

HYCOM Data Management -- opportunities & planning --

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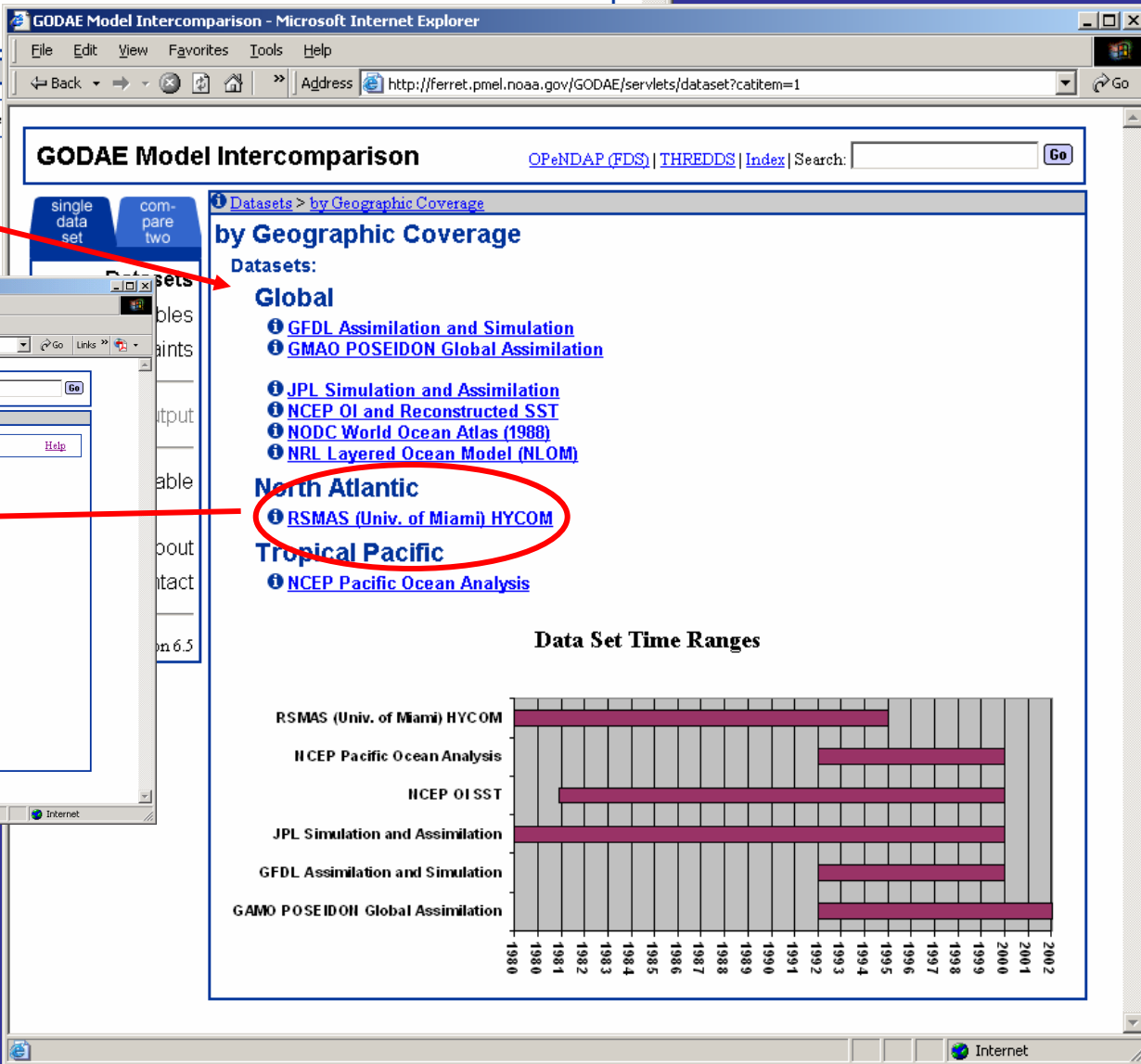
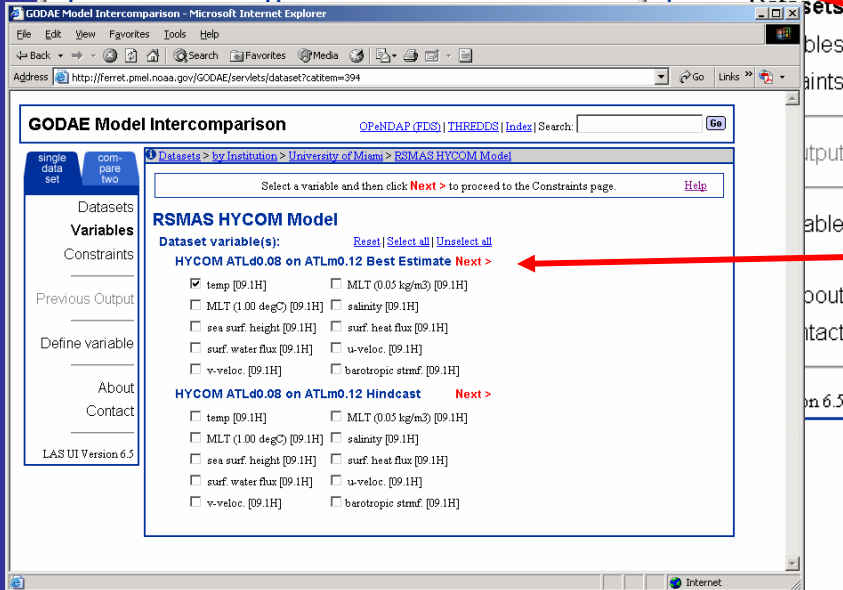
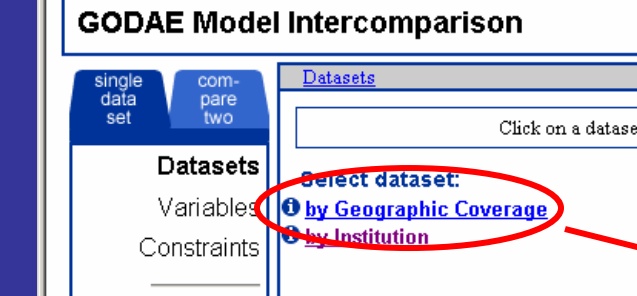
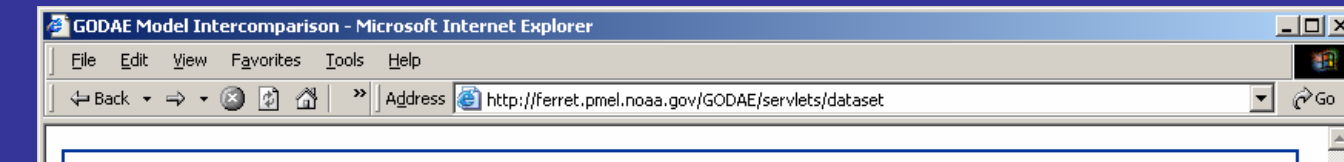
Roland Schweitzer (Weathertop Consulting),

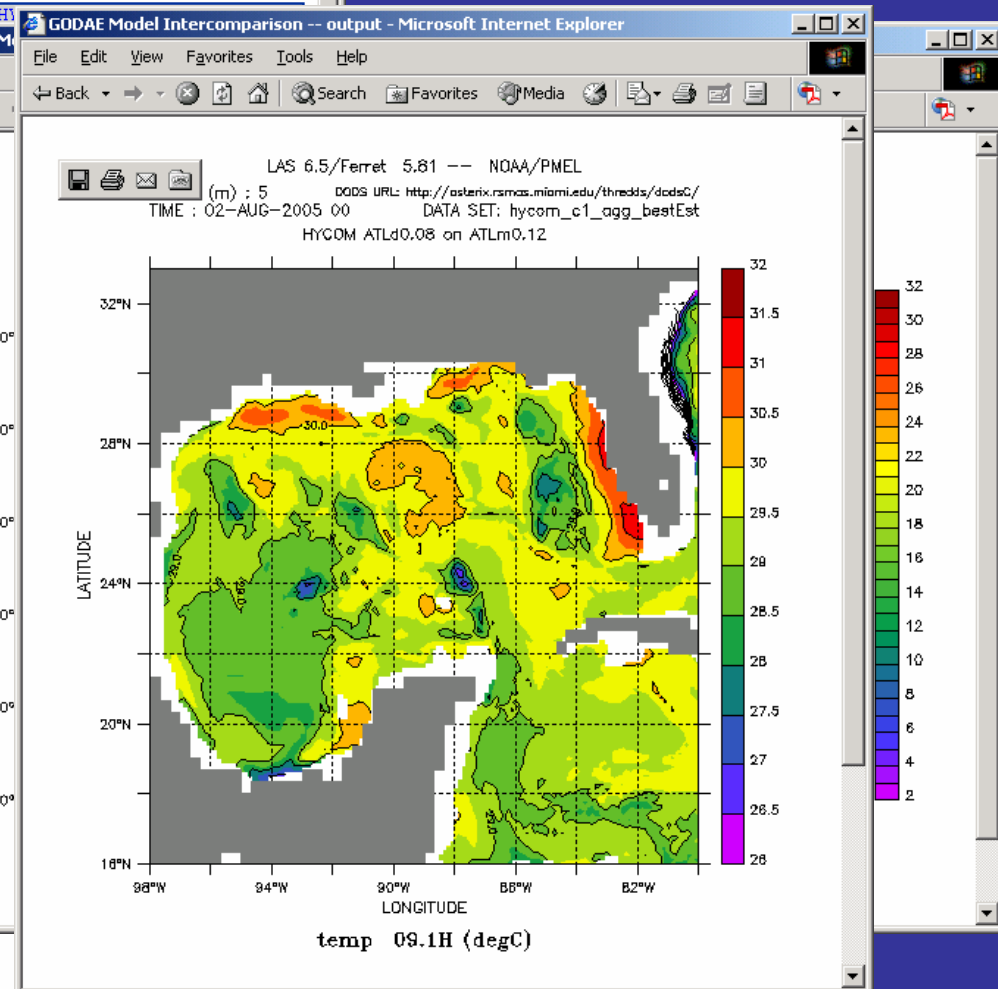
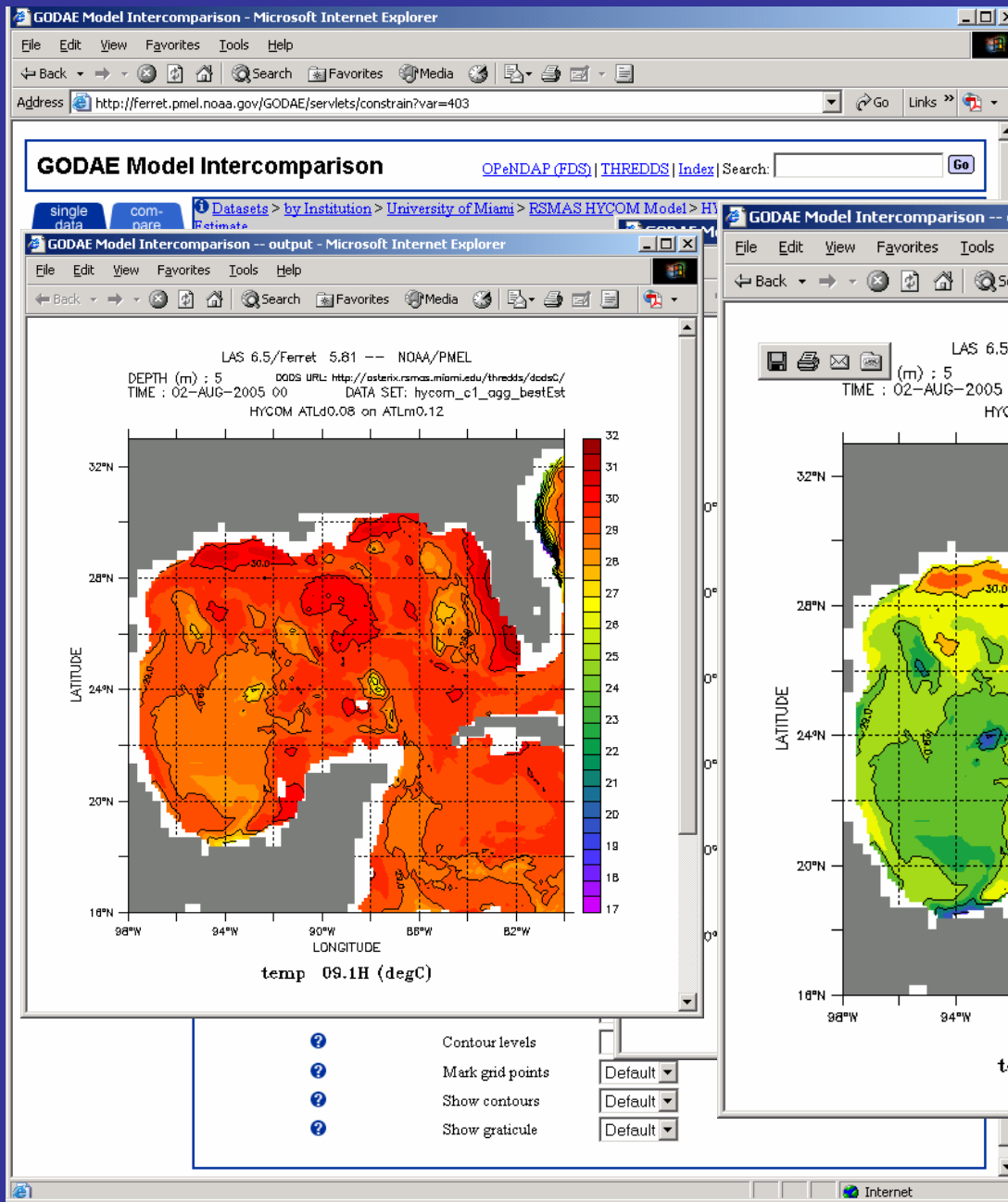
Ansley Manke (NOAA/PMEL)

The OPeNDAP developers

Phil Sharfstein, Dave Dimitriou (FNMOC)

HYCOM National Meeting
December, 2005





GODAE Model Intercomparison - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address <http://ferret.pmel.noaa.gov/GODAE/servlets/constrain?var=59> Go

GODAE Model Intercomparison

[OPeNDAP \(FDS\)](#) | [THREDDS](#) | [Index](#) | Search:

[Datasets](#) > [by Geographic Coverage](#) > [Global](#) > [NRL Layered Ocean Model \(NLOM\)](#) > [NRL Layered Ocean Model \(NLOM\) \(from APDRC\)](#)

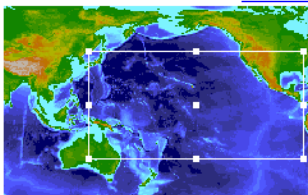
Variable(s): **Sea Surface Height**

Select your desired view (geometry of output) and output (type of product). Then set the 4-D region (lon-lat-depth-time) and any additional constraints. [Help](#)

Select view: Longitude-Latitude map (xy) [Next >](#)

Select output: Color plot

Select region: Equatorial Pacific [Use the tv](#)

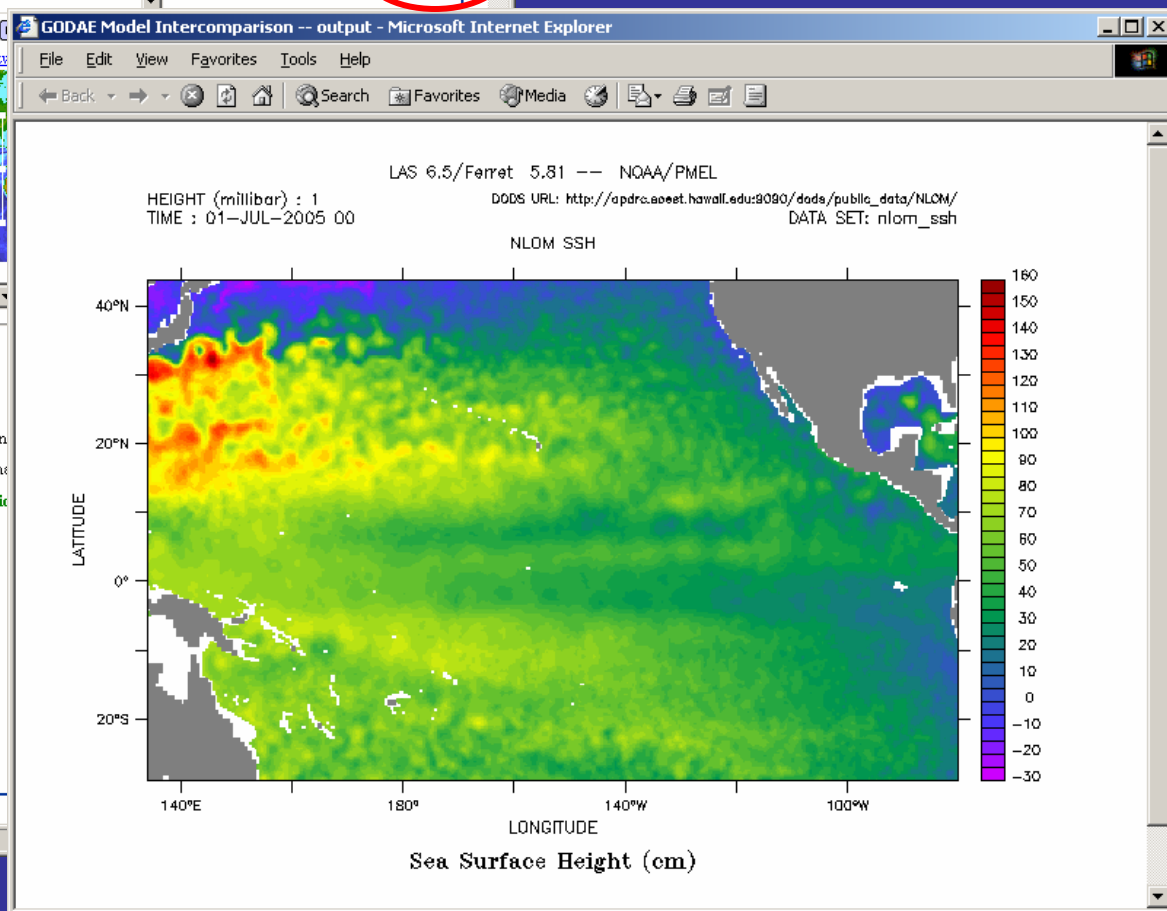


Select time: 01 Jul 2005

Select options:

- ☐ Image format
- ☐ Plot size
- ☐ View interpolation
- ☐ Show reference map
- ☐ Evaluate expression
- ☐ Land fill style
- ☐ Palette
- ☐ Color fill style
- ☐ Color fill levels
- ☐ Contour levels
- ☐ Mark grid points
- ☐ Show contours
- ☐ Show graticule

Get output for selected variable



GODAE Model Intercomparison - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address <http://ferret.pmel.noaa.gov/GODAE/servlets/constrain?var=59>

GODAE Model Intercomparison

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[Datasets](#) > [by Geographic Coverage](#) > [Global](#) > [NRL Layered Ocean Model \(NLOM\)](#) > [NRL Layered Ocean Model \(NLOM\) \(from APDRC\)](#)

Variable(s): **Sea Surface Height**

single data set | compare two

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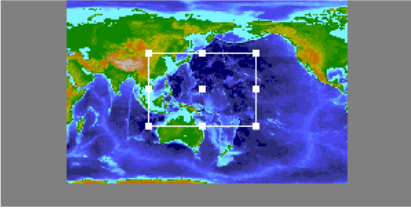
LAS UI Version 6.5

Select your desired view (geometry of output) and output (type of product). Then set the 4-D region (lon-lat-depth-time) and any additional constraints. [Help](#)

Select view: Longitude-Latitude map (xy)

Select output: Color plot

Select region: Full Region [Use the two-click map](#) [Help](#)



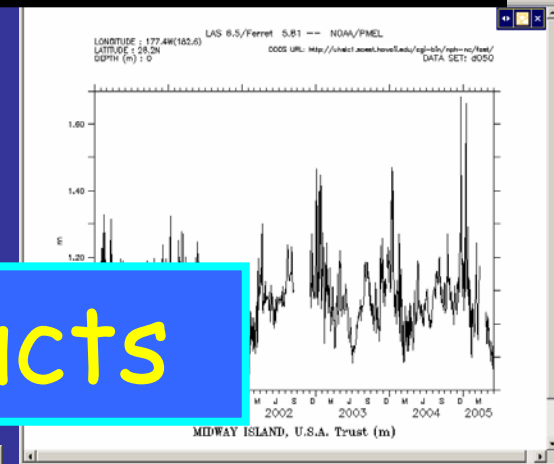
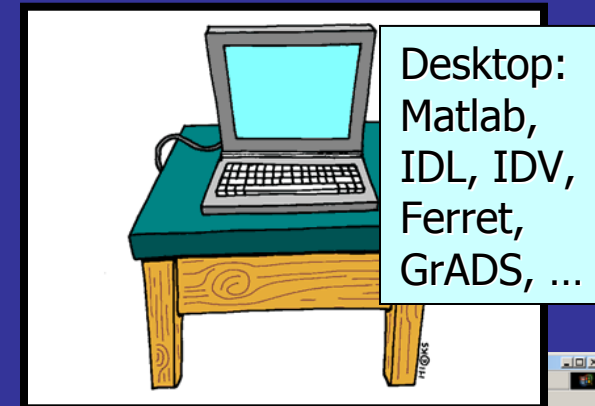
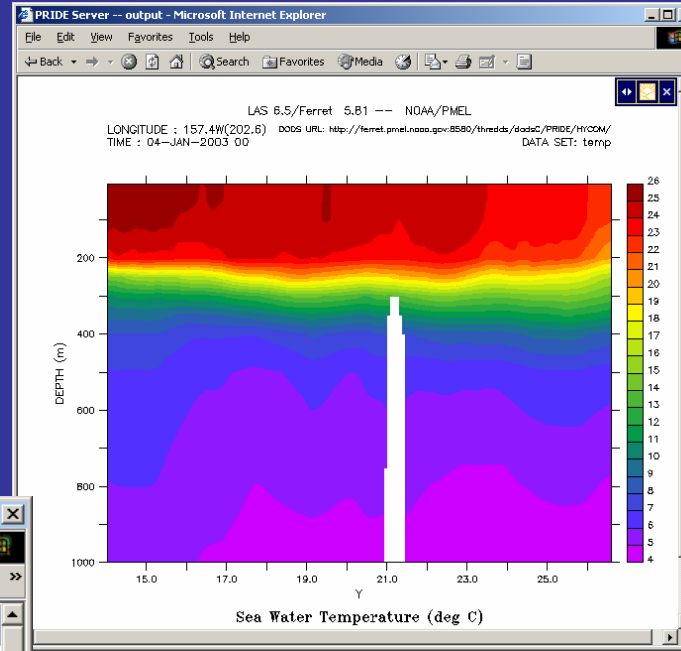
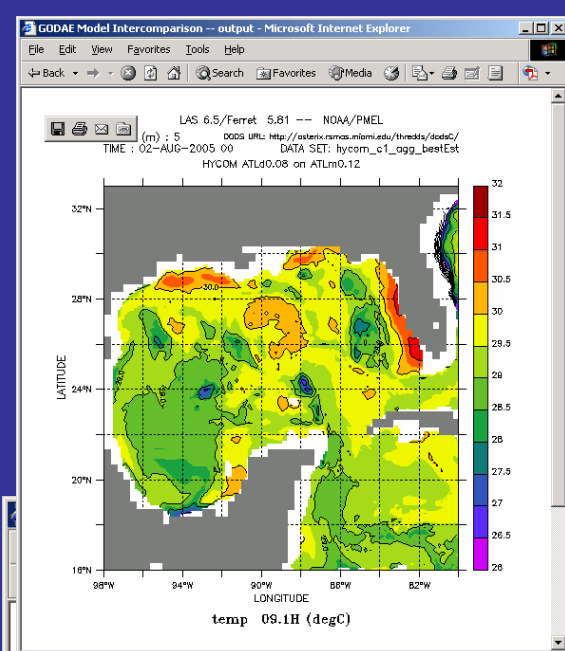
44.0 N
106.0 E 160.0 W
21.0 S

Select time: 29 Aug 2002 29-Aug-2002

Select options:

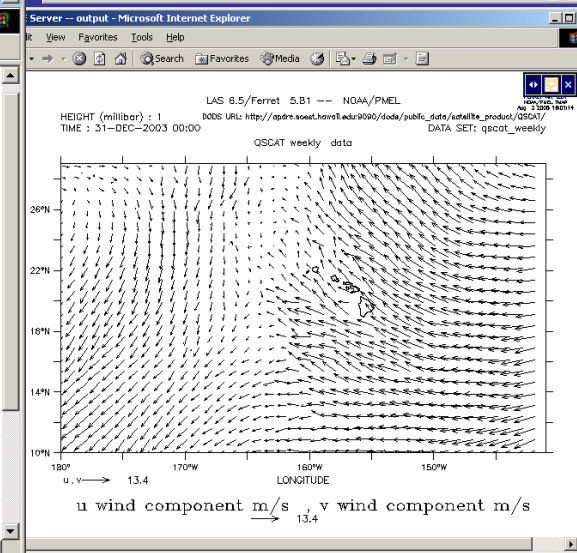
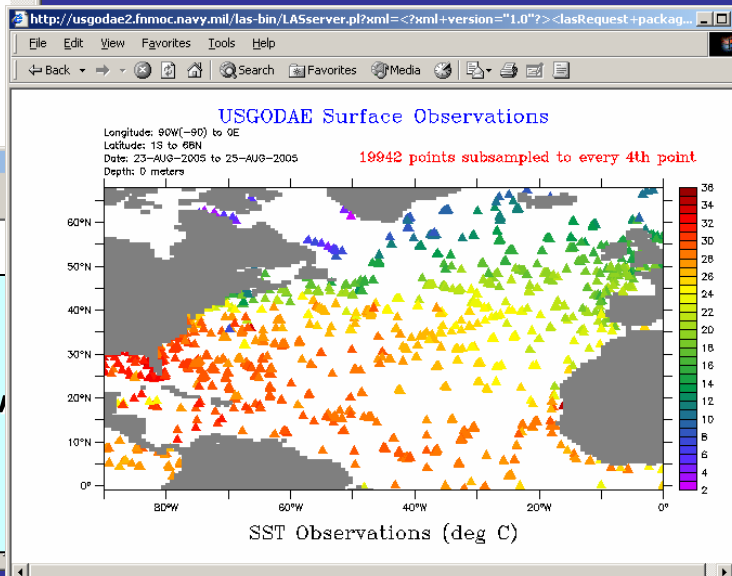
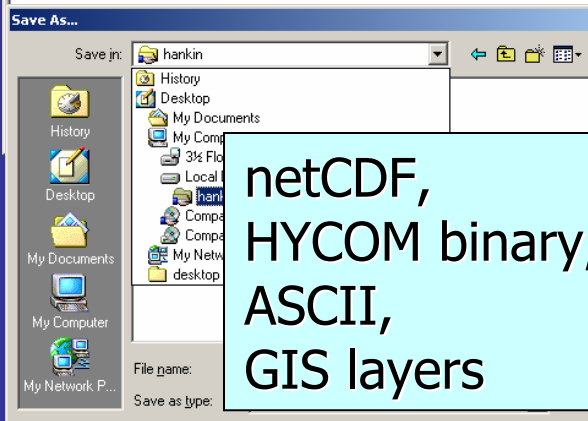
- ☐ Image format: Default
- ☐ Plot size: default
- ☐ View interpolation: Off
- ☐ Show reference map: Yes
- ☐ Evaluate expression:
- ☐ Land fill style: Default
- ☐ Palette: Default
- ☐ Color fill style: Default
- ☐ Color fill levels:
- ☐ Contour levels:
- ☐ Mark grid points: Default
- ☐ Show contours: Default
- ☐ Show graticule: Default

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Information Products

01-JAN-2005 12 / 7306: 1.119
 02-JAN-2005 12 / 7307: 1.136
 03-JAN-2005 12 / 7308: 1.081
 04-JAN-2005 12 / 7309: 1.047
 05-JAN-2005 12 / 7310: 1.040
 06-JAN-2005 12 / 7311: 1.116
 07-JAN-2005 12 / 7312: 1.258



GODAE Model Intercomparison - Microsoft Internet Explorer

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GODAE Model Intercomparison

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single data set

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Variable(s): **Sea Surface Height**

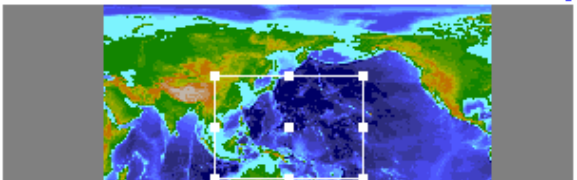
Select your desired view (geometry of output) and output (type of product). Then set the 4-D region (lon-lat-depth-time) and any additional constraints. [Help](#)

Select view:

Select output:

Select region:

[Use the two-click map](#) [Help](#)



LAS: Desktop Application Data Access Scripts - Microsoft Internet Explorer

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[Matlab](#)

```
loadadds('http://ferret.pmel.noaa.gov/GODAE-FDS/LAS/NLOM/ssh?SSH[1185:1185][0:0][816:1856][796:1866]')
```

```
SET REGION/x="106.0": "200.0"/y="-21.0": "44.0"/k=1/t="29-Aug-2005 00:00:00": "29-Aug-2005 00:00:00"
```


GODAE Model Intercomparison

[OPeNDAP/FDS](#)

single
data
set

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Variable 1

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LAS UI Version 6.5

1: [Datasets](#) > [by Geographic Coverage](#) > [Global](#) > [NRL Layered Ocean Model \(NLOM\) \(from APDRC\)](#)

1: Variable(s): **Sea Surface Height**

2: [Datasets](#) > [by Geographic Coverage](#) > [Global](#) > [NRL Layered Ocean Model \(NLOM\) \(from APDRC\)](#)

2: Variable(s): **Sea Surface Height**

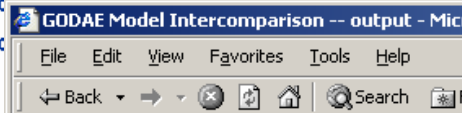
Select your desired view (geometry of
Then set the 4-D region (lon-lat-depth)

Select view:

Longitude-Latitude map (xy)

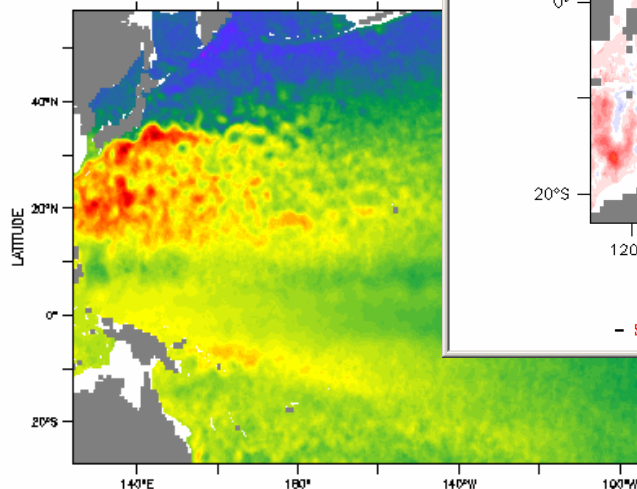
Select

Select



LAS 6.5/Ferret 5.81 -- NOAA

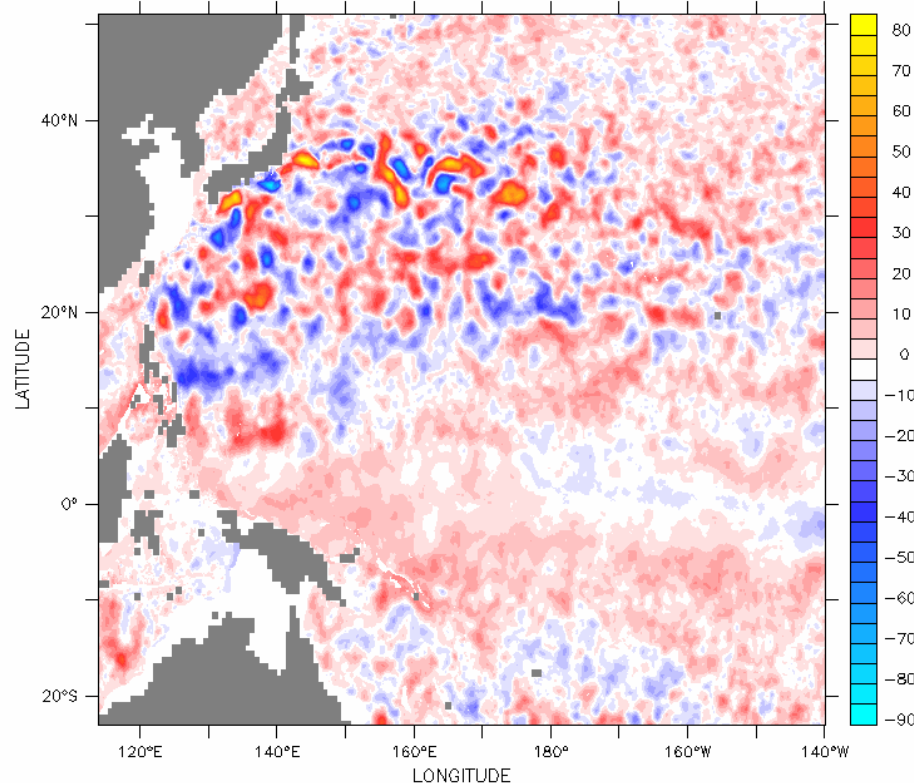
Time(1): 01-Jun-2003 00:00:00



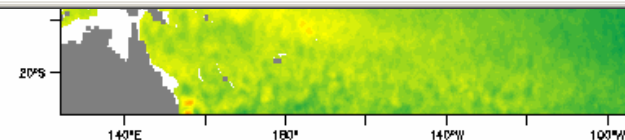
Sea Surface Height(cm) from NRL Layered Ocean Model (NLOM) (from APDRC)

LAS 6.5/Ferret 5.81 -- NOAA/PMEL

Time(1): 01-Jun-2003 00:00:00 Time(2): 01-Jun-2004

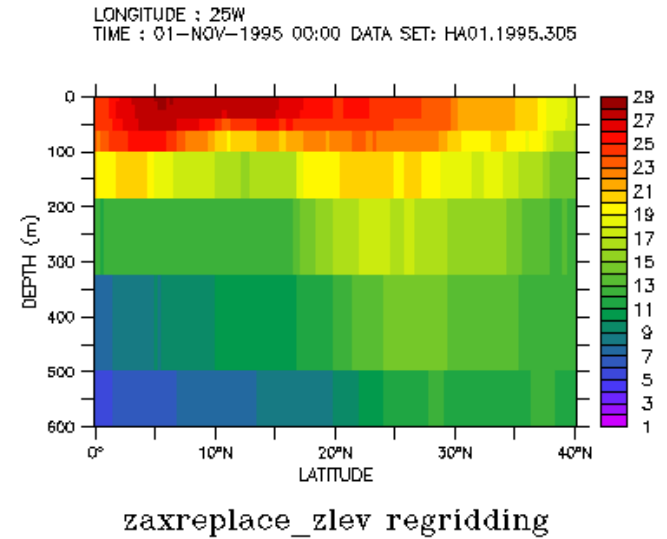
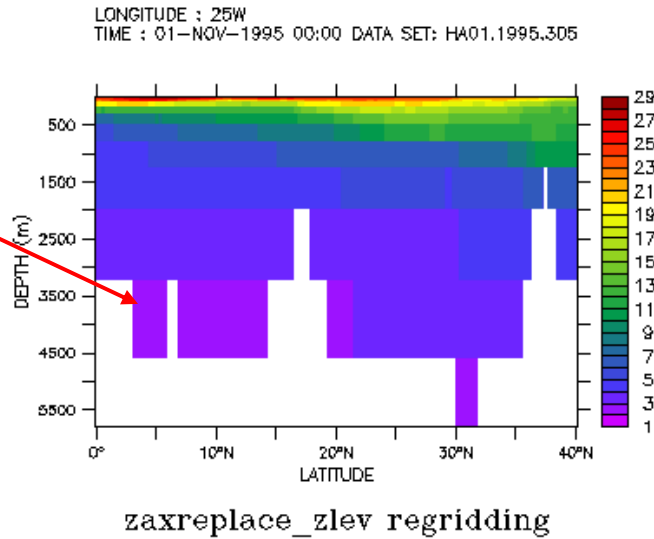
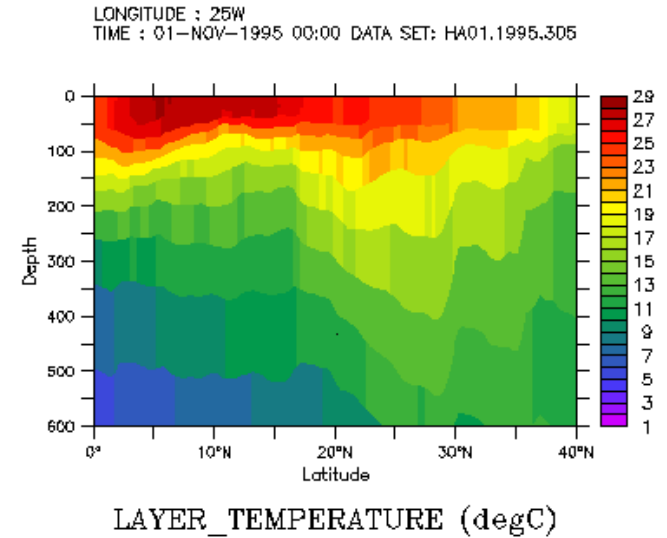
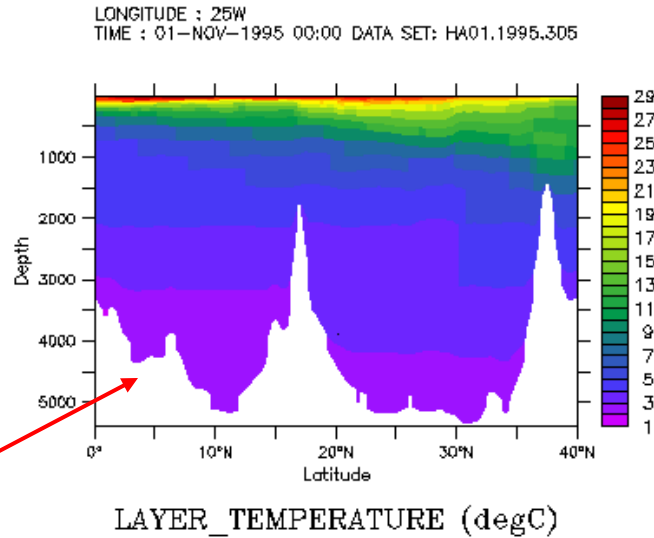


Sea Surface Height (cm) from NRL Layered Ocean Model (NLOM) (from APDRC)(1)
- Sea Surface Height (cm) from NRL Layered Ocean Model (NLOM) (from APDRC)(2)

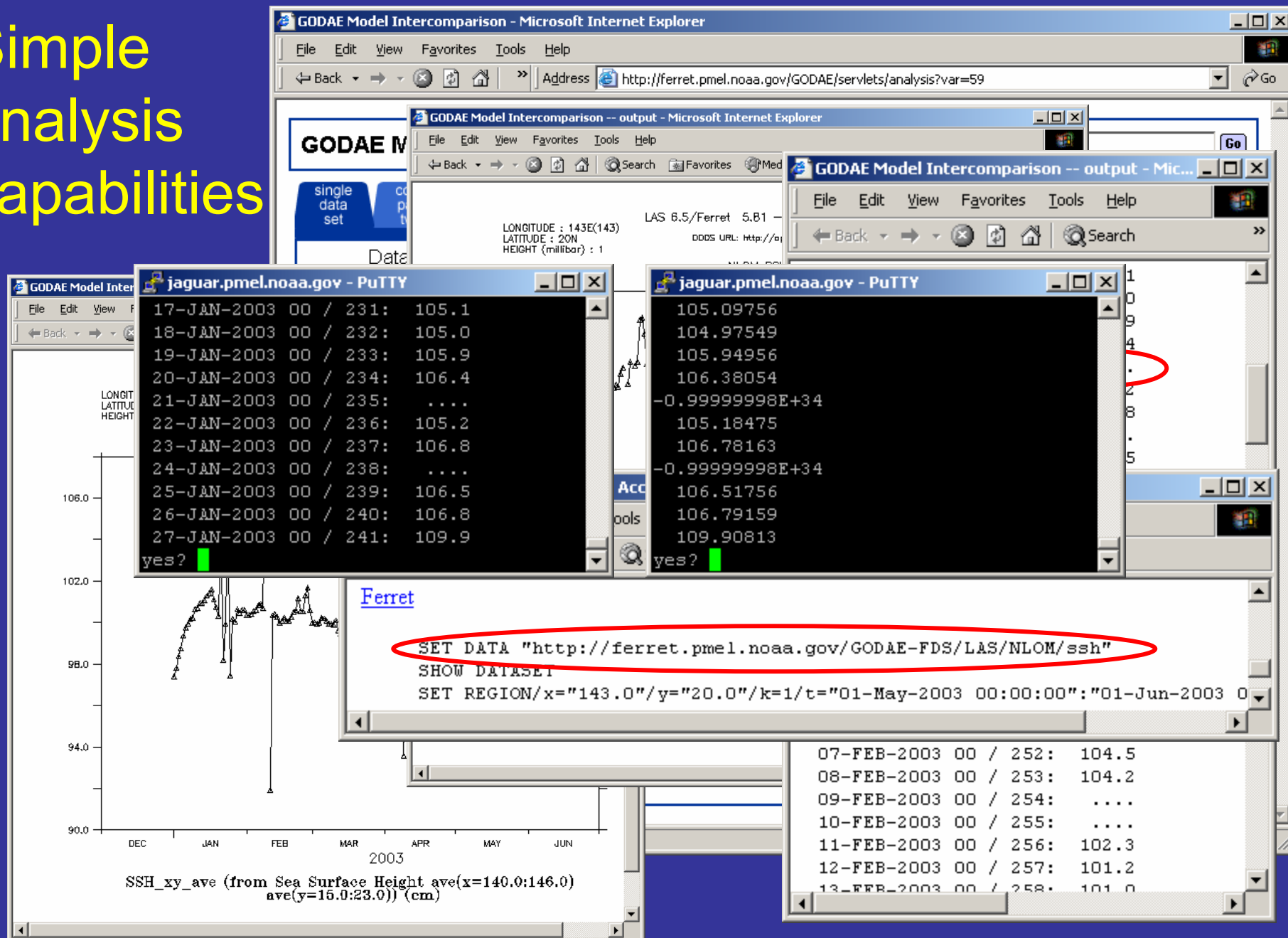


Sea Surface Height(cm) from NRL Layered Ocean Model (NLOM) (from APDRC)

Similarly
from
hybrid-Z
to
rectilinear



Simple analysis capabilities



HYCOM data at the desktop

(for Matlab, IDL, Ferret, GrADS, ...)

The remote dataset is just a “filename”

http://server/FDS/my_output

FDS is an OPeNDAP server

- “standardizes” datasets
- can perform analyses

Vertical average of variable “TEMP”

http://server/FDS/expr_{my_output}{Tave=TEMP[Z=@AVE]}

FDS

- “Delayed evaluation”
 - The whole domain appears to be transformed
 - Calculations are on-demand, “surgical”
- Can greatly reduce network data volumes
- Can provide regridding on-the-fly

Ocean obs via LAS (incl. custom "constraints")

Live Access to the World Ocean Data Base - Microsoft Internet Explorer

Address: <http://ferret.pmel.noaa.gov/WODB/servlets/constrain?var=14>

Live Access to the World Ocean Data Base

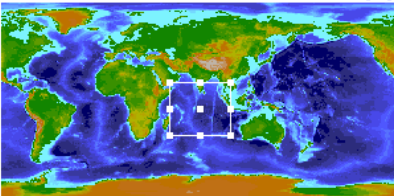
single data set | compare two

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1 Datasets > World Ocean DataBase Profile Observations
Variable(s): Temperature

Select your desired view (geometry of output) and output (lat-depth-time) and any additional constraints.

Select view: Longitude-Latitude
Select output: Metadata plot (GIF)
Select region: No Regions Available [Go] [Don't use map app](#)



Select time range: 01 Jan 1900 to 31 Dec 2001
Select depth range: 0 to 100
Select Constraints:
Apply: ☐ Probe Type = OSD
Apply: ☐ Project = ABYSSAL BOUNDARY CURRENT STUDY

Next >

File Edit View Favorites Tools Help

Address: <http://ferret.pmel.noaa.gov/WODB/servlets/data>

Live Access to the World Ocean Data Base

Search: [] Go

1 Datasets > World Ocean DataBase Profile Observations
Variable(s): Temperature

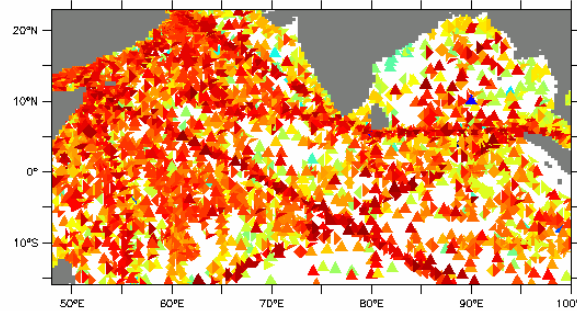
You may modify the appearance of plots through the "Options" page. The navigation bar on the left will take you directly to any LAS page. [Help](#)

[Start Over >](#)

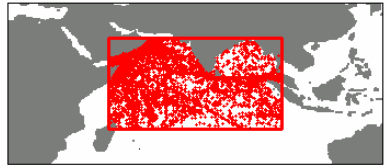
World Ocean DataBase Profile Observations

Longitude: 48E to 100E
Latitude: 16S to 23N
Date: 01-JAN-1900 to 31-DEC-2001

color key = hours since 25-FEB-1905



19-DEC-2000
09-APR-1977
29-JUL-1953
17-NOV-1929
25-FEB-1905



GTS Ocean obs on US GODAE Server

Live Access to USGODAE Data - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address <http://usgodae2.usgodae.org/las/servlets/constrain?var=735>

Links [pending](#) [CVS](#) [LAS](#) [PMEL](#) [Webster](#) [~HANKIN](#) [NOAA Locator](#) [FERI](#)

Live Access to USGODAE Data

single data set
compare two

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LAS UI Version 6.2.1

1 Datasets > USGODAE Data Sets > In-Situ Data > USGODAE Surface Obs

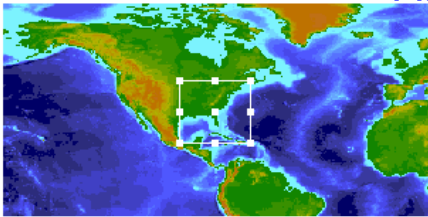
Variable(s): **SST Observations**

Select your desired view (geometry of output) and Then set the 4-D region (lon-lat-depth-time) and a

Select view: Latitude-longitude

Select output: Surface values plot (GIF)

Select region: Full Region [Don't use map applet](#)

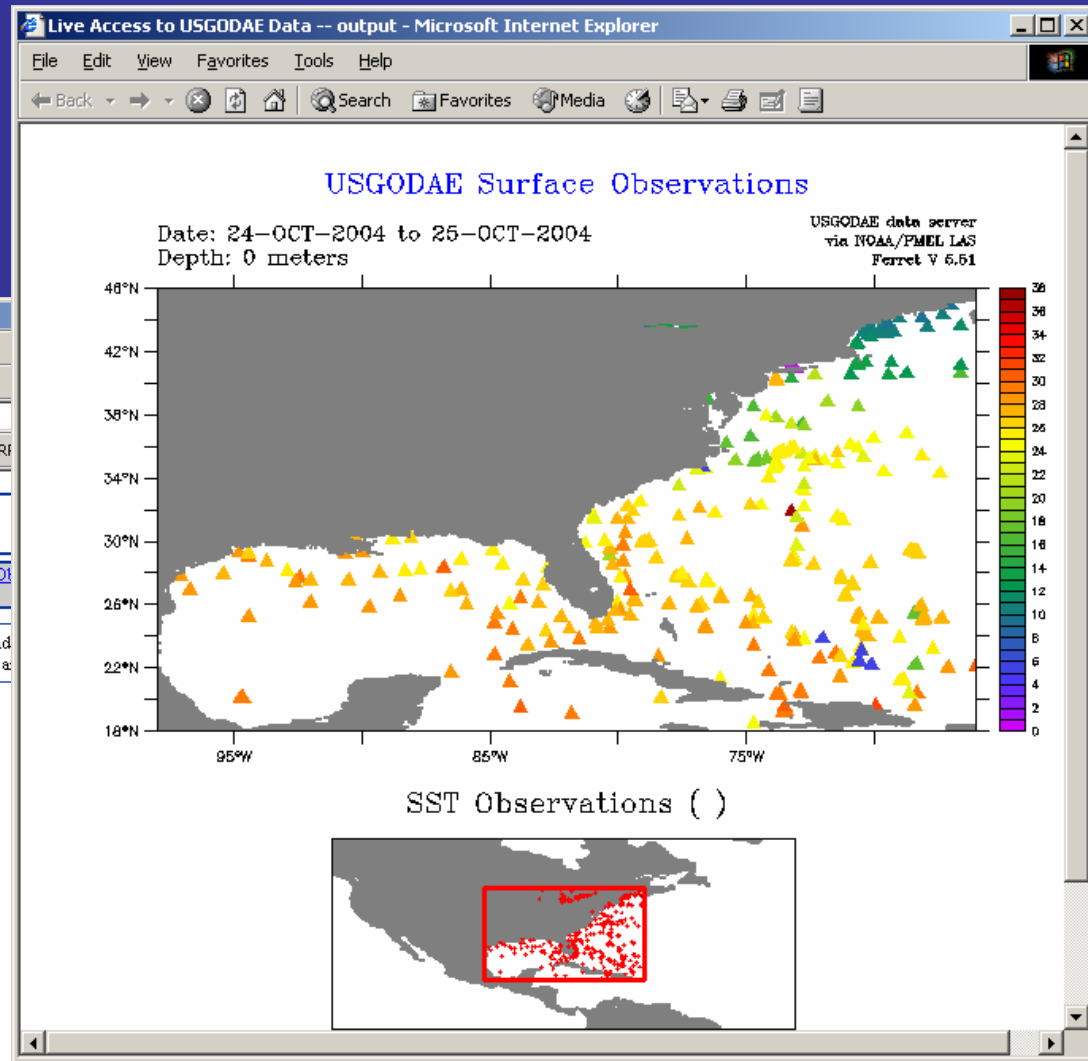


Select time range: 24 Oct 2004 to 25 Oct 2004

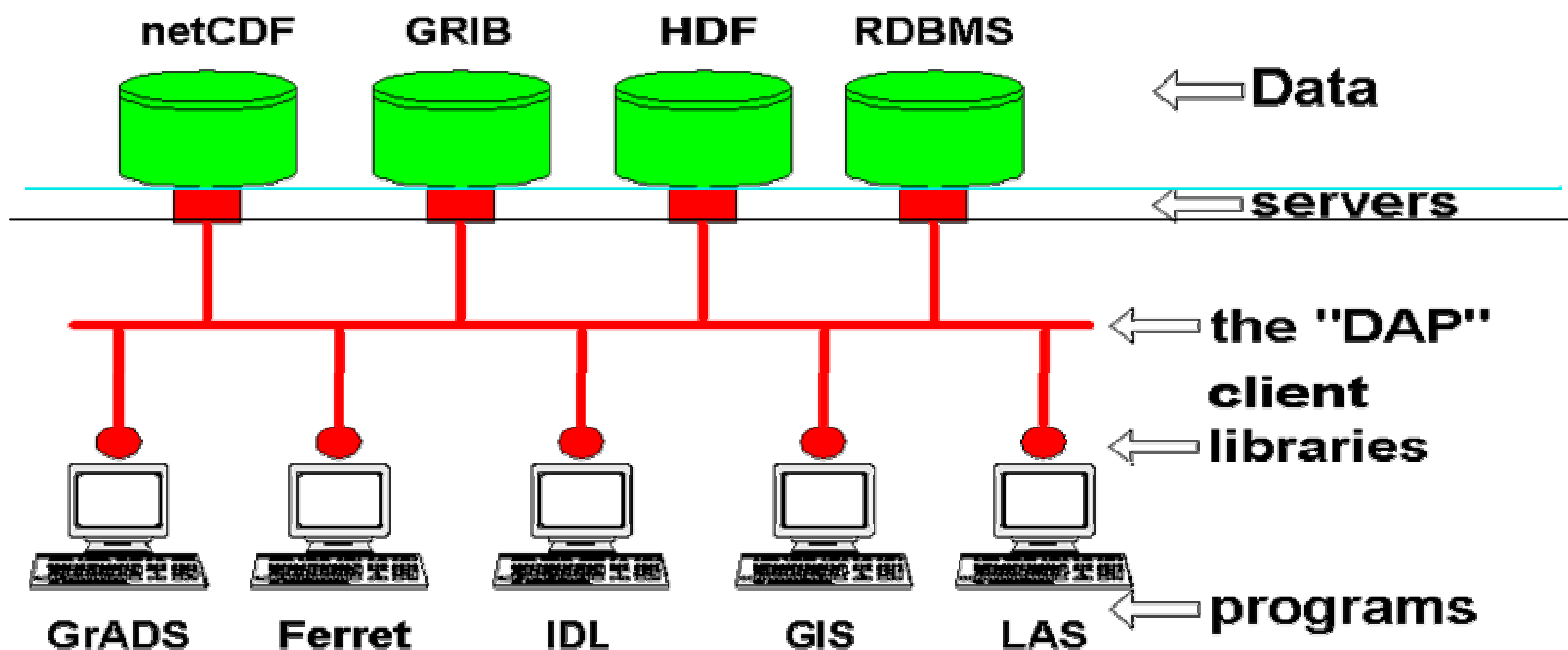
Select Constraints:

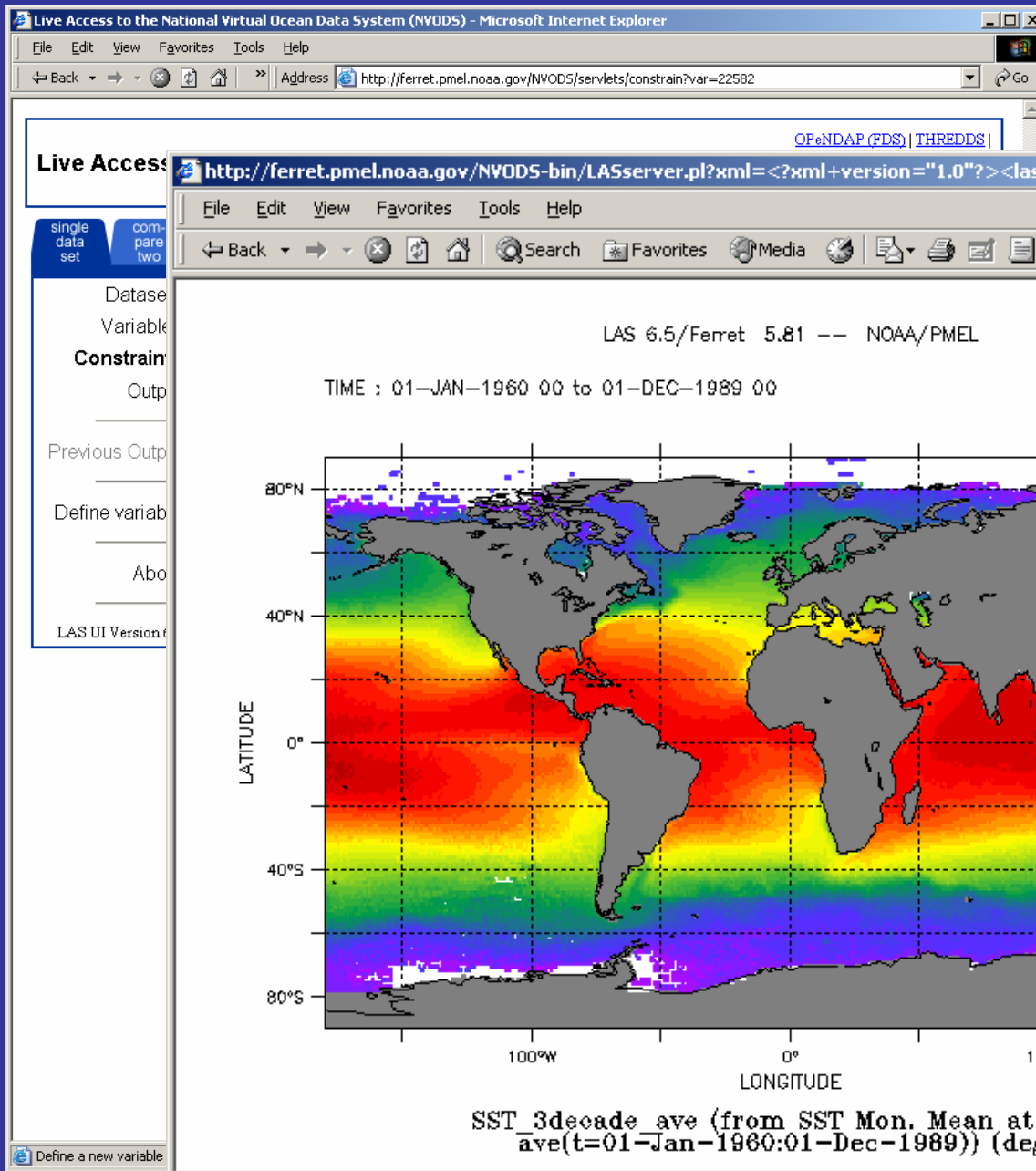
Apply: ☐ Age of Observation

[Next >](#)



OPeNDAP: network access to data and “semantic metadata”





“Scripted” access to LAS

Query available data sets:

```
>lasls http://cpu/LAS
```

Query variables in data set “model_1”:

```
>lasls http://cpu/LAS model_1
```

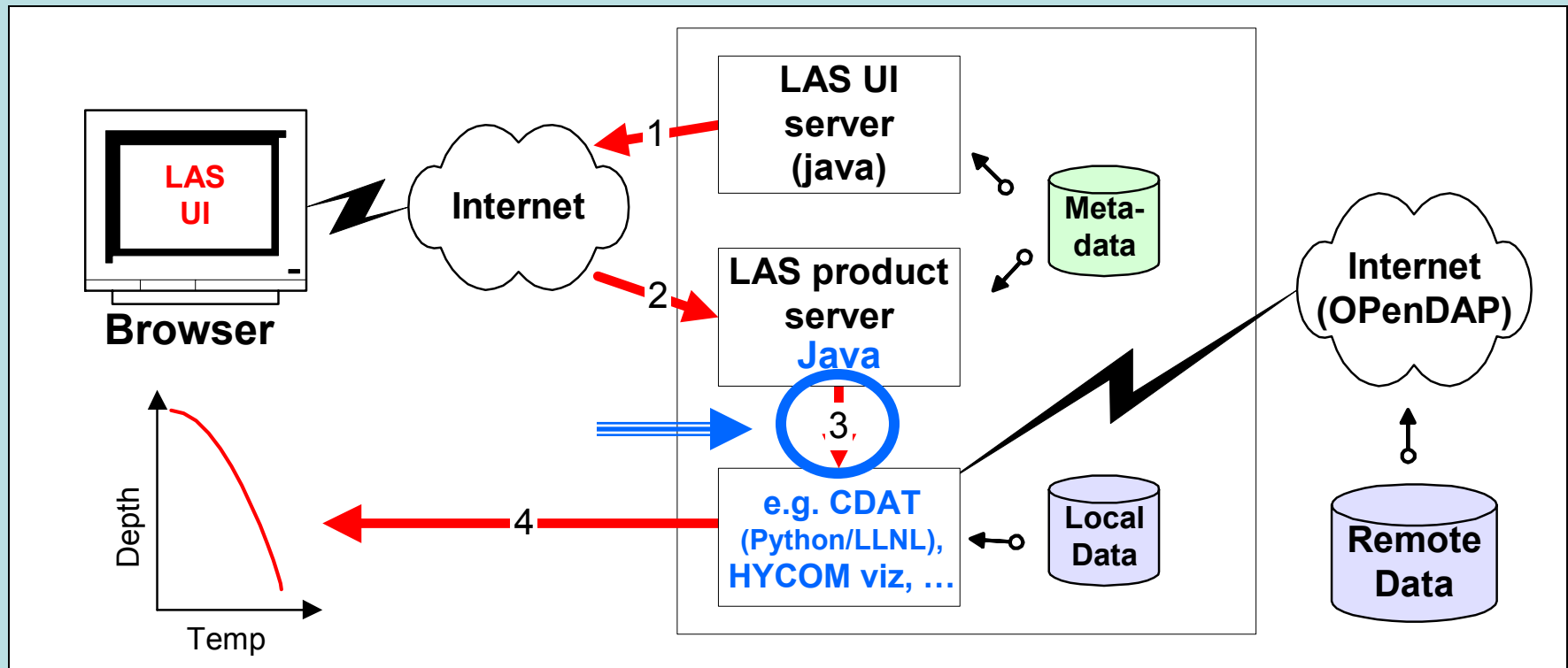
Query space-time domain:

```
>lasls http://cpu/LAS model_1 sst
```

Request a subset of data as a file: (“asc” for ASCII format)

```
>lasget -x 20:60 -y 20:60 -t 11-Dec-2000 -f asc  
http://cpu/LAS model_1 sst
```

LAS -- an "Information Product Server"

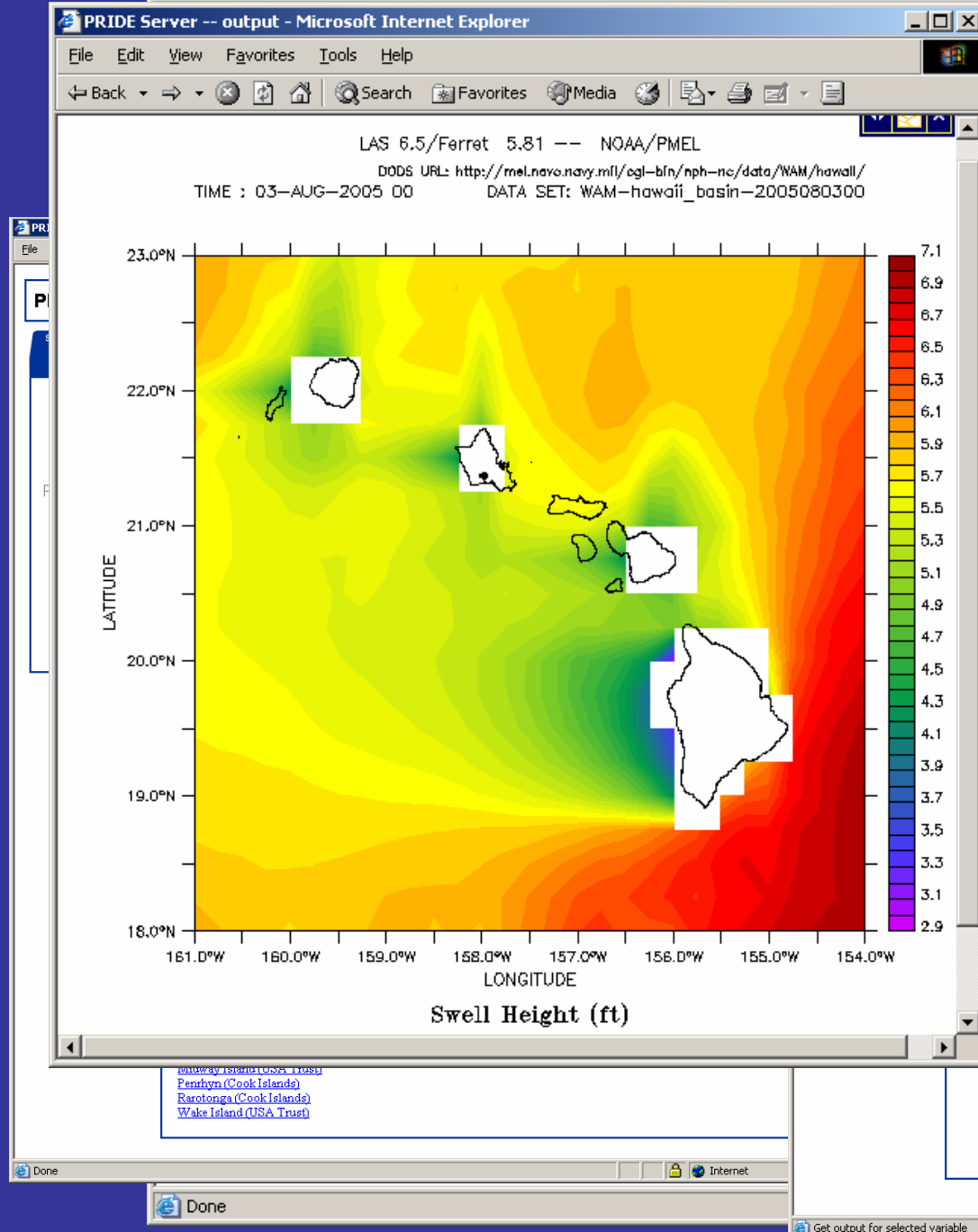


- XML Metadata contains the "intelligence"
- Back end applications do the real work
- OPeNDAP provides remote data access

New: Back end application via SOAP Web Service

Dec. 03  <http://fer>





PRIDE Server -- output - Microsoft Internet Explorer

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for access to data.

PRIDE Server -- output - Microsoft Internet Explorer

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[PRIDE Regions](#) > [Hawaiian Islands](#) > [Wave Ocean Model \(WAM\) 60 hour forecast \(from NAVOCEANO\)](#)
Variable(s): **Swell Height**

Select your desired view (geometry of output) and output (type of product).
Then set the 4-D region (lon-lat-depth-time) and any additional constraints. [Help](#)

ct view:
ct output:
ct region: [Use the two-click map](#) [Help](#)

23.0 N
161.0 W 154.0 W
18.0 N

ct time:

ct options:

- Image format:
- Plot size:
- View interpolation:
- Show reference map:
- Evaluate expression:
- Land fill style:
- Palette:
- Color fill style:
- Color fill levels:
- Contour levels:
- Mark grid points:
- Show contours:
- Show graticule:

HYCOM information & data portal

GFDL Research Projects - Microsoft Internet Explorer

Address http://www.gfdl.noaa.gov/gfdl_research.html

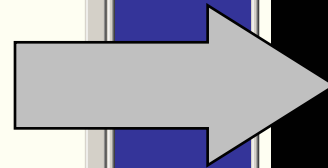
Information access

[Oceans and Climate](#)

[Climate Diagnostics](#)

[Weather and Atmospheric Physics](#)

http://www.gfdl.noaa.gov/~ljp/WAD/Group_old.html



GFDL Research Projects - Microsoft Internet Explorer

Address http://www.gfdl.noaa.gov/gfdl_research.html

Uniform data access

Live Access Server

Navigation server - Netscape

Search: Go

Select your desired view (geometry of output) and output (type of product). Then set the 4-D region (lon-lat-depth-time) and any additional constraints.

xy (lat/lon) slice

Shaded plot (GIF)

Full Region

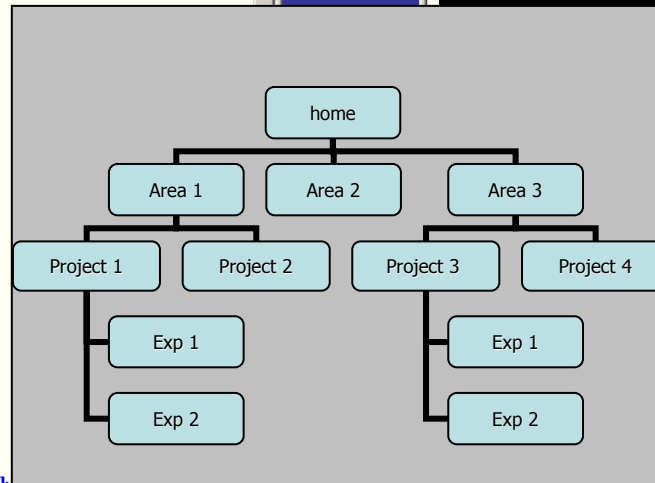
Don't use map applet

14-Jan-0151 12:00:00

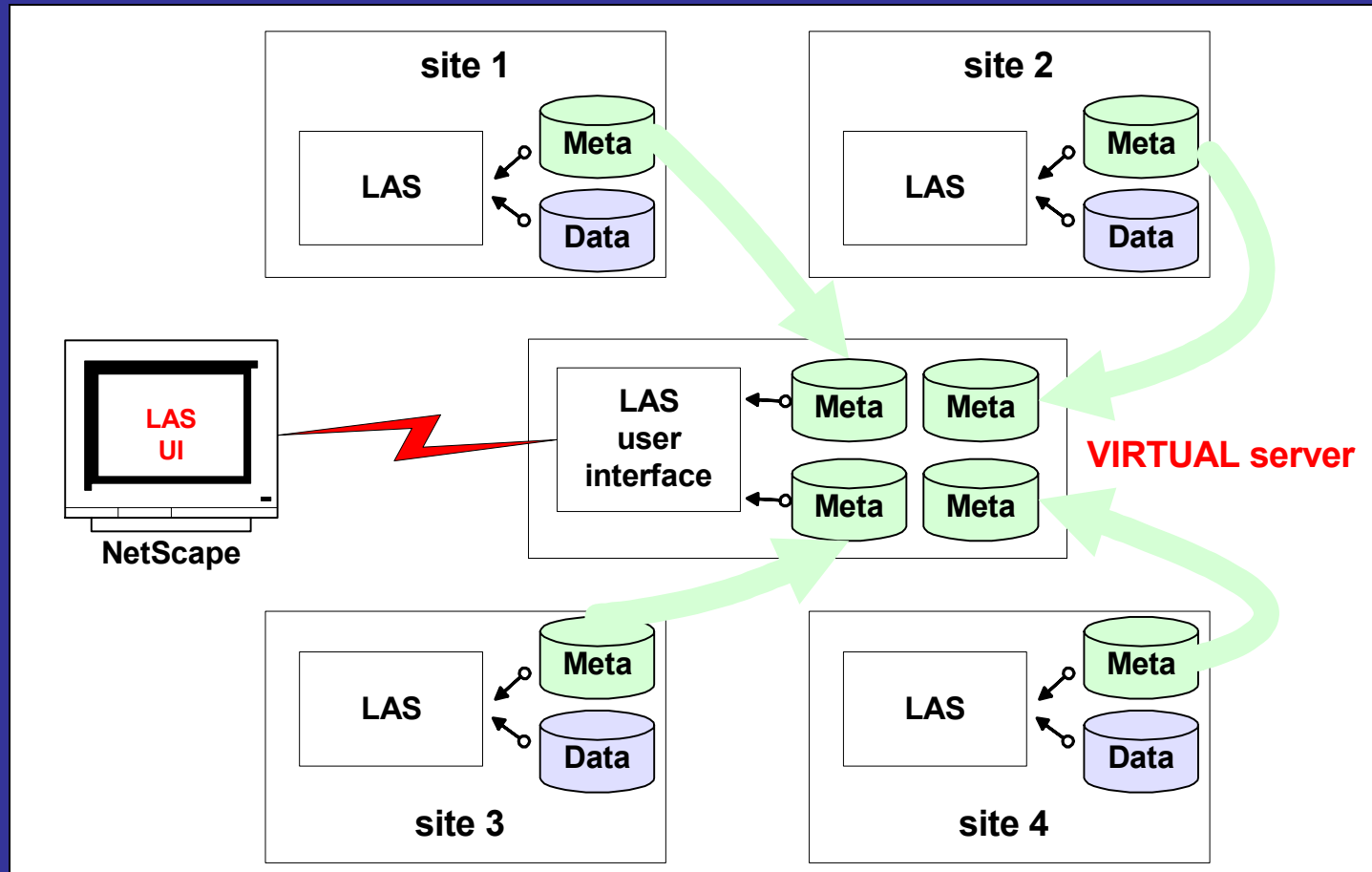
14-Jan-0151

Applet map running

http://www.gfdl.noaa.gov/~ljp/WAD/Group_old.html



Collaborating “sister” servers



Comparison between datasets becomes straightforward:
Servers request regridded data from one another via FDS.

for breakout: next steps

Two categories of data management service:

1. Inward: for HYCOM Consortium members:

- provide forcing fields for "downscaling"
- intra-consortium collaboration & interaction tools
- access to "validation" data – satellite fields, climatologies, other models, in-situ

2. Outward: for others

- the research community
- the "IOOS" (end user) community
- potential new HYCOM modelers

to think about:

- How to make "downscaling" simpler
- New products or services to add
 - e.g. standard HYCOM viz
- New data to add
 - “validation friendly” (regridded) fields
- Places we should advertise our data
 - Potential users we should contact
- Systematic “archive strategy”
 - e.g. High performance access to surface fields

(Breakout discussions to follow ...)

Discussion? Questions?



Some areas to think about:

- How to make "downscaling" simpler
- New products or services to add
 - GIS "layers"
 - HYCOM viz.
- New data to add
 - "validation friendly" (regridded) fields
- Places we should advertise ourselves
 - Potential users we should contact
- Systematic "archive strategy" -- especially easy access to
 - HYCOM surface fields
 - Reduced suite of variables (u,v,t,s,layer thickness)
 - "canonical" vertical sections
- GUIs for Matlab & IDL
- Collaborative framework for assimilation investigations (mini-GODAE)
 - Web site, including model descriptions
 - Ability to compare results
 - How to create a controlled environment for assimilation data
- Other metadata to add for on-line access (model configurations)
- Data retention periods for forecasts? (N. Atlantic, Pacific, global)