

Oyster Restoration and Enhancement Efforts in Rhode Island: Recent Initiatives and Next Steps



RI Bay SAMP Education Series - Tuesday Dec 14, 2021

Presented by: Eric Schneider
RI DEM Div. of Marine Fisheries



Oyster Populations in RI

- Eastern Oyster (*Crassostrea virginica*) found primarily in subtidal waters of coastal lagoons and estuaries
- Provide ecosystem services such as:



Photo by Melissa Devine

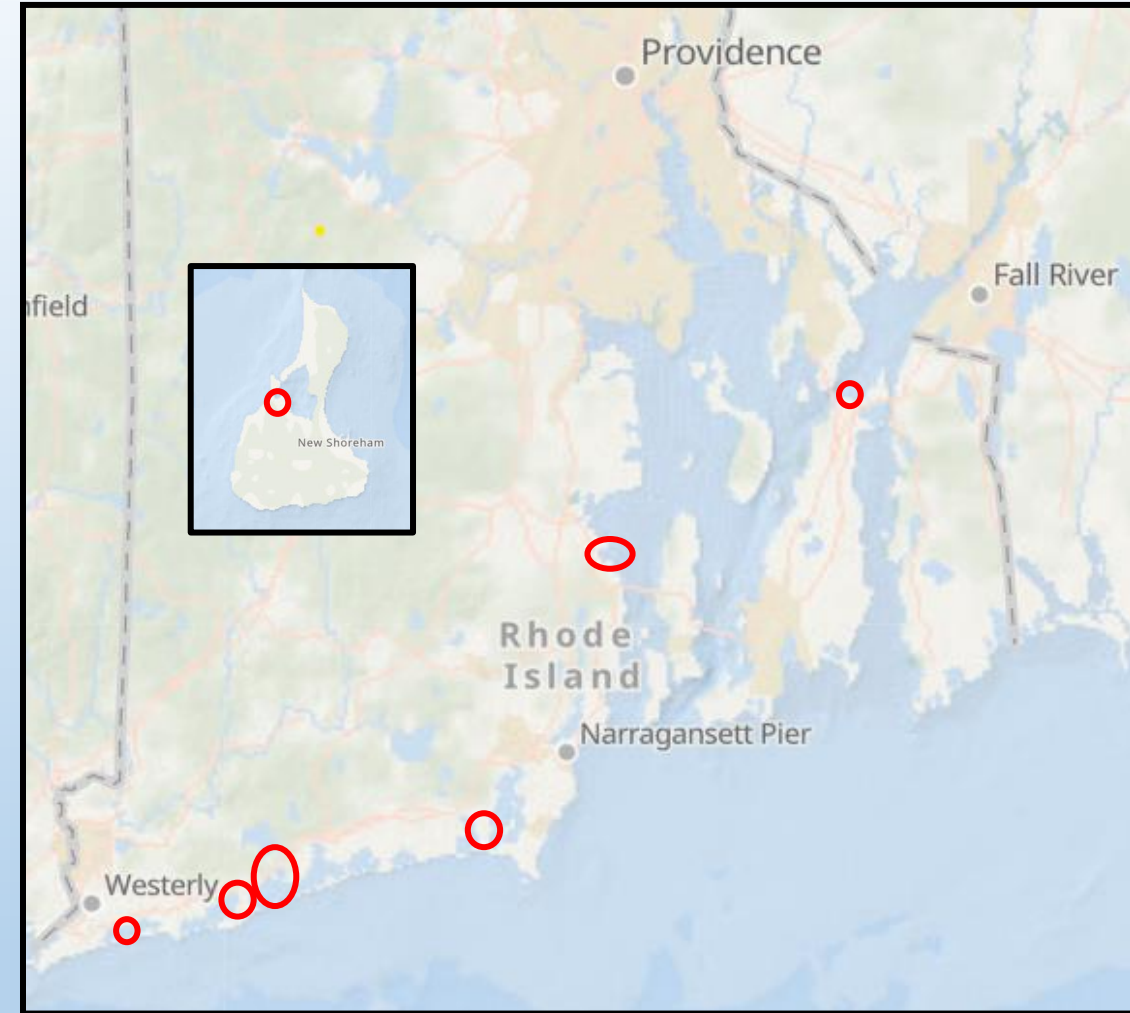
Current Restoration and Enhancement (R&E) focus:

1. Restore wild populations
2. Enhancing fish habitat
3. Enhanced harvest – supplemental seeding
(stay tuned.... Next talk)



1. RI NRCS EQIP Oyster Initiative

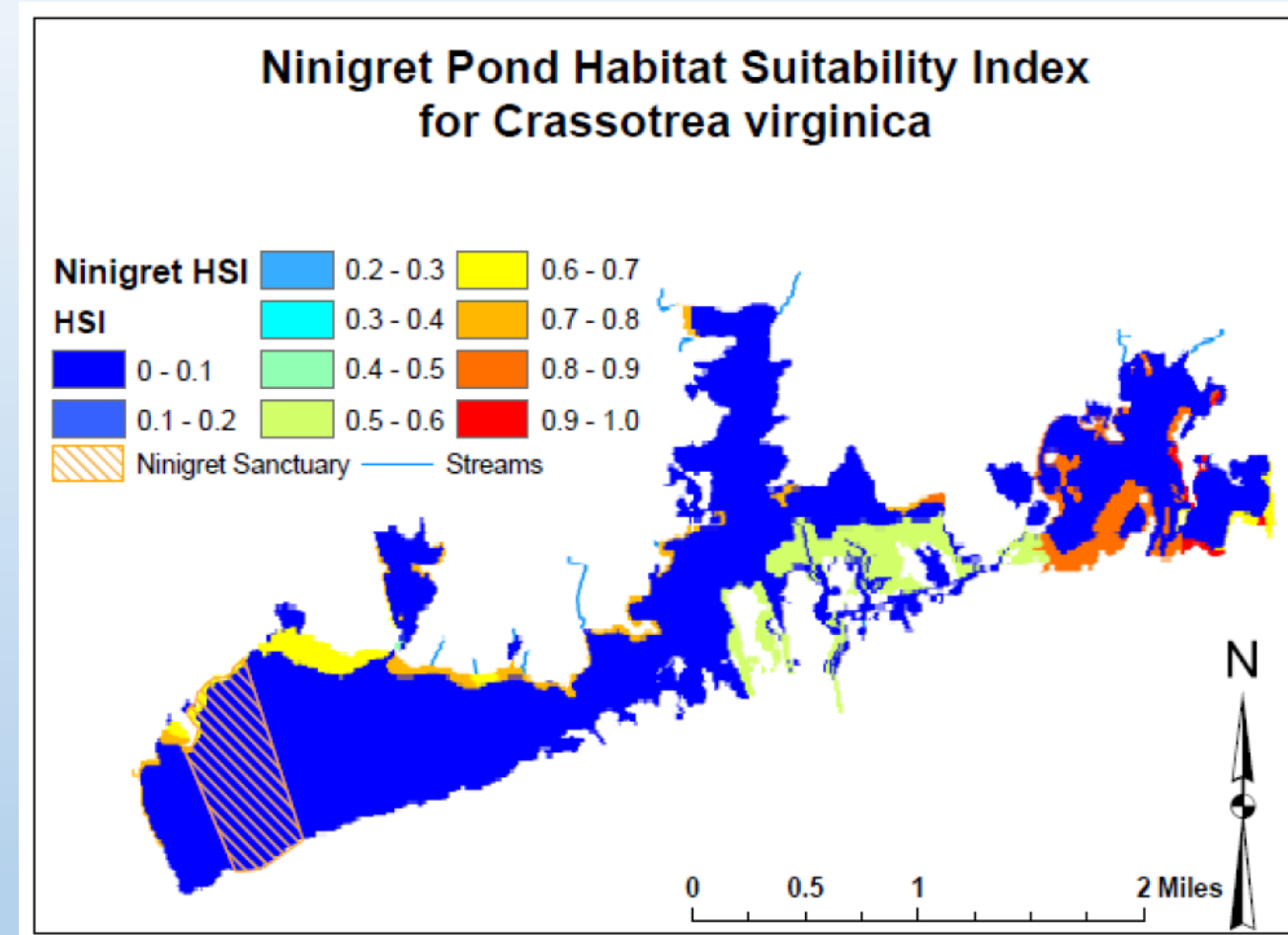
- Partners: NRCS, DMF, aquaculture community
- Goal: Create sustainable wild populations
- Since 2015
 - 7 Locations
 - 40 Aquaculturists
 - Monitoring and research critical



Rhode Island
Oyster Aquaculturists

1. EQIP Oyster Initiative

- DMF Role
 - Restoration location and techniques
 - Lead management and permitting
- Site selection critical in determining success
 - Oyster HSI, if available (e.g., TNC 2013)
 - Subaqueous soils
 - Inferred salinity
 - Historical occurrence or BPJ



TNC (2013) Oyster HSI for Ninigret and Green Hill Pond

1. EQIP Oyster Initiative – Reef Creation

- Cultch only
 - Used when substrate is limited
 - Oyster or surf clam shell



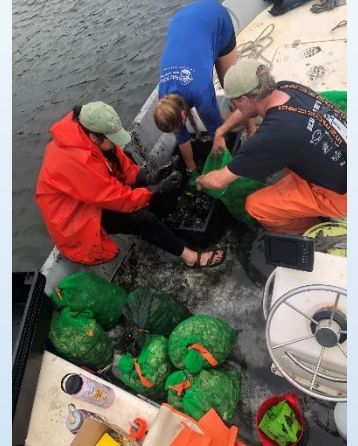
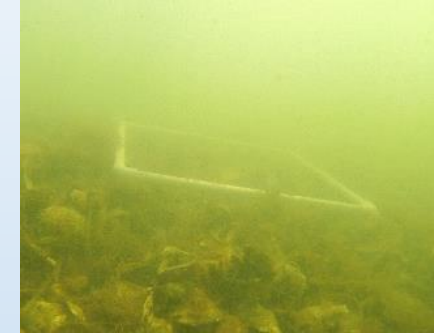
1. EQIP Oyster Initiative – Reef Creation

- Seeded Reefs
 - Used when broodstock is in sufficient
 - Cultch reef base
- +
- Seeded with juvenile spat-on-shell oysters



1. EQIP Oyster Initiative – Monitoring

- Monitoring is critical
- Improve Restoration practices
 - Customized by location
 - RI approach is the standard for NE region
 - Gaining coast-wide attention
- However, recruitment is not sufficient
 - We'll revisit later



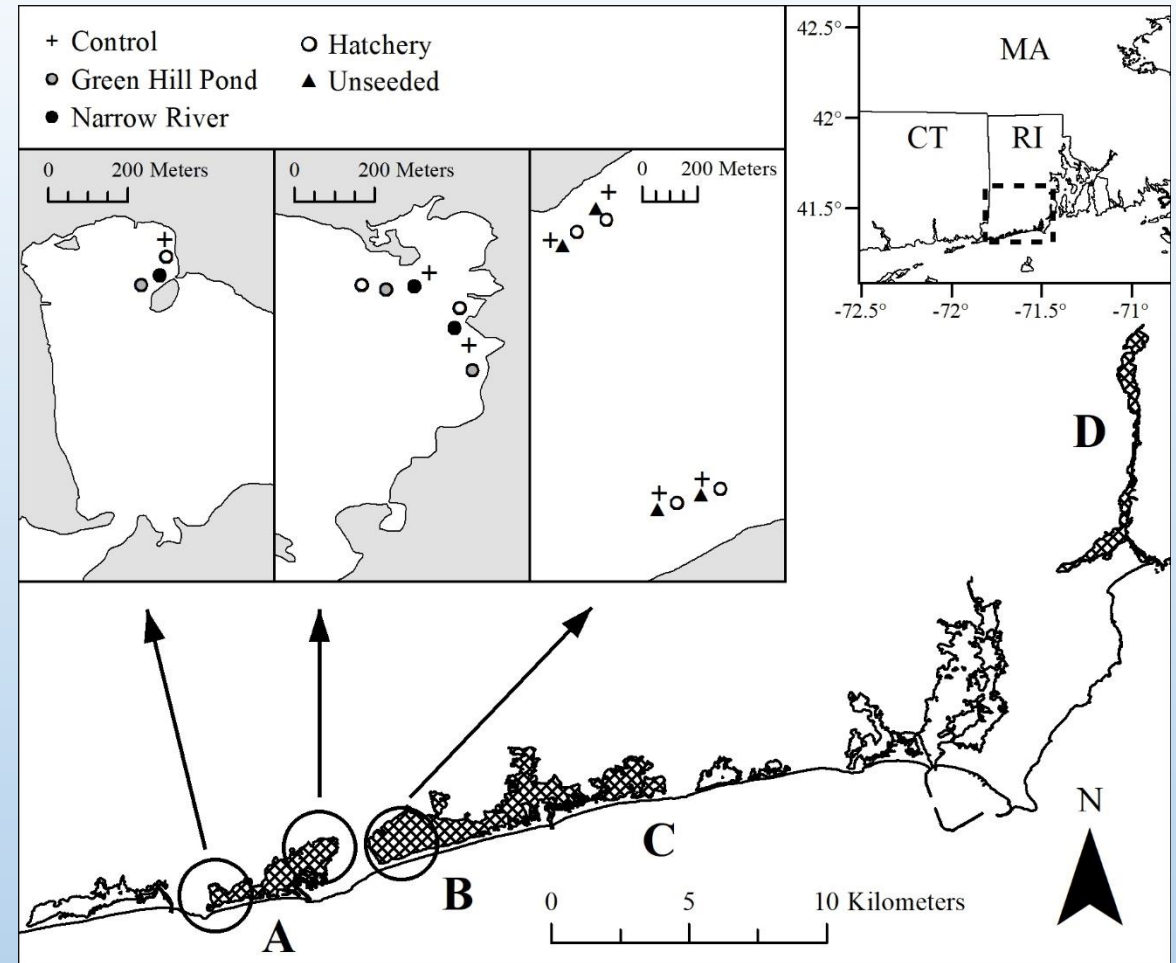
2. Fish Habitat Enhancement

- Partners: DMF, TNC, Northeastern Univ.
- Goal: Evaluate if the creation of oyster reefs can improve juvenile sportfish populations
- Process:
 1. Pre-enhancement baselines
 2. Create oyster reefs
 3. Post-enhancement monitoring to assess changes



2. Fish Habitat Enhancement

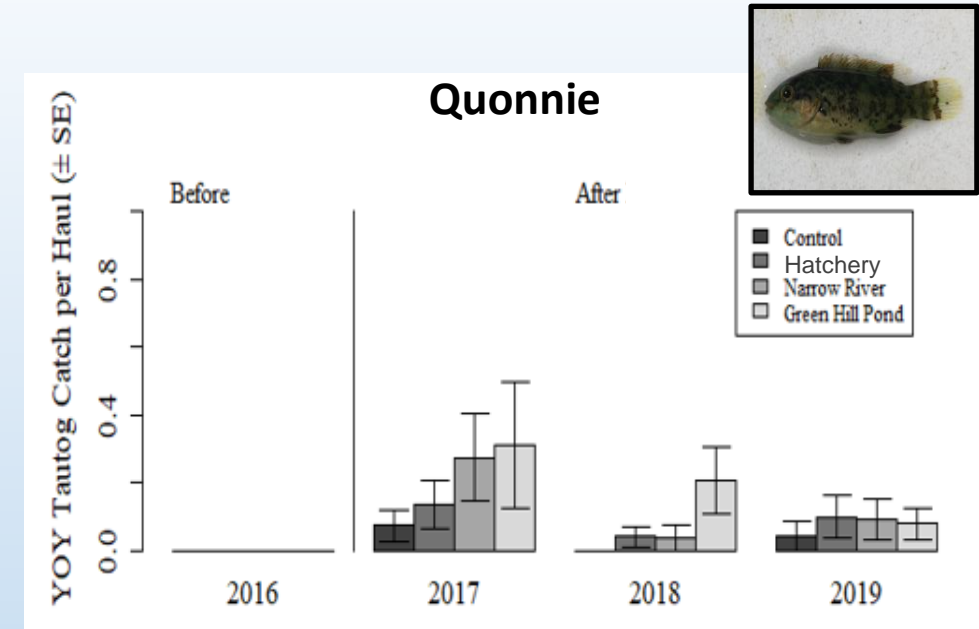
- Locations:
 - Quonnie: 2016 – 2019
 - 3 Regions
 - Control and 3 seeded
 - Ninigret: 2015 – 2019
 - 2 Regions
 - Control, unseeded, and seeded
- Monitoring
 - Oyster: Spring, Fall
 - Fish: Apr – Oct



Map of FHE Sites (Barrett et al. in review)

2. Fish Habitat Enhancement

- Creation of oyster reefs improve fish abundance
 - Reef-dwelling species
 - fish abundance increased after reef creation
- In progress
 - Assessing long-term fishery and habitat responses
 - Quantifying fisheries production

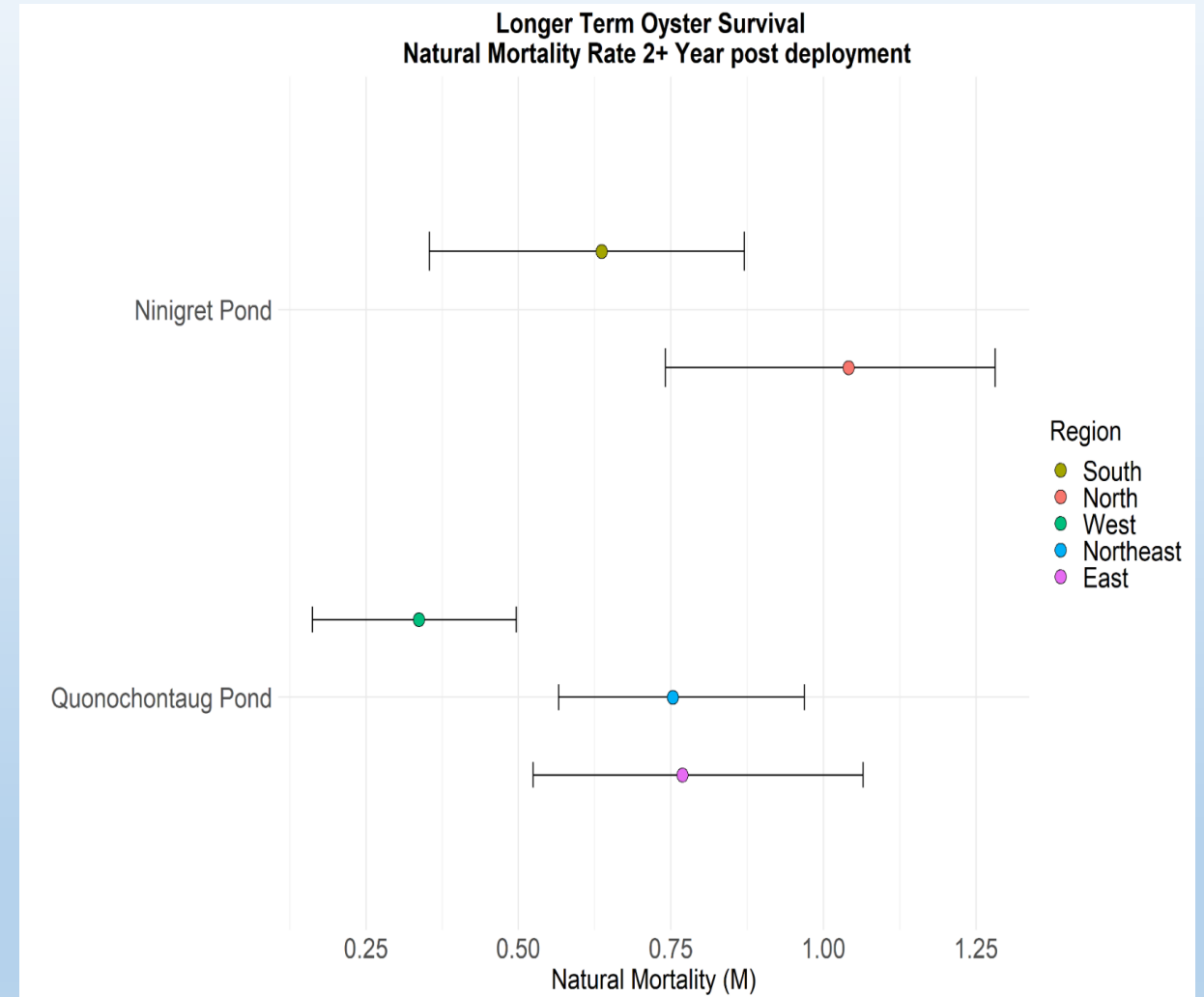


RI SPR 2020



2. Fish Habitat Enhancement

- Oyster Mortality
 - Differed
 - Between ponds
 - Between regions w/in ponds
 - Within region (not shown here)
 - Influenced by site-level factors
 - Source (lineage)



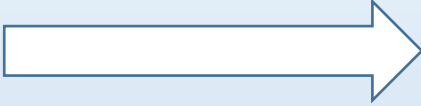
Median natural mortality (M) estimates for each region, with 95% CI (Barrett et al. in review).

Summary – EQIP and Fish Habitat Enhancement

- Cont. to improve restoration practices
 - RI EQIP now regional standard
 - Coastwide attention
- Reefs enhance fish abundance
 - Working to assess production
- Oyster survival varies within and between locations
- Recruitment limiting long-term sustainability



Challenges

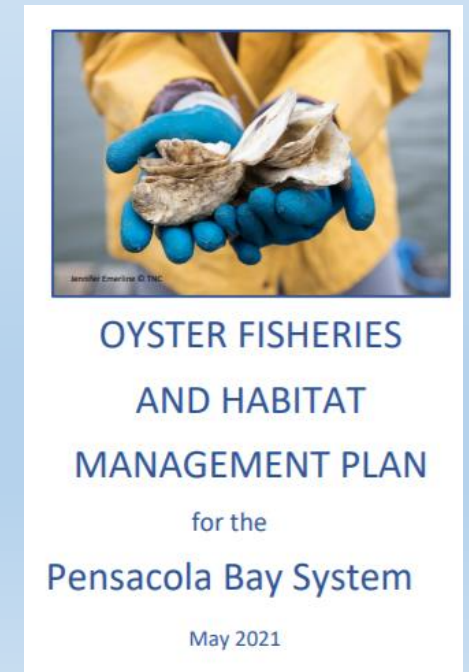
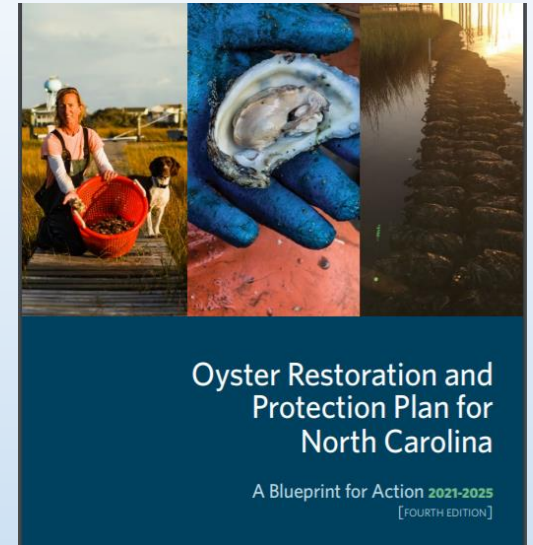
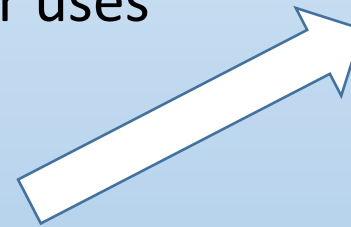
- Recruitment and survival
 - Improve site selection: HSI 
- Consider seascape-level attributes:
 - Connectivity to other populations
 - Minimize impacts habitats and conflicts with other uses

Enhancing Rhode Island's estuaries through habitat conservation and restoration planning



Challenges

- Recruitment and survival
 - Improve site selection: HSI
- Consider seascape-level attributes:
 - Connectivity to other populations
 - Minimize impacts habitats and conflicts with other uses
- Widely recognized need a cohesive overarching plan
 - Considers needs of stakeholders and managers
 - Address social and ecological data gaps
 - Improves outreach and engagement



RI Statewide Shellfish Restoration and Enhancement Plan (SREP)

- Partners: DMF, Pew Charitable Trusts, Northeastern Univ., NRCS



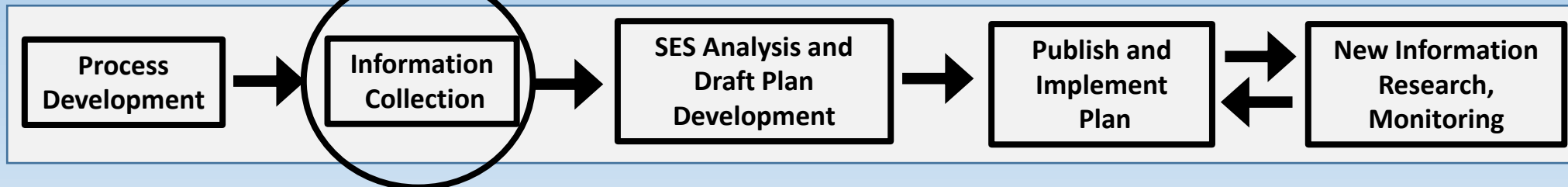
- Approach: Social-Ecological System (SES) approach to planning
 - Understanding dynamics of the natural and social environments and how influence one another
 - Participatory planning process
 - Stakeholders inform R&E priorities and goals

RI Statewide Shellfish Restoration and Enhancement Plan (SREP)

- Transparent and open process
- Leverage partnerships and expertise
- Multiple approaches & opportunities to participate
 - Meetings, webinars, workshops, or surveys
- **Join us! Contact: Eric.Schneider@dem.ri.gov for more information.**



Kickoff Spring
2022



Partners, Contributors, and Funding Sources



DEM
RHODE ISLAND



Roger Williams
University



THE RHODE ISLAND
Shellfish Initiative

Rhode Island
Shellfish Restoration Working Group

Rhode Island
Oyster Aquaculturists

Contact: Eric.Schneider@dem.ri.gov for more information