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Physics 203
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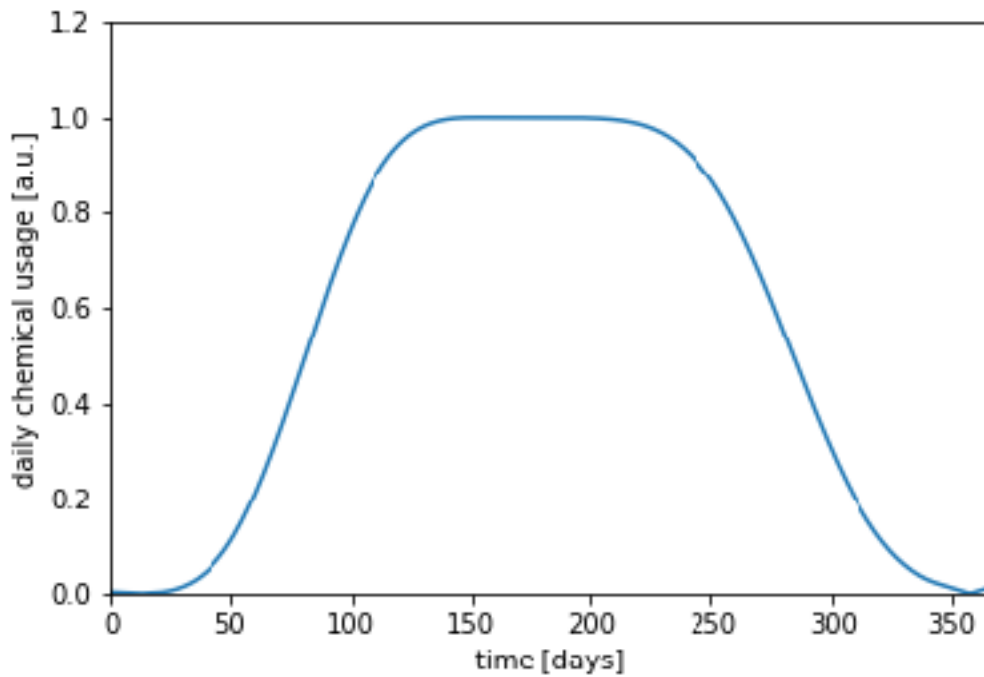
The Common Problem Project

Question: *At what levels of organo-chlorides do they become dangerous to fish-eating birds?*

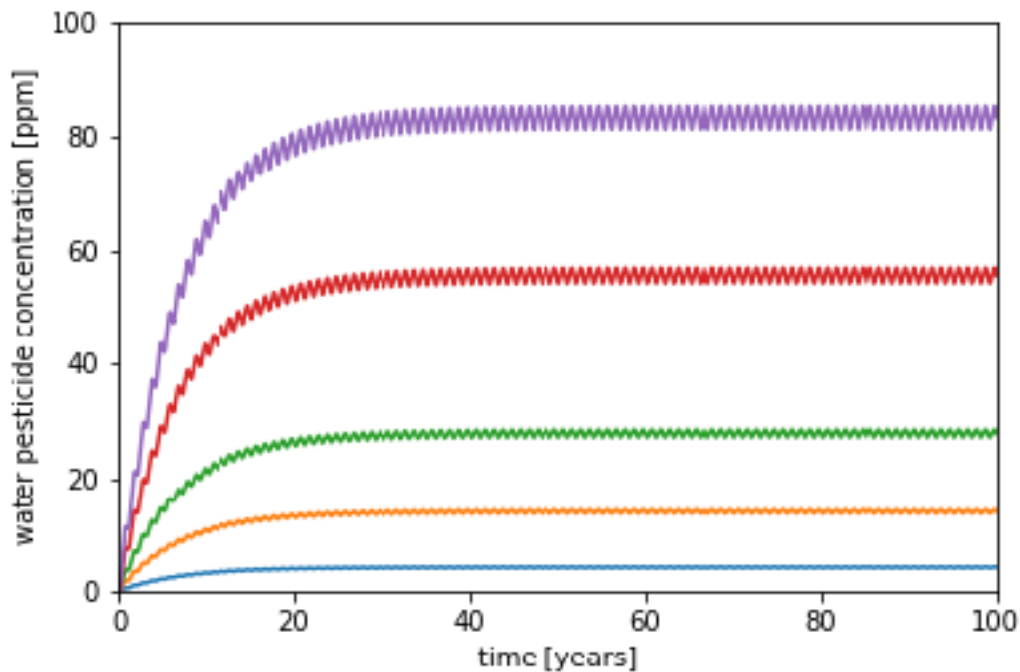
1) This project focuses on the effects of organo-chlorides on fish-eating birds, and more specifically, the amount of organo-chlorides that could be consumed before reaching a dangerous level. Organo-chlorides are common in pesticides, insecticides, and insulators. When water runoff from farms and businesses goes into streams and lakes it gets absorbed by the fish and is held in body tissues or organs. Most fish can withstand an incredible amount of toxins, but the birds that prey on them can not. When too many toxins are consumed the birds eggs are thinned, causing them to break and their population to decrease. This project illustrates the effect the use of pesticides has on fish-eating birds lives.

2) The biggest issue in this project is clearly the amount of organo-chlorides present in natural water sources, which then effects the fish, the birds, and eventually the eggs of the birds—thus declining the population. Creating a law that would limit the amount of pesticide use or creating a better system to direct the drainage of water to avoid natural water sources would both drastically improve the the life of the fish and birds in the environment.

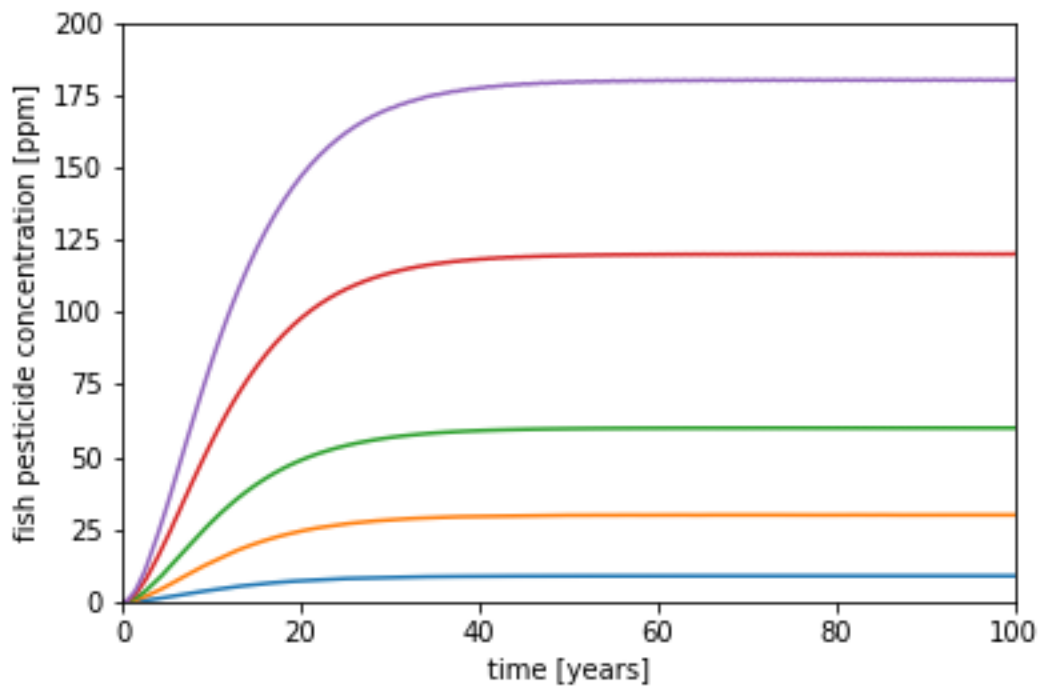
3) This project has a lot of variables, as an ecosystem is so interconnected. The usage of **organo chlorides** has a effect on the pesticide **concentration in water** with a positive relationship. As the amount of organo-chlorides used in farms increases, the concentration in the water increases. This then causes the amount of **concentration of toxins in the fish** to increase! More pesticides in the water, more pesticides in the fish. The increase of toxins in the fish increases the amount of **toxins that are in the birds**. The more fish that the birds eat, the more toxins that are kept in their bodies. With this, the higher amount of toxins in a bird, the more **thin their shells** become when giving birth. Amount of toxins and weakness of shells have a direct correlation, as the amount of toxins increase, the shells become thinner and thinner eventually being smashed before birth. Lastly, the amount of shells smashed and babies killed obviously decreases the amount of **birds that survive**, declining the population.



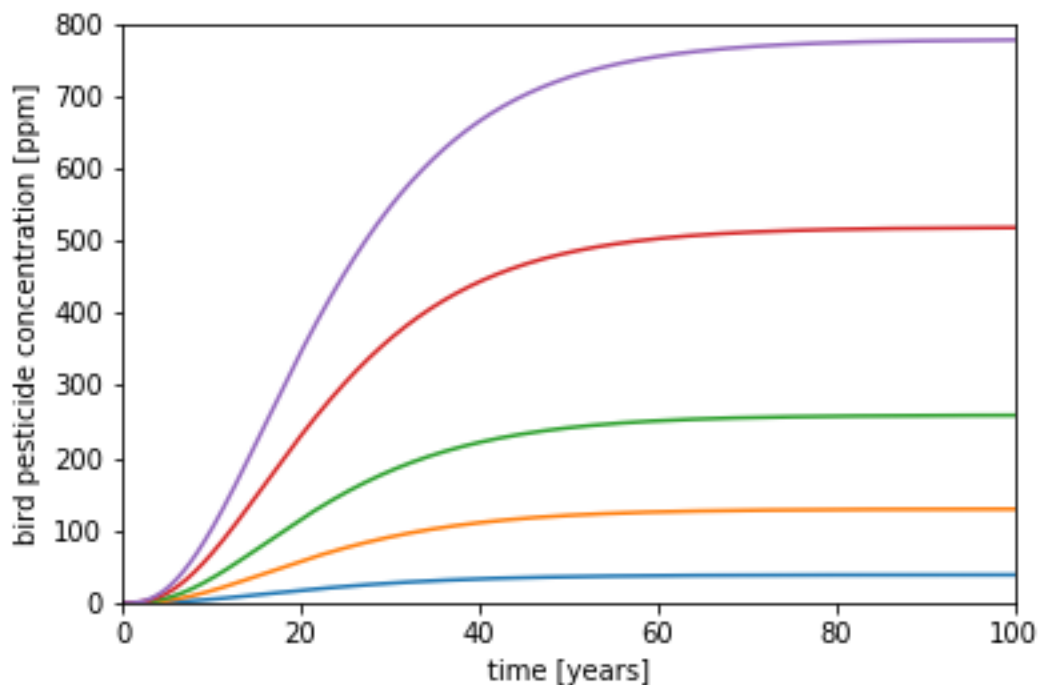
This graph shows the relationship between time and daily chemical usage in a year. The graph has a steady rise to represent spring and summer when more pesticides are used, and a decline during the colder months.



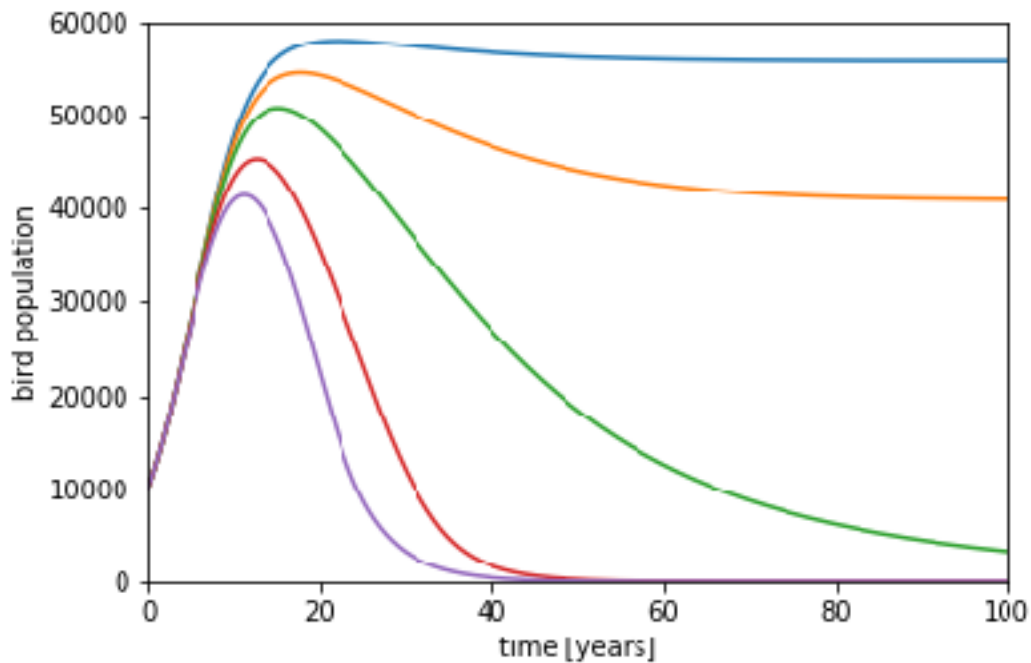
This graph shows the relationship between time and water pesticide concentration. This shows as years go on the amount of pesticides steadily increase. They eventually flatten out, as the amount of pesticides cannot fully replace a lake or big body of water, as some will naturally wash ashore and be taken out by other elements. It has a stair-like trend to represent the amount of pesticides entering the water each year, which fluctuates with the seasons as shown in the graph before.



This graph similarly shadows the previous graph, as the concentration of pesticides in the water increase, naturally the amount of toxins in the fish also increase. However it does not have a staircase effect as the amount of pesticides will not decrease when they are in winter month, it will just continue to increase as the pesticides are added.



This graph again is directly connected to the previous graph, as the amount of concentration of toxins in the fish increases, the more that goes into the birds bodies. As seen in the graph, as the birds consume more fish they have higher rates of toxins in their bodies as the fish, for the fish are measured on how much is in their system and the birds have multiple fish in their system.



This graph shows the overall effects of the use of organo-chlorides on the population of fish-eating birds. This graph is what means the most in the project, as the population sharply starts to decline. As the birds continue to eat the fish with the toxins it adds up in their bodies, which affects the thinness of their eggs and the lives of their children. As shown, the first few years seem to be unaffected, but as the eggs continue to get smashed and not hatch it not only affects that individual bird, but all of the birds that could've been descendants as well. This is shown by the sharp decline when the population of the birds starts low and the lack of incline for all predictions. The affect of organo-chlorides on birds is shown as clearly detrimental in this graph.

5. With this data there are two opposing views that the information can be involved in. There's an environmentalist standpoint, which would concerns the amount of birds that are dying from unnatural causes. The population decline of fish-eating birds doesn't just happen in one specific area, but is seen all around the U.S. and in various other countries. The decline of the birds not only is a danger to them, but also the ecosystem around them as there are much less predators of the fish and prey for other animals. To help fix this situation, would be to control the runoff of the organo-chlorides and ensure none entered any natural water source, or to create a pesticide that will be non-toxic to the birds. The latter would be much harder to accomplish, so the most realistic solution would be to create a way to dispose of the runoff, or to limit the amount of pesticide usage, so although it would still have effects, they would be much smaller.

However, limiting the use of pesticides would affect farmers greatly. By limiting their use, it would be most likely that less of their crops would survive, giving them less money and putting them in more of an economic hardship. Although the pesticides are harming fish and birds, it is more beneficial for the farmers and businesses to continue to use pesticides to support their own lifestyle.

Overall, I believe the majority of people would side with the environmental argument with

this information, the people directly involved with the use of pesticides would hold an opposing position.