Lab-3: SeaDAS: http://oceancolor.gsfc.nasa.gov/seadas Mar.-5, 2010

Today we will combine results from c-shell scripting to access L0 (level-0) data to produce the L1B (level-1B) data that is input for subsequent fortran or Matlab coding and analyses. Seadas facilitates this task as it converts raw satellite counts (L0) to calibrated, earth-referenced physical data (L1B) using a collection of C, C++, Fortran, and shell-scripting source codes that is provided free of charge by NASA. I installed the latest version on our class server muenchow.cms.udel.edu and here ask you to make it work on your account. Make yourself a new directory, you will download, explode, and process large volumes of data, up to 2 GB for an individual image.

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| 1. | From your home directory, copy a configuration file called .cshrc (it sets environmental variables and paths:<br>>cp ../andreas/.cshrc .<br>then log out and back, because this configuration file executes upon login. |
| 2. | In an appropriately named sub-directory, make yourself a c-shell called step-1.csh to contain:<br>./proc2.csh A20100581555000<br>where proc2.csh is a second c-shell and the argument A201000581555000 is a specific Modis granule (chose one you like from your preferred area of study) |
| 3. | In the same directory, make yourself another c-shell called proc2.csh to contain<br>set name = $argv[1]<br>echo $name<br>if (! –e $name.L0_LAC) then<br>echo 'No such file in current directory'<br>endif |
| 4. | Download the file that apparently does not yet exist (a 5 minute Modis granule, about 300 MB zipped):<br>wget –r –nd –l1 --no-check-certificate http://oceandata.sci.gsfc.nasa.gov/cgi/getfile/$name.L0_LAC.bz2 |
| 5. | Unzip the downloaded L0 file (to about 500 MB binary file)<br>bunzip2 $name.L0_LAC.bz2 |
| 6. | Convert L0 file to L1A files running SeaDAS c-shell scripts that will run C and C++ codes (another 500 MB)<br>modis_L0_to_L1A_GEO.csh $name.L0_LAC –b<br>Either this or the next step will fail for the reasons explained in the body of the message. Fix it and rerun. The needed file is /sw/seadas6.1/config and you will need a new directory called .seadas under your home root (same location where your .cshrc is). You will also edit that file seadas.env_user_csh to set environmental variables related to Modis attitude and emphemeris. |

This is roughly the location that most of you reached today. The following steps are left as a homework that I like you to complete before next Friday when we will actually go over the steps you here did slowly. You will redo all these steps many times during the project-phase of this class when you will actually start doing science with some of the data you are accessing here. In order to be successful in that phase:

I expect you to thoroughly ***understand every line*** in this developing code ***to access MODIS data***.

Homework: Complete the SeaDas processing to modify your script proc2.csh
Due: Friday, March-12, 2010, 8am

Please come and see me before Friday morning with ANY problems you may have in accomplishing these tasks:

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| 7. | Create geolocation files<br>modis_L1A_to_GEO.csh $name.l1A_LAC -b |
| 8. | Create L1B files<br>modis_L1A_to_L1B.csh $name.L1A_LAC $name.GEO -b |
| 9. | Remove files that are not needed anymore that take up 0.5 GB space<br>rm *.L1A_LAC |
| 10. | Create a file of IDL commands to be run in #11 to work with the newly created HDF files that have all Modis data from 36 frequency bands at 250-m (QKM), 500-m (HKM), and 1000-m (LAC) resolution:<br>echo "load, '"$name.L1B_QKM"',gfile='"$name.GEO"', prod_ix=[1,2]" >test.cmd<br>echo "out, 'bin1', /data, band=1, ftype='FLAT',/geo" >>test.cmd<br>echo "out, 'nav', /nav, band=1, ftype='FLAT'" >>test.cmd |
| 11. | Run the command script test.cmd to extract flat binary files bin1 and nav that contain band-1 and navigation data (used by getbin.f); the following extracts these data from embedded IDL routines without requirements of a license for this widely used but expensive commercial software product (details on SeaDAS web-site):<br>seadas –em –b test.cmd |
| 12. | Extract relevant information on calibration, file size, scan numbers, etc, from a header dump, e.g.<br>hdfdump –h $name.LAC_QKM >HeaderInfo.ascii |
| 13. | Rewrite and run your getbin.f fortran code to run the new bin1 and nav files (loc is a subset of HeaderInfo.ascii). You will need to figure out which fields contain the relevant information and extract those that you may need (using nawk perhaps with its substr() functionality. |

I expect you to thoroughly ***understand every line*** in this developing code ***to access MODIS data***.

Deliverables:

(a) Working scripts step-1.csh and proc2.csh containing items #1 through #13 above;
(b) Working getbin.f that takes bin1 and nav of the above;
(c) A single ascii file with latitude, longitude, and the 645 nm MODIS band-1