Marine community & population ecology

Biological invasions

Conservation biology

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3 Habitat Related Projects

• 1. Biogeography of Oyster Reef Functions

• 2. Ecosystem Effects of Novel Seaweed Invasion

• 3. Marsh-Upland Connections
Ecosystem Functions of Reefs

- Oyster Production (food)
- Fish Habitat
- Sediment stabilization
- Filtration—water quality/denitrification
Monitored Metrics

• **Physical**
  – Temperature
  – Salinity
  – Inundation
  – Slope
  – Topography
  – Flow
  – Landscape features
Monitored Metrics

• **Physical**
  – Temperature
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• **Biological**
  – Benthic Productivity
  – Invertebrates
  – Small, resident fish
  – Transient predators
  – Oysters themselves
  – Density, demography, filtration
3 treatments

• Control
3 treatments

- Control
- Meso-Predators
3 treatments

- Control
- Meso-Predators
- Higher Predators
2. Ecosystem Effects of Novel Seaweed Invasion
Gracilaria vermiculophylla
Major Findings

• Increasing *Gracilaria* biomass facilitated epifauna, particularly amphipods and snails

• Primary production of *Gracilaria* was variable, but massive in some areas

• The seaweed rapidly degraded upon burial, losing 79% of its mass in 10 days
3. Marsh-Upland Connections
Are marsh areas being delineated correctly?
Two histograms showing high tides in an estuarine area.

**Upper Histogram**
- Mar 2011 to Feb 2012
- Estuarine Area: N = 707
- Upland: 2.3%

**Lower Histogram**
- Mar 2010 to Feb 2011
- Estuarine Area: N = 705
- Upland: 1.6%
How are energy and species moving between these habitats?
Armases cinereum
Can we detect impacts of uplands on marsh?
Austrobilharzia variglandis

Lepocreadium setiferoides

Microphallus similis
Trematode Life Cycle
Experimental Oyster Reefs

- Subcage
- Focal oyster cluster
- Spat tile
- Clams (patch of 10)

3 m
Slope of interface affects extent of inland migration of marsh edge and estuarine area with sea level rise.
4 Areas of Active Research

- Biological Invasions
- Aquatic parasites (trematodes)
- Ecosystem Engineers
- Marine Biogeography