ESS 330 Project Proposals

## Section

Title: Monarch Butterfly Decline in the U.S. Justification: The loss of biodiversity is something that we are seeing more and more of as climate change worsens. This topic is one that I have experience observing back home in New York. Throughout the past 20 or so years, there has been a heavy decrease in the amount of monarch sightings across the country, with an estimated 81% decline in monarchs from 1999 to 2010 (Pleasants & Oberhauser, 2013). Monarch population decline is linked to the decline of milkweed population, as they feed primarily on this. Long-term plant surveys have been utilized to evaluate the correlation of milkweed and monarchs, which found a 68% loss of milkweed available to monarchs (Zaya,2017). This is a significant problem because monarchs are on track to become endangered and extinct, and if the statistics and data show this a main contributor for the decline of milkweed, we can change that and hopefully bring back the population of monarchs and avoid a loss of species and more biodiversity. Research objective/question/hypothesis: Decline in milkweed growth leads to the decline of monarch populations in the U.S. Prosed Methods: The variables I would like to measure are monarch population, milkweed growth within the U.S., and a time span of 20 years. I will perform a statistic test to determine their correlation based on the data that I find. I will also plot the results I get. I will look at the data.gov and on Nature Scientific Data, to find datasets that show the monarch and milkweed correlation. I will also look at DataCite for more data. This scope will be within the U.S. Before I start with my correlation tests, I will assess normality and skewness in the data, and make adjustments to clean the data if necessary. Expected Outcomes: I would expect to find that there is a statistically significant value that shows a positive correlation between milkweed and monarch population.

Pleasants, J. M., & Oberhauser, K. S. (2013). Milkweed loss in agricultural fields because of herbicide use: Effect on the monarch butterfly population. *Insect Conservation and Diversity*, *6*(2), 135–144.