My NASA Data - Mini Lesson/Activity

Explore Albedo Values: Student Activity

Student Directions

1. Introduce or review the concept of albedo with students by showing the NASA Climate Bits: Albedo video.

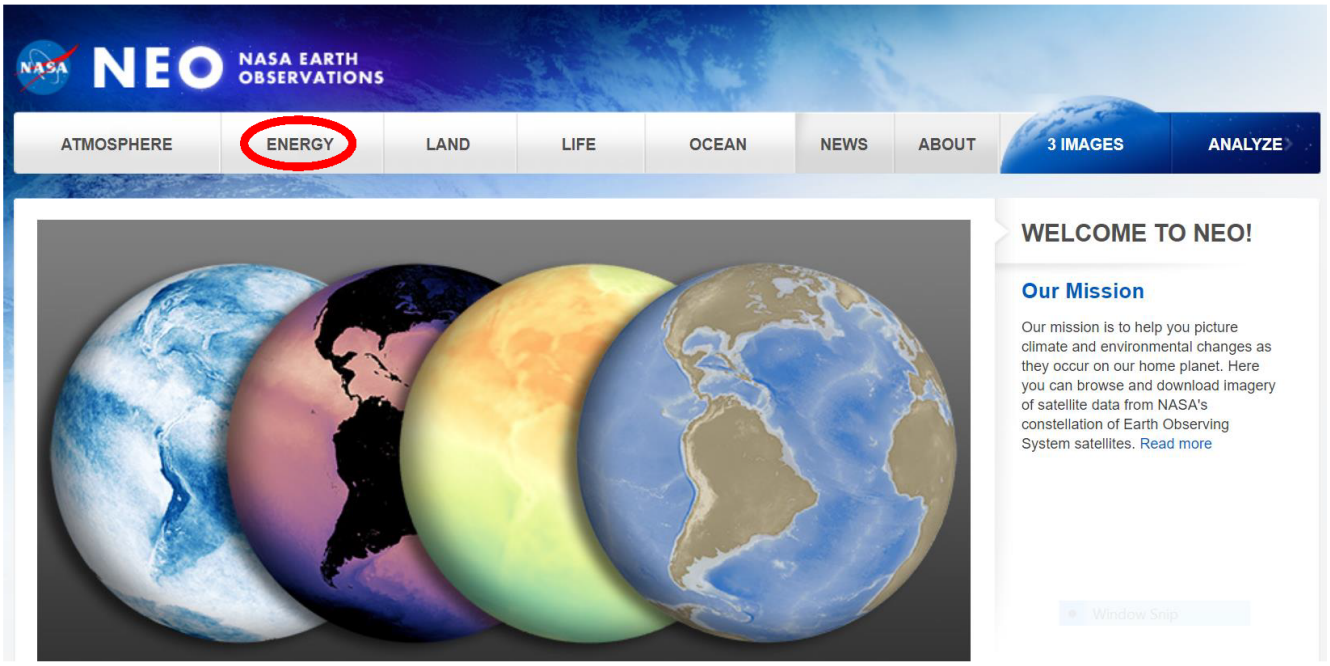
Video: ClimateBits: Albedo

Video

ClimateBits: Albedo | https://www.youtube.com/watch?v=d1U7X1k3d0Y | Source: ClimateBits

1. After watching the video, have students go to the NASA Earth Observations Website (https://neo.sci.gsfc.nasa.gov/). They will select three months of albedo data and use the data probe tool to explore the albedo values in the Arctic region.

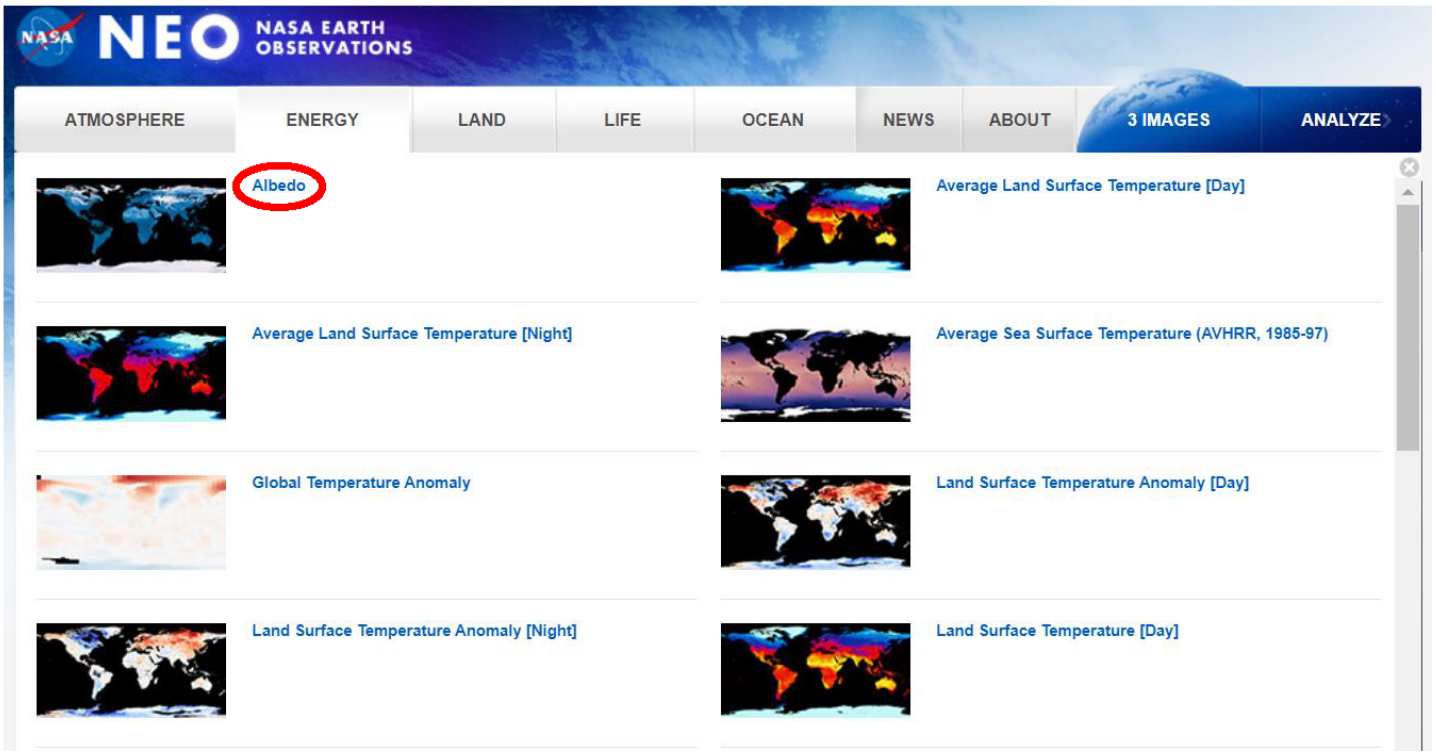
2. The first screen will look like this.



Credit: NASA Earth Observations

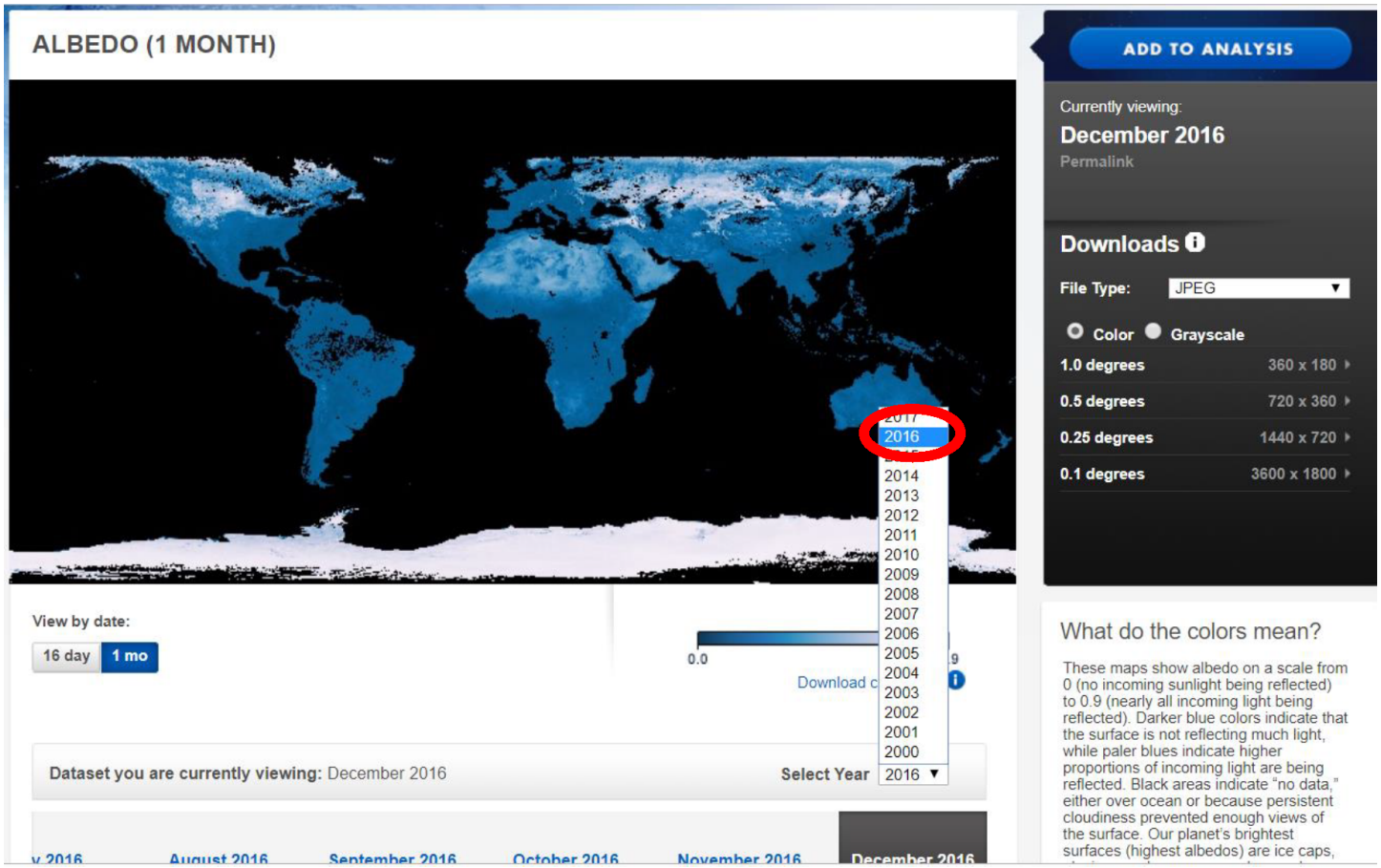
4. Have the students click on Energy at the top of the screen as indicated by the red oval in the image above.

5. Students will then click on Albedo.



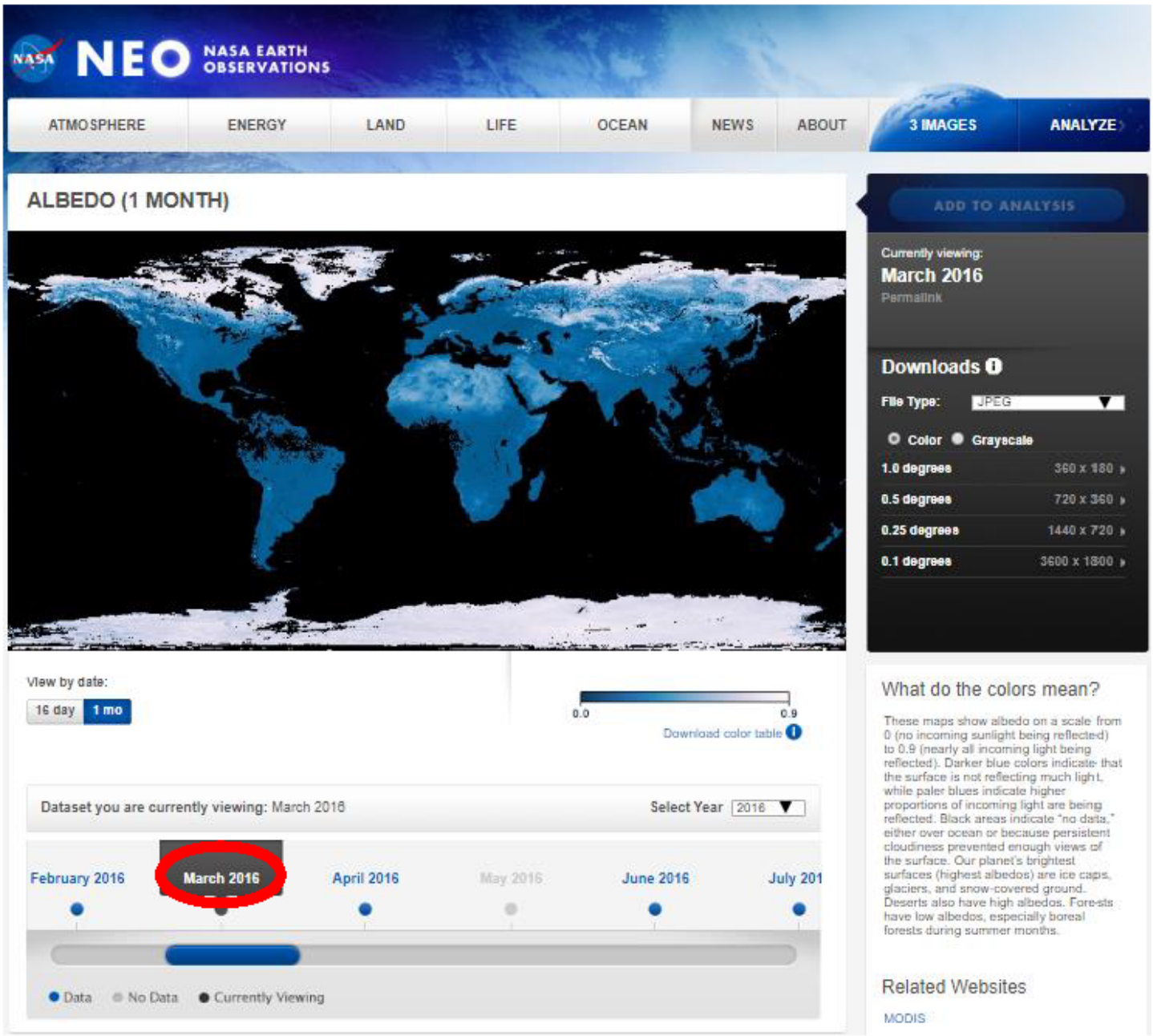
Credit: NASA Earth Observations

6. When the albedo screen comes up, students should select the dropdown for the year and click on 2016.



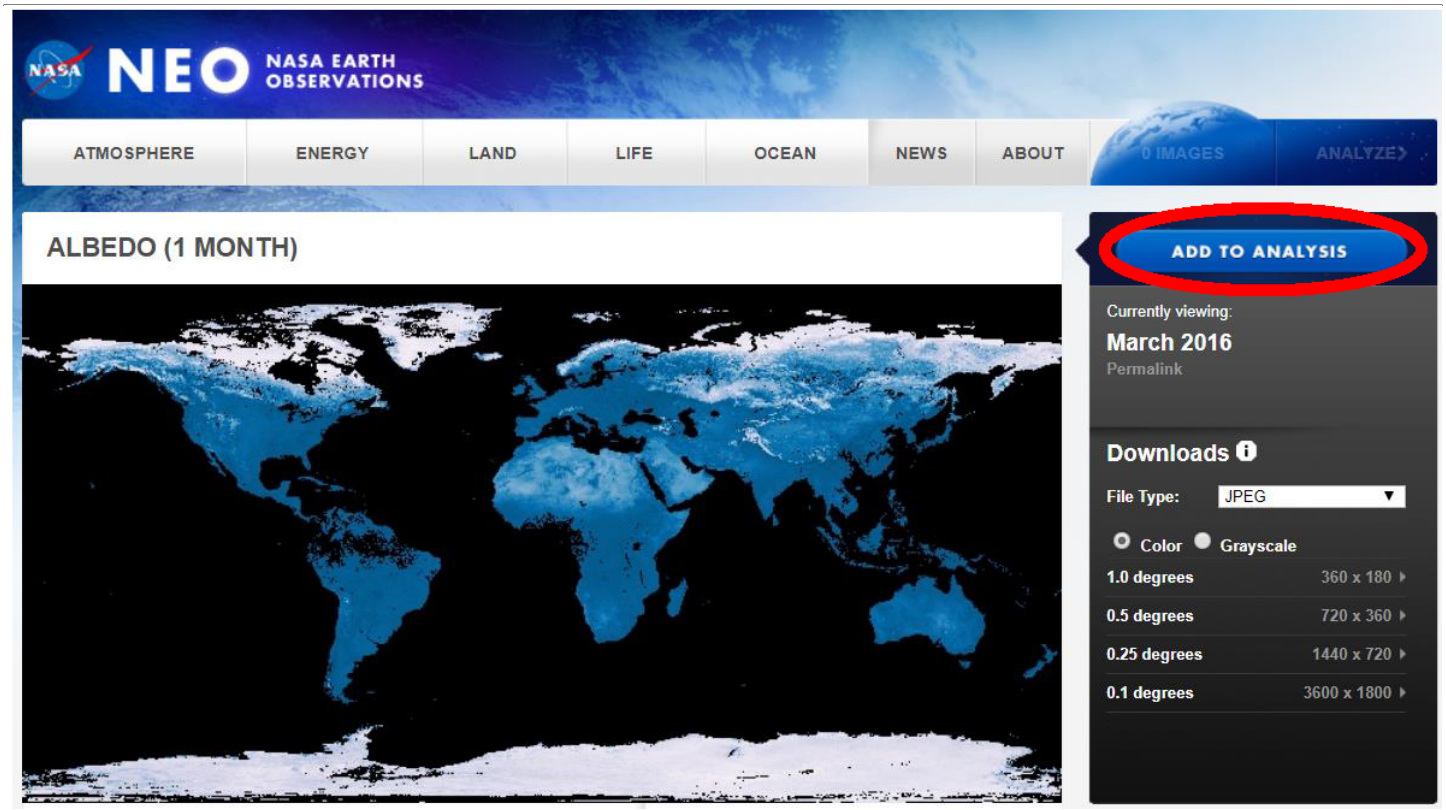
Credit: NASA Earth Observations

7. On the next screen, they will slide the date bar to the left and click on the words March 2016.



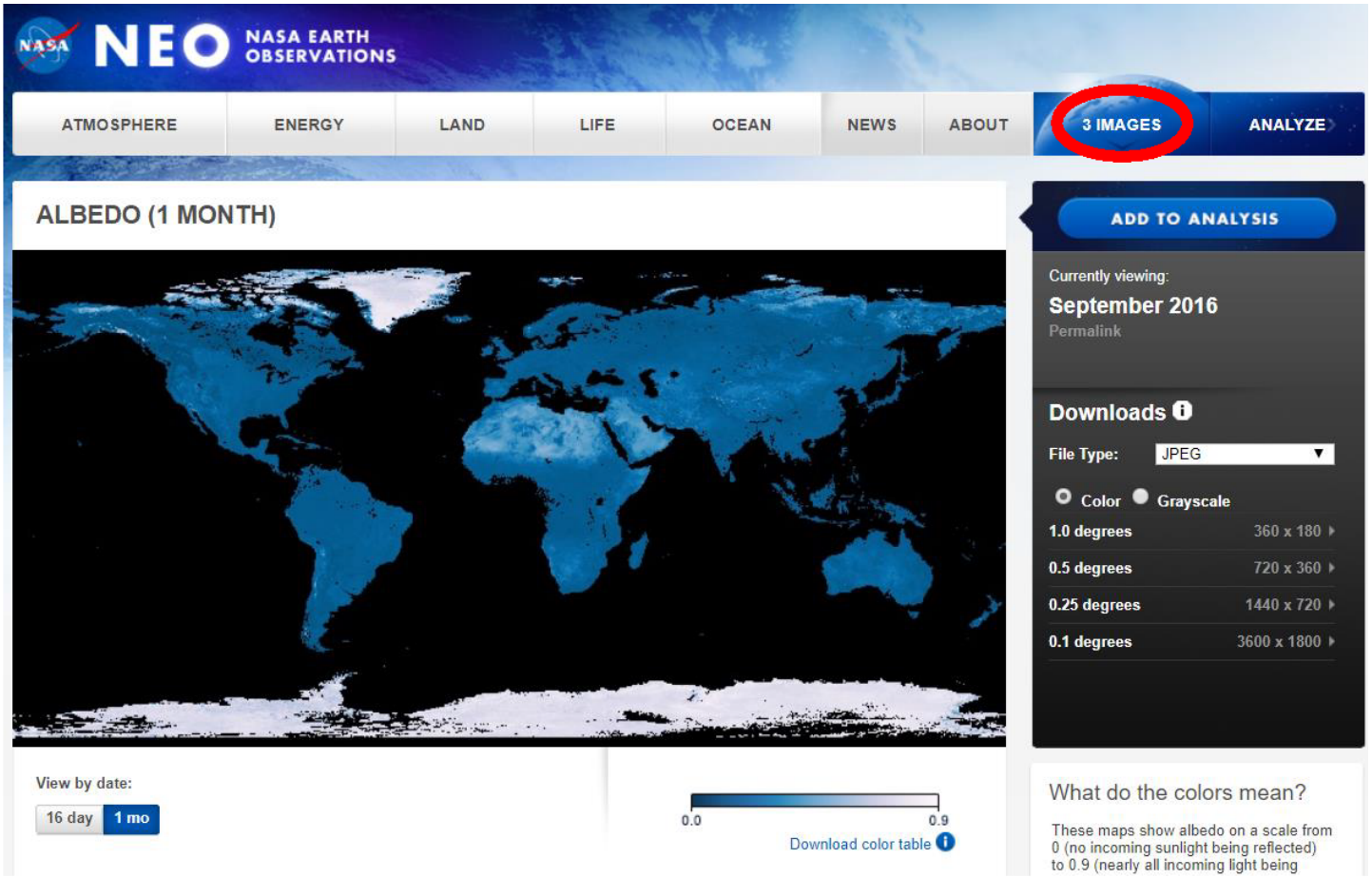
Credit: NASA Earth Observations

8. After the March 2016 image is displayed, click on Add to Analysis at the top right of the screen.



Credit: NASA Earth Observatory

9. Follow the same steps to select June 2016 and September 2016. Once the three images are added, students should see that there are three images selected.



Credit: NASA Earth Observatory

10. Have students click on the Analyze button at the top right of the screen.

Credit: NASA Earth Observations

11. On the next screen, students should verify that the mode is basic exploration and the file size is 0.25 degrees. Then they should click on Launch Analysis.

Credit: NASA Earth Observations

12. When the analysis screen appears, point out to students that the three months are indicated by different colors. Have students click on Data Probe. They will be able to move the cursor over different locations and see the albedo values for all three months in their respective colors.

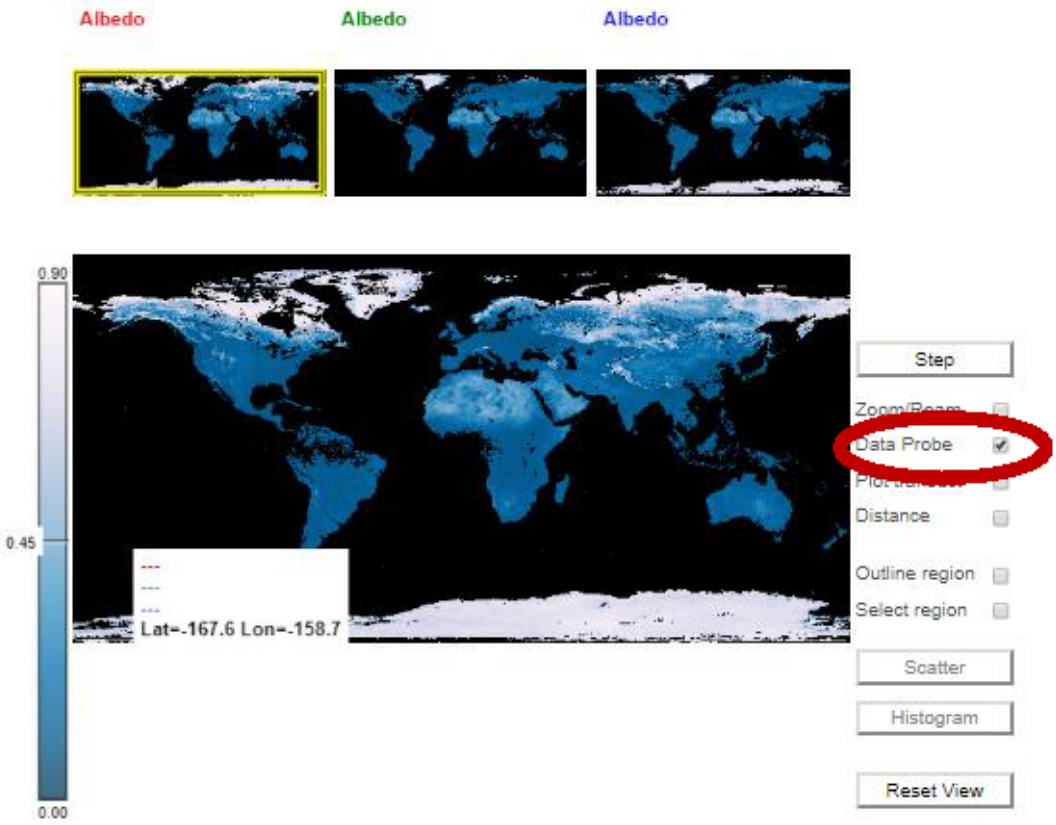
NEO NASA EARTH OBSERVATIONS

ATMOSPHERE | ENERGY | LAND | LIFE | OCEAN | NEWS | ABOUT | 3 IMAGES | ANALYZE

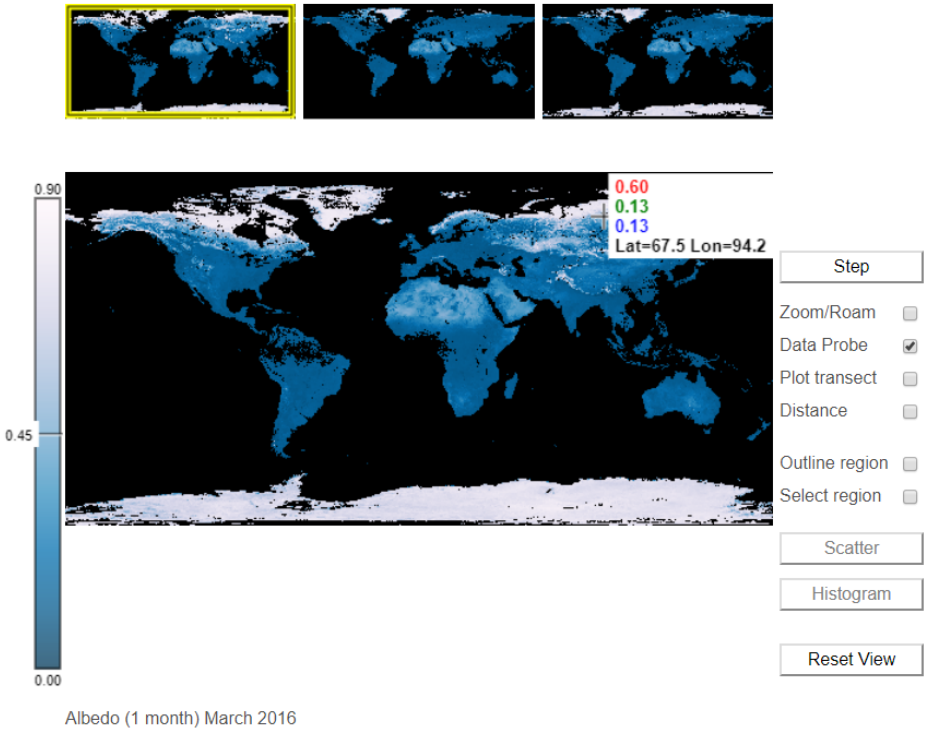
ANALYSIS TOOL

Back to configuration

1. Albedo (1 month) March 2016
2. Albedo (1 month) June 2016
3. Albedo (1 month) September 2016



Albedo (1 month) March 2016



Credit: NASA Earth Observations

13. Let students explore for a few minutes and then have them answer the following questions.

- Fill in the table with the data you collect.

	Latitude	Longitude	Mar-16	Jun-16	Sep-16	Range
Mainland US						
Alaska						
Arctic						
Northern Canada						
Greenland						
Africa						

- After filling in the data, calculate the range for each location by subtracting the lowest albedo value from the highest albedo value.
- Which locations have the lowest range?
- Which locations have the highest range?
- Areas with a higher range experience more change in albedo during the year. What do these areas have in common?
- Why do you think these areas experience changing albedo?

Credit: NASA Earth Observations

Students will use the NASA Earth Observations analysis tool to explore changing albedo in the Arctic compared with other areas of Earth. Students should notice that the northernmost areas experience a greater variation. These are areas that have cycles of ice growth and melt throughout the seasons.

Ice has a high albedo. As it melts, the albedo decreases. This leads to changes in albedo in the

Arctic as the seasons change. Areas over land such as Africa and the mainland US experience less change because the reflectivity of the land does not change as much as the melting ice.

My NASA Data Visualization Tool

- Earth System Data Explorer