

# CHICAGO-AREA EASTERN LILAC PHENOPHASE DATA 1961 – 2014



## 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 general tendency.

According to the National Phenology Network, “Changes in phenological events like flowering and animal migration are among the most sensitive biological responses to climate change.” (USA-NPN, 2017)

The data you will be examining are the median dates of the first bloom of the Eastern Lilac (*Syringa vulgaris*) in the greater Chicago area, as reported to the Chicago Botanical Society and Ellen Denny, the Monitoring Design & Data Coordinator for the USA National Phenology Network (USA-NPN) in Tucson, Arizona. From 2008 until 2014, data was collected through a citizens’ science survey conducted by Dryad, a non-profit membership organization that collated phenology data from many states into a large database. That information was then made available through web-based resources.

The definition that is used by the NPN for the first bloom is as follows: “the date when at least 50% of the flower clusters of a given plant have at least one open flower.”

## 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 what has happened to the dates of first flowering of this spring species over the 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 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, insights from your analysis to share with the larger student group and any other comments that you wish to share.

## REFERENCES:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4520215/>

<https://my.chicagobotanic.org/tag/phenology/>

<https://www.usanpn.org/news/spring>

<https://hort.uwex.edu/articles/phenology/>

<https://datadryad.org/stash/dataset/doi:10.5061/dryad.0262m>