

## Terrestrial vs Aquatic Biomes

Terrestrial   Aquatic

Buoyancy  
Viscosity  
Temperature  
Autotrophs

Oxygen

Limits to NPP

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## Consequences of living in water

- High buoyancy reduces need for massive structural components & animals can be large.
- High viscosity increases the E required for movement.
- Constancy of temperature increases the sensitivity of organisms to rapid changes in temperature.
- Autotrophs are small & float near the surface where light penetrates.

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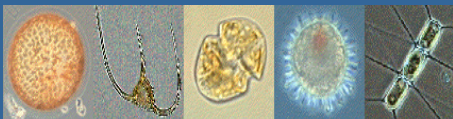
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## Three categories of aquatic organisms

- Plankton –

Phytoplankton -



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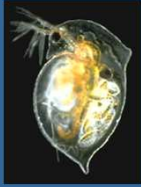
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• Plankton –

Zooplankton -



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• Nekton -



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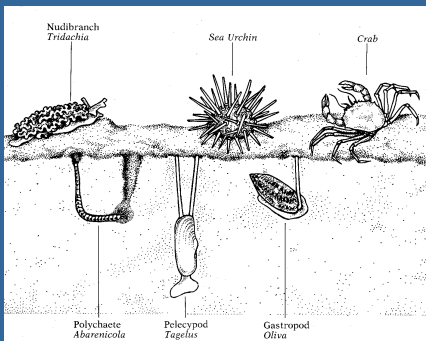
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• Benthos -



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## Marine habitats are classified on the basis of :

- Depth & the distance from the shore.
- Open water or bottom.
- The ability of light to penetrate.

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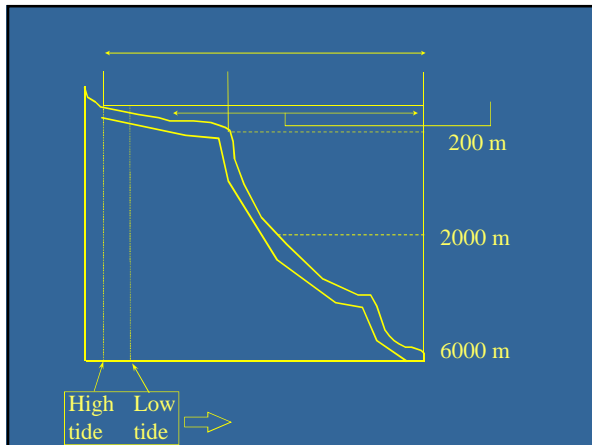
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## Ocean Biome

Intertidal - stressful

Neritic - highly productive WHY???

Oceanic - ~ 88% of ocean

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### Creatures from the Abyss



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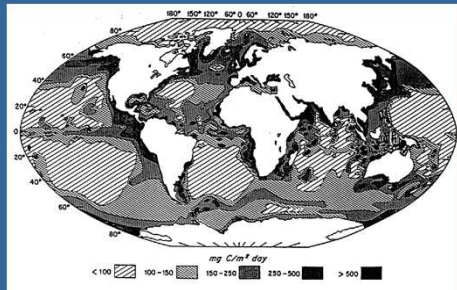
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### Productivity of the oceans



Highest productivity per unit area: coastal & upwelling areas.  
However, open ocean accounts for 76% of total.

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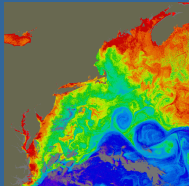
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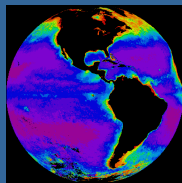
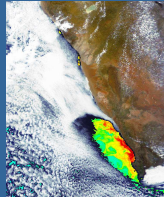
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### Ocean Productivity Viewed from Satellite Images

East Coast USA



West Coast S. Africa



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## Biomes Provide a Useful Classification For Global Estimates

**Table 5.2** Primary Production and Biomass Estimates for the World\*

Ecosystem	Area (10 <sup>6</sup> m <sup>2</sup> )	Mean plant biomass (kg C/m <sup>2</sup> )	Carbon in vegetation (10 <sup>6</sup> g)	Mean net primary production (g C/m <sup>2</sup> /yr)	Net primary productivity (10 <sup>6</sup> g/yr)
Tropical wet and moist forest	10.4	15	156.0	800	8.3
Tropical dry forest	7.7	6.5	49.7	620	4.8
Temperate forest	9.2	8	73.3	650	6.0
Boreal forest	15.0	9.5	143.0	430	6.4
Tropical woodland and savanna	24.6	2	48.8	450	11.1
Temperate steppe	15.1	3	43.8	320	4.9
Desert	18.2	0.3	5.9	80	1.4
Tundra	11.0	0.8	9.0	130	1.4
Wetland	2.9	2.7	7.8	1500	3.8
Cultivated land	15.9	1.4	21.5	760	12.1
Rock and ice	15.2	0	0.0	0	0.0
Global total	145.2		558.8		60.2

\*From Houghton and Skole (1990).

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