Non-plastic materials for oyster reef and shoreline restoration in Florida:

understanding what is needed and where the field is headed


Photo: UCF


Photo: City of Naples


Photo: Brevard Zoo

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What we know:

- Coastal habitat loss results in loss of ecosystem services
- Estuarine habitat restoration can help recover services
- Oyster replenishment has been underway for >100 years, restoration accelerated in the past 2 decades


Photo: USACE


Photo: TNC

UNF – cement/shell composite


UCF – oyster tile


UF – metal gabion and BESE mat


Sandbar Oyster Company - OysterCatcher


UF and SeaGrant– Reef Prism

Getting creative

- Stakeholders and practitioners in Florida expressed concern about plastic legacy
  - Florida Microplastics Project

- New products and ideas emerging from many partners
- But….how was it going? What we were learning?


FWC – oyster mattress


Bureau Waardenburg - BESE mats


Photo: BESE-products

Let’s ask!

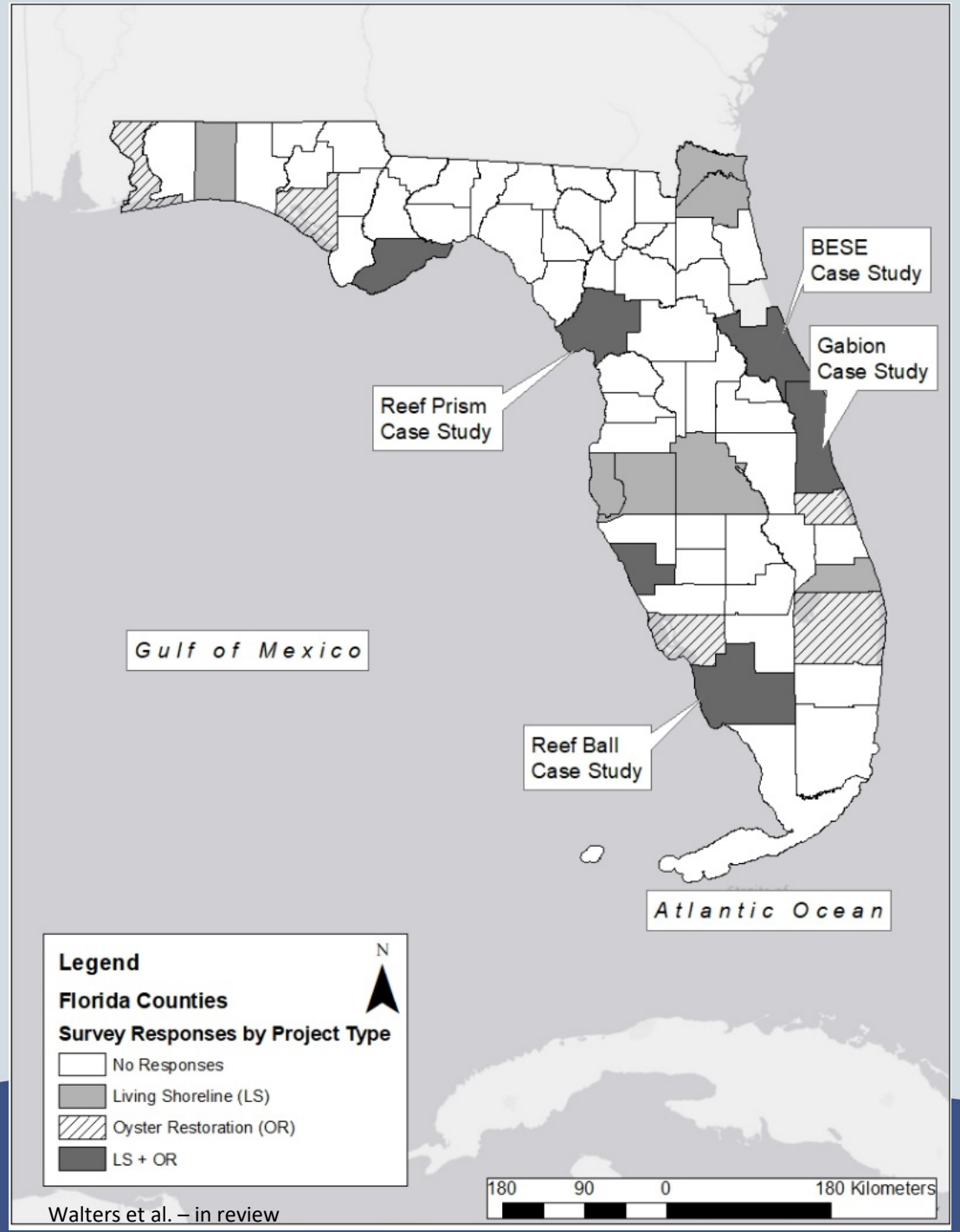

Photo: UCF

- Non-random survey focused on experiences and attitudes of coastal restoration practitioners in Florida

- 29 questions (10 – 15 min completion time)
  - open and close-ended questions
  - Scope, scale, material, production/sourcing, permitting, installation, material performance

- 5 habitat restoration listservs (835 members combined) with snowball sampling
- 23-day response window in April 2021

Responses



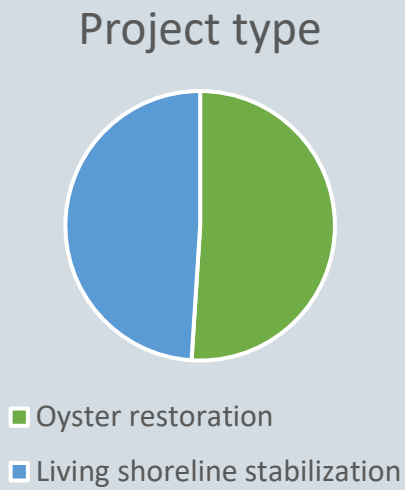
Walters et al. – in review

49 total

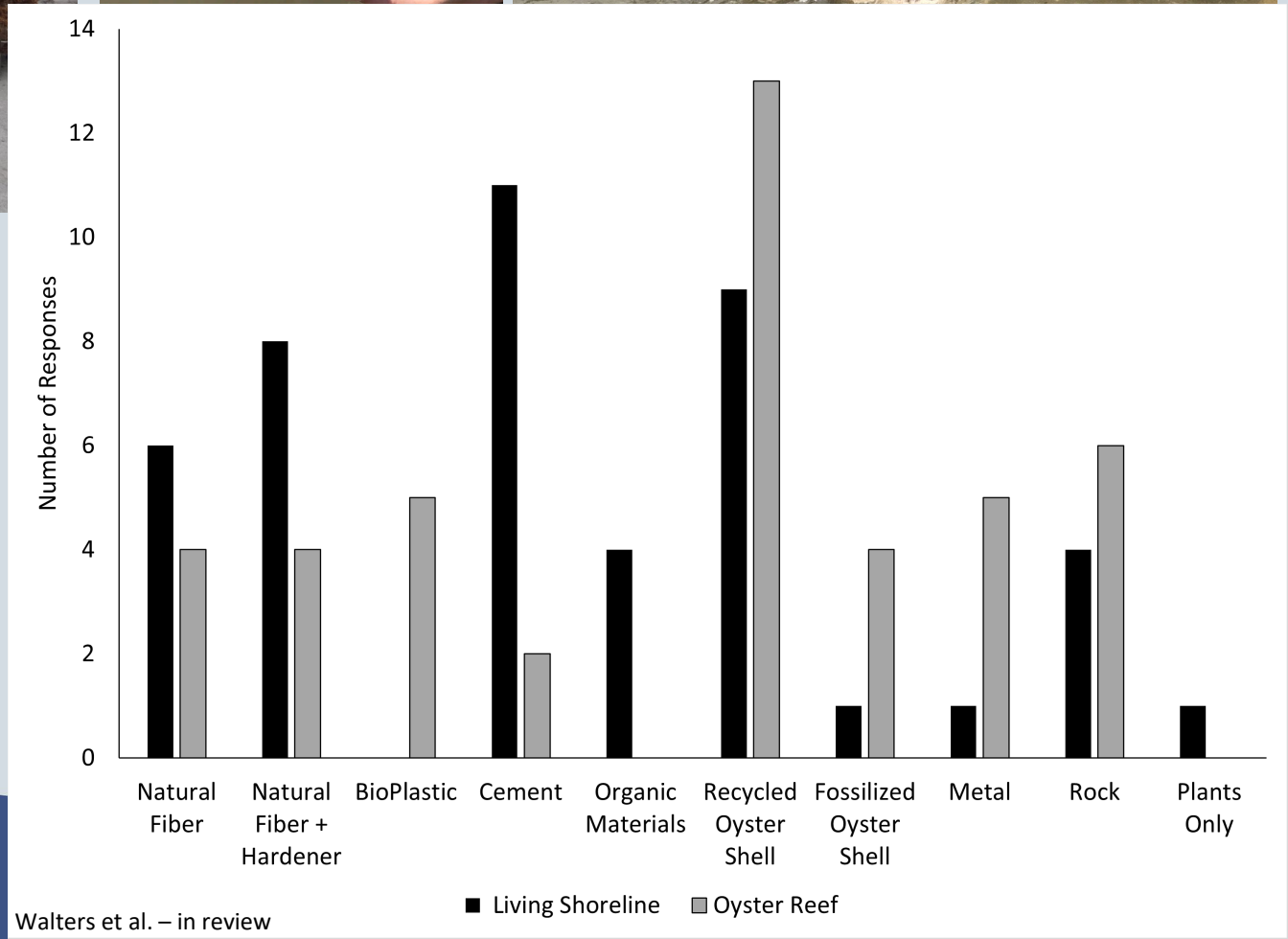
- 46 FL (19 counties)
- 1 TX, 1 MS, 1 AL

2000 – 2022

65% of projects in the last 3 yrs (2019 – 2021)



What are we using?



Walters et al. – in review

How do non-plastics, compare to plastic materials?

- "Easy" to produce or source (61%)
- Installation "Difficult" or "Moderately difficult" (69%)
- Appropriate for able-bodied volunteers (65%)
  - Not appropriate for K-12 students in preparation (75%) or installation (80%)
  - Need additional safety precautions (45%, not related to material)
- Greater cost (47%)
  - 34% unknown
- Greater time commitment (43%)
  - 22% unknown

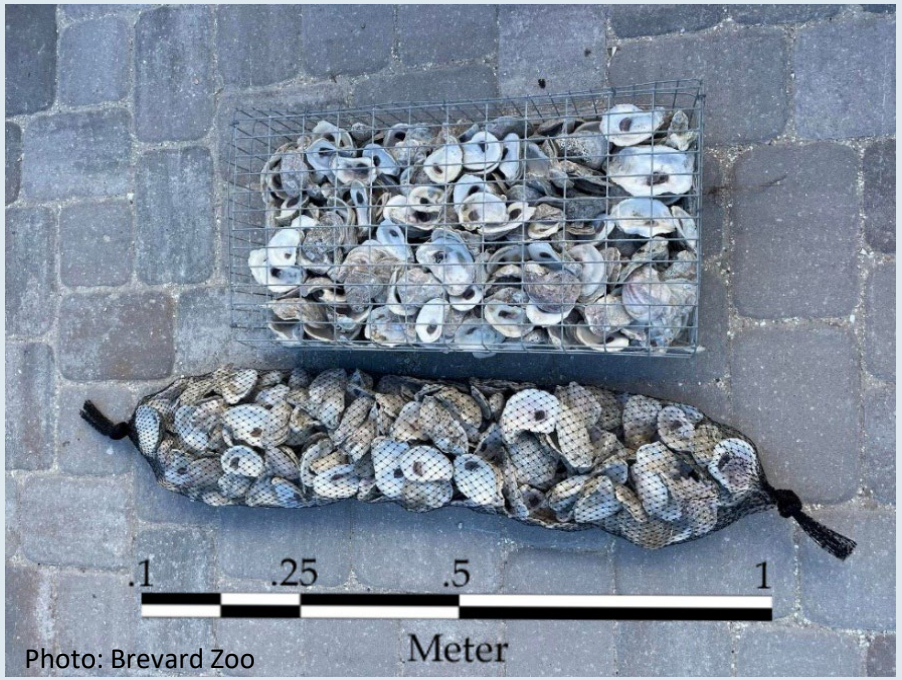


Photo: Brevard Zoo


Photo: UCF

How do we feel about non-plastic materials?

Willingness to use again

86%

Would recommend to a colleague

86%

Do they work?

All respondents included monitoring

- 2 years+ monitoring planned for 75% of projects
- Annual (29%) and quarterly (27%) most common

Material integrity > expected (55%)
Oyster recruitment ≥ nearby natural reefs (49%)

Little data on wave attenuation

Most projects <3 years old (65%)

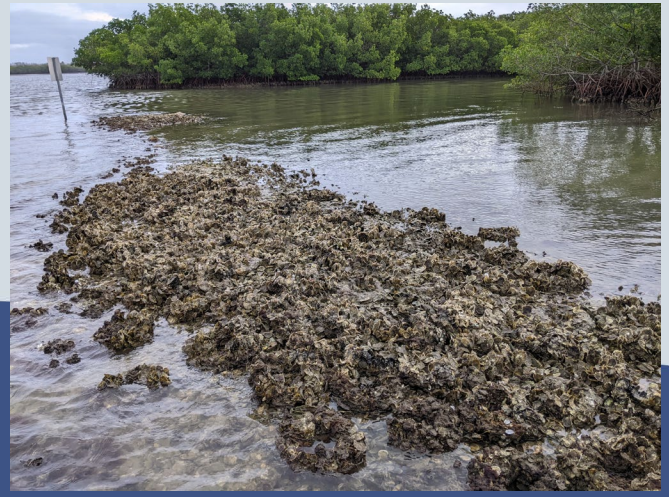
Lack of data that covers the life span of materials

What else did we learn?

Permitting challenges rare (86% reported no issues)

- Issues included size, location, or design
- No material-related permitting issues

Non-plastics are being prioritized by funding sources (37%)

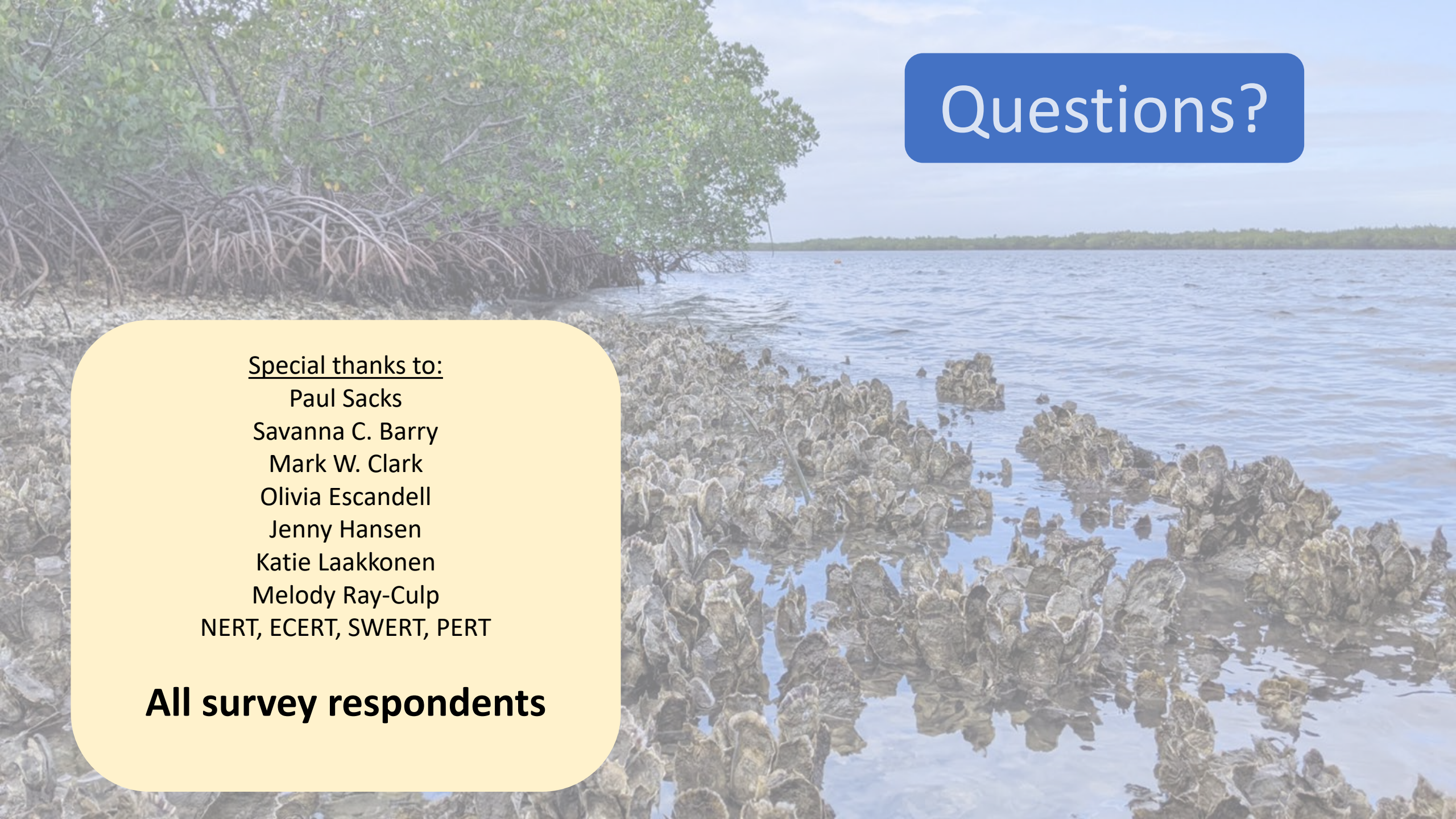


What now?

- Continue learning!
  - Adapt, test, monitor, scale up, adapt again, share results

- Look at possible unintended impacts of non-plastics
  - Impacts on sediment, plant/animal communities, possible interactions
  - Products of degradation (Nitsch et al. 2021)
  - Carbon-emissions from production

- *Sustainability* paper submitted



Questions?

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All survey respondents