

# Haileybury MUN

## Research report



Environmental Commission  
The question of Bioaccumulation  
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### **Definitions:**

Bioaccumulation

*The accumulation of a chemical substance within an organism.*

### **Introduction:**

For a long time, environmentalists have looked into the danger of bioaccumulation. Since the publishing of Rachel Carson's *Silent Spring* in 1962 which looked into the devastating impacts of DDT along a food chain and in various organisms, research into bioaccumulation and humans' impact on nature has become more significant. One of the first mentions of bioaccumulation by the UN was its acknowledgement to be an issue in upper trophic levels as an impact of persistent organic pollutants by the UNECE (United Nations Economic Commission for Europe) in 1979, in which it set out to reduce the discharges of these persistent organic pollutants.

### **Key Issues:**

*Bioaccumulation in top trophic levels*

Inorganic substances accumulate greatly in consumers of higher trophic levels, which means that biomagnified chemicals become much more toxic to them. If these high-level species are predators, it may lead to the decrease in population of a species that is essential for controlling populations in lower trophic levels. This can lead to population imbalance throughout ecosystems. If these predators are a key-stone species, bioaccumulation could lead to extinction or loss of species.

*Bioaccumulation leading to ecological defects*

Bioaccumulation may also lead to defects in some species, which may put their populations at risk. For example, the use of DDT in the 1960s caused bioaccumulation in bald-eagles, which resulted in the thinning of their eggshells. Consequently, their population numbers dropped. Moreover, bioaccumulation could impair enzyme function in organisms or soil, which could cause problems in food webs.

*Impact on Humans*

The bioaccumulation of heavy metals can cause severe health defects in humans. For instance, the bioaccumulation of heavy metals can cause cancers, reproductive problems, and the malformation of red blood cells, to name a few. Moreover, as humans are at the top of many food chains, chemicals biomagnify up the food chain, and often humans consume high concentrations of toxic chemicals.

*Preventative Measures*

As the primary cause of bioaccumulation can be considered the use of pesticides, one could deduce that the best way to prevent bioaccumulation and its consequences would be to limit the use of pesticides or the

substances that are used to make them. Other preventative measures could include bans or limits on certain chemicals or regulations on their disposal.

### Some Key Events:

Date	Description of Event
27 September 1962	Publication of <i>Silent Spring</i> – Carson’s research provided basis for research around bioaccumulation of pesticides and the impact on organisms.
13 December 1979	UNECE Protocol to the 1979 convention on long-range transboundary air pollution on persistent organic pollutants – briefly outlined that bioaccumulation could be an issue that affects humans
22 May 2001	Stockholm Convention on Persistent Organic Pollutants (POPs) – international treaty to protect humans and the environment from the impact of POPs, by eliminating or restricting their use.

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