A watercolor illustration of a garden scene. On the left, there is a tall green tree and a bush of yellow-green flowers. In the foreground, there are several flowers: a yellow one, a purple one, a pink one, and a small orange one. A woven basket is visible at the bottom center. On the right, there is a yellow flower and a cluster of blue flowers. The background is a light, textured surface with a dashed border.

# Data Integrity in Fear to Hope

By: Madelyn Steimer



# Schools Involved in the Data Integrity Study

- **An Achievable Dream Academy Newport News (AAD NN)**
  - Reciprocal Study
  - One class (no averages were taken)
- **Woodside High School**
  - Reciprocal Study
  - 3-4 classes (averages taken)
- **Heritage High School**
  - Salt Study
  - 1-2 classes (averages taken)
- **An Achievable Dream Academy Virginia Beach (AAD VB)**
  - Reciprocal Study
  - 1-3 Measures (averages taken)

## **Reciprocal Study:**

Schools who keep their trees outside were given trees from Massachusetts and North Carolina to see the effects on climate.

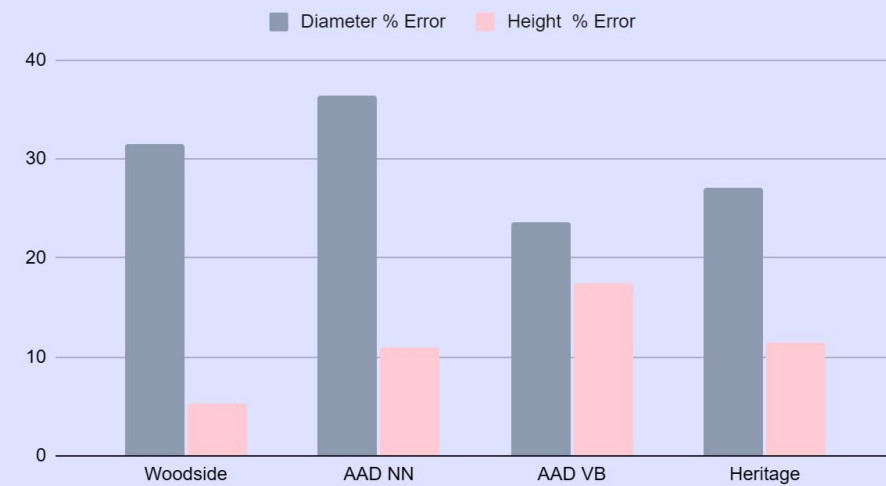
## **Salt Study:**

Schools who look at the effects of salt on the saplings.

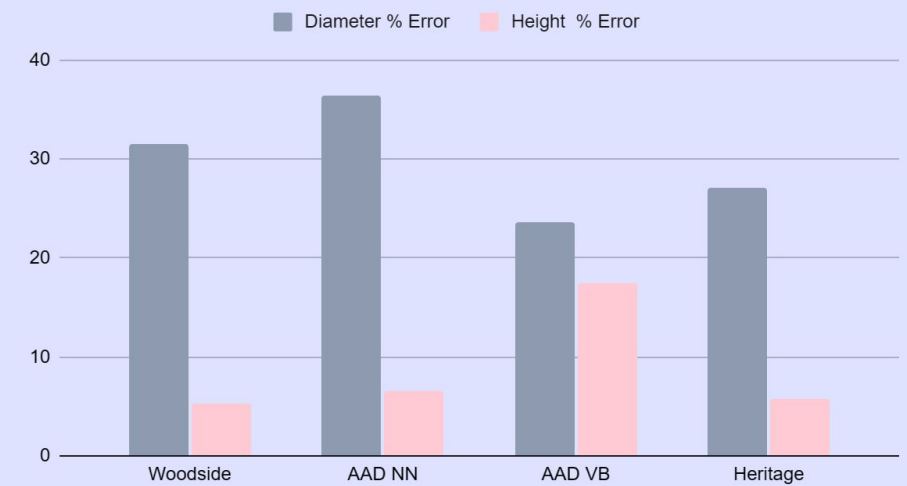


# Graphs Of Percent Error

Raw Percent Error



Cleaned Percent Error



Cleaned data: looking at obvious areas of data errors (ex. inputting inches instead of centimeters)



## Where the Errors Originated From

- **Measurer-** Performing a different style of measurement and measuring at different places on the tree. Dr. Perry, VIMS Emeritus wetland ecologist, designed a bar to locate a consistent base per tree.
- **Morphometric variables-** All schools had higher error for stem diameter measurements. This is of concern since basal diameter has been shown to predict seedling biomass for purposes of measuring growth (Hudson et al., 2016).



- **Errors with measuring tools-** Not ensuring the instruments were zeroed and not using the correct units can be addressed by mentors.
- **Data-** data entry errors such as incorrect unit conversions, mistyped numbers, missing dates measurements, can be addressed by mentors who can institute a quality check.

# Plans for Lowering Percent Error

- **To minimize student error:**
  - mentors should remind students of proper measuring techniques and insure correct units are used.
  - The implementation of the Perry Bar.
- Year-round growth should be measured and should include the Perry Bar.
- For the validity of using ninth graders to contribute to research-based solutions to climate change, precision may be less important in this context than in most studies. Investigators are interested in general trends rather than specific values.

