GHRSST Data Access

How to Access GODAE High Resolution SST Products from the GDAC and LTSRF

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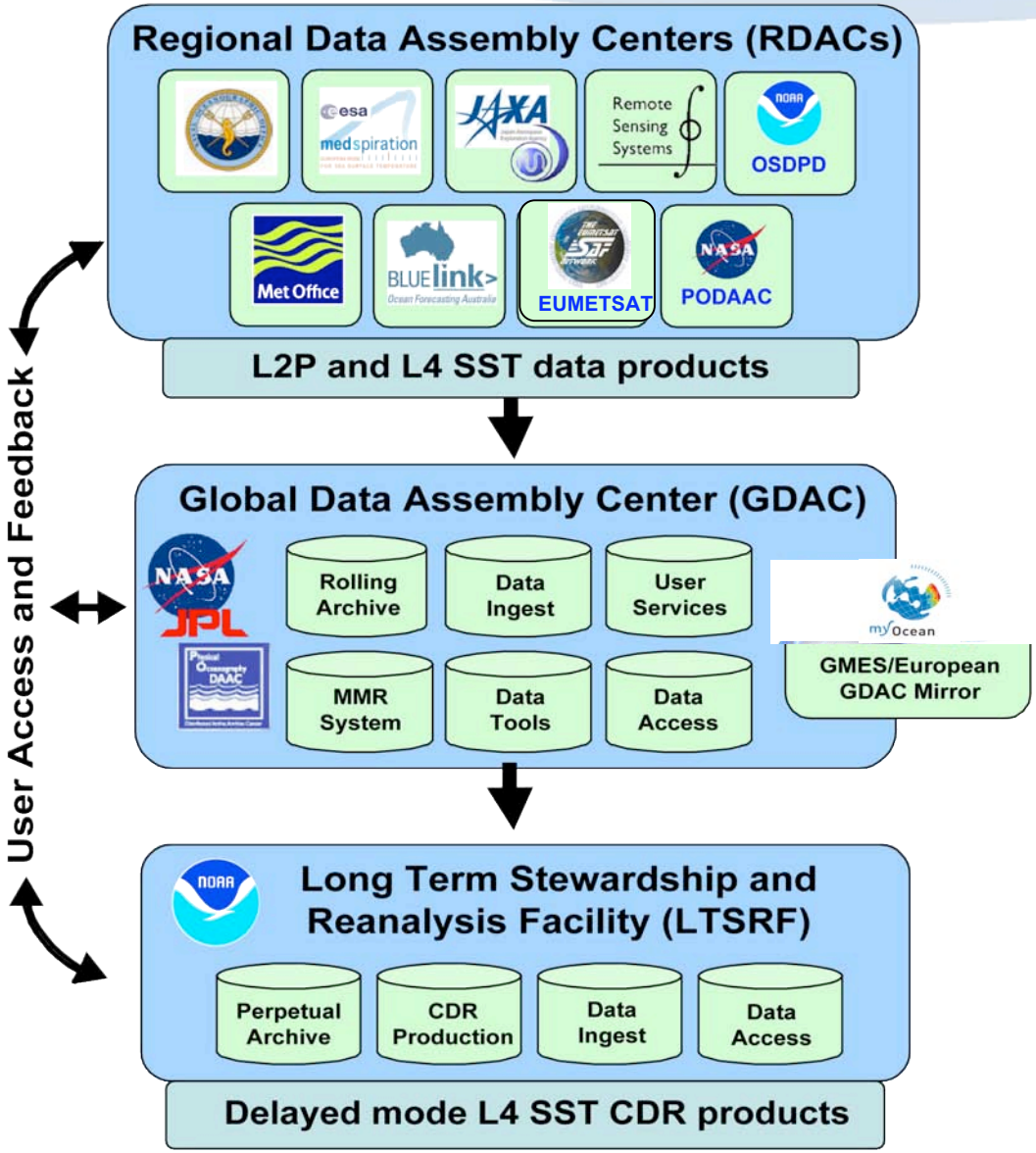
Regional/Global Task Sharing



GHRSST data access is possible from all levels of the Regional/Global Task Sharing Framework.

This tutorial covers the basic data access mechanisms from the GDAC at NASA PO.DAAC and the LTSRF at NOAA NODC.

Individual data providers - the RDACs at the top of this framework, also provide their data in a variety of ways. Access to data from the RDACs is not discussed here.

Current Status

- **As of July 2007, GHRSST provides integrated Level 2 Preprocessed (L2P) SST observations from the following sensors:**
  - AMSR-E, AVHRR-16, AVHRR-17, AVHRR-18 (GAC,LAC,HRPT), MODIS Aqua and Terra, SEVIRI, AATSR, TMI, GOES-11, and GOES-12
- **In addition, gap-free Level 4 (L4) SST products are available from the following analysis systems:**
  - OSTIA: global, daily, 5 km
  - Daily OI: global, daily, 25 km
  - Mediterranean: daily, 2.2 km

Current Status

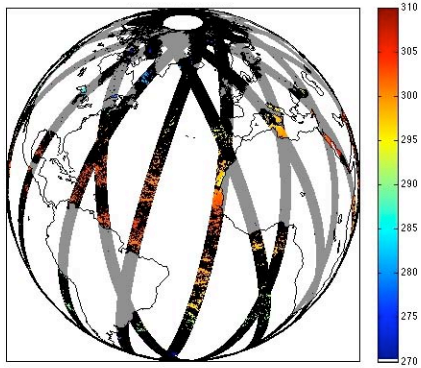
- All data files are in netCDF file format
- All data files contain COARDS/CF compliant file level metadata
- All data files have a corresponding DIF metadata record, and once in the LTSRF, FGDC metadata as well

All data are free and openly available to everyone

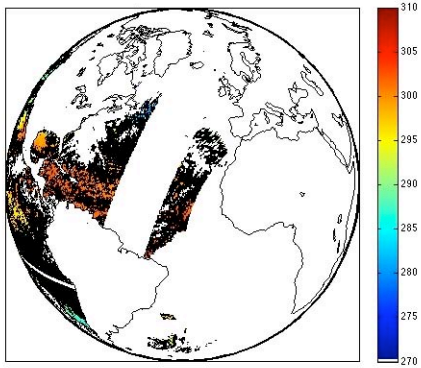
(only OSTIA requires use of a Crown copyright statement)

Example L2P and L4 Data

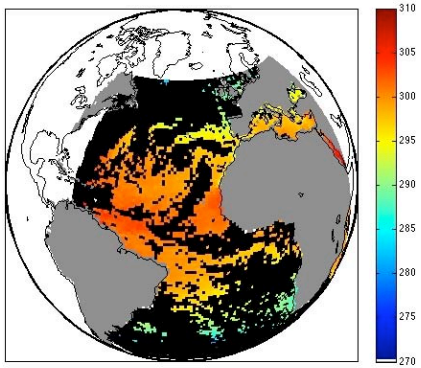
AATSR L2P



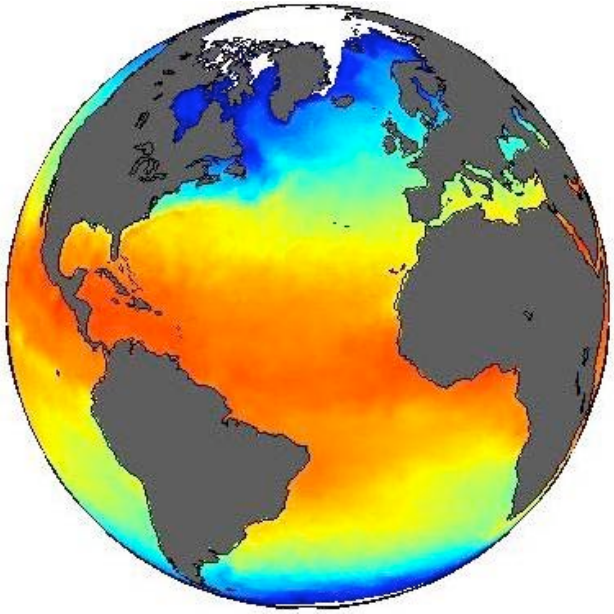
GOES-11 L2P



SEVIRI L2P



Shown above are example L2P images (each image may have been generated using several separate L2P files from the same day) and to the right is an example L4, blended, gap-free analysis product



OSTIA L4 - gap-free analysis product

GHRSST Access Overview

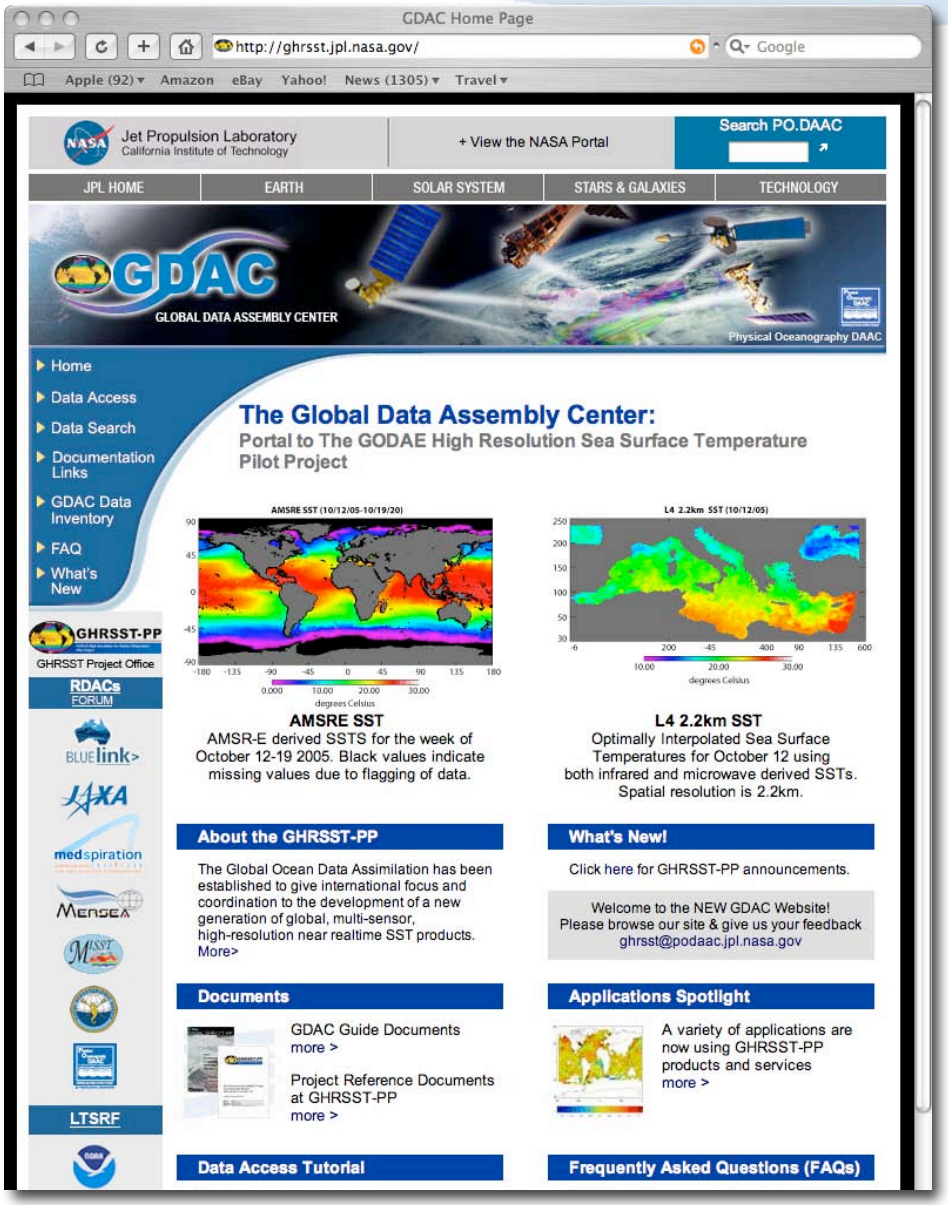
- Due to the enormity of the task, GHRSST data management is achieved through a partnership between the NASA Physical Oceanography Distributed Active Archive Center (PO.DAAC) and the NOAA National Oceanographic Data Center (NODC)
- PO.DAAC operates the GHRSST Global Data Assembly Center (GDAC) and provides SST data within 30 days of observation
- NODC operates the GHRSST Long Term Stewardship and Reanalysis Facility (LTSRF), where GHRSST SST data older than 30 days are available in perpetuity
- GHRSST is working toward making access to these data as seamless as possible across the two centers

GHRSST Access Overview

- The GDAC will typically be the place you should go to begin searching for GHRSST data and tools
- However, if the data you are looking for are more than 30 days old, you can also begin your search at the LTSRF
- This tutorial will begin at the GDAC, and walk you through some of the basic search and access techniques
- After that, the tutorial will walk you through the search and access mechanisms available at the LTSRF

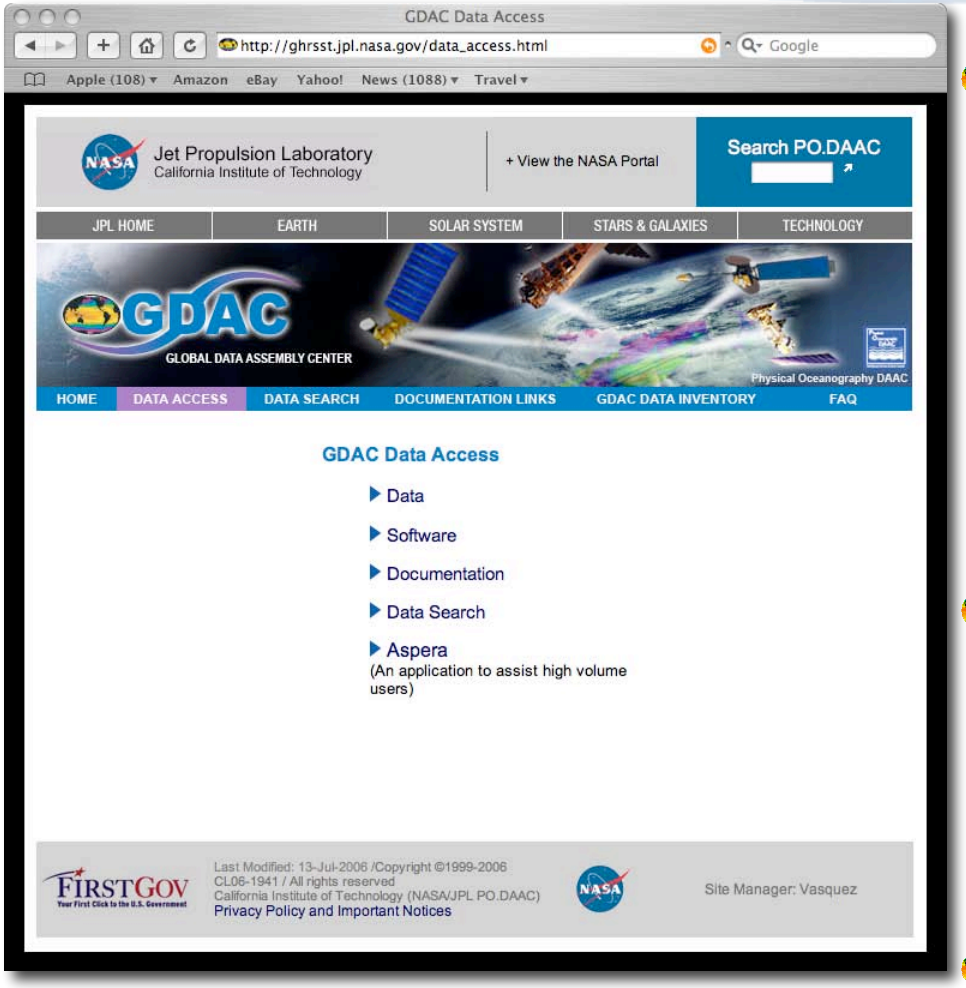
GDAC Access: Getting Started

http://ghrsst.nodc.noaa.gov



- Typically, to begin looking for GHRSST data, a user should start at the GDAC: http://ghrsst.jpl.nasa.gov
- General information is available here
- Click on "Data Access" to access data and tools

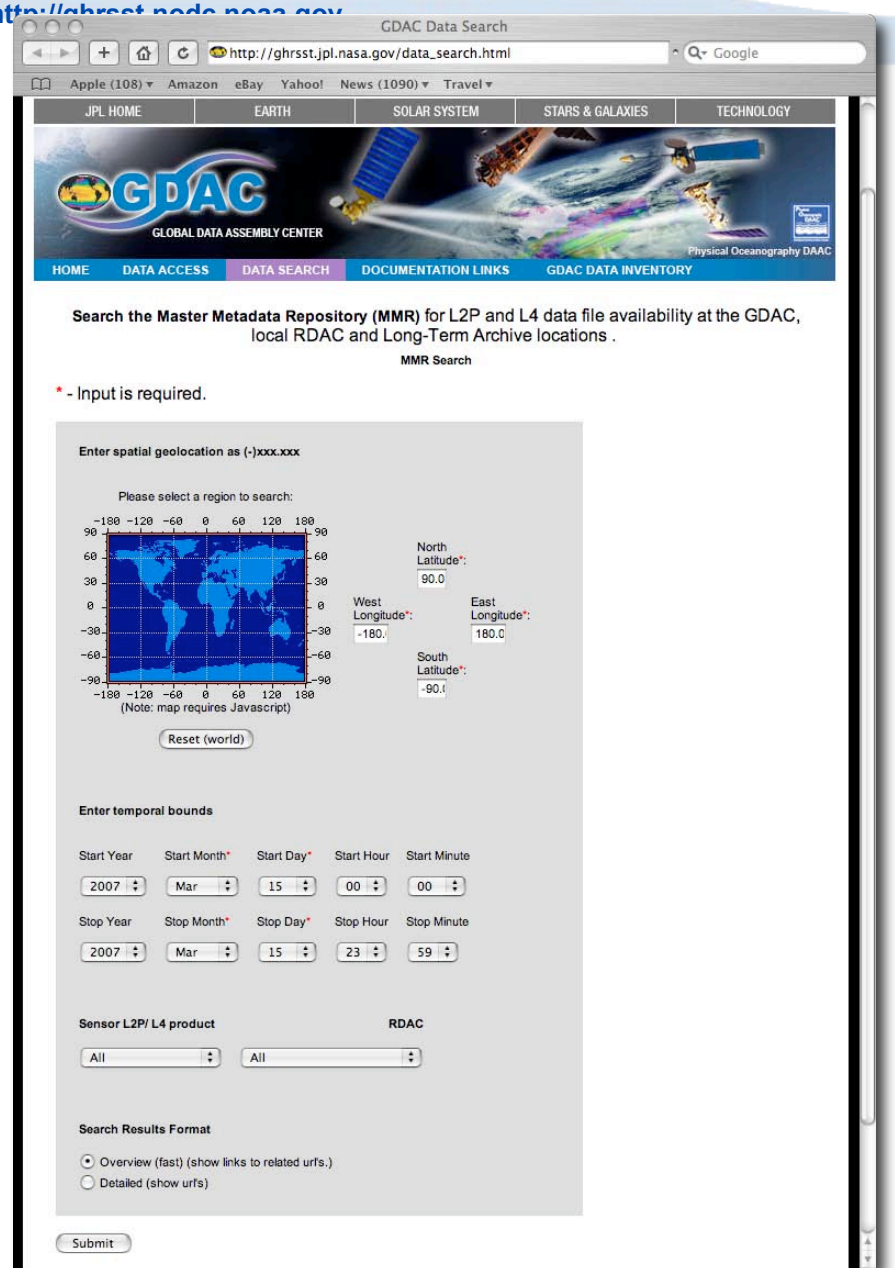
GDAC Access: Getting Data and Info



- Here on the GDAC Data Access Page, clicking on “Data” will take you straight to the FTP directories, where you can access the data directly. If you are familiar with GHRSST products and conventions, this is a good way to get right to the data you want
- Clicking on “Software” or “Documentation” will take you to example code (currently in C and IDL, with Matlab available soon) and documents describing GHRSST products
- Clicking on “Data Search” will take you to the GHRSST search tool

GDAC Access: Data Search

http://ghrsst.pode.noaa.gov



- Here on the GDAC Data Search Page, you can look for GHRSST data by geographic region, time, by Sensor/Product Level, and by RDAC
- As an example, select 2007-Jan-13 as both start and stop dates, select AMSR-E as the Sensor, and select “Detailed” as the search results format to find all AMSR-E data from that date.
- Then click on “Submit”

GDAC Access: Data Search

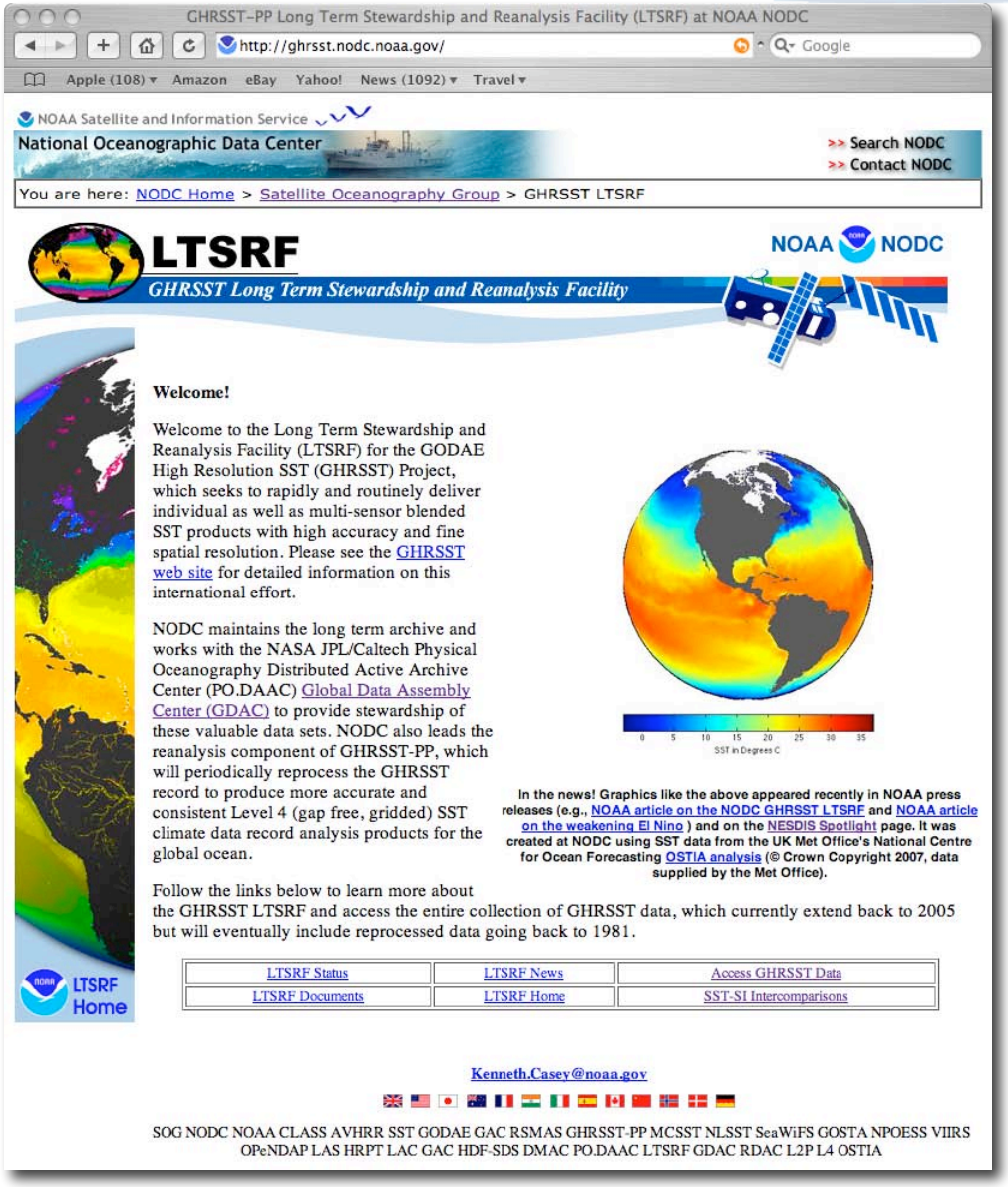
	File name: 20070113-AMSRE-REMSS-L2P-amsr_l2b_v05_r24974.dat-v01.nc
	Location: ftp://ftp.misst.org/amsre/swath/nc/2007/20070113-AMSRE-REMSS-L2P-amsr_l2b_v05_r24974.dat-v01.nc.gz
FTP server	Location: ftp://podaac.jpl.nasa.gov/pub/GHRSST/data/L2P/AMSRE/REMSS/2007/013/20070113-AMSRE-REMSS-L2P-amsr_l2b_v05_r24974.dat-v01.nc.gz
	File name: 20070113-AMSRE-REMSS-L2P-amsr_l2b_v05_r24975.dat-v01.nc
	Location: ftp://ftp.misst.org/amsre/swath/nc/2007/20070113-AMSRE-REMSS-L2P-amsr_l2b_v05_r24975.dat-v01.nc.gz
FTP server	Location: ftp://podaac.jpl.nasa.gov/pub/GHRSST/data/L2P/AMSRE/REMSS/2007/013/20070113-AMSRE-REMSS-L2P-amsr_l2b_v05_r24975.dat-v01.nc.gz
	File name: 20070113-AMSRE-REMSS-L2P-amsr_l2b_v05_r24976.dat-v01.nc
	Location: ftp://ftp.misst.org/amsre/swath/nc/2007/20070113-AMSRE-REMSS-L2P-amsr_l2b_v05_r24976.dat-v01.nc.gz
FTP server	Location: ftp://podaac.jpl.nasa.gov/pub/GHRSST/data/L2P/AMSRE/REMSS/2007/013/20070113-AMSRE-REMSS-L2P-amsr_l2b_v05_r24976.dat-v01.nc.gz
	File name: 20070113-AMSRE-REMSS-L2P-amsr_l2b_v05_r24977.dat-v01.nc
	Location: ftp://ftp.misst.org/amsre/swath/nc/2007/20070113-AMSRE-REMSS-L2P-amsr_l2b_v05_r24977.dat-v01.nc.gz
FTP server	Location: ftp://podaac.jpl.nasa.gov/pub/GHRSST/data/L2P/AMSRE/REMSS/2007/013/20070113-AMSRE-REMSS-L2P-amsr_l2b_v05_r24977.dat-v01.nc.gz
	File name: 20070113-AMSRE-REMSS-L2P_GRIDDED_25-amsre_20070113v5-v01.nc
	Location: ftp://ftp.misst.org/amsre/gridded/nc/2007/20070113-AMSRE-REMSS-L2P_GRIDDED_25-amsre_20070113v5-v01.nc.gz
FTP server	Location: ftp://podaac.jpl.nasa.gov/pub/GHRSST/data/L2P_GRIDDED/AMSRE/REMSS/2007/013/20070113-AMSRE-REMSS-L2P_GRIDDED_25-amsre_20070113v5-v01.nc.gz
	File name: 20070113-AMSRE-REMSS-L2P-amsr_l2b_v05_r24978.dat-v01.nc
	Location: ftp://ftp.misst.org/amsre/swath/nc/2007/20070113-AMSRE-REMSS-L2P-amsr_l2b_v05_r24978.dat-v01.nc.gz
FTP server	Location: ftp://podaac.jpl.nasa.gov/pub/GHRSST/data/L2P/AMSRE/REMSS/2007/013/20070113-AMSRE-REMSS-L2P-amsr_l2b_v05_r24978.dat-v01.nc.gz
	File name: 20070113-AMSRE-REMSS-L2P-amsr_l2b_v05_r24979.dat-v01.nc
	Location: ftp://ftp.misst.org/amsre/swath/nc/2007/20070113-AMSRE-REMSS-L2P-amsr_l2b_v05_r24979.dat-v01.nc.gz

- Here are some of the results. Notice that FTP (and OPeNDAP links if available) are provided for the relevant data, and that the links point to the data both at the GDAC and the originating RDAC (if available).
- Eventually, if your search query returns data older than 30 days, then links to the LTSRF holdings will also be provided
- You can click on a file to download it, or you can use your favorite FTP client to access the data

LTSRF Access: Getting Started

GHRSST Data Access Tutorial

http://ghrsst.nodc.noaa.gov

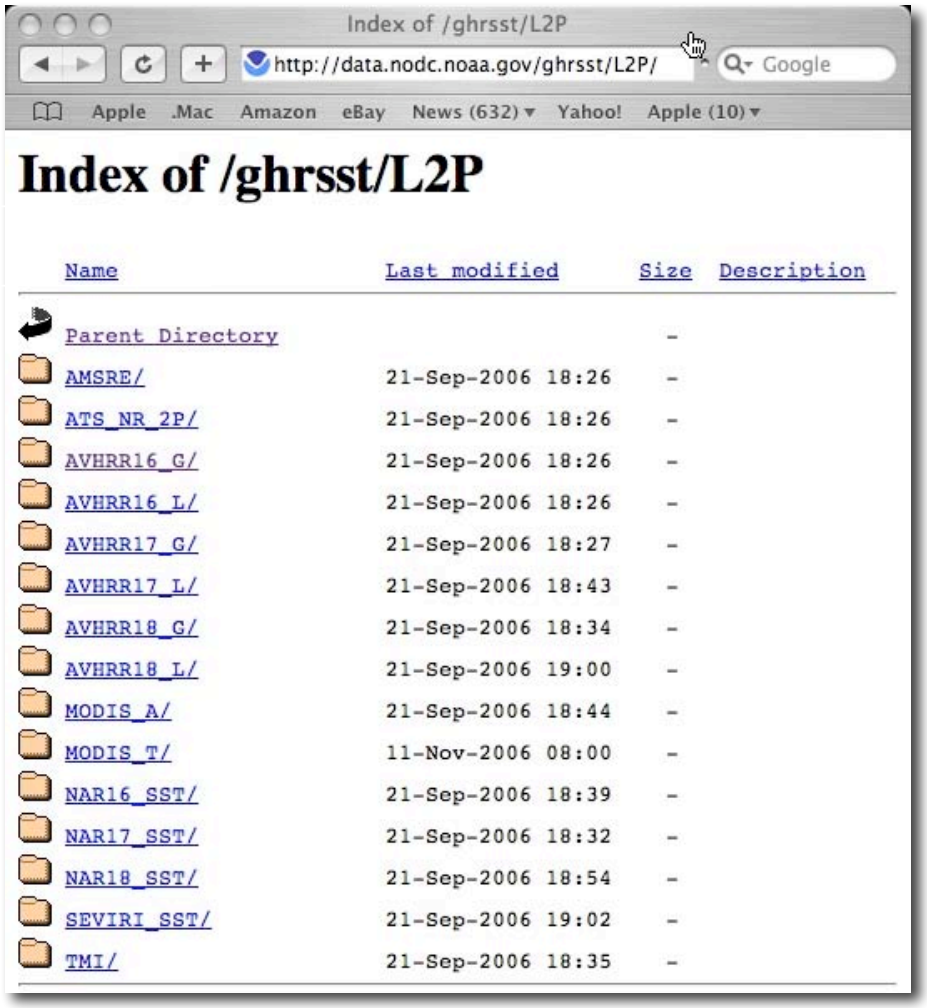


- If you know you want data that are more than 30 days old, or if you want to find out more about the stewardship and reanalysis activities in GHRSST, you can go straight to the LTSRF at http://ghrsst.nodc.noaa.gov
- Near the bottom of every page you will find the same set of informational links, and you can also click on the image on the left to return you to the LTSRF home page
- Click on “Access GHRSST Data” to get to the GHRSST LTSRF archives

LTSRF Access: Data Access

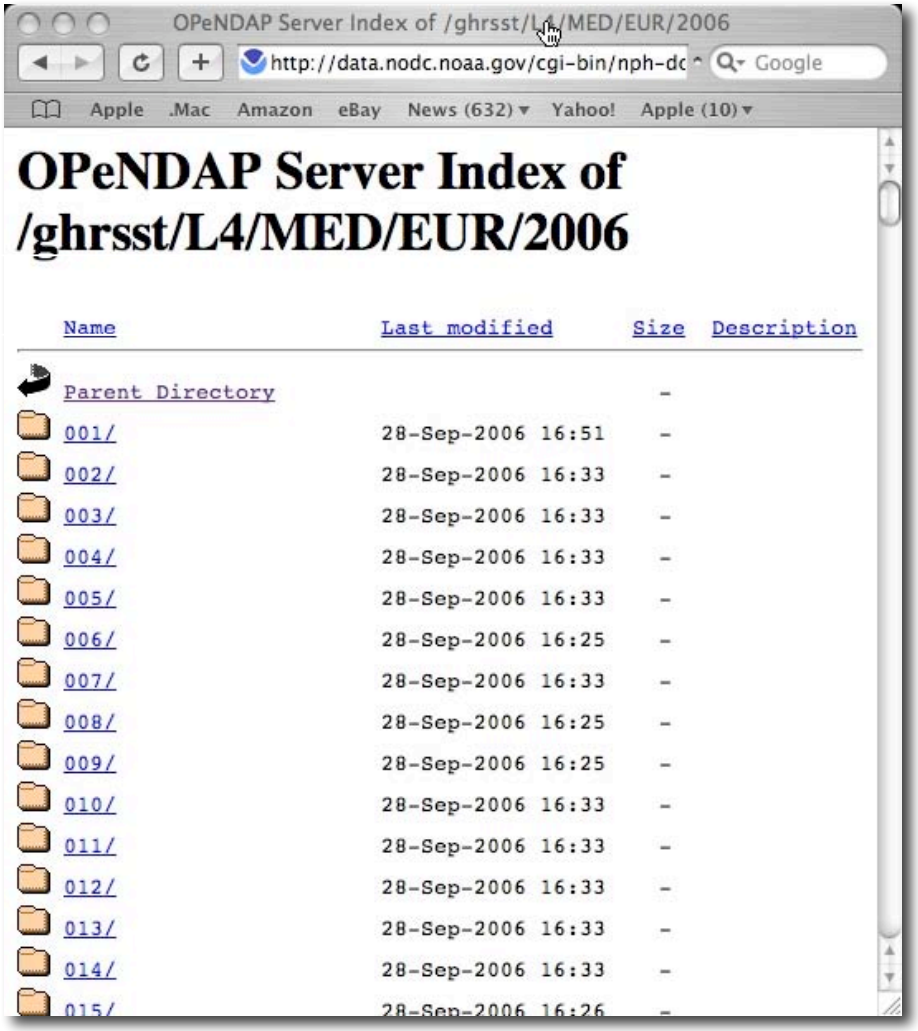
- **On the "Access GHRSST Data" page you will see a link directly to the four main ways you can get GHRSST data from the NODC LTSRF:**
  - HTTP
  - FTP
  - OPeNDAP
  - NODC Ocean Archive System
- **HTTP and FTP access mechanisms are very straightforward… you may click through to those directories and download data files directly. The next slide shows an example of what the L2P directory looks like…**

LTSRF Access: HTTP and FTP



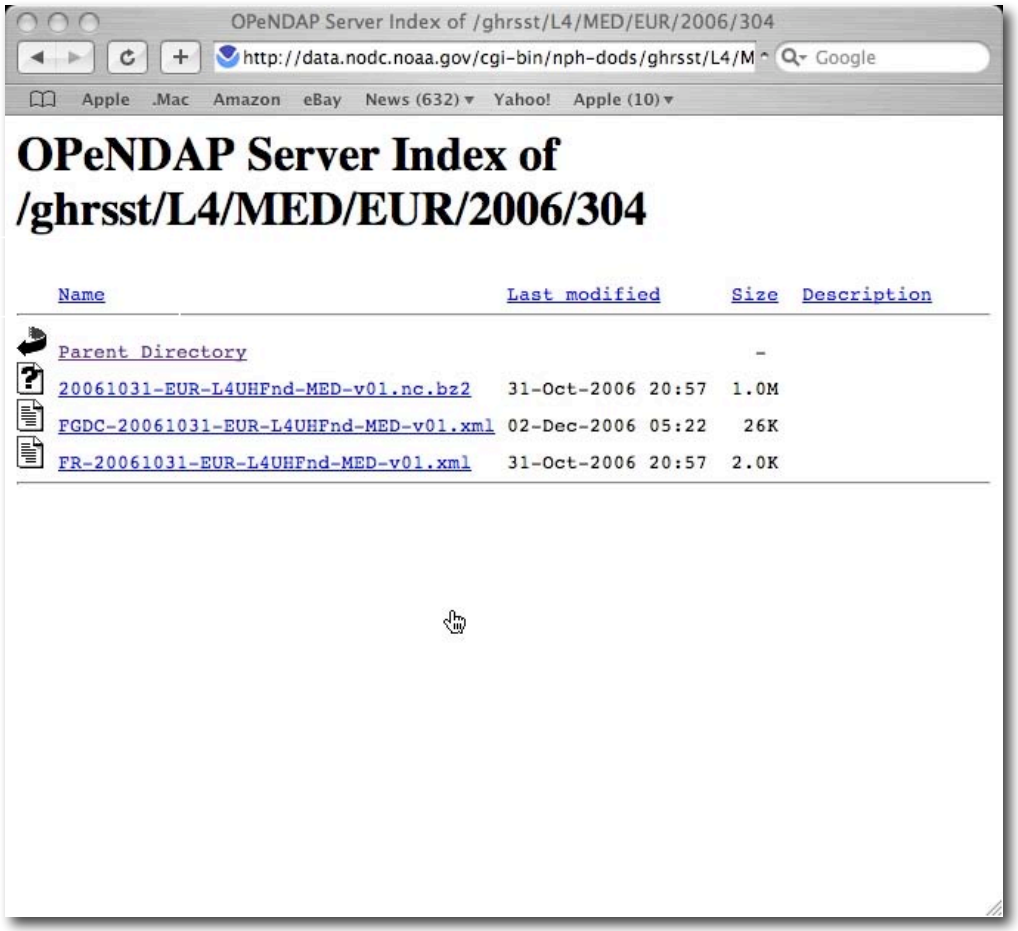
- Here is the example GHRSST L2P directory structure as seen using HTTP. Up one level higher in the parent directory at http://data.nodc.noaa.gov/ghrsst you can also see the L2P_GRDIDED and L4 directories. Note that when additional data streams enter the LTSRF, additional directories will be shown.
- The FTP directory structure is identical and can be examined using your browser or favorite ftp client. Just point them at ftp://data.nodc.noaa.gov/pub/data.nodc/ghrsst.

LTSRF Access: OPeNDAP



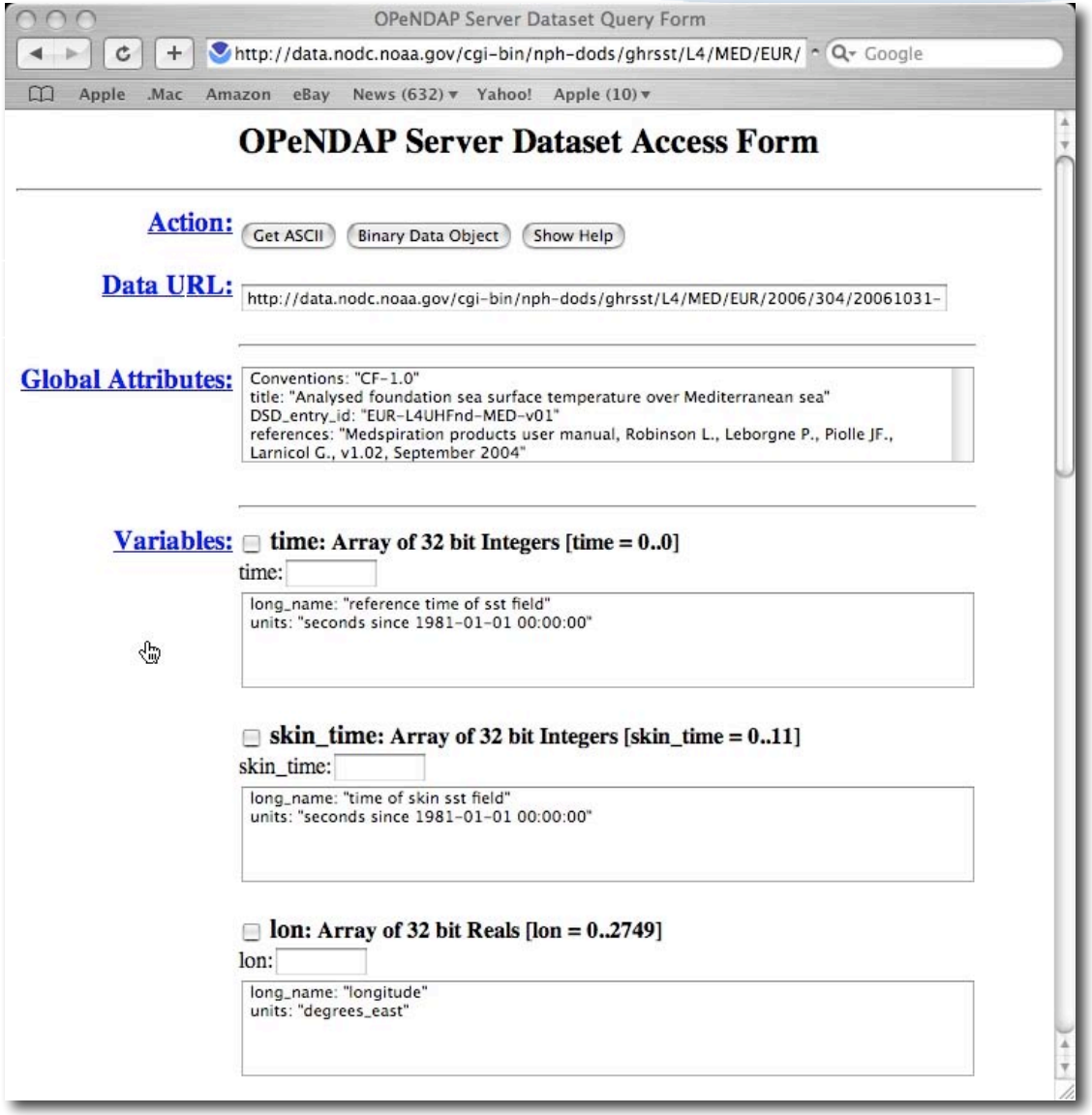
- The OPeNDAP structure is also identical, but it has a different base URL: http://data.nodc.noaa.gov/cgi-bin/nph-dods/ghrsst
- To the left is what one example L4 product looks like in the OPeNDAP directory
- The next several slides will demonstrate how to select a particular file and look at its contents using OPeNDAP and your web browser
- From the listing for L4 MED (Mediterranean area) data from the EUR (European) RDAC, select day 304…

LTSRF Access: OPeNDAP



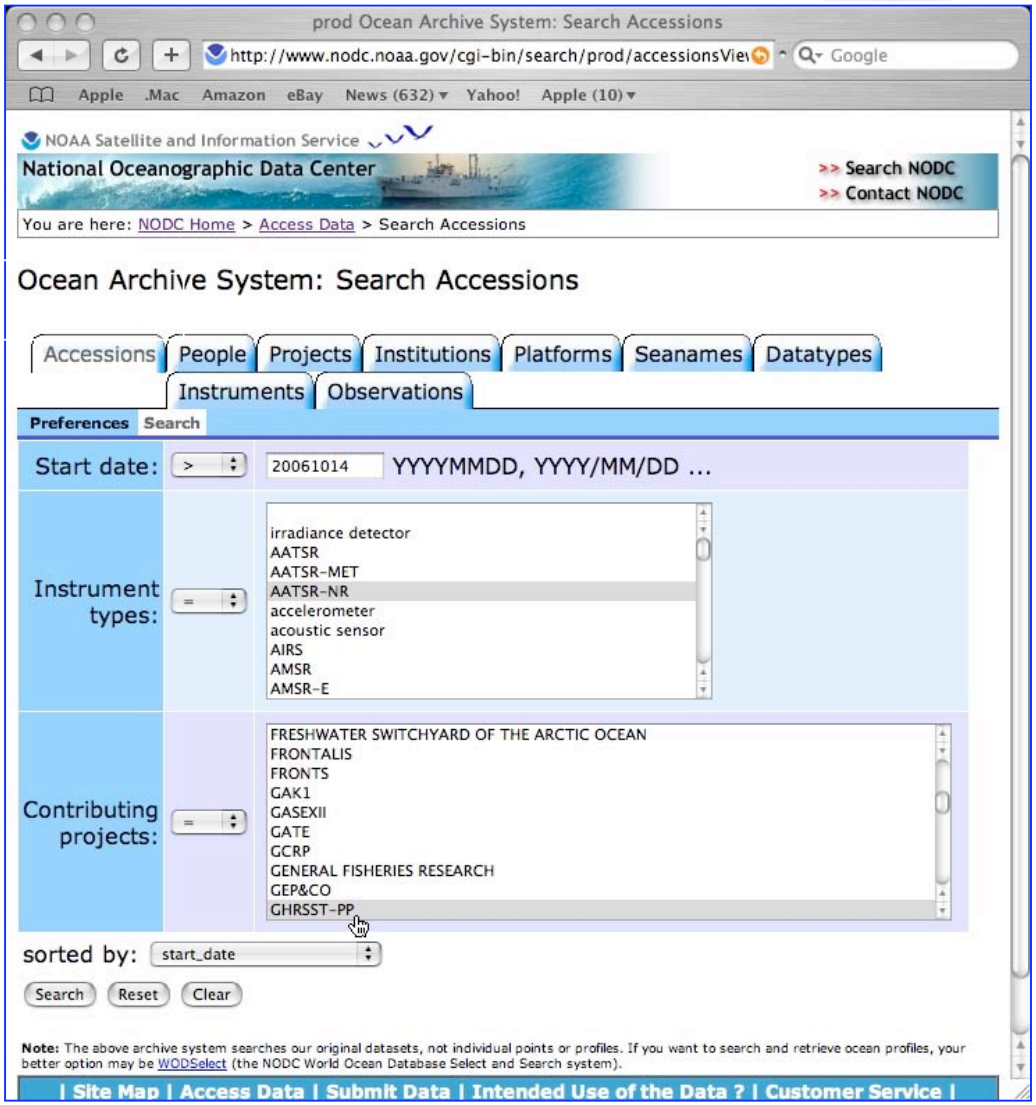
- **After selecting day 304, you'll see the files on the left**
  - The *.nc.bz2 is the bzip2-compressed netCDF data file
  - The FDGC*.xml file is the corresponding FGDC metadata record
  - The FR*.xml file is the original DIF-formatted metadata record (which contains much less information than the FGDC record)
- **Now click on the *.nc.bz2 file to open the OPeNDAP web form…**

LTSRF Access: OPeNDAP



- Here is the OPeNDAP web form, which shows the attributes and variables contained in the GHRSST netCDF files. You can select any of the parameters and then click on “Get ASCII” to see the data in plain text - you would not want to do this to download significant amounts of data but it can be useful for quickly browsing some of the contents.
- There is one more way to search for and access GHRSST data at the LTSRF…

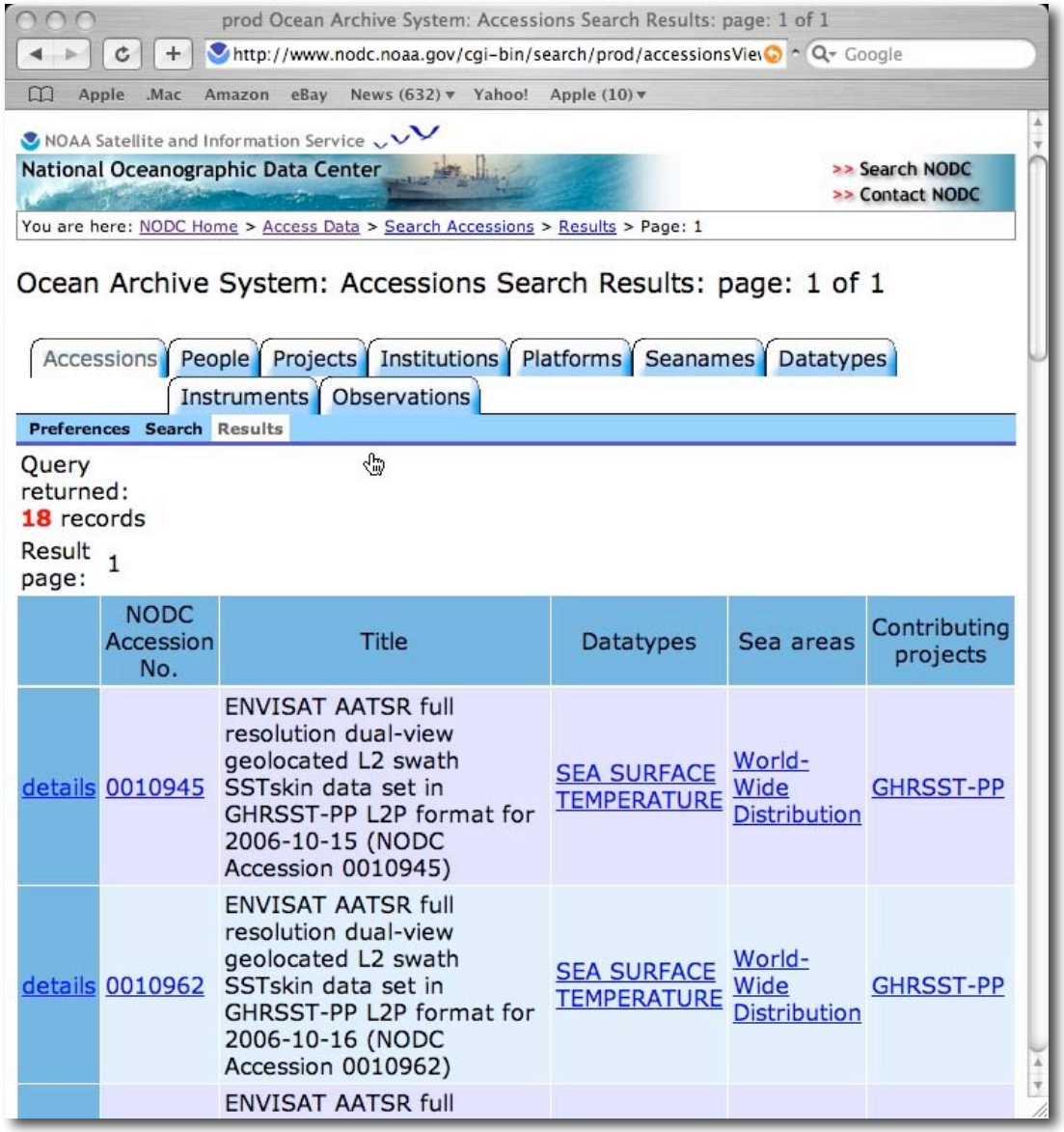
LTSRF Access: OAS



- Here is the general NODC Ocean Archive System (OAS), which you can use to find GHRSST datasets
- Following the link below, you can then select various fields to search on… to limit the searches to only GHRSST data, make sure you set Contributing Projects equal to "GHRSST-PP"
- The example here further limits the search to only GHRSST AATSR data (use instrument type = "AATSR-NR") since 14 October 2006.
- Click on "search"…

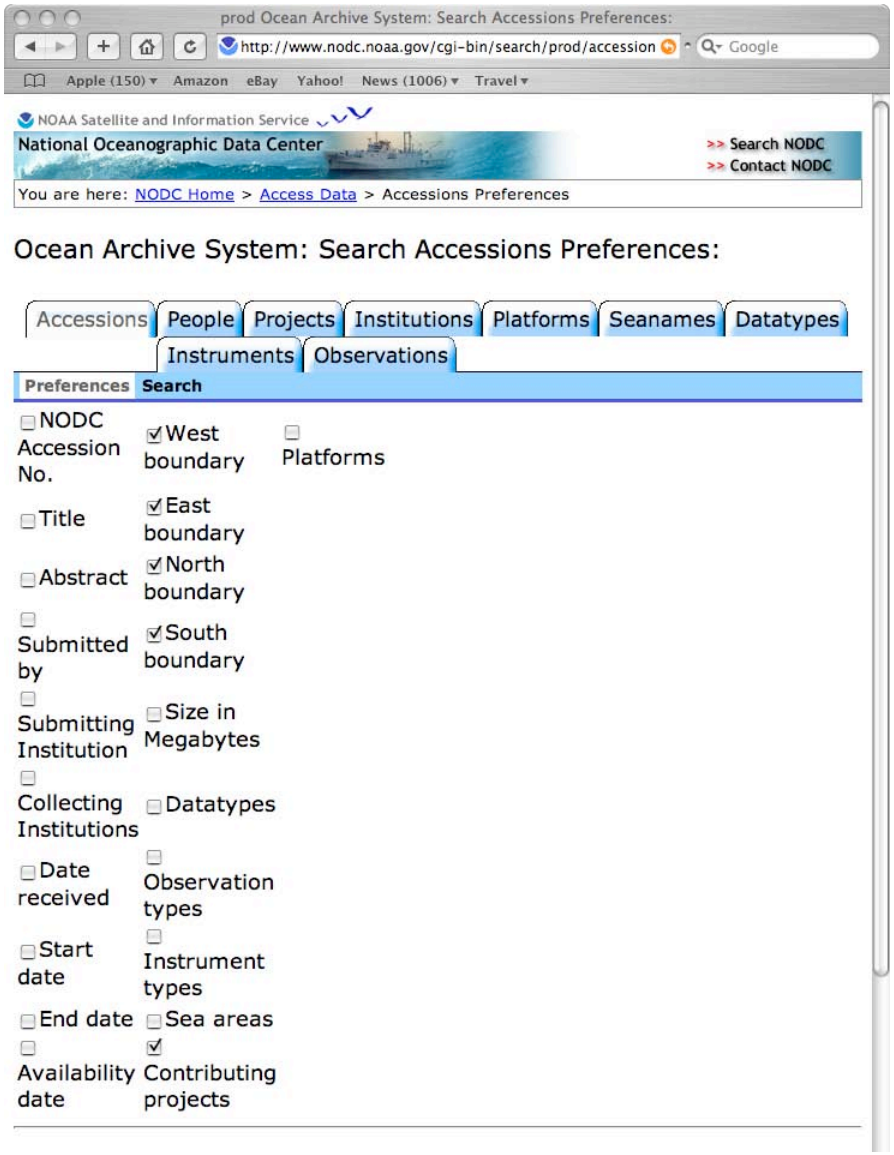
http://www.nodc.noaa.gov/cgi-bin/search/prod/accessionsView.pl/pref

LTSRF Access: OAS



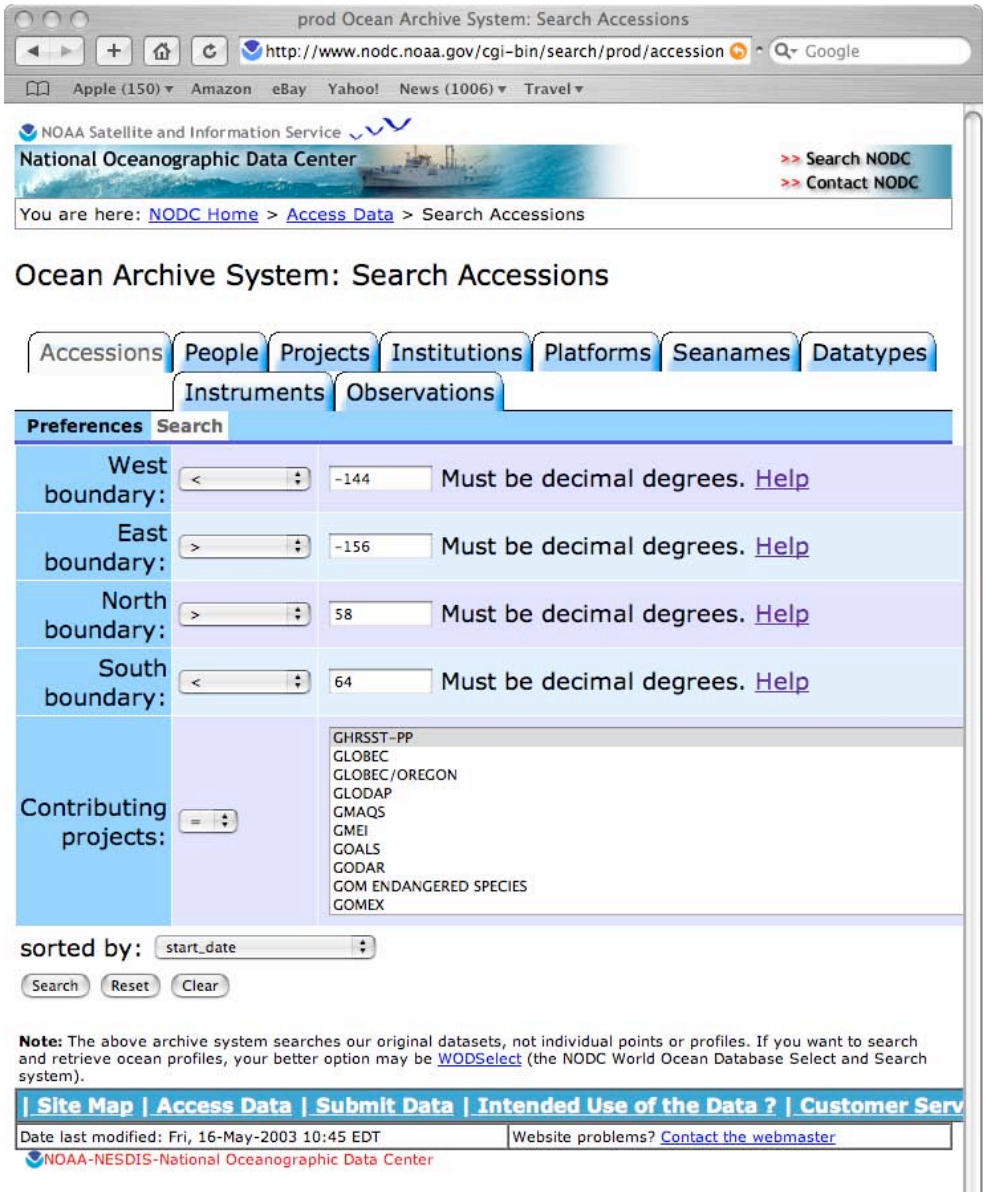
- Here are the results of that search… when this example was generated, 18 records (each record consists of all of the files from a given RDAC, for a given sensor, on a given day) matched the search criteria.
- You can click on “details” for more metadata information or on the accession number to go right to the archive directory if you wish to access the data

LTSRF Access: OAS



- **Important note:** the OAS geographic search capability is counter-intuitive, and works basically opposite to how you might expect
- To use geographic searches, set your preferences to include the four boundary elements, and again remember to set Contributing Projects equal to "GHRSST-PP"
- Click on "Continue" at the bottom of the page (not shown here)

LTSRF Access: OAS



- As an example, search for GHRSST data that include Cook Inlet, Alaska. A box that bounds this region spans 58 to 64º North, and -156 to -144º West (Remember West longitudes and South latitudes are negative).
- In most search tools, you'd simply use 58 as South, 64 as North, -156 as West, and -144 as the East Boundary
- HOWEVER, the OAS is different. See how this example is implemented in the image on the left. It would take several pages to try to explain this in words… so follow this example. At the time this presentation was created, 2911 records were returned.

We hope this simple tutorial helps, but please remember…

- There are many people ready to assist you - at the RDACs, at the GDAC, and at the LTSRF. Don't hesitate to call or email!
- More sophisticated access and browse mechanisms exist at many RDACs (for example, Live Access Servers) and are being developed for the GDAC and LTSRF. This presentation is intended to focus only on the basic GDAC and LTSRF access techniques like FTP, OPeNDAP, and the Ocean Archive System (OAS).

For More Information:

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http://ghrsst.nodc.noaa.gov