OSSIM Mapping ARchive
OMAR™ Users Guide

Version 1.8.16
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1.0 (U) Points of Contact

(U) OMAR is developed by RadiantBlue Technologies, Inc. and is supported by a team that is reachable by email or phone.

(U) For those accessing the OMAR to view NTM imagery/FMV on JWICS or SIPR, you have 24x7 access to the Technology Stewards at 571-721-7287.

(U) For those accessing other instantiations of OMAR, or for general inquiries, please contact the following:

Name	*Role*	*Email Address*
Dennis O'Connor	Help Desk 321-473-4316	doconnor@radiantBlue.com

2.0 (U) Overview

(U) Welcome to OMAR (**O**SSIM **M**apping **AR**chive), a service that allows the user to search, locate and view airborne and satellite imagery as well as full motion video (FMV).

(U) OMAR allows users access to full resolution imagery pixels even on low-bandwidth networks through the use of Web Mapping Service (WMS). Rather than providing the entire picture at once, OMAR returns only the information requested by the user at any given time (i.e. enough pixels to fill the screen, e.g. 100 KB per screen vs. 400 MB for a file). Imagery is processed in real-time through OMAR's OSSIM library and users can sharpen and adjust the contrast of images as necessary, letting the web server do the work, freeing up valuable Desktop CPU resources.

(U) OMAR is based on the Open Source Software Image Map (OSSIM), an Open Source Geospatial Foundation (OSGeo - http://www.osgeo.org/ossim) project. OSSIM is a high performance engine for remote sensing, image processing, geographical information systems and photogrammetry. OMAR integrates other open source software products such as Apache Tomcat, Open Layers, MapServer, GRAILS, GEOServer, PostGIS and Postgres, among others.

2.1 (U) Feedback

(U) Users may leave feedback in the *Report* section of the *Home* page or may email the OMAR group directly (see Points of Contact).

All Feedback is greatly encouraged and deeply appreciated!!

(U) Typographical Conventions
(U) Typographical conventions found in this User Guide.

Convention	Description
Bold Text	Indicates a user action, such as selecting a link or an action button
Italics	Identifies a specific section, window or function within the current view

3.0 (U) Getting Started

Note: go to 16.0 to view how to do a quick start query.

(U) OMAR can be accessed via a WMS layer interface or a GEOINT tool capable of employing KML network links (i.e. Google Earth, ArcGIS, etc). There are no hardware requirements to use OMAR however we recommend Mozilla Firefox 3.0 or higher and Internet Explorer 7.0 or higher; additionally, flash is required for video playback. Regardless of which method is used, all users must first self-register an account in OMAR.

(U) To create an account:

(U) Navigate to http://omar in a web browser. [1]

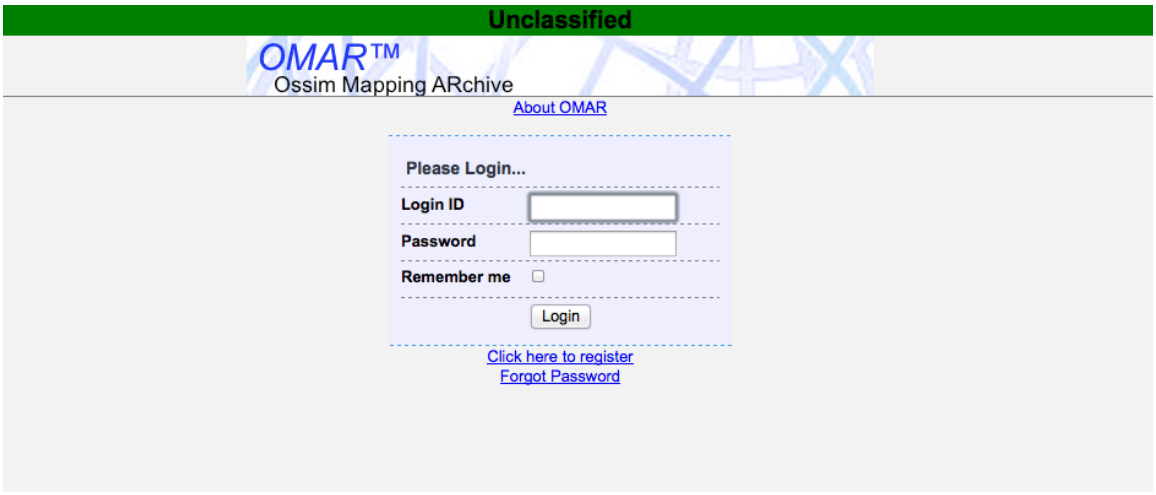


Figure 1. Login Screen

(U) At the OMAR login page, select **Click here to register** to create your OMAR account.

(U) In the *User Registration* window, complete all required information, including a valid email address. The email address should be consistent with the level of the system where you are accessing OMAR (e.g., a SIPR address is you are accessing OMAR on the SIPR network).

(U)When an account is created, OMAR will send a verification email to the email address provided.

[1] The actual URL will vary depending on the specific OMAR application being accessed.

Figure 2: OMAR User Registration Screen

(U) After logging in, the *Home* page appears (Figure 3). This page provides the primary top level choices for OMAR operation:

- Search — Section 3
- Browse — Paragraph 3.6; Section 4
- KML Network Links — Section 7
- GeoRSS Links
- User Preferences — Enter individual preferences
- Report — Enter user feedback
- Logout — Stop the OMAR application

Figure 3: OMAR Home Page

(U) An admin user has two additional sections available in the *Home* page (Figure 4). These sections provide the following functionality:

- User Management — administration of users
- Edit Tables — direct access to database table content

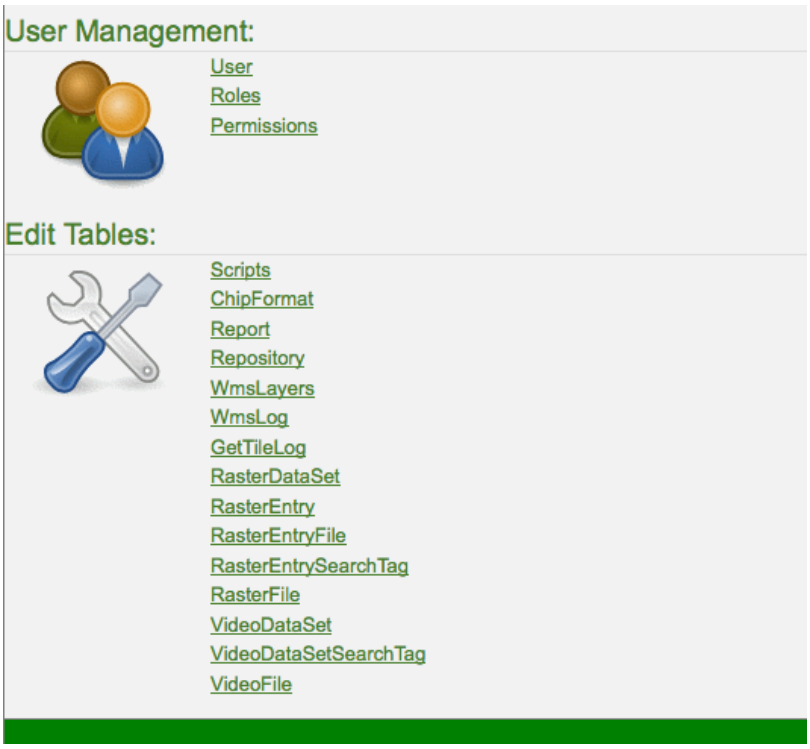


Figure 4: OMAR Home Page, Admin Functions

4.0 (U) Federated Searching Imagery

(U) There are different ways that a user can do a federated search using OMAR.

(U) Federated search came about to meet the need of searching multiple content sources with one query. This allows a user to search multiple databases at once in real time, arrange the results from the various databases into a useful form and then present the results to the user.

4.1 (U) Geographic Criteria

(U) OMAR provides four options to search geographically by specifying either bounding box, point radius, date/time, query or map.

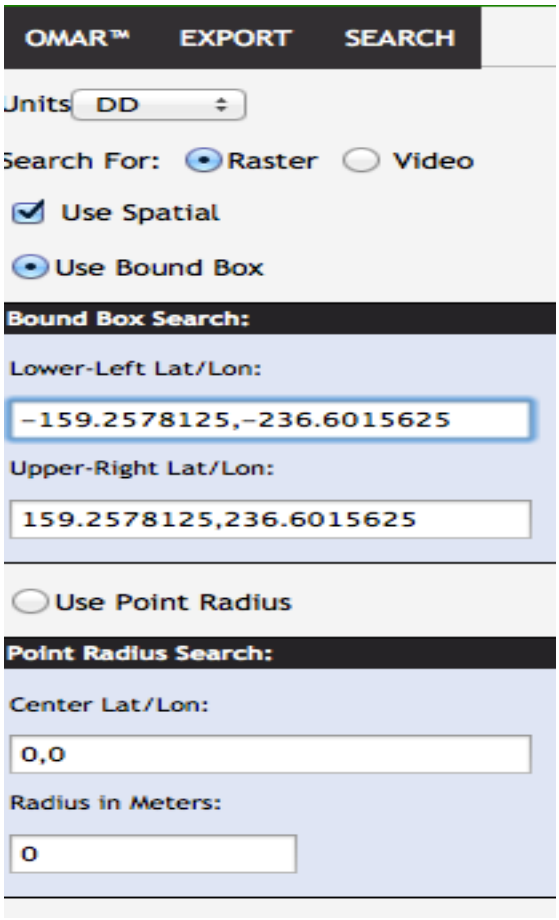
(U) Note: Input the geographical coordinates in the following formats by selecting the appropriate *Display Unit* drop-down menu at the top of the page:

- Decimal Degrees **(DD),**
- Degrees, Minutes, Seconds **(DMS),**
- Military Grid Reference System **(MGRS)**

4.2 (U) B Search for images on bound Box

(U) This option is used to search imagery based on a bounding box of a specified size.

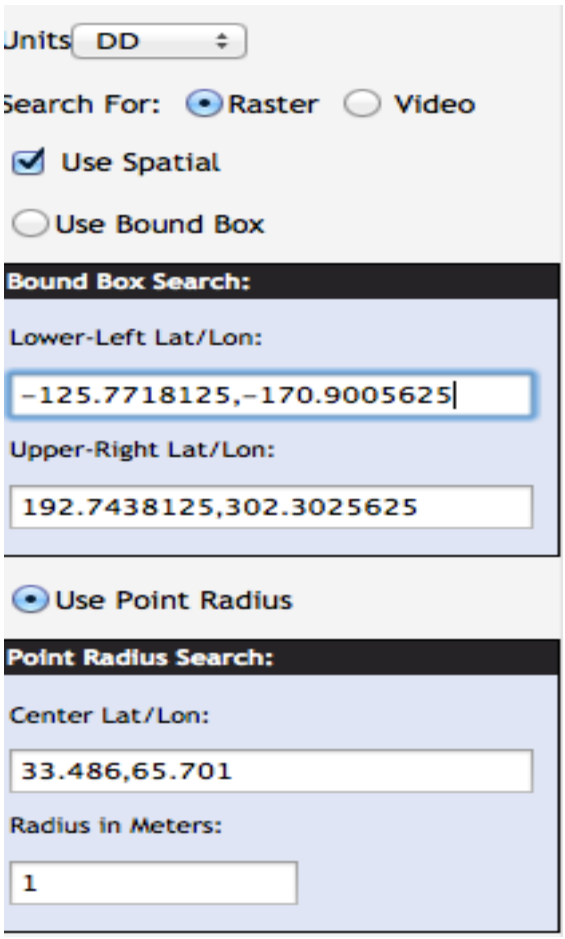
- *Lower Left* - southwestern coordinate of bounding box
- *Upper Right* - northeastern coordinate of bounding box
- *Clear Bound Box* - action button to clear the contents of the bound box



4.3(U) Search for images on Point Radius

(U) This option is used to search imagery based on a circle with a specified center and radius.

- *Map Center* – enter coordinates to specify the center of the search
- *Radius in Meters* – radius to specify the extent of the search
- *Set Map Center* - action button to center the map based on the coordinates specified

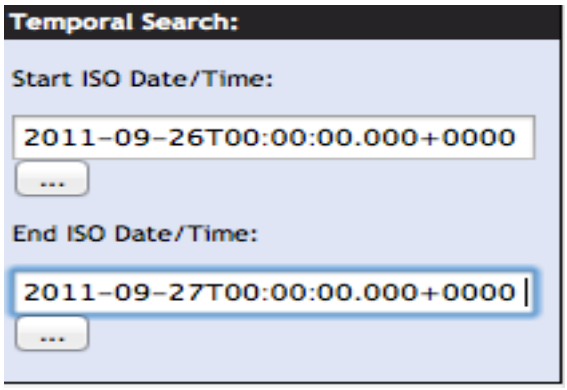


(U) Search for images on Time

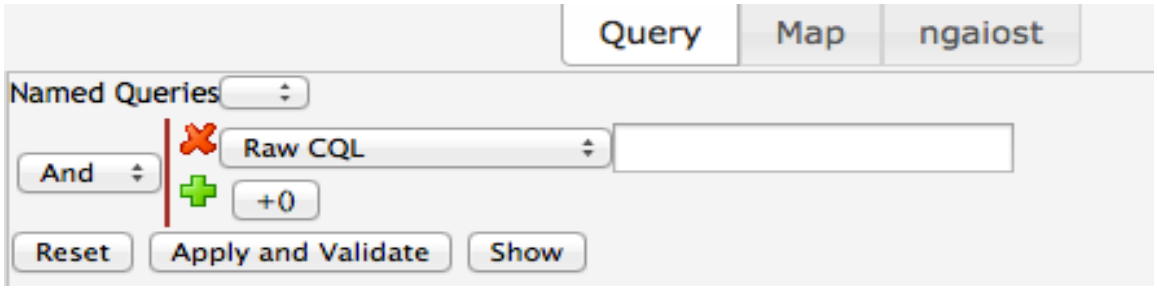
4.3.1 (U) Date/Time Criteria

(U) This option is used to search imagery within a specific timeframe.

- *Start Date/Time* – oldest date/time for which OMAR will search for imagery
- *Stop Date/Time* – most recent date/time for which OMAR will search for imagery



4.4 (U) Search Using Query



(U) Below lists all of the different Medata Records that can be query on. They can be use one at a time or stringed together for a better more accurate query.

4.4.1 (U) Metadata Criteria

Raw CQL
Record ID
BE
IID2
Class Name
Country
File Type
Filename
IID
Mission
NIIRS
Sensor

Target ID
Image Representation
Azimuth Angle
Grazing Angle
Acquisition Date
Access Date
Ingest Date
Receive Date
Ground Geom "
Entry Id
Width
Height
Number of Bands
Number of Res Levels
GSD Units
GSD X
GSD Y
Bit Depth
Data Type
Index ID
Product Id
ICAT
Security Classification
Security Code
Isource
Organization
Description
Wac Code
Sun Elevation
Sun Azimuth
Cloud Cover
Exclude Policy

Min Lat / Lon
Max Lat / Lon
Center Lat / Lon

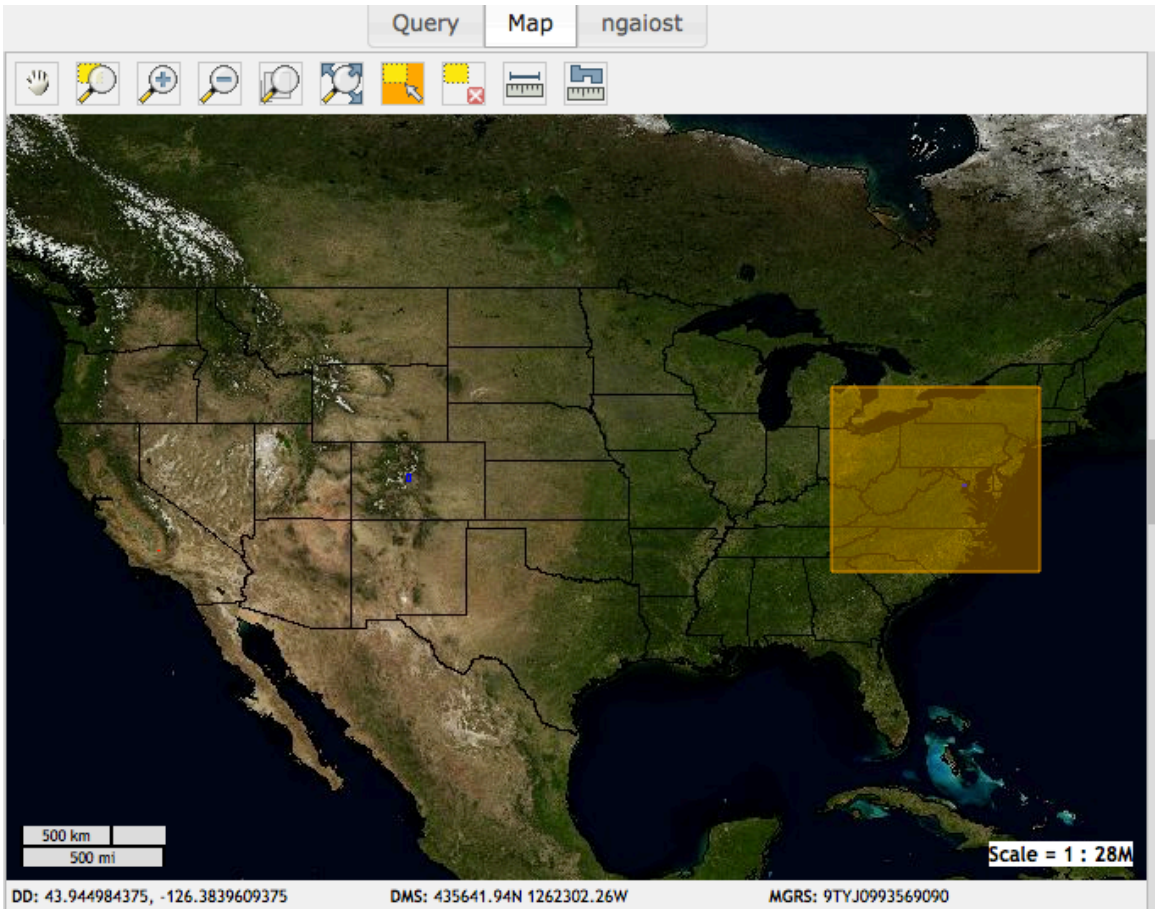
4.5 (U) Searching Using the Map

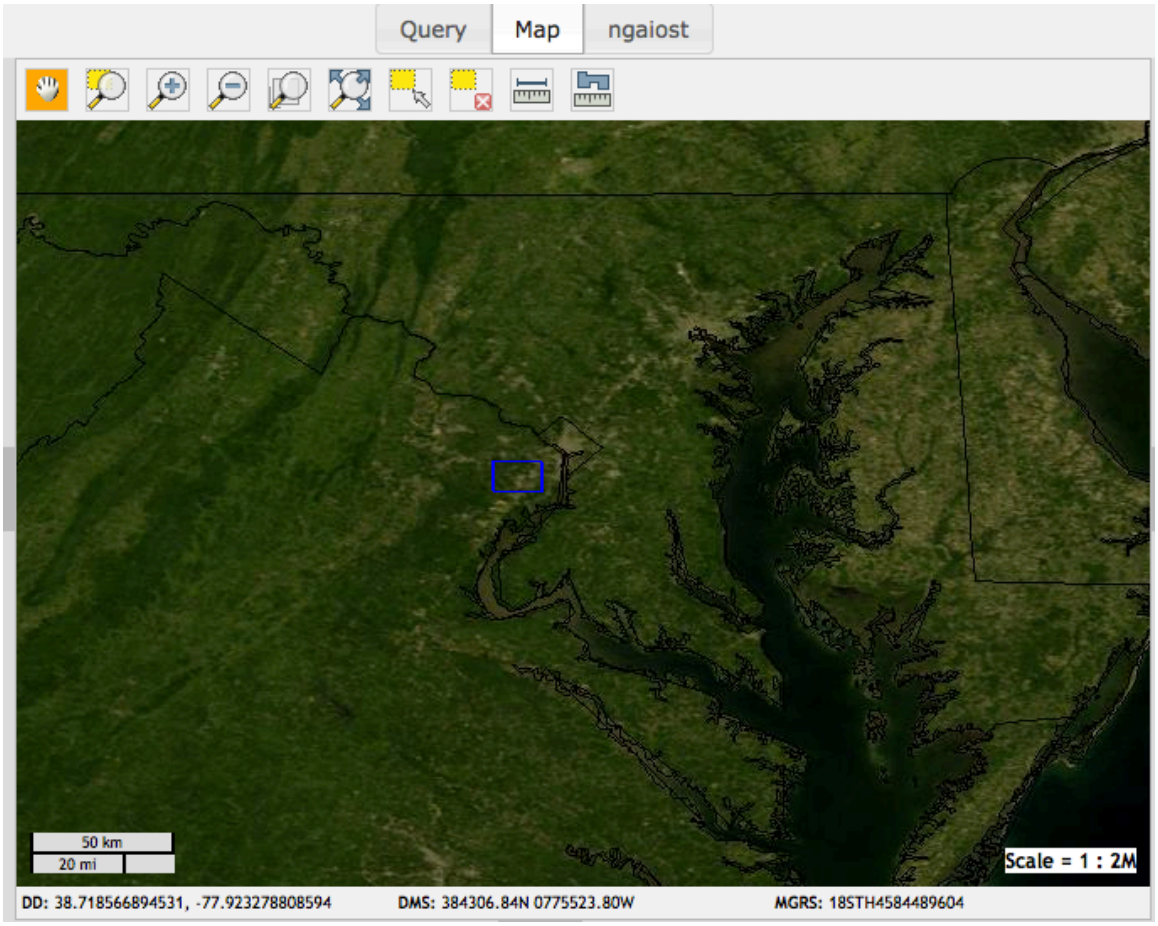
(U) After selecting **Imagery** from the *Search* section of the *Home* page, the *Imagery Search* page is displayed. The bright colored polygons (aka footprints) on the globe

represent areas that have been imaged and are in the OMAR database. The footprint colors are keyed based on the legend in the right panel.

(U) When no search criterion is entered, as in this case, all OMAR imagery that is contained within the bounding box on the screen is returned in date/time order starting with the most recent image.

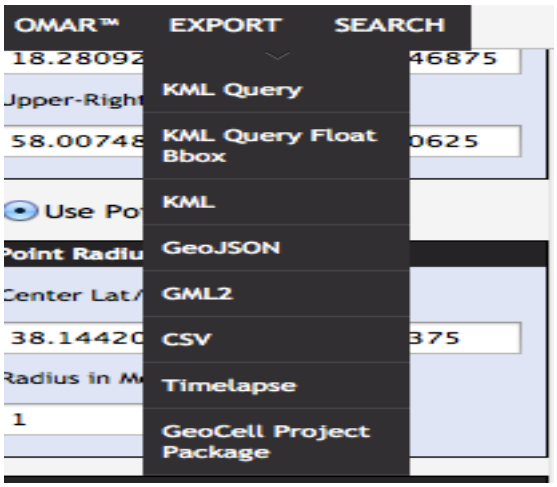
(U) Note: Panning around the map or zooming to a different location after setting the map center, will cause the *Map Center* input box to update with the new center.





5.0 (U) Export

5.1 (U) Keyhole Markup Language (KML Query)



(U) Keyhole Markup Language (KML) is an XML notation for expressing geographic annotation and visualization within Internet-based, two-dimensional maps and three-dimensional Earth browsers. KML was developed for use with Google Earth, which was originally named Keyhole Earth Viewer. It was created by Keyhole, Inc, which was acquired by Google in 2004. KML became an international standard of the Open Geospatial Consortium in 2008.[1][2] Google Earth was the first program able to view and graphically edit KML files. Other projects such as Marble have also started to develop KML support.[

(U) When an AOI is selected from the map, that query will be open and displayed in Google Earth.

5.2 (U) Keyhole Markup Language (KML Query Float Bbox)

(U) Is the same KML query but has a JavaScript library for displaying windowed content over top of web pages

(U) When an AOI is selected from the map that query will be open and displayed in Google Earth

5.3 (U) GeoJSON

(U) GeoJSON allows geographic data to be stored in a human-readable way that is generally more compact than XML.

(U) When an AOI is selected from the map that query will be open and display XML.

5.4 (U) GML - Geography Markup Language

(U) The **Geography Markup Language** (**GML**) is the XML grammar defined by the Open Geospatial Consortium (OGC) to express geographical features. GML serves as a modeling language for geographic systems as well as an open interchange format for geographic transactions on the Internet. Note that the concept of feature in GML is a very general one and includes not only conventional "vector" or discrete objects, but also coverage's and sensor data. The ability to integrate all forms of geographic information is key to the utility of GML.

(U) When GML is selected it can be open in a browser like Firefox and will display an XML text.

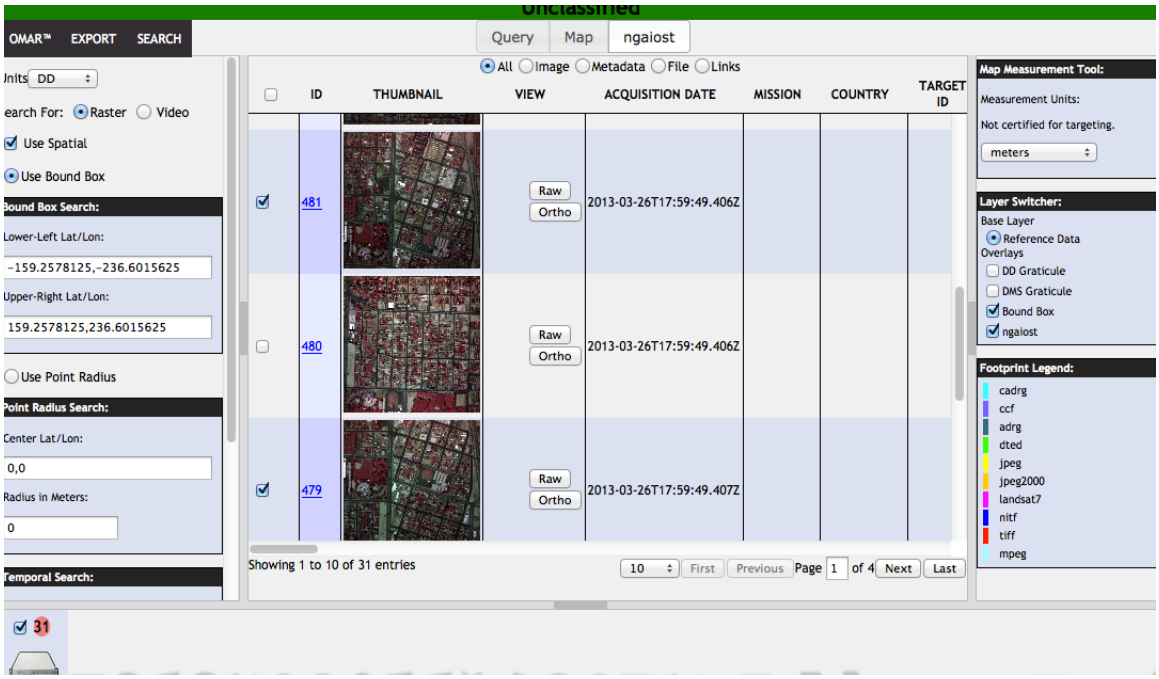
5.5 (U) Comma-separated values (CSV)

(U) A **comma-separated values** (**CSV**) file stores tabular data (numbers and text) in plain-text form. Plain text means that the file is a sequence of characters, with no data that has to be interpreted instead, as binary numbers. A CSV file consists of any number of records, separated by line breaks of some kind; each record consists of fields, separated by some other character or string, most commonly a literal comma or tab.

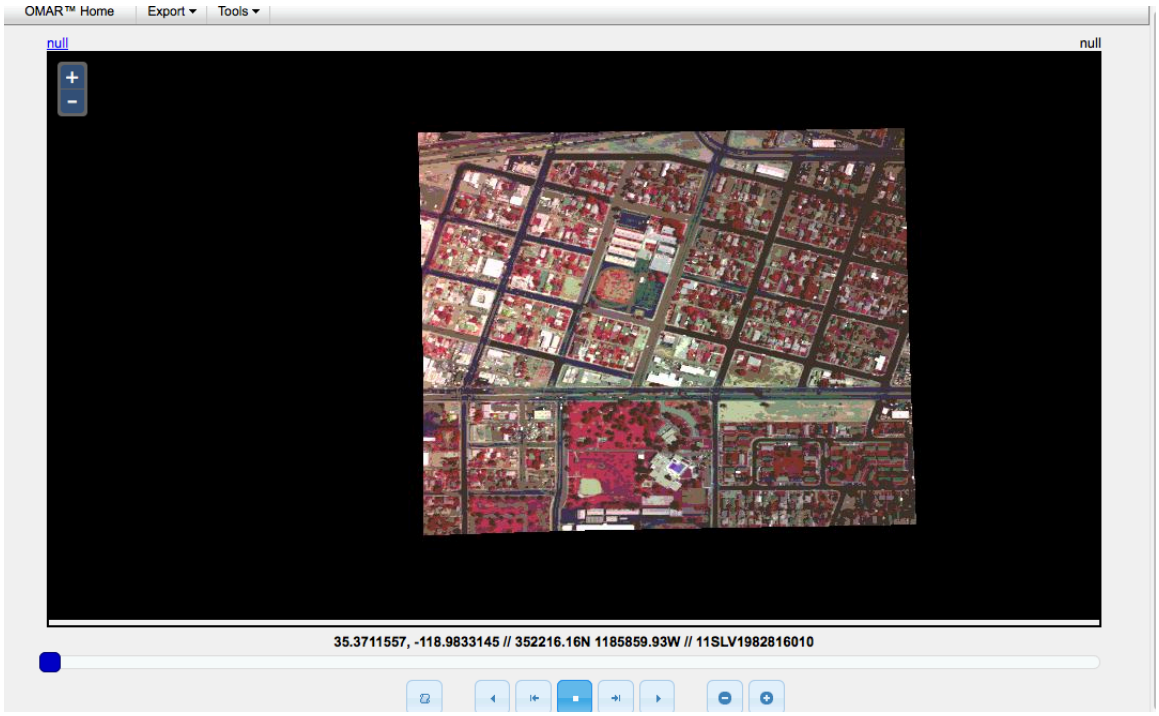
(U) CSV can be open in a number of different applications.

5.6 (U) Timelapse

(U) Timelapse is used not from the map as the others exports but is used from a completed query display



(U) A user will select images that cover the same AOI, and then the user will select Timelapse to play the images. You can see that images 481 and 479 are selected



(U) After Timelapse is selected then the Timelapse displayed and you are able to see the play button at the bottom of the display. There is a zoom button at the top left of the display that a user can zoom in or out of the display.

5.7 (U) GeoCell Project Package

(U) A user will select images to be downloaded to the client platform for use in the GeoCell exploitation tool. GeoCell is a stand-alone executable program that can be used for a number of advanced exploitation operations (e.g. registration, change detection, etc.).

(U) After "GeoCell Project Package" is selected, a message will appear that states that export has been initiated. The user must remain on the search page while a zip archive containing all image support files is created. When archiving is complete, a standard download window appears and the user can either press *Save File* or *Cancel*. After the zip file is downloaded, the user can unzip the archive or move it to a different location.

(U) After the file has been unzipped there will be a .geom, .ovr, .his and image file (and other support files for selected image types) for each image that was selected. The GeoCell User Manual may be consulted for information regarding GeoCell operations.

6.0 (U) Navigation Bar

(U) The *Navigation Bar* found at the top of the *Search* page provides a variety of functions that allows the user to navigate through the world map. Hover over any of the ten buttons in the *Navigation Bar* to view their function.

 Click and drag to pan map

 Click and drag to zoom into an area

 Click to zoom in

 Click to zoom out

 Click to zoom to full resolution

 Click to zoom to the max extent

 Click and drag to specify an area of interest

 Click to clear area of interest

 Measure path length

 Measure polygon area

7.0 (U) Map Measurement Tool

(U) The *Map Measurement Tool* is use in conjunction with the *path length*  and *polygon area*  tools on the Navigation bar to measure distance or area.

7.1 (U) Measuring Path Length

(U) Select the desired unit from the *Map Measurement Tool* drop-down menu.

(U) Select the *path length*  tool from the Navigation bar.

(U) Move the cursor onto the map and click a point for the path start.

(U) Move the cursor to the desired end point and double click to complete the path.

(U) Note the distance in the area under the unit's drop-down menu.

7.2 (U) Measuring Polygon Area

(U) Select the desired unit from the *Map Measurement Tool* drop-down menu

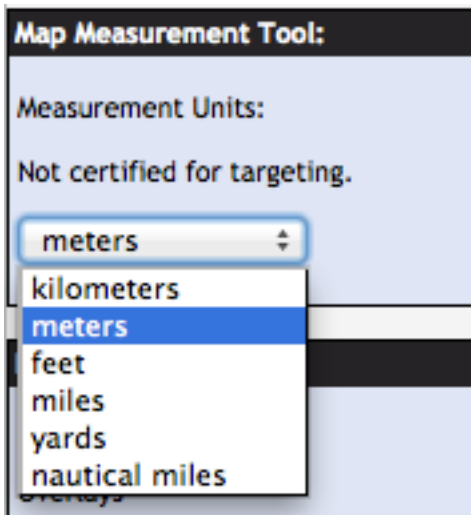
(U) Select the *polygon area*  tool from the Navigation bar.

(U) Move the cursor onto the map and click a point to start the polygon.

(U) Move the cursor to the next location on the map and click to establish the next vertex of the polygon. Note: A polygon requires a minimum of 3 vertices.

(U) Close the polygon by double-clicking on the start point.

(U) Note the area in the space under the units drop down menu.



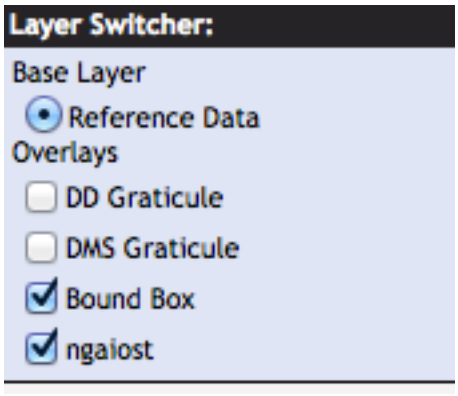
8.0 (U) Map Layers

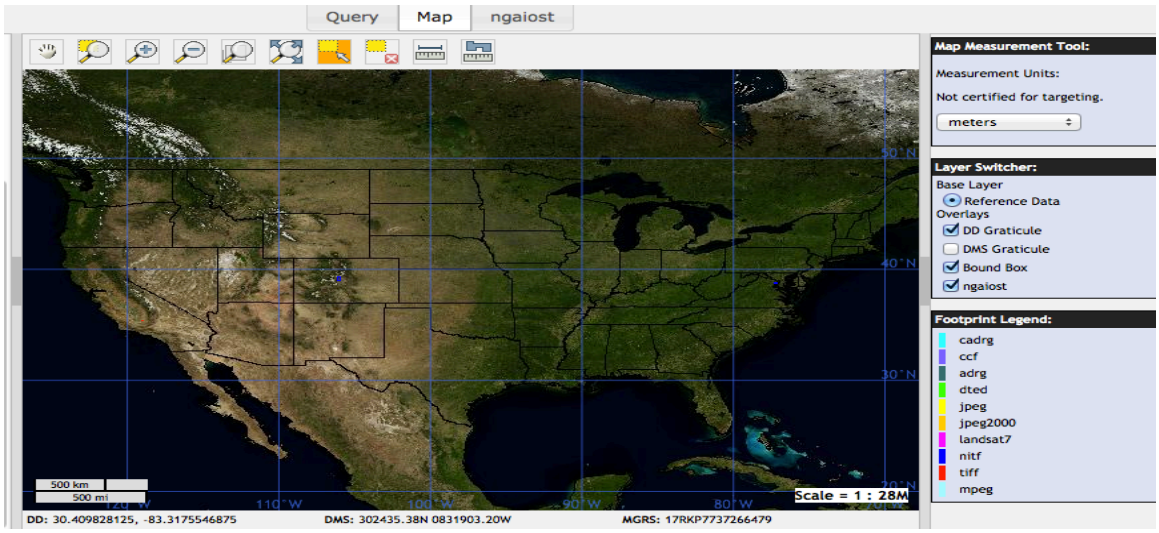
(U) OMAR offers a library of digital raster map backgrounds.

(U) Layer Switcher

(U) The Layer Switcher provides the capability to turn on/off various map overlays and reference data.

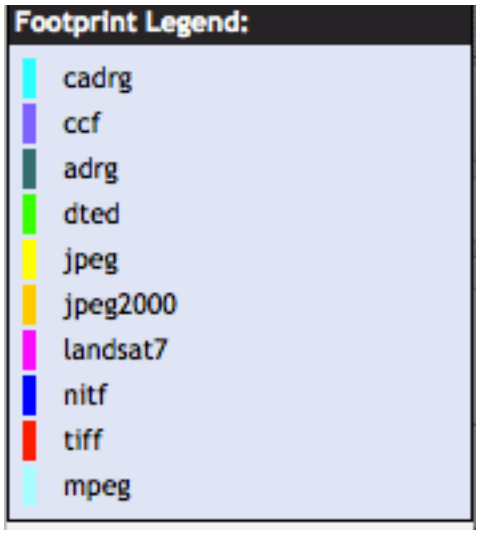
- Base Layer
  - Reference Data - OMAR defaults to the Blue Marble reference data
- Overlays - Provides the option to turn on/off the following overlays using the appropriate check box
  - OMAR Imagery Coverage - footprints depicting imagery coverage
  - Bound Box - bound box designated by the user
  - DD Grid - Decimal Degree grid (scales based on zoom level)
  - DMS Grid - Degree, Minutes, Seconds Grid (scales based on zoom level)





9.0 (U) Footprint Legend

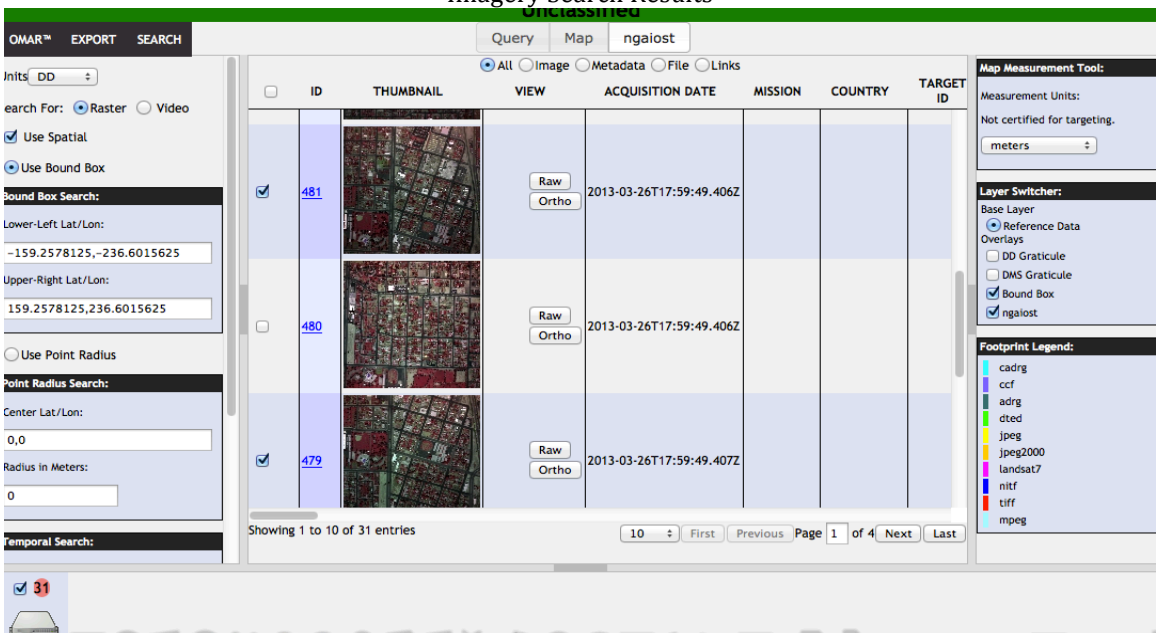
(U) Colored footprints have been added to the Map Layer where a user will be able to locate format or sensor on the map by its color.



10.0 (U) Imagery Search Results

(U) Once you have entered the desired search criteria, select the **Search** button to view the results of the search. There are two search buttons one at top left of the display and one on the bottom left of the display.

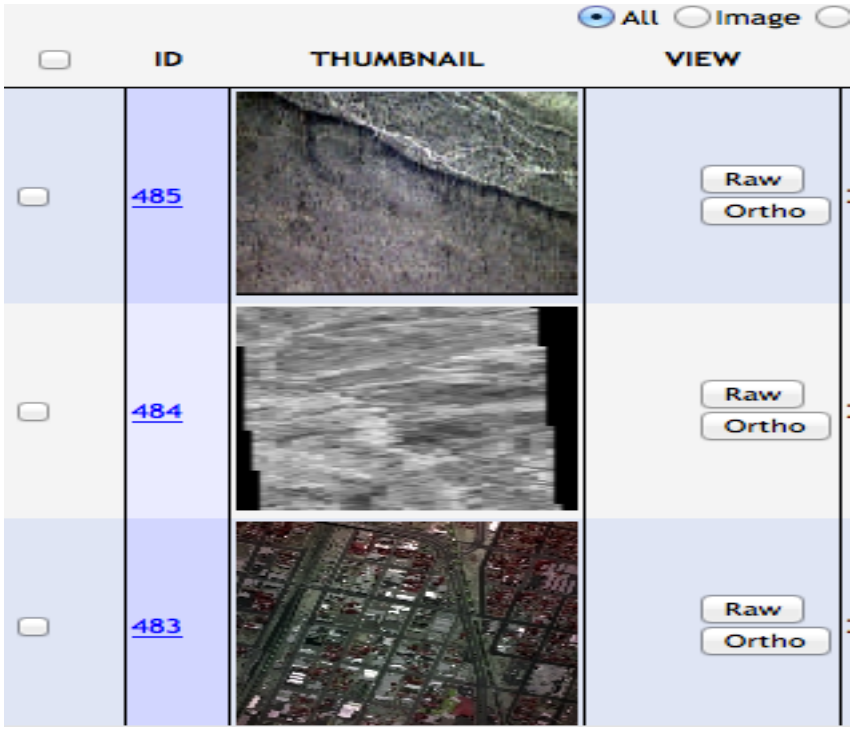
Imagery Search Results



10.1 (U) Image 

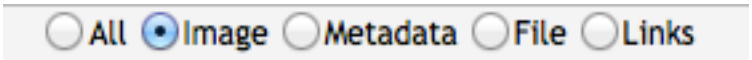
(U) After a search has been completed the display will show Thumbnails and Medata. At the bottom of the display a box that looks like a disk will list the number of images that was found on the search. For a federated search there could be more than one disk displayed. There is a check box that will select the disk to view the images. If the box is not checked then the image cannot be viewed.

(U) For the Image section of the display there will be an ID listed for the image, a thumbnail and a section labeled VIEW. Under VIEW there are two buttons labeled Raw and Ortho where, Raw will display the image with no rectification and Ortho will be rectified.



11.0 (U) View of Metadata

(U) There are five buttons at the top center of the display. When one is selected the user will be able to see the image information of the image.

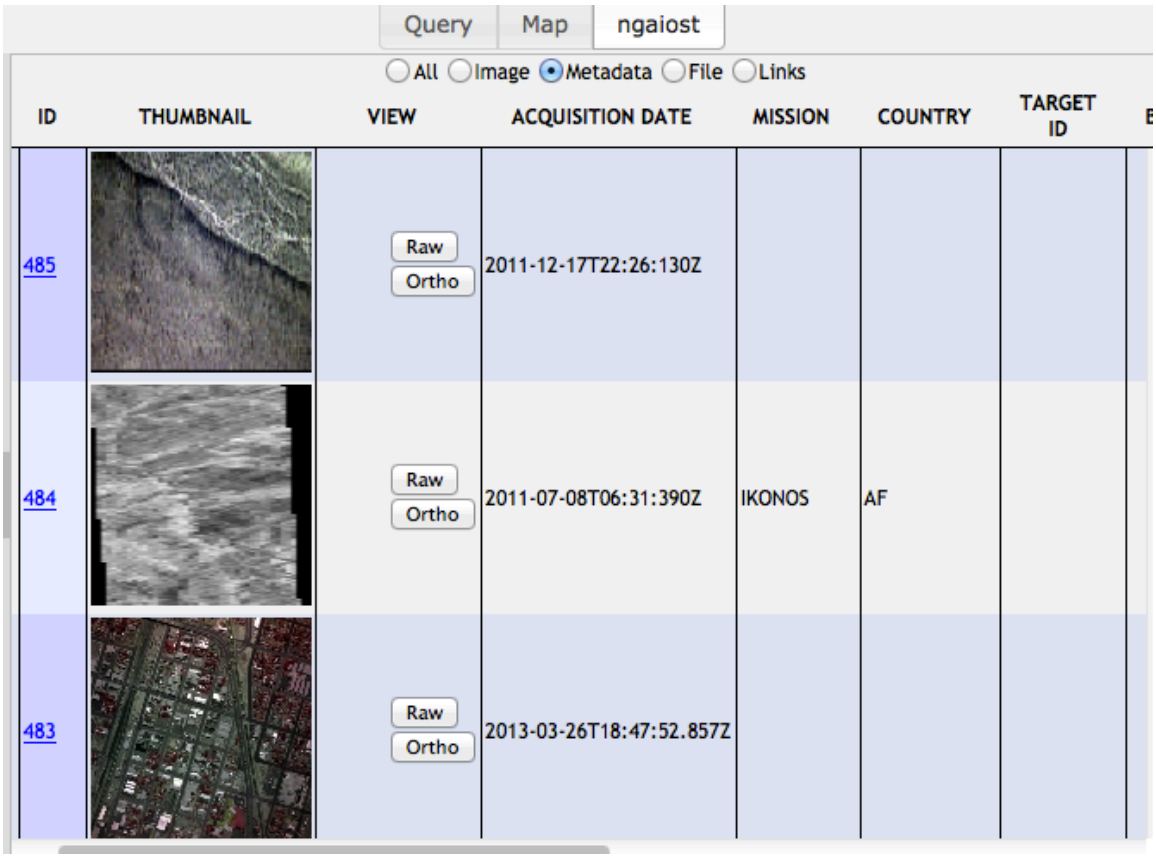


11.1(U) Information for the button Image

- *Id* – integer given to each image as they are ingested into OMAR
- *Thumbnail* – preview of the image
- *View* - option to view raw or Orthorectified
- *Width* – width of image in pixels
- *Height* – height of image in pixels
- *Bands* – number of bands within the electromagnetic spectrum that the image contains
- *R-Levels* – number of resolution levels
- GSD X
- GSD Y
- *Bit Depth* – how many bits represent each pixel
- *Entry*
- *Min Lat Lon* – minimum east-west geographic coordinate in the image
- *Max Lat Lon* – maximum north-south geographic coordinate in the image
- *Center Lat Lon*

11.2 (U) Information for the button Metadata

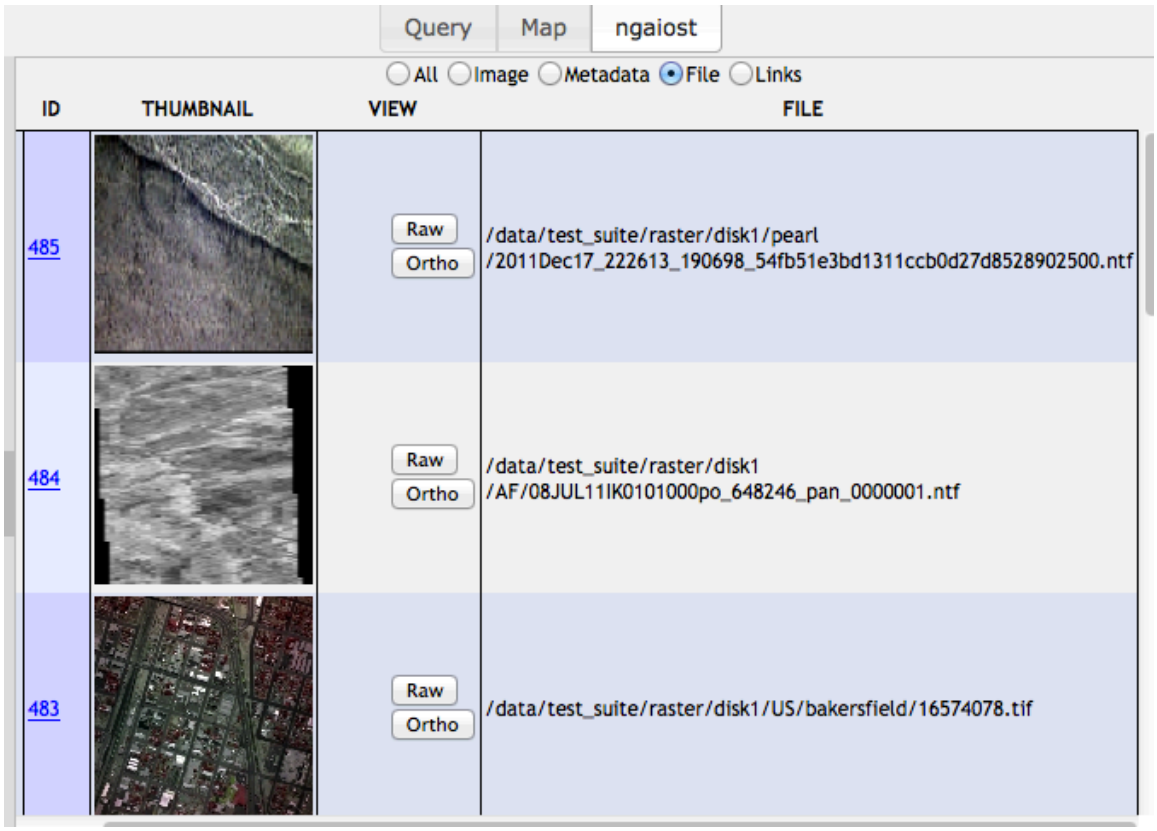
- *Id* – integer given to each image as they are ingested into OMAR
- *Thumbnail* – preview of the image
- *Raw / Ortho*
- *View* - option to view raw or Orthorectified (opens the image in the viewer)
- *Acquisition Date* – the time and date the image was taken
- *Mission* – mission number representing which asset captured the image
- *Country* – unique two-letter identifier given to each country
- *Target ID*
- *BE*
- *Sensor* ID– sensor type that acquired the image (e.g., VIS, MS, etc.)
- *IID* - unique identifier given to each image
- File Type
- Class Name
- *NIIRS* – National Imagery Interpretability Rating Scale - a scale used to measure the overall quality of the image
- *Image Id* – unique identifier given to each image



11.3 (U) File

(U) Information for the button File

- *Id* – integer given to each image as they are ingested
- *Thumbnail* – preview of the image
- *Raw / Ortho*
- *View* - option to view raw or Orthorectified (opens the image in the viewer)
- *Filename* – physical location in the OMAR file system



11.4 (U) Links

Information for the button Links

- *Id* – integer given to each image as they are ingested
- *Thumbnail* – preview of the image
- *Raw / Ortho*
- *View* - option to view raw or Orthrectified (opens the image in the viewer)
- *WMS GetCapabilities* – XML code for WMS call to view imagery elsewhere
- *WMS GetMap* – returns a screen sized JPEG chip for the image
- *Get KML* – generates a KML file for the image
- *Super Overlay* – generates a super overlay KML file for the image

11.5 (U) Web Feature Service (WFS)

(U) OMAR provides the capability to create an XML document that identifies imagery, which matches a certain set of features within the image metadata. With each image in OMAR comes a host of features that are searchable via URL. See Appendix for more details and examples.

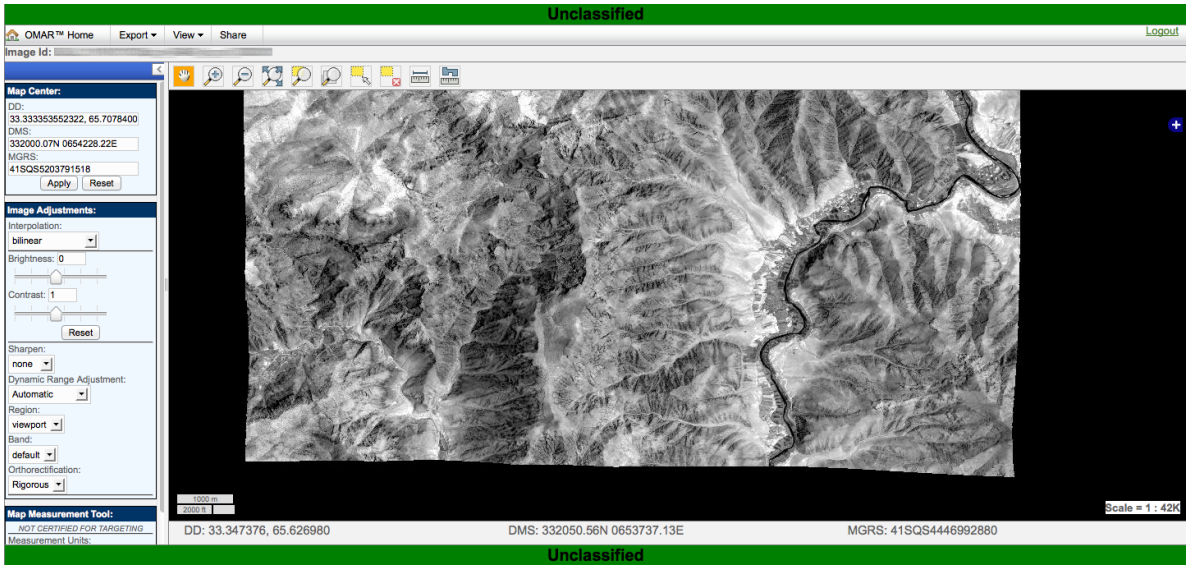
11.6 (U) Web Coverage Service (WCS)

(U) OMAR provides the capability to return a chip of an image that fits inside a specified BBOX. The service can be configured to return a chip of either a specific image or all images in OMAR that exist inside a specified BBOX. See Appendix for more details and examples.

12.0 (U) Viewing Imagery

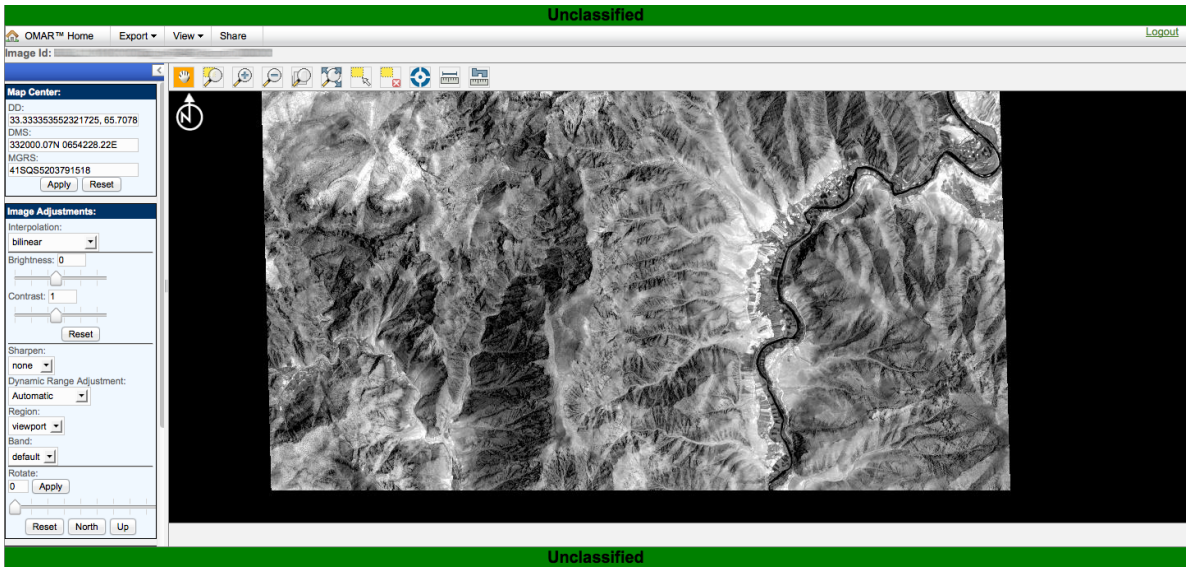
(U) To view an image, click on a *Thumbnail* in the *Results Window* or on either *Raw* or *Ortho* link in the *View* column.

(U) OMAR image viewing is possible in either of two modes, *Orthorectified* and *Image Space*. In *Orthorectified* space, the image is Orthorectified to the underlying elevation surface using the applicable projection. In this mode it represents a map view. Note that, in many cases, the apparent image shape/boundaries will be deformed depending on the image acquisition geometry and terrain relief characteristics.



OMAR Orthrectified View

(U) In *Image* space, the image is displayed as it was originally acquired (no rectification).



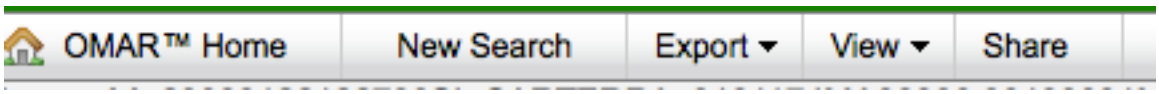
OMAR Image View

12.1 (U) Common Elements

(U) The Orthorectified and Image viewers share many common user interface components.

12.2 (U) Toolbar Buttons

(U) At the top of the page, there are five buttons available to the user, as described below.

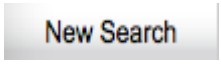


12.3 (U) OMAR™ Home

(U) This button returns the user to the OMAR home page.

12.4 (U) New Search

(U) Will allow the user to start a new search



12.5 (U) Export

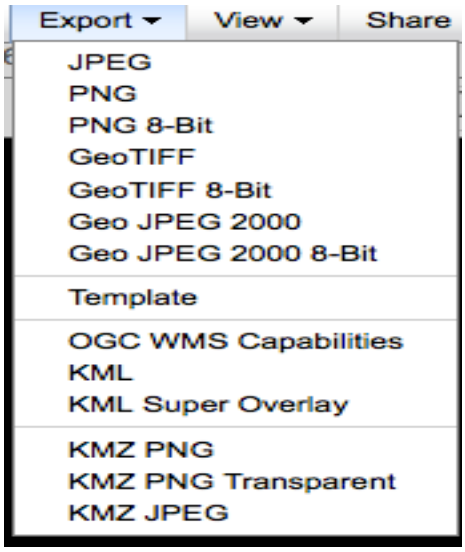
12.5.1 (U) In *Orthorectified* view, the following export choices are available:

- *JPEG* – creates a JPEG file of the image displayed in the viewport
- *PNG* – creates a PNG file of the image displayed in the viewport
- *PNG 8-bit* – creates an 8 bit PNG file of the image displayed in the viewport
- *Geotiff* – creates a GEOTIFF file of the image displayed in the viewport
- *Geotiff 8-bit* – creates an 8 bit GEOTIFF file of the image displayed in the viewport
- *Geo Jpeg 2000* – creates a GEO JPEG 2000 file of the image displayed in the viewport
- *Geo Jpeg 2000 8-bit* – creates an 8 bit GEO JPEG 2000 file of the image displayed in the viewport

- *Template* - provides the capability to save the view as an annotated product

- *OGC WMS Capabilities* – provides a web page containing XML coded metadata about the image
- *KML* – creates a KML file of the imagery for use in external GEOINT tools such as Google Earth
- *KML Superoverlay* – This is similar to a normal KML Query however a Superoverlay file is optimized for Google Earth and its caching scheme. It creates a directory of links to image tiles at different zoom resolutions and caches them such that when a user returns to the same spot at a previous zoom level, the image does not need to be reloaded.

- *KMZ PNG* – creates a KML with the currently displayed viewport image attached as a PNG (no transparency)
- *KMZ PNG Transparent* – creates a KML with the currently displayed viewport image attached as a PNG (with transparency)
- *KMZ JPEG* – creates a KML with the currently displayed viewport image attached as a JPEG (no transparency)

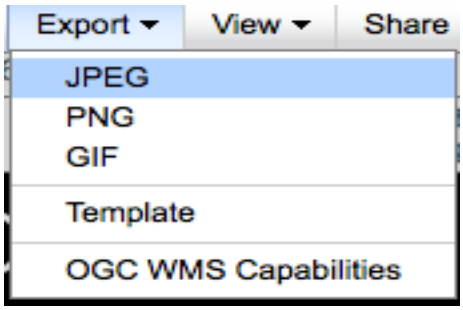


12.5.2 (U) In *Image Space North Up* view, the following export choices are available:

- *JPEG* – creates a JPEG file of the image displayed in the viewport
- *PNG* – creates a PNG file of the image displayed in the viewport
- *GIF* – creates a GIF file of the image displayed in the viewport

- *Template* - provides the capability to save the view as an annotated product

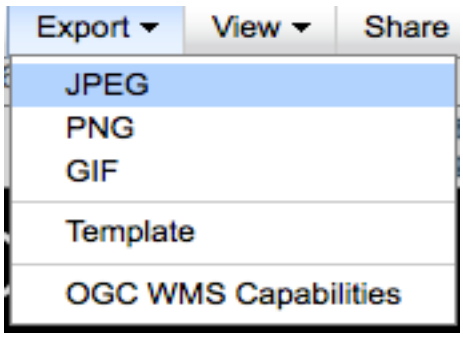
- *OGC WMS Capabilities* – provides a web page containing XML coded metadata about the image



12.5.3 (U) In *Image Space Up is Up* view, the following export choices are available:

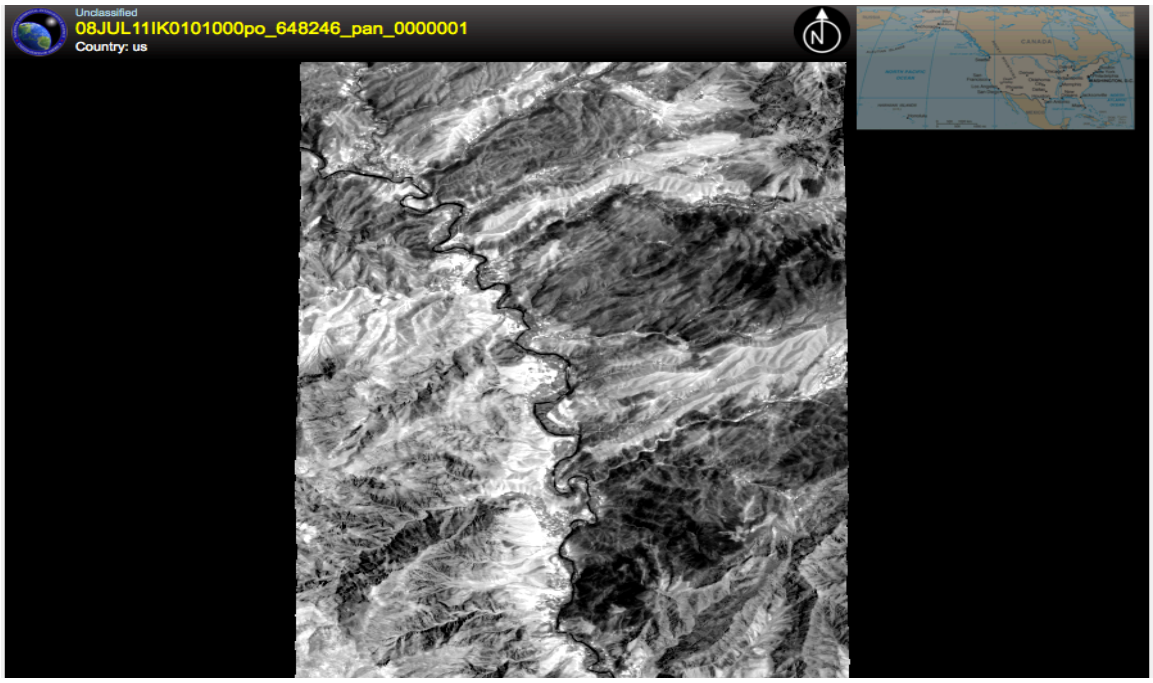
- *JPEG* – creates a JPEG file of the image displayed in the viewport
- *PNG* – creates a PNG file of the image displayed in the viewport

- *GIF* – creates a GIF file of the image displayed in the viewport
- *Template* - provides the capability to save the view as an annotated product
- *OGC WMS Capabilities* – provides a web page containing XML coded metadata about the image



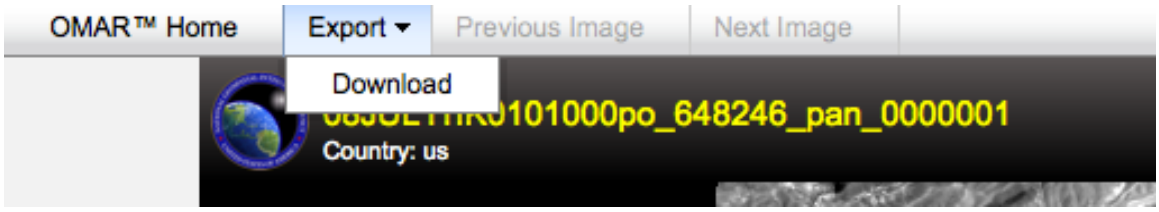
12.5.4 (U) The Template

The Template capability allows the user to save the current viewport, formatted within a basic annotated framework. The header displays Classification, Image ID, Country Code, Map and North Arrow. Each of these headers can have different colors selected.



Template Export

(U) After the Template has all of the information enter then the user can download the Template as a PDF file. A message will be displayed showing the download progress.

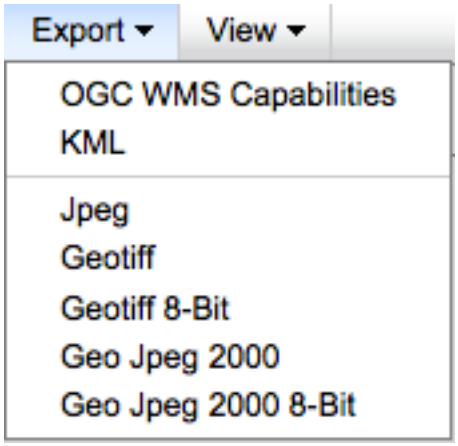


(U) Fields are populated automatically where possible and can be manually specified as required.

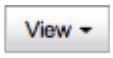
12.5.5 (U) Orthorectified Multilayers the following export choices are available.

- *OGC WMS Capabilities* – provides a web page containing XML coded metadata about the image

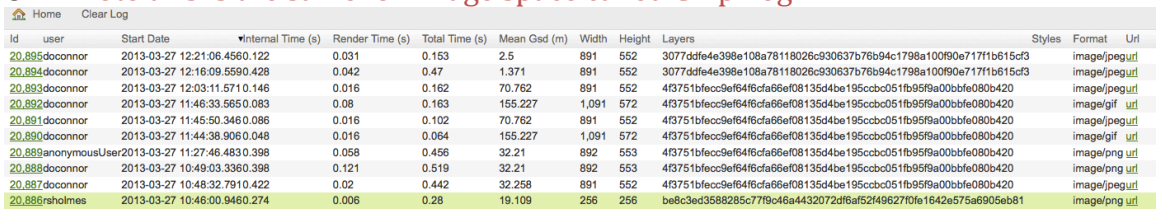
- *KML* – creates a KML file of the imagery for use in external GEOINT tools such as Google Earth
- *JPEG* – creates a JPEG file of the image displayed in the viewport
- *Geotiff* – creates a GEOTIFF file of the image displayed in the viewport
- *Geotiff 8-bit* – creates an 8 bit GEOTIFF file of the image displayed in the viewport
- *Geo Jpeg 2000* – creates a GEO JPEG 2000 file of the image displayed in the viewport
- *Geo Jpeg 2000 8-bit* – creates an 8 bit GEO JPEG 2000 file of the image displayed in the viewport



12.6 (U) View

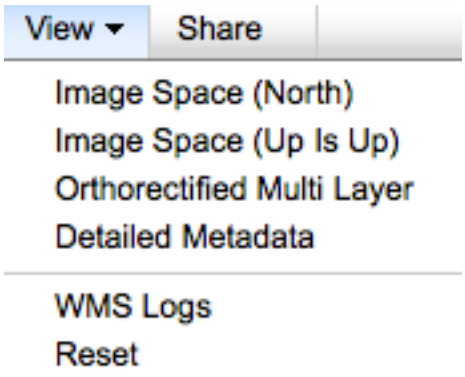


- *O*rthrectified - the image and orients it with north being up
- Image Space (North) – North up as originally acquired (no rectification)
- Image Space (North) – North up as originally acquired (no rectification),
- *Multi Layer Viewer* – Orthorectified the image and orients it with north being up with the ability to apply additional layers from NGA
- *Detailed Metadata* – A listing of the images metadata
- *WMS Logs* – Gives Start Date, Time, GSD, Width , Height, Layer, Formant and URL. Note this is the same for image space called Chip Log


Home Clear Log

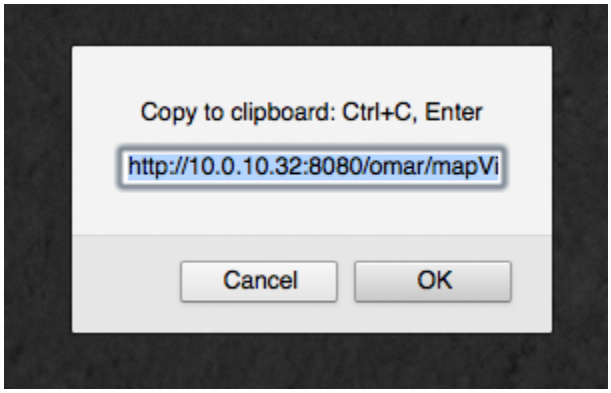
Id	user	Start Date	Internal Time (s)	Render Time (s)	Total Time (s)	Mean Gsd (m)	Width	Height	Layers	Styles	Format	Url
20,895	doconnor	2013-03-27 12:21:06.456	0.122	0.031	0.153	2.5	891	552	3077ddfe4e398e108a78118026c930637b76b94c1798a100f90e717f1b615cf3		image/jpeg	url
20,894	doconnor	2013-03-27 12:16:09.559	0.428	0.042	0.47	1.371	891	552	3077ddfe4e398e108a78118026c930637b76b94c1798a100f90e717f1b615cf3		image/jpeg	url
20,893	doconnor	2013-03-27 12:03:11.571	0.146	0.016	0.162	70.762	891	552	4f3751bfecc9ef64f6cfa66ef08135d4be195ccbc051fb95f9a00bbfe080b420		image/jpeg	url
20,892	doconnor	2013-03-27 11:46:33.565	0.083	0.08	0.163	155.227	1,091	572	4f3751bfecc9ef64f6cfa66ef08135d4be195ccbc051fb95f9a00bbfe080b420		image/gif	url
20,891	doconnor	2013-03-27 11:45:50.346	0.086	0.016	0.102	70.762	891	552	4f3751bfecc9ef64f6cfa66ef08135d4be195ccbc051fb95f9a00bbfe080b420		image/jpeg	url
20,890	doconnor	2013-03-27 11:44:38.906	0.048	0.016	0.064	155.227	1,091	572	4f3751bfecc9ef64f6cfa66ef08135d4be195ccbc051fb95f9a00bbfe080b420		image/gif	url
20,889	anonymousUser	2013-03-27 11:27:46.483	0.398	0.058	0.456	32.21	892	553	4f3751bfecc9ef64f6cfa66ef08135d4be195ccbc051fb95f9a00bbfe080b420		image/png	url
20,888	doconnor	2013-03-27 10:49:03.336	0.398	0.121	0.519	32.21	892	553	4f3751bfecc9ef64f6cfa66ef08135d4be195ccbc051fb95f9a00bbfe080b420		image/png	url
20,887	doconnor	2013-03-27 10:48:32.791	0.422	0.02	0.442	32.258	891	552	4f3751bfecc9ef64f6cfa66ef08135d4be195ccbc051fb95f9a00bbfe080b420		image/jpeg	url
20,886	rsholmes	2013-03-27 10:46:00.946	0.274	0.006	0.28	19.109	256	256	be8c3ed3588285c77f9c46a4432072df6af52f49627ff0fe1642e575a6905eb81		image/png	url

- *Reset* – resets all image viewing parameters and zooms out all the way



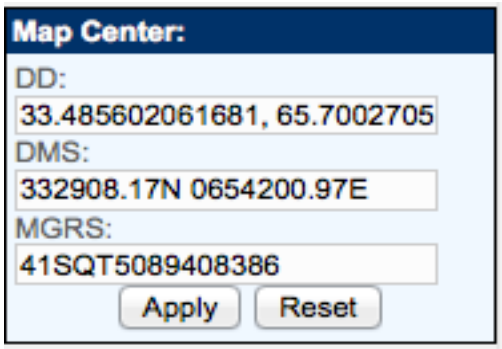
12.7 (U) Share

(U) This button provides a popup with a link to the current display, allowing easy sharing with other users. This shared link preserves all the formatting applied before selecting the **Share** button.



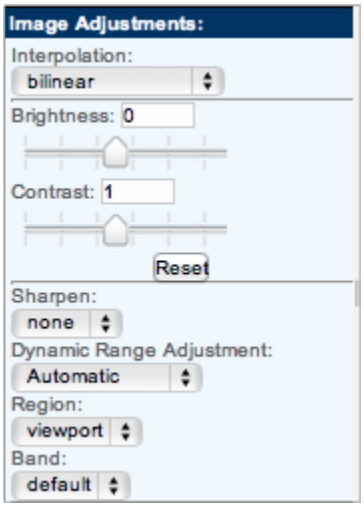
12.7.1 (U) Map Center:

(U) The Map Center displays the Lat / Long of the center of the image in the viewer.



12.8 (U) Open Source Software Image Map (OSSIM) Tools

(U) OMAR offers a host of OSSIM tools for image processing. To take advantage of these tools, simply click on an image thumbnail from the imagery search results page and adjust the controls in the *Image Adjustments* section in the left hand pane.



12.8.1 (U) Interpolation

(U) Interpolation describes the method in which unknown pixels in an image are generated from known pixel values. Each interpolation method uses a different set of neighboring known pixels to determine the unknown pixel value. There are different levels of interpolation that OMAR offers, listed here in order increasing complexity (and quality, generally speaking)

- *bilinear* (default)
- *nearest neighbor*

- *cubic*
- *sinc*

12.8.2 (U) Brightness

(U) Adjusting the brightness (values range from -1 to +1) will raise or lower the overall brightness of the image.

12.8.3 (U) Contrast

(U) Adjusting the contrast (values range from 0 to 2) will cause brighter pixels to become brighter and darker pixels to become darker.

12.8.4 (U) Reset

(U) Resets the brightness and contrast back to default setting.

12.8.5 (U) Sharpen

- *none* – no edge filtering done
- *light* – runs a light filtering algorithm to bring out edges
- *heavy* – runs a heavy filtering algorithm to bring out more edges

12.8.6 (U) Dynamic Range Adjustment

(U) The DRA feature runs a contrast enhancing algorithm that allows users to brighten up an image in areas that may appear dark under low or no stretch. To enhance contrast, the algorithm will select out different portions of the Gaussian distribution and remap the pixels (i.e. spread them out) along the axis of possible pixel brightness. For example, an 8-bit image will have brightness values from 0-255, or 256 possible brightness values from 0 (completely black) to 255 (completely white).

(U) In general, an image with very low contrast (a "flat" image) consists of a narrow grouping of pixels around a mean brightness value (a "narrow grouping") and for viewing enhancement will benefit from spreading the pixels further out along the x-axis ("brightness bins").

- *Automatic* – default; calculates pixel spread by statistical mean

- *1st Std* – pixels from +/- 1 standard deviation are remapped
- *2nd Std* – pixels from +/- 2 standard deviations are remapped
- *3rd Std* – pixels from +/- 3 standard deviations are remapped
- *No Adjustment* – no contrast stretch.

(U) See Figures 10-14 for examples of the DRA effect.

Figure 10:
DRA = No Adjustment

Figure 11:
DRA = 1st Std

Figure 12:
DRA = 2nd Std

Figure 13:
DRA = 3rd Std

Figure 14:
DRA = Automatic

12.8.7 (U) Region

(U) This selection specifies how to apply the sharpening and/or contrast filters.

- *global* – apply to the entire image
- *viewport* – apply to only the image region displayed on screen. The histogram is calculated for a 256x256 chip centered at the viewport center.

12.8.8 (U) Band

(U) A computer monitor displays colors as a combination of red, green and blue at different intensities. The band selections in OMAR allow users to change which image bands are represented by which color on the screen.

(U) For example, a multispectral image, as well as a multispectral image from GEOEYE, IKONOS and WORLDVIEW-1 commercial satellites will have the following four bands:

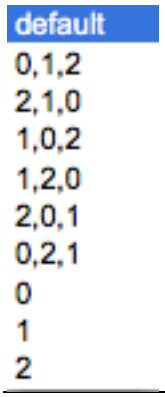
- Band 0: Blue (B)
- Band 1: Green (G)
- Band 2: Red (R)
- Band 3: Near IR (N)

(U) Note: The 8-band WORLDVIEW-2 imagery and other multi/hyper spectral imagery do not follow this pattern.

(U) The colors on the monitor cannot switch their order and will always follow a red, green and then blue pattern. Therefore, the default display in OMAR for multispectral images (0,1,2) will look strange because it displays the colors in the following manner.

- Red: 0 (Blue) All the blue in the image will appear red
- Green: 1 (Green) All the green in the image will appear green
- Blue: 2 (Red) All the red in the image will appear blue

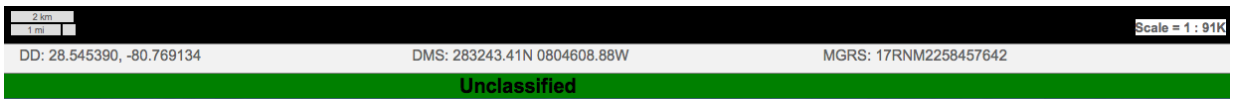
(U) In order to display the colors in the correct order, select 2,1,0. Choosing to display only one band at a time will produce a gray scale representing the color intensity within that band.



(U) Note: At present OMAR does not support band 3, near IR.

12.8.9 (U) Orthorectified View

(U) The Orthorectified viewer presents an orthorectified representation of the image. This allows continuous cursor position readout to be provided below the image. Position is provided in geographic decimal degrees (DD) and degrees-minutes-seconds (DMS), as well as in the Military Grid Reference System (MGRS). The current display scale is also provided.



Orthorectified Continuous Position Information Display

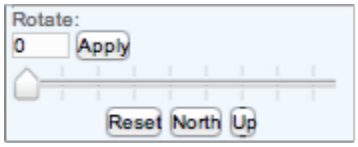
12.8.10 (U) Orthorectification

(U) The user can allow OMAR to be more (or less) rigorous in calculating the geographic locations of pixels because OMAR "paints" the image on the screen as it calculates the pixels' locations, the more rigorous the process, the slower the image will be painted on the screen.

- *Rigorous* – slower; uses the most rigorous sensor modeling available to map the pixels
- *Simple* – (bilinear) faster; only uses the four corner point of the image to map the pixels

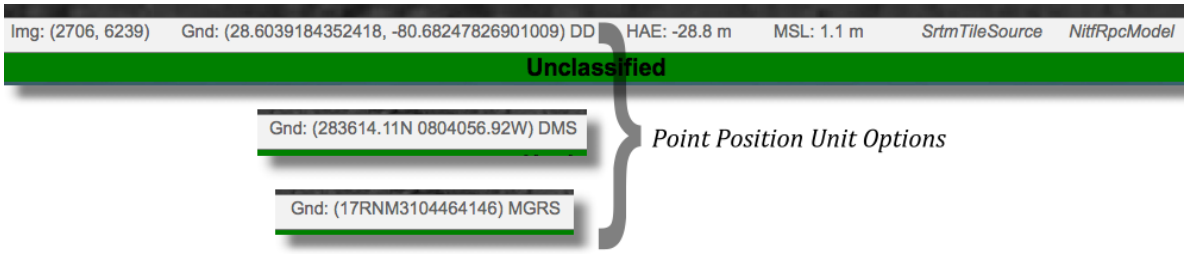
12.8.11 (U) Rotation

(U) Image rotation is accomplished by moving the slider until the image is in the desired position or by inputting the amount of rotation in degrees in the *rotate* box.



12.8.12 (U) Geopositioning

(U) In Image view, continuous readout of ground position is not available. However, discrete point geopositioning is accessible by selecting the **Point Drop** button . When this button is activated, a left mouse click causes the display.

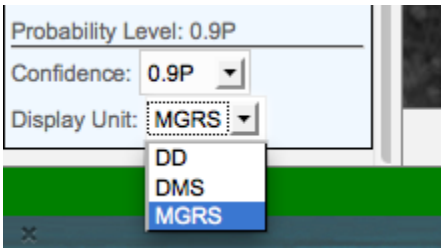


Geopositioning (Point Drop) Information Display

(U) The contents of the display, from left to right, include the following:

1 Img image coordinates (sample, line)
2 Gnd ground coordinates, in optional units:
    a latitude, longitude; decimal degrees (DD)
    b latitude, longitude; degrees, minutes, seconds (DMS)
    c Military Grid Reference System (MGRS)
3 HAE height above ellipsoid
4 MSL height above mean sea level
5 elevation surface type
6 projection type (e.g. sensor model)

(U) The units of the point position display are selectable in the left panel.



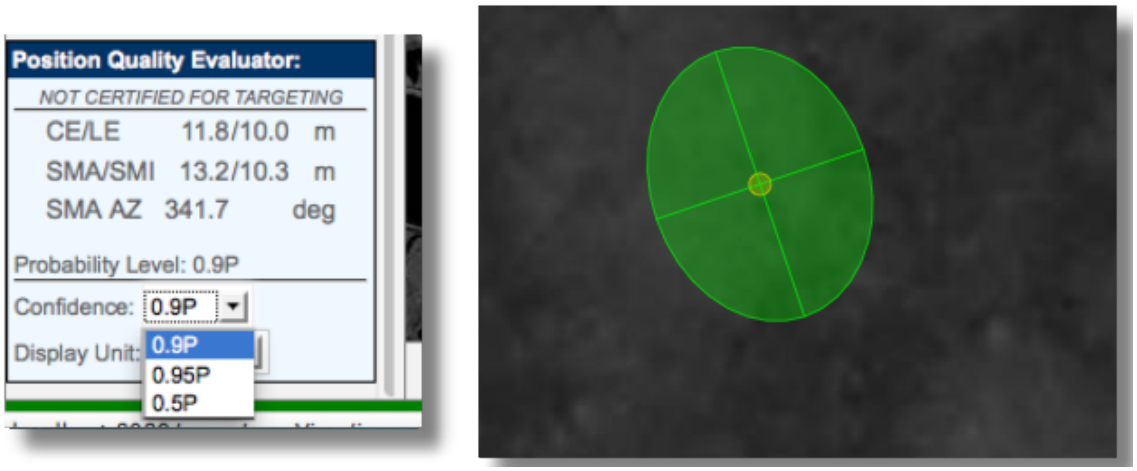
Point Position Display Unit Selection

(U) Note that the difference between HAE and MSL represents the geoid-ellipsoid separation at that point on the earth's surface.

12.8.13 (U) Position Quality Evaluator

(U) The Position Quality Evaluator (PQE) is integrated with the geopositioning capability described in the previous paragraph. It is only available for RPC images having valid bias and random error components in their metadata. This function propagates the previously mentioned line-of-sight (LOS) error components and the elevation model uncertainty through the imaging ray/surface intersection geometry to estimate geopositioning accuracy. The estimated accuracy is displayed graphically via an error ellipse and numerically through the PQE panel on the left side of the page. If the image metadata does not support PQE computations, the ellipse will not be displayed and the panel content will be absent.

(U) It is important to emphasize that this is an ESTIMATE of probable position error and NOT a guarantee of maximum position error.



Panel and Associated Error Ellipse

(U) The contents of the panel include the following:

- *CE/LE* circular/linear error (horizontal/vertical)
- *SMA/SMI* semi-major/semi-minor axes (radii)
- *SMA AZ* semi-major axis azimuth
- *Probability Level*

(U) Note that the probability level is currently selectable at the following:

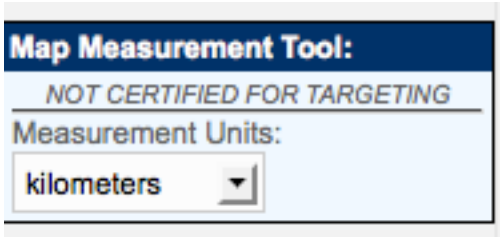
- *0.5P* 50% circular error probably (CEP)
- *0.9P* 90% map accuracy standard (MAS)
- *0.95P* 95% 2-sigma

12.9 (U) Map Measurement Tool

(U) Selection of the path measurement provides the capability to draw a line (or path) directly on the image. A double-click terminates the draw function and fills the panel. The panel contains the following information:

- *Geodetic Dist* curvilinear geodetic distance (by Vincenty's method)
- *Rect Dist* rectilinear (straight line) distance
- *Azimuth* azimuth (cw from north) from point 1 to point 2

(U) Can measure in : Kilometers, meters, feet, miles, yards and nautical miles



(U) The *Map Measurement Tool* is use in conjunction with the *path length* and *polygon area* tools on the Navigation bar to measure distance or area.

12.9.1 (U) Measuring Path Length

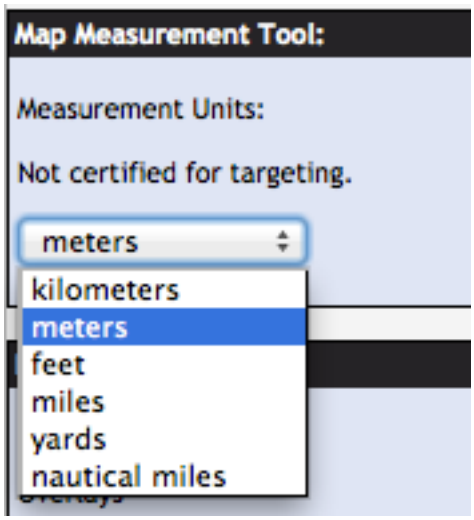
1 Select the desired unit from the *Map Measurement Tool* drop-down menu

2 Select the *path length* tool from the Navigation bar

3 Move the cursor onto the map and click a point for the path start
4 Move the cursor to the desired end point and double click to complete the path.
5 Note the distance in the area under the units drop-down menu

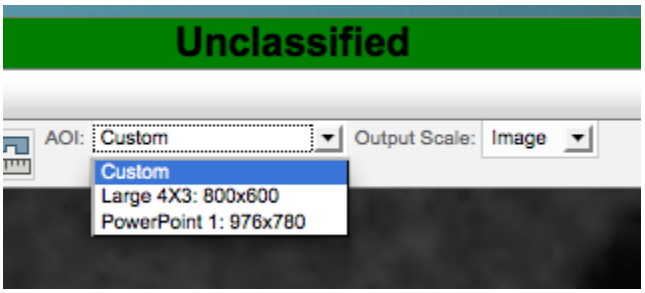
12.9.2 (U) Measuring Polygon Area

1 Select the desired unit from the *Map Measurement Tool* drop-down menu
2 Select the *polygon area* tool from the Navigation bar
3 Move the cursor onto the map and click a point to start the polygon
4 Move the cursor to the next location on the map and click to establish the next vertex of the polygon. Note: A polygon requires a minimum of 3 vertices.
5 Close the polygon by double-clicking on the start point
6 Note the area in the space under the units drop down menu



12.9.3 (U) Predefined AOI Chipping Formats

(U) This capability is only in the image space allows the use of dimension presets for quick extraction and insertion of image chips into other presentation frameworks such as PowerPoint. The user interface for this capability is shown with two examples in the drop-down menu.

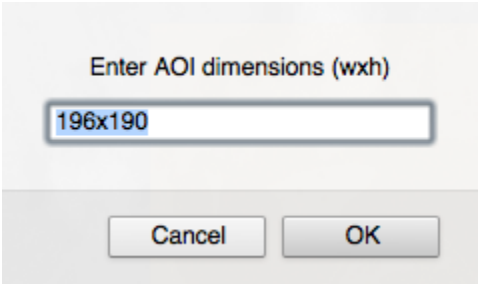


(U) If **Custom** is selected, the popup menu allows the user to enter any dimensions for immediate use. The numeric dimensions must be separated by an "x".

(U) The "Output Scale" may be specified by choosing one of the following:

- *Screen* - AOI is dimensioned in screen space
- *Image* - AOI is dimensioned in actual image space, that is, scaled to current image scale display and output at full resolution

(U) The output chip has the specified dimensions in both cases.



(U) The content of the AOI drop-down menu can be edited by an admin by selecting **ChipFormat** under the *Edit Tables* section of the *Home Page*. At that time a new format is created by clicking on **Enter New Chip Format** and entering a user defined label and the desired width/height of the AOI.

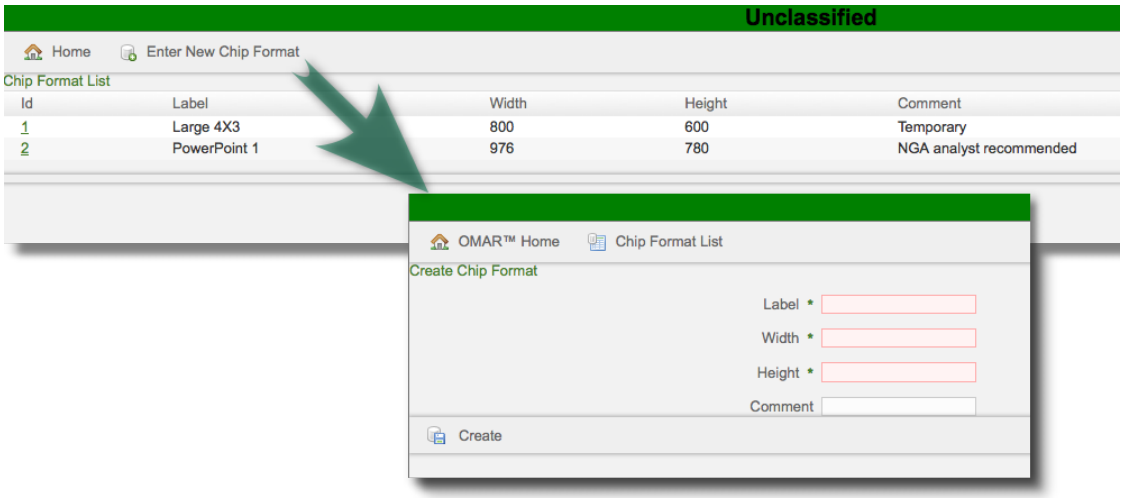
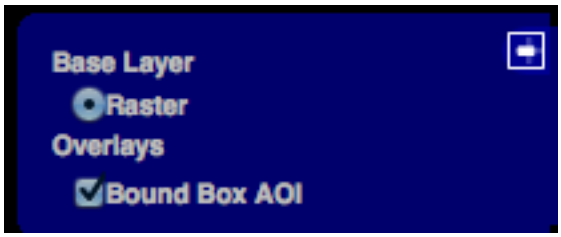


Figure 21. Chip Format Maintenance

12.10 (U) Base Layer / Overlay

(U) On the top right of the viewer that is a blue plus only on the Orthrectified selection a user will be able to deselect a federated disk or a bounding box



13.0 (U) Searching Video

13.1 (U) Federated Searching video

(U) There are different ways that a user can do a federated search using OMAR.

(U) Federated search came about to meet the need of searching multiple content sources with one query. This allows a user to search multiple databases at once in real time, arrange the results from the various databases into a useful form and then present the results to the user.

13.1.1 (U) Geographic Criteria

(U) OMAR provides four options to search geographically by specifying bounding box, point radius, date/time, query or map.

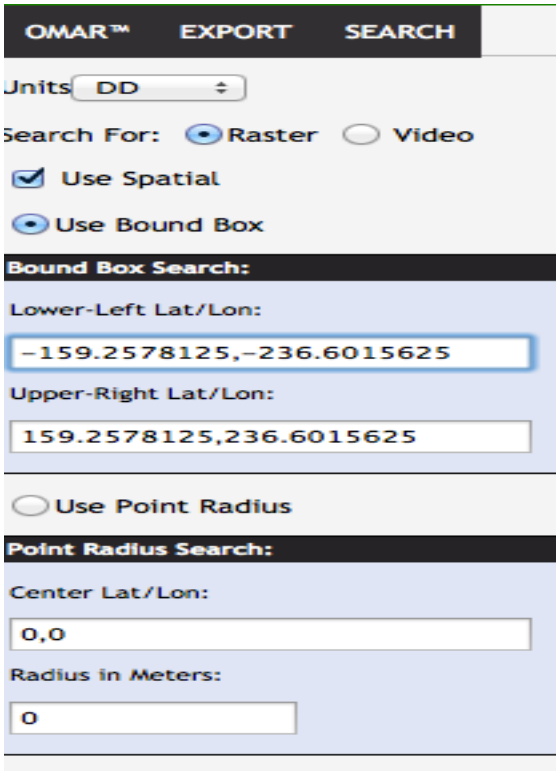
(U) Note: Input the geographical coordinates in the following formats by selecting the appropriate *Display Unit* drop-down menu at the top of the page:

- Decimal Degrees **(DD),**
- Degrees, Minutes, Seconds **(DMS),**
- Military Grid Reference System **(MGRS)**

13.1.2 (U) Bound Box

(U) This option is used to search video based on a bounding box of a specified size.

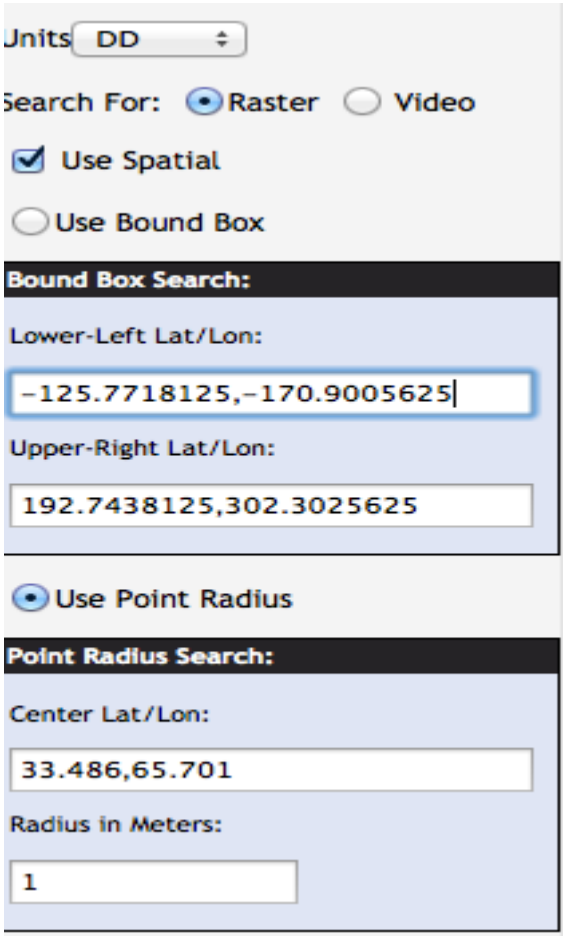
- *Lower Left* - southwestern coordinate of bounding box
- *Upper Right* - northeastern coordinate of bounding box
- *Clear Bound Box* - action button to clear the contents of the bound box



13.1.3 (U) Search for Video on Point Radius

(U) This option is used to search Video based on a circle with a specified center and radius.

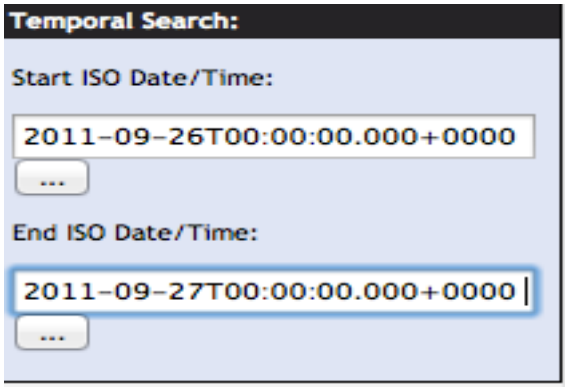
- *Map Center* – enter coordinates to specify the center of the search
- *Radius in Meters* – radius to specify the extent of the search
- *Set Map Center* - action button to center the map based on the coordinates specified



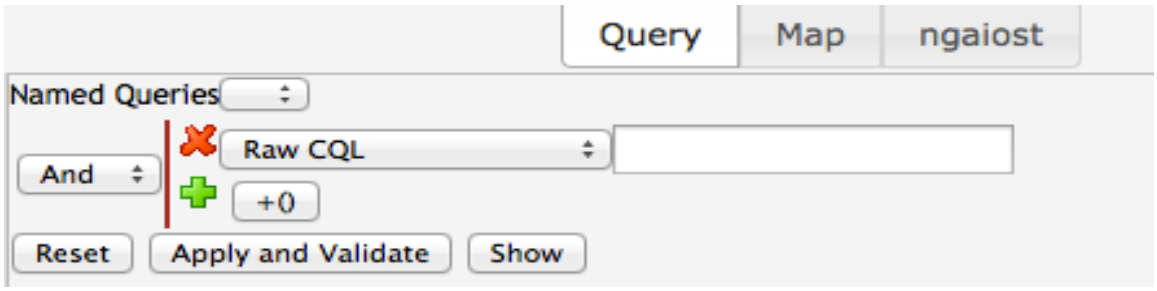
13.1.4 (U) Date/Time Criteria

(U) This option is used to search Video within a specific timeframe.

- *Start Date/Time* – oldest date/time for which OMAR will search for video
- *Stop Date/Time* – most recent date/time for which OMAR will search for video



13.2 (U) Search Using Query

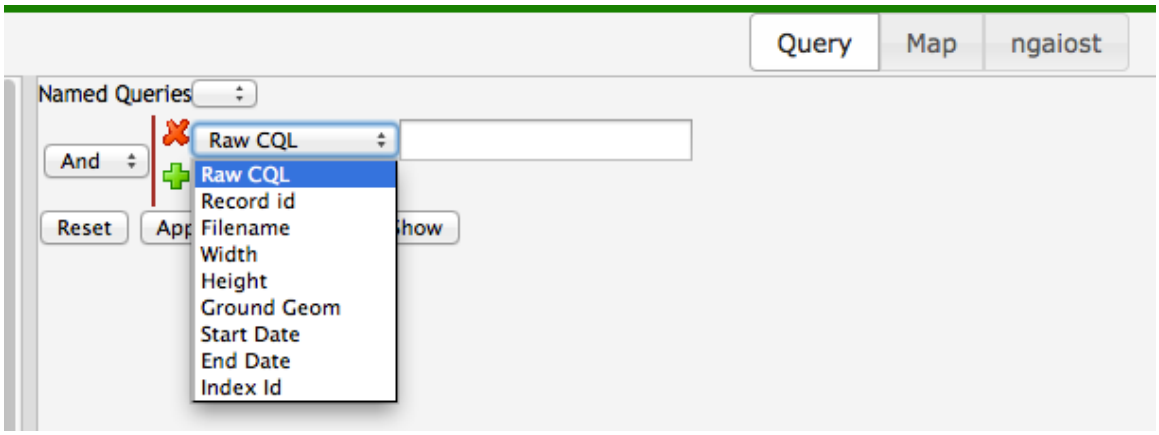


(U) Below lists all of the different Medata Records that can be query on. They can be use one at a time or stringed together for a better more accurate query.

13.2.1 (U) Metadata Criteria

Raw CQL
Record ID

Filename
Width
Height
Ground Geom
Start Date
End Date
Index Id

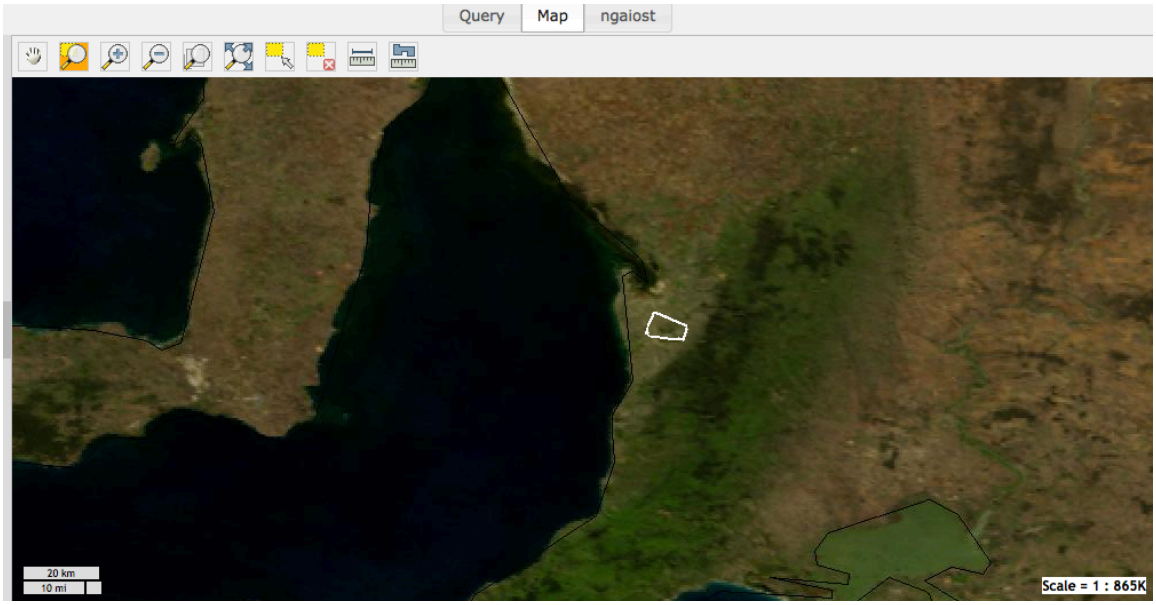


13.3 (U) Searching Using the Map

(U) Select the map button form the top of the viewer. The bright colored polygons (aka footprints) on the globe represent areas that have been videoed and are in the OMAR database. The footprint colors are keyed based on the legend in the right panel.

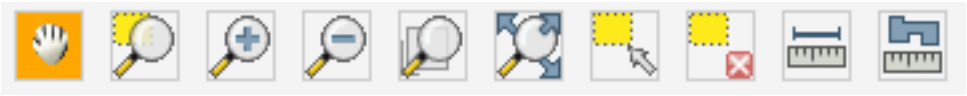
(U) When no search criterion is entered, as in this case, all OMAR imagery that is contained within the bounding box on the screen is returned in date/time order starting with the most recent image.

(U) Note: Panning around the map or zooming to a different location after setting the map center, will cause the *Map Center* input box to update with the new center.



13.4 (U) Navigation Bar

(U) The *Navigation Bar* found at the top of the *Search* page provides a variety of functions that allows the user to navigate through the world map. Hover over any of the ten buttons in the *Navigation Bar* to view their function.



 Click and drag to pan map

 Click and drag to zoom into an area

 Click to zoom in

 Click to zoom out

 Click to zoom to full resolution

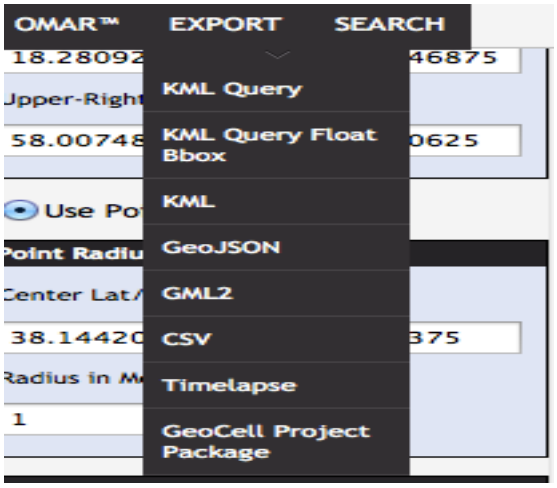
 Click to zoom to the max extent

 Click and drag to specify an area of interest

 Click to clear area of interest

Measure path length

13.5 (U) Export



13.5.1 (U) Keyhole Markup Language (KML Query)

(U) Keyhole Markup Language (**KML**) is an XML notation for expressing geographic annotation and visualization within Internet-based, two-dimensional maps and three-dimensional Earth browsers. KML was developed for use with Google Earth, which was originally named Keyhole Earth Viewer. It was created by Keyhole, Inc, which was acquired by Google in 2004. KML became an international standard of the Open Geospatial Consortium in 2008.[1][2] Google Earth was the first program able to view and graphically edit KML files. Other projects such as Marble have also started to develop KML support.[

(U) When an AOI is selected from the map that query will be open and displayed in Google Earth.

13.5.2 (U) Keyhole Markup Language (KML Query Float Bbox)

(U) Is the same KML query but has a JavaScript library for displaying windowed content over top of web pages

(U) When an AOI is selected from the map that query will be open and displayed in Google Earth

13.5.3 (U) GeoJSON

(U) GeoJSON allows geographic data to be stored in a human-readable way that is generally more compact than XML.

(U) When an AOI is selected from the map that query will be open and display XML.

13.5.4 (U) GML - Geography Markup Language

(U) The **Geography Markup Language** (**GML**) is the XML grammar defined by the Open Geospatial Consortium (OGC) to express geographical features. GML serves as a modeling language for geographic systems as well as an open interchange format for geographic transactions on the Internet. Note that the concept of feature in GML is a very general one and includes not only conventional "vector" or discrete objects, but also coverage's and sensor data. The ability to integrate all forms of geographic information is key to the utility of GML.

(U) When GML is selected it can be open in a browser like Firefox and will display an XML text.

13.5.5 (U) Comma-separated values (CSV)

(U) A **comma-separated values** (**CSV**) file stores tabular data (numbers and text) in plain-text form. Plain text means that the file is a sequence of characters, with no data that has to be interpreted instead, as binary numbers. A CSV file consists of any number of records, separated by line breaks of some kind; each record consists of fields, separated by some other character or string, most commonly a literal comma or tab.

(U) CSV can be open in a number of different applications.

13.5.6 (U) Timelapse

(U) Timelapse is not used for Video only imagery files.

13.6 (U) Map Measurement Tool

(U) The *Map Measurement Tool* is use in conjunction with the *path length*  and *polygon area*  tools on the Navigation bar to measure distance or area.

13.6.1 (U) Measuring Path Length

(U) Select the desired unit from the *Map Measurement Tool* drop-down menu.

(U) Select the *path length*  tool from the Navigation bar.

(U) Move the cursor onto the map and click a point for the path start.

(U) Move the cursor to the desired end point and double click to complete the path.

(U) Note the distance in the area under the unit's drop-down menu.

13.6.2 (U) Measuring Polygon Area

(U) Select the desired unit from the *Map Measurement Tool* drop-down menu

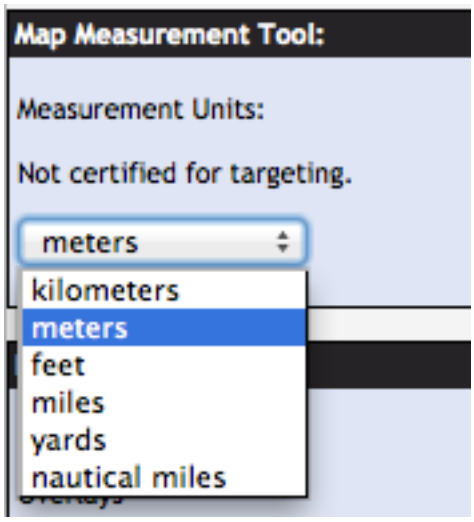
(U) Select the *polygon area*  tool from the Navigation bar

(U) Move the cursor onto the map and click a point to start the polygon

(U) Move the cursor to the next location on the map and click to establish the next vertex of the polygon. Note: A polygon requires a minimum of 3 vertices.

(U) Close the polygon by double-clicking on the start point

(U) Note the area in the space under the units drop down menu



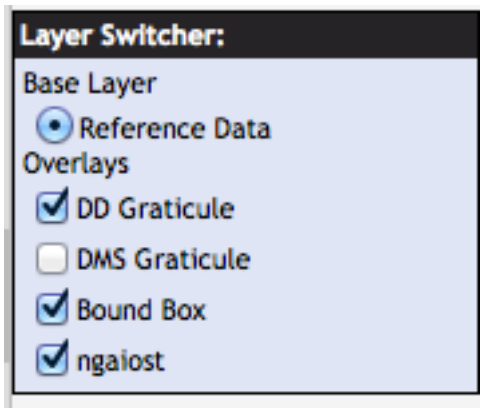
13.7 (U) Map Layers

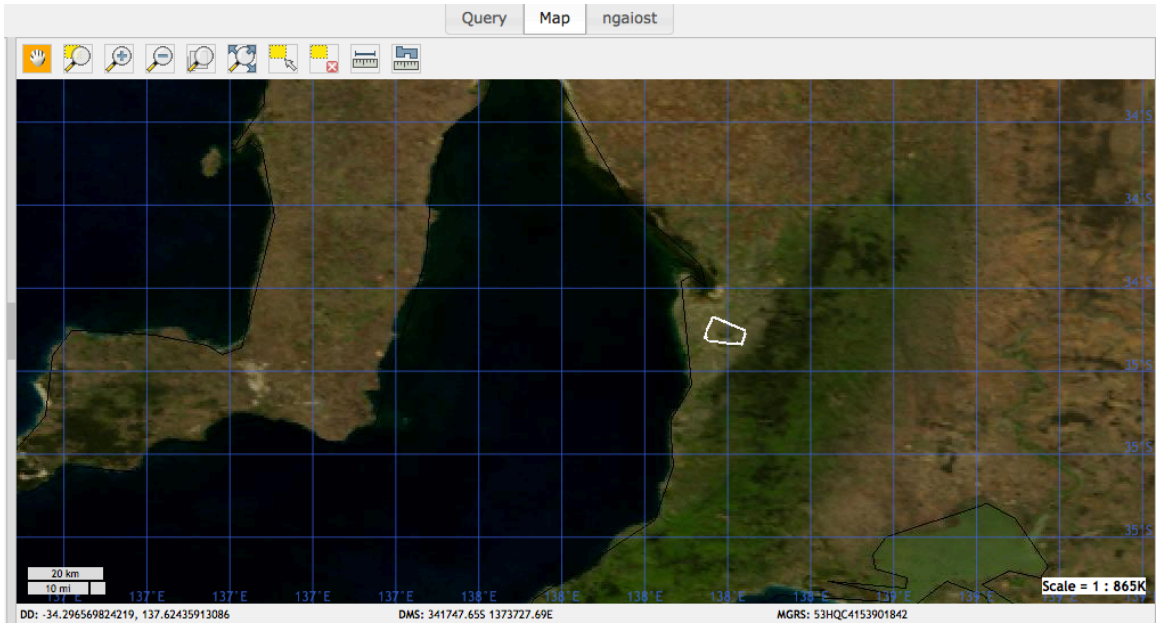
(U) OMAR offers a library of digital raster map backgrounds.

13.7.1(U) Layer Switcher

(U) The Layer Switcher provides the capability to turn on/off various map overlays and reference data

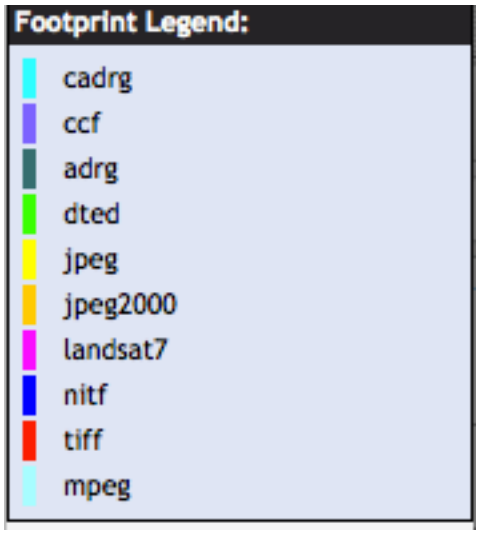
- Base Layer
  - Reference Data - OMAR defaults to the Blue Marble reference data
- Overlays - Provides the option to turn on/off the following overlays using the appropriate check box
  - OMAR video Coverage - footprints depicting video coverage
  - Bound Box - bound box designated by the user
  - DD Grid - Decimal Degree grid (scales based on zoom level)
  - DMS Grid - Degree, Minutes, Seconds Grid (scales based on zoom level)





13.8 (U) Footprint Legend

(U) Colored footprints have been added to the Map Layer where a user will be able to locate format or sensor on the map by its color. **Note mpeg is a lite blue**



13.9 (U) Imagery Search Results

(U) Once you have entered the desired search criteria, select the **Search** button to view the results of the search (Figure 6) there are two search buttons one at top left of the display and one on the bottom left of the display

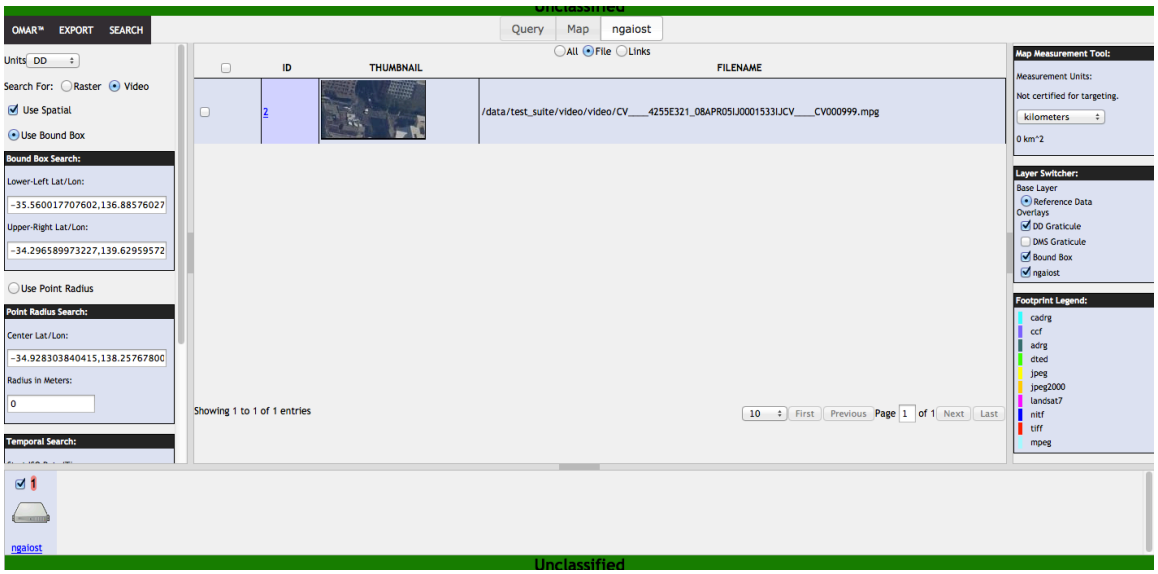


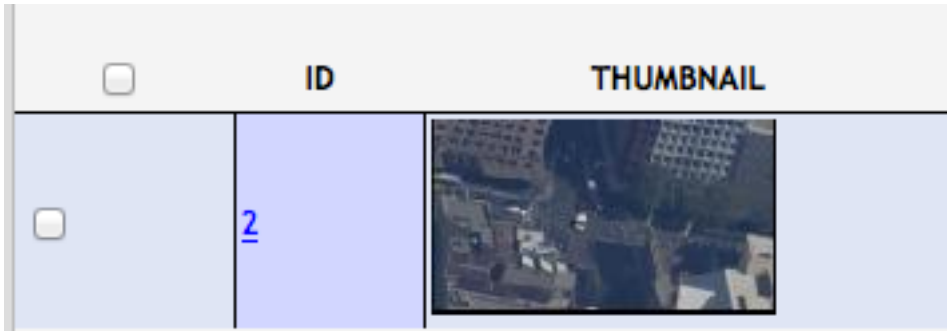
Figure 6. Imagery Search Results

13.9.1 (U) Video

(U) After a search has been completed the display will show Thumbnails and Medata. At the bottom of the display a box that looks like a disk will list the number of videos that was found on the search. For a federated search there could be more than one disk displayed. There is a check box that will select the disk to view the images. If the box is not checked then the videos cannot be viewed.

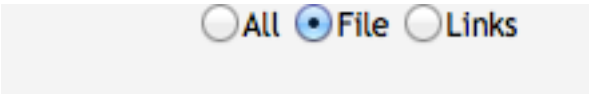
14.0 (U) Video Section

(U) For the video section of the display there will be an ID listed for the video, and a thumbnail.



14.1 (U) Metadata Buttons

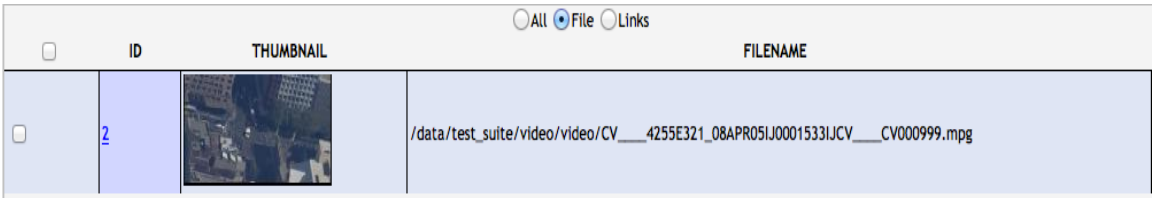
(U) There are three buttons at the top center of the display. When one is selected the user will be able to see the video information.



14.1 1 (U) File

(U) Information for the button File

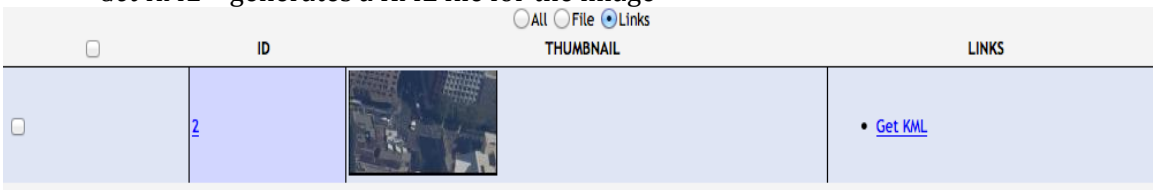
- *Id* – integer given to each image as they are ingested
- *Thumbnail* – preview of the image
- *Filename* – physical location in the OMAR file system



14.1 2 (U) Links

(U) Information for the button Links

- *Id* – integer given to each image as they are ingested
- *Thumbnail* – preview of the image
- *Get KML* – generates a KML file for the image



14.2 (U) Web Feature Service (WFS)

(U) OMAR provides the capability to create an XML document that identifies video, which matches a certain set of features within the image metadata. With each image in OMAR comes a host of features that are searchable via URL. See Appendix for more details and examples.

14.3 (U) Web Coverage Service (WCS)

(U) OMAR provides the capability to return a chip of a video that fits inside a specified BBOX. The service can be configured to return a chip of either a specific video or all videos in OMAR that exist inside a specified BBOX. See Appendix for more details and examples.

14.4 (U) Viewing Video

(U) To view a video, click on a *Thumbnail* in the *Results Window*. Note the video ID will be displayed at the top of viewer.

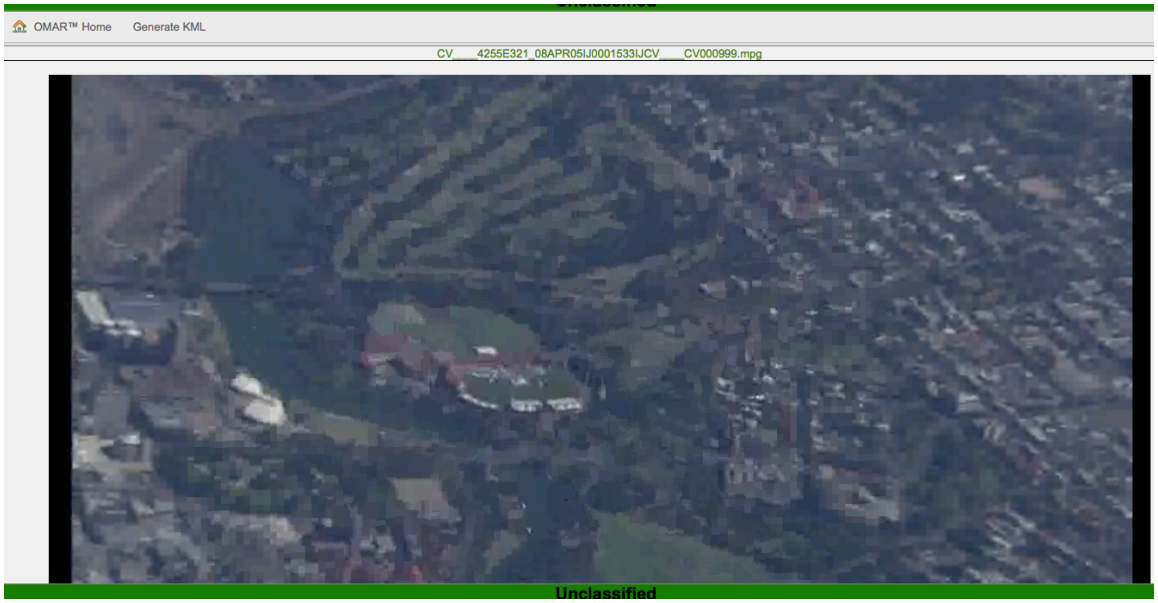
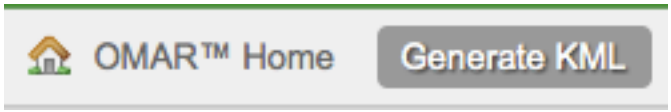


Figure 7. OMAR Video View

14.4.1 (U) Home/KML

(U) Once in OMAR Viewer, a user has the ability to execute any of the following actions:

- *OMAR Home* – Goes back to the home page
- *Generate KML* – create a KML of the clip (located at the top of screen)



Note: In order for the video to play, the flash player plug-in must be installed in the browser.

15.0 (U) OMAR Web Mapping Service (WMS) Interface

15.1 (U) Keyhole Markup Language (KML) Network Links

(U) OMAR provides incredibly rapid and agile access to the repository from external GEOINT tools via KML network links. The tools that are currently available include the following pre-built network links, available for download from the OMAR Welcome page under **KML Network Links**:

(U) Most Recent Images for View
This KML provides the most recent <user specified number> images available in OMAR, given certain geographic criteria (i.e. bounding box). This helps determine what OMAR data is available in the user's area of interest.

(U) Most Recent Videos for View
This KML provides the most recent <user specified number> of 1-minute video clips available in OMAR, given certain geographic criteria (i.e. bounding box). This helps determine what OMAR data available in the user's area of interest.

(U) Most Recent Days Images for View
This KML places green wire frames on the globe, representing imagery that OMAR has ingested within the last <user specified number> days. This helps determine whether OMAR has recent imagery available in the user's area of interest.

(U) Most Recent Videos for View
This KML places a red wire frames on the globe for every 1-minute video clip that OMAR has ingested within the last <user specified number> number of days. This helps determine whether OMAR has recent video available in the user's area of interest.

15.2 (U) Viewing OMAR Imagery in Google Earth

(U) To view video stored in OMAR for the area in your view port:

1. Login to OMAR
2. Under **KML Network Links**, next to **Most Recent Images for View** enter the number of videos for which you want to query OMAR
3. Click **Most Recent videos for View** and download the KML file
4. Open the KML file in Google Earth
5. Navigate and zoom to an area of interest in Google Earth

6 In the temporary places folder, right-click on the **OMAR Last <#> videos For View** KML file and click **Refresh**.
7 Click the **+** sign in the left-hand column to expand the **OMAR Last <#> Days videos** folder. Up to ten images in that area are displayed.

(U) Note: videos are date stamped. Ensure that the date/time slide ruler is expanded so that the appropriate date range is displayed.

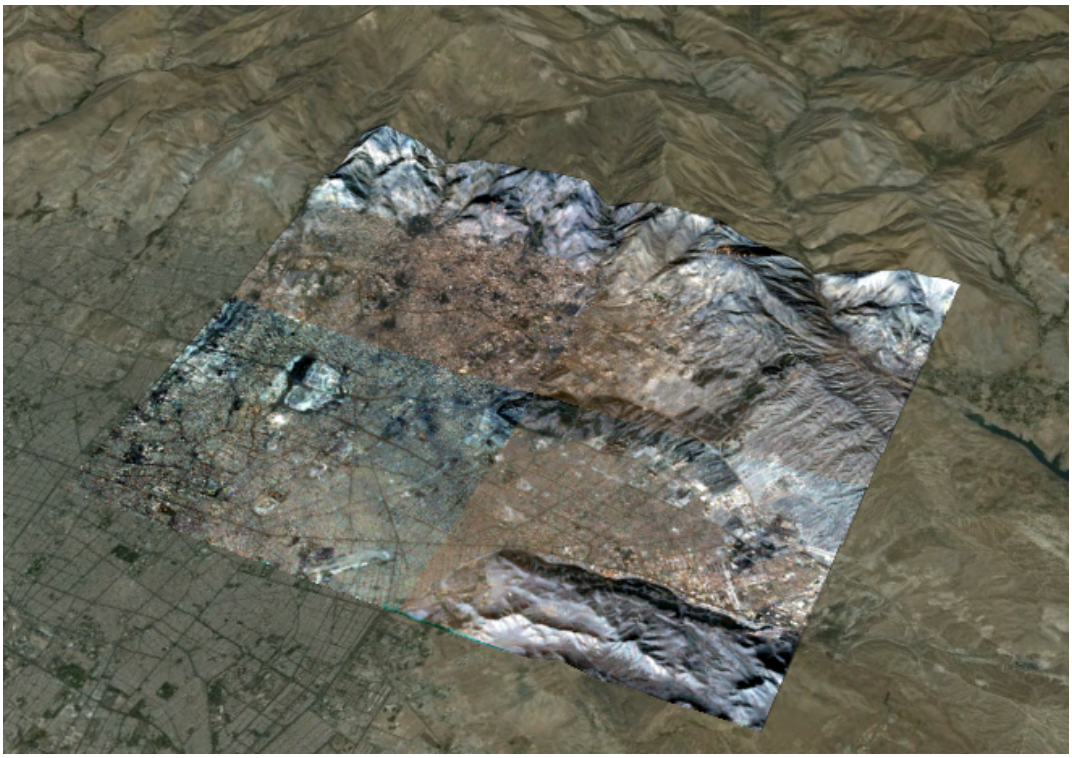


Figure 25: Image Overlay in Google Earth

15.3 (U) Video Playback from OMAR in Google Earth

(U) The video network link will fetch the last 10 Videos (or however many days you selected) available for the current AOI in Google Earth. Select the appropriate thumbtacks to view the 1-minute playback.

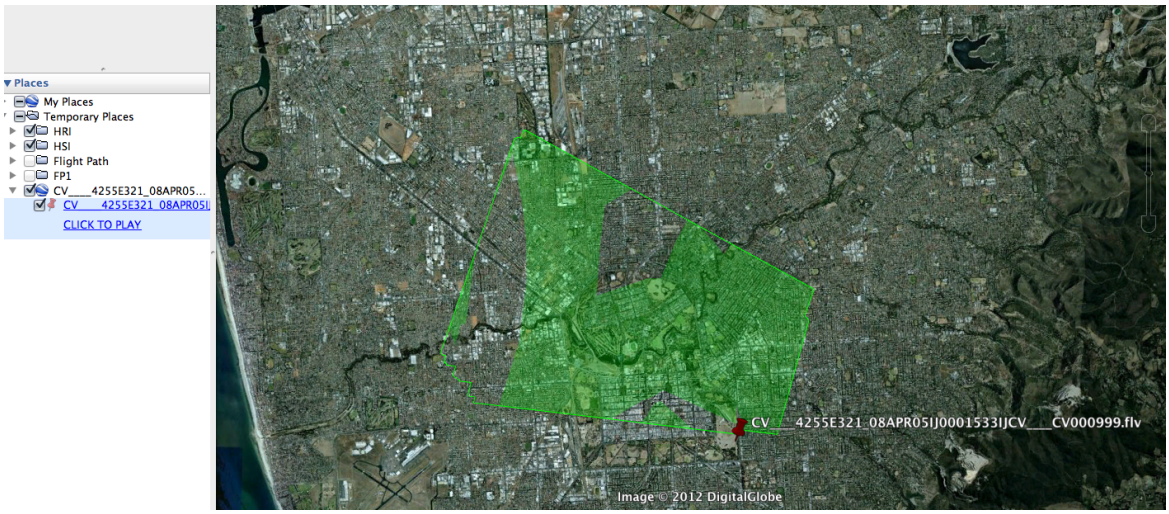
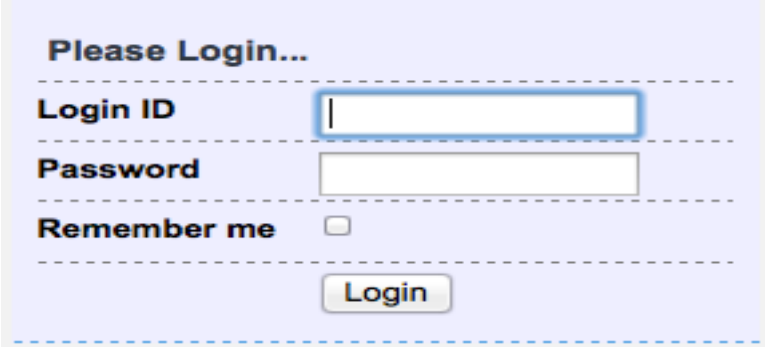


Figure 26: Video Footage Coverage in Google Earth

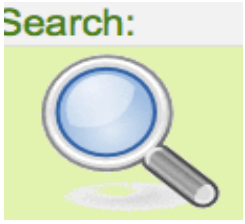
16.0 (U) Quick Start Query Flat Frame Imagery and Video

16.1 (U) Query Flat Frame Imagery

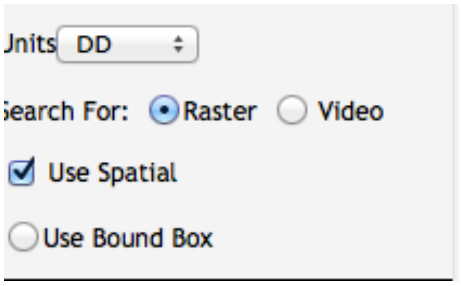
16.1.1 (U) Login to OMAR



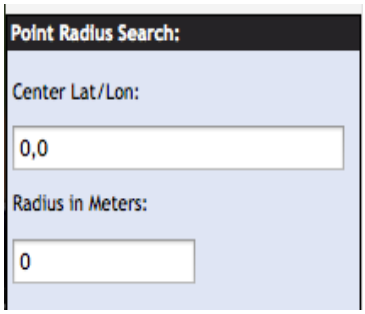
16.1.2 (U) Select Search to go to the query page



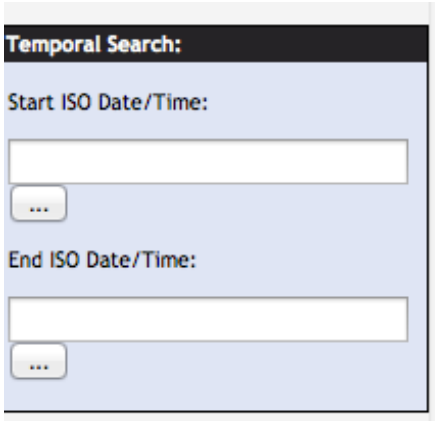
16.1.3 (U) Select Raster for imagery



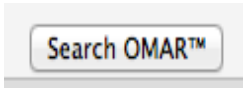
16.1.4 (U) Enter your Lat/Long into the point Radius



16.1.5 (U) Enter the Date/Time for your query.



16.1.6 (U) Click on Search button

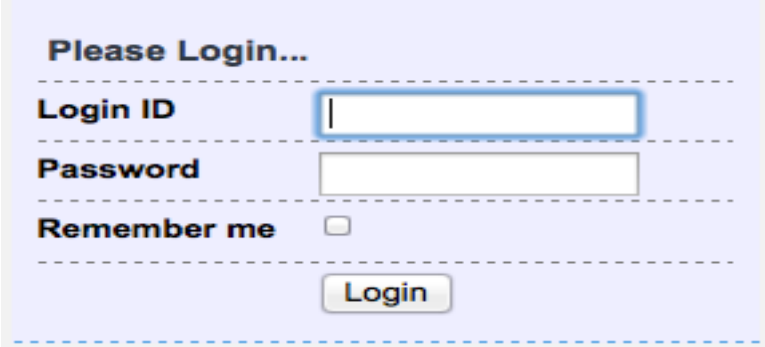


16.1.7 (U) View queried images from the Federated disks.

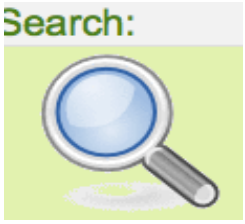
(U) If you have a number of federated users then there can be a number of disks displayed at the bottom of the display. If all disks are selected then all returned images would be displayed. If not then each will need to be viewed.

16.2 (U) Query Video

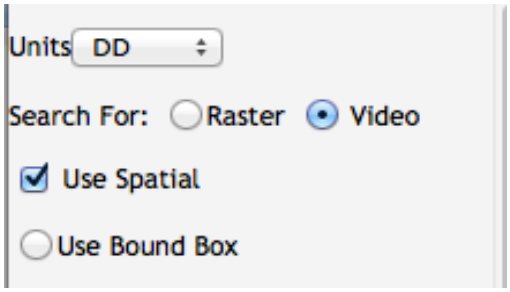
16.2.1 (U) Login to OMAR



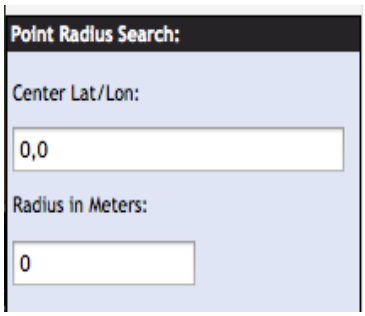
16.2.2 (U) Select Search to go to the query page



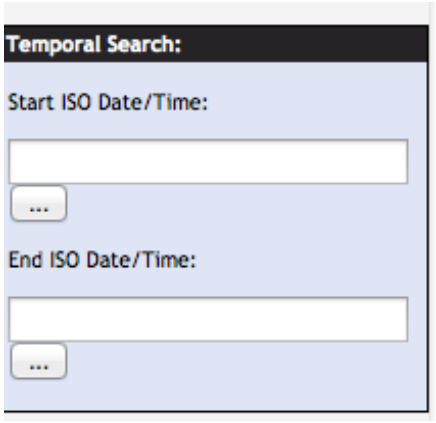
16.2.3 (U) Select Video for video



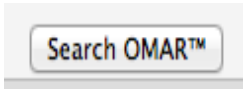
16.2.4 (U) Enter your Lat/Long into the point Radius



16.2.5 (U) Enter the Date/Time for your query.



16.2.6 (U) Click on Search button



16.2.7 (U) View queried video from the Federated disks.

(U) If you have a number of federated users then there can be a number of disks displayed at the bottom of the display. If all disks are selected then all returned video would be displayed. If not then each will need to be viewed.

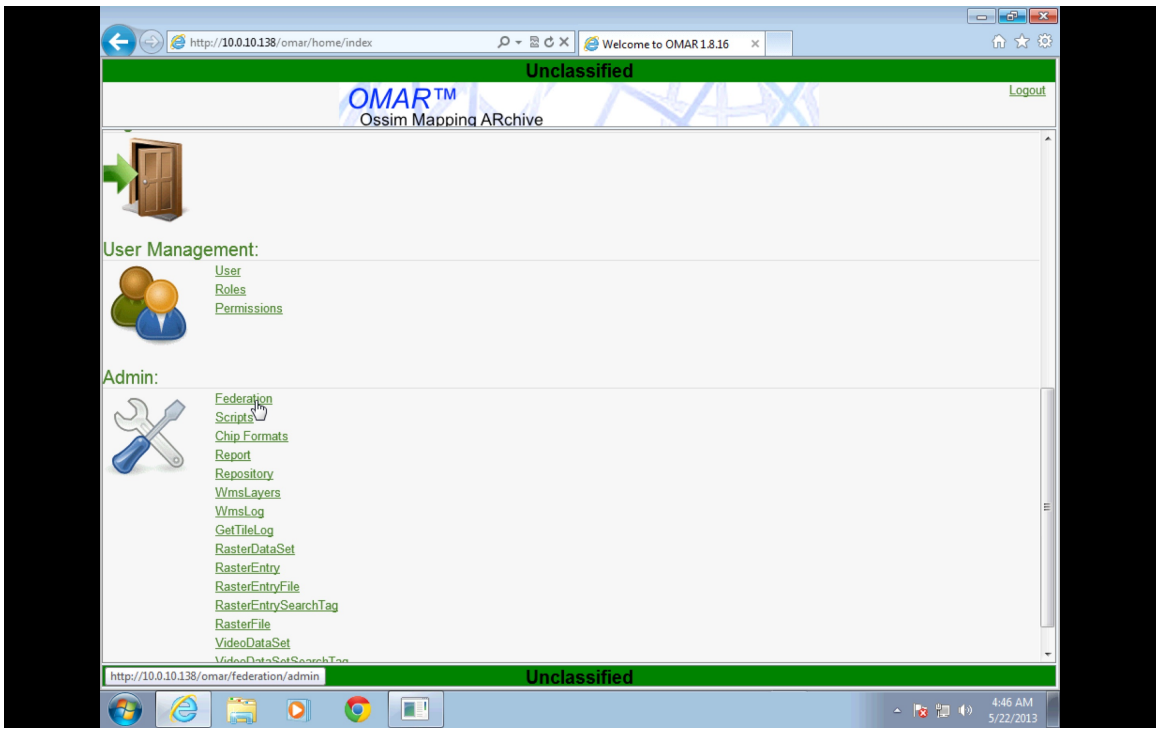
17.0 (U) Appendix

17.1 (U) Setup a Federated User

17.1.1 (U) Federation from the OMAR home page

(U) To setup a Federated User it is an Admin function so only an Administrator can perform this function.

(U) Go to the bottom of the home page and move down to the Admin section.



17.1.2 (U) Select Federation Page

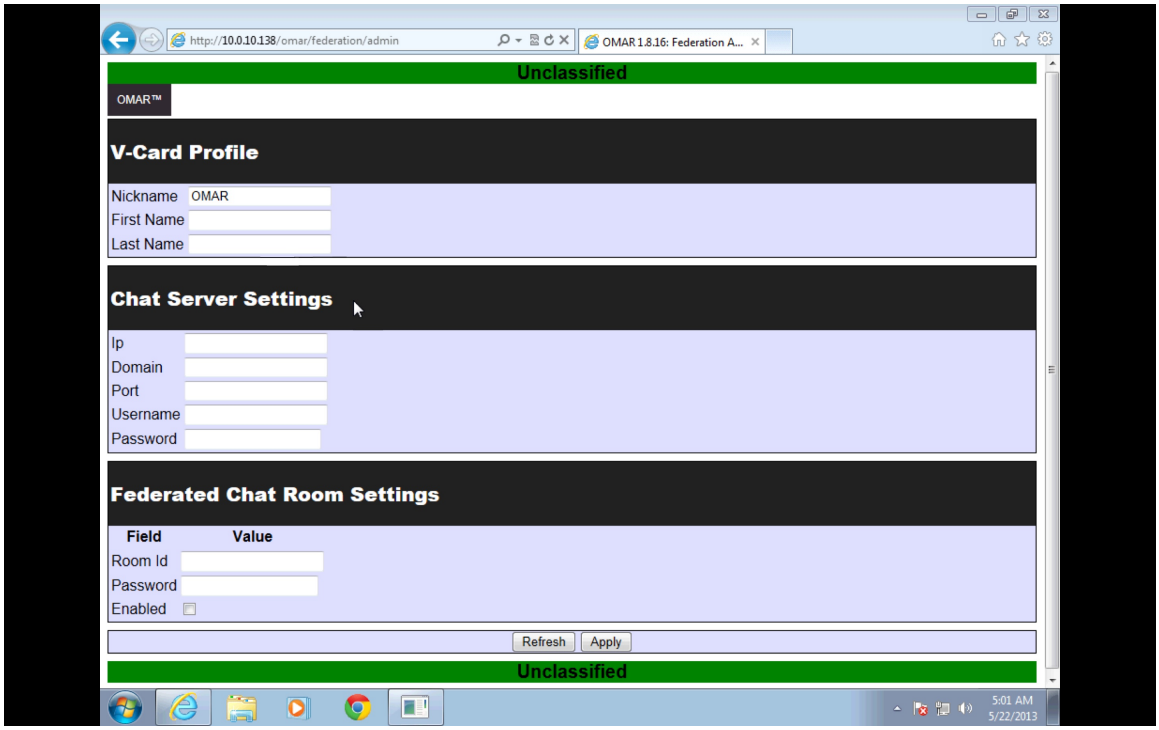
(U) Select the first field Federation from the Admin section on the OMAR™ home page

(U) This will display the federation page so you can federate with another server.

(U) V-Card - Is the identifying information of your OMAR™ server. The nickname of the V-Card is the most important to add and is used as the main display name by all other servers this OMAR™ is federated to.

(U) Chat Server – IP, Domain, Port, Username and Password of the jabber server used as the federation server.

(U) Federated Chat Room –The Administrator that is setting up the federation will enter this information. The jabber server will have a room created that your OMAR™ server can log into and will be used to pass the V-Card information to all connected OMAR™ servers.



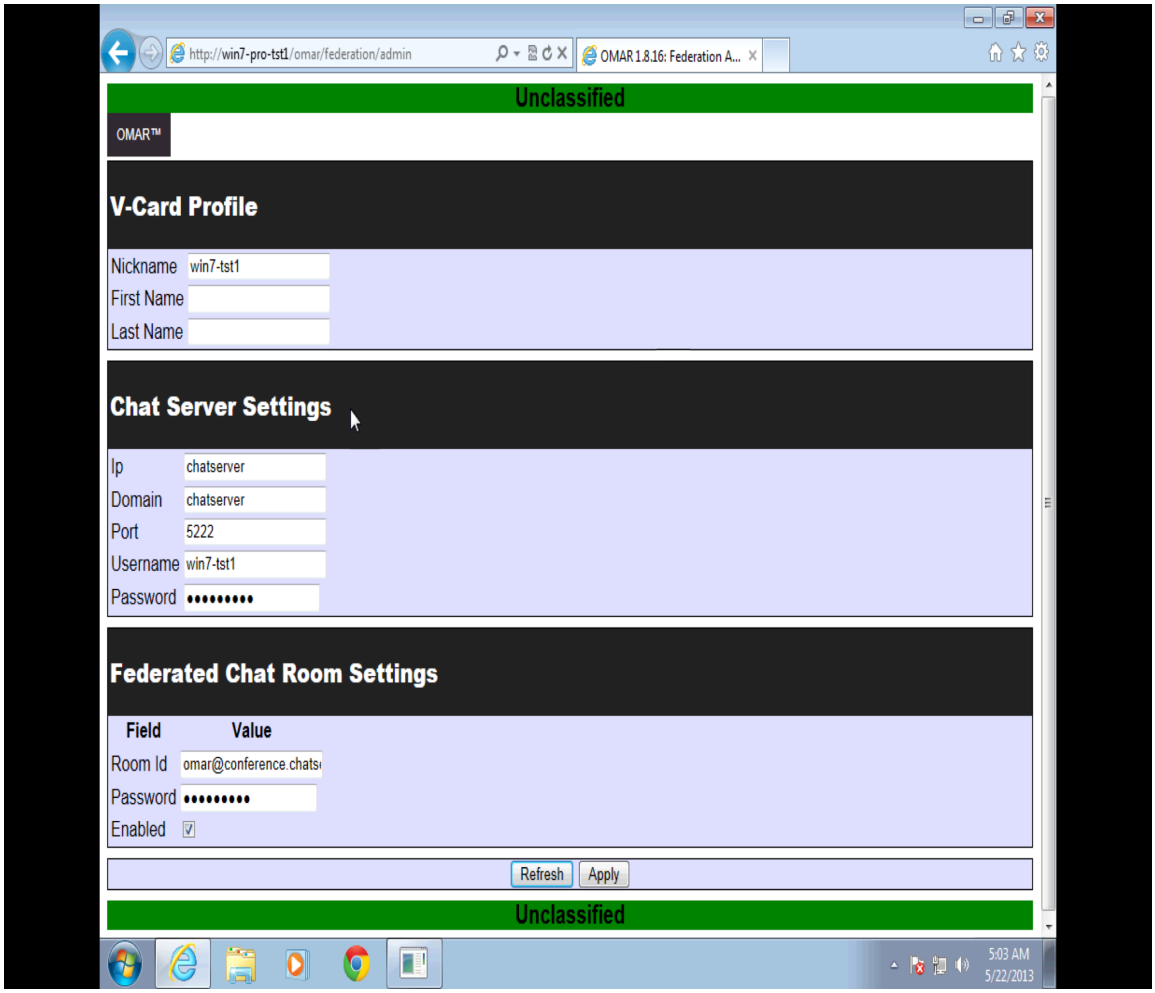
17.1.3 (U) Example of a Federated Page

(U) Here is an example of what a federated page will look like.

(U) Note that only the nickname was entered for the V-Card Profile.

(U) All of the fields were filled for the Chat Server Settings

(U) Federated Chat Room Setting was given a room ID, Password and was enabled so the server could be federated. If you want to remove your server from the chat room then deselect the enable button and hit the apply button.



17.2 (U) Common Query Language (CQL)

17.2.1 (U) Imagery Examples

(U) Search for all image footprints that have width less than 10,000 pixels and have height less than 10,000 pixels.

```
CQL Statement: width < 10000 and height < 1000
```

Figure 27: CQL Example 1

(U) Search for all imagery that intersects the polygon with lon/lat values -180, -90; -180, 90; 180, 90; 180, -90; -180, -90 and have a width greater than 1,000 pixels and a height less than 100,000 pixels and an acquisition date after 5/10/11 @ 15:08:18Z.

```
CQL Statement: INTERSECTS(ground_geom, POLYGON((-180 -
90, -180 90, 180 90, 180 -90, -180 -90))) and width >
1000 and height < 100000  and acquisition_date >
'2011-05-10T15:08:18.000Z'
```

Figure 28: CQL Example 2

17.2.2 (U) Video Example

(U) Search for all video files that have “mpg” in the title.

```
CQL Statement: filename like '%.mpg'
```

Figure 29: CQL Example 3

17.2.3 (U) Supported Search Parameters for Imagery

Column Name	Column Type	Supported Operators
width	long	=, <>, <, >, <=, >=
height	long	=, <>, <, >, <=, >=
number_of_bands	integer	=, <>, <, >, <=, >=
number_of_res_levels	integer	=, <>, <, >, <=, >=
gsd_unit	string	=, <>, like
gsd_x	double	=, <>, <, >, <=, >=
gsd_y	double	=, <>, <, >, <=, >=
bit_depth	integer	=, <>, <, >, <=, >=
data_type	string	=, <>, like
index_id	string	=, <>, like
filename	string	=, <>, like
image_id	string	=, <>, like
target_id	string	=, <>, like
product_id	string	=, <>, like
sensor_id	string	=, <>, like
mission_id	string	=, <>, like
image_category	string	=, <>, like
image_representation	string	=, <>, like
azimuth_angle	double	=, <>, <, >, <=, >=
grazing_angle	double	=, <>, <, >, <=, >=
security_classification	string	=, <>, like
security_code	string	=, <>, like
title	string	=, <>, like
isorce	string	=, <>, like
organization	string	=, <>, like

description	string	=, <>, like
country_code	string	=, <>, like
niirs	double	=, <>, <, >, <=, >=
wac_code	string	=, <>, like
sun_elevation	double	=, <>, <, >, <=, >=
sun_azimuth	double	=, <>, <, >, <=, >=
cloud_cover	double	=, <>, <, >, <=, >=
ground_geom	polygon	See Example
access_date	date time	=, <>, <, >, <=, >=
ingest_date	date time	=, <>, <, >, <=, >=
receive_date	date time	=, <>, <, >, <=, >=
file_type	string	=, <>, like
class_name	string	=, <>, like

17.2.4 (U) Supported Search Parameters for Video

Column Name	**Column Type**	**Supported Operators**
filename	string	=, <>, like
width	long	=, <>, <, >, <=, >=
height	long	=, <>, <, >, <=, >=
ground_geom	polygon	See Example 3
start_date	date	=, <>, <, >, <=, >=
end_date	date	=, <>, <, >, <=, >=
index_id	string	=, <>, like

17.2.5 (U) Supported Search Clauses

and	or	not

17.3 (U) Web Feature Service (WFS)

17.3 1 (U) Imagery Example

(U) Search for images that are of the file type NITF and have a NIIRS value of greater than.5. The URL would be constructed to look like:

http://omar. /omar/ogc/wfs?request=getFeature&typename=raster_entry&filter=file_type='nitf' and niirs >.5

Figure 30: WFS Example 1

17.3.2 (U) Video Example

(U) Search for video started before 4/20/11 @ 10:00:22z and has a height more than 400 pixels. The URL would be constructed to look like:

http://omar. /omar/ogc/wfs?request=getFeature&typename=video_data_set&filter=start_date < '2011-04-20 10:00:22' and height > 400

Figure 31: WFS Example 2

17.3.3 (U) Supported Feature List for Imagery

Feature	Type	Feature	Example
access_date	dateTime	keep_forever	boolean
acquisition_date	dateTime	mission_id	string
azimuth_angle	double	niirs	double
be_number	string	number_of_bands	integer
bit_depth	integer	number_of_res_levels	integer
class_name	string	organization	string
cloud_cover	double	other_tags_xml	string
country_code	string	product_id	string
data_type	string	raster_data_set_id	long
description	string	receive_date	dateTime

entry_id	string	release_id	decimal
exclude_policy	string	security_classification	string
file_type	string	security_code	string
filename	string	sensor_id	string
grazing_angle	double	style_id	decimal
ground_geom	class com.vividsolutions.jts.geom.Geometry		
gsd_unit	string	sun_azimuth	double
gsdx	double	sun_elevation	double
gsdy	double	target_id	string
height	long	tie_point_set	string
image_category	string	title	string
image_id	string	valid_model	integer
image_representation	string	version	long
index_id	string	wac_code	string
ingest_date	dateTime	width	long
isorce	string		

17.3.4(U) Supported Feature List for Video

Feature	**Type**
end_date	dateTime
filename	string
ground_geom	class com.vividsolutions.jts.geom.Geometry
height	long
index_id	string
other_tags_xml	string
repository_id	long

start_date	dateTime
style_id	decimal
version	long
width	long