

2.1.5. Half-life and Biomagnification

Case study: Pine Island Estuary

A study done in 1969 on Pine Island Sound showed the following levels of DDT in tissues of various animals in the sound. This shows bioaccumulation factors of 850x, and biomagnification factors up to 30 times. When we look at the whole food chain, the overall magnification is over 240,000x!

water to zooplankton:	850x	
zooplankton to fish #1:	30x	
fish #1 to fish #2:	2x	
fish #2 to gull:	5x	
overall:		240,000x

1. Research the specific effects that DDT has on organisms and report back to the class.

DDT is not the only toxin to biomagnify. All of the following have the potential to biomagnify:

Substance	Use & Problems
PCB's polychlorinated biphenyls	insulators in electrical transformers fire inhibitor bioaccumulates can cause reproductive failures
PAH's poly-aromatic hydrocarbons	Derived from petroleum products carcinogenic
Heavy metals: mercury copper cadmium chromium lead nickel zinc tin (TBT or tributyltin)	Used in mining, pulp and paper industry Affects nervous system (mercury and Minimata disease) and reproductive system
cyanide	used in processing gold, extremely toxic
selenium	concentrated by over-farming nutrient-depleted soils can cause reproductive system problems, toxic