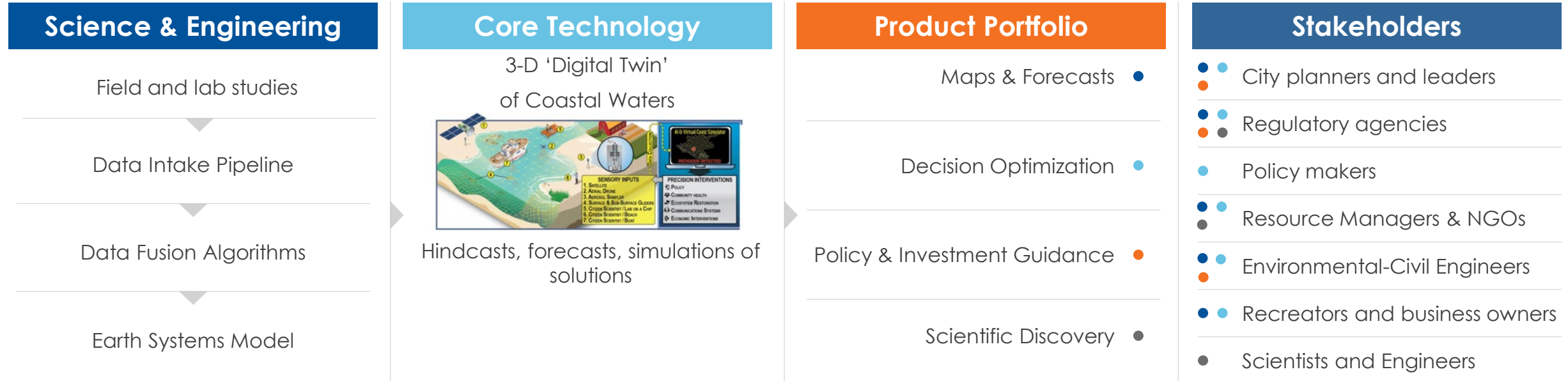
Complexity that obscures the root cause of coastal habitat change/hazards and undermines the development of proactive, effective solutions to resolve these threats.



THE SOLUTION

The Center for Coastal Solutions is providing the intelligence needed for proactive decision-making and the prevention of coastal water quality hazards

Our Data-Modeling Technology Infrastructure: Delivering Intelligence to Address Coastal Water Quality Hazards



This Technology-to-Solutions Ecosystem is powered by :

01

A Diverse, Deep Bench of Talent:

The CCS has unmatched expertise in AI, Oceanography, Ecology, Economics, and other key disciplines

02

Exceptional Supercomputing:

The CCS technology ecosystem runs on an exceptionally powerful supercomputer: the UF-NVIDIA HiPerGator 3.0

03

Unrivaled Public-Private Partner Network:

CCS partners are accelerating innovation, enhancing our product portfolio, and helping us engage our users

Fall 2021 Coastal Policy Lab

Co-production of Science & Policy Guidance with Local Communities



- FL Sea Grant Sponsored
- Semester-long Experiential Learning Lab
- 4 Teams of UF Law + PhD in Science/Engineering Students
- Client-driven science-to-policy challenges
- Mentored by Ankersen, DePaolis, Angelini, Clients



The Principles That Guiding Us

Our Vision is for our coastal waterways to be cleaner and our beaches, wetlands, reefs, and other natural infrastructure to be healthier tomorrow than they are today.

Our Mission is to produce the advanced science, technologies, and policy guidance needed to achieve real improvements in coastal waterway and natural infrastructure health.

Our Purpose is to preserve the vibrancy of our coasts for our own enjoyment and that of future generations by accelerating the science, technology, policy innovation required to identify and advocate for where investments must be made to meaningfully clean our waters and restore our natural infrastructure.

