



# Using the Forest Change Assessment Viewer

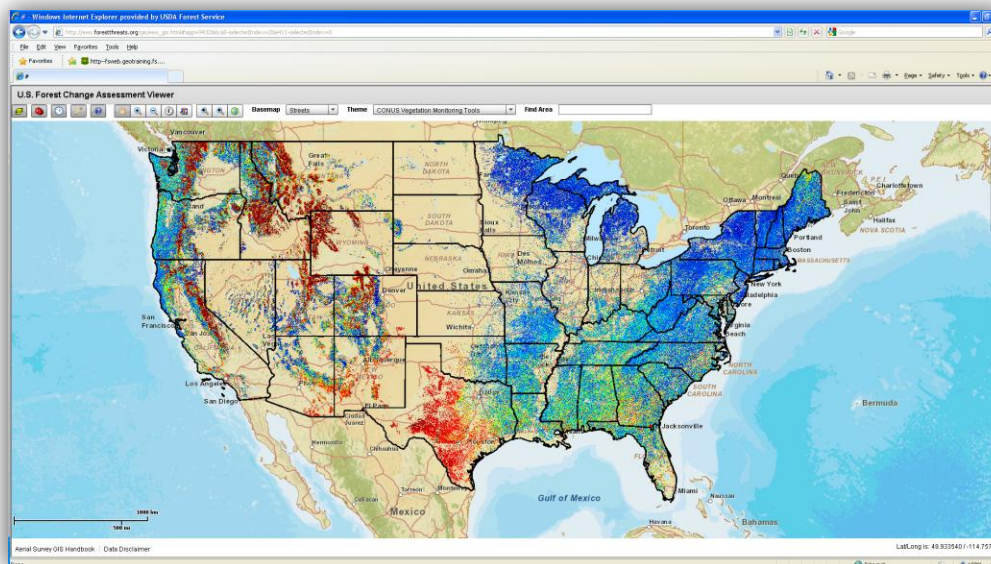
*from the Forest Services' Eastern Forest Environmental Threat Assessment Center (EFETAC)  
and the Western Wildlands Environmental Threat Assessment Center (WWETAC)*



## A Help document for basic navigation, data layers and uses

(click heading to jump to section)

1. [Map Navigation](#)
2. [Obtaining Data Layer Information](#)
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MODIS Near Real Time \(NRT\) Products](#)
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7. [The "Multi-graph" Control](#)
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Forest Change Assessment Viewer Website:

<http://ews.forestthreats.org/>

Threat Assessment Center Websites:

<http://forestthreats.org/>  
<http://www.fs.fed.us/wwetac/>





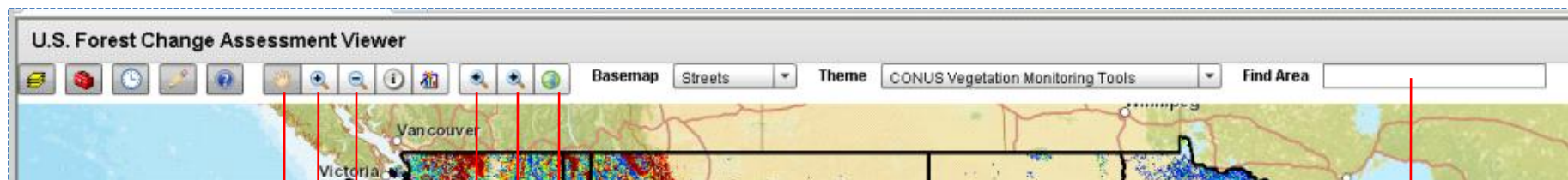
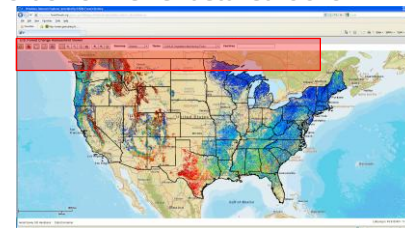
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Portion of Viewer detailed is shown in red

## Basic Navigation: Moving around the map



Type in a U.S. county by name to zoom-to

"Full Extent," resets the view to the conterminous United States (CONUS)

"Next Extent," click to jump ahead to a viewing area previously visited

"Previous Extent," click to jump back you your previous viewing area

"Zoom-out" control, drag a box over the area of interest to zoom-out

"Zoom-in" control, drag a box over the area of interest to zoom-in

"Pan" around the image by clicking and dragging the image

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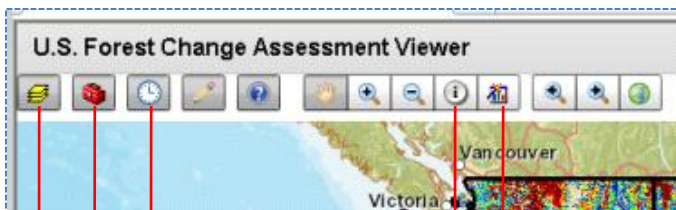
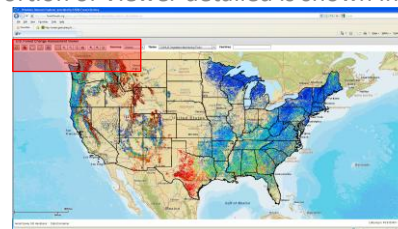
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## Basic Navigation: **Obtaining Information**



“Graph NDVI” shows a locations’ change in NDVI value through time [\(use and interpretation\)](#)

“Identify” control, displays database information for layers that are clicked ‘on’ [\(to remove highlight\)](#)

Opens a time-line control that can display the 8-day images in a time series

Toggles on and off the Legend box for each layer that are ‘on’

Toggles on and off the ‘Table of Contents,’ the data layers

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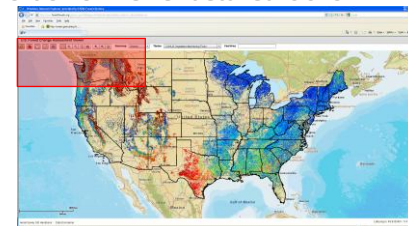
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## Data Layers: Choosing a Basemap

Portion of Viewer detailed is shown in red



Click the “Basemap” dropdown to choose among the types below

*...this may become more important when viewing forest disturbance image products later, keep the default “Streets” to begin with*

Streets



Relief



Terrain



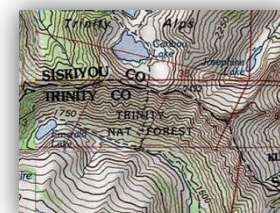
Imagery



Topo Map



USA Topo\*



Notes – all basemap layers exhibit increased detail when zoomed

(\*) USGS quads 1:24k, 1:100k and 1:250k

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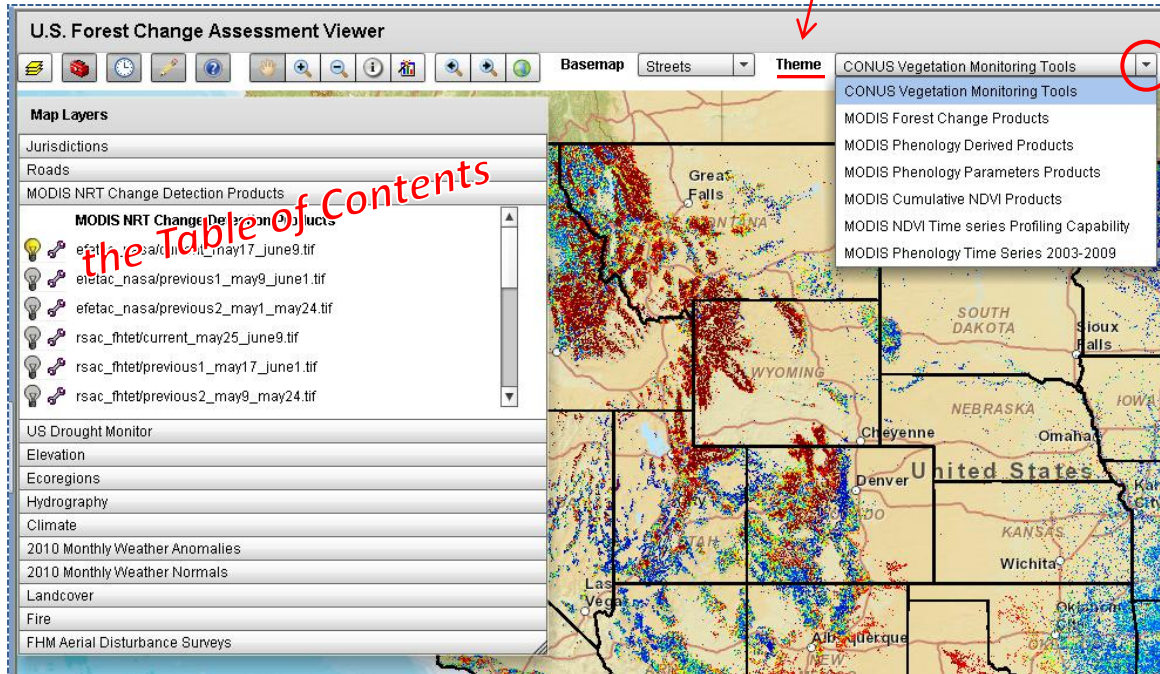
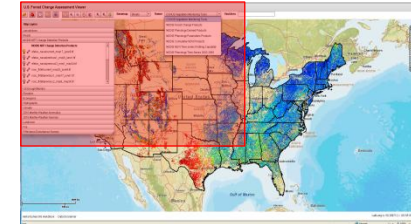
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## Data Layers: Choosing a Data Theme

Portion of Viewer detailed is shown in red



— The “Theme” dropdown adds specific data layers to the Table of Contents, only one “Theme” can chosen at a time.

Beginning users should leave the theme choice set to the default “CONUS Vegetation Monitoring Tools.”

More detail will follow regarding the other thematic collections, the specific data layers that are added to the Table of Contents and to which purpose(s) the other themes and data layers are appropriate.

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# Using the Forest Change Assessment Viewer

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## Data Layers: Viewing the most recent forest change image product

1. In the Table of Contents window, click on the tab heading "MODIS NRT Change Detection Products" to expand and view the data layers (NRT – near real time)
2. Click the 'lightbulb' to the left of the top data layer, this turns-on the most recent forest change detection image
3. Use the 'wrench' icon adjust the transparency of any layer to better view the basemap, or other layers
4. The top three layers are the (3) most recent eight-day forest change products from EFETAC
5. Uses: toggle the three most recent products to view a time-based progression of a disturbance (shades of yellow to red), or "green-up" (shades of green to blue)

The screenshot shows the Forest Change Assessment Viewer interface. The Map Layers panel on the right lists various data layers. The Table of Contents window on the right is expanded, showing the 'MODIS NRT Change Detection Products' section. A red arrow points from the 'MODIS NRT Change Detection Products' tab in the Table of Contents to the corresponding section in the Map Layers panel. Another red arrow points from the 'lightbulb' icon next to the top layer in the Map Layers panel to the 'efetac\_nasa/current\_may17\_june9.tif' layer. A third red arrow points from the 'wrench' icon next to the same layer to the layer's transparency slider. Below the screenshot, a color scale legend is shown with the text 'What do the colors mean?'. The legend has a horizontal bar with a color gradient from red to blue, labeled '-100 % change 100'. Below the bar, the text 'Less' and 'More' are positioned, with a double-headed arrow between them, and 'Forest Productivity' at the bottom.

**What do the colors mean?**

-100 % change 100

Less More

Forest Productivity

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# Using the Forest Change Assessment Viewer

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## Data Layers: Forest Change image products from the RSAC (the Remote Sensing Application Center, USDAFS)

1. In the Table of Contents window, click on the tab heading "MODIS NRT Change Detection Products" to expand and view the data layers (NRT – near real time)
2. Click the 'light bulb' to the left of the top "RSAC" data layer, this turns-on the most recent forest change detection image from the RSAC Forest Health Technology Enterprise Team of the USDA Forest Service (\*)
3. Uses: toggle the three most recent RSAC image products to view a time-based progression of a disturbance (shades of yellow to red), or "green-up" (shades of green to blue)

**Map Layers**

Jurisdictions

Roads

MODIS NRT Change Detection Products

**MODIS NRT Change Detection Products**

- efetac\_nasa/current\_may17\_june9.tif
- efetac\_nasa/previous1\_may9\_june1.tif
- efetac\_nasa/previous2\_may1\_may24.tif
- rsac\_fhtet/current\_may25\_june9.tif**
- rsac\_fhtet/previous1\_may17\_june1.tif
- rsac\_fhtet/previous2\_may9\_may24.tif
- efetac\_nasa-retro/1YrBaseline/current\_december3\_december26.tif
- efetac\_nasa-retro/1YrBaseline/previous1\_november25\_december18.tif
- efetac\_nasa-retro/1YrBaseline/previous2\_november17\_december10.tif
- efetac\_nasa-retro/3YrBaseline/current\_december3\_december26.tif
- efetac\_nasa-retro/3YrBaseline/previous1\_november25\_december18.tif
- efetac\_nasa-retro/3YrBaseline/previous2\_november17\_december10.tif
- efetac\_nasa-retro/AllYrBaseline/current\_february18\_march13.tif
- efetac\_nasa-retro/AllYrBaseline/previous1\_february10\_march5.tif
- efetac\_nasa-retro/AllYrBaseline/previous2\_december3\_december26.tif

**What do the colors mean?**

-100 % change 100

RSAC-FHTET\_current

(\*) Different methodologies are employed by EFETAC and RSAC to produce forest change image products

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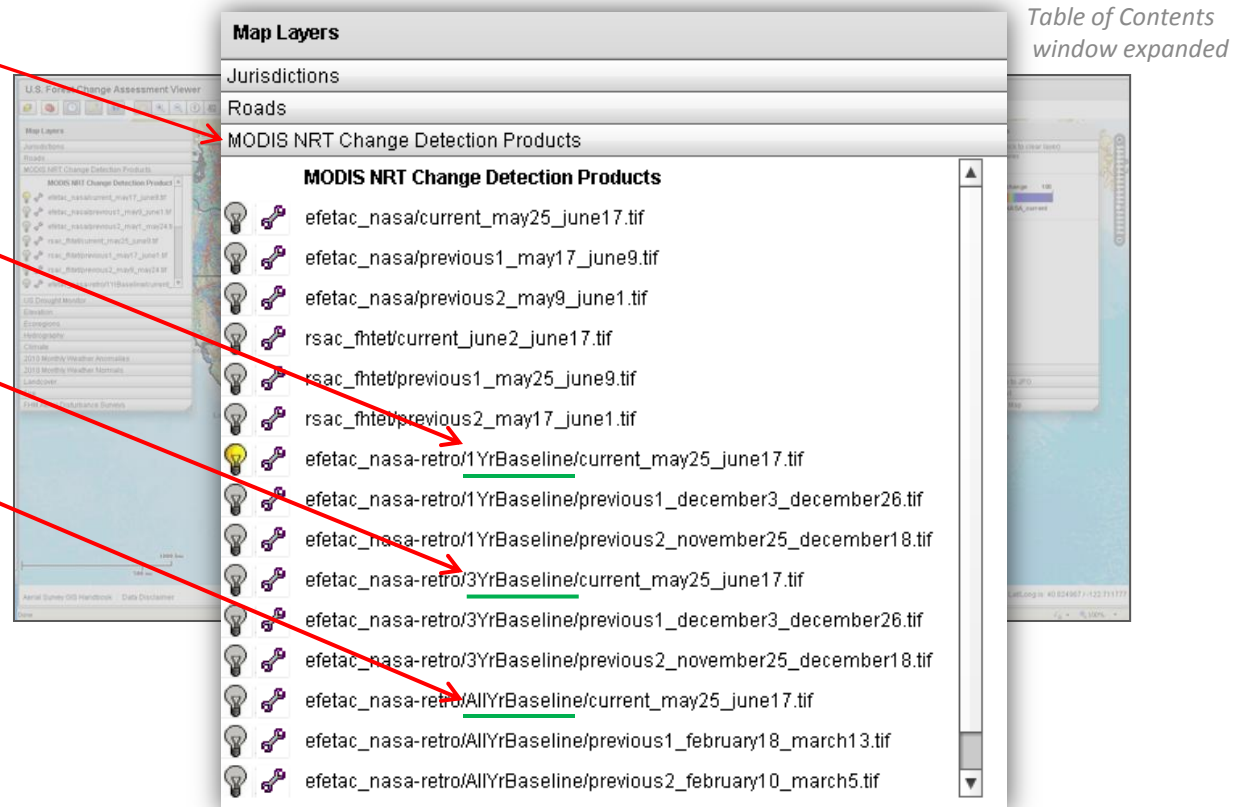
# Using the Forest Change Assessment Viewer

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## Data Layers: The (3) most recent “BASELINE” forest change image products

1. In the Table of Contents window, click on the tab heading “MODIS NRT Change Detection Products,” this expands the tab and presents the data layers (NRT – near real time)
2. The “Baseline” products are identified by three time periods: (a) a 1-year, (b) a 3-year and (c) an “All-year” baseline
3. The 1-year baseline image presents the degree of forest change for a specific date compared to the maximum greenness value of for all the images of the previous 1-year (2009)
4. The 3-year baseline image presents the degree of forest change for a specific date compared to the maximum greenness value of for all the images of the previous 3-years (2006-2009)
5. The All-year baseline image presents the degree of forest change for a specific date compared to the maximum greenness value of for all the images of the previous 9-years (2003-2009)
6. Use the ‘wrench’ icon adjust the transparency of any layer to better view the basemap , or other layers
7. The top three layers are the (3) most recent eight-day forest change products from EFETAC based on the All-year
8. Uses: toggle the three most recent products to view a time-based progression of a forest disturbance (shades of yellow to red), or forest productivity , and/or “green-up” (shades of green to blue)



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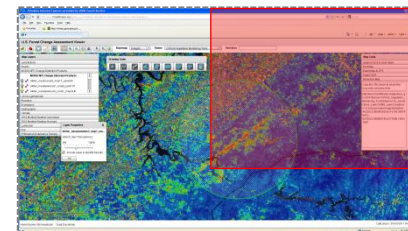


# Using the Forest Change Assessment Viewer

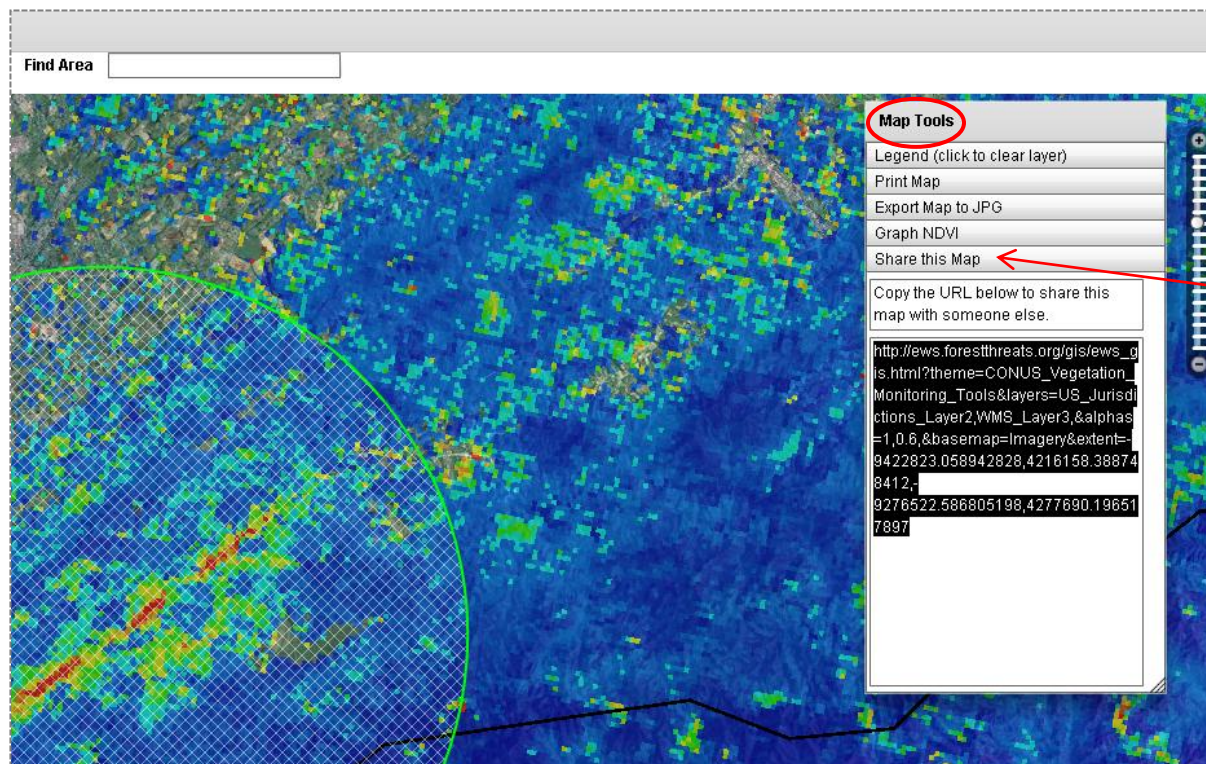
from the Forest Services' Eastern Forest Environmental Threat Assessment Center (EFETAC)  
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Portion of Viewer detailed is shown in red



## How to: Share Disturbance Events with Colleagues



The “Map Tools” box in the upper right portion of the Viewer offers the capability to send a URL of a view via your email client to a colleague.

Click the “Share this Map” tab, then highlight and copy the URL, and paste the link into your email program. Your colleague can open the Viewer to the same extent and data layers you were using to explore a disturbance event.

Printing, graphing and the ability to save a JPEG of the view is also available here.

*Shown: Forest damage by an EF4 tornado in the Great Smoky Mountains National Park (April 27, 2011).*

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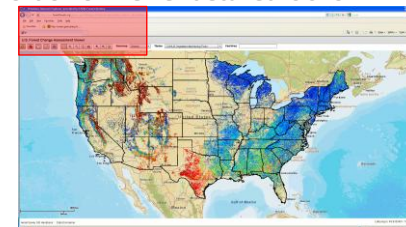


## What is the “Multi-graph” Tool *(pg 1 of 4)*



The “Graph NDVI” tool presents a graph of NDVI values for a specific location over the period of 11-years, with measurements recorded every 8-days

Portion of Viewer detailed is shown in red



Use of this tool allows one to observe an 11-year NDVI history of a single MODIS pixel (231 meter square area), anywhere in the conterminous U.S. (CONUS). NDVI values are presented in x and y graph format. NDVI values are plotted along the y-axis, and the 11-year time scale, with measurements recorded every 8-days, are plotted along the x-axis. Changes in NDVI values fluctuate and relate primarily to changes to vegetative condition and vigor, but also can noticeably change due to natural disturbance events and anthropogenic modifications.

### Natural disturbances causing a decline in NDVI value

- Tornados and hurricane events
- Wind and ice storm damage
- Drought and flood conditions
- Insect and disease outbreaks
- Fall season brown-up
- Snow pack extent
- Wildfire events

### Human-Induced disturbances causing a decline in NDVI value

- Forest fragmentation, conversion and urban sprawl
- Forest clear-cutting and stand thinning
- Mining, oil and natural gas activities
- Non-native plant species invasions
- Climate variability and change
- Prescribed fire
- Arson wildfire

### Events that can increase NDVI values

- Vegetative recovery from disturbance
- Non-native plant species invasions
- Precipitation events in arid locales
- Forest canopy closure
- Forest plantings
- Spring leaf-out

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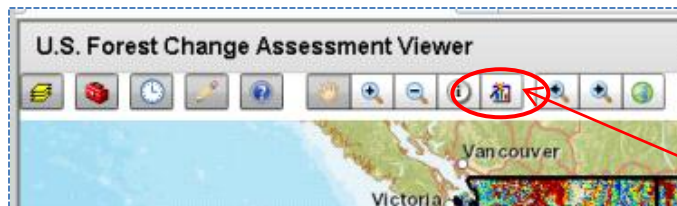


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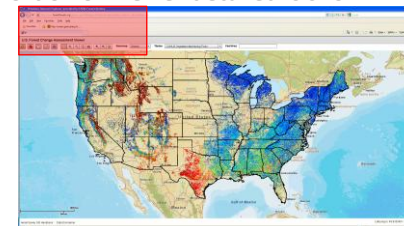


## How to: Use of the “Multi-graph” Tool (pg 2 of 4)

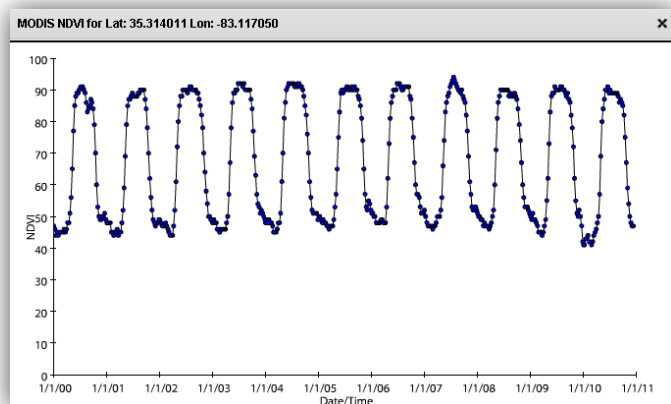


The “Graph NDVI” tool presents a graph of NDVI values for a specific location over the period of 11-years, with measurements recorded every 8-days

Portion of Viewer detailed is shown in red



To operate the “Graph NDVI” tool, first, zoom to your area of interest, then select the icon displayed in the Viewers top left banner. Perform a single click of the mouse on your area of interest and a separate window will open with a graph of the NDVI values for that specific location. Try using the ‘imagery’ basemap to guide your selection of a point to graph with the Multi-graph tool.



- To CLOSE the multi-graph window, click the ‘x’ in the upper right corner of the graph window

### Optional

Expanding the axes spreads-out the data measurements and provides more detail:

- to spread-out the Date/Time axis, place the mouse cursor inside graph window and on the x-axis, press and hold SHIFT, and move cursor left and right to expand and contract the timescale axis, release the SHIFT key and ‘drag’ the Date/Time axis left and right to see more detail
- to spread-out the NDVI axis, place the mouse cursor inside graph window and on the y-axis, press and hold SHIFT, and move cursor up and down to expand and contract the NDVI axis, release the SHIFT key and ‘drag’ the NDVI axis up and down to see more detail
- whether expanding or contracting an axis, remember to place your cursor on the axis to affect

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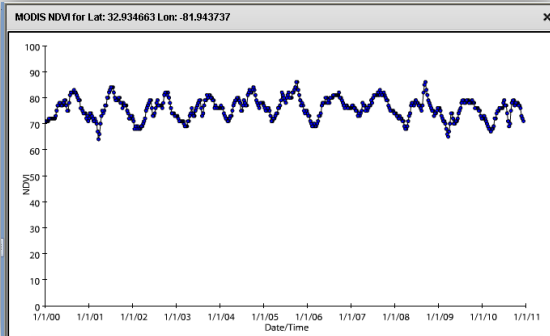
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## How to: Interpret the “Multi-graph” Graphic, *The Basics* (pg 3 of 4)

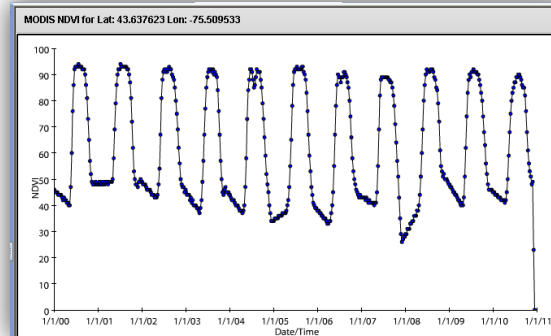
An entire course of study can be devoted this topic alone. Be aware of the following NDVI-curve response characteristics when interpreting the NDVI signature that the multi-graph produces: the data range and amplitude of NDVI values, the duration of change that NDVI values experience across time, the modality, or period, of reoccurring NDVI values of similar character, the type of land cover or land use that was selected, the phenological character of increase and/or decrease in NDVI value over time and denote the date that abrupt changes in NDVI values occur. Here are a few typical NDVI response curves from basic vegetative land covers:



### Pine Plantation

(*Pinus sp.*, GA)

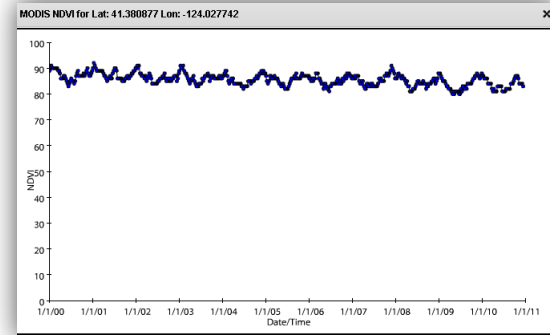
- relatively high average-NDVI values
- amplitude relatively narrow
- annual NDVI value increase and decrease due to photosynthetic response to annual phenology



### Mixed Hardwood Forest

(Adirondack Park, NY)

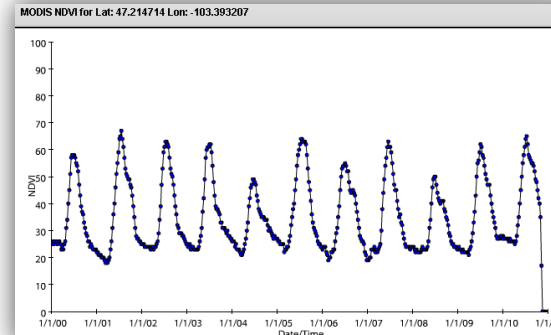
- high maximum-NDVI values
- data range relatively high
- NDVI increase and decrease due to annual phenology
- NDVI-minimum variability may be due to snow events masking the shrub layer



### Coastal Redwoods

(*Sequoia sempervirens*, CA)

- relatively high and constant NDVI values
- amplitude of change very narrow
- slight phenological variation across time



### Prairie Grasslands

(National Grasslands, ND)

- relatively low average-NDVI values and range large
- sharp NDVI increase and decrease due to annual phenology
- variability in yearly maximums due to variations in seasonal precipitation



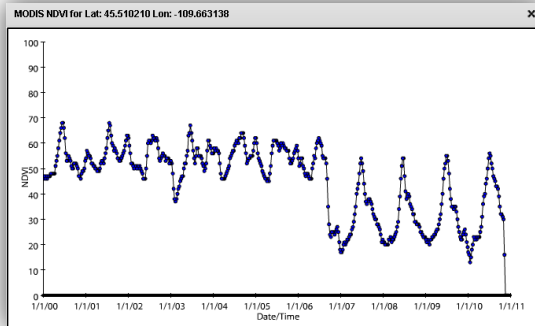
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## How to: Interpret the “Multi-graph” Graphic, Advanced (pg 4 of 4)

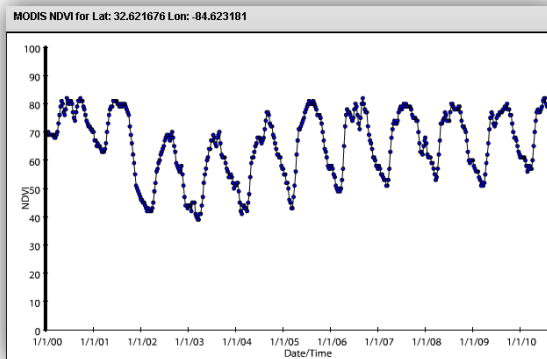
Abnormal, or unexpected changes in NDVI values can be explained. Here are some typical examples of changes in vegetative vigor that is observed in the NDVI curve produced by the Multi-graph tool:



### 2006 Derby Wildfire

(southern Montana)

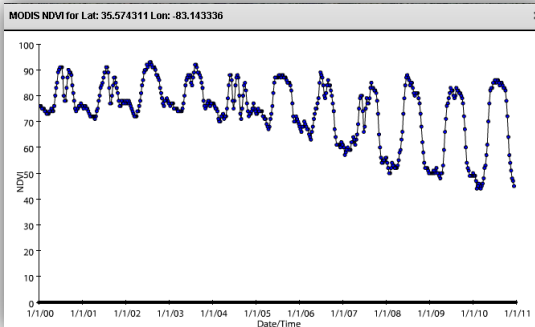
- Pre-fire, dominated by low density Ponderosa Pine
- Post-fire, tree killing event led to grass dominated landscape
- observe greater peakedness and lower winter minimums



### Timber Harvest and Recovery

(central Georgia)

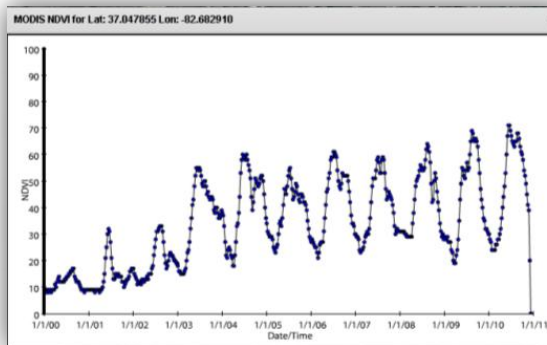
- drop in NDVI due to plantation clear-cut in 2001
- crown closure of the pine plantation reduces the amplitude of the annual phenological signal
- note the trend in increased minimum NDVI values over time



### Non-native Invasive Species

(Hemlock Woolly Adelgid, TN)

- declining Hemlock composition causes a drop in the winter minimum
- defoliation began during the 2005 growing season
- this tool can be used to monitor the rate of decline for this area and for new sites



### Strip-Mining Reclamation

(western Virginia)

- NDVI increase due to the mined area being replanted
- has not achieved maximum greenness of original forest cover
- this tool can provide insights into the ability of reclaimed land to recover its productivity within a specified time frame



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## Quick Start Guide (for returning users, and those familiar with web-based map viewers)

1. Open this URL in a web browser  
[http://ews.forestthreats.org/gis/ews\\_gis.html?#](http://ews.forestthreats.org/gis/ews_gis.html?#)
2. In the Table of Contents window, click on the tab heading "MODIS NRT Change Detection Products" to expand and view the data layers (NRT – near real time)
3. Click the 'light bulb' to the left of the top data layer, this turns-on the most recent forest change detection image
4. Use the map controls to zoom and pan, or type the name of a county in the "Find Area" box in the top-right area of the FCAV viewer window
5. Use the 'wrench' icon to adjust the transparency of any layer to better view the basemap, or other layers
6. Return to this Help documents' first page to learn more of the Forest Change Assessment Viewer (FCAV)

**Map Layers**

- Jurisdictions
- Roads
- MODIS NRT Change Detection Products
  - MODIS NRT Change Detection Product**
    - efetac\_nasa/current\_may17\_june9.tif
    - efetac\_nasa/previous1\_may9\_june1.tif
    - efetac\_nasa/previous2\_may1\_may24.tif
    - rsac\_fhtet/current\_may25\_june9.tif
    - rsac\_fhtet/previous1\_may17\_june1.tif
    - rsac\_fhtet/previous2\_may9\_may24.tif
    - efetac\_nasa-retro/1YrBaseline/current\_...
- US Drought Monitor
- Elevation
- Ecoregions
- Hydrography
- Climate
- 2010 Monthly Weather Anomalies
- 2010 Monthly Weather Normals
- Landcover
- Fire
- FHM Aerial Disturbance Surveys

**What do the colors mean?**

-100    % change    100

Less                      More

Forest Productivity

Table of Contents window expanded

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## Tips and Hints

- If a URL hangs up during load, try changing the backdrop
- The "imagery" basemap works very well to locate general disturbances, since it has dark colors
- To see if a potential disturbance is drought related, try turning on the Drought Monitor Data Layer
- To see if a potential disturbance is wildfire related, turn on the "Monitoring Trends in Burn Severity" (MTBS) fire layers, this layer is associated with the default "Theme" located under the "Fire" tab
- To see if a potential disturbance is insect or disease related, try turning on the sketchmapper polygons from past years. If there has been insect or disease activity nearby in the past, it is likely to have happened again
- To view a past disturbance to a forested area, access the Archived imagery and choose imagery before and after the incident:
  - to view previous 8-day imagery, change the "Theme" to "MODIS Forest Change Products," in the Table of Contents open the tab named "Archived NRT EFETAC-NASA," scroll to dated pre- and post-incident to view the extent of forest change, or disturbance
- The EWS provides an extraordinary mechanism for mapping fuel-producing events and fuel moisture. Blow-downs, ice storms and beetle kill areas can be targeted for fuels management (Norman, EFETAC)
- The 1-year Baseline product can present less 'noise' when interpreting the severity of a forest disturbance
- Other standard data layers can assist in the interpretation of a forest disturbance event, following are some examples:
  - under the Elevation tab, "SRTM" (Shuttle Radar Topography Mission) "DEM" (Digital Elevation Model) may suggest affects from a gradient of altitude
  - under the Elevation tab, use of the "Aspect" and "Hillshade" layers can assist in the interpretation of the effects of topographic position
- To view the "MODIS NRT Change Detection Products" on a desktop GIS via a Web Map Service (WMS) connection, use the URL below to define the WMS location (in ESRI's ArcGIS Desktop 9.3.1, choose version 1.0.0 in the GIS Server properties dialog box):  
  
<http://fswms.nemac.org/ewswgs84?SERVICE=WMS&REQUEST=GetCapabilities&>
- Using the MODIS NRT WMS connection will allow desktop users to integrate their own local data layers for comparison, analysis and quantification of the spatial extent, content and severity of forest disturbance events
- Use the MODIS NRT WMS connection to screen digitize polygons of forest disturbance

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## Frequently Asked Questions (pg 1 of 2)

### What is the best image to display to see if there is any forest disturbance in my area of interest?

The most recent forest disturbance image is located in the Table of Contents, under the tab named "MODIS NRT Change Detection Product." Click this tab and look at the top of the listing for the most recently-dated file called "*efetac\_nasa/current\_monthday\_monthday.tif*" (replace the "month day" reference with the most current date range), click the 'light-bulb' to display the image.

#### MODIS NRT Change Detection Products

[efetac\\_nasa/current\\_may25\\_june17.tif](#)

[efetac\\_nasa/previous1\\_may17\\_june9.tif](#)

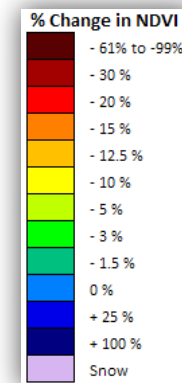
[efetac\\_nasa/previous2\\_may9\\_june1.tif](#)

Also, look down in the data layer listing under this heading for the most recently dated "Baseline" product from EFETAC. For descriptions of the "Baseline" products, [click here](#) (MODIS = Moderate Resolution Imaging Spectrometer, 231 meter pixel)(NRT = Near-Real-Time)

### What do the colors mean?

Generally, the colors relate to forest productivity as compared to a previous baseline (8-year: the default, 3-year or 1-year baseline). Shades of blue-to-green denote a healthy forest condition and similar in development to previous year(s). Shades of red-to-yellow denote a forest condition where the greenness at that time period differs greatly-to-moderately when compared to the forest productivity, or greenness values of the previous year(s).

Specifically, the colors denote the percent change difference when comparing the current images NDVI (Normalized Difference Vegetation Index) value with the maximum NDVI pixel value over the past 8-, 3- or 1-year baseline NDVI image set. NDVI values are calculated via a band ratio of red to infrared (of the electromagnetic spectrum) and range from +1.0 to -1.0 in value.



Baseline products: Located under the same tab named "MODIS NRT Change Detection Product," the first three forest change images (the three most recent) are a result of comparing the observed "greenness" for that date range with the maximum "greenness" observed over the past 8-years (2003-2010). Try looking at the "current" 1-year baseline for the most current date to display the forest change image for the current period compared to ONLY last year (be sure to unclick the most recent 8-year baseline image to see the 1-year baseline image).

### The forest disturbance image is covering up the basemap and I can't see where I am viewing?

Located in the Table of Contents beside each data layer is a "wrench"-looking icon, clicking this icon will open a control that one can use to apply a transparency for any data layer. Set the slider at a position where you can see both the basemap and the colors of the forest disturbance image.



The transparency tool  
is located in the Table of Contents

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# Using the Forest Change Assessment Viewer

from the Forest Services' Eastern Forest Environmental Threat Assessment Center (EFETAC)  
and the Western Wildlands Environmental Threat Assessment Center (WWETAC)



## Frequently Asked Questions (pg 2 of 2)

### What are the "Baseline" products?

Baseline products: Located under the same tab named "MODIS NRT Change Detection Product," the first three forest change images (the three most recent) are a result of comparing the observed "greenness" for that date range with the maximum "greenness" observed over the past 8-years (2003-2010). Try looking at the "current" 1-year baseline for the most current date to display the forest change image for the current period compared to ONLY last year (be sure to unclick the most recent 8-year baseline image to see the 1-year baseline image).

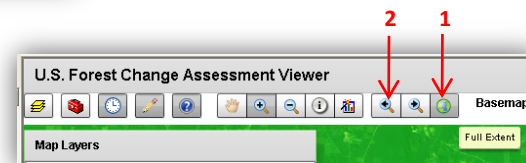
The image to the right is a zoomed portion of the Table of Contents tab "MODIS NRT Change Detection Products"

Note: at the time of this printing only the most currently dated change image is available in the three baseline products, eventually, the three most current forest change products will be available in the Table of Contents for the three baseline periods.



### How do I remove the highlight color after an "Identify" operation is performed ?

At this stage, the only way to remove the highlight of a data layer from the Viewer is to click an area in the ocean (try clicking the "Full Extent" icon-1, then click an area of the ocean, then the "Previous Extent" icon-2, to return)



### What is the quickest way to see if a forest disturbance is taking place in my area?

Reference the "Quick Start Guide" of this help document ([click here](#)).

**What if the Table of Contents is empty?** Clear your computers internet cache and refresh the webpage by pressing F5.

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# Using the Forest Change Assessment Viewer

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## 2011 Forest Disturbance 'NEWS' Events

viewable at this URL - <http://www.geobabble.org/~hnw/first/EWSNews/>



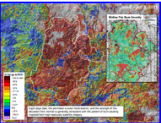
### Threat Assessment Centers' National Early Warning System NEWS

Examples of 2011 Forest Disturbance Detections

[William W. Hargrove](#), [Joseph P. Spruce](#), [Steven P. Norman](#), and [William M. Christie](#)

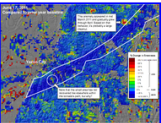
Last Modified: Thu Jul 14 10:13:53 EDT 2011

Click on any image or headline below to read additional details



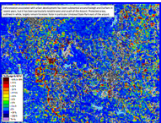
**[The Wallow Fire, May 29, 2011 -- Arizona, USA](#)**

The Wallow Fire was ignited on May 29, 2011 in east-central Arizona and grew to over a half million acres during the next month. It is the largest wildfire that Arizona has on record for the past century. The Threat Centers' Early Warning System provides long-term forest monitoring that captures the conditions long before and after this and every fire event. This can help us understand the vegetative and climatic conditions that led to this remarkable, but long predicted event.



**[Forest regrowth monitored a year after the severe April 2010 Yazoo City tornado -- Mississippi, USA](#)**

The recovery in greenness following the April 24, 2010 Yazoo City tornado represents the combined response of early successional growth and recovery of surviving vegetation. Salvage logging reduced greenness compared to adjacent areas that were either not salvaged or were logged more lightly. As long as these areas remain in forest and are not developed, continued recovery in greenness is expected over the coming years.



**[Deforestation due to Urban Growth in the Raleigh-Durham area, North Carolina, USA](#)**

The Raleigh-Durham area has experienced phenomenal population growth during the last decade. According to the US Census, the six county area added 400,000 residents between 2000 and 2010, and it is now home to about 1.6 million people. Due to annexation and the great flux of new arrivals, Raleigh now ranks as the fastest growing city in the US. Its population increased 46% over the last decade. Vegetation change patterns detected by the EWS within the Raleigh-Durham area consist of numerous sharp patches of reduced vegetation vigor. Comparison with historical aerial photos shows that most of this pattern was caused by deforestation for urban development.

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Eastern Forest Environmental Threat Assessment Center  
Southern Research Station  
200 W.T. Weaver Blvd.  
Asheville, NC 28804  
<http://www.forestthreats.org>



## Points of Contact

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**Outreach:** [Perdita Spriggs](#), Communications Director, [pspriggs@fs.fed.us](mailto:pspriggs@fs.fed.us)

**Technical Assistance:** [Bill Christie](#), Biological Scientist (GIS/RS), 828.257.4370, [wchristie@fs.fed.us](mailto:wchristie@fs.fed.us)



National Environmental Modeling and  
Analysis Center (NEMAC)  
University of North Carolina - Asheville

- Partners -

NASA  
Stennis Space Center  
Bay St. Louis, MS



Eastern Forest Environmental Threat Assessment Center  
Southern Research Station  
200 W.T. Weaver Blvd.  
Asheville, NC 28804

<http://www.forestthreats.org>

## Phenology-related Websites

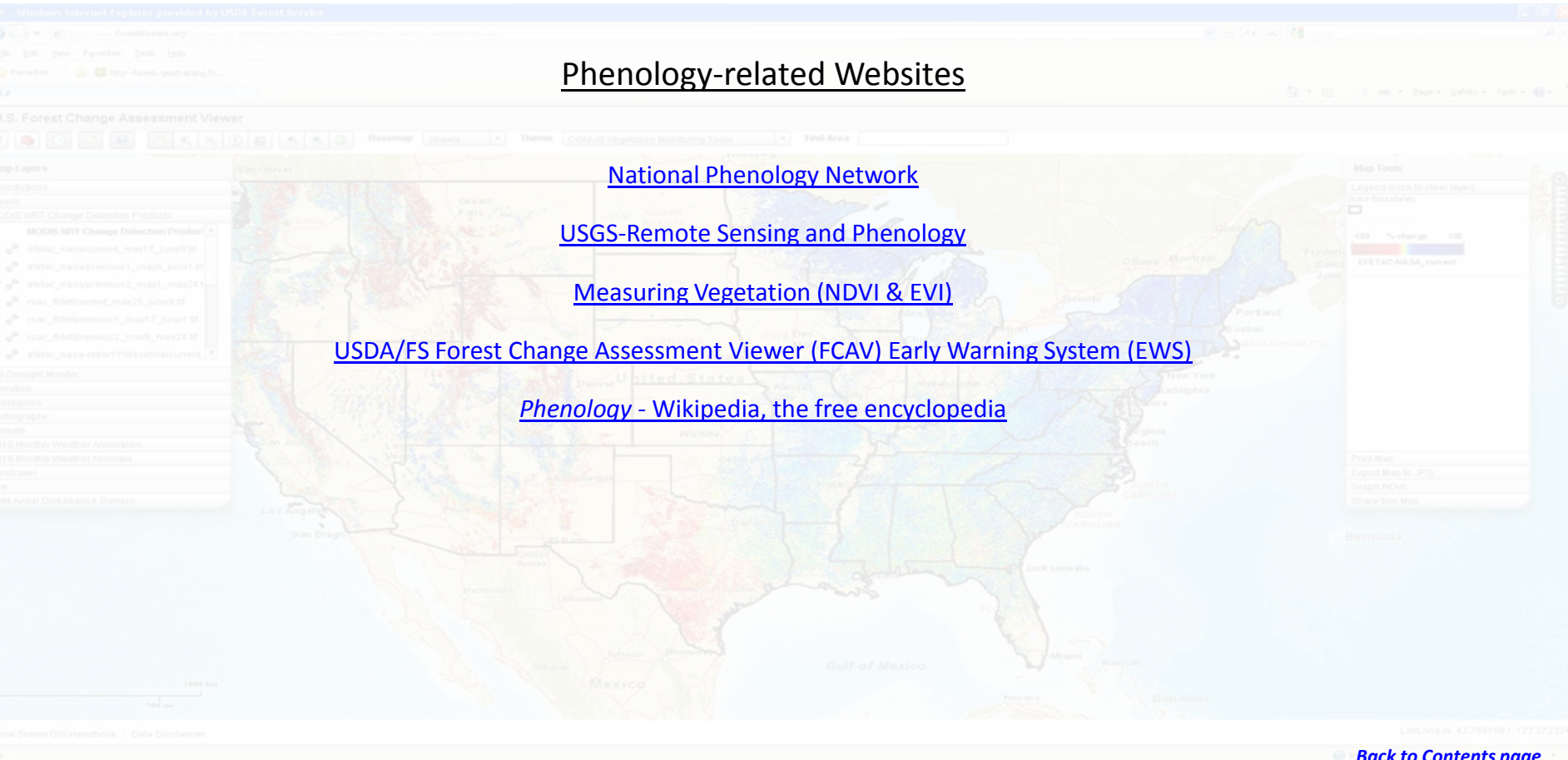
[National Phenology Network](#)

[USGS-Remote Sensing and Phenology](#)

[Measuring Vegetation \(NDVI & EVI\)](#)

[USDA/FS Forest Change Assessment Viewer \(FCAV\) Early Warning System \(EWS\)](#)

[Phenology - Wikipedia, the free encyclopedia](#)







# Using the Forest Change Assessment Viewer

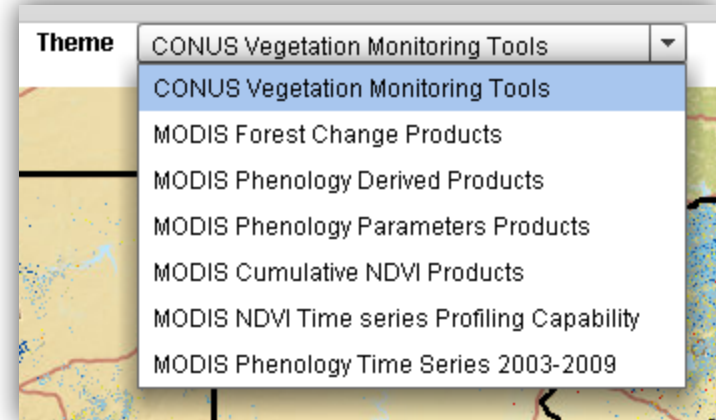
*from the Forest Services' Eastern Forest Environmental Threat Assessment Center (EFETAC)  
and the Western Wildlands Environmental Threat Assessment Center (WWETAC)*



## Appendices: Theme-based Data Layers

*(click heading to jump to section)*

1. [CONUS Vegetation Monitoring Tools](#)
2. [MODIS Forest Change Products](#)
3. [MODIS Phenology Derived Products](#)
4. [MODIS Phenology Parameters Products](#)
5. [MODIS Cumulative NDVI Products](#)
6. [MODIS NDVI Time Series Profiling Capability](#)
7. [MODIS Phenology Time Series 2003 – 2009](#)



**For a description of the following products, go to:**

<http://www3.nemac.unca.edu/wpfstest/ews/datasets/national-phenology-data-set-npds/>

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## Appendix 1: CONUS Vegetation Monitoring Tools (Thematic Group Data Layers)

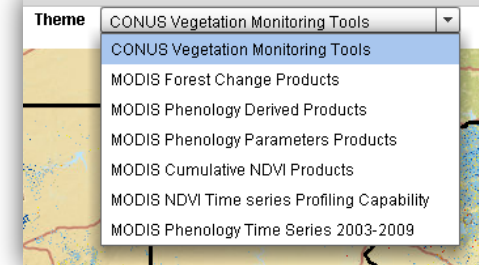
### MODIS NRT Change Detection Products

-   efetac\_nasa/current\_may17\_june9.tif
-   efetac\_nasa/previous1\_may9\_june1.tif
-   efetac\_nasa/previous2\_may1\_may24.tif
-   rsac\_fhtet/current\_may25\_june9.tif
-   rsac\_fhtet/previous1\_may17\_june1.tif
-   rsac\_fhtet/previous2\_may9\_may24.tif
-   efetac\_nasa-retro/1YrBaseline/current\_december3\_december26.tif
-   efetac\_nasa-retro/1YrBaseline/previous1\_november25\_december18.tif
-   efetac\_nasa-retro/1YrBaseline/previous2\_november17\_december10.tif
-   efetac\_nasa-retro/3YrBaseline/current\_december3\_december26.tif
-   efetac\_nasa-retro/3YrBaseline/previous1\_november25\_december18.tif
-   efetac\_nasa-retro/3YrBaseline/previous2\_november17\_december10.tif
-   efetac\_nasa-retro/AllYrBaseline/current\_february18\_march13.tif
-   efetac\_nasa-retro/AllYrBaseline/previous1\_february10\_march5.tif
-   efetac\_nasa-retro/AllYrBaseline/previous2\_december3\_december26.tif

*The (3) most recent 8-day forest change image products, look for a new forest change image every 8-days from EFETAC*

*The (3) most recent 8-day forest change image products, look for a new forest change image every 8-days from RSAC*

*In preparing current MODIS forest change images, a new NDVI image is compared to one of three baselines to establish percent change. As of 06/2011, change products are created via looking at the maximum NDVI value for a pixel against the longest baseline, specifically, the 2003 – 2009 baseline. Future plans are to create the (3) most recent forest change products based on each baseline length, namely, the current NDVI value compared to the maximum NDVI value during baseline 2001 – 2010, during baseline 2005-2010, and during baseline 2010.*



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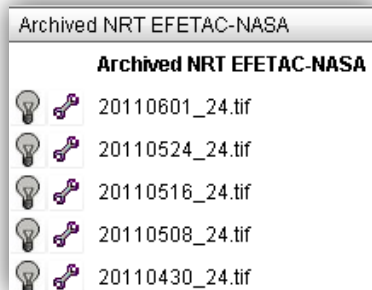


# Using the Forest Change Assessment Viewer

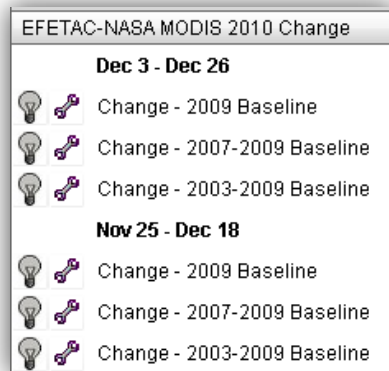
from the Forest Services' Eastern Forest Environmental Threat Assessment Center (EFETAC)  
and the Western Wildlands Environmental Threat Assessment Center (WWETAC)



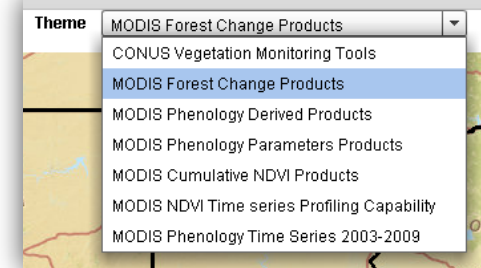
## Appendix 2: MODIS Forest Change Products (Thematic Group Data Layers )



*Individual 8-day images of forest change produced throughout the year from EFETAC. Look for a similar archive in the Table of Contents that presents forest change products from USDAFS Remote Sensing Application Center (RSAC)*



*Composite forest change images given the current 3-baseline time periods from EFETAC. Look for a similar data layer set in the Table of Contents that presents forest change products from USDAFS Remote Sensing Application Center (RSAC) for 2010.*



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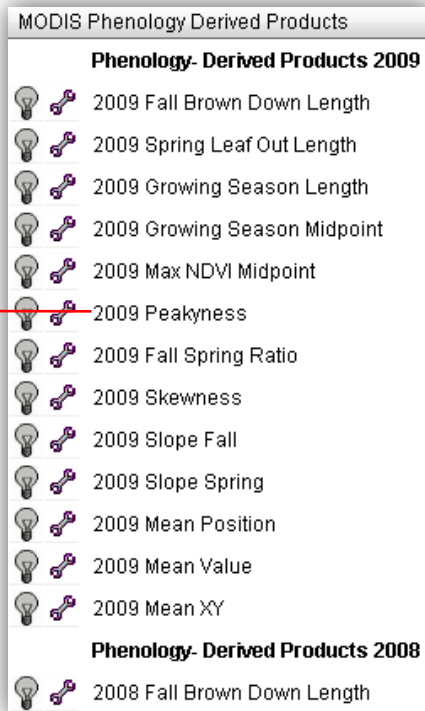
# Using the Forest Change Assessment Viewer

from the Forest Services' Eastern Forest Environmental Threat Assessment Center (EFETAC)  
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## Appendix 3: MODIS Phenology Derived Products (Thematic Group Data Layers)

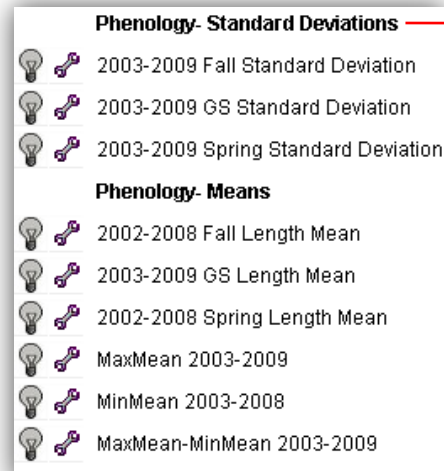
### 2003 – 2009 Phenology-based image products



listing repeats for next year...

*Contrasts vegetation that keeps a small amount of leaf area over a long period of time versus vegetation that explosively produces a large amount of leaf area, but only holds it for a short time*

### 2003 – 2009 Phenology Standard Deviations and Means



*Shows places that are particularly predictable versus places that are particularly unpredictable (GS – Growing Season)*

**For a description of these products, go to:**

<http://www3.nemac.unca.edu/wpfstest/ews/datasets/national-phenology-data-set-npds/>

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# Using the Forest Change Assessment Viewer

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## Appendix 4: MODIS Phenology Parameter Products (Thematic Group Data Layers )

### 2003 – 2009 Phenology parameter products

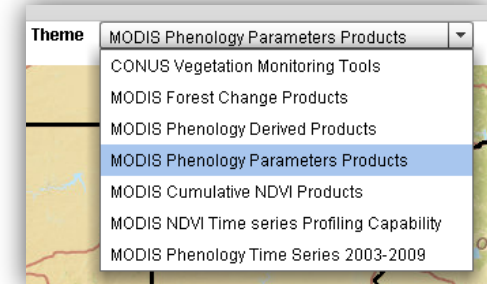
MODIS Phenology Parameters Products	
Phenology- Parameters 2009	
	2009 Large Integral
	2009 Maximum NDVI Position
	2009 Maximum NDVI Value
	2009 QC Flags
	2009 Left 20% Position
	2009 Right 20% Position
	2009 Left 20% Value
	2009 Right 20% Value
	2009 Left 80% Position
	2009 Right 80% Position
	2009 Left 80% Value
	2009 Right 80% Value
	2009 Left Minimum Position
	2009 Right Minimum Position
	2009 Left Minimum Value
	2009 Right Minimum Value
	2009 Small Integral
Phenology- Parameters 2008	

listing continues...

*Phenological Parameters do not represent the percentage of the year, but rather the percentage of the maximum NDVI values over the course of the year*

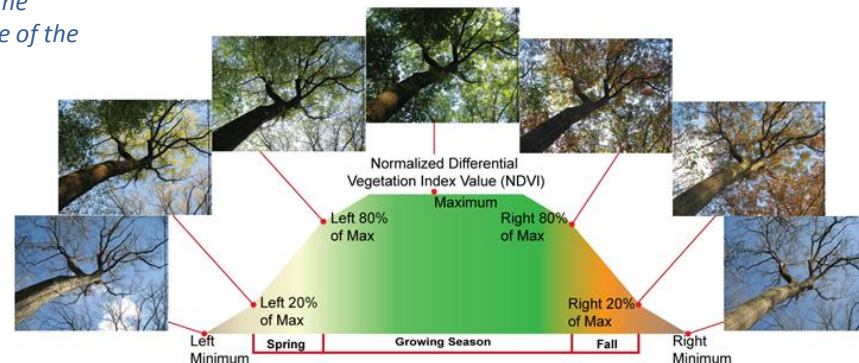
### Phenology Parameter Means

Parameter Means	
	2003-2009 Left 20% Position Mean
	2003-2009 Right 20% Position Mean
	2003-2009 Left 80% Position Mean
	2003-2009 Right 80% Position Mean
	2003-2009 Max NDVI Position Mean
	2003-2009 Min Position Left Mean
	2003-2009 Min Position Right Mean
	2003-2009 Small Integral Mean



For a description of these products, go to:

<http://www3.nemac.unca.edu/wpfstest/ews/datasets/national-phenology-data-set-npds/>



*The Phenological Curve  
(red dots indicate measurement points)*

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and the Western Wildlands Environmental Threat Assessment Center (WWETAC)



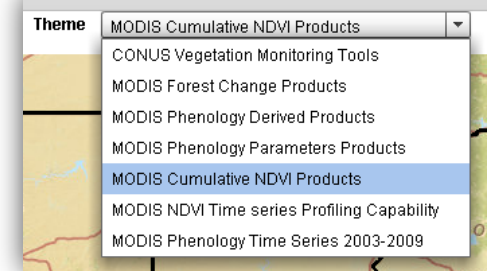
## Appendix 5: MODIS Cumulative NDVI Products (Thematic Group Data Layers )

### 2003 – 2009 Cumulative NDVI products

MODIS Cumulative NDVI Products 2003-2006		
MODIS Cumulative NDVI Products 2007-2009		
		2009 Cumulative Integral 2
		2009 Cumulative Integral 1
<b>2008 Cumulative NDVI</b>		
		2008 Cumulative Integral 22
		2008 Cumulative Integral 21
		2008 Cumulative Integral 20
		2008 Cumulative Integral 19
		2008 Cumulative Integral 18
		2008 Cumulative Integral 17
		2008 Cumulative Integral 16

*Treating yearly NDVI in a cumulative way causes differences to become more pronounced throughout the year (Hargrove, EFETAC).*

*The MODIS satellite takes a complete picture of the continental United States every day, although cloud cover, smoke, and other interference often blocks the view of the landscape. To get a complete picture, a 16-day composite is made by taking the highest value for each pixel recorded over the 16-day period. For the Cumulative Phenology data set, the NDVI values in each successive 16-day interval are then summed to form an accumulating total, starting over at the beginning of each year. The first national 16-day interval map, or Interval #1, is usually excluded from products because it covers the December-January transition from one year to the next. Therefore, there are usually 22 intervals that make up one year (#2–23).*



For a description of these products, go to:

<http://www3.nemac.unca.edu/wpfstest/ews/datasets/national-phenology-data-set-npds/>

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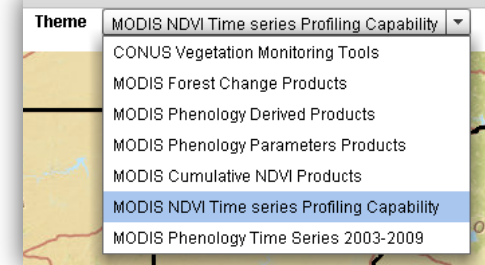


## Appendix 6: MODIS NDVI Time Series Profiling Capability (Thematic Group Data Layers)

### 2003 – 2009 NDVI Time Series Products (DOY – Day of Year)

MODIS NDVI 2003-2006	
MODIS NDVI 2007-2009	
 	2008 DOY 65
 	2008 DOY 49
 	2008 DOY 33
 	2008 DOY 1
NDVI 2007	
 	2007 DOY 353
 	2007 DOY 337
 	2007 DOY 321
 	2007 DOY 305
 	2007 DOY 289

*The DOY products can tell one what day in the year a threshold is attained*



For a description of these products, go to:

<http://www3.nemac.unca.edu/wpfstest/ews/datasets/national-phenology-data-set-npds/>

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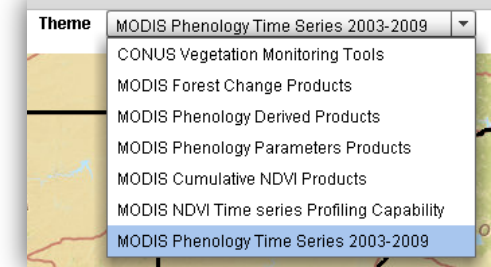


## Appendix 7: MODIS Phenology Time Series 2003 - 2009 (Thematic Group Data Layers )

### 2003 – 2009 Phenology Time Series Products DOY – Day of Year

MODIS NDVI 2003-2006	
MODIS NDVI 2007-2009	
	2009 DOY 49
	2009 DOY 33
	2009 DOY 1
NDVI 2008	
	2008 DOY 353
	2008 DOY 337
	2008 DOY 321
	2008 DOY 305
	2008 DOY 289

*The DOY NDVI value product can tell one what day  
in the year a threshold is attained*



For a description of these products, go to:

<http://www3.nemac.unca.edu/wpfstest/ews/datasets/national-phenology-data-set-npds/>

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