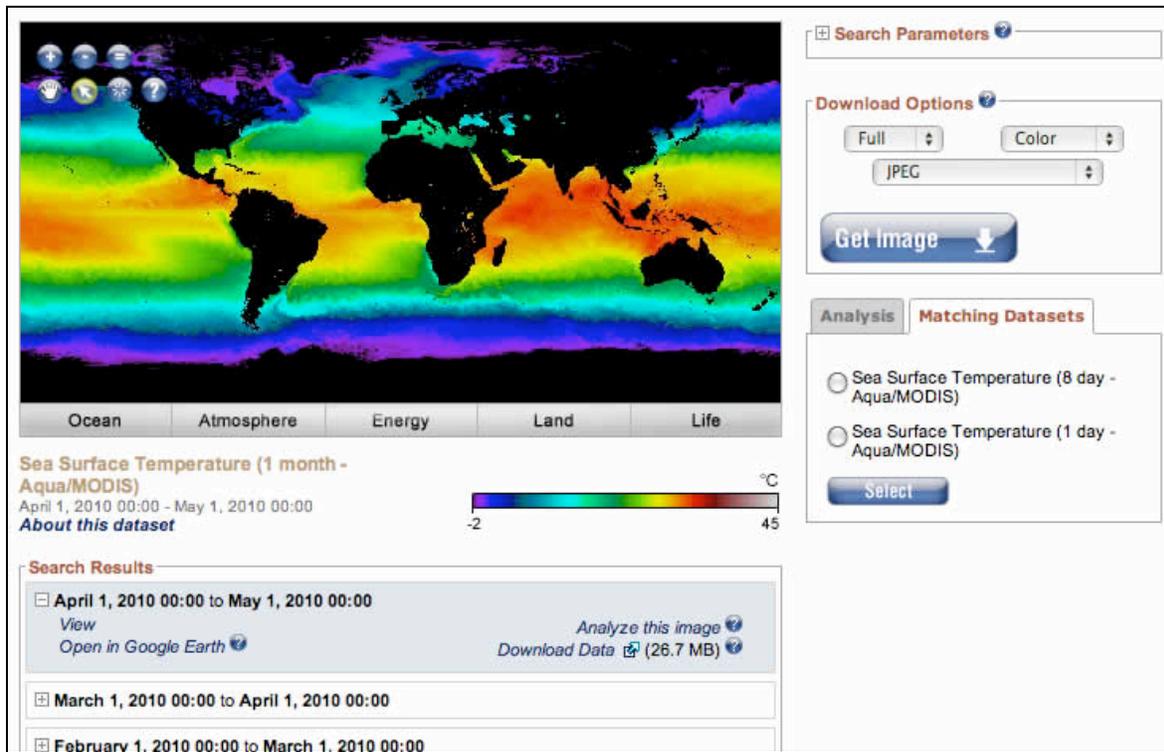


## NASA Earth Observations (NEO): A Brief Introduction

NEO is a data visualization tool that allows users to explore a wealth of environmental data collected by NASA satellites. The satellites use an array of sensors to detect the various wavelengths of electromagnetic radiation that are reflected by or emitted from Earth's surface. That data is then converted to color images that are available on the NEO Web site.



### Interface/Features

(This document highlights only a few features of NEO.)

The data available in NEO is organized into five categories: **Ocean**, **Atmosphere**, **Energy**, **Land**, and **Life**. Clicking one of these five buttons opens a list (not shown) of the available data sets related to that category. There are more than 40 different data sets available; some are available under more than one category. (See below for a complete list). The image above is part of the Sea Surface Temperature data set, one of the options available under the **Ocean** button.

Once you've selected a data set, the image showing the most recent data will automatically open, and a list of data for earlier time periods (often several years worth of data) will appear below, in reverse chronological order. To view data from an earlier time period, click the symbol next to the date to expand the box and then click **View**. Other options in that same box include *Open in Google Earth*, *Analyze this image*, and *Download Data*. Click the help button (question mark) for more information about each of these options. More information about *Analyze this image* is provided below. The set of buttons in the top left corner of the image allow you to manipulate the image. Click the help button for details.

Once a specific data set is selected, NEO will list related data sets in the panel titled **Matching Datasets**, which is to the right of the image.

You can download an image to your computer by using the **Get Image** button in the panel labeled **Download Options**. Use the dropdown menus to select image size, color, and type prior to downloading. Downloading images allows you to see a much larger image and is also is one way to view and compare multiple images.

### Image Analysis

An analysis option allows you to view graphed numerical data for selected sections of up to three images at a time. To analyze an image, click on the link **Analyze this image**; this will open the Analysis panel to the right of the image and list the image details in the panel. In the example below, Sea Surface Temperature for both January and April have been added to the Analysis panel.

Sea Surface Temperature (1 month - Aqua/MODIS)  
April 1, 2010 00:00-May 1, 2010 00:00  
[About this dataset](#)

Search Results

- April 1, 2010 00:00 to May 1, 2010 00:00  
[View](#)  
[Open in Google Earth](#)  
[Analyze this image](#)  
[Download Data](#) (26.7 MB)
- March 1, 2010 00:00 to April 1, 2010 00:00
- February 1, 2010 00:00 to March 1, 2010 00:00

Download Options

Full Color  
JPEG

Get Image

Analysis Matching Datasets

Sea Surface Temperature (1 month - Aqua/MODIS) Apr. 1 2010 00:00-May. 1 2010 00:00 [remove](#)

Sea Surface Temperature (1 month - Aqua/MODIS) Jan. 1 2010 00:00-Feb. 1 2010 00:00 [remove](#)

[configure/launch analysis](#)

Once you have added between one and three images to the **Analysis** panel, click the link **configure/launch analysis** at the bottom of the panel. This opens the **Configure Analysis** panel, which you can explore but which is not included in this example. At the bottom of the **Configure Analysis** panel, click the link **launch analysis**.

Sea Surface Temperature (1 month - Aqua/MODIS) Apr. 1 2010 00:00-May. 1 2010 00:00 [remove](#)

Sea Surface Temperature (1 month - Aqua/MODIS) Jan. 1 2010 00:00-Feb. 1 2010 00:00 [remove](#)

Configure Analysis Select Area Mode File Sizes Download

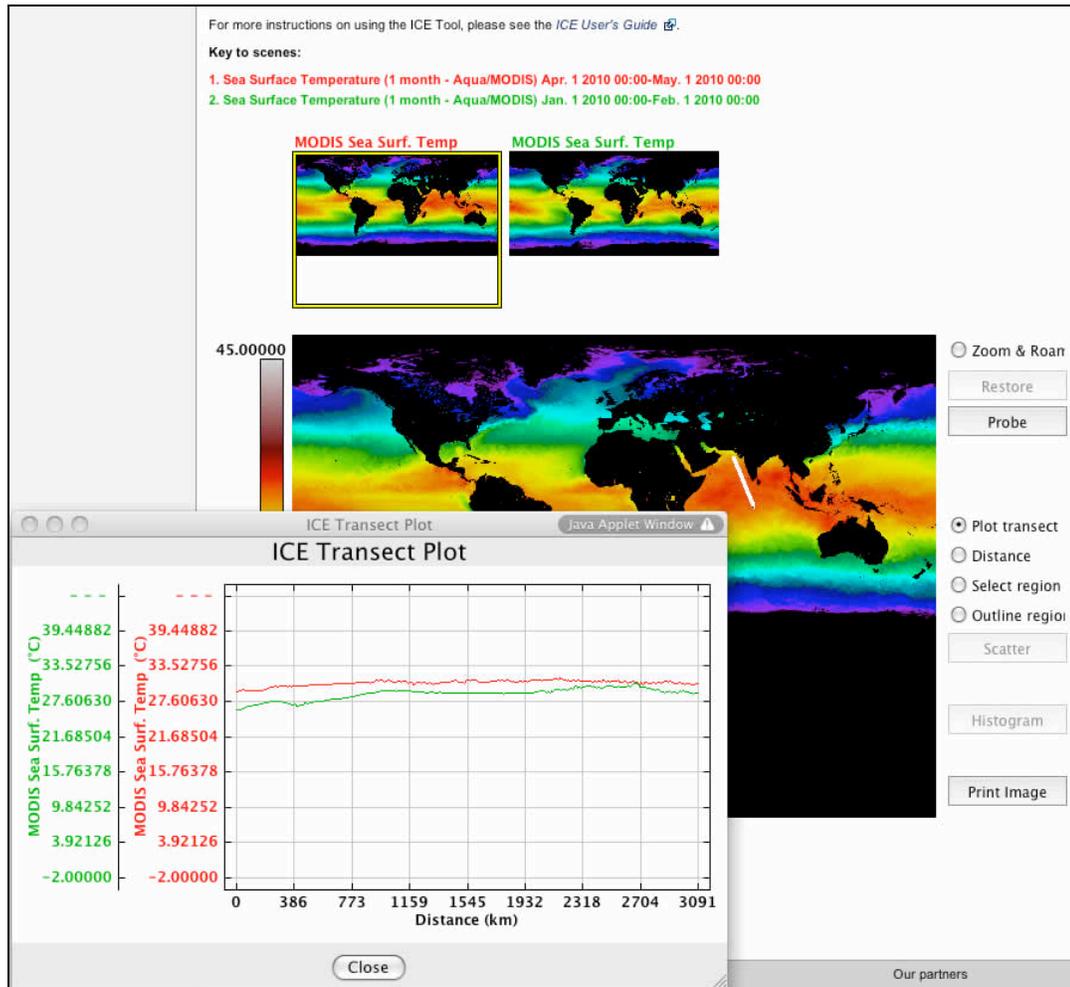
Configure analysis

You may configure the analysis further by selecting a specific area to analyze, selecting different modes under which the analysis will run, or adjust the size of the files (resolution) that will be used in the analysis. For more information on each of these options, click on the appropriate tab. If you would like to accept the defaults and run the analysis, click on the 'Launch analysis' link below.

Launch analysis

The new window that opens display thumbnails of both images you have selected to analyze. Whichever thumbnail is highlighted also appears below the thumbnails.

In the image below, the **Plot transect** radio button was selected and the cursor was used to draw a line in the ocean parallel to the west coast of India (see white line). Drawing this line opens another window (ICE Transect Plot) that shows the *numerical value* of ocean temperature along that line for both the January (green) and April (red) data sets.



You can also plot data for areas as well as along lines, using the other radio button options.

You are not limited to analyzing just those images in the same category (e.g., **Oceans**); you can use the analysis feature to compare any two or three data sets that display the link **Analyze this image**. Note that whenever you select a new data set, the **Matching datasets** panel will reopen, covering the data you have added to the Analysis panel, but if you re-open the Analysis panel you'll find that the data that you have added is still there.

## **Data Sets Available in NEO**

Below is a list of the data sets, by category, available in NEO as of June, 2010. The data sets that are highlighted in yellow are ones that have already been listed under a previous category.

### ***OCEAN***

Average Sea Surface Temperature 1985-1997 (AVHRR)  
Blue Marble: Next Generation  
Chlorophyll Concentration (MODIS)  
False Color (MODIS)  
Global Bathymetry (GEBCO)  
Sea Surface Temperature (AMSR-E)  
Sea Surface Temperature (MODIS)  
Sea Surface Temperature Anomaly (AMSR-E)  
Snow Cover & Sea Ice Extent  
True Color (MODIS)  
Water Leaving Radiance (MODIS)

### ***ATMOSPHERE***

Aerosol Optical Thickness (MODIS)  
Aerosol Particle Radius (MODIS)  
Carbon Monoxide (MOPITT)  
Cirrus Reflectance (MODIS)  
Cloud Fraction (MODIS)  
Cloud Optical Thickness (MODIS)  
Cloud Particle Radius (MODIS)  
Cloud Water Content (MODIS)  
False Color (MODIS)  
Total Rainfall (TRMM)  
True Color (MODIS)  
Water Vapor (MODIS)

### ***ENERGY***

Average Land Surface Temperature [Day]  
Average Land Surface Temperature [Night]  
Average Sea Surface Temperature 1985-1997 (AVHRR)  
Land Surface Temperature Anomaly [Day]  
Land Surface Temperature Anomaly [Night]  
Land Surface Temperature [Day] (MODIS)  
Land Surface Temperature [Night] (MODIS)  
Net Radiation  
Outgoing Longwave Radiation  
Reflected Shortwave Radiation  
Sea Surface Temperature (AMSR-E)  
Sea Surface Temperature (MODIS)  
Sea Surface Temperature Anomaly (AMSR-E)  
Solar Insolation

## ***LAND***

Active Fires (MODIS)

Average Land Surface Temperature [Day]

Average Land Surface Temperature [Night]

Blue Marble: Next Generation

False Color (MODIS)

Global Topography (SRTM/RAMP2)

Greenland / Antarctica Elevation (ICESat/GLAS)

Land Cover Classification (MODIS)

Land Surface Temperature Anomaly [Day]

Land Surface Temperature Anomaly [Night]

Land Surface Temperature [Day] (MODIS)

Land Surface Temperature [Night] (MODIS)

Leaf Area Index (MODIS)

Net Primary Productivity (MODIS)

Permafrost

Snow Cover & Sea Ice Extent

Snow Cover (MODIS)

Snow Water Equivalent (Passive Microwave)

True Color (MODIS)

Vegetation Index [NDVI] (MODIS)

## ***LIFE***

Chlorophyll Concentration (MODIS)

Leaf Area Index (MODIS)

Net Primary Productivity (MODIS)

Population

Vegetation Index [NDVI] (MODIS)