

USGS Data Exploration Unit: Bald Eagle Activity 3 Student Workbook

Opening Questions

Read and answer each question.

1. What state had the highest DDE concentrations post-1980? From what location within the state were these records collected?

CA, Santa Catalina Island

2. What could explain such high DDE concentrations in this one location?

Must be highly contaminated. Perhaps some illegal use of DDT or dumping or leaking of stored DDT.

Discussion Questions

Refer to the datasheets and graphs for Bald Eagle Activity 3 to answer the following questions. Discuss each question as a group before deciding on an answer. You may attach additional sheets of paper as needed.

1. Review the hypotheses you proposed after viewing the graph from Bald Eagle Activity 2. Does this new graph support any of the hypotheses you proposed? Why or why not?

Depends on hypothesis.

2. While Santa Catalina is extremely different when compared to the other states, within the non-California group there are differences between states as well. How might these differences be explained?

AK isolated, differences in use of DDT between states, inaccuracy introduced by small sample sizes.

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3. Look at the graph and values for DDE concentrations in the combined dataset for AK, DE, FL, MD and ME. Do you think the increase you see on the graph from 1994-1996 and 1997-2000 reflects an actual increase in DDE across the United States? Why or why not?

No, the increase is comparing values from AK with those from other states. Nothing can be said about a trend across the US. The best that can be concluded is trends in particular states, but even for that it would be better to have larger sample sizes and data from locations throughout the state.

4. How long did it take for DDE concentrations to decrease to an insignificant concentration in bald eagle eggs? Is this the same or different then the time it took for osprey eggs? How might you explain this difference between the two species?

Other than AK and FL, DDE concentrations remain higher than 3 ug/g ww. Thus, 18 years after the ban, DDT concentrations are still high enough to harm bald eagles in some parts of the country. This difference between ospreys and bald eagles might be explained by the fact that bald eagle tend to eat bird and mammal carcasses that are high in DDE while ospreys tend to feed almost entirely on fish.

5. Given your answer to the question above, at what year in the future do you think DDE concentrations might decrease to insignificant concentrations in bald eagle eggs collected from Santa Catalina Island?

Perhaps 20 years.

6. Reflect back on your experience of the different ways to view and analyze the bald eagle data. How did data analysis techniques bias the results received and alter the conclusions that might be drawn from the same set of data?

In Bald Eagle Activity 1, if we did not look at the data closely but just looked at the graph we would have concluded that DDE concentrations in bald eagle eggs have not decreased in the 18 years following the passing of the DDT ban. By looking at DDE concentrations by state, we noticed that DDE concentrations vary by location. We further realized that DDE concentrations have decreased in most locations with the exception of Santa Catalina Island.

Final hypothesis

Develop a hypothesis to explain why DDE concentrations are so high in bald eagle eggs collected from Santa Catalina Island from 1989 to 2000. Describe the experiment you would conduct and the data you would need to collect to test your hypothesis. Be prepared to present your hypothesis and experiment to the class if time allows.