

## Handout Kuliah Minggu 3 – TINJAUAN UMUM EKOSISTEM AKUATIK

Pokok Bahasan Kuliah:

### SIKLUS HIDROLOGI

#### EKOSISTEM MARIN/LAUT

- Arus air (*current*), gelombang (*waves*) dan pasang-surut (*tide*)
- Zonasi laut: istilah *epipelagic*, *mesopelagic*, *bathypelagic*, fotik, afotik dsb.
- Contoh-contoh ekosistem (termasuk lahan basah): muara, terumbu karang, rawa payau, mangrove dsb.

#### EKOSISTEM AIR TAWAR

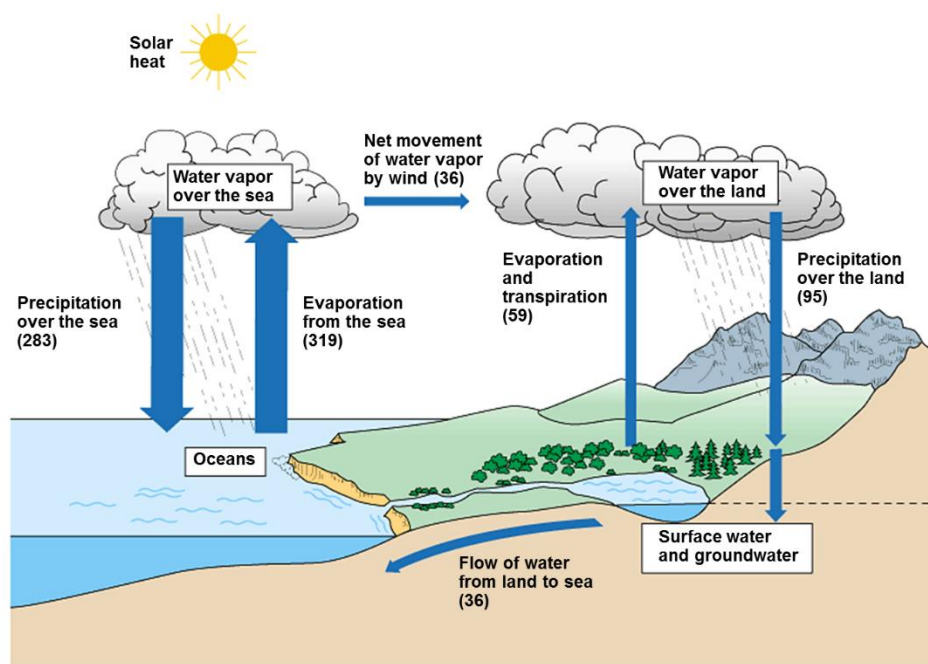
- Faktor-faktor fisika-kimia
- Danau:
  - Zonasi: istilah litoral, limnetik, epilimnion, metalimnion, hypolimnion dsb.
  - Stratifikasi termal/perubahan musiman/*turnover*
  - Kondisi eutrofik dan oligotrofik
- Sungai:
  - Lingkungan sungai
  - *River continuum concept*

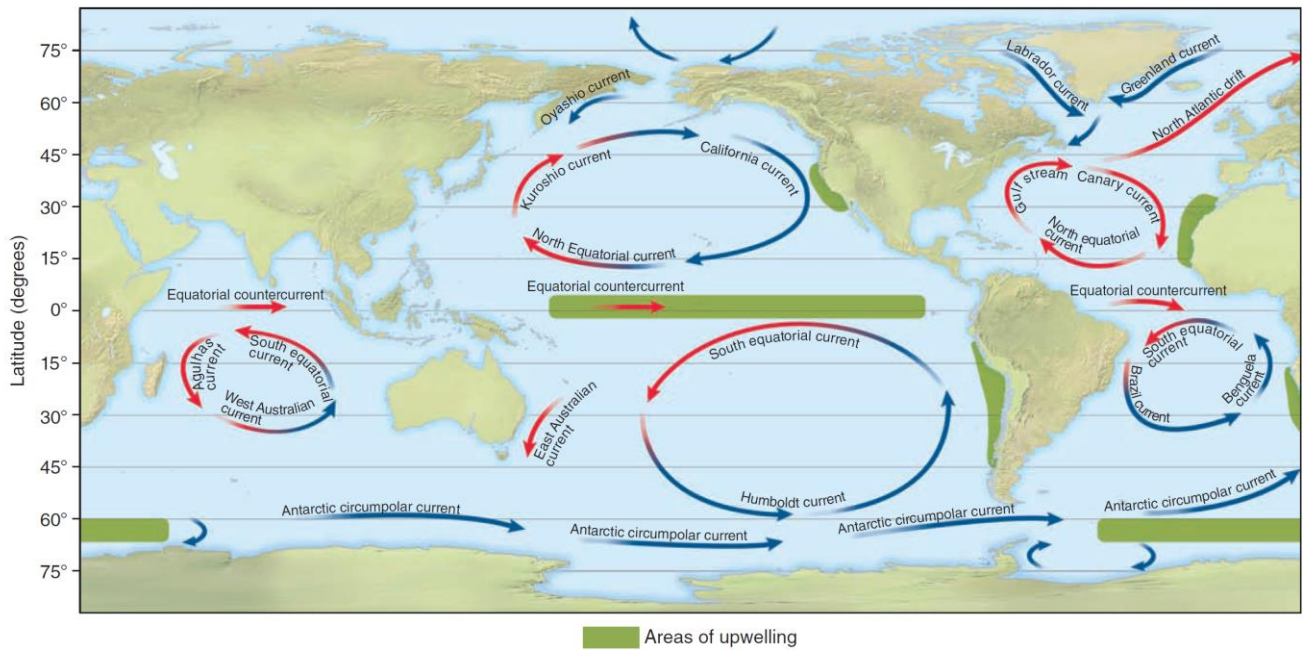
Sumber ilustrasi:

Campbell, N.A. & J.B. Reece. 2002. Biology. 6<sup>th</sup> edition. Benjamin Cummings, San Francisco: **Gambar 50.10; 54.16**

Molles, M.C.Jr. 2015. Ecology: concepts and applications. 7<sup>th</sup>. Edition (atau edisi lainnya). McGraw-Hill, New York. Dari 4<sup>th</sup> edition (2008): **Gambar 3.30; 3.34; 3.37; 3.38; 3.39**

Stiling, P. 2012. Ecology: global insights and investigations. McGraw-Hill, New York: **Gambar 23.1; 23.3; 23.7; 23.10**



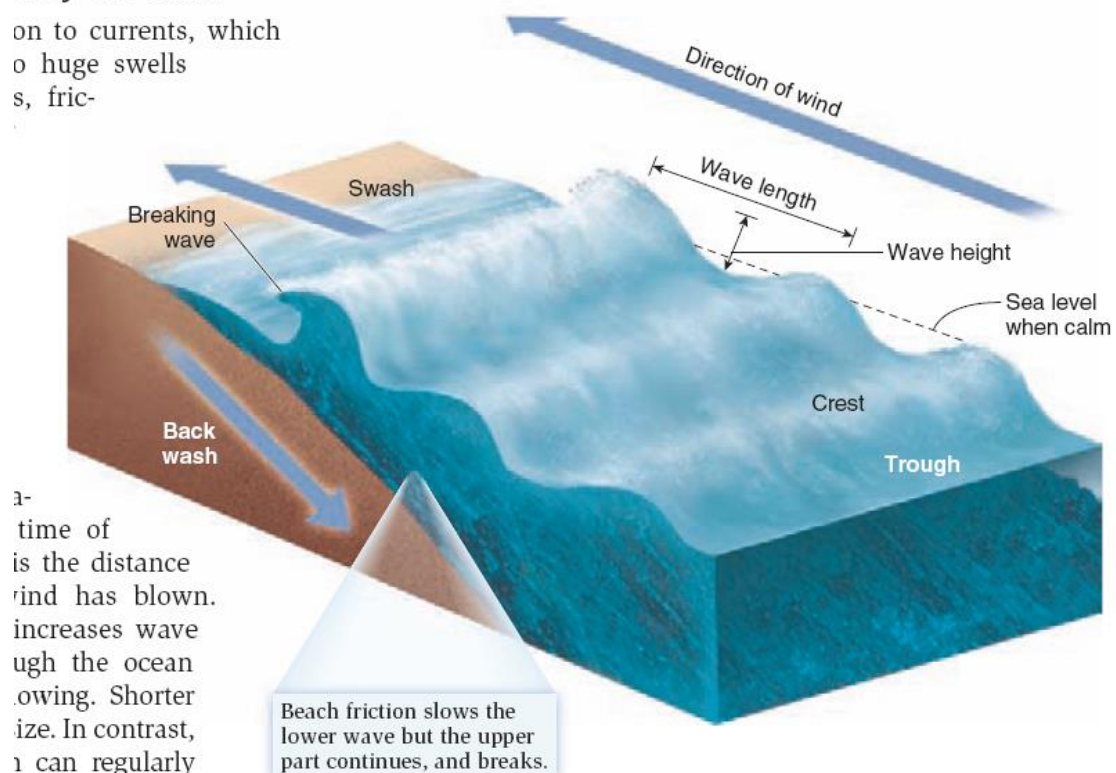


**Figure 23.1** Ocean currents of the world. The red arrows represent warm water; the blue arrows, cold water. Upwelling zones are shaded.

#### ECOLOGICAL INQUIRY

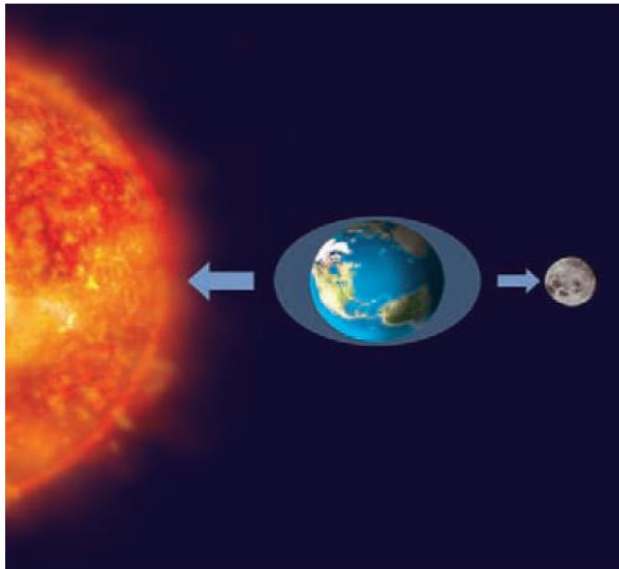
Based on this figure and our discussion of fog in Chapter 22, where might fog constitute an important source of moisture to terrestrial biomes?

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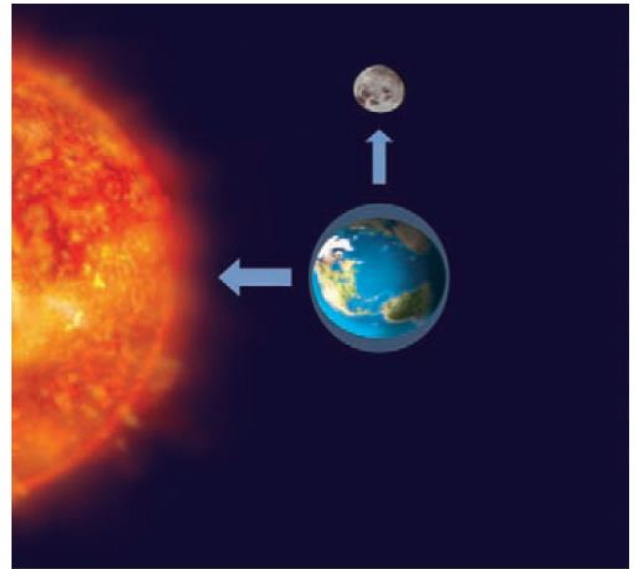


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**Figure 23.3** Wave formation in the ocean.



(a) Spring tide



(b) Neap tide

**Figure 23.7** Tide formation. (a) Spring tides form when the sun, Earth, and moon are in alignment. (b) Neap tides result when the sun, moon, and Earth are at a  $90^\circ$  angle.

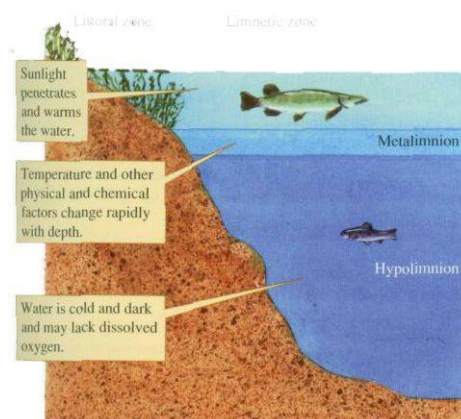
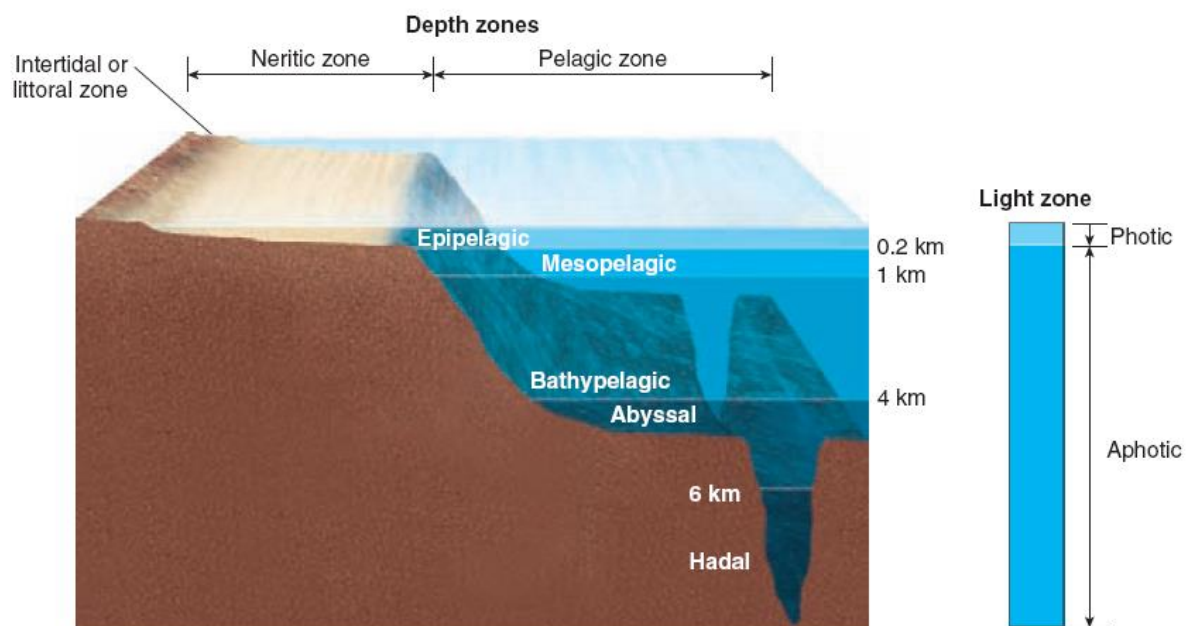
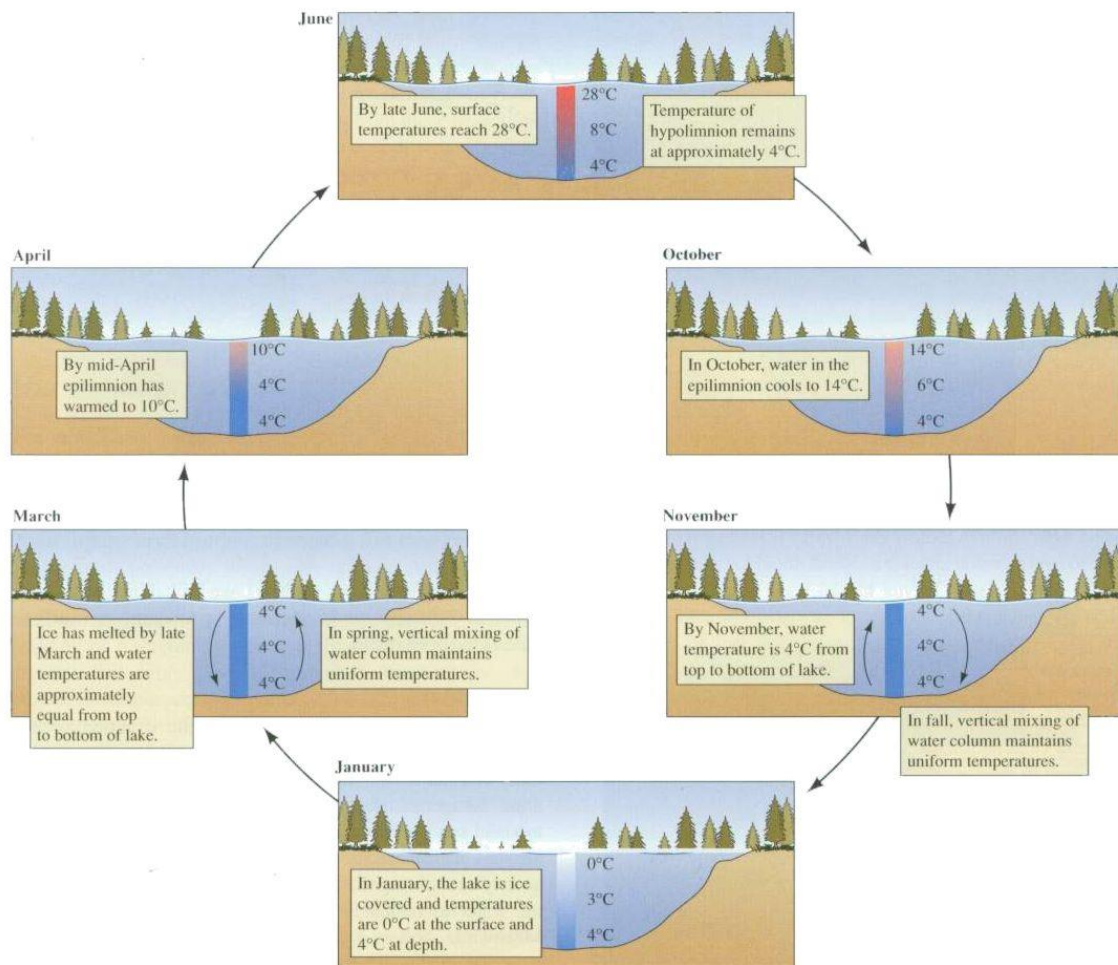
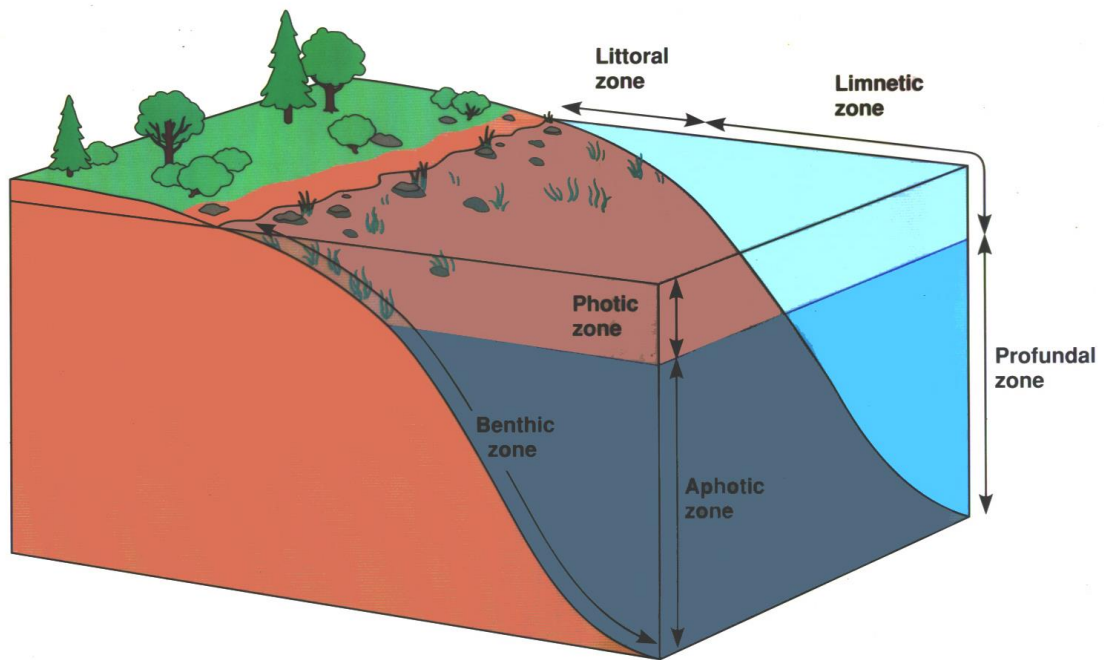




Figure 50.10 Zonation in a lake

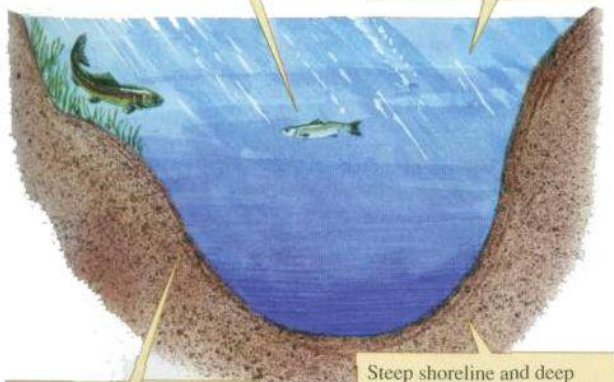


Cool temperatures and high oxygen concentrations provide a suitable environment for fish such as trout and whitefish.

Low availability of nutrients, especially phosphorus and nitrogen, support low densities of phytoplankton and vascular aquatic plants.

Warm temperatures and low oxygen availability provide environments favoring tolerant fish such as catfish and bowfins.

High availability of nutrients, especially phosphorus and nitrogen, support high densities of phytoplankton and vascular aquatic plants.



Invertebrate species requiring high oxygen concentrations are dominant in the benthic fauna.

Steep shoreline and deep bottom reduce heating during summer and help maintain lower water temperatures.



Benthic invertebrate biomass is high and dominated by species tolerant of warm temperatures and low oxygen.

Shallow bottom reduces total water volume and increases heating in summer.

