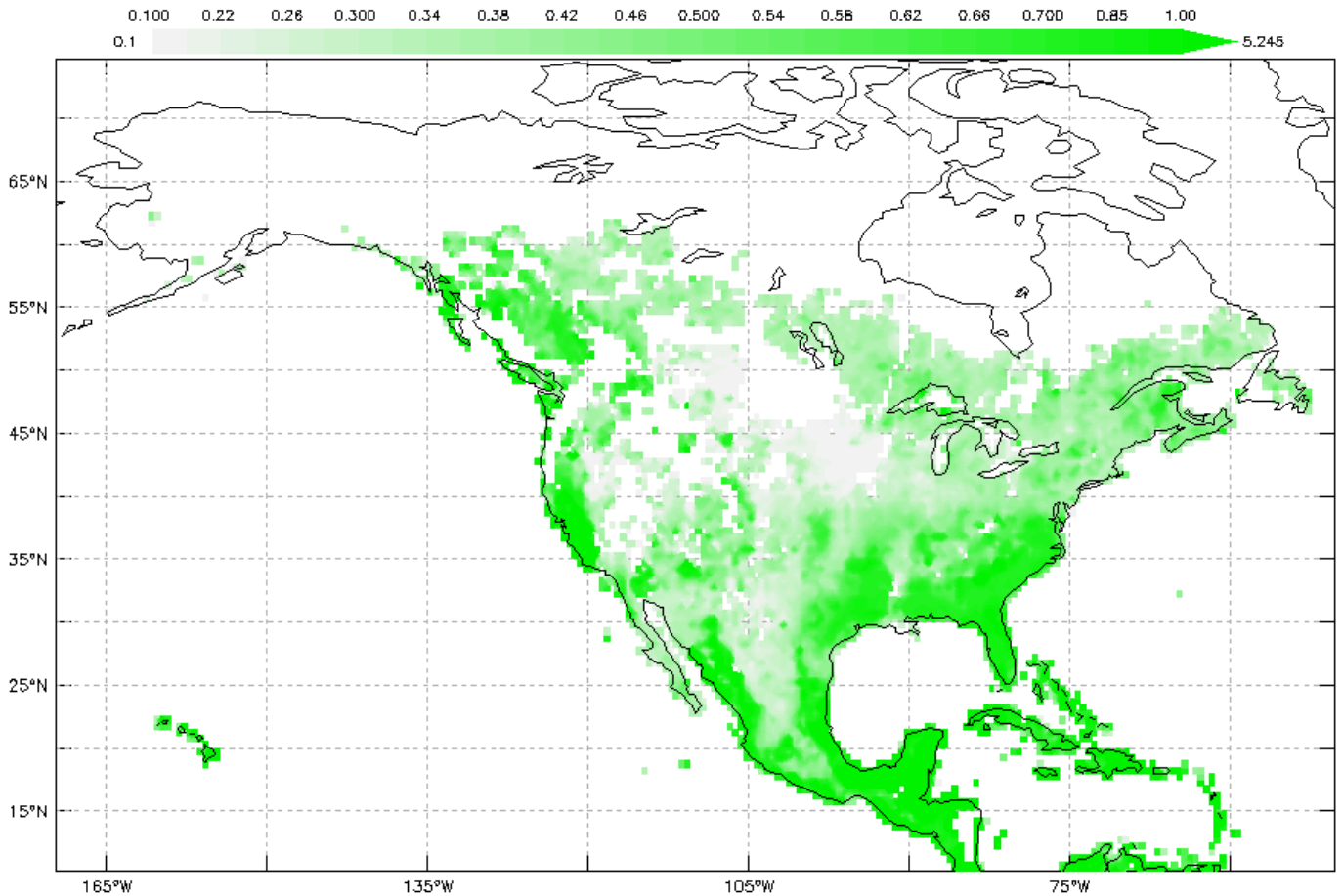

My NASA Data - Mini Lesson

Seasonal Leaf Area



Mini Lesson

Goal: Students observe seasonal images of Monthly Leaf Area, looking for any changes that are occurring throughout the year.

Procedures:

Distribute seasonal global images of the target variable.

1. Have students arrange images in **what they predict to be** in chronological order.
2. Ask groups to identify seasonal cycles for leaf changes throughout the year. Use the following guiding questions:
 1. What changes do you see through the year? What explanations can you suggest for these patterns?

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2. Choose a location or region. During which months do the extreme highs and lows occur? What explanations can you suggest for the timing of those extremes?
 3. Which regions experience both the extreme highs and lows? Which regions don't experience the extremes? Why do you think this happens?
 4. What differences, if any, do you find between the year's variations over the oceans versus the year's variations over the continents?
 5. Are there regions that remained relatively unchanged over the year? Why do you think this happens?

[Teaching Hint: if students have trouble locating significant changes have them focus their attention on one location on the image throughout the year.]

After several minutes, ask the groups to share with the entire class their discoveries of patterns and their interpretation of those patterns.

One of the key "vital signs" of Earth's vegetation is the total green leaf area for a given ground area. The Moderate Resolution Imaging Spectroradiometer (MODIS) aboard NASA's Terra and Aqua satellites collects global Leaf Area Index (LAI) data on a daily basis. The map above shows the LAI for the time period indicated, expressed in terms of square meters of leaf area per square meter of ground area. Values range from 0 to 7 square meters of leaf area per square meter of land surface.

How can there be more square meters of leaf than land surface in an area? Because the vegetation grows in layers above the ground. For instance, an LAI value of 5 means that there are five layers of leaves in that area. A value of less than 1 means that if you took all the leaves in an area and laid them flat on the ground, there wouldn't be enough to cover the land surface.

Knowing the total leaf area in a plant canopy helps scientists determine how much water will be stored and released by an ecosystem, how much leaf litter it will generate, and how much photosynthesis is going on. Such information also helps scientists understand the flow of energy among the various layers of vegetation, the atmosphere, and the ground, which in turn affects climate.

Crosscutting Concepts

- [Patterns](#)
- [Scale, Proportion, and Quantity](#)
- [Systems and System Models](#)

Earth System Data Explorer

- [Monthly Leaf Area Index \(2126\)](#)

Related Links

- [LEAF AREA INDEX \(1 MONTH - TERRA/MODIS\)](#)
- [Data Literacy Cubes Page](#)