Bioaccumulation

Bioaccumulation

- Process by which substances not readily broken down or excreted can build up and be stored in living tissue (usually in fatty tissue)

- As bigger animals eat smaller animals, the level of contamination in the food is added to the level of contamination already in their body

Bioaccumulation

- AKA: biomagnification

- Substances become more concentrated in the bodies of consumers as one moves up the food chain (trophic levels)

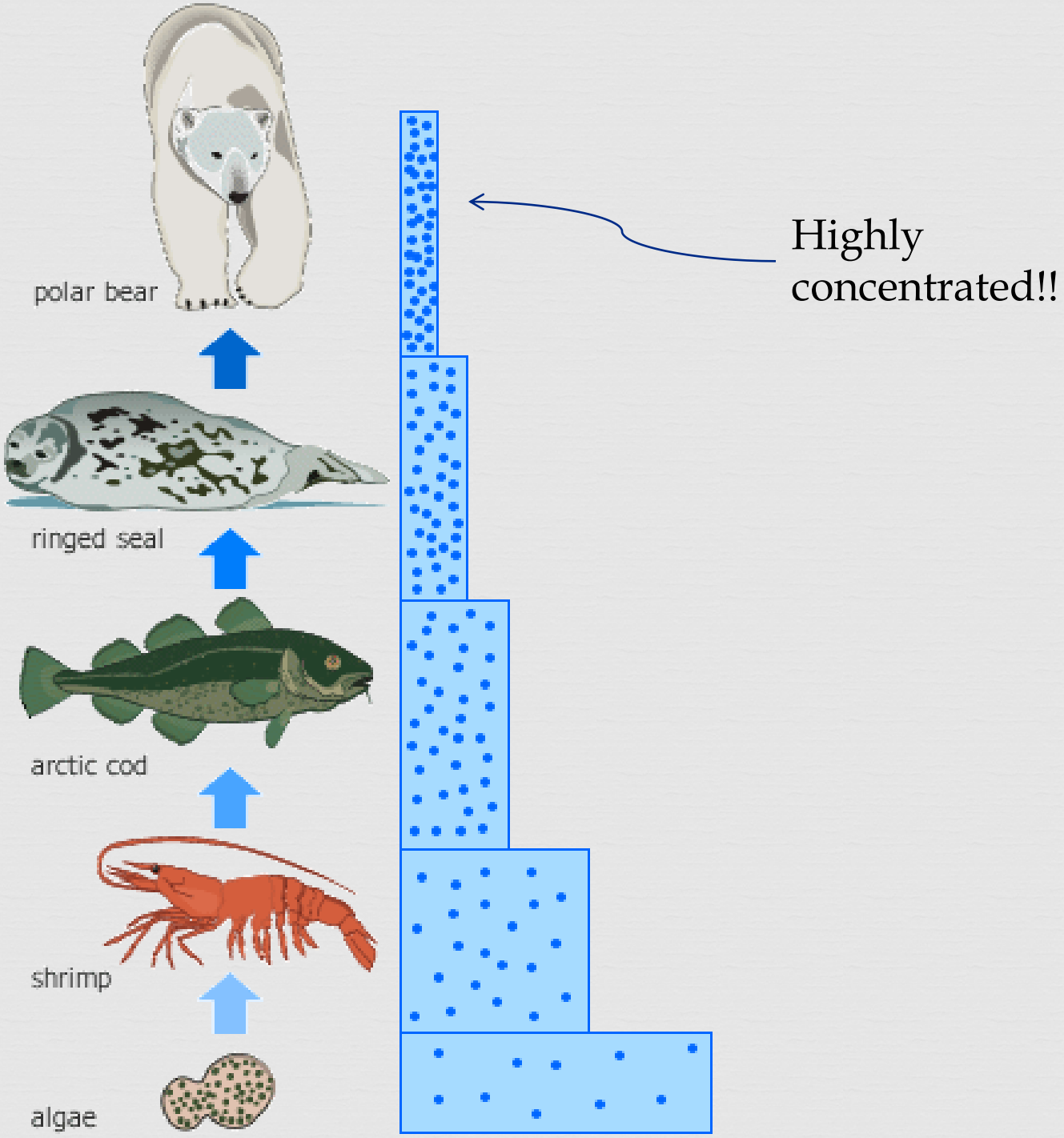
Factors affecting Bioaccumulation

(If chemicals are immediately eliminated, they will **not** bioaccumulate)

- Duration of exposure
- Size of organism
- Age of organism – long-lived, low metabolic rate, low excretion rate = more bioaccumulation

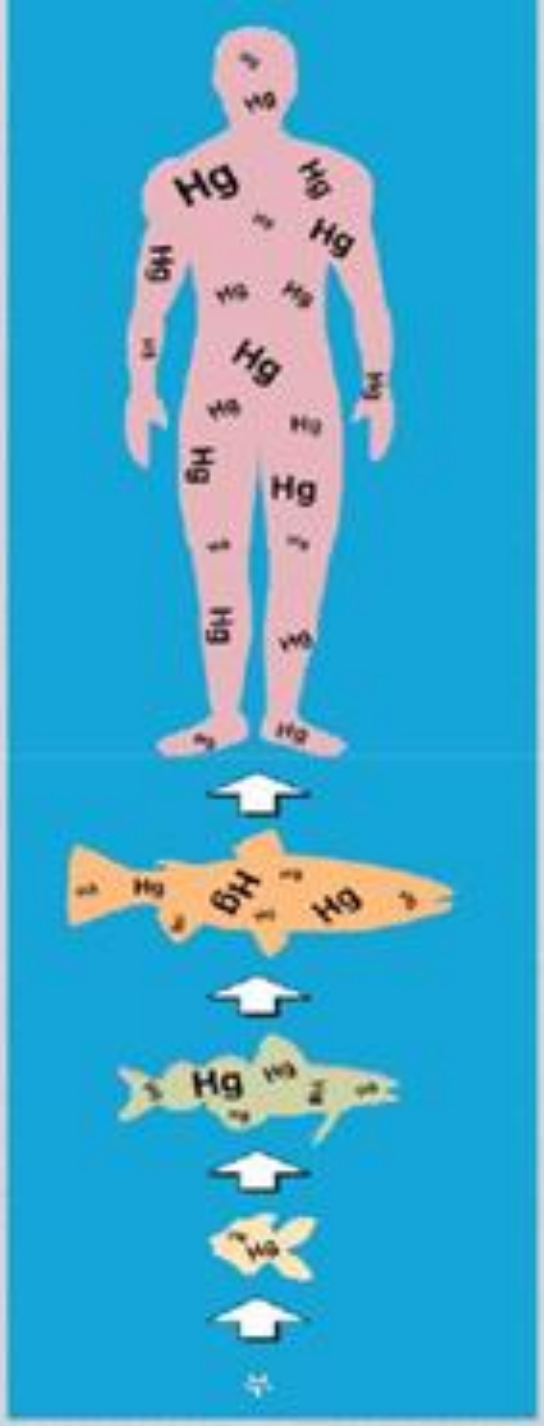
Bioaccumulation

- Problem in North
  - Higher concentration of toxic pollution
  - Northern animals have a lot of fat to keep them warm – toxins accumulate mostly in fat!


polar bear
ringed seal
arctic cod
shrimp
algae
Highly concentrated!!

Case Study: DDT

- Pesticide (used in U.S. until 1972)
- Accumulates in living tissues (fatty tissue)
- High concentrations in some bird species → thin egg shells



Case Study: Methyl Mercury

- Rapidly taken up by body (of aquatic organisms), slowly eliminated
- Health effects include: deterioration of nervous sys., impairment of hearing/speech/vision, involuntary muscle movements

Case Study: PCBs

- Polychlorinated biphenyls – manmade chemicals
- Used for cosmetics, ink, carbonless copy paper, pesticides, weatherproofing & fire-resistant coatings to wood and plastic
- Banned by gov't
- Effects immune system, fertility, increases risk of cancer