

II. The 3-Layered Dilemma

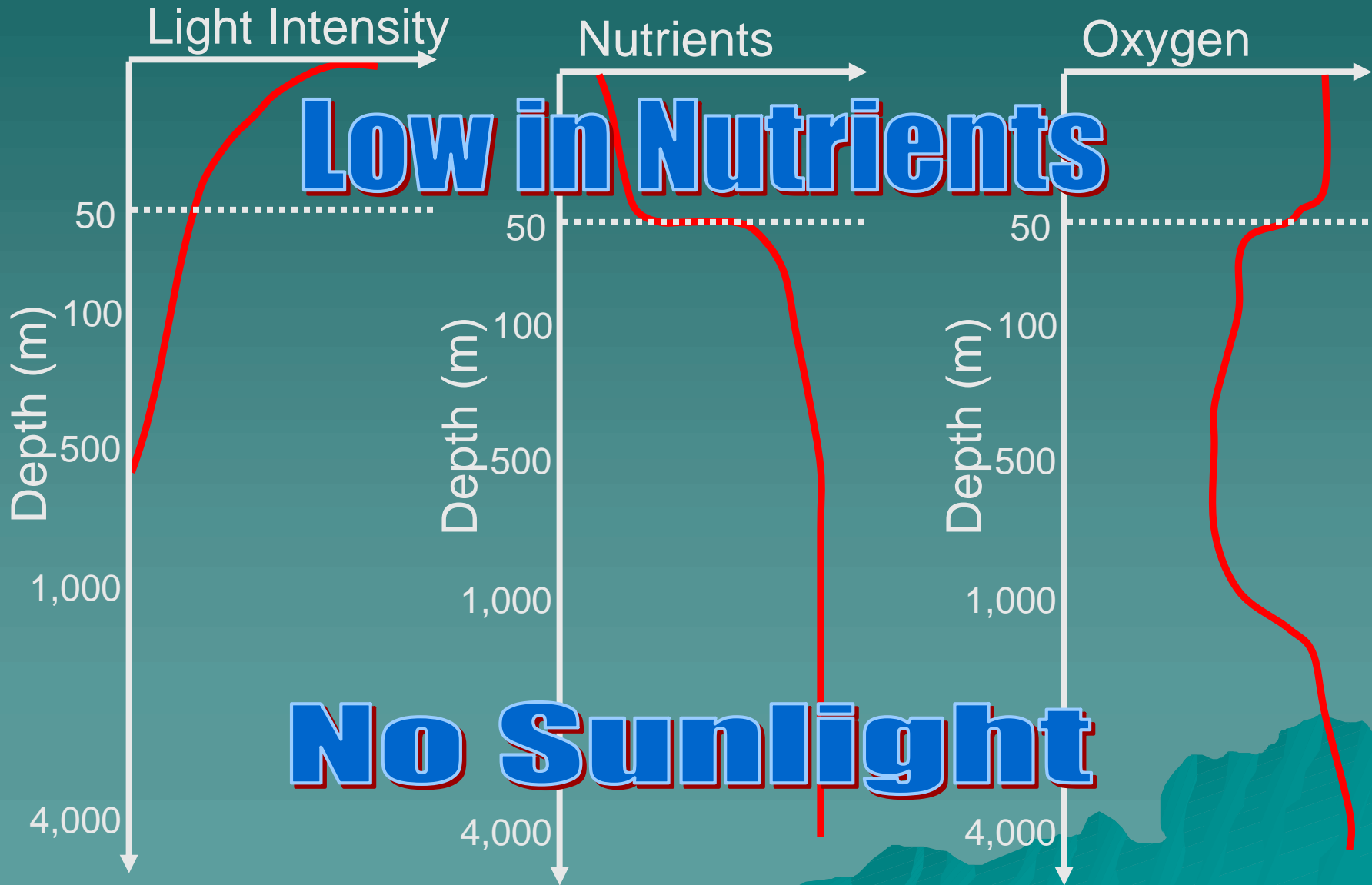
- ◆ Oceans cover 70%, but most of the ocean has little or no life.
- ◆ The physical properties of ocean water strongly influence where life occurs in the ocean.

Requirements for Ocean Life

Life requires 3 things to exist.

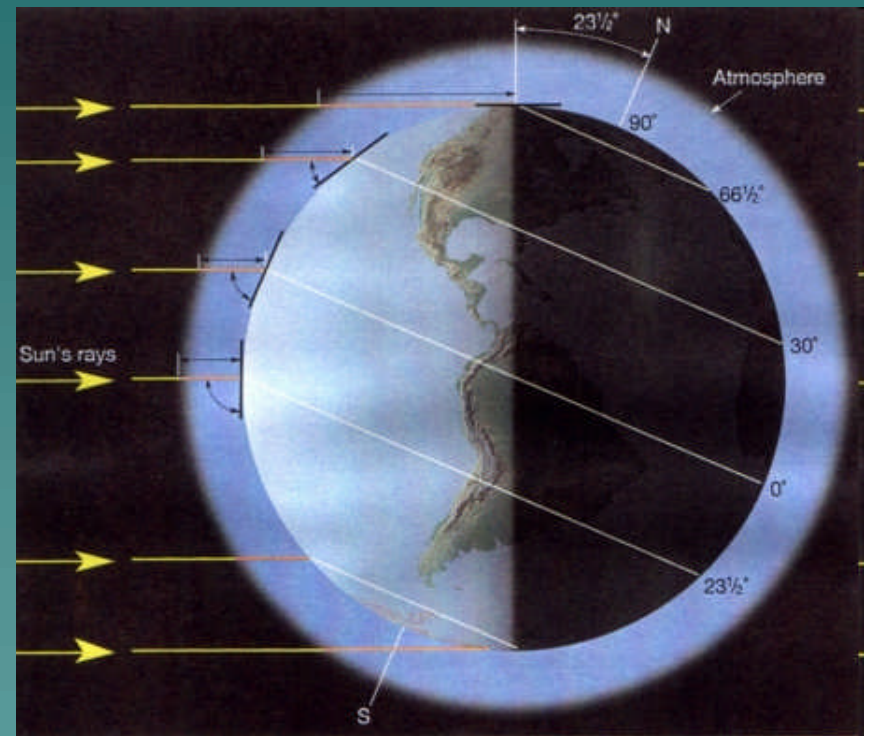
- ◆ **Sunlight** – Energy supply for photosynthesis
- ◆ **Nutrients** – nitrogen and phosphate are used to build important biomolecules (think of fertilizer)
- ◆ **Oxygen** – Used for cellular respiration

Dilemma for Life in the Ocean

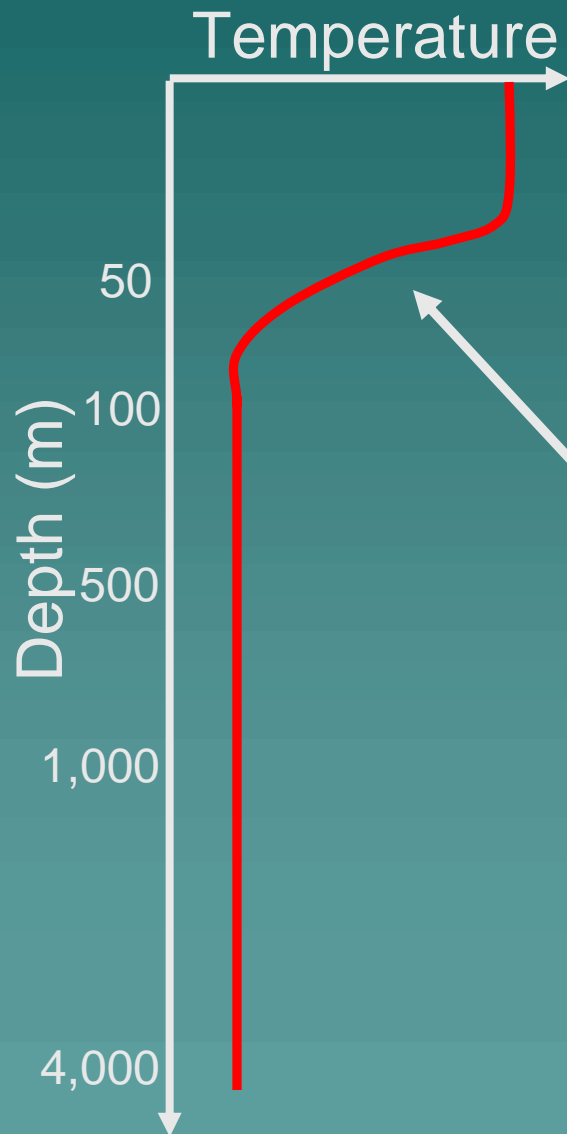


Temperature

- ◆ Surface temperature mostly affected by angle of sun.



Temperature and Depth



Thermocline: Layer of ocean 300-1000 meters deep where there is a rapid change in temperature.

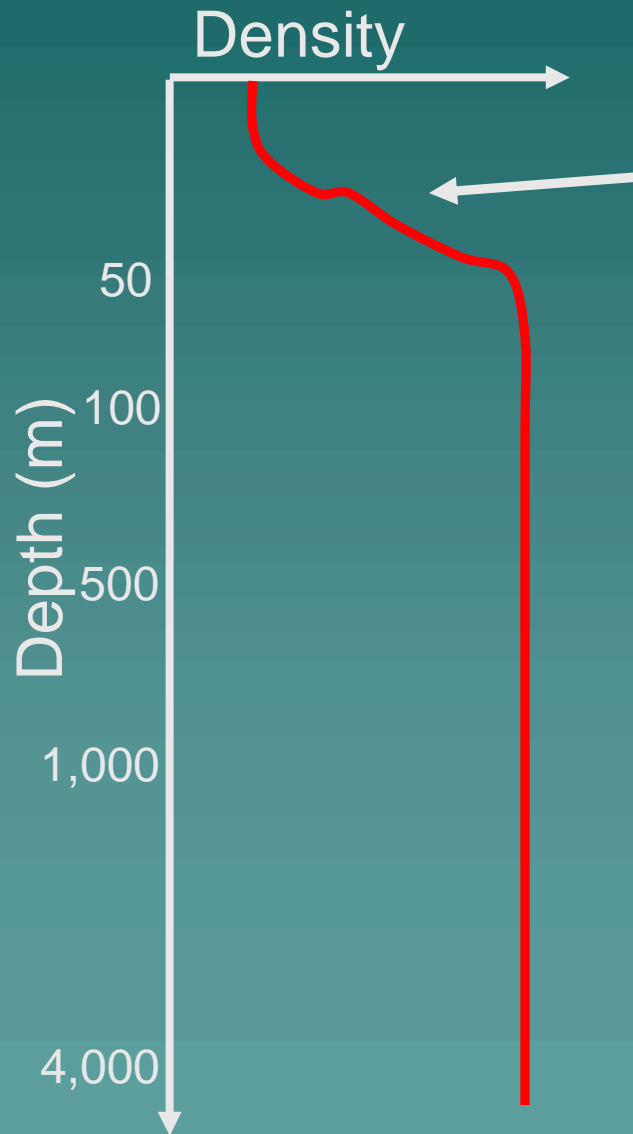
Thermo = Heat

Cline = Slope (recline, incline)

Seawater Density

- ◆ **Density** is affected by temperature and salinity.
- ◆ ↑ temperatures → ↓ density.
- ◆ ↑ salinities → ↑ density.

Density and Depth



Pycnocline: Layer of ocean 300-1000 meters deep where there is a rapid change in density.

Pycno = density

Cline = Slope (recline, incline)