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Principles of Biology: Section 12M, EMPACTS Project
Fall 2020, Dr. Casey Brewster, Instructor
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Introduction



Presented by: Tania

Were there any flowering plants in the outdoor lab during early fall?



Introduction: Proposal

~~Everything dies in fall to prepare for winter.~~

Wrong.



Then what does?



The idea as a child that most plants and flowers die in the fall and winter caused our group to wonder if we could discover any native arkansas plants that are still in bloom.

Some non-native plants, such as mums, can be planted and grown in the fall, but the Outdoor Learning Lab gives us the opportunity to discover native and non-native plants still in bloom.



Introduction: Summary

Our project focused on the diversity of flowers that were still blooming in early fall (late September, early October). Our group chose this project because we wanted to compare the population of flowering plants observed at the beginning semester with that still flowering mid-semester. This experiment contradicts the belief that all flower species are dominant during the fall.

All the flowers that are left play an important part in their habitat. Many of the flowers we found in the Outdoor Learning Lab that were still blooming, could be a result of the climate changes going on around them.

The result of 11 different flowering species is what our group discovered in the Outdoor Learning Lab during our observation.



Methods of Data Collection

We walked around the outdoor learning lab and looked at the pretty flowers, with one person spotting, one using the seek app, while the others made sure to record what was seen. The group also went back through the path to confirm the sightings.



Data Collection

We used an app called iSeek™ on our phones which helped us identify the plants that were still blooming at the time (late September, early October). We then recorded the different types of species we saw and collected the different number of times we saw each of them along the 70m line in the Outdoor Learning Lab (OLL).

We compared the plants we found the second time, to the plants that were observed in the beginning of the semester (late August, early September) with the same method. Once we collected our data, one of our group members analyzed it using a table and specific formula to determine the biodiversity in this specific area.

Flowers	Number Bloomed
American Aster	4
Swamp Rose Mallow	4
Pink weed	3
Asteroidae	1
Genius Golden Rod	2
Fire Weed	4
apoidae	1
Iron Weed	3
Galina Horse Weed	1
Cardinal Flower	1
Bonesets	2



Project Map

This area was near the pond, so our group also documented aquatic blooming plants.

Our species richness was recorded the second time (Mid-semester) with 11 different species in our designated region (70 Meters).

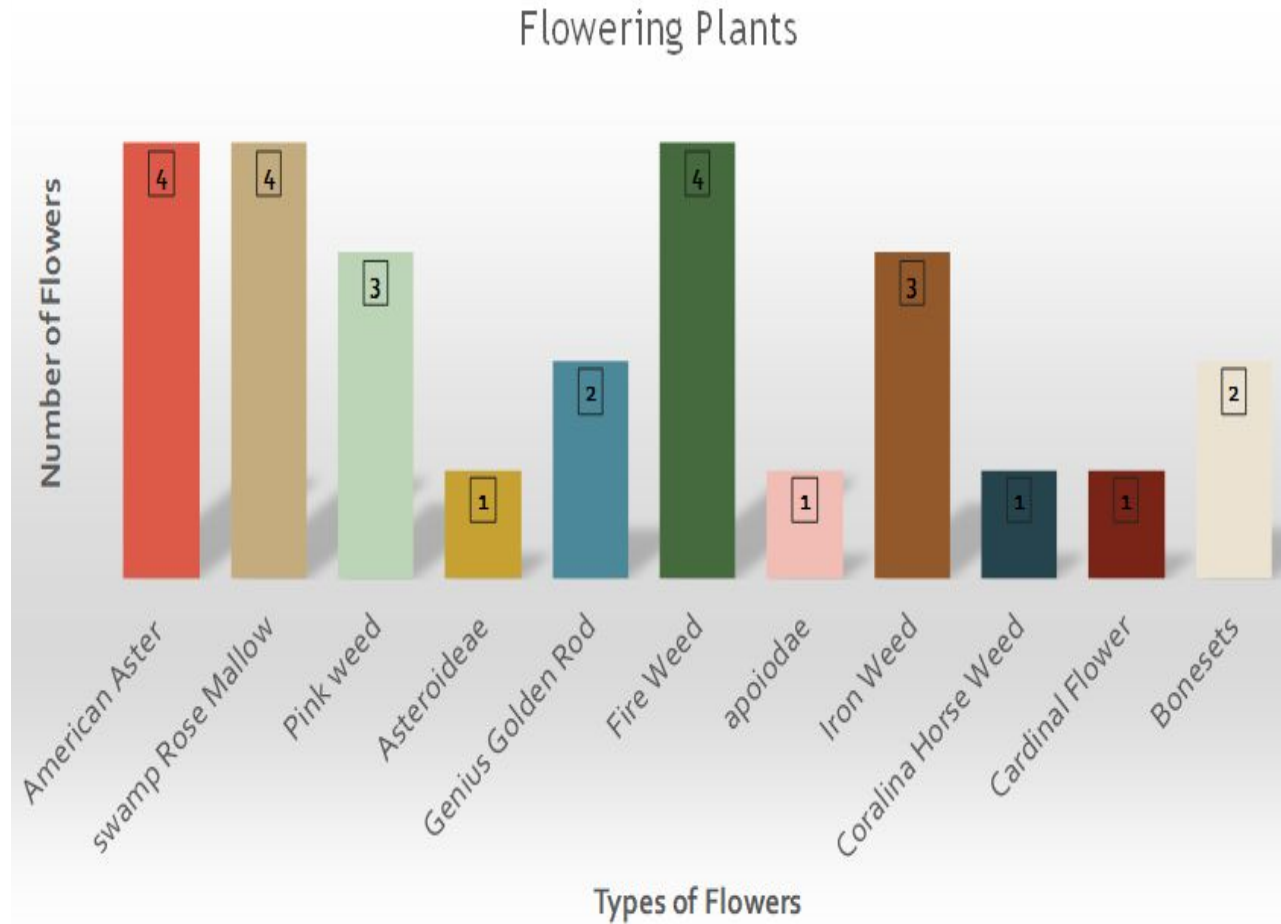
We recorded American aster, Swamp rose mallow, and fireweed as recurring the most which was four times each.



Project Graph

Once we plugged our data into a chart, we used a specific formula $(-LN(P)*P)$ to determine the diversity of this habitat.

The species diversity index came out to be 2.471, the species richness was 11, the sum of the species abundance was 22, and the species evenness was 0-1. These results of over ten different species show the diversity of this region, however the relative abundance is greater than anticipated drastically among the species.





Three Most Common Flowering
Plant Species Found

American Aster: Native Species

Symphotrichum racemosum

Habitat: Terrestrial, wetlands,
occasionally in non-wetlands

Flower type: the flower head
has tubular disk flowers in the
center and ray flowers, these
often strap-shaped, around the
periphery

Symphotrichum racemosum (small white
American-aster): Go Botany
(nativeplanttrust.org)



Fireweed: Native Species

Erechtites hieraciifolius

Habitat: Semi-shaded forested areas, sunny meadows, rocky ground, waste areas, and woodland edges

Flower Type: Four petals ranging from rose to purple in color, and the white filaments terminate in larger red anthers

[Fireweed: Pictures, Flowers, Leaves & Identification | Chamerion angustifolium \(ediblewildfood.com\)](https://ediblewildfood.com)

Fireweed in the Outdoor Learning Lab



Fireweed in Bloom [online photo]



Swamp Rose Mallow: Native Species

[Hibiscus moscheutos](#)

Habitat: Wetlands, and other moist regions, with clay or well-drained soil

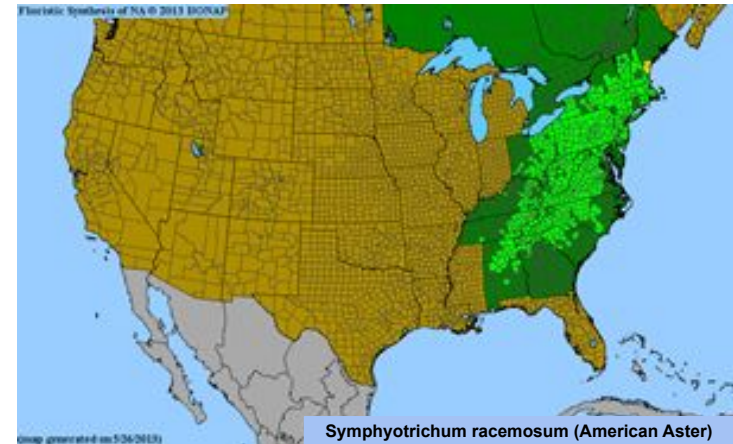
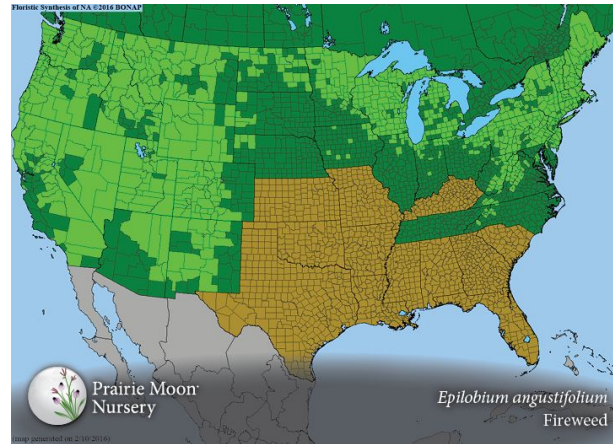
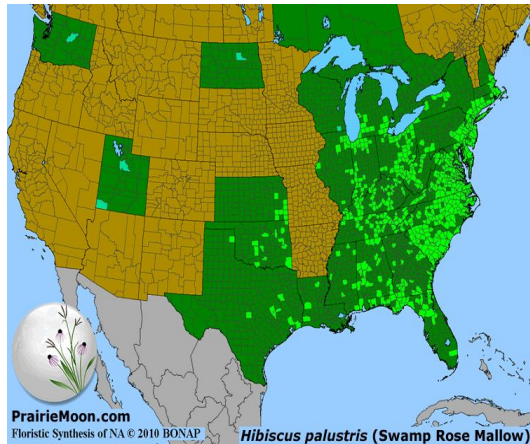
Flower type: Trumpet-shaped flower, that ranges in pink and white with red centers

[Swamp rose mallow | The Morton Arboretum](#)





Maps Containing Native Habitat Locations of:
Swamp Rose Mallow, *Fireweed*, and *American Asters*



Other Plants Found in the Outdoor Learning Lab



Pink Weed



Cardinal Flower



**Swamp
Smartweed**



**Carolina
Horsenettle**

Discussion



The main goal of flowers is to attract pollinators so they can spread the pollen around to continue the reproduction and survival of the plant species in their ecosystem. Many plants have adapted characteristics to ensure survival over the years as the environment continues to change over time (survival of the fittest).

All the flowers that are left play an important part in their habitat. Many of the flowers we found in the OLL that were still blooming, could be a result of the climate changes going on around them. As stated above, many of these flowers have evolved over time to be able to survive in harsher conditions such as the weather being colder or warmer, not receiving as much water, and even sunlight.

The result of 11 different flowering species also goes against the modern agricultural ecosystem, which made our group believe that the OLL is a natural ecosystem allowing for our findings of flowering plants to be more important.

Flowers that Survive in Fall/Winter Months

Caryopteris



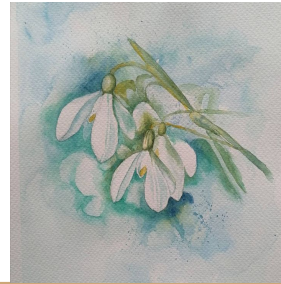
Purple Cornflower



Summersweet



Snowdrop



To the left are some other Arkansas native plants that also bloom in the fall and winter months.

Daffodil



Pansy



Camiellia



Crocus



To the left are non-native Arkansas plants that bloom in the fall and winter months.

Acknowledgements

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Citations -

Prairie Moon Nursery. (n.d.). <https://www.prairiemoon.com/>