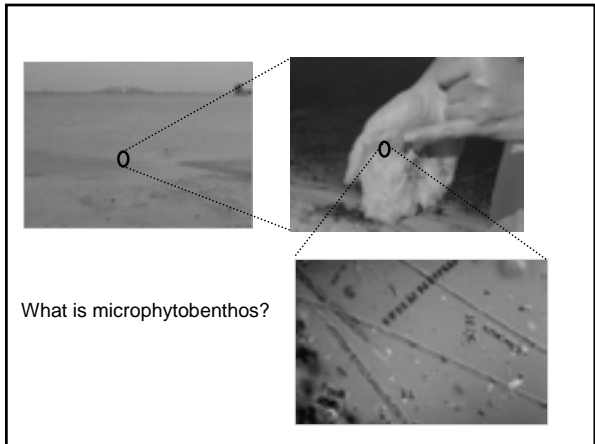
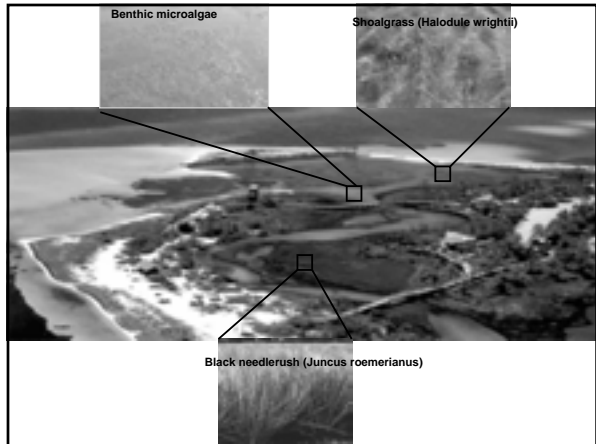
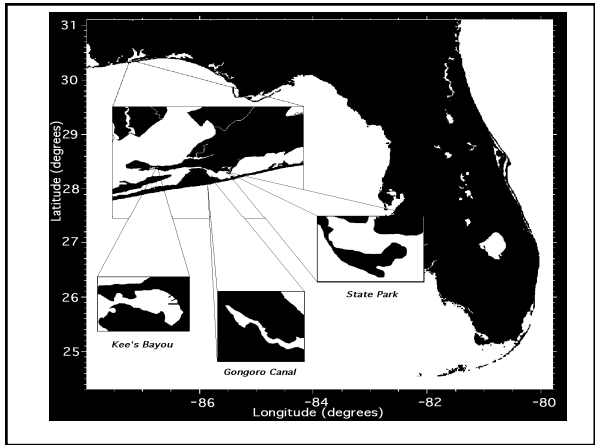
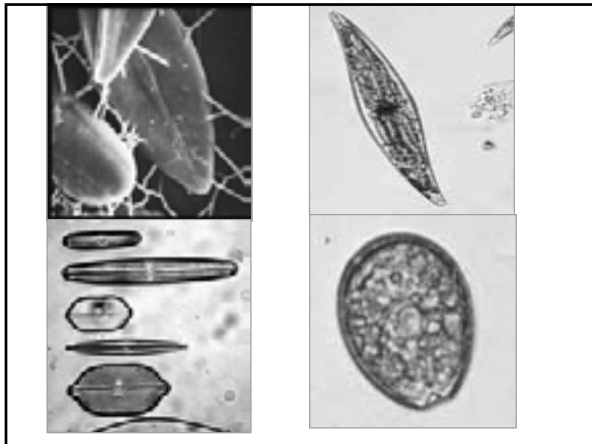


- ### Plan
- 1) **Shallow coastal lagoons**
 - 2) **Anthropogenic eutrophication**
 - 3) **Effects of anthropogenic eutrophication on shallow coastal lagoons**

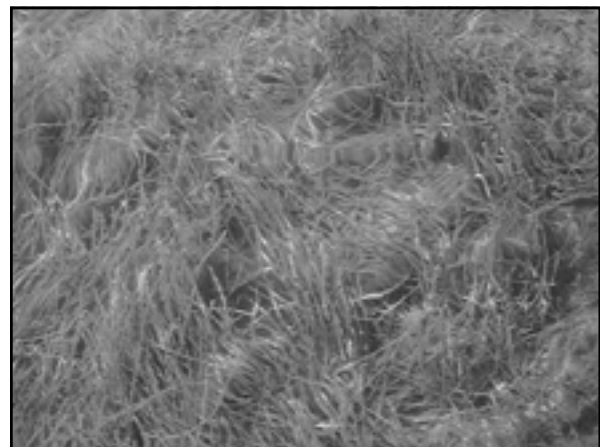
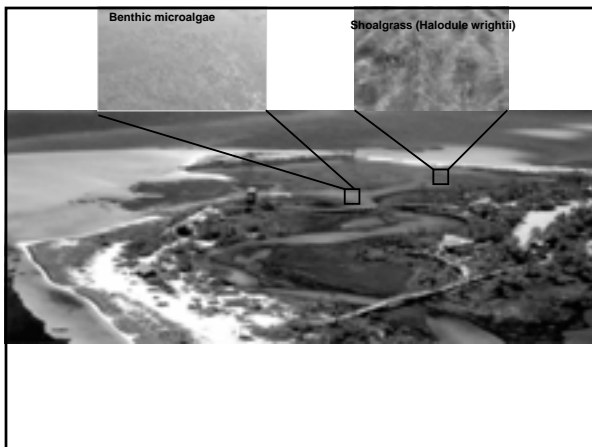
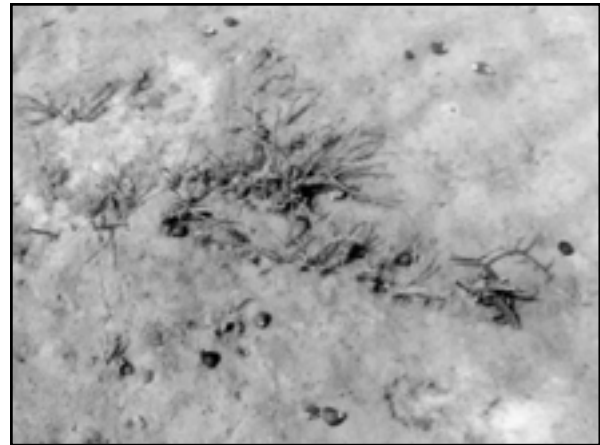
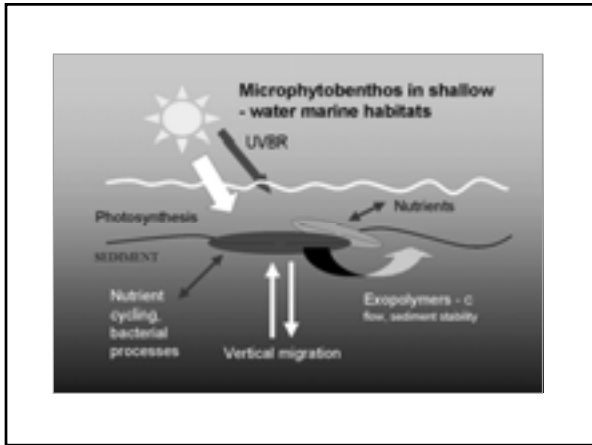


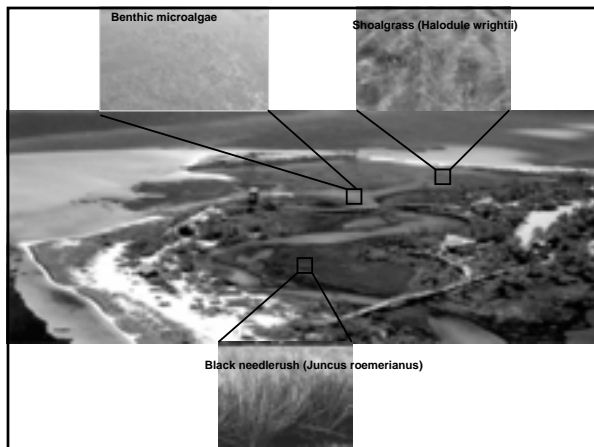
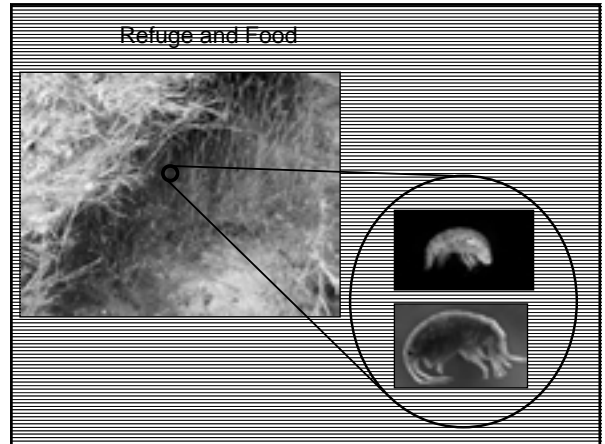
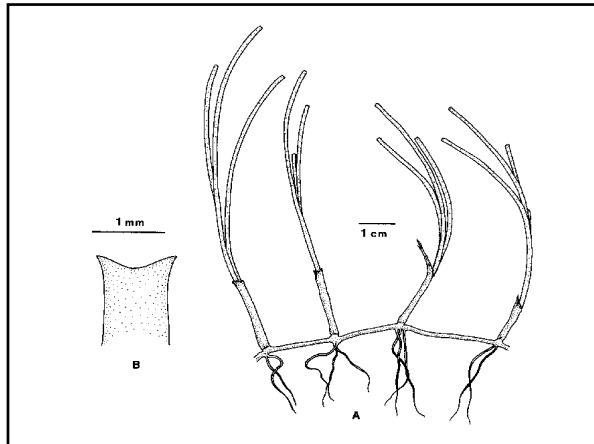


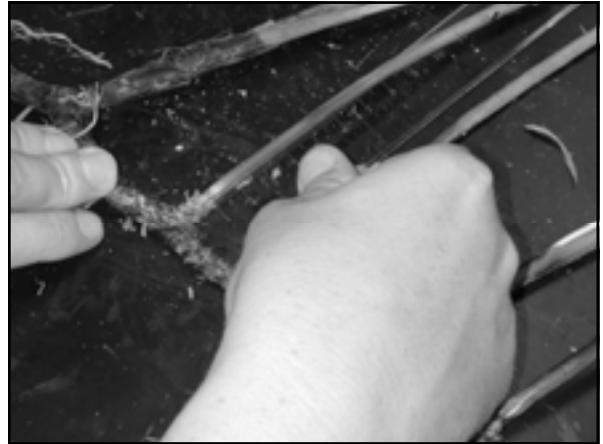
Microphytobenthos
play a number of important ecological roles

Moncreiff et al. 1992

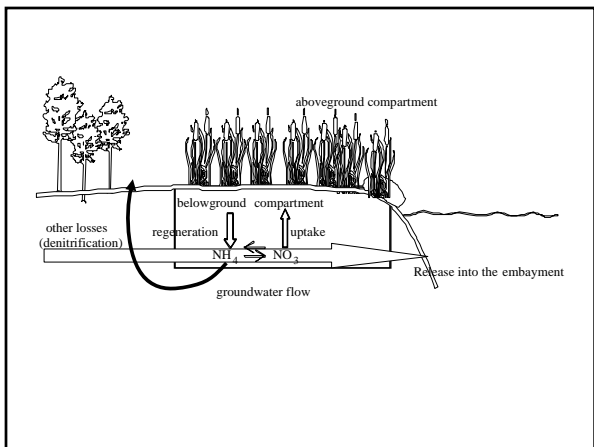
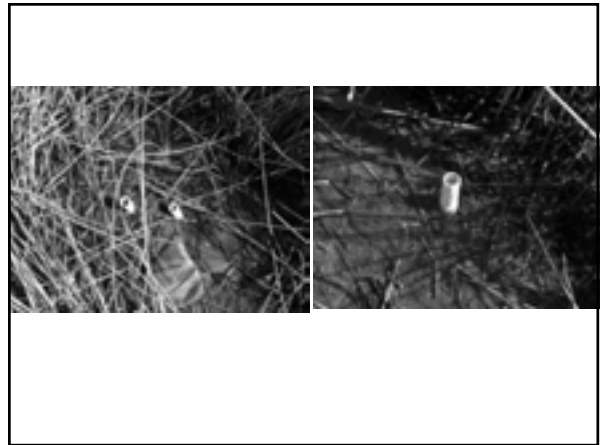
- 0 Significant primary producers at the m² scale and major producers at the landscape level
- 0 Sediment stabilizers
- 0 Important mediators of coastal biogeochemical cycles
- 0 Major food resources for benthic and pelagic consumers





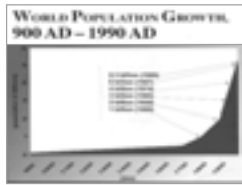


- Abundant level of shelter and refuge
- High levels of food for local and allochthonous consumers
- Carbon and Nutrient sinks
- Coastal builders
- Filters of land-derived nutrients



- ### Plan
- 1) **Shallow coastal lagoons**
 - 2) **Anthropogenic eutrophication**
 - 3) **Effects of anthropogenic eutrophication on shallow coastal lagoons**

Anthropogenic eutrophication: a world-wide problem



Large changes in land use of coastal watersheds

Anthropogenic changes in coastal watersheds

House development:



Anthropogenic changes in coastal watersheds

Farms, aquaculture facilities and golf courses



Anthropogenic use of coastal watersheds often leads to increased nutrient loading into coastal waters

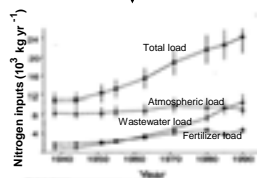
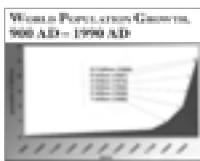


Watershed inputs

Point sources

Non-point sources

pervious
impervious



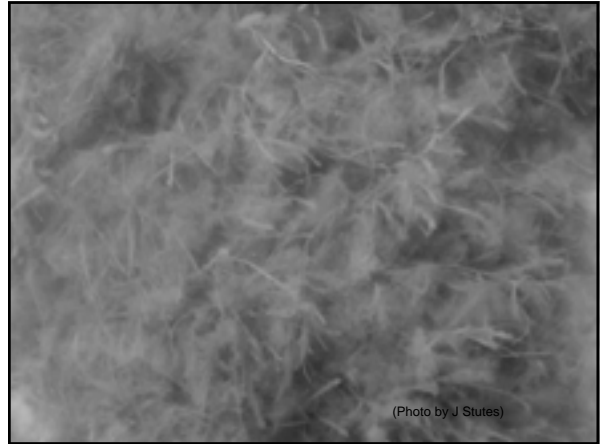
Bowen and Valiela 2001

Plan

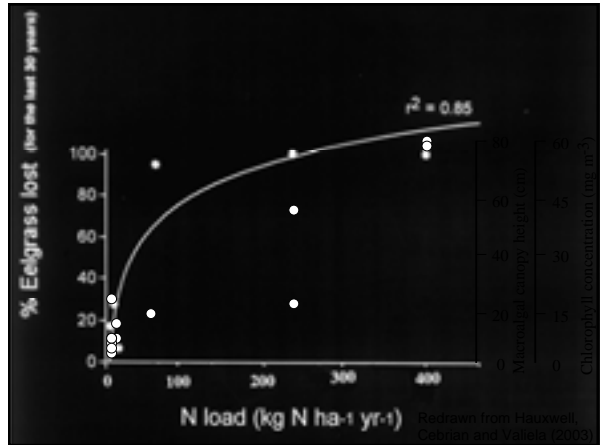
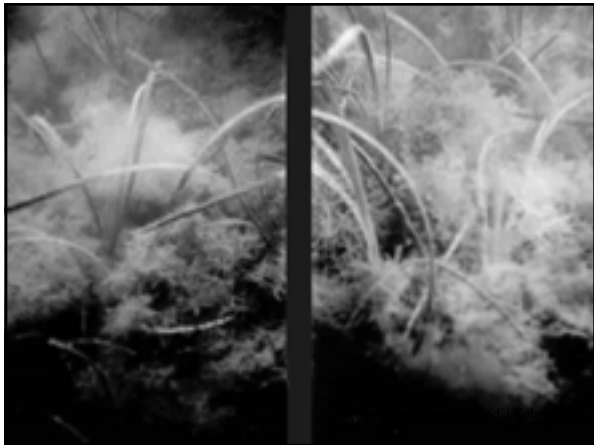
- 1) **Shallow coastal lagoons**
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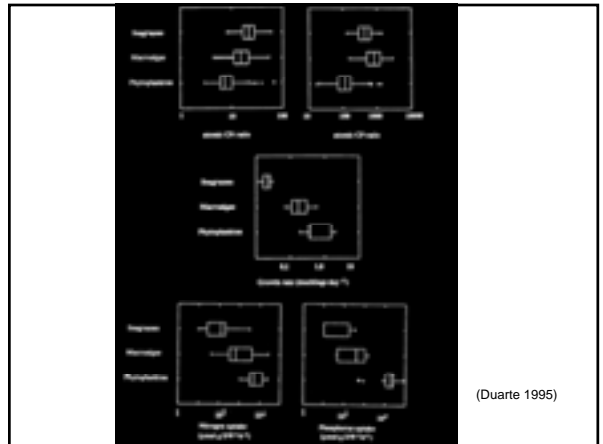
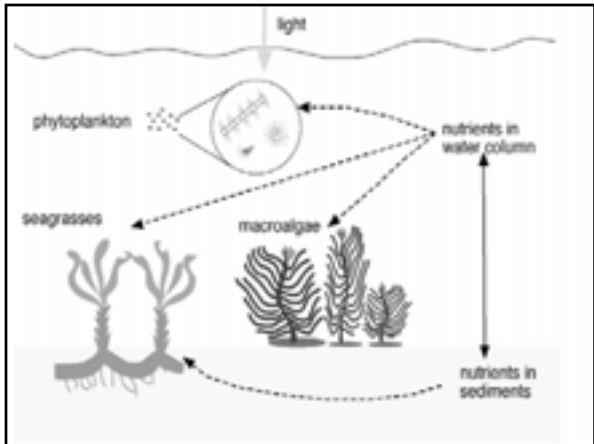
(Photo by J Hauxwell and J Cebrian)



(Photo by J Stutes)



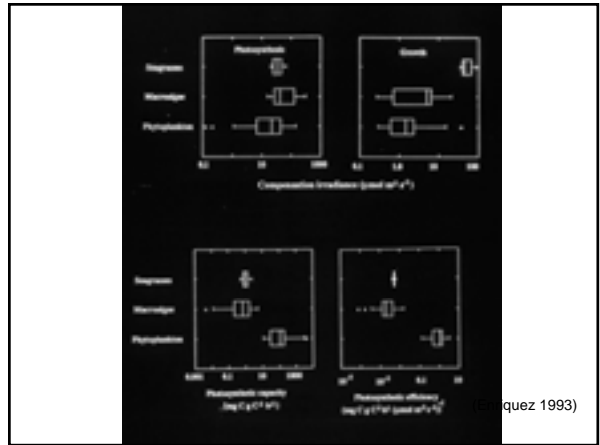
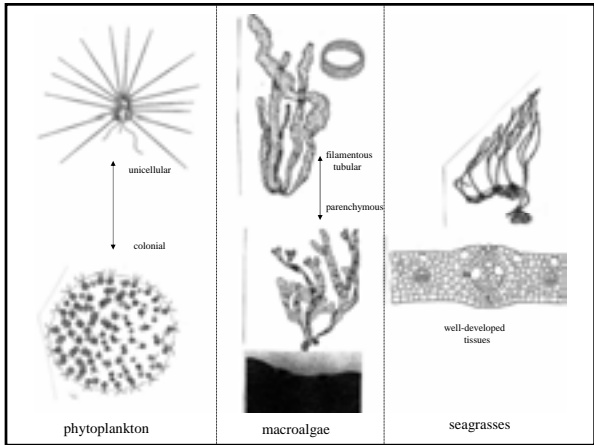
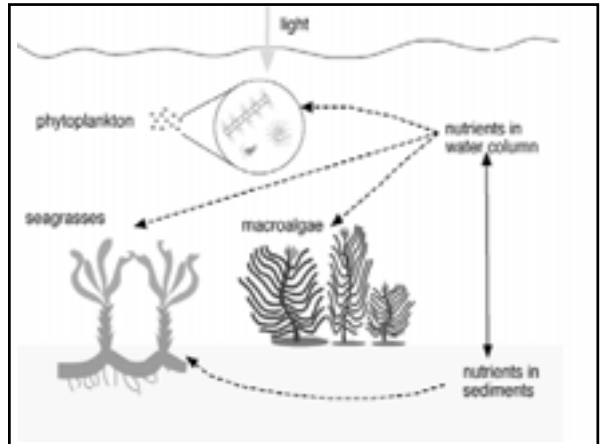
Redrawn from Hauxwell, Cebrian and Stutes (2002)



(Duarte 1995)

SO:

Susceptibility to nutrient limitation:
 phytoplankton>macroalgae>seagrasses



SO:

Susceptibility to nutrient limitation:
 phytoplankton>macroalgae>seagrasses

⇕

Susceptibility to light limitation:
 seagrasses>macroalgae>phytoplankton

