

## Primary production

What is primary productivity? Process of creating high energy organic material using solar energy

Gross vrs. Net primary productivity

Standing crop (low) and turnover rates (high) in the ocean

Factors affecting primary productivity:

- light
- nutrients
- herbivore grazing

## Characterizing the open ocean

Generally low primary productivity

Patchy primary productivity

Seasonal patterns:

- Temperate seas
- Warm (tropical) seas
- Polar seas

Often inverted trophic pyramids

## Shore habitats: soft bottom

- Wetlands: Importance
- Wetlands: destruction
- Sea Grass communities
- Mangroves
- Estuaries
- Physical characteristics
- Organisms and adaptations
- Conservation issues

## Wetlands

- Wetlands are giant 'sponges', at the base of a *watershed*
- They are an important land/ocean interface
- They have very high primary productivity
- These nutrients flow to the ocean
- They tend to be shallow, and often in the process of 'filling in'
- Primarily soft bottomed
- Important nursery areas for many species

## Wetlands: conservation/management

- High sediment loads with long residence times
- Leads to toxin build-ups and biomagnification
- Filling in
- Introduced species (invasives)
- Pollution and seepage
- Damming and diversion

## Characteristics of Sea Grass communities



Heather Dine - Florida Keys NMS

- Soft bottoms
- High primary productivity
- Shelter for many species
- Stabilizes and acts as a wave break
- Leads to sand/mud build-up, sometimes leading to succession into terrestrial communities

### **Destruction**

- Dredging
- Runoff
- Construction
- Overfishing
- Pollution and sewage
- Role?

### **Mangroves**

- Primarily in the tropics
- Flowering (salt tolerant) plants
- Build islands: sedimentation
- Stabilize
- Zonation moving inland
- Protection for juveniles
- High primary productivity\*\*\*
- Shallow root systems
- Soft bottoms (hard roots provide habitat)

### **Mangroves: Destruction**

- Cutting for wood and construction
- Cutting for mosquitos
- Insect control: insecticides
- Overfishing
- Lack of knowledge about the system
- Storms/episodic events (El Nino)

### **Shore habitats: soft bottom**

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- Wetlands: destruction
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  - Organisms and adaptations
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