

McIDAS-V Tutorial

Using the McIDAS-X Bridge

updated August 2009 (software version 1.0beta4)

McIDAS-V is a free, open source, visualization and data analysis software package that is the next generation in SSEC's 35-year history of sophisticated McIDAS software packages. McIDAS-V displays weather satellite (including hyperspectral) and other geophysical data in 2- and 3-dimensions. McIDAS-V can also analyze and manipulate the data with its powerful mathematical functions. McIDAS-V is built on SSEC's VisAD and Unidata's IDV libraries, and contains "Bridge" software that enables McIDAS-X users to run their commands and tasks in the McIDAS-V environment. The functionality of SSEC's HYDRA software package is also being integrated into McIDAS-V for viewing and analyzing hyperspectral satellite data.

McIDAS-V is currently a beta version of the software, which means that the software may contain bugs and not always work as expected. If you encounter any errors, please send them to the McIDAS Help Desk at mug@ssec.wisc.edu. You will be notified at the startup of McIDAS-V when new versions are available on the McIDAS-V webpage - <http://www.ssec.wisc.edu/mcidas/software/v/>. More training materials are available on the McIDAS-V webpage and in the Getting Started chapter of the McIDAS-V User's Guide, which is available from the Help menu within McIDAS-V.

This tutorial assumes that you have McIDAS-X and McIDAS-V installed on your machine, and that you know how to start McIDAS-V. If you cannot start McIDAS-V on your machine, you should follow the instructions in the document entitled *McIDAS-V Tutorial – Installation and Introduction*.


The McIDAS-X Bridge

The bridge to McIDAS-X is useful for visualizing things in McIDAS-V that can currently only be done in McIDAS-X, either because the functionality has not yet been developed in McIDAS-V or because the user code has not yet been ported from McIDAS-X to McIDAS-V. In this tutorial, you will use:

- the WWDISP command from McIDAS-X. There is no functionality currently in McIDAS-V for displaying watches and warnings from the NOAAPort data stream, so you still need to rely on WWDISP to access this data.
- an example of user code that has not yet been ported by the user to McIDAS-V. You will run the MCV-TDIFF.MCB McBASI script and then visualize the data in McIDAS-V using the local AREA servers.

Loading data using the McIDAS-X Bridge: Displaying non-navigated data

1. Start a McIDAS-X session with 10 frames and start the listener by entering in the command: **MCLISTEN START**. Minimize the McIDAS-X windows, but do not exit the session.
2. Return to McIDAS-V.
3. In the *Data Explorer*, select the *McIDAS-X Bridge* chooser and connect to *localhost* on port *8080*.

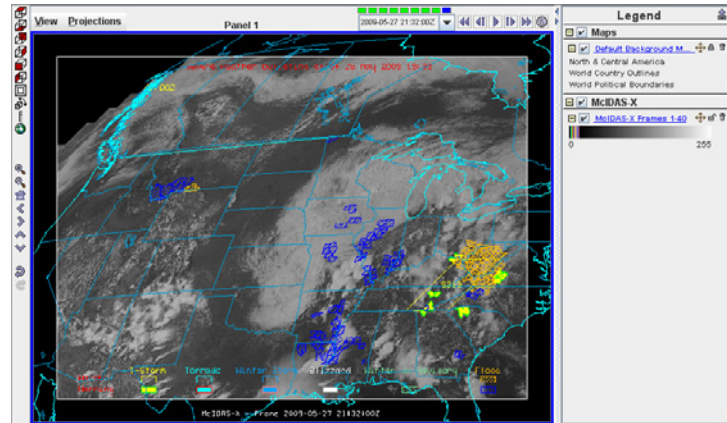
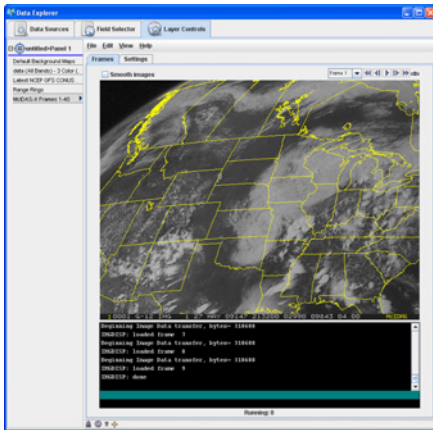
4. In the **Fields** panel of the *Field Selector*, you have the options to select all available McIDAS-X frames, or one single frame.
 - a. Select the *Frame Sequence*, and select the *McIDAS-X Image Display* display type.
 - b. Click **Create Display**. This will create a new display in the *Layer Controls* tab mirroring the McIDAS-X frame(s) selected.
 - c. To see the McIDAS-X image and text windows, you may need to undock the control window by clicking the undocking icon () in the bottom-left corner of the *Layer Controls* tab.
 - d. You can enter McIDAS-X commands in the "Command Line" text entry box at the bottom of the *Layer Controls*. This will run McIDAS-X commands, and the McIDAS-V display in the *Layer Controls* will update to reflect the results.
5. Run the following two commands to set up local data to be displayed with the bridge (the data can be located anywhere on your machine, but the directory name cannot contain any special characters or spaces):


```
DSSERVE ADD A/A AREA DIR=/home/aos/Desktop/Data/AREAfiles/*
DSSERVE ADD M/M MD DIR=/home/aos/Desktop/Data/MD*
```
6. Run the command **SFCMG EGLL DAY=15/OCT/07 TIME=23 DAT=M/M.1** to plot a 24-hour surface meteorogram for London/Heathrow, ending at 23 UTC, 15 Oct 2007 with data from position 1 of M/M.

Loading data using the McIDAS-X Bridge: Satellite Images and Weather Warnings

1. Display a loop of GOES-East satellite images: **IMGDISP A/A.1 2 REP=9**
 - a. Use the **Time Animation Controls** to loop through the 10 McIDAS-X frames in the *Layer Controls*.
 - b. By default, McIDAS-V does not automatically import McIDAS-X frames into the McIDAS-V 3D panel because non-navigated frames can not be displayed. To import these McIDAS-X frames into the current McIDAS-V 3D panel, select the *Settings* tab and check the **Display data in main 3D panel** option. This will import all of the navigated McIDAS-X frames into the McIDAS-V main window.
2. If at any time you receive an error message: **Selected image(s) not available**, it is because McIDAS-V will only import navigated frames. Frame 1, consisting of a surface meteorogram, is a non-navigated display.
3. View the McIDAS-V main window to see the McIDAS-X images in the 3D display. It is recommended that you do not use the maps from McIDAS-X, as their quality diminishes as you zoom in with the 3D display.
4. To turn the option off to import graphics, uncheck the **Graphics** box under the **Data** section of the *Settings* tab in McIDAS-X layer controls.
5. Use the zooming and panning controls, and time animation controls to loop the images from McIDAS-X.
6. Add the following data source to McIDAS-X: **DATALOC ADD RTWXTEXT ADDE.UCAR.EDU**
7. Display the current weather watches and warnings over the satellite image: **WWDISP**

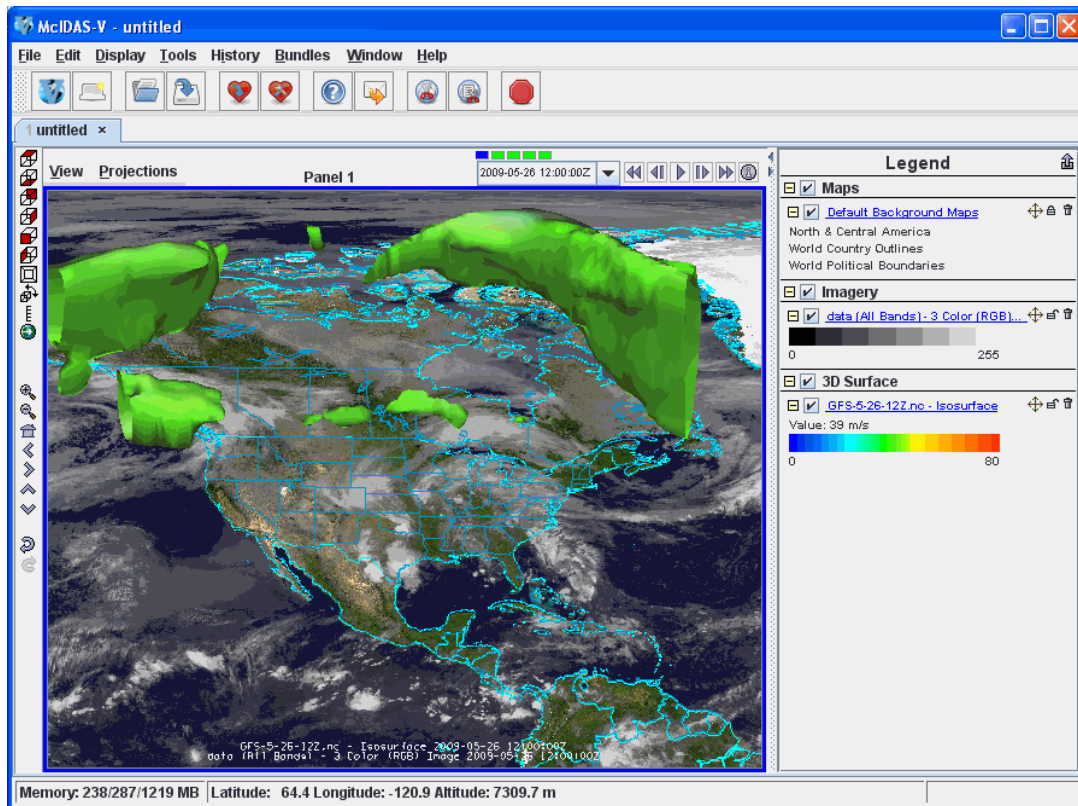
8. View the watches and warning in the main window of McIDAS-V. You may need to turn the graphics back on and/or loop through the images to see the image with the watches and warnings.



Loading data using the McIDAS-X Bridge: Running a McBASI Job

1. In the **Settings** tab of the McIDAS-X Bridge layer controls, uncheck “Display data in main 3D panel”.
2. Erase all frames: **ERASE F 1 10**
3. Move the MCV-TDIFF.MCB file that you downloaded for this tutorial and place it into your mcidas/data directory. Then, run the McBASI job: **MCV-TDIFF**
4. The MCV-TDIFF.MCB script created an AREA file with three bands that correspond to the Red, Green, and Blue channels of an RGB image. To view this RGB image, you will need to create the local ADDE dataset to access the AREA file, load the AREA file into the *Field Selector*, and then define the Red, Green, and Blue channels of the RGB image for your image display.
 - a. To create the local ADDE dataset, begin by selecting *Tools -> Local ADDE Data* from the menu in the main display window.
 - i. Select *File -> Add New Dataset* from the manager menu.
 - ii. Enter in a **Dataset:** TRAINING
 - iii. Enter in a **Image Type:** McBASI AREA files
 - iv. Select a **Format:** McIDAS AREA
 - v. Navigate to the directory: /home/aos/mcidas/data/MCV-TEMP/final
 - vi. Click **OK**.
 - vii. Click **Close** to close the Local ADDE Manager.

- b. To load the AREA files into the *Field Selector*, begin by returning to the *Data Sources* tab in the *Data Explorer*.
 - i. Select the *Satellite->Imagery* chooser, and connect to the **Server:** <LOCAL DATA> and the **Dataset:** TRAINING.
 - ii. Select the **Image Type:** McBASl AREA files
 - iii. Select the **Most Recent** time.
 - iv. Select **Channel:** All Bands
 - v. Change the **Image Size:** 1080 x 2160, and click **Add Source**.
 - c. To define the Red, Green, and Blue channels of your image display, begin by clicking on **Formulas** under the Data Sources listed in the *Field Selector*.
 - i. Select *Imagery -> Three Color (RGB) Image*, and click **Create Display**.
 - ii. In the pop up box, select **data (All Bands) -> Band 1 -> Brightness** as Red, **data (All Bands) -> Band 2 -> Brightness** as Green, and **data (All Bands) -> Band 3 -> Brightness** as Blue and click **OK**.
5. One of the strengths of the McIDAS-X Bridge is that you can view images and data files created by McIDAS-X while continuing to load data in McIDAS-V. The two are not exclusive of one another. To show this, load a 3D Isosurface of data from the GFS model output on top of the RGB image that you displayed from data created in McIDAS-X.
- a. From the *Projections* menu in the main display, turn the *Projections -> Auto-set Projection* option off.
 - b. Return to the *Data Sources* tab in the *Data Explorer*, and select the *Gridded Data -> Local* chooser.
 - c. In the file browser, “Look In” the location where you downloaded the **GFS-5-26-12Z.nc** grid, select the file, and click **Add Source**.
 - d. In the *Field Selector*, select the *3D grid -> Derived -> Speed* field.
 - e. Select the *3D Surface -> Isosurface* Display type.
 - f. In the **Times** tab, uncheck the “Use Default” box and select the first 5 times.
 - g. Click **Create Display** to see an example of how you can view data created by McIDAS-X and McIDAS-V together within McIDAS-V.
 - h. Use the Zooming, Rotating, and Panning controls to zoom over the US and rotate the display.
 - i. Use the Time Animation controls to start/stop the loop.



Zooming, Panning, and Rotating Controls

Zooming	Panning	Rotating
	Mouse	
<p>Shift-Left Drag: Select a region by pressing the <i>Shift</i> key and dragging the left mouse button.</p> <p>Shift-Right Drag: Hold <i>Shift</i> key and drag the right mouse button. Moving up zooms in, moving down zooms out.</p>	<p>Control-Right Mouse Drag: Hold <i>Control</i> key and drag right mouse to pan.</p>	<p>Right Mouse Drag: Drag right mouse to rotate.</p>
	Scroll Wheel	
<p>Scroll Wheel-Up: Zoom Out.</p> <p>Scroll Wheel-Down: Zoom In.</p>		<p>Control-Scroll Wheel-Up/Down: Rotate clockwise/counter clockwise.</p> <p>Shift-Scroll Wheel-Up/Down: Rotate forward/backward clockwise.</p>
	Arrow Keys	
<p>Shift-Up: Zoom In.</p> <p>Shift-Down: Zoom Out.</p>	<p>Control-Up arrow: Pan Down.</p> <p>Control-Down arrow: Pan Up.</p> <p>Control-Right arrow: Pan Left.</p> <p>Control-Left arrow: Pan Right.</p>	<p>Left/Right arrow: Rotate around vertical axis.</p> <p>Up/Down arrow: Rotate around horizontal axis.</p> <p>Shift-Left/Right arrow: Rotate Clockwise/Counterclockwise.</p>