SNC 1D
J. Kropac

Pesticides and Bioaccumulation

Pesticides - a substance used for destroying insects or other organisms harmful to plants or to animals.

Example: DDT

History of DDT Use

- Pesticide used after WWII, often called the 'atomic bomb of insect killers.'
- Used on farms to control potato beetles, earthworms, cotton bollworms
- Also used to control insects who carried malaria and yellow fever
- Banned in 1972 on use for crops.

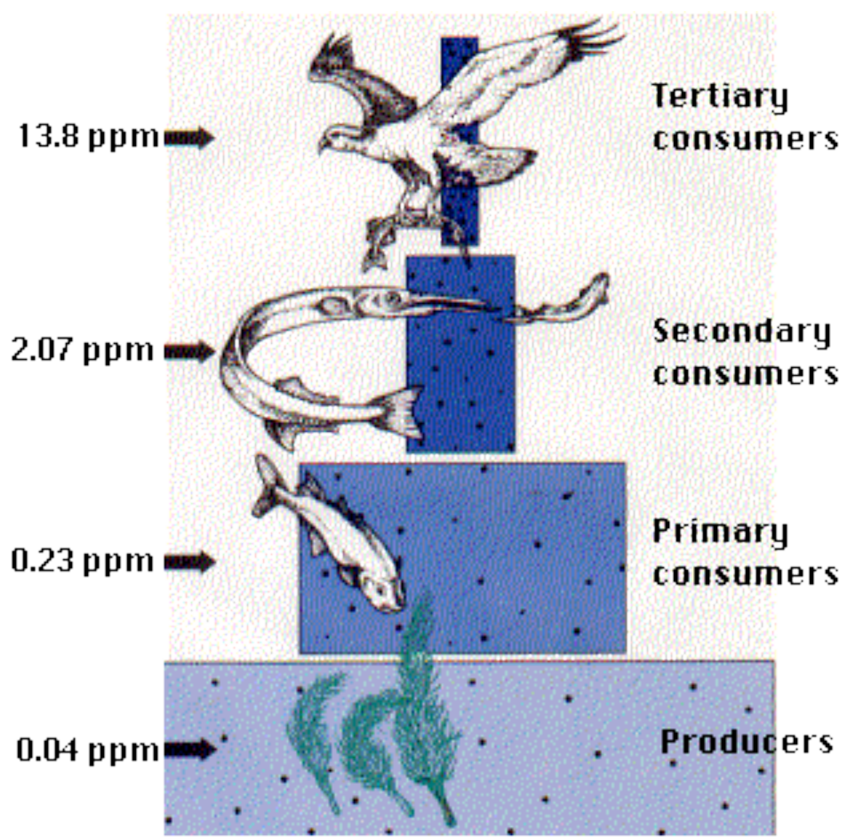
DDT Affect on Organisms

- DDT is stored in fatty tissues and is not broken down by organisms
- Acts to interfere with an animal's nervous system, often resulting in death
- Makes shells of birds weaken, causing babies to die
- DDT is linked to vomiting, confusion, cancer, and death in humans

DDT and Bioaccumulation

Bioaccumulation: ***(biological magnification)*** the increase in the concentration of a toxic substance as it moves up the food chain

- occurs because an organism at a higher trophic level must eat many organisms below it to stay alive
- DDT is often found on many ***producers***. While not necessarily harmful to the producers, the amount of DDT amplifies in ***primary consumers*** who have eaten multiple producers containing DDT.
- DDT concentration increases again in ***secondary consumers***, who consume several primary consumers.
- DDT is highest in the ***tertiary consumers***, who have eaten several secondary consumers.



The numbers are representative values of the concentration in the tissues of **DDT** and its derivatives (in parts per million, ppm)

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Mercury Bioaccumulation Activity

Mercury is a toxin that is found on many aquatic ecosystems. Ocean organisms ingest a form of mercury called methyl mercury. This pollutant is produced in several industrial processes and is found in run-off into streams and rivers. These rivers eventually lead to the ocean where the mercury builds up and is ingested by small organisms.

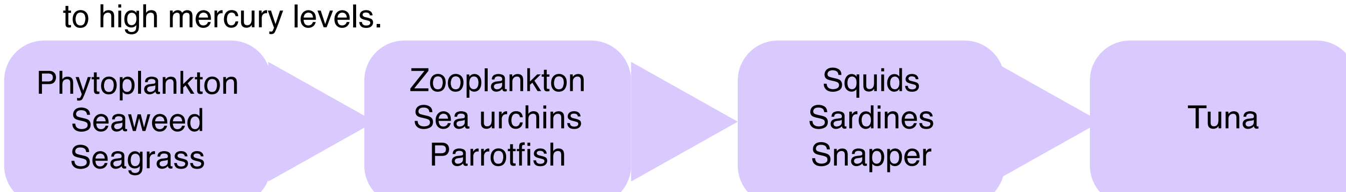
Mercury typically does not have any short term effects, but can cause issues over decades. Consistently being exposed to small amounts of mercury can cause problems is later years. These problems may include numbness, blindness, memory loss and death.

The table below uses theoretical data to represent mercury levels in fish captured from two seperate areas. Create a bar graph showing how mercury levels vary at each tropic level. Label 'Mercury ppm' on your y-axis and 'Trophic Level' on your x-axis. Use a legend and two separate colours to represent *Environment A* and *Environment B.*

Trophic Level	**Environment A: Pacific Ocean near California**	**Environment B: Atlantic Ocean near New York**
Producers	1 ppm	2 ppm
Herbivores	3 ppm	34 ppm
Primary Consumers	9 ppm	56 ppm
Secondary Consumers	22 ppm	112 ppm
Tertiary Consumers	48 ppm	390 ppm

Use your graph to answer the following questions

1) According to your graph, fish from what environment would be riskier to consume?
2) The World Health Organization has put the levels for mercury poisoning at 50 ppm. Is there any fish that exceed this limit?
3) In recent years there has been a large concern about the level of mercury present in several tuna brands. Use the food chain to below to explain why tuna may be prone to high mercury levels.



**Modified from HASPI*