

CHERRY BLOSSOM PHENOPHASE

WASHINGTON, D.C.

1921 - 2021



INTRODUCTION / BACKGROUND

Phenology refers to the timing of biological events. It is key to the existence of both plants and animals because many species are dependent on others for life services such as pollination, seed dispersal, and of course, humans use plant and animal life cycle cues to time such activities as the planting of agricultural seed, the application of fertilizers and pesticides and the estimation of harvest time activities. It is the leafing out of plants that provide food for developing insect larvae and they, in turn, are a vital source of food for other animals, such as larger insects and young birds and mammals.

A phenophase is defined as a specific event that occurs during the life cycle of a given species. It is relatively easy to identify certain phenophasic markers in plants. Aggregated botanical data typically includes identifiable features such as dates of first leaf appearance, first flowering, first ripe fruit, and color change in the instance of deciduous trees and shrubs. There are, of course, ranges within these events for each species, but it is useful to recognize that these phenophases are typically clustered around a central tendency.

An important community and cultural event that happens each spring in the nation's capital is the Cherry Blossom Festival. The activities celebrate the gift, in 1912, of 3,000 flowering Yoshino cherry trees (*Prunus × yedoensis*) from the mayor of Tokyo, Japan to the city of Washington, D.C. The gift was intended to honor the friendship between the two countries and their continued close relationship. (nationalcherryfestival.org, 2018)

An interesting historical anecdote is that, in 1981, a flood destroyed many of the flowering cherry trees in Japan and we were able to provide cuttings for the country to begin to replenish its own botanical stock, bringing the gift full circle.

The National Cherry Blossom Festival began as a celebration over several days for schoolchildren in 1927 and has expanded to almost five weeks of activities that draw over 1.5 million people to our nation's capital at a time when nature is at its loveliest.

You and your partners will examine the phenophase event of cherry blossom blooming. By definition, for the purposes of collecting data, the peak blossom date is when 70% of the blossoms are in full bloom. Data about blossom phenophase has been recorded for many years by the National Park Service and, it has been noted that the timing of the bloom varies, as it is driven by local temperature during winter and early spring. (<https://www.epa.gov/climate-indicators/cherry-blossoms>)

DIRECTIONS

Open the data files and use Excel or Google Sheets to format and analyze the data. You will want to evaluate the information to see how the cherry blossom phenophase has deviated from the median date over many years. You should graph the data, generate a trendline (exponential, linear, other) by determining with your data partners which is most appropriate. Be sure to justify your choice. Include the equation of the trendline and its r^2 value. Establish a growth rate (positive or negative) using rolling data approximations. You may choose to add error bars to the data representation if it lends more confidence to your findings.

Be sure to keep track of any “noticings.” What do you notice as you examine the data? What is significant to you? Is the trendline predictive of the future? Why or why not? Are you confident that the data represents what is really happening? Are there data that you would like to see?

Prepare a poster that includes an appropriate title for your data analysis, a representation of your data with its trendline, a claim about the trend that you discover, based in evidence and your group should be able to justify the insights from your analysis. You may be asked to share your ideas with the larger KAMSC student group, so do your best!

REFERENCES:

<https://www.epa.gov/climate-indicators/cherry-blossoms>

<https://nationalcherryblossomfestival.org/about-us/#History>

<https://cherryblossomwatch.com/peak-bloom/>

<https://www.theguardian.com/environment/2021/apr/03/early-cherry-blossoms-bloom-washington-dc>

<https://www.nps.gov/subjects/cherryblossom/index.htm>

EPA's Climate Change Indicators in the United States: www.epa.gov/climate-indicators