



Animation Window

David Nelson, Michael Garay, Sebastian Val, Michael Tosca

Columbus Technologies and Services, Inc.

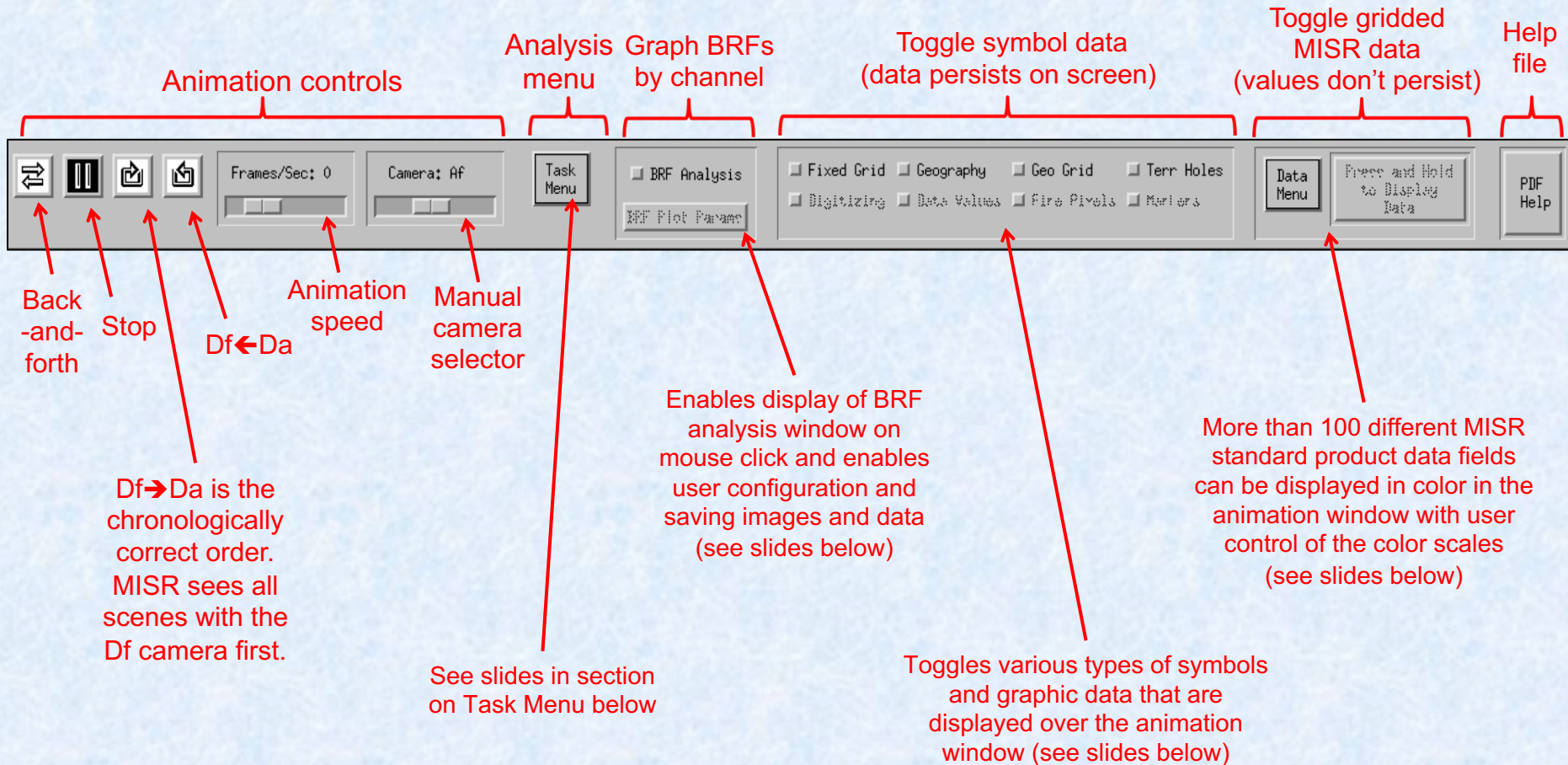
Raytheon Company

Jet Propulsion Laboratory, NASA

California Institute of Technology



Upper Task Bar

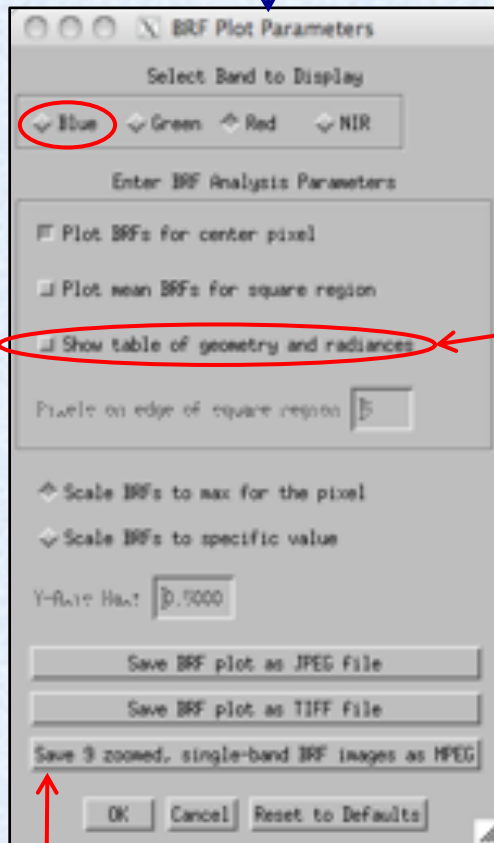


BRF Analysis

(Bidirectional Reflectance Factor)



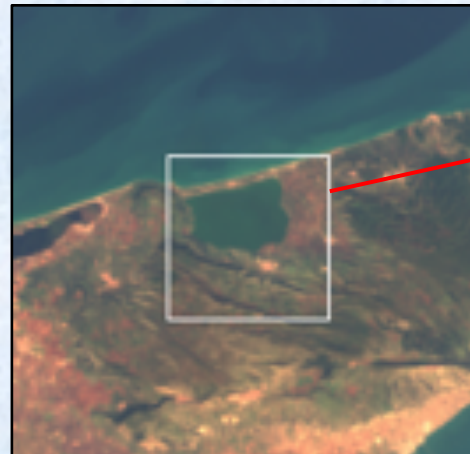
When BRF Analysis button is checked and user clicks in the animation window, this plot and zoomed image are shown.



Zoomed image is scaled to data ranges in zoom window allowing subtle features, such as ship wakes at sea, to be seen.

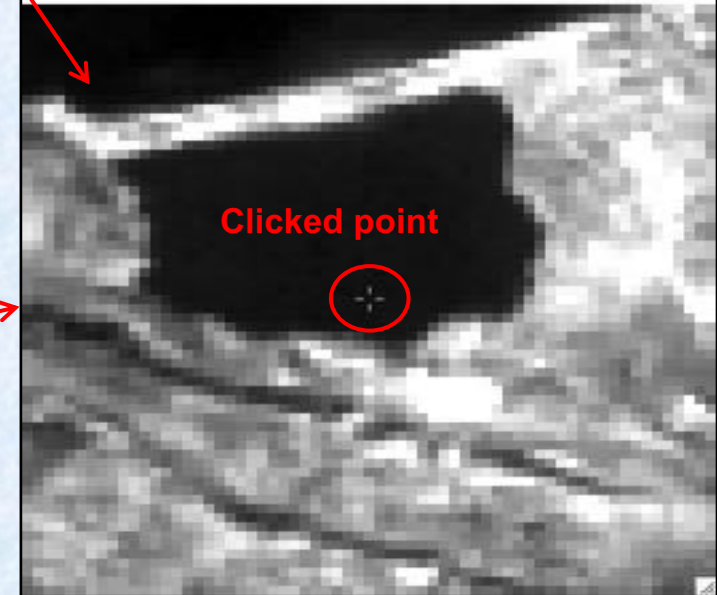
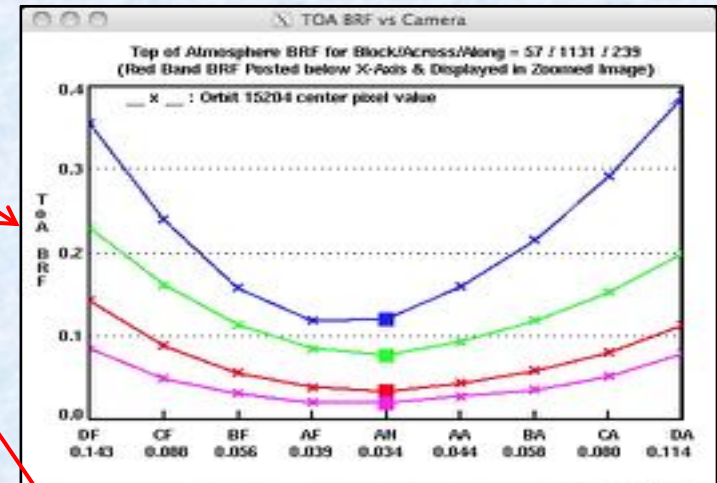
ASCII table of sun and camera angles and radiances, equivalent reflectances and BRFs for clicked point can be saved to file.

Image of graph and zoomed window can be saved to file. IDL license is required for MPG.



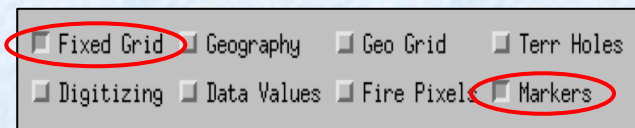
Scene showing 64x64 pixel square centered on point clicked by user

Top-of-Atmosphere BRF .vs. camera for clicked point (or mean for region)

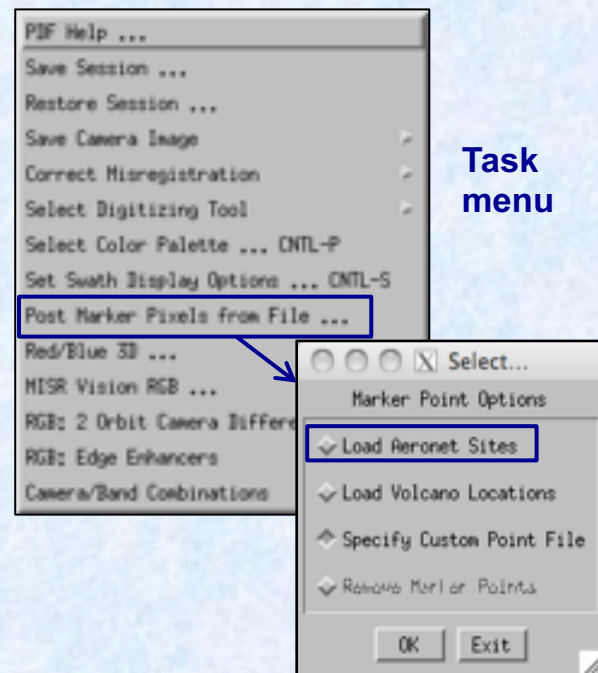


8x zoomed image of white square is displayed in band selected in dialog box

Toggle Symbol Data - 1

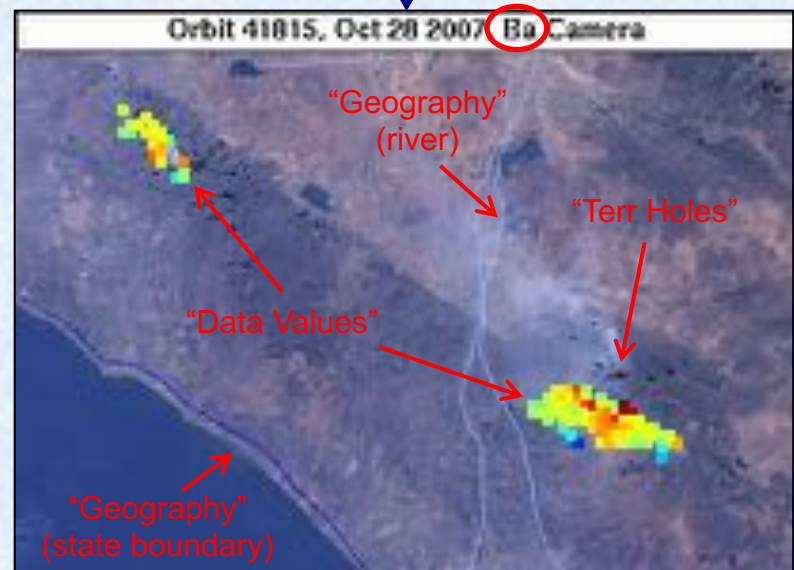
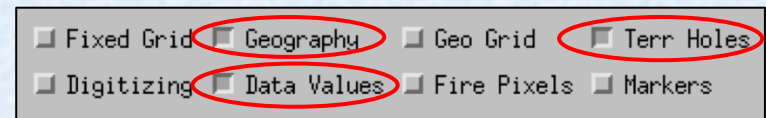
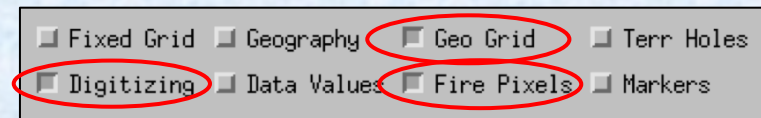


Fire scene SE of Los Angeles in 2007 showing yellow “Fixed Grid” ‘+’ symbols and cyan “Markers” ‘x’ symbols that identify Aeronet sites.



- Symbols remain on screen until toggled off – they persist.
- Yellow “Fixed grid” points are stationary and uniformly spaced and are useful for judging relative motion during animation.
- “Markers” selected from the Task menu are read from files and include 3 options: 1195 Aeronet sites, 1543 volcanos or a user-defined list of points.

Toggle Symbol Data - 2



- “Geography” includes IDL’s database of country and state boundaries, coastlines, rivers, lakes etc.
- “Geo Grid” is a latitude-longitude grid that can be overlain on the image for location and NS reference .
- “Terrain Holes” refers to black, no-data areas seen only on oblique-looking cameras where the projection of level 1 Ellipsoid data to create Terrain data has hidden the surface behind steep terrain features like mountains.
- “Digitizing” symbols created by the user include outline of polygon, direction arrow and plume name.
- “Data Values” are posted after retrieval of heights inside the polygon digitized by user. Other data types and display options can be selected in the “Select Data Overlay Options...” dialog box in the Task Menu.
- “Fire Pixels” are generated from MODIS data using the “Plume Utilities” option on the MINX Main Menu.
- “Markers” (volcanos, Aeronet sites or custom markers) are loaded from the Task Menu.

Data menu - Toggle Gridded Data

2-level
dropdown
list box

STER: Zero-wind hts
STER: Wind-corr hts
STER: Windspeed cross
STER: Windspeed along
STER: CloudMask

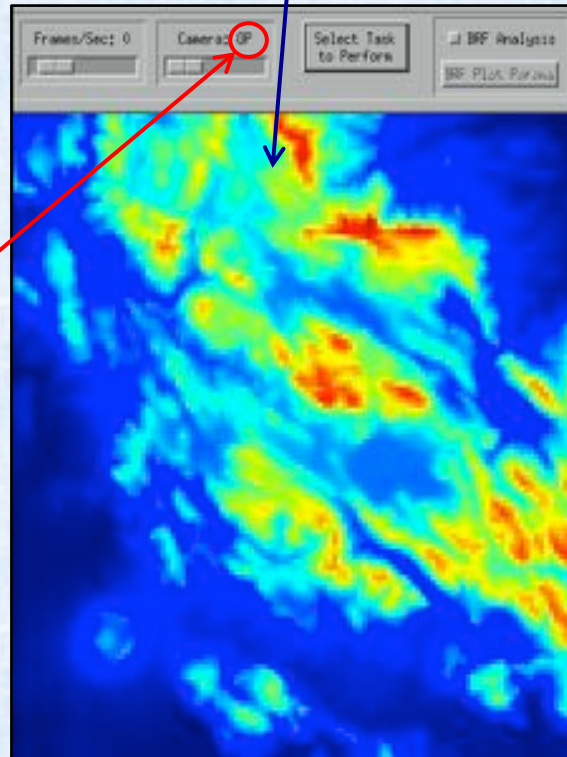
Terrain height
Land-Water mask
Biome class map
Sun angles
Camera zenith angle
Camera azimuth angle
Camera scatter angle
Camera glitter angle
Aerosol optical depth
Aerosol SS albedo
Aer: angstr exp best est
Aer: angstr exp low resid
Aerosol size fraction
Aerosol shape fraction
Land surface
TC Stereo
TC Cloud
SVM Scene classifier
TOA Local albedo
TOA Restrictive albedo
TOA Expansive albedo

- Gridded data refers to MISR standard data products that are pixelated to cover most of the area of the animation window.
- Gridded data are shown in an “extra”, zeroth camera window called **OP** (for OPerations) located on the far left end of the “Camera:” slider control.
- By rapidly pressing and releasing the “Press and Hold” button, a visual correlation between gridded data and MISR level 1 BRF data can be made.



When a data product is selected from the Data Menu list, the user is asked to select the file containing the chosen MISR gridded data if not already loaded.

Toggle button for displaying data.
Text changes to reflect the data type selected in the dropdown list.



Portion of animation window showing color-coded terrain heights displayed while “Press and Hold...” button is depressed

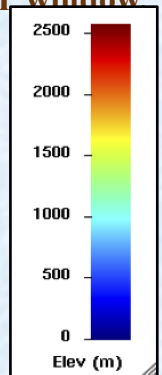
Color bar parameters can be modified from a dialog box as described in slides below in the section on the Task Menu

When “Press and Hold” is pressed:

- Data are copied into the OP window.
- The view switches to the **OP window**.
- A color bar is displayed either on the image or in a separate window and is updated if not already present and current.

When “Press and Hold” is released:

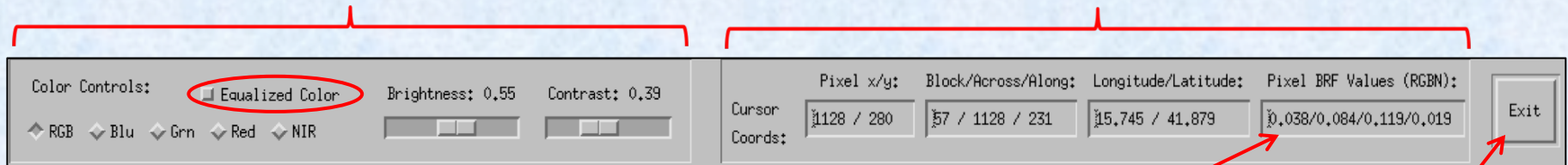
- The view switches back to the original window.
- Data remain in the OP window and are manually accessible with the “Camera:” slider .
- The color bar window remains until another operation is selected or it may be hidden behind another window.



Lower Task Bar

Color controls

Coordinate display is updated whenever user clicks in the Animation window.



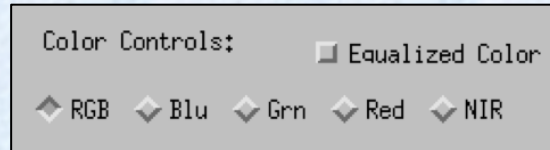
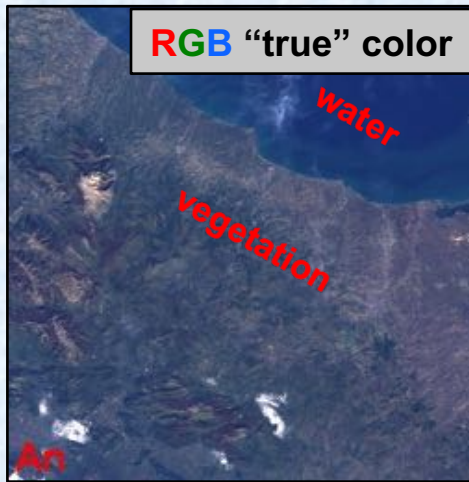
Besides the default RGB display, any band can be displayed alone in gray scale.

BRF values are shown for MISR's 4 bands: red, green, blue, NIR.

Clicking here returns user to the Animate cameras dialog to select another orbit.

- “Equalized color” = OFF (default) maps radiance (BRF) data to a color scale for each of MISR’s 36 channels based on that channel’s range of values. This enables better feature discrimination.
- “Equalized color” = ON maps BRF data to a single color scale for all 36 channels. This allows the display of “truer” relative brightness between cameras. The difference between ON and OFF may vary widely between orbits, depending on their color content.
- “Brightness” and “Contrast” sliders provide a means to control the display’s color quality.
- “Pixel x/y:” uses a single coordinate system for the entire animation window based on 275 m pixels with origin [0,0] at the lower left corner of the window. Use these coordinates to specify an image rectangle when saving images to file.
- “Block/Across/Along:” uses a separate coordinate system for each MISR block based on 275 m pixels with origin [0,0] at the upper left corner of each block. Coordinates at left and right image edges can range outside the normal values of 0 to 2047.

Display Single Bands



- Water absorbs NIR and Red light and reflects Blue and green.
- Vegetation absorbs Red light and reflects NIR and Green.
- Blue light is most strongly scattered by many aerosols.
- White features (clouds, snow, ...) scatter all wavelengths equally.

