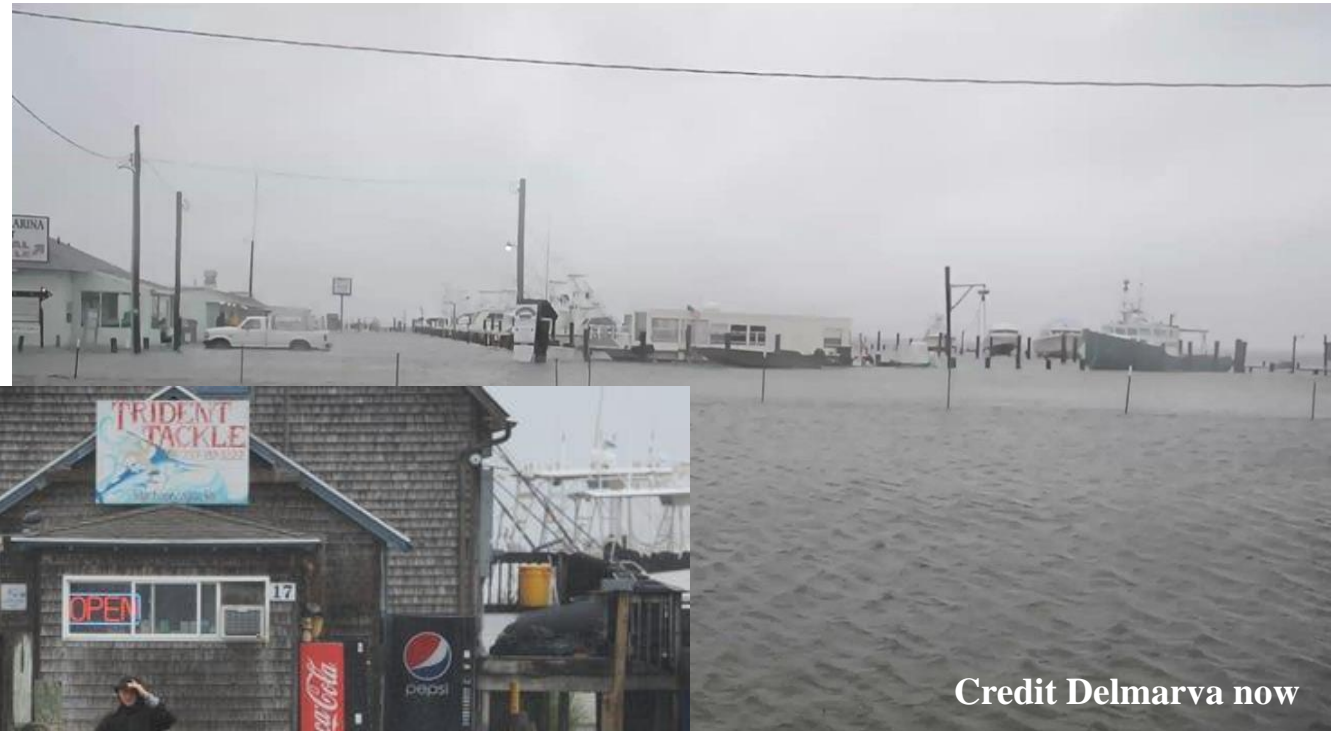




Wachapreague at risk



Credit Delmarva now





Marshes as natural buffers

marsh of particular importance
to Wachapreague

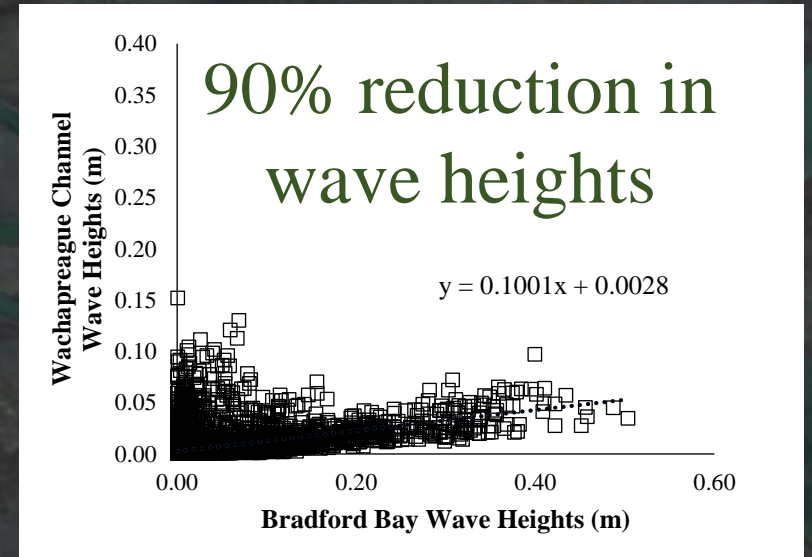


- Often the last defense to wind waves
- Stabilize sediments and reduce wave energy

Why is this marsh island so important?



Acts as first line of defense to wave activity



Wachapreague Channel

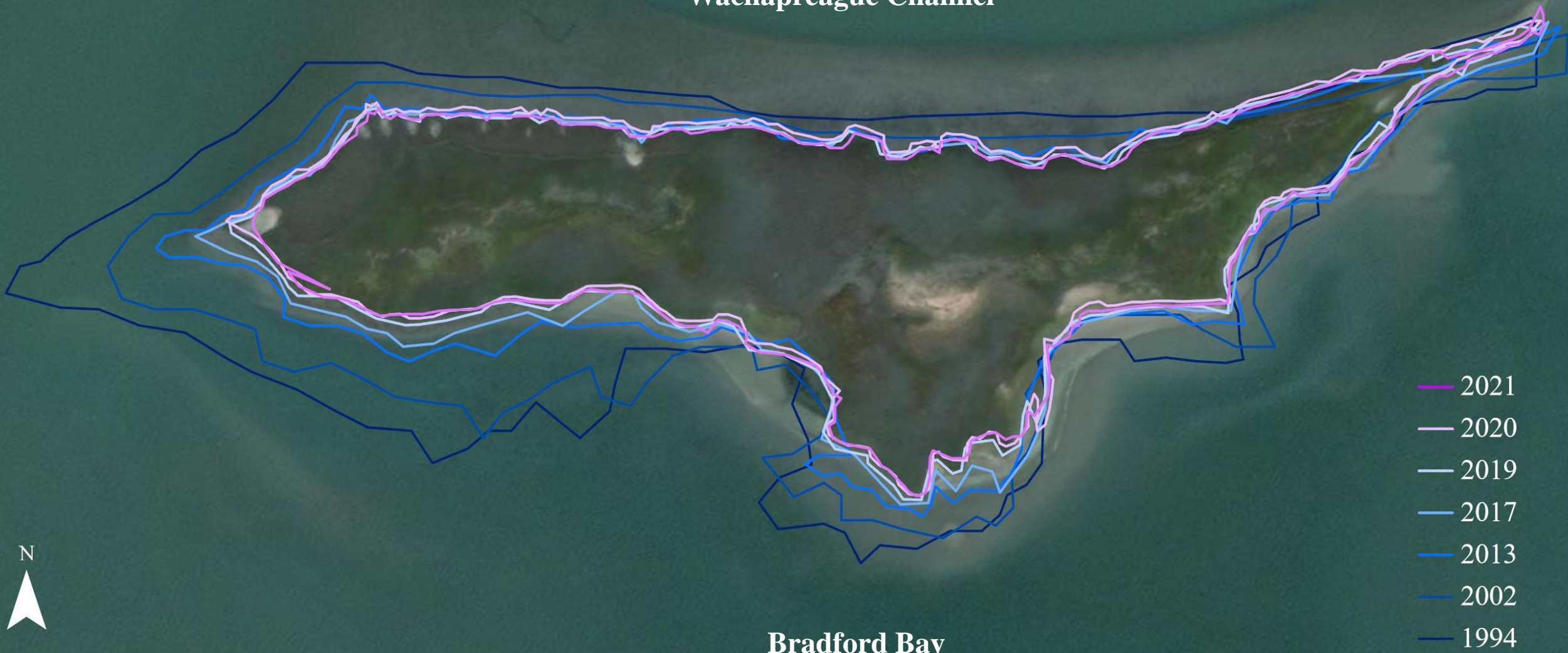


Bradford Bay



Erosion of marsh island since 1994

Wachapreague Channel

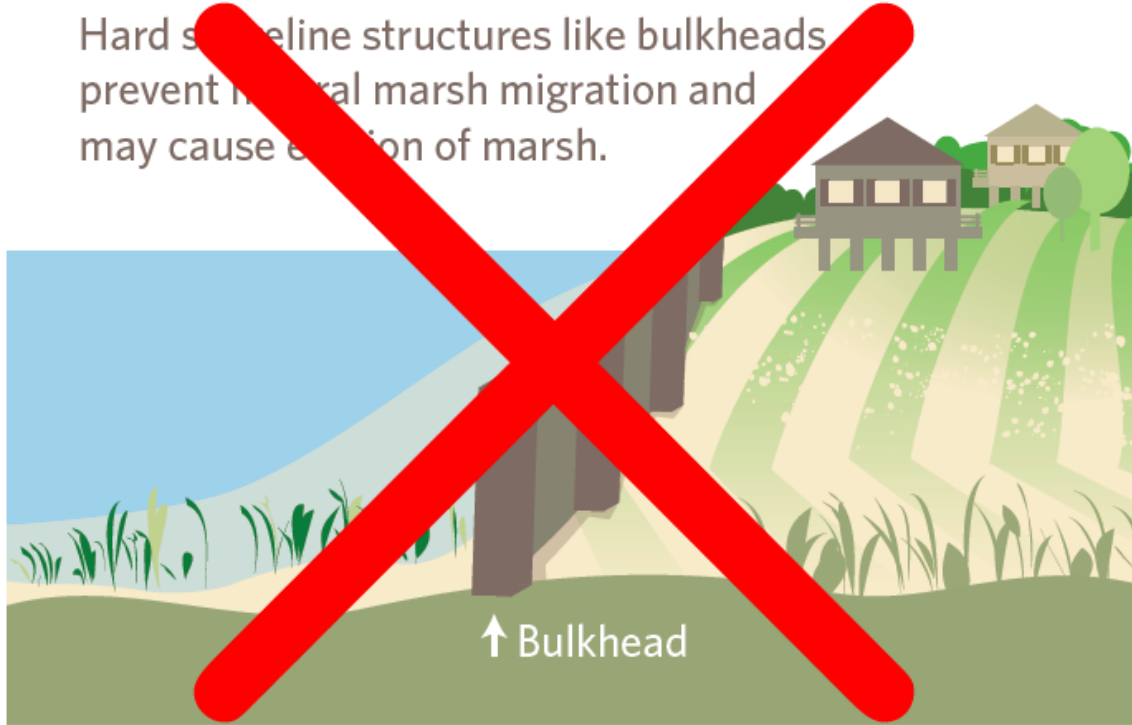


0 20 40 80 Meters

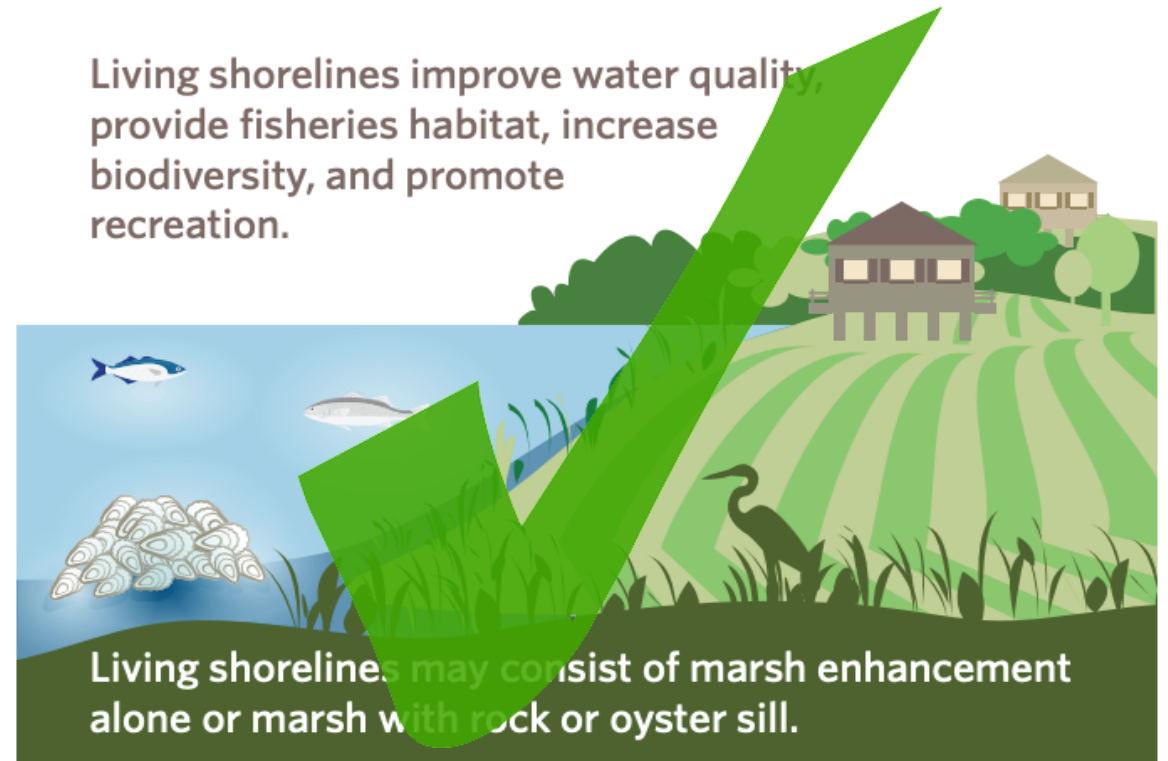


Shoreline protection approaches

Hard shoreline structures like bulkheads prevent natural marsh migration and may cause erosion of marsh.



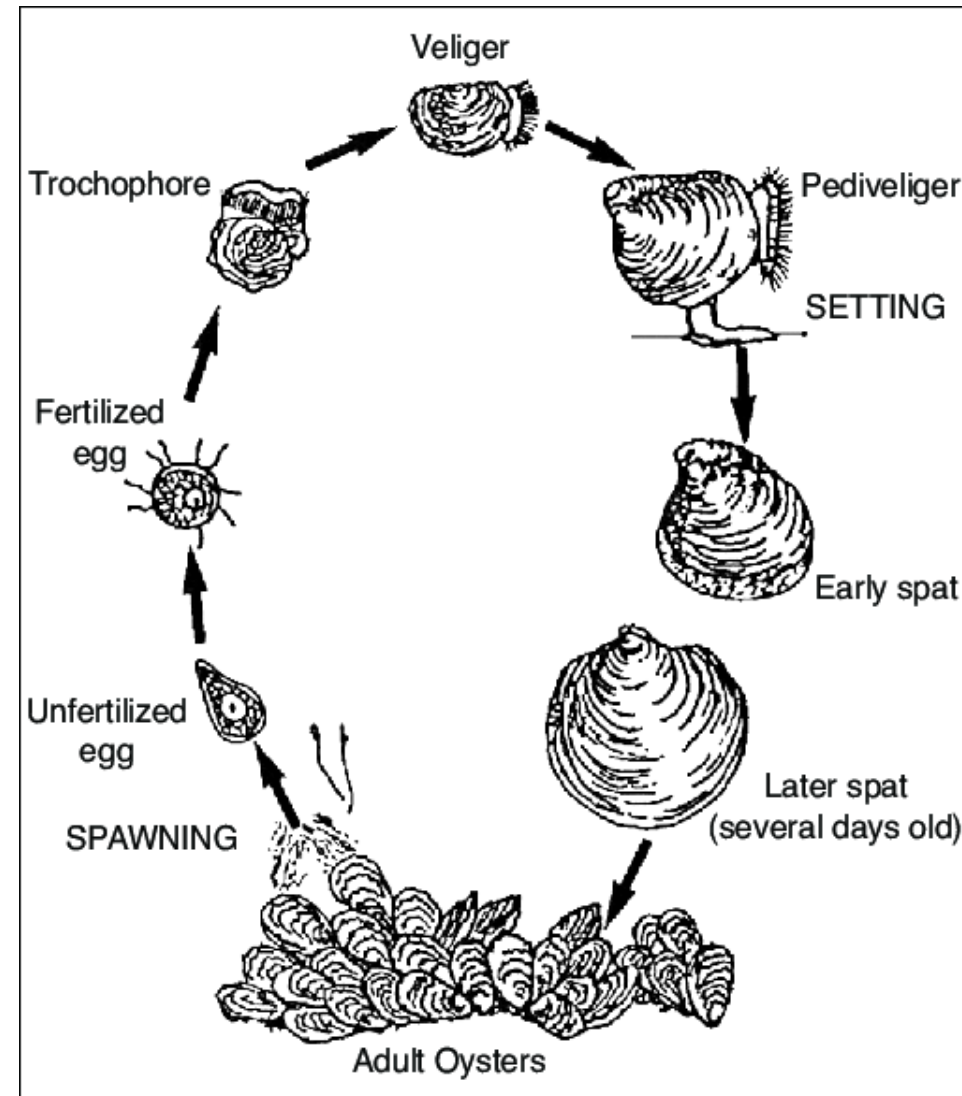
Living shorelines improve water quality, provide fisheries habitat, increase biodiversity, and promote recreation.



Living shorelines may consist of marsh enhancement alone or marsh with rock or oyster sill.

Credit TNC, 2017

What is an oyster?



Credit F. Rikard

Oysters as ecosystem engineers



Wave attenuation

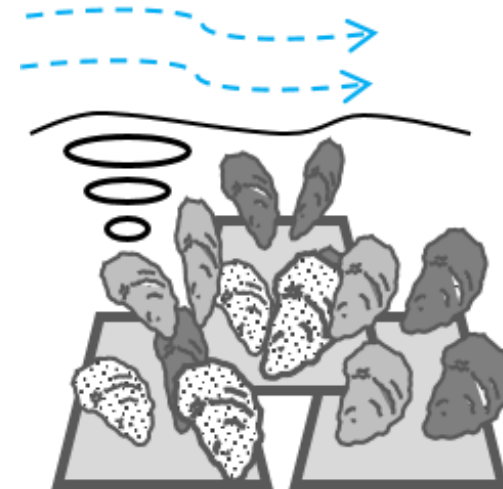
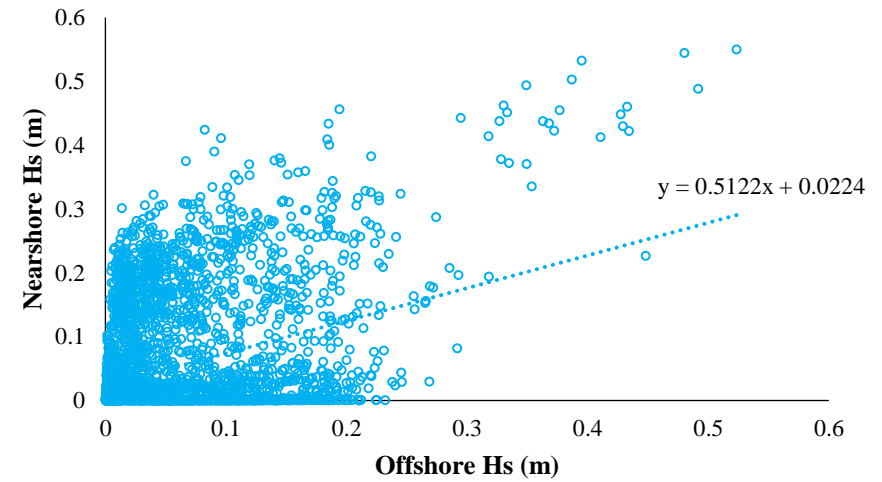
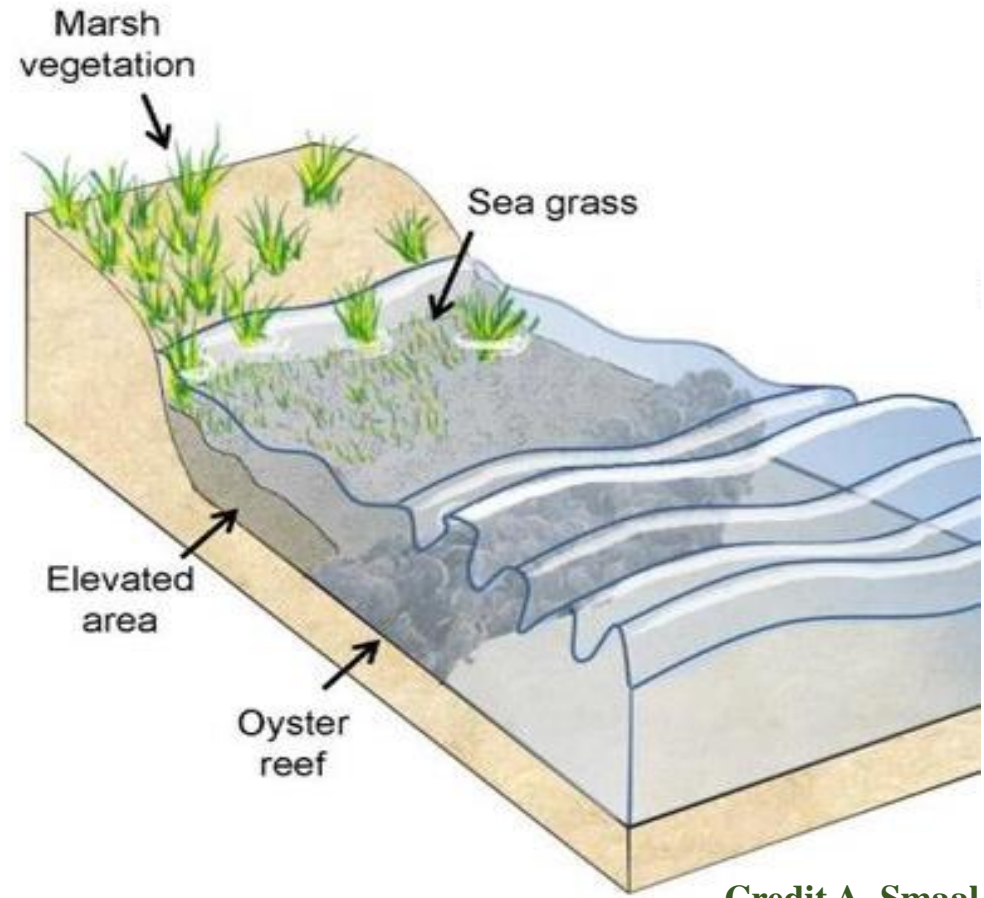
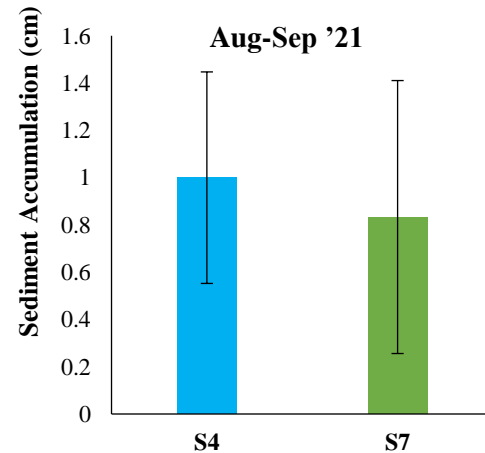
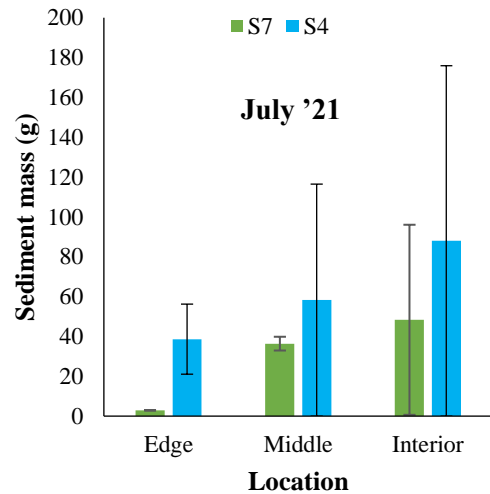


Figure from Ferguson 2010, adapted from Taube 2013.

Oysters as ecosystem engineers

Sediment accretion



Credit A. Smaal

Oysters as ecosystem engineers



**Habitat creation
and enhancement**



Credit B. Collins