The Mapserver, Terascan, and Ice Observations Form project software was written for and tested using the previous SCS Data System real-time data format on the USCGC Healy. This software was intended for use on the USCGC Polar Star, but was never updated to use the newer real-time data format from the USCGC Polar Star data systems. This project was halted per the request of USCG's Dave Cohoe (Dave.Cohoe@uscg.mil).

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NCAR/EOL
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TeraScan Processing

NOTE: The TeraScan processing was never completed, since the TeraScan satellite system was not running when the system test was conducted in May 2012. Therefore, the process to send satellite imagery from the main TeraScan computer to the teramap computer was never completely tested.

How to navigate and create GeoTifs:

DMSP

1) Choose an image.

cd ~/scripts/postprocs/output

The naming convention is fxx.yyjjj.hhmm.jpeg
      xx – satellite number
      yy – year
      jjj – Julian day of year
      hh – hour of the start of the pass
      mm – minute of the start of the pass

View images (*.jpeg) using the gthumb command.

Locate a recent image that shows a good view of the land and the ice, then
cd ~/scripts/geotiff_dmsp
cp data/fxx.yyjjj.hhmm.ols . – Copy image to current directory.

2) Navigate the satellite image.

source /opt/terascan/etc/tscan.login
or
source /opt/terascan/etc/tscan.bash_profile
depending on the shell that you are running.

teranav fxx.yyjjj.hhmm.ols (or use File -> Open image)
Scroll down until the satellite image is displayed in the TeraNav window.
Open Tasks -> Satellite control
Click on 2 or more points at the edges of clearly seen coastal areas.
Adjust the coastline in the NavLens window to match the actual coastline.
Switching between channels at the top of the TeraNav window can help locate areas to click on.
Time adjusts up/down; sample adjusts left/right
Once the image is navigated, click on the Update button in the Satellite Control window.
Check the resulting satellite image for accurate navigation.
Note: Use Reset All button to reset all values to their initial values.
Error on the side of less adjustment, be careful not to confuse ice/snow with land boundary.
Note: It is best to get a good spread of NavLens coverage. If your NavLenses are clustered in the center or on one side of the image, then only that area will be accurately navigated, and the coast overlay for the rest of the image may end up worse than it started.

Once the image has been successfully navigated, select
Tasks -> Apply changes to dataset (This command modifies the original data file with the current navigation changes).

3) Generate the tif image.

./expim.pl fxx.yyjjj.hhmm.ols

This will generate the geotiff file fxx.yyjjj.hhmm.tif.

4) Add the tif image to Mapserver. See the section on Ice Imagery in Mapserver in the GISMappingProject.pdf for more information on adding the satellite imagery to Mapserver. There is also more information in the msice-exercise.pdf file.

AVHRR

AVHRR processing is similar to the DMSP processing.

1) Choose an image.

cd ~/scripts/postprocs/output

The naming convention is nxx.yyjjj.hhmm.jpeg
      xx – satellite number
      yy – year
      jjj – Julian day of year
      hh – hour of the start of the pass
      mm – minute of the start of the pass

View images (*.jpeg) using the gthumb command.
Locate a recent image that shows a good view of the land and the ice, then
cd ~/scripts/geotiff_hrpt
cp data/nxx.yyjjj.hhmm.avhrr . – Copy image to current directory.

2) Navigate the satellite image (This step may be skipped for AVHRR imagery unless there are noticeable navigation errors).

source /opt/terascan/etc/tscan.login
or
source /opt/terascan/etc/tscan.bash_profile
depending on the shell that you are running.

teranav fxx.yyjjj.hhmm.ols (or use File -> Open image)
Scroll down until the satellite image is displayed in the TeraNav window.
Open Tasks -> Satellite control
Click on 2 or more points at the edges of clearly seen coastal areas. Adjust the coastline in the NavLens window to match the actual coastline.
Switching between channels at the top of the TeraNav window can help locate areas to click on.
Time adjusts up/down; sample adjusts left/right
Once the image is navigated, click on the Update button in the Satellite Control window.
Check the resulting satellite image for accurate navigation.
Note: Use Reset All button to reset all values to their initial values.
Error on the side of less adjustment, be careful not to confuse ice/snow with land boundary.
Note: It is best to get a good spread of NavLens coverage. If your NavLenses are clustered in the center or on one side of the image, then only that area will be accurately navigated, and the coast overlay for the rest of the image may end up worse than it started.

Once the image has been successfully navigated, select
Tasks -> Apply changes to dataset (This command modifies the original data file with the current navigation changes).

3) Generate the tif image.

./rgb.pl nxx.yyjjj.hhmm.avhrr

This will generate the geotiff file nxx.yyjjj.hhmm.tif.

4) Add the tif image to Mapserver. See the section on Ice Imagery in Mapserver in the GISMappingProject.pdf for more information on adding the satellite imagery to Mapserver. There is also more information in the msice-exercise.pdf file.

Switching master files

The fastreg command is used in the programs that create the geotiff images (expim.pl and rgb.pl), which registers 2-D data to a user-defined base map and projection and limits the area of interest. The fastreg command uses a master file that defines the base map and projection. As the ship travels to the Bering Sea and back to Seattle, there will be a need to switch masters. There may also be a need to occasionally add another big image to get more coverage of storms and ice by using a different master file. There are *.csh files in ~/scripts/postprocs which will create new master files for the Seattle area and for the Bering Sea area. There are 1 km and 4 km master files for each location, so use the appropriate master for the satellite imagery being processed. There are some additional *.csh files that define other areas that may be of some use.

The process of switching master files:
1) Run the appropriate *.csh file to create the new master file.
2) Edit the expim.pl or rgb.pl programs to point to the correct master file.

Each of the *.csh files use the "master" command to generate a master file and the master file name is included in the expim.pl and rgb.pl programs.

For DMSP visible, there is an "expimxxx.pl" program, which uses a master file that covers a larger area.

For DMSP infrared, there is an "expim_ir.pl program.

NOTE: The projection information must match from master through fastreg, gdal* programs, and into the mapserver LAYER. Note that terascan, gdal, and mapserver (proj4) have different names for the same parameter and different meanings for the same name.

See http://remotesensing.org/geotiff/proj_list for more information on projections and the parameter names.

List of Programs

scripts/geotiff_dmsp/expim.pl – Creates geotiff images from DMSP ols data files for DMSP visible imagery.

scripts/geotiff_dmsp/expim_ir.pl – Creates geotiff images from DMSP ols data files for DMSP infrared imagery.

scripts/geotiff_dmsp/expimxxx.pl – Creates geotiff images from DMSP ols data files for DMSP visible imagery using a master file that covers a larger area.

scripts/geotiff_hrpt/rgb.pl – Creates geotiff images from AVHRR hrpt data files.

scripts/postprocs/*.csh – Scripts that will create different master files that are used by the expim* and rgb.pl programs.

scripts/postprocs/tscan_environ.pl – File that is used by the expim* and rgb.pl programs to define the TeraScan environment.

All the files above, except for the scripts that create the master files, will need to be updated. The tscan_environ.pl file needs the directory names updated. The expim* and rgb.pl programs need the TeraScan home directory updated and the location of the master file corrected.

NOTE: Before any of the expim* or rgb.pl programs are run, master files will need to be created using the csh scripts. Master files are binary and therefore cannot be transferred from another computer.