CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY

Name(s)
Davis Huang

Project Number
S1412

Project Title
Fixing the Graymodel

Abstract

Objectives/Goals
A population dynamics model of gray whales by a biologist John Brandon does not "work" for unknown reasons. My goal was to discover why and attempt to fix this "graymodel."

Methods/Materials
The populations model is online at graymodel.stanford.edu. I used Processing, a sub language of Java, to model some of Brandon's equations and Microsoft Excel for graphs. T analyzed Brandon's equations and data that he used to find out which equations or what data could be modified, kept, thrown out, etc. to obtain a better model. Mainly, my analysis focused on the kill count of gray whales.

Results
There was a major flaw in the model, a discrepancy between the numbers modeled and the data given. From there, I took certain equations and data and "fixed" and re-graphed the data, which should now more accurately model the kill count of the whales.

Conclusions/Discussion
There is now new data for the model; however, there is no way to measure the accuracy or precision of these obtained numbers from my program. In addition, many of Brandon's equations were confusing and difficult to understand. There were several attempts to contact John Brandon through email and personal visits, but no reply was given. Without contact from the original programmer, progress has been slow, starting from ground zero. However, I do believe that the data is more accurate and could potentially help in the process of fixing this population model. The results will be sent to John Brandon and hopefully future contact will be made to continue this project.

Summary Statement
My project focuses on analyzing a pre-existing gray whale population dynamics model by biologist John Brandon to find the error in the model and to fix it.

Help Received
Diana Herrington provided background information on the model; Dr. Ke Wu helped explain some of the mathematics; Mother helped glue the display