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CERSER
SEA SPACE

TERASCAN TRAINING REPORT

CERSER (Center Excellence Of Remote Sensing and Education and Research) offered their researchers to participate in a two weeks SeaSpace training learning about TeraScan. I eagerly accepted the opportunity to broaden my horizon in the STEM field. This training would open other doors to a career path for me in the future. SeaSpace was a new topic for me to learn about as well as TeraScan. Throughout, this training it did taught me a new topic in the STEM field to take an interest in for a career choice. It was challenging and tough training for me since it was a first time learning about TeraScan.

SeaSpace is a corporation, and established in 1982. SeaSpace has been spanning remote sensing for over 30 years. They have connected more than 550 land stations and systems in over 47 countries. SeaSpace develop satellite landscape station technology. The corporation focused their skills on meteorological, oceanographic, and environmental remote sensing. SeaSpace technology delivers the solutions for monitoring weather and environmental management, satellite operations, or defense needs.

Located on the SeaSpace website are their products that they used for research. According to SeaSpace, TeraScan's accessible architecture and script directed operation give us the capability and flexibility to create the processing environment we need. TeraScan vest for us whether it is data accretion, sensor conversion, algorithm generation, visualization, or data export and distribution. Another product that we used a lot in the training of theirs is TeraVision. It is the tool for visualization in the TeraScan software package. The software permits the user to operate a wide range of image manipulations, along with enhancements, color adjustments; addition of overlays such as coastlines and political boundaries, latitude/ longitude grids, and topography. Annotations of meteorological symbols, weather fronts, text, and color legends. TeraVision implement tools for combining images through mathematical functions, and data analysis tools for generating and displaying statistics in the form of histogram plots, skew T diagrams, and scatter plots. It can also be used an analysis tools allow the user to determine distance, bearing, area, perimeter, mean, median, minimum, maximum, and standard deviation.

The first week of the SeaSpace training was conducted by Andrew Brumfield. He taught us how to use the TeraScan system, TeraVision, and the command lines. Unfortunately, the system wasn't updated with the new WI-FI and the end results to that we had to use that TeraScan main system. The conductor set up a learning system which was you teach one person and then that person will teach someone. It was very time consuming, but we completed our tasks. Learning style is very helpful for to obtain the information.

The first tasks were to learn the basic command lines on the Linux machine. To write out command lines we used terminal; it is a command line that enables you to communicate with your computer. First day of training was basically understanding the basic command lines. The commands were: ls (list), cd (change directory), nano/vi(text editor), mkdir(make a new folder), pwd(print working directory). These commands are case sensitive meaning there is a certain way to type in the commands. Nexus is one of the file path ways which contains images and data. The path way to get to images is nexus/data1/products/training/, to enter the master file is opt/terascan/pass/masters and opt/terascan/pass/congfiproc/gvar.train. I had to keep in the mind on how to enter and leave the insert mode in terminal, which is esc, shift, colon, and wq.

Before we could be given a task; we were taught about the TeraVision from the instructor. There are many buttons in the TeraVision to be used to make the image realistic. There is a button for coast overlay that prints the coast lines on the image. Grid overlay and topography overlay can also be added to the image. We used the coast overlay and grid overlay the most throughout the training. Several boxes for zoom in and out of the picture and you have to be careful, the image can be zoomed out too much for you not to be able to see the image. If there are multiple passes the show all frame button can be handy to see all the images; there is a button to just look at one frame at a time. By clicking on tools there are many options to pick from to add more features to the image; Such as: Annotate- to add text, symbols, and lines to the image. Enhance- to add color, operations, make a histogram and enhancement plot. Filter- to narrow down the result in the set. Survey- to add points on the image and gather the SST (sea surface temperature), longitude, and latitude. Palette Edit- To edit the color to the image. Palette Select- To select the color. The open data shelf opens a green screen to be able to add you information in order to make the image. To create a library shelf: click on edit data library, click on new (right side), a screen will pop up to the choose shelf location to be added to the library. It took me some time to get use to this process, because I had to remember to click on the location twice. Finally, you will accept and then create a data type within the data library shelf. After your finish product click on file, export, and set the format to JPEG.

The image below displays the data we collected, which included the sea surface temperature, latitude and longitude in the Gulf of Mexico and Gulf Stream. Record the values for that day and make a composite of the day sea surface temperature. The steps were: key in TVIS to bring up TeraVision, library shelf, SST, whole pass, zoom box, panel right, survey, click on the plus button to add the point into the survey, click on tools and then palette select, aaa_sst, click on tools and enhance, increase the steps, go back to survey, save the data, file, open, data shelf, control click the points, tools and palette edit, the color should be blue gm red yellow, click on the points and load it up, select the frame, save in the directory. We pulled up the images and recorded the temperature at the time of the day. See figure one and two down below.

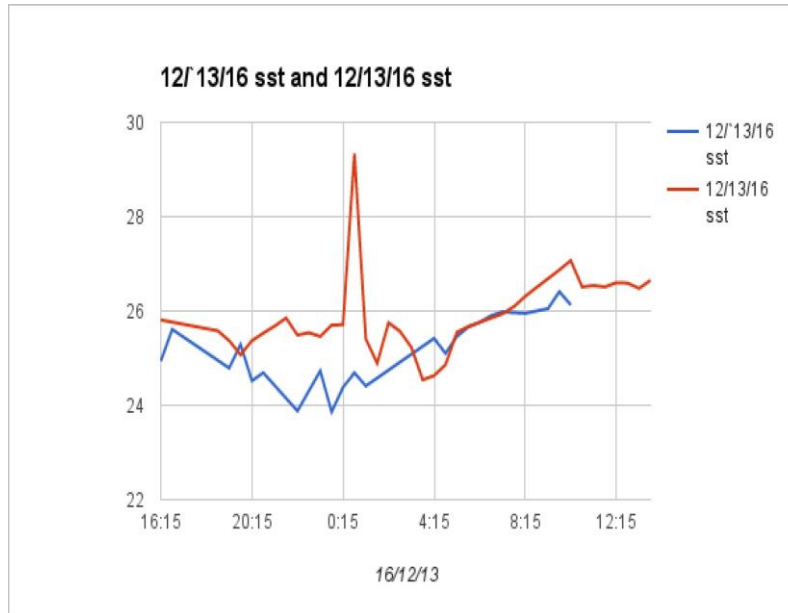


Figure 1: *Gulf of Mexico and Gulf Stream SST*

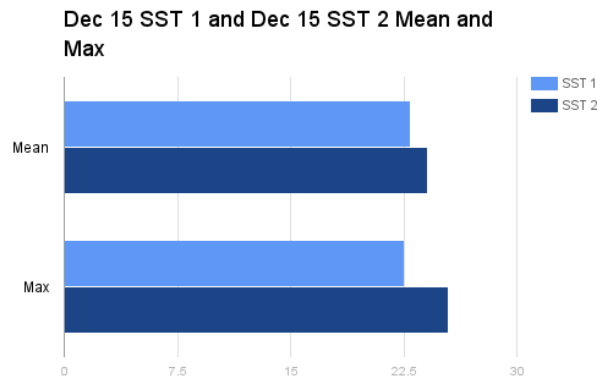


Figure 2: *Mean and Max Gulf of Mexico and Gulf Mexico*

The second week of training we were able to work from our computers using TeraScan. David Mobly was our other instructor for the week to help us get through the training. There were many different commands to be used and learned. The commands, cd, lspass, tvview, mkdir, impasc, hrptin, printvar, help, emathp, master, cat, expasc, sample, ls, etc. help- to help give information about the commands, emathp- to allow multiple output variables. Cat- to show you what is in the file. Hrptin- Input telemetry data can be read from the pass disk can be processed at once. The smallest rectangular area required to cover a region defined by a master dataset. Expasc- exports TeraScan dataset variable data to disk files. The output data can be sorted by element or by leading dimension. Printvar- Prints data for one or more variables. Master- Generate a master dataset containing attributes that parameterize an earth transform.

The image down below displays the last day of the training we pulled together what we have been doing past week. We used the latitude and longitude points to be placed on the map. The process was long and vigorous. First, we went inside the ndvi folder to make the two points. The two points were to be the latitude and longitude of ECSU and our home town. Cat > point.csv used to type in the latitude and longitude points for the areas. Impasc- produces TeraScan datasets from free format files. Impasc, 2(Inputted 2 points), set the chart latitude, longitude, name, fl fl str10. It can import 3 dimensional data. We sampled the data to access the files. See figure three down below.

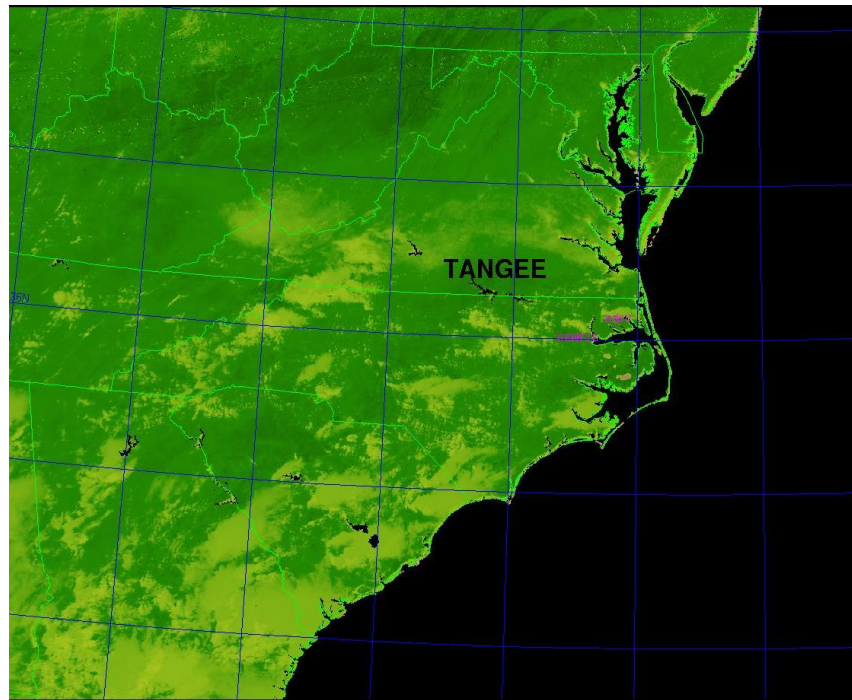


Figure 3: Point of Bertie County

This training made a major impact on decision for a career. It was hard and tense at some points, but I overcame the situation. At first, I was losing an interest in TeraScan, because of the made silly mistakes that were made and having that good memory for the steps. The training was fun and informal; at the time I did not know anything about SeaSpace, TeraScan, and TeraVision. My major is Computer Science and learning about TeraScan is genuinely effective for me. There were tremendous amounting of coding/ scripting and mastering the terminal commands.