



## Causal Analysis: Salmon Essay

Readings: Salmon Nation: People, Fish, and Our Common Home  
"Listing Salmon as Endangered Threatens Farmers"  
"Listing Salmon as Endangered Protects Jobs"  
(essays in Reader)

Over the last century, the number of salmon that return to California rivers has been decreasing. Is this a serious problem? Should anything be done in response to this situation? You will investigate questions like these in your essay. The table below gives data for the number of Chinook salmon ( in thousands) from 1986 to 2000.

year	count
1986	825.6
1987	876.3
1988	1317.2
1989	530.9
1990	423.4
1991	294.9
1992	163.4
1993	279.6
1994	295.6
1995	679.3
1996	380.6
1997	487.4
1998	227.3
1999	290.9
2000	429.2

## Initial Mathematical Work

- Let  $x$  represent the years since 1985 and  $y$  represent the California chinook count. Use the spreadsheet to construct a scatterplot of the data. Begin to think about what the data tell you.
- Although the data are not strongly linear, construct a linear model to approximate the data. Select two points of the scatterplot to determine a line that provides a good fit for the data in the scatterplot. Use these two points to find a linear model that describes the chinook count as a function of the year.
- Use the spreadsheet to graph the linear model on the scatterplot. Recall that the data will appear on the graph, as discrete points, and then the model will be superimposed as a line. This gives a good visual check of the fit of your model.
- Use the graph to approximate the answers to the following:
  - predict the California chinook count this year (2005)
  - predict the year in which the California chinook count will reach zero (that is, the year in which the California chinook run will be extinct)
- Use the linear model (the equation) to approximate answers to the following:
  - predict the California chinook count this year (2005)
  - predict the year in which the California chinook count will reach zero (that is, the year in which the California chinook run will be extinct)

## Writing Your Paper

For this paper, you are reading essays that discuss, from various angles, the salmon controversy in the Pacific Northwest. You are also working with data to generate your own predictions for a salmon run. Using at least three of these sources, in addition to the predictions you generate yourself, you are going to write an essay that makes a point about the current status or future of the salmon population, focusing on and discussing the important causes and/or effects you have identified.

Review the discussion of cause and effect and classification in [The Practical Stylist](#) ( pp. 165-172). These strategies will be useful in this paper. Then study the readings carefully, looking for what intrigues you. What is your understanding of this controversy? Find a thesis, the main point you want to make about salmon runs or salmon fisheries and what is happening to them. You may want to emphasize what has caused the current crisis or what you see as the effects, now and in the future. You may also look at some combination of cause and effect. In any case, try to use your synthesis of all these writers' ideas, as well as your own predictions based on the data you have received, to present fresh insights to your reader.

In this essay, your introduction can be utilitarian, but it can also be descriptive or personal. Have you ever gone fishing, bought fresh salmon in Half Moon Bay, or enjoyed a great salmon barbecue? Don't be afraid to make a personal connection to the topic. Then make a transition to the general topic and your thesis. Be certain your thesis is clearly presented at the end of your introduction. Avoid broad generalities such as "There are many causes and effects of the salmon crisis." Instead, narrow and focus your thesis so that it is unique to your paper.

Your body paragraphs, which will probably each focus on a particular cause or effect, should be especially well developed with textual references, discussion and detail. They should follow some logical order within the essay that is predicted by your thesis.

You will also include a discussion that will develop and present your mathematical findings. You will go on, after presenting your own predictions based on the data you have received, to explain how they relate to the other information you are presenting: Does your prediction support your other findings from the essays? If it does, explain how it relates. If it does not, can you explain other factors in the situation that would help the reader to understand the discrepancy?

We will be working in class on ways to construct this essay, to create a coherent, strong explanation of a complicated but disturbing situation.

Finally, consider returning, in some fresh way, to your introductory strategy in your conclusion. This technique helps bring a satisfying closure to your essay. You could also discuss the ecological or economic significance of this issue.

Note: The data source is the Pacific Fishery Management Council, which was formed to implement the Magnuson-Stevens Fishery Conservation and Management Act. The data were taken from Appendix A (page A7) of the document "Review of 2000 Ocean Salmon Fisheries". This document can be found at the website:

<http://www.pcouncil.org/salmon/salsafe00/salsafe00.html>