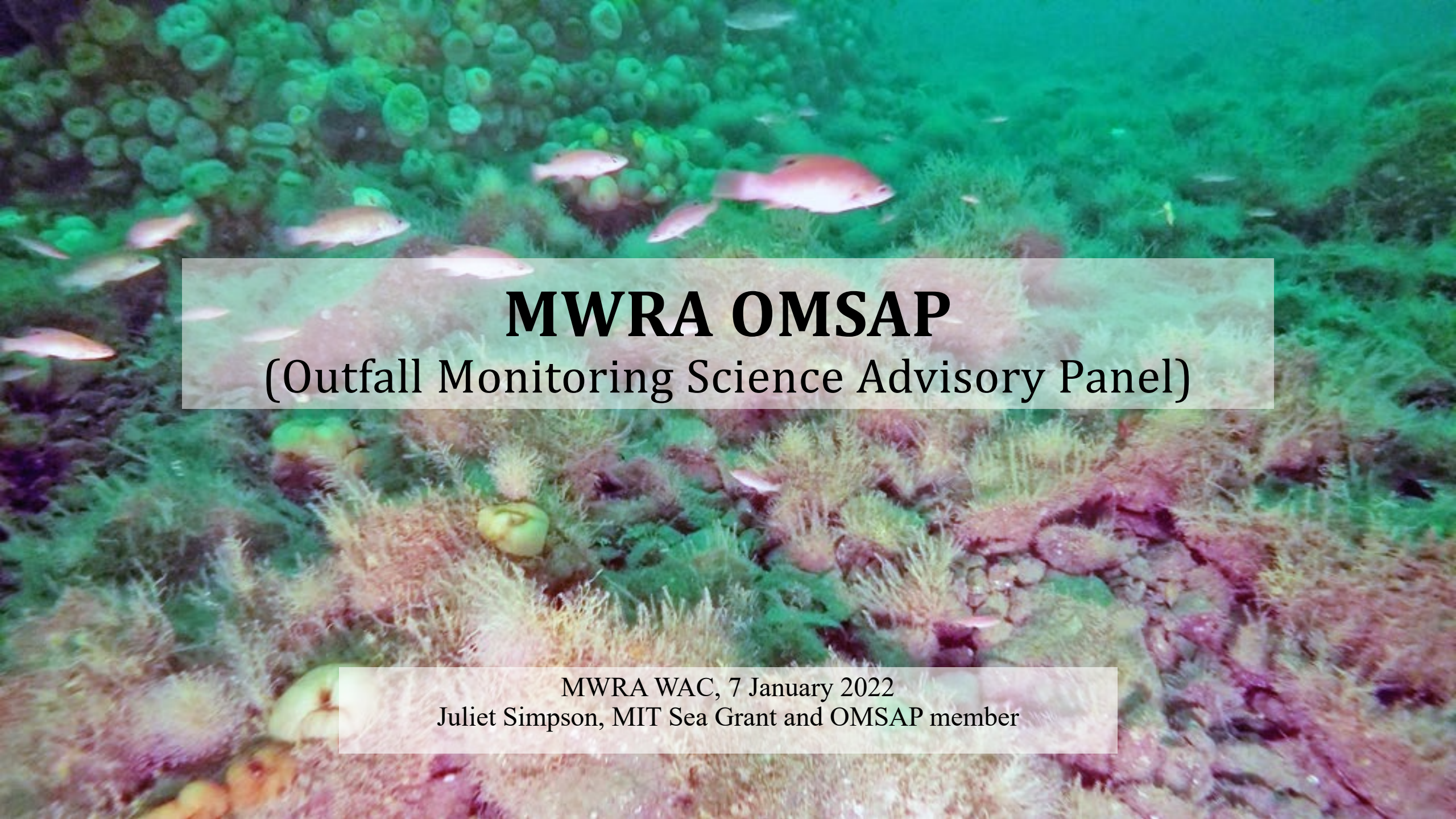
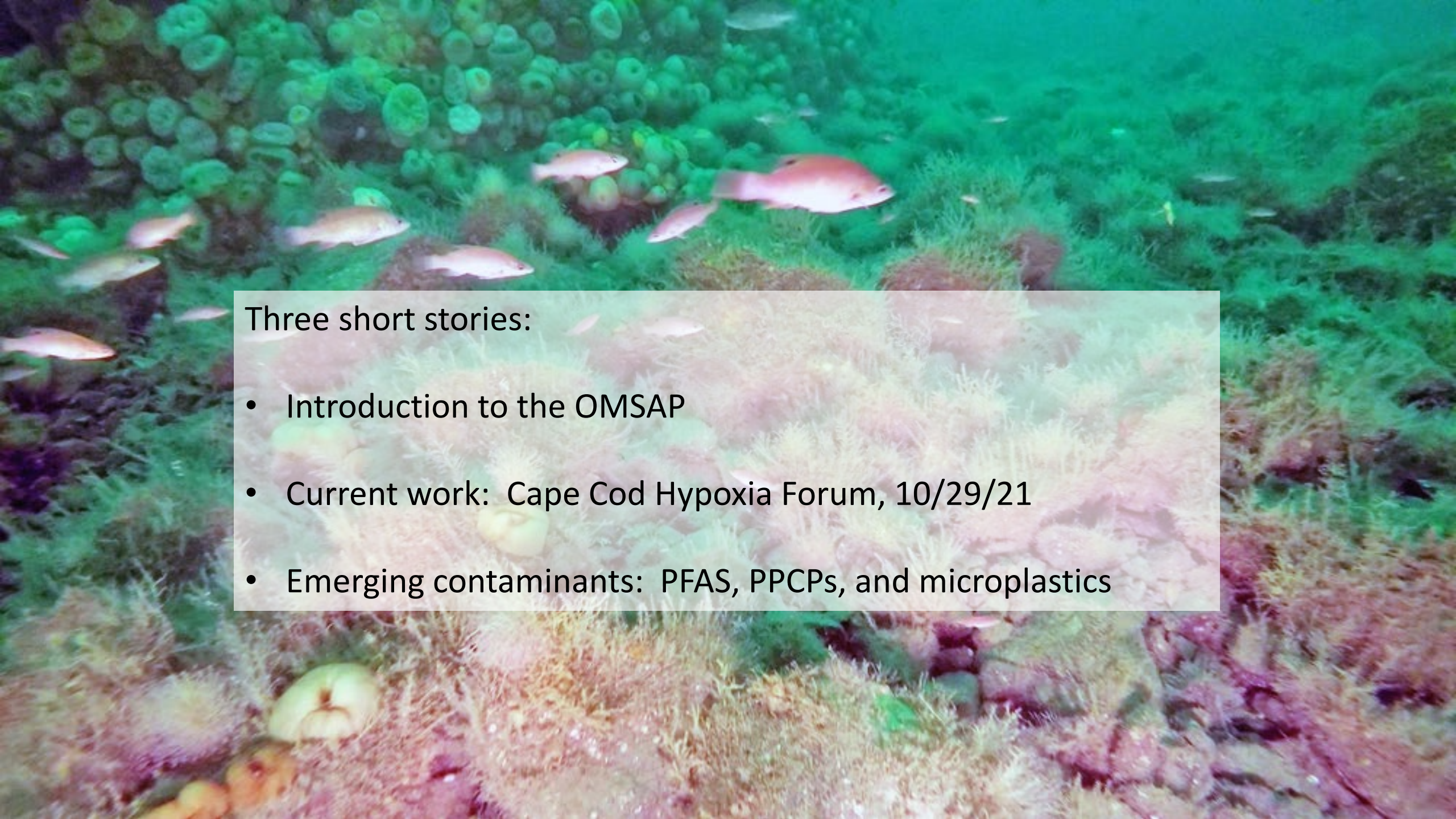


MWRA OMSAP
(Outfall Monitoring Science Advisory Panel)

MWRA WAC, 7 January 2022

Juliet Simpson, MIT Sea Grant and OMSAP member



Three short stories:

- Introduction to the OMSAP
- Current work: Cape Cod Hypoxia Forum, 10/29/21
- Emerging contaminants: PFAS, PPCPs, and microplastics

OMSAP: Outfall Monitoring Science Advisory Panel

Specified in NPDES permit and convened by EPA and MA DEP: "… an independent panel of scientists to review monitoring data and advise EPA and the MADEP on key scientific issues related to this permit. This team of experts, called the Outfall Monitoring Science Advisory Panel (OMSAP), will conduct peer reviews of monitoring reports; evaluate monitoring data and advise EPA and the MADEP on the implications of that data; advise EPA and the MADEP on proposed modifications to the monitoring plan; and meet regularly with EPA and MADEP staff to ensure that any issues related to the MWRA discharge receive careful scientific attention."

- Regular meetings to review monitoring data, make recommendations for monitoring plan
- Additional ad hoc meetings as needs arise – all open to public

Example: Cape Cod Hypoxia Forum

OMSAP: Outfall Monitoring Science Advisory Panel

- Regular meetings to review monitoring data
- Additional ad hoc meetings as needs arise – all open to public

Example: Cape Cod Hypoxia Forum

October 2021: At the request of EPA and in response to concerns about recent hypoxia events in Cape Cod Bay, MassBays convened an expert panel to inform OMSAP.

Massachusetts Bays
NATIONAL ESTUARY PARTNERSHIP

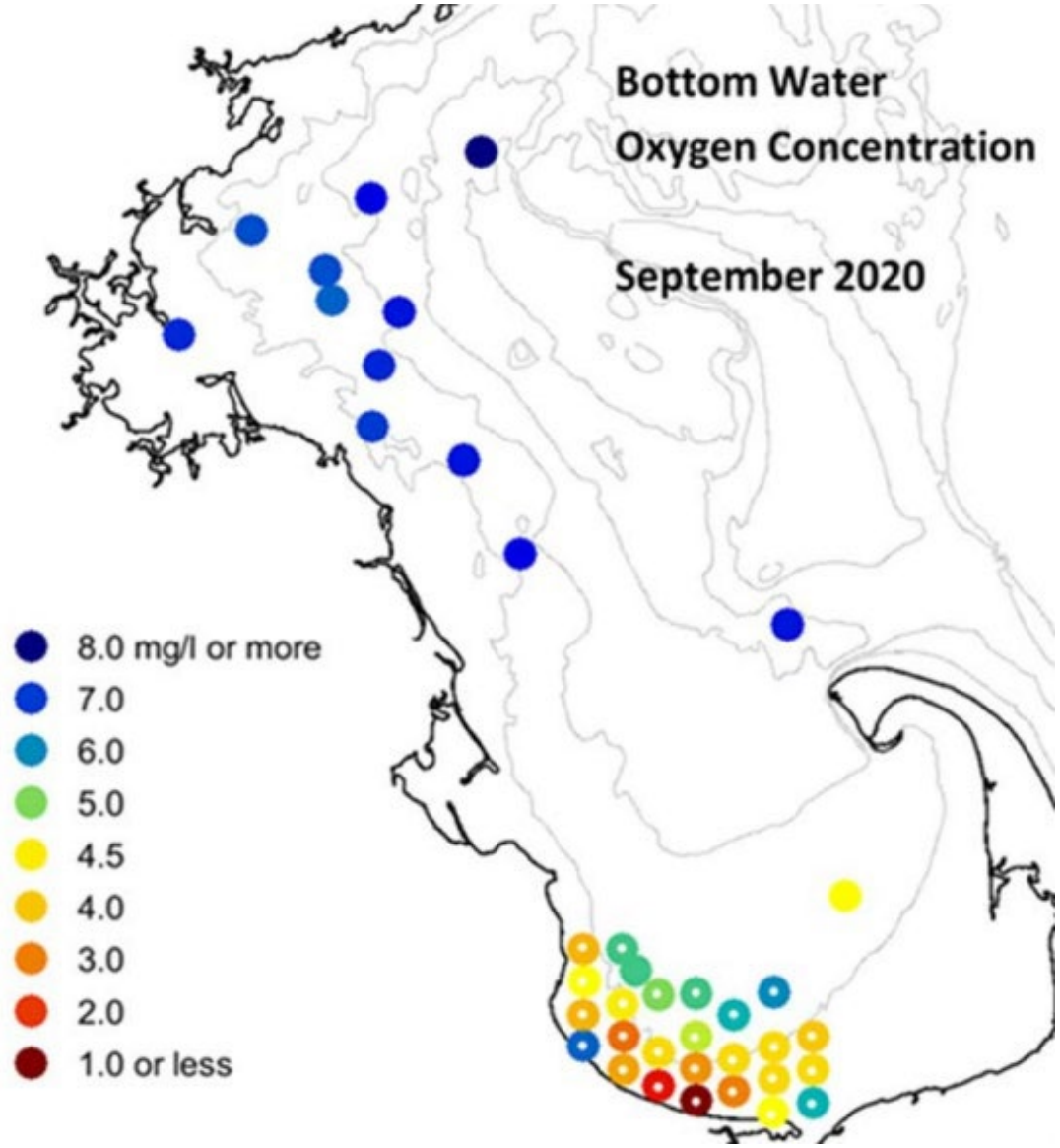
Science Forum: Investigating and Responding to Hypoxia in Cape Cod Bay

October 29th, 2021

Part I. Invited speakers characterize the problem and possible contributing factors.

Part II. Speakers and invited panelists discuss potential response actions

Part III. Attendees ask questions, suggest additional considerations



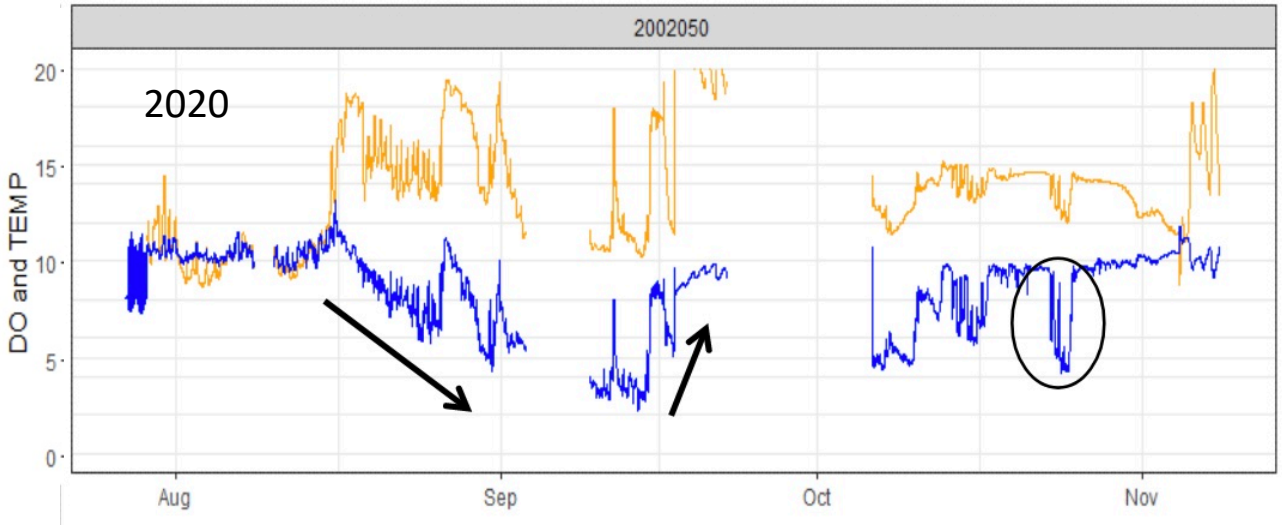
Observed Hypoxia Events in Cape Cod Bay

Presenter: Tracy Pugh/DMF

2019: observations of dead scallops, trapped lobsters & crabs

2020, 2021: “Cape Cod Study Fleet”

- **DO** & **temperature** measured at 15-min intervals via data loggers deployed from lobster boats
- In addition to MWRA, Center for Coastal Studies monitoring programs

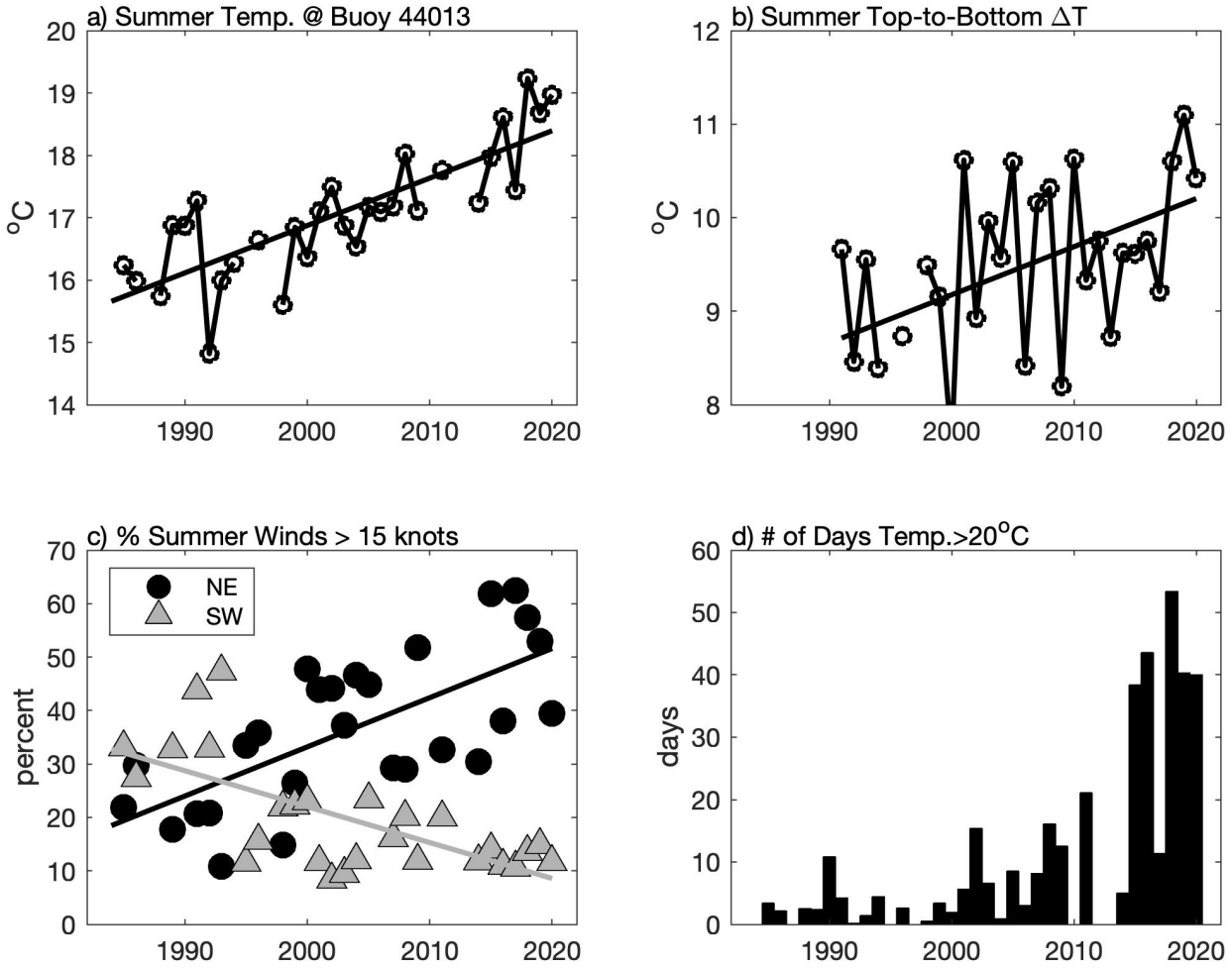


Long-term Changes in Physical Conditions in CCB

Presenters: Malcolm Scully & Rocky Geyer/WHOI, Amy Costa/CCS

Changes in physical conditions in Cape Cod Bay:

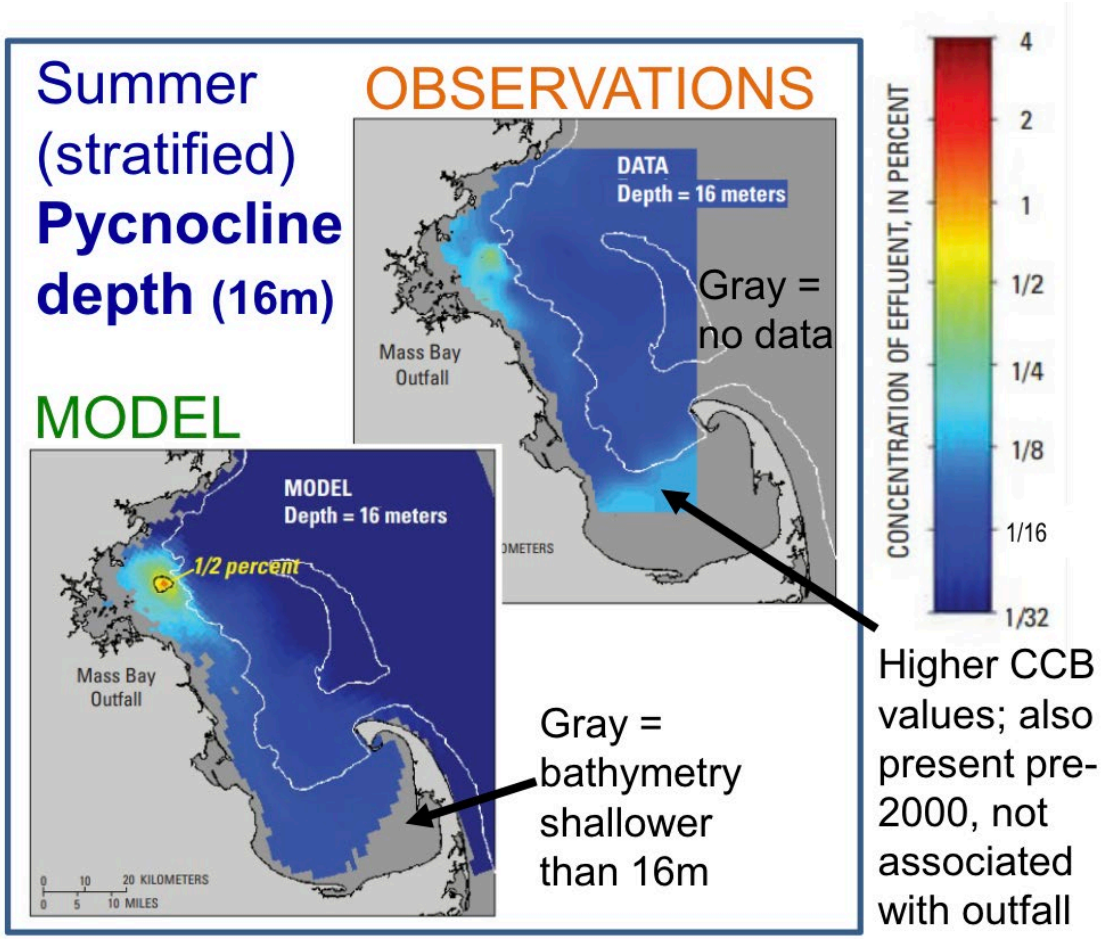
- Waters are warming
- Depth stratification is increasing



MWRA Effluent/Nitrogen and Cape Cod Bay

Dan Codiga/MWRA

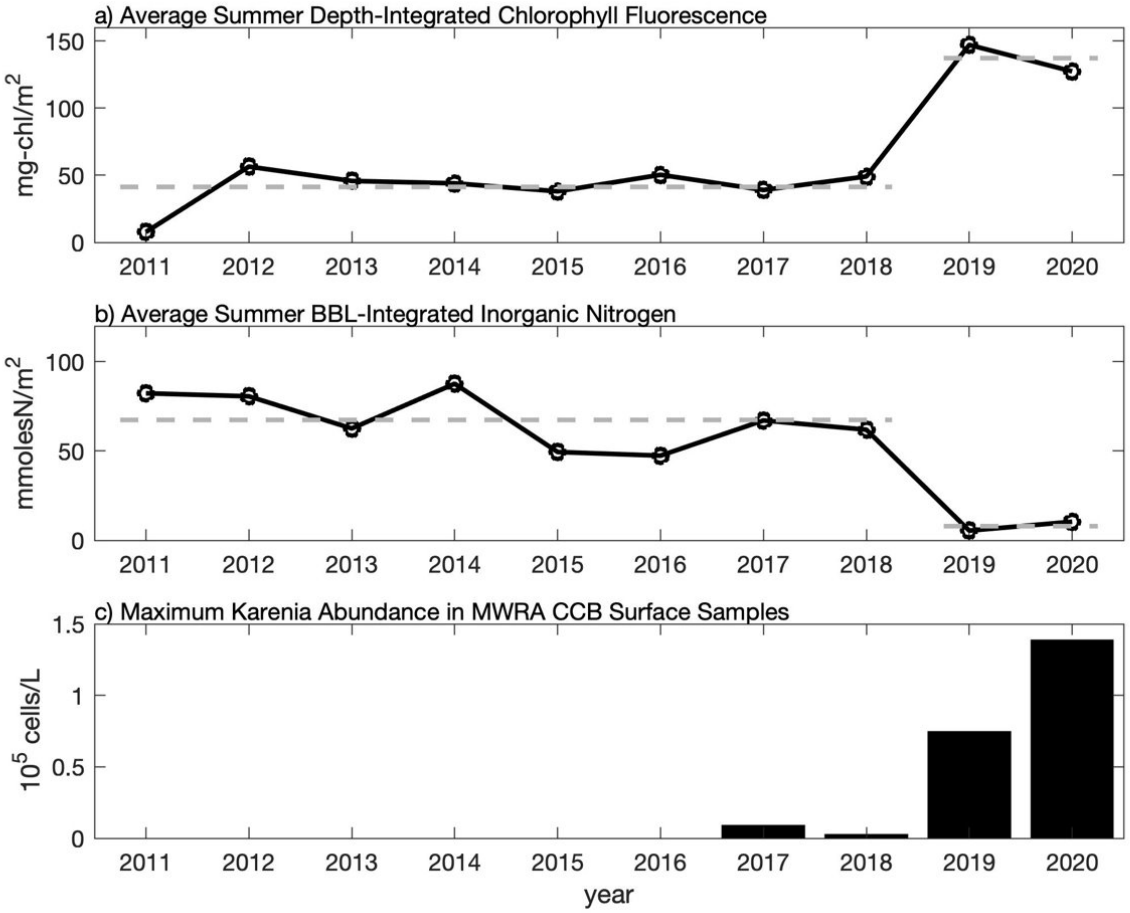
- Outfall startup dates to 2000.
- Outfall influence is locally significant (to 20km) for N, not Chl or POC.
- No hypoxia observed in Mass Bay.



Karenia mikimotoi and Harmful Algal Blooms

David Borkman/URI, RIDEM Malcolm Scully/WHOI

- Dinoflagellate adapted to wide range of temperatures and low light conditions, persists at the pycnocline, and may overwinter in a resting stage. Blooms are obvious and harmful to benthic infauna (but not humans).



Panel Discussion

All presenters, plus Lealdon Langley & Cathy Vakalopoulos/DEP, Ken Moraff/EPA, Joyce Novak/Peconic Estuary Partnership

- *Massachusetts Bay and Cape Cod Bay are changing; need to understand influence of MWRA outfall in the context of that change.*

- *Do we have the data and tools needed to identify the most likely cause(s) of the observed hypoxia events in Cape Cod Bay?*
  - *K. mikimotoi* appears to be a likely cause – influenced by nutrients and temperature.
  - We will need funding for monitoring, access to models
- *What should be our next steps to address the issue, including monitoring, research, and management actions?*
  - Define the research question
  - Convene a group to implement studies and responses.

Looking Forward: Emerging Contaminants

In 2021 the OMSAP produced white papers summarising the current state of knowledge on three classes of contaminants of emerging concern (CEC) in wastewater:

- Pharmaceuticals and Personal Care Products (PPCPs)
- PFAS – Per- and Poly-fluoroalkyl substances (“forever chemicals”)
- Microplastics

Findings from the CEC papers:

- Lack of standardized protocols and methodologies for monitoring PPCPs, PFAS, microplastics in WWTP
- There is a need for literature reviews on sources, presence, and risk assessments for MWRA with a focus on the compounds likely to cause impacts.
- Need to conduct special studies to address knowledge gaps; model transport and fate
- Importance of source control / reduction

CEC white papers available soon through MIT Sea Grant (PPCP and PFAS being published now; microplastics paper in review)

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