HYCOM Data Service

An overview of the current status and new developments in Data management, software and hardware

Ashwanth Srinivasan & Jon Callahan
COAPS –FSU & PMEL

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Overview

- The HYCOM Data Service continues to mature and improve utility and usability through feedback from users and consortium members

  Current focus areas:
  - Upgrades of server hardware and software
  - New operational procedures and tool development
  - Addition and integration of new data sets
  - better documentation, information and presentation
- Server usage shows steady, consistent growth.
- Planned improvements to the server hardware and continued integration of new data sets will make the data server a true community resource
- The server is positioned to play an important role as a collaborative tool for the ongoing data assimilation comparison exercise

Data Management
Top 5 Priorities

1. The HYCOM data services should include a reliable capability to request custom netCDF subsets (specify region and variables) of HYCOM outputs (mostly in place)

2. Procedures to better inform the HYCOM Consortium members of new data management capabilities, new datasets, changes to status of servers, etc. (What's new page, mailing lists, data shoppers catalog)

3. The HYCOM data services should provide OPeNDAP, LAS, and FTP access to all data on the HYCOM Web site. HYCOM outputs should be available on native grids as well as engines for format transfer and regridding (mostly in place, tools under development)

4. In order to make "nesting" from HYCOM to HYCOM models simpler provide "packaged access" (ability to request a tar file) of all files needed to set up the nested run (new LAS will have this capability)

5. Provide access to detailed model run metadata for all model outputs provided – model domain; source code configuration; forcing fields, BCs, ICs; PI name. (blkdat.input available)

Currently Available Data Sets

1. Near real-time 1/12° Atlantic Ocean prediction system output (June 2003 – Present)
2. Monthly mean 1/12° Pacific Ocean Simulation output (1978-2003)
3. Monthly mean 1/12° Global climatological simulation output (1 year)
4. Monthly snapshots from 1/3° Atlantic Ocean simulation output (1980-2000)
5. Several 1/12° Gulf of Mexico Simulations for inter - comparing data assimilation schemes (HYDAE)
6. MERSEA outputs (sub-sampled Ocean prediction system outputs interpolated to depth levels)

Means of Data Access

- Live Access Server

  visualization and downloads in different formats, batch access etc.

- OPeNDAP enabled clients

  choice of common applications or user written programs to access data

- FTP

  NetCDF files for each variable

http://asterix.rsmas.miami.edu/las/servlets/dataset

soon at: www.hycom.org/las

HYCOM CONSORTIUM LAS - Microsoft Internet Explorer

File Edit View Favorites Tools Help Back Search

Address http://asterix.rsmas.miami.edu/las/servlets/constrain?var=97 Go

HYCOM CONSORTIUM LAS

OPeNDAP (FDS) | THREDDS | Index | Search:

single data set | com-pare two

Datasets
Variables
Constraints
Previous Output
Define variable
About
LAS UI Version 6.5

Datasets > MERSEA North Atlantic Class 1 Products > Bulletins > Latest Bulletin
Variable(s): **Eastward sea water velocity (m/s)**

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:
Select region:

Longitude-Latitude map (xy)
Longitude-depth sections (xz)
Longitude-time hofmoeller (xt)
Latitude-depth sections (yz)
Latitude-time hofmoeller (yt)
Depth-time hofmoeller (zt)
Longitude line (x)
Latitude line (y)
Depth profile (z)
Time series (t)
xyz volume

Help

65.0 N
98.5 W 10.0 E
10.0 N
Zoom In Zoom Out

Select time: 25-Oct-2006 00:00:00 25-Oct-2006 00:00:00
Select depth: 5 5

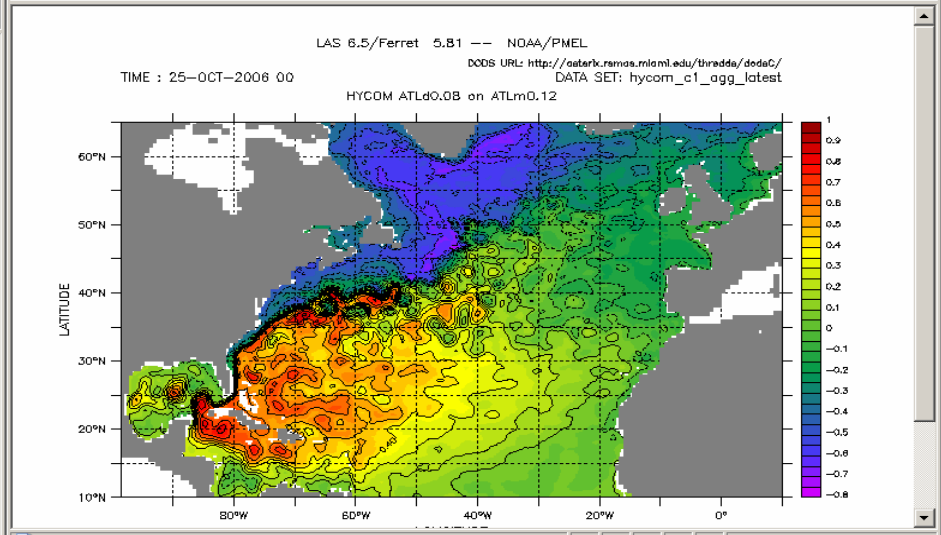
Select options:

Image format	Default
Plot size	default
View interpolation	Off
Show reference map	Default
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

Get output for selected variable Internet

http://asterix.rsmas.miami.edu - HYCOM CONSORTIUM LAS -- output - Microsoft I...

File Edit View Favorites Tools Help Back Search



Internet

HYCOM CONSORTIUM LAS - Microsoft Internet Explorer

File Edit View Favorites Tools Help Back Search

Address http://asterix.rsmas.miami.edu/las/servlets/dataset?catitem=70 Go

Datasets
Variables
Constraints
Previous Output
Define variable
About
LAS UI Version 6.5

Dataset variable(s): Reset | Select all | Unselect all

- barotropic eastward sea water velocity
- barotropic northward seawater velocity
- boundary layer depth
- eastward seawater velocity
- eastward seawater velocity (mapped to z levels)
- layer thickness
- mixed layer density
- mixed layer depth
- mixed layer eastward seawater velocity
- mixed layer northward seawater velocity
- mixed layer salinity
- mixed layer temperature
- northward seawater velocity
- northward seawater velocity (mapped to z levels)
- sea surface elevation
- seawater potential density
- seawater potential temperture
- seawater potential temperture (mapped to z levels)

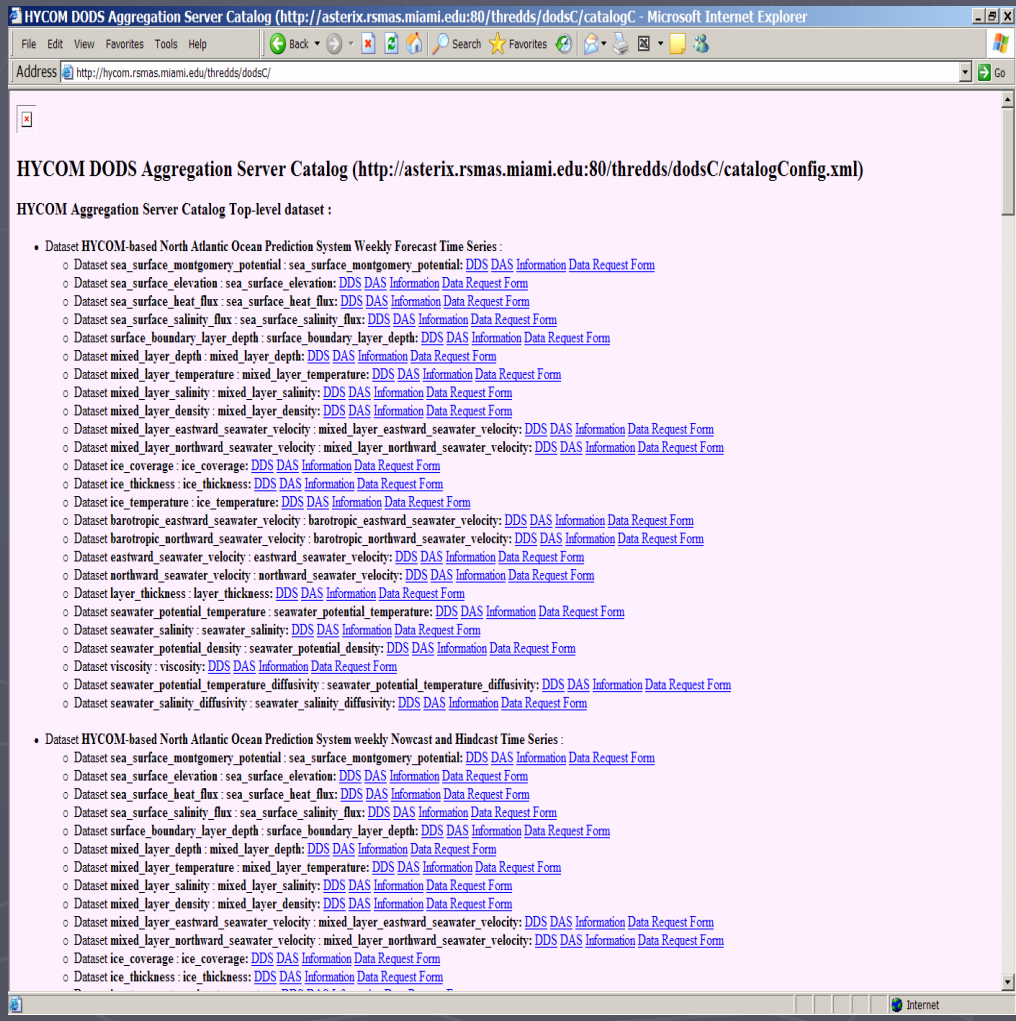
Show datasets Internet

Internet

OPeNDAP Clients Access

Catalog: http://hycom.rsmas.miami.edu/thredds/dodsC/

- Matlab
- IDL
- Ferret
- User's Fortran programs
- HYCOM ALL package
- OPeNDAP -MATLAB HYCOM GUI interface

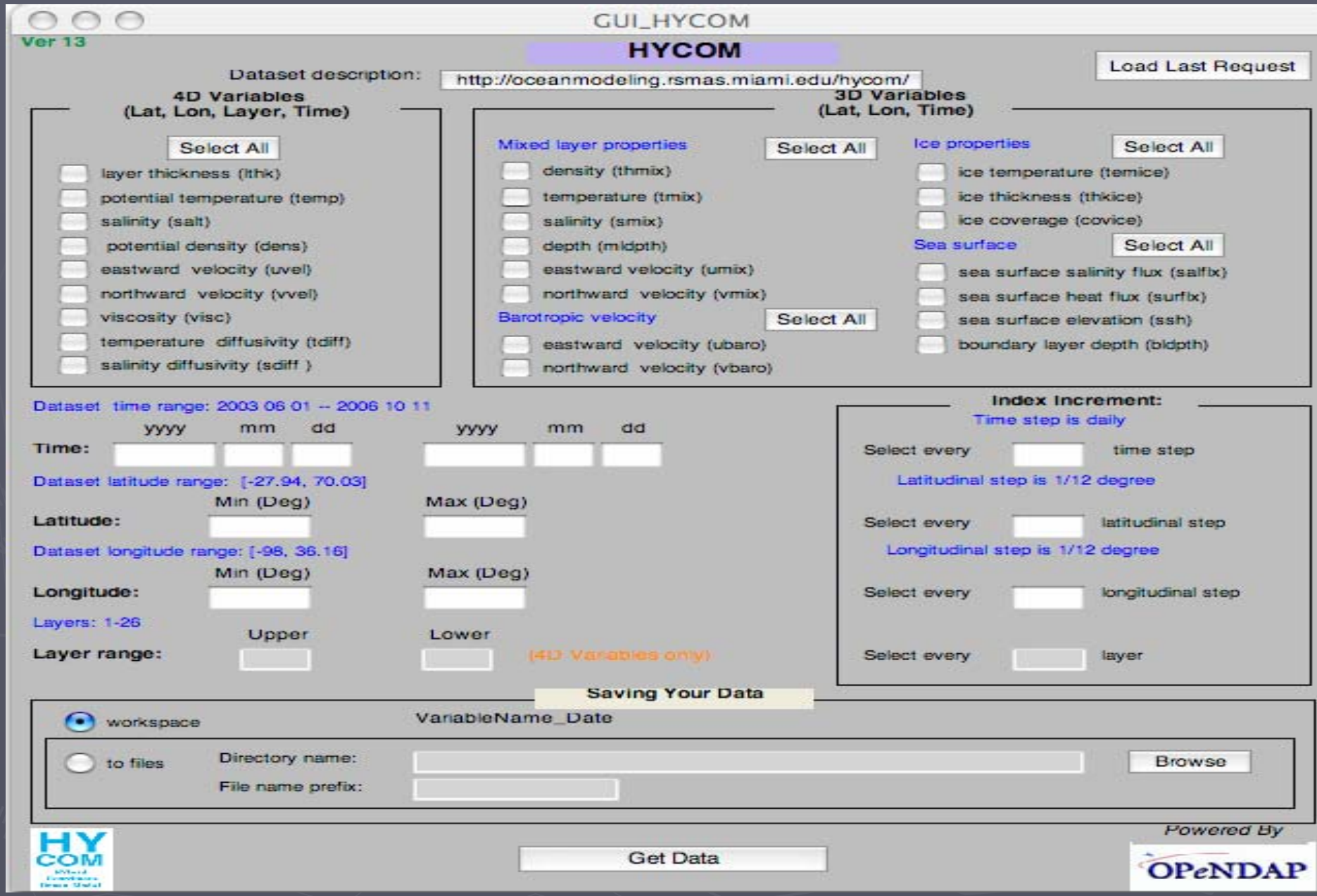


- The Matlab GUI developed for the 1/12° North Atlantic Model Runs has been significantly modified.
  - Access the GUI from:

    http://opendap.org/download/ml-toolbox.html

- The OPeNDAP-IDL client is now robust and can be used to access HYCOM data (no GUI yet).
- Many modifications to the netCDF-OPeNDAP libraries.
- Server4 - supporting GridFTP is now available.

The HYCOM Matlab GUI



Access the OPeNDAP Matlab GUIs from the OPeNDAP download webpage

http://opendap.org/download

Or go directly to the GUI web page

http://opendap.org/download/ml-toolbox.html

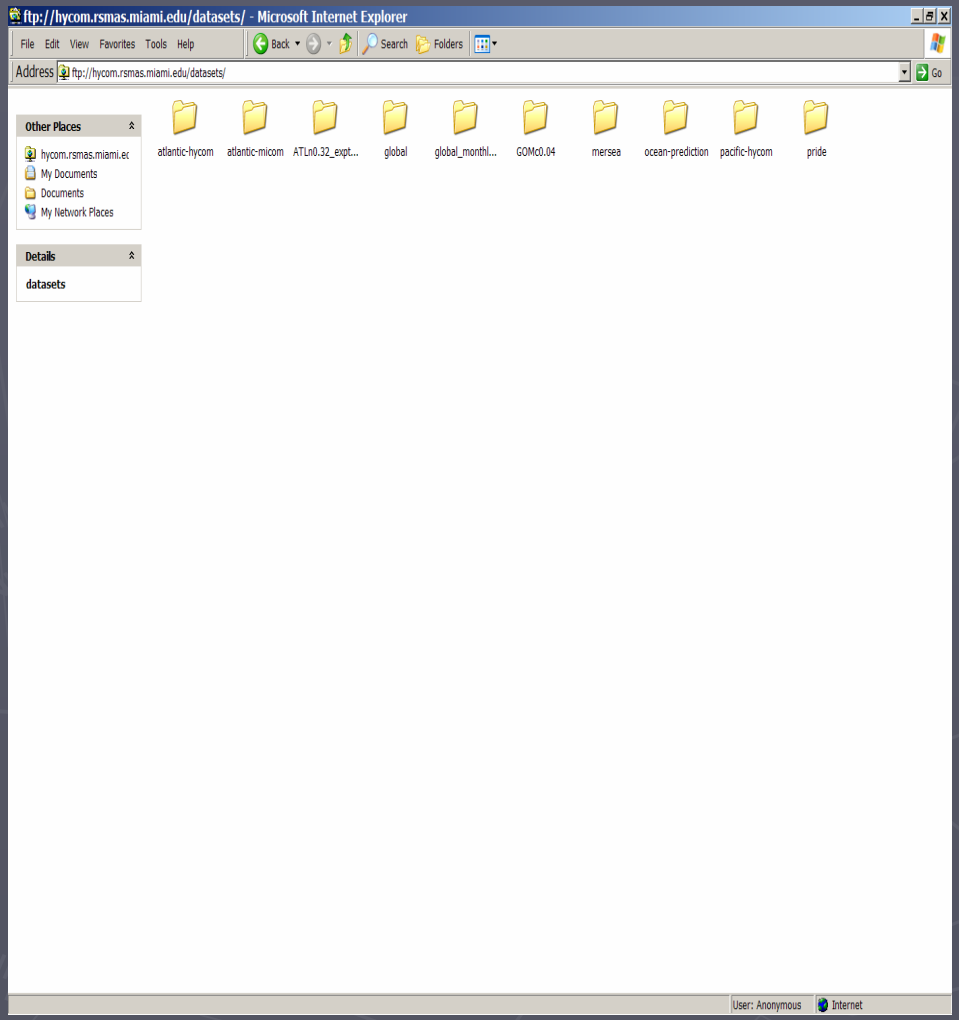
Suite of Matlab-OPeNDAP GUIs

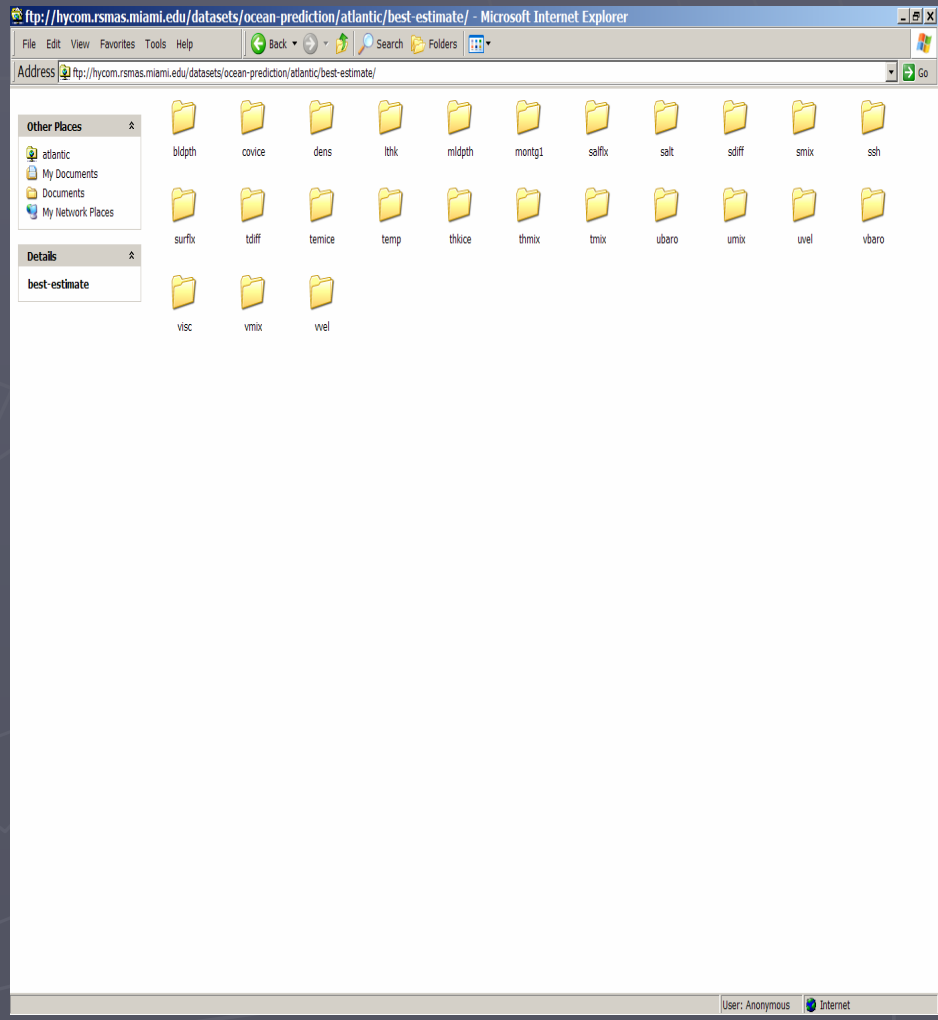
Data set	Type	Temporal		Spatial	
		Period	Resolution	Coverage	Resolution
HYCOM	Model	2003-Present	Daily	-28° to 70°N 262° to 36°E	1/12°
AVHRR Pathfinder	SST	1985-2005	Twice Daily	Global	4km
MODIS	SST	2000-Present	Twice Daily	Global	4km
GOES	SST	2000-Present	Daily	-45° to 60°N 180° to 330°E	5km
QuikSCAT SeaWinds	Vector Winds	August 1999 to Present	Twice Daily	Global	25km

These GUIs operate similarly
You've seen one, you've seen 'em all

FTP – Access

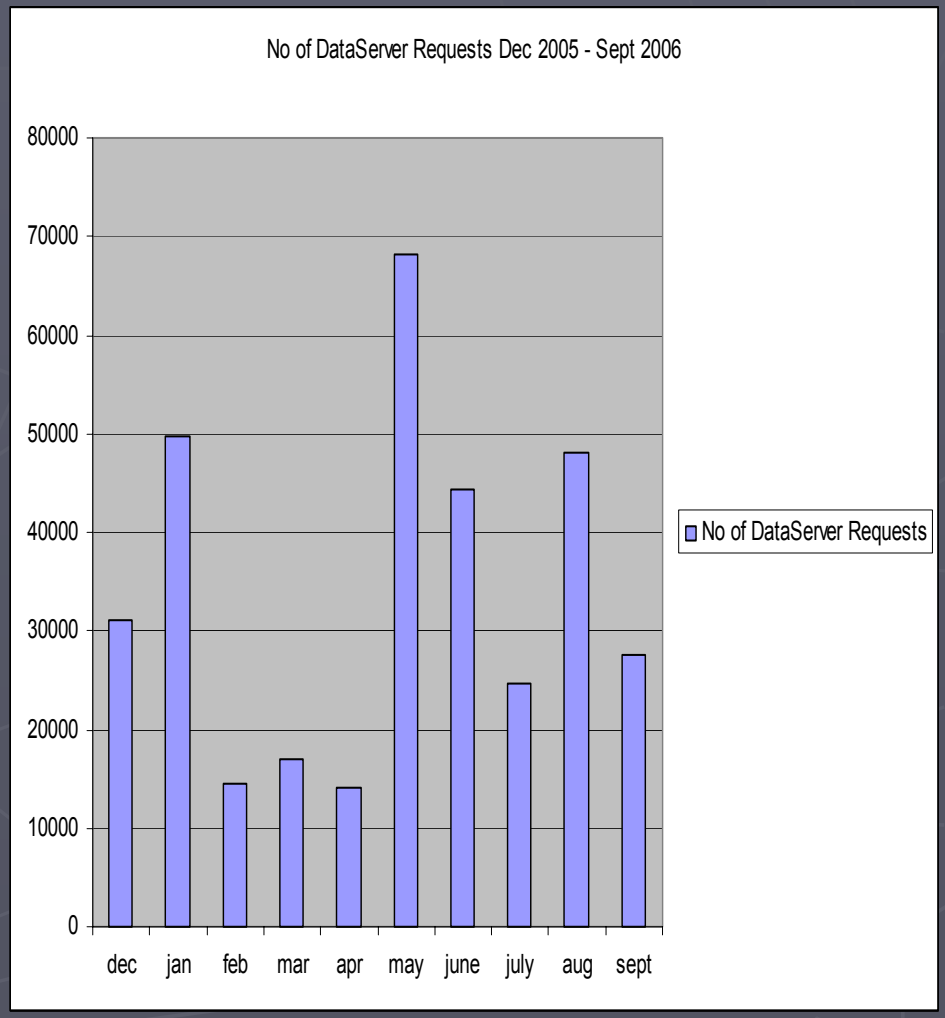
FTP://hycom.rsmas.miami.edu/datasets





User Community

- HYCOM Partners
- U. Miami Collaborators
- Breck Owens, Woods Hole
- Joao Ferreira, Portugal
- N. Idrissi, UVI
- Erik van Sebille, S. Africa
- TNC
- WRI
- Meteorem, France
- Global Marine



Coming Soon …

- Big Hardware upgrade
- Operational Enhancements
- Tool Development
- Web site development

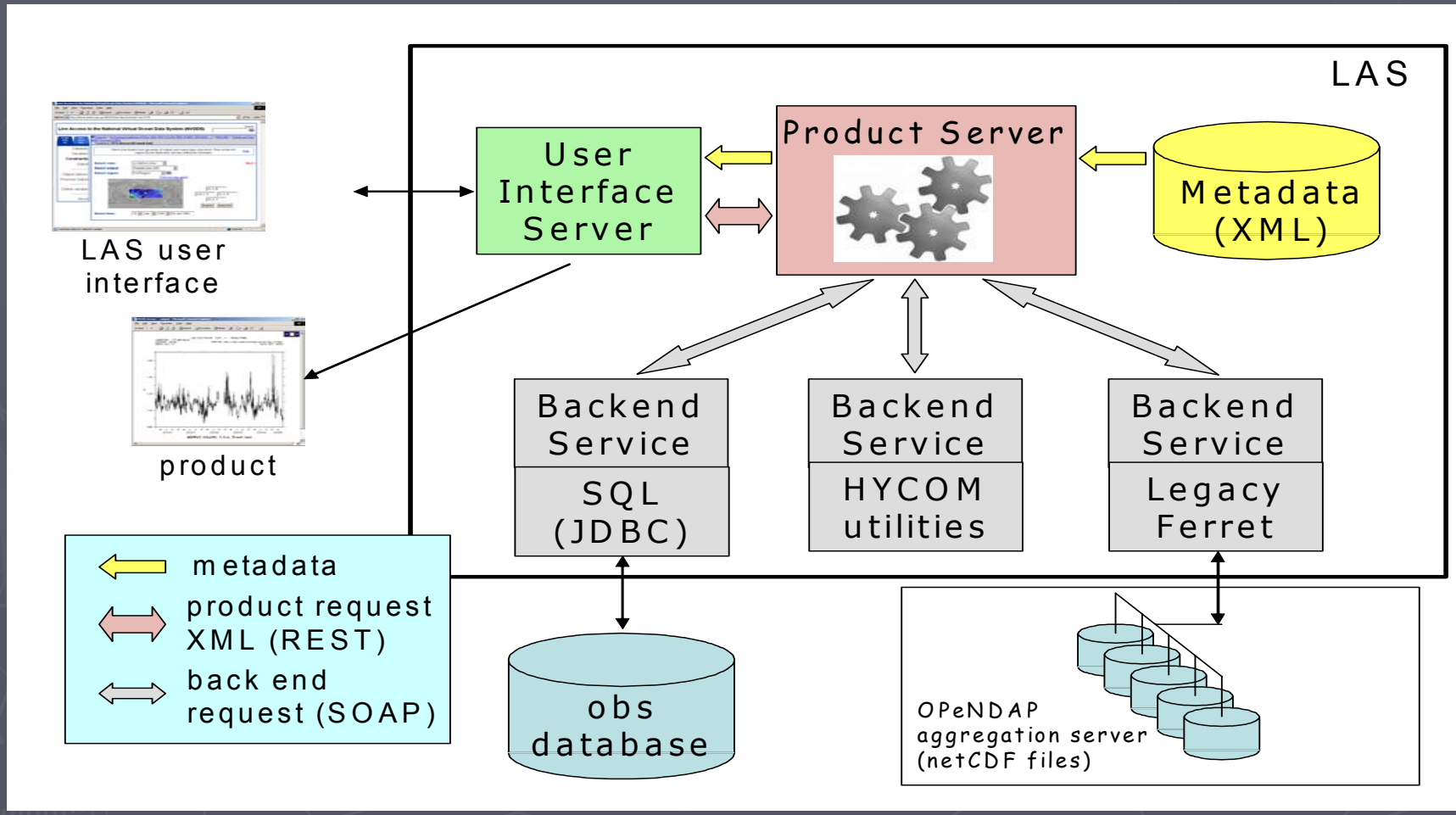
100 TB SAN

- 100 TB of RAID 5 (FC-SATA II) storage connected to three servers with 8 CPUs and 32 GB RAM each
- RAID arrays can be combined using GFS into a single logical volume of the desired size
- To be delivered this week

Operational Enhancements

- All components (LAS,OPENDAP,FTP) will be co-located in the same physical machine.
- Subset of files will be uncompressed for faster access
- In memory decompression by using RAM scratch disks
- High-availability architecture – minimal downtime during updates

LAS Access to HYCOM Pre/Post Processing Tools



OPeNDAP enabled HYCOM Pre/Post Processing Tools

- Fortran programs in the ALL package are being linked with OPeNDAP Libraries to enable network access for hycom to hycom nesting
- Some technical issues to be sorted out on using g77 and HYCOM routines

Other Tools

- programs/scripts to read HYCOM .[ab] files for different client applications are being developed – some of the available tools:

  MATLAB function/script to read .[ab]

  IDL script to read .[ab] (courtesy Alexandra Bozec)

  Will be available in the website soon.

Other Addition/Improvements

- Forcing data
- Reference observational data sets
- A completely redesigned website is being planned along the lines of GODAE server
- Searchable mailing list, FAQ's
- Links to other data repositories

Community Collaborations

- Working with John Caron at Unidata on testing the Forecast Aggregation server with large operational datasets
- Building a HYCOM .[ab] format IO service provider (ISOP) to be incorporated into the JAVA NetCDF 2.2 library
- Partnership with IOOS data management Caucus