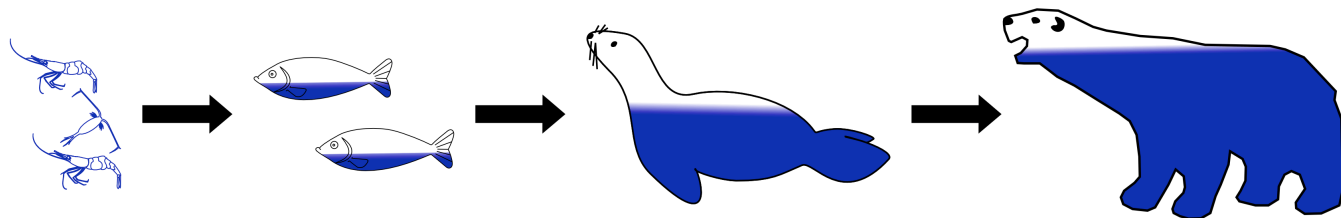
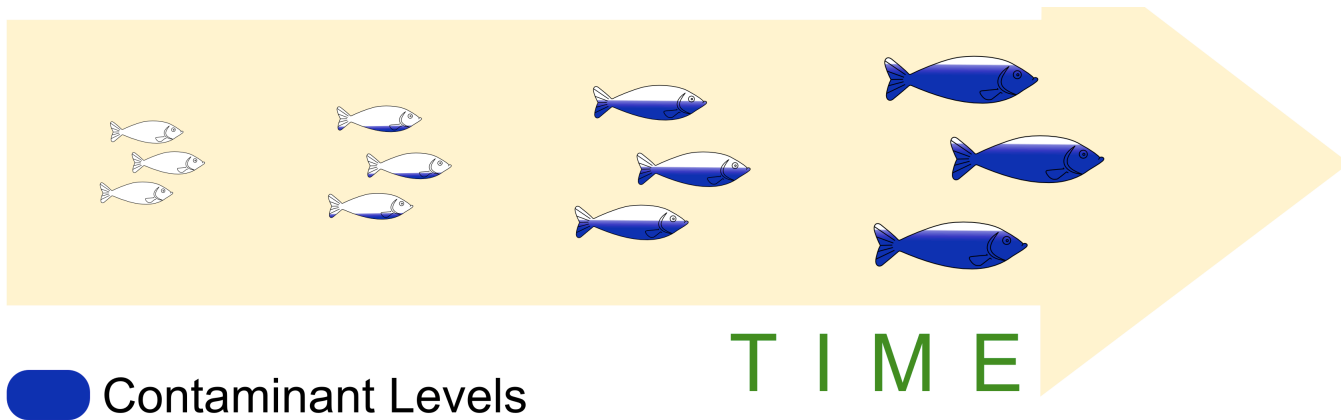


Biomagnification and Bioaccumulation





DANGER



TOXIC SHELLFISH

Shellfish in this area are unsafe to eat due to biotoxins: paralytic shellfish poisoning (PSP) and/or amnesic shellfish poisoning (ASP).

DO NOT EAT clams, oysters, mussels, or scallops.



For more information, call 1-800-562-5632.

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Lynne Peoples

Bioaccumulation

- Refers to the gradual buildup of chemicals in living organisms
- Chemicals enter organisms through food intake, skin contact, or respiration
- May be harmful to organisms when not metabolized or excreted

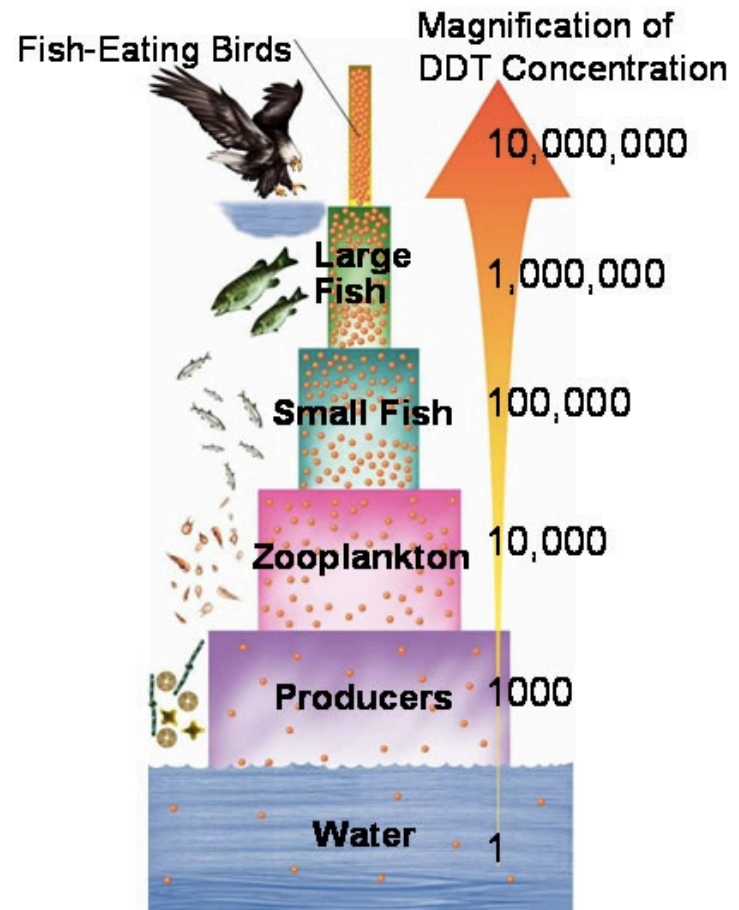
Biomagnification

- The process by which chemicals become more concentrated at each trophic level
- At each level of the food pyramid, chemicals that do not get broken down build up in organisms
- When a consumer in the next trophic level eats organisms with a chemical accumulation, it receives a huge dose of the chemical



Biomagnification

If a toxin is not broken down, the concentration of the toxin increases at each trophic level.



Methods of quantifying toxins.

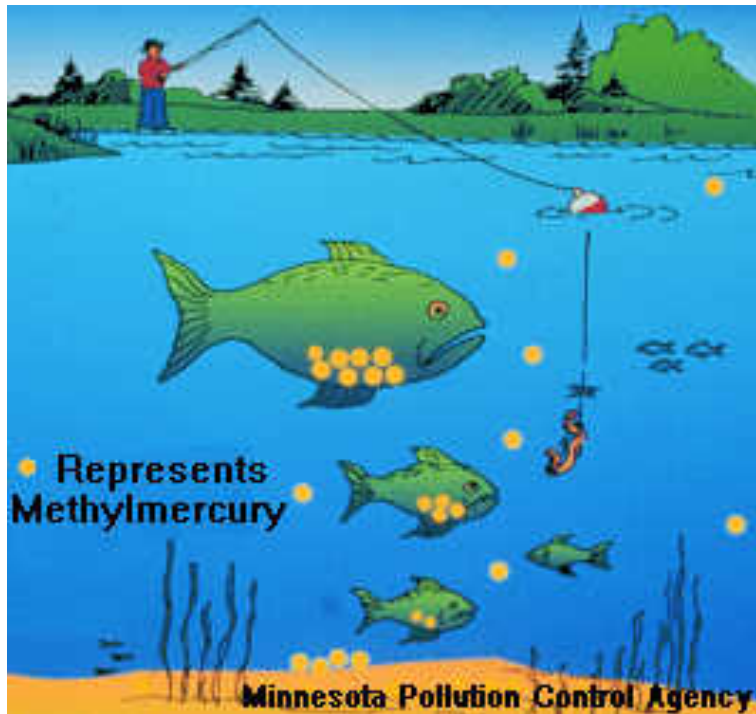
PPM (parts per million.)

- 1 PPM means:
 - 1 molecule of toxin for every 999,999 molecules of everything else.

Half-Life

- How long it takes for the concentration to reduce by half
 - Ex if the half-life is 20 years, the concentration will go from 16 ppm to 8 ppm in 20 years

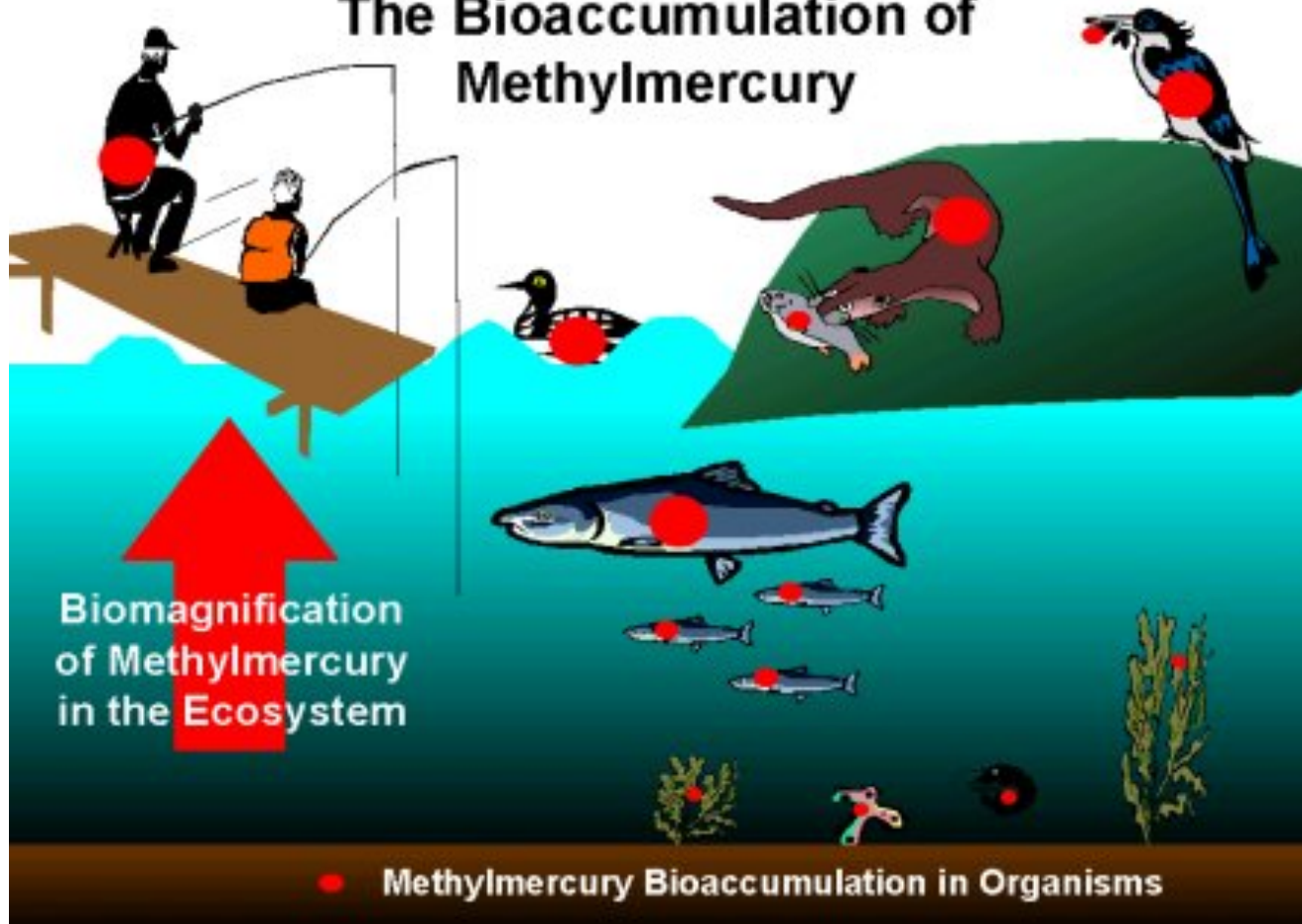
Classic Example – Methylmercury



- Mercury released in Canada attributed to:
 - Waste incineration
 - Coal combustion
 - Base metal smelting
 - Various consumer products (ex... fluorescent lights)
 - Unregulated industrial waste dumping

Bioremediation - Mercury

The Bioaccumulation of Methylmercury



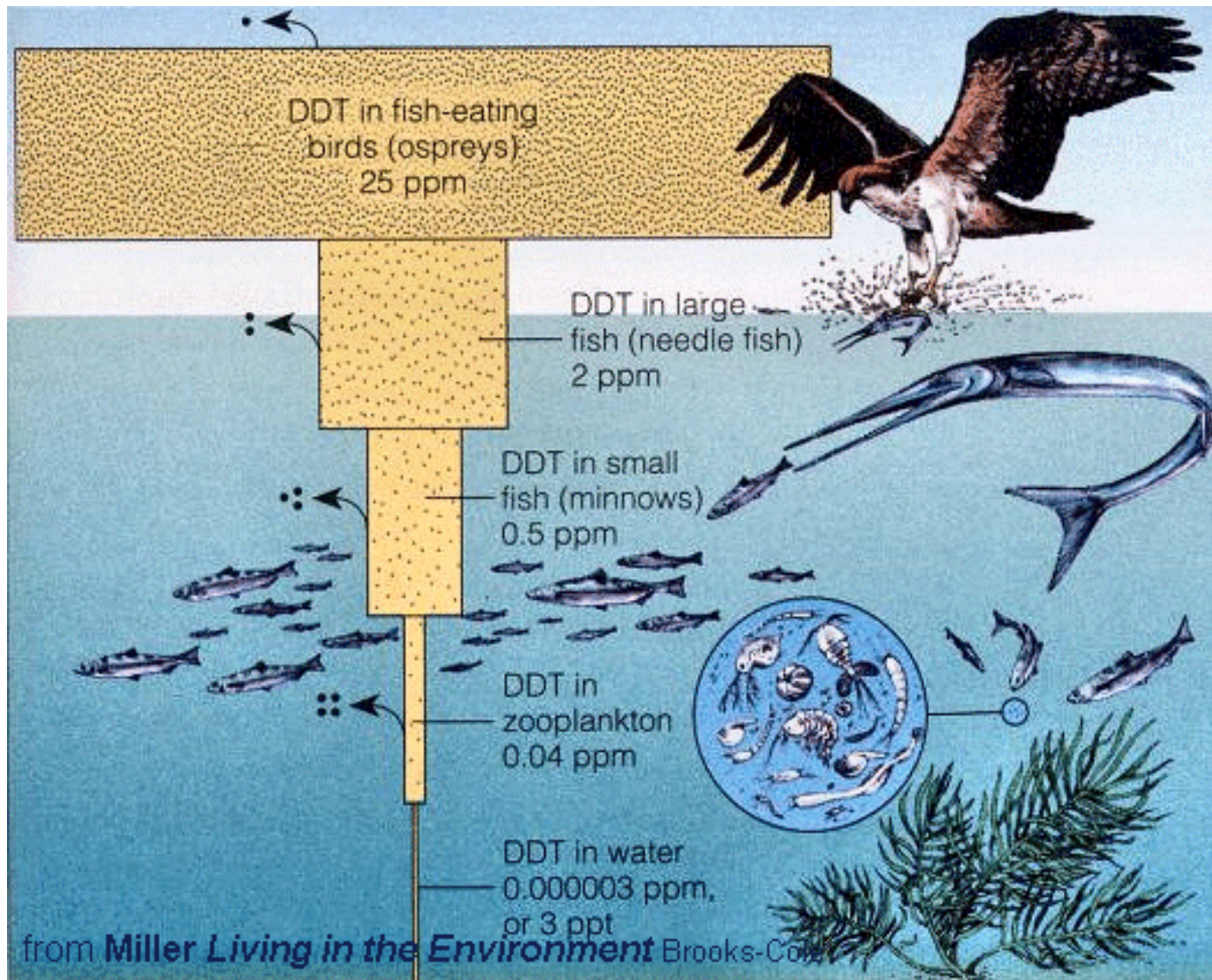
Other Notable Pollutants

DDT

- An insecticide introduced during WWII to control malaria and other diseases
- Can cause nervous, immune, and reproductive system disorders in animals even at low levels

PCBs

- Chemicals that were used for many industrial and electrical applications in mid-20th century
- Banned in North America in 1977 because of their environmental impact



Bioremediation - Landmines



Arabidopsis spp.