

## OCTOBER 1 - 14 , 2018 NATURAL HISTORY NOTES

By Dick Harlow

### FALL FOLIAGE

What determines how vibrant colors will be during Fall Foliage season?



**Fall Foliage**, Reds, Oranges, and Yellows.

© Dick Harlow

Obviously, sunlight, temperature, moisture in the ground and wind will play a part in how leaves will look as Fall progresses.

The change in leaf color is caused when chlorophyll (the green pigment) in leaves is eliminated. Put it another way, the chlorophyll has to be destroyed before the other colors that are hiding in the leaf will become apparent. Chlorophyll can't be eliminated as long as there is water from the tree to the leaf providing dissolved nutrients to the chlorophyll. For a leaf to fall off the stem, a block or layer has to form between the leaf stem and the branch to which it is attached. This block is called the **abscission** layer. When the abscission layer forms the breakdown of chlorophyll can begin. As the temperature decreases abscission layers in leaves develop. As chlorophyll breaks down, oranges, reds and purple colors start to show up in various species of trees. There are some trees that will show more prevalence toward reds and purple, others will lean toward yellows, orange and some red colors.

Cool temperatures help the Fall colors, whereas **freezing** temperatures prevent the tree from producing reds and purple pigments, thus destroying or limiting Fall colors.

I am sure many have seen trees in August that show reds, and yellows before there is any significant cold weather. If we have had a drought or if a portion of the tree has

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limited nutrients coming to the leaves, this will cause an early abscission layer to develop. Thus, the leaf will show some color or turn brown early and drop.



**Fall Foliage, Reds**

© Dick Harlow

No matter how much sunlight there is if we have freezing temperatures or heavy rain and wind these forces will cause leaves to drop early. At any rate, enjoy the beautiful colors of Fall in Vermont

## **MONARCH MIGRATION**

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Generally, butterflies do not migrate long distances. They do move from state to state or across state lines, but generally they do not move from New England to Florida or Michigan to Mexico. However, the Monarch butterfly does!

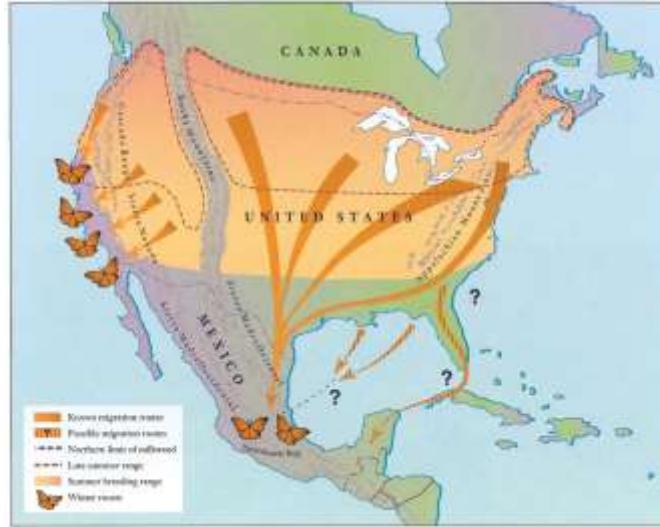


**Monarch**, Female, *Danaus plexippus*, feeding on Swamp Milkweed. © Dick Harlow

"A magnetic compass aids monarch butterfly migration Patrick A. Guerra, Robert J. Gegear & Steven M. Reppert gave convincing evidence that migrant monarch butterflies (*Danaus plexippus*) use a magnetic compass to aid their fall migration has been lacking from the spectacular navigational capabilities of this species. Here we use flight simulator studies to show that migrants indeed possess an inclination magnetic compass to help direct their flight equatorward in the fall. The use of this inclination compass is light-dependent utilizing ultraviolet-A/blue light between 380 and 420 nm. Notably, the significance of light o420 nm for inclination compass function was not considered in previous monarch studies. The antennae are important for the inclination compass because they appear to contain light-sensitive magneto-sensors. For migratory monarchs, the inclination compass may serve as an important orientation mechanism when directional daylight cues are unavailable and may also augment time-compensated sun compass orientation for appropriate directionality throughout the migration."

*Nature Communications* volume 5, Article number: 4164 (2014)

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The above map shows some of these migrating paths for Monarchs. Banding data is the source of much of this information. The foregoing quoted section will give you an idea of the research into the little known ability of Monarchs to find their way to the South or Mexico.



**Monarch**, larva, *Danaus plexippus*, feeding on Common Milkweed. © Dick Harlow

The above photograph of the Monarch larva was taken in August 2018 on milkweed we have growing in our garden. As I have said before, this year has been a banner year for Monarch Butterflies. This year gives us hope for the species.

However, I must stress that there has been an overall insect population decline as evidenced by a declining population in swallows and flycatchers overall in the United States.

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## **OBSERVATIONS**

### MAMMALS

Coywolf pack heard  
Gray Squirrel

### BUTTERFLIES

Clouded Sulphur  
Cabbage White

### **Weather Tidbits**

**Month of OCTOBER 1-14, 2017**

*[All Measurements taken at solar noon \(1230 EST\).](#)*

### **PRECIPITATION**

**Total Precipitation: 153.2 mm or 6.0 inches**

**Overcast/Rain Days: 7**