



Canadian Foundation for Climate
and Atmospheric Sciences (CFCAS)

Fondation canadienne pour les sciences
du climat et de l'atmosphère (FCSCA)

GOAPP

Global Ocean-Atmosphere
Prediction and Predictability

OPeNDAP and LAS for GOAPP Data Serving

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Outline

- Introduction
- OPeNDAP
- Matlab OPeNDAP Ocean Toolbox
- LAS
- Apache Tomcat
- Concluding Remarks

Introduction

The GOAPP Data Management Policy outlines the need to facilitate the exchange of data between researchers, projects and themes. To that end, OPeNDAP server and client software have been installed in a test environment at Dalhousie University and are being evaluated. A test LAS server will be installed in June.

OPeNDAP

Open-source Project for a Network
Data Access Protocol

OPeNDAP Features

- An application providing remote access to scientific datasets and metadata, via the Internet.
- Supports data subsetting.
- Supports metadata augmentation.
- Serves gzip (.gz), bzip2 (.bz2) and compress (.Z) format data files.

OPeNDAP Architecture

- A client-server architecture.
- A wide range of possible clients include: web browsers, spreadsheet applications, Ferret, GrADS, ncdump, ncview and even LAS.
- The latest server, Hyrax (server 4), replaces the Perl and CGI based server 3.

Hyrax Server Components

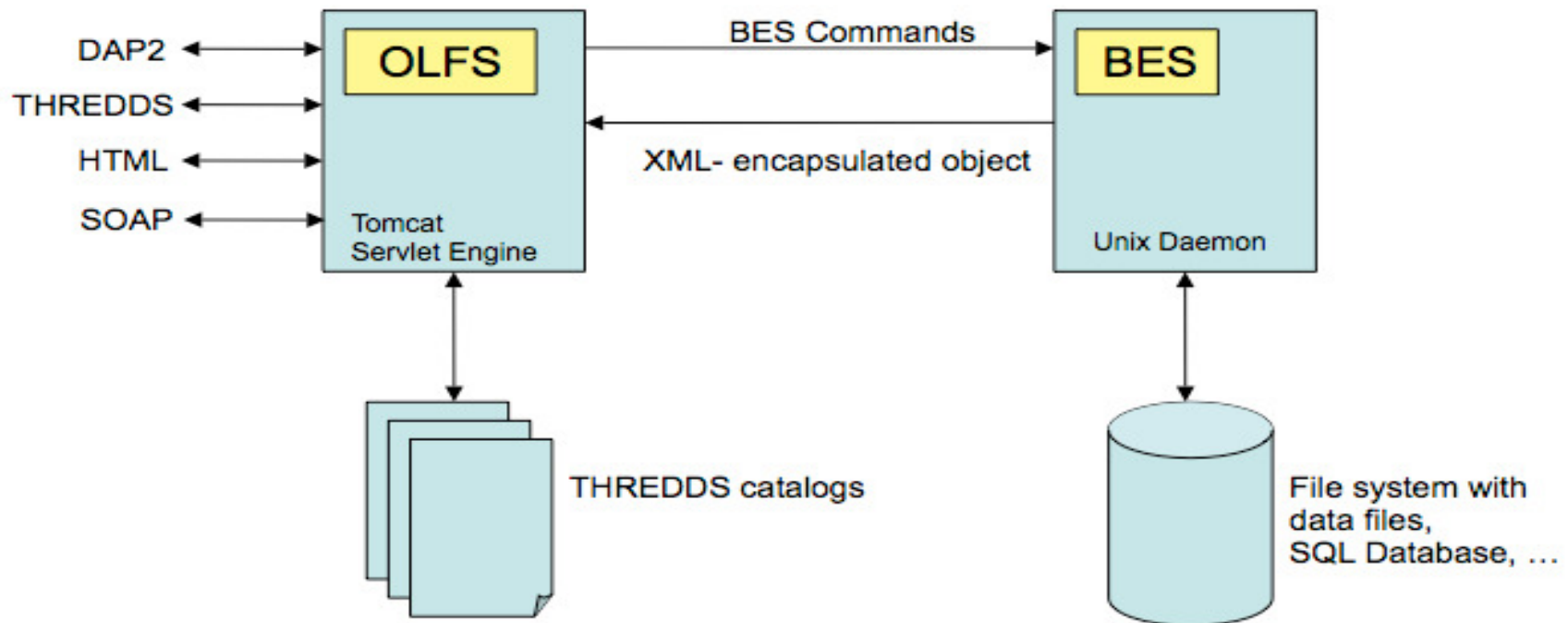
OLFS (OPeNDAP Light Front end Servlet)

- Written in Java.
- Executes within the Apache Tomcat Servlet / JSP Container.

BES (Back End Server)

- Written in C++.
- Utilizes loadable data handlers for serving netCDF, HDF4, HDF5, DBF, ASCII and binary formats.

Hyrax Architecture



OPeNDAP Developer's Workshop Feb 21-23 2007

Source: <http://docs.opendap.org/index.php/Hyrax>

OPeNDAP

Sample Session With
GOAPP Server
Via a Web Browser



Contents of /

Name	Last Modified	Size	Response Links
data/	2009-05-14T17:20:17	-	- - - - -

[THREDDS Catalog XML](#)

Hyrax development sponsored by [NSF](#) , [NASA](#) , and [NOAA](#)

OPeNDAP Hyrax (1.5.0) [ServerUUID=e93c3d09-a5d9-49a0-a912-a0ca16430b91-contents](#)

[Documentation](#)



Contents of /data

Name	Last Modified	Size	Response Links
Parent Directory/			
ff/	2009-05-14T15:02:29	-	- - - - -
nc/	2009-05-14T17:20:17	-	- - - - -

[THREDDS Catalog XML](#)

Hyrax development sponsored by [NSF](#) , [NASA](#) , and [NOAA](#)

OPeNDAP Hyrax (1.5.0) [Documentation](#)



Contents of /data/nc

Name	Last Modified	Size	Response Links
Parent Directory/			
bears.nc	2009-05-14T17:20:17	852	ddx dds das info html
coads climatology.nc	2009-05-14T17:20:17	3114044	ddx dds das info html
compressed/	2009-05-29T21:50:17	-	- - - - -
fnoc1.das	2009-05-14T17:20:17	162	- - - - -
fnoc1.nc	2009-05-14T17:20:17	23944	ddx dds das info html
fnoc1.nc.html	2009-05-14T17:20:17	177	- - - - -
fw sst 12145578.nc	2009-05-27T19:28:37	3556124	ddx dds das info html
more/	2009-05-29T19:28:58	-	- - - - -

```
<?xml version="1.0" encoding="UTF-8"?>
<Dataset name="fnocl.nc"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns="http://xml.opendap.org/ns/DAP2"
xsi:schemaLocation="http://xml.opendap.org/ns/DAP2 http://xml.opendap.org/dap/dap2.xsd">

  <Attribute name="NC_GLOBAL" type="Container">
    <Attribute name="base_time" type="String">
      <value>88- 10-00:00:00</value>
    </Attribute>
    <Attribute name="title" type="String">
      <value> FNOC UV wind components from 1988- 10 to 1988- 13.</value>
    </Attribute>
  </Attribute>
  <Attribute name="DODS_EXTRA" type="Container">
    <Attribute name="Unlimited_Dimension" type="String">
      <value>time_a</value>
    </Attribute>
  </Attribute>

  <Array name="u">
    <Attribute name="units" type="String">
      <value>meter per second</value>
    </Attribute>
    <Attribute name="long_name" type="String">
      <value>Vector wind eastward component</value>
    </Attribute>
    <Attribute name="missing_value" type="String">
      <value>-32767</value>
    </Attribute>
    <Attribute name="scale_factor" type="String">
      <value>0.005</value>
    </Attribute>
    <Attribute name="DODS_Name" type="String">
      <value>"Uwind";</value>
    </Attribute>
    <Attribute name="b" type="Byte">
```

Dataset {

```
    Int16 u[time_a = 16] [lat = 17] [lon = 21];
```

```
    Int16 v[time_a = 16] [lat = 17] [lon = 21];
```

```
    Float32 lat[lat = 17];
```

```
    Float32 lon[lon = 21];
```

```
    Float32 time[time = 16];
```

```
} fnoc1.nc;
```

```
Attributes {
  u {
    String units "meter per second";
    String long_name "Vector wind eastward component";
    String missing_value "-32767";
    String scale_factor "0.005";
    String DODS_Name "UWind";
    Byte b 128;
    Int32 i 32000;
    Url WOA01 "http://localhost/junk";
  }
  v {
    String units "meter per second";
    String long_name "Vector wind northward component";
    String missing_value "-32767";
    String scale_factor "0.005";
    String DODS_Name "VWind";
  }
  lat {
    String units "degree North";
  }
  lon {
    String units "degree East";
  }
  time {
    String units "hours from base_time";
  }
  NC_GLOBAL {
    String base_time "88- 10-00:00:00";
    String title " FNOC UV wind components from 1988- 10 to 1988- 13.";
  }
  DODS_EXTRA {
    String Unlimited_Dimension "time_a";
  }
}
```

Dataset Information

base_time: 88- 10-00:00:00

title: FNOC UV wind components from 1988- 10 to 1988- 13.

Unlimited_Dimension: time_a

Variables in this Dataset

u: Array of 16 bit Integers [time_a = 0..15][lat = 0..16][lon = 0..20]

units: meter per second

long_name: Vector wind eastward component

missing_value: -32767

scale_factor: 0.005

DODS_Name: "UWind"

b: 128

i: 32000

WOA01: "http://localhost/junk"

v: Array of 16 bit Integers [time_a = 0..15][lat = 0..16][lon = 0..20]

units: meter per second

long_name: Vector wind northward component

missing_value: -32767

scale_factor: 0.005

DODS_Name: "VWind"

lat: Array of 32 bit Reals [lat = 0..16]

units: degree North

lon: Array of 32 bit Reals [lon = 0..20]

units: degree East

OPeNDAP Server Dataset Access Form

Action:

Get ASCII

Get as NetCDF

Binary (DAP) Object

Show Help

Data URL:

`http://129.173.23.234:8080/opensdap/hyrax/data/nc/fnoc1.nc?u[0:1:3][0:1:4][0:1:5]`

Global Attributes:

```
NC_GLOBAL.base_time: 88- 10-00:00:00
NC_GLOBAL.title:  FNOC UV wind components from 1988- 10 to 1988- 13.
DODS_EXTRA.Unlimited_Dimension: time_a
```

Variables:

u: Array of 16 bit Integers [time_a = 0..15][lat = 0..16][lon = 0..20]

time_a: lat: lon:

```
units: meter per second
long_name: Vector wind eastward component
missing_value: -32767
scale_factor: 0.005
DODS_Name: "UWind"
b: 128
```

Help for the OPeNDAP World Wide Web Query Builder

General Help

This form displays information from the dataset whose URL is shown in the *DataURL* box. Each variable in this dataset is shown below in the section labeled *Variables*.

- To select a variable, click on the checkbox to its left.
- To constrain a variable that you've selected, edit the information that appears in the text boxes below the variable. When entering values for selections on String variables, you may need to quote those values.
- To get data in ASCII, various common formats or DODS binary objects, click on one of the buttons labeled *Get ...*. The *Get ASCII* and *Get DODS Data Object* buttons will always be present. Other buttons may be present providing access other types of return formats such as NetCDF, HDF, et cetera. Note that in order to use the DODS Data Objects, you'll need to download software from the [OPeNDAP web site](#) to decode them.
- The URL displayed in the *DataURL* field is updated as you select and/or constrain variables. The URL in this field can be cut and pasted in various clients such as the Matlab, ferret, GrADS et cetera. See the [OPeNDAP home page](#) for information about those clients.

Help on specific parts of the form



Contents of /data/nc/compressed

Name	Last Modified	Size	Response Links
Parent Directory/			
global sla 200801.nc.gz	2009-05-27T19:28:36	3931801	ddx dds das info html
global sla 200805.nc.bz2	2009-05-27T19:28:35	756605	ddx dds das info html
global sla 200807.nc.Z	2009-05-27T19:28:36	643729	ddx dds das info html



Contents of /data/ff

Name	Last Modified	Size	Response Links
Parent Directory/			
1998-6-avhrr.dat	2009-05-14T15:02:29	10980	ddx dds das info html
1998-6-avhrr.dat.das	2009-05-14T15:02:29	464	- - - - -
1998-6-avhrr.fmt	2009-05-14T15:02:29	373	- - - - -
Test-for-opendap.dbf	2009-05-27T14:59:05	1942	- - - - -
avhrr.dat	2009-05-14T15:02:29	2958368	ddx dds das info html
avhrr.dat.das	2009-05-14T15:02:29	1618	- - - - -
avhrr.fmt	2009-05-14T15:02:29	725	- - - - -
gsodock.dat	2009-05-14T15:02:29	11902	ddx dds das info html
gsodock.fmt	2009-05-14T15:02:29	681	- - - - -

Matlab OPeNDAP Ocean Toolbox

Matlab OPeNDAP Ocean Toolbox

- An OPeNDAP client for Matlab.
- Download data directly into Matlab variables.
- Access predefined ocean datasets only.
- Interactive (GUI) or batch (script) execution.
- Available for: Mac OS X (Intel, PPC), Windows XP / Vista and Linux (i386, x86_64).

Matlab OPeNDAP Ocean Toolbox

Sample Session
at NASA / REASoN Ocean Data
Portal

File Edit Debug Distributed Desktop Window Help

Current Directory: /users/staff/fred/matlab-opensdap-ocean-toolbox

Shortcuts How to Add What's New

Current Directory

Workspace

Stack: Base

Name	Value	Min	Max
------	-------	-----	-----

Command Window

New to MATLAB? Watch this [Video](#), see [Demos](#), or read [Getting Started](#).

```
>> ocean_toolbox
>>
```

Command History

Start


```
>> ocean_toolbox
>>
```

Powered By



MATLAB OPeNDAP Ocean Toolbox 2.1.0

Funded By



Data Sets

Click below for data access:

- [?](#)
- [?](#)
- [?](#)
- [?](#)
- [?](#)
- [?](#)
- [?](#)
- [?](#)

Variables

- wind
- wind stress
- air temperature
- air pressure
- cloud cover
- water vapor
- heat flux
- temperature
- salinity
- density
- currents
- mixed layer depth
- sea surface temperature
- sea surface salinity
- sea surface height
- ocean color
- ice
- other

Narrow Data Sets

Available time range: [1978-11-09 to 2009-05-30]*

By Time

Available latitude range: [-90.0 to 90.0]

By Latitude

Available longitude range: [-180.0 to 180.0]

By Longitude

*Note that all available ranges are approximate. Please select a data set (button to far left) for more precise values.

Include the following data types & sources:

- time series
- climatology
- satellite
- model

Software Support

Powered By

OPeNDAP

Funded By



MATLAB OPeNDAP Ocean Toolbox 2.1.0

Data Sets

Click below for data access:

AIRS



GOES (SST)



HYCOM



OAFlux



OceanColor



Pathfinder1km



Pathfinder4km



AVISO Altimetry



Variables

- wind
- wind stress
- air temperature
- air pressure
- cloud cover
- water vapor
- heat flux
- temperature
- salinity
- density
- currents
- mixed layer depth
- sea surface temperature
- sea surface salinity
- sea surface height
- ocean color
- ice
- other

Select All

Clear All

Narrow Data Sets

Available time range: [1978-11-09 to 2009-05-30]*

yyyy mm dd yyyy mm dd

By Time

Available latitude range: [-90.0 to 90.0]

Min (deg)

Max (deg)

By Latitude

Available longitude range: [-180.0 to 180.0]

Min (deg)

Max (deg)

By Longitude

*Note that all available ranges are approximate. Please select a data set (button to far left) for more precise values.

Include the following data types & sources:

- time series
- climatology

- satellite
- model

Software Support

Documentation

Contact Us

Powered By

OPeNDAP

Funded By



MATLAB OPeNDAP Ocean Toolbox 2.1.0

Data Sets

Click below for data access:

- [AIRS](#) 
- [GOES \(SST\)](#) 
- [HYCOM](#) 
- [OAFIux](#) 
- [OceanColor](#) 
- [Pathfinder1km](#) 
- [Pathfinder4km](#) 
- [AVISO Altimetry](#) 

Variables

- wind
- wind stress
- air temperature
- air pressure
- cloud cover
- water vapor
- heat flux
- temperature
- salinity
- density
- currents
- mixed layer depth
- sea surface temperature
- sea surface salinity
- sea surface height
- ocean color
- ice
- other

Narrow Data Sets

Available time range: [1978-11-09 to 2009-05-30]*

By Time

Available latitude range: [-90.0 to 90.0]

By Latitude

Available longitude range: [-180.0 to 180.0]

By Longitude

*Note that all available ranges are approximate. Please select a data set (button to far left) for more precise values.

Include the following data types & sources:

- time series
- climatology

- satellite
- model

Software Support

Powered By



Pathfinder4km

Load Last Request

Funded By



Climatology

Clim_SST [Apply mask](#)
 Land mask

[Ancillary fields](#)

Clim_StandardDeviation
 Clim_Counts

Time Series

SST [Apply masks](#)
 SST anomaly [Update File List](#)

Land mask
 Quality mask: > 4 (good)

[Ancillary fields](#)

Quality (qual) First guess SST (BSST)
 Standard Deviation (sdev) Mask 1
 Number of Observations (num) Mask 2

Time:

mm dd mm dd

Temporal averages

Daily ▼

Select approximate time of satellite pass

1985-2001 [Select All](#)

1, Night (ascending)
 3, Day (descending)

Satellite times can be tricky

Available latitude range: [-89.98 to 89.98]

Latitude: Min (Deg) Max (Deg)

Available longitude range: [-179.982 to 179.982]

Longitude: Min (Deg) Max (Deg)

Subsampling

[Temporal resolution is daily](#)

Select every time step

[Spatial resolution is 4 km](#)

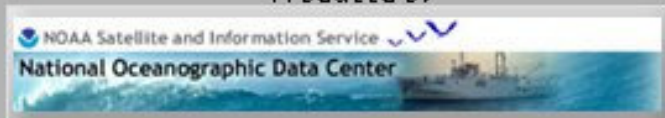
Select every latitudinal step
 Select every longitudinal step

Saving Your Data

in workspace Mode: opendap ▼

to files Directory name: [Browse](#)
 File name prefix:

Produced By



Get Data

Served By



Powered By

Pathfinder4km

Funded By



Load Last Request

Climatology

Clim_SST

Apply mask

Land mask

Ancillary fields

Clim_StandardDeviation

Clim_Counts

Time Series

SST

SST anomaly

Apply masks

Land mask

Quality mask:

> 4 (good)

Ancillary fields

Quality (qual)

Standard Deviation (sdev)

Number of Observations (num)

First guess SST (BSST)

Mask 1

Mask 2

Update File List

Time:

mm dd

mm dd

Temporal averages

Annual

Select approximate time of satellite pass

1985-2001

Select All

1, Night (ascending)

3, Day (descending)



Satellite times can be tricky

Available latitude range: [-89.98 to 89.98]

Latitude: Min (Deg) Max (Deg)
 20 60

Available longitude range: [-179.982 to 179.982]

Longitude: Min (Deg) Max (Deg)
 -70 -30

Subsampling

Temporal resolution is annual

Select every 5 time step

Spatial resolution is 4 km

Select every 4 latitudinal step

Select every 4 longitudinal step

Saving Your Data

in workspace

Mode: native

to files

Directory name:

Browse

File name prefix:

Produced By



Served By



Get Data

File Edit View Graphics Debug Distributed Desktop Window Help

Current Directory: /users/staff/fred/matlab-opendap-ocean-toolbox

Shortcuts How to Add What's New

Current Directory

Workspace

Stack: Base

Name	Value	Min	Max
Clim_SST_annual_day	<1x1 struct>		

Command Window




New to MATLAB? Watch this [Video](#), see [Demos](#), or read [Getting Started](#).

```
>> ocean_toolbox
http://satdat1.gso.uri.edu/opendap/sea_surface_temperature/climateolo
http://satdat1.gso.uri.edu/opendap/sea_surface_temperature/climateolo
Data have been acquired.
>>
```

Command History

Start

File Edit View Graphics Debug Distributed Desktop Window Help



 Current Directory: /users/staff/fred/matlab-opendap-ocean-toolbox
Shortcuts  How to Add  What's New

Current Directory

Workspace


← □ ↗ ×


 Stack: Base ▾

Name ↕	Value	Min	Max
 Clim_SST_annual_day	<1x1 struct>		

Array Editor - Clim_SST_annual_day


↔ □ ↗ ×


 Stack: Base ▾

Field ↕	Value
Clim_SST	<228x228 double>
Latitude	<228x1 double>
Longitude	<228x1 double>

Command Window

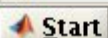
↔ □ ↗ ×

 New to MATLAB? Watch this [Video](#), see [Demos](#), or read [Getting Started](#).

```
>> ocean_toolbox
http://satdat1.gso.uri.edu/opendap/sea_surface_temperature/climatolo
http://satdat1.gso.uri.edu/opendap/sea_surface_temperature/climatolo
Data have been acquired.
>>
```

Command History

← □ ↗ ×

 Start

File Edit View Graphics Debug Distributed Desktop Window Help

Current Directory: /users/staff/fred/matlab-opendap-ocean-toolbox

Shortcuts How to Add What's New

Current Directory

Workspace

Stack: Base

Name	Value	Min	Max
Clim_SST_annual_day	<1x1 struct>		

Array Editor - Clim_SST_annual_day.Clim_SST

Stack: Base

	25	26	27	28	29	30	31
214	26.8500	26.8500	26.7750	27	26.8500	26.7750	26.77
215	26.8500	26.8500	26.9250	26.9250	26.8500	26.8500	26.77
216	27	26.9250	26.8500	26.8500	26.9250	26.9250	26.85
217	26.9250	26.9250	26.9250	26.9250	26.8500	26.8500	26.85
218	26.9250	26.9250	27.0750	27.0750	27	27	
219	27.1500	27.1500	27.0750	26.9250	26.9250	26.9250	26.85
220	27.0750	27.0750	26.9250	27.0750	26.9250	26.9250	26.77
221	27.1500	27.1500	27	26.8500	26.9250	26.8500	26.77
222	27.1500	27.0750	27	27.0750	26.9250	26.9250	26.92
223	27.0750	27	27.0750	27.0750	27	26.9250	
224	27.0750	27	27	27.1500	27.0750	26.9250	
225	27.0750	27	27.0750	27.0750	27.0750	27	27.07
226	27.0750	27.0750	27.1500	27.0750	27.0750	27.0750	27.15
227	27	27.1500	27.0750	27.0750	27.0750	27.0750	
228	27.0750	27.0750	27.0750	27.0750	27.0750	27.0750	27.07
229							
230							
231							

ay.Longitude x Clim_SST_annual_day.Latitude x Clim_SST_annual_day.Clim_SST x

Command Window

New to MATLAB? Watch this [Video](#), see [Demos](#), or read [Getting Started](#).

```
>> ocean_toolbox
http://satdat1.gso.uri.edu/opendap/sea_surface_temperature/climatolo
http://satdat1.gso.uri.edu/opendap/sea_surface_temperature/climatolo
Data have been acquired.
>>
```

Command History

Start

LAS

Live Access Server

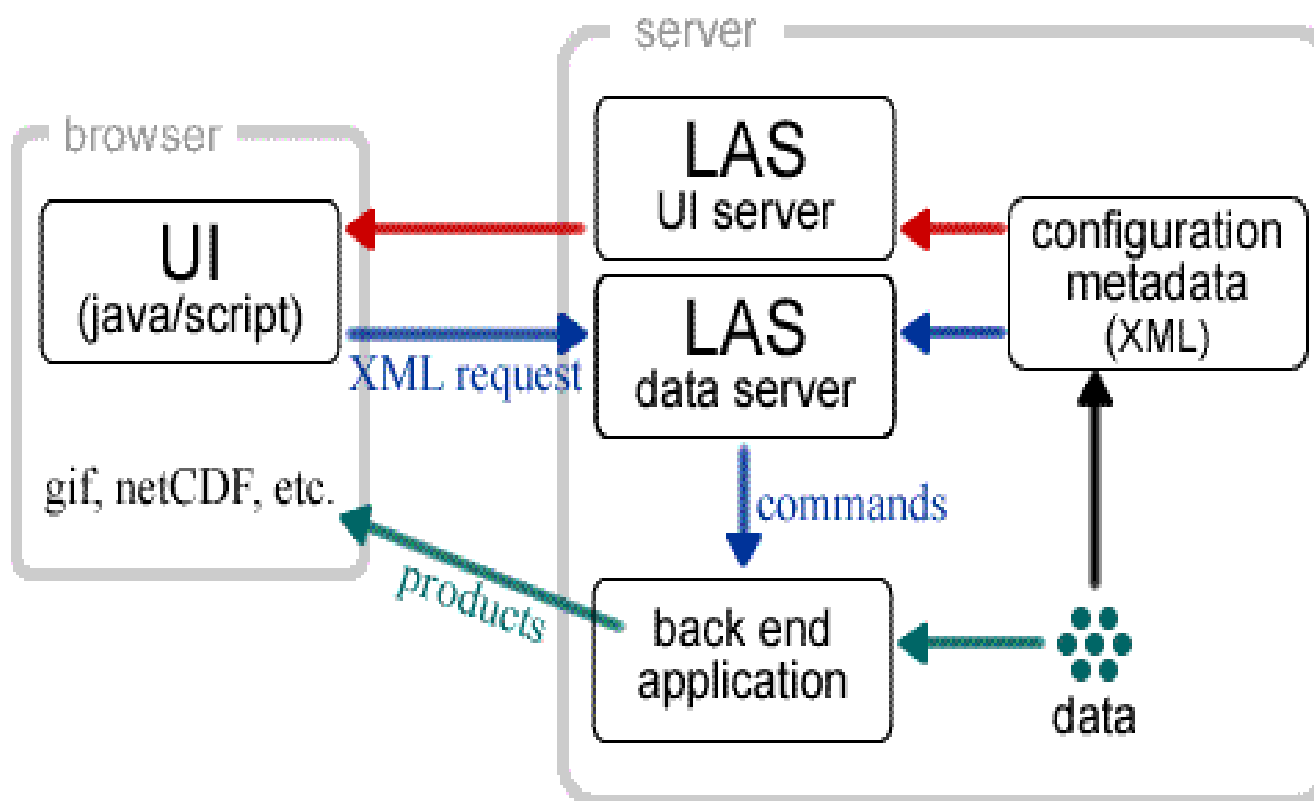
LAS Features

- A web application for serving scientific datasets via the Internet.
- Similar to OPeNDAP.
- Capabilities vary, but may include:
 - On-the-fly 2-D images
 - On-the-fly statistics, interpolation, conversion
 - Data subsetting
 - netCDF, ASCII, ArcView format output

LAS Architecture

- Three tiered architecture.
- A web browser is the only LAS client.
- The back end application defines the types of data formats that may be served.
- Available back end applications include Ferret, Matlab, NCL, ILD and GrADS.
- The default back end (Ferret) reads netCDF and OPeNDAP file formats.

LAS Architecture



Source: <http://ferret.pmel.noaa.gov>

LAS Data Servers

Institutions hosting LAS servers include: AVISO, MERCATOR, MERSEA, IFREMER, CSIRO, NOAA, NASA, U.S. NAVY, U.S. DOE, NCAR and HYCOM.

LAS

Sample Session
at NOAA OceanWatch
Via a Web Browser

Near Real Time Satellite Data

Ocean Surface Temperature

Dataset	Coverage	Resolution
AVHRR	Global	11 km
AVHRR (individual images)	N. American W. Coast	1.25 km
AVHRR (composites)	North American West Coast	1.25 km
GOES (composites)	Western Hemisphere	5.5 km
REMSS Blended	Global	9 km
GOES (individual images)	N. American W. Coast	0.05 deg

Ocean Surface Chlorophyll-a

Dataset	Coverage	Resolution
MODIS on Aqua	Western Hemisphere	2.5 km

Currently Selected Dataset

Please Select a dataset

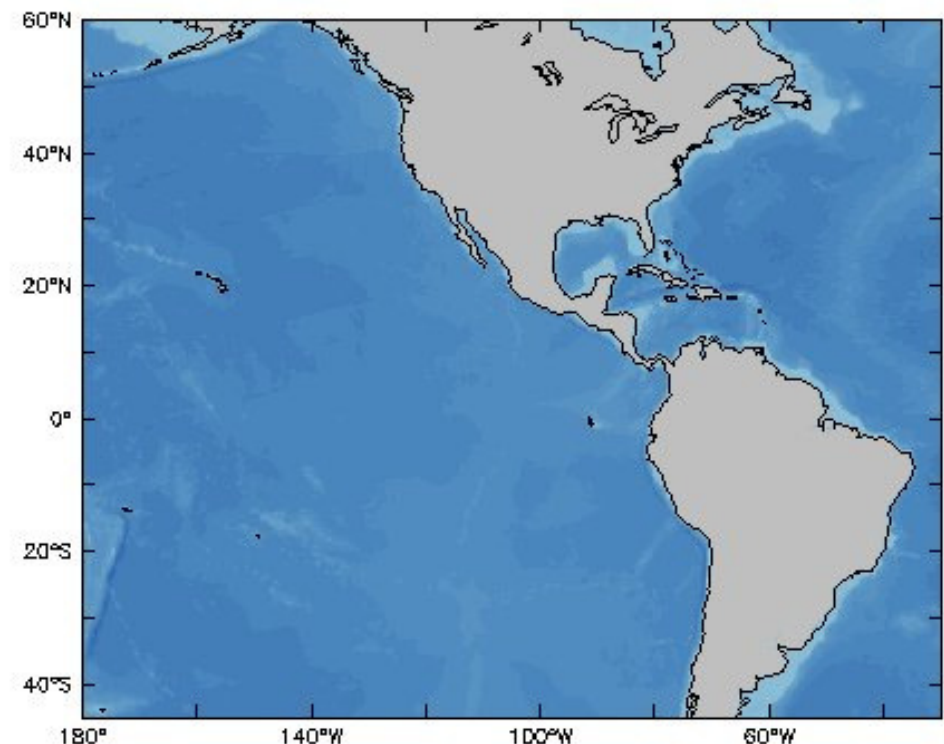
Title:

Coverage:

Resolution:

Data courtesy of:

Most recent image:



Near Real Time Satellite Data

Ocean Surface Temperature

Dataset	Coverage	Resolution
AVHRR	Global	11 km
AVHRR (individual images)	N. American W. Coast	1.25 km
AVHRR (composites)	North American West Coast	1.25 km
GOES (composites)	Western Hemisphere	5.5 km
REMSS Blended	Global	9 km
GOES (Individual Images)	N. American W. Coast	0.05 deg

Ocean Surface Chlorophyll-a

Dataset	Coverage	Resolution
MODIS on Aqua	Western Hemisphere	2.5 km
MODIS on Terra OSU DB	US West Coast	1.25 km
MODIS on Aqua OSU DB	US West Coast	1.25 km
MODIS on Aqua	US West Coast	1.25 km

Ocean Surface Winds

Dataset	Coverage	Resolution
QuikSCAT	Global	0.25 deg

Ocean Surface Currents

Dataset	Coverage	Resolution
HF Radar Monterey Bay	Monterey Bay	0.03 deg
HF Radar SF Bay	San Francisco Bay	0.03 deg
HF Radar SF Bay Outlet	San Francisco Bay Outlet	0.25 deg

Ocean Surface Height

Dataset	Coverage	Resolution
---------	----------	------------

Derived Quantities

Dataset	Coverage	Resolution
Frontal Probability Index	Western Hemisphere	5.5 km
Primary Productivity	Global	0.1 deg

Currently Selected Dataset

Multiple-Satellite Blended Products

Title: **Sea Surface Temperature**

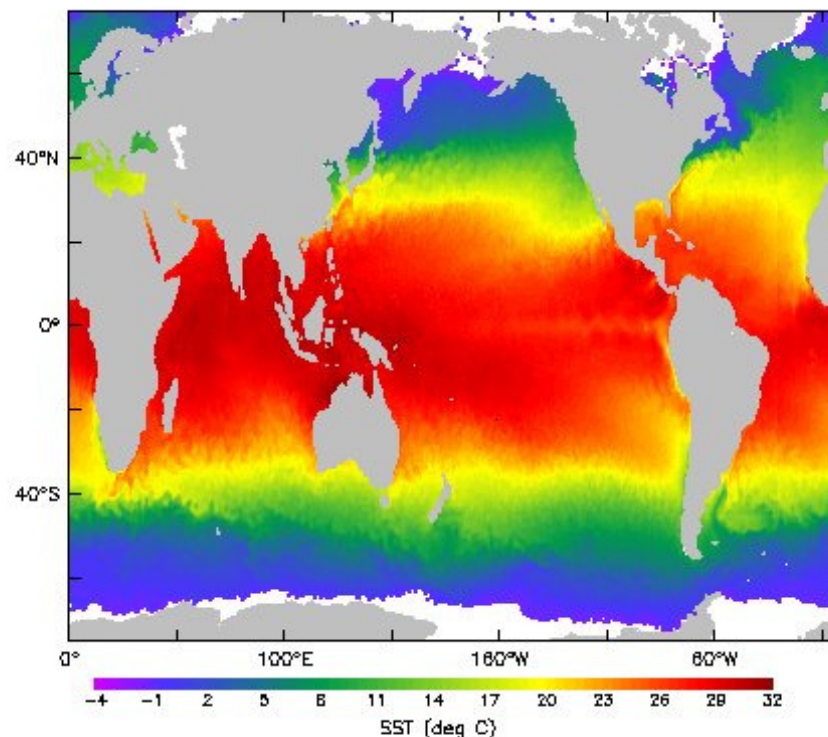
Coverage: **Global**

Resolution: **0.1 deg**

Data courtesy of:

RSS, JAXA, NASA, OSDPD, CoastWatch

Most recent image:



Choose a variable:

temperature
 used for sub-variables

Choose a composite:

monthly
 16-APR-2009 00:00
 Used for time series

Select Type of Download:

Map (xy)

Choose a region:

No region selected

or enter a region:

lat
 lon lon
 lat

Show Custom Region

GOES (composites)	Western Hemisphere	5.5 km
REMSS Blended	Global	9 km
GOES (individual images)	N. American W. Coast	0.05 deg

Ocean Surface Chlorophyll-a

Dataset	Coverage	Resolution
MODIS on Aqua	Western Hemisphere	2.5 km
MODIS on Terra OSU DB	US West Coast	1.25 km
MODIS on Aqua OSU DB	US West Coast	1.25 km
MODIS on Aqua	US West Coast	1.25 km

Ocean Surface Winds

Dataset	Coverage	Resolution
QuikSCAT	Global	0.25 deg

Ocean Surface Currents

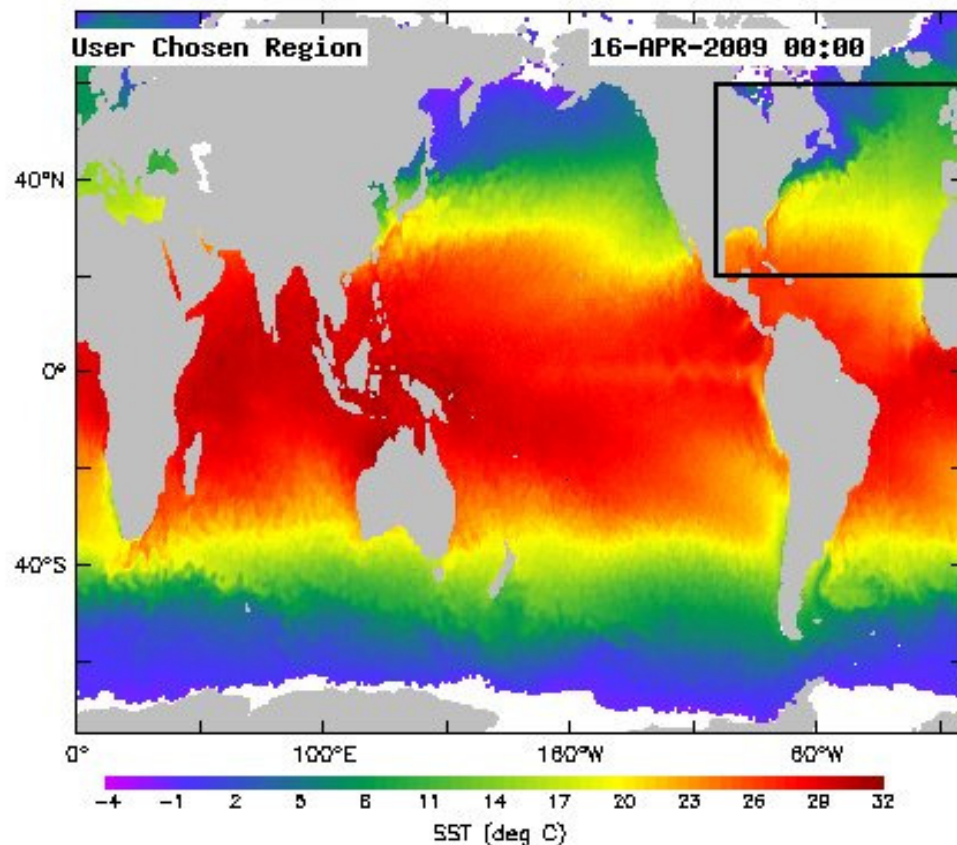
Dataset	Coverage	Resolution
HF Radar Monterey Bay	Monterey Bay	0.03 deg
HF Radar SF Bay	San Francisco Bay	0.03 deg
HF Radar SF Bay Outlet	San Francisco Bay Outlet	0.25 deg

Ocean Surface Height

Dataset	Coverage	Resolution
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Derived Quantities

Dataset	Coverage	Resolution
Frontal Probability Index	Western Hemisphere	5.5 km
Primary Productivity	Global	0.1 deg



Choose a variable:

temperature
 used for sub-variables

Choose a composite:

monthly

Choose a time:

16-APR-2009 00:00
 Used for time series

Select Type of Download:

Map (xy)

Select Output format:

Image

Choose a region:

User Chosen Region

or enter a region:

lat
 lon lon
 lat

Show Custom Region

Get Now

Delayed, Science-Quality Satellite Data

Choose a variable:

temperature

used for sub-variables

Choose a composite:

monthly

Choose a time:

16-APR-2009 00:00

Used for time series

Select Type of Download:

Map (xy)

Select Output format:

Image

Choose a region:

User Chosen Region

or enter a region:

lat

60

lon

260

lon

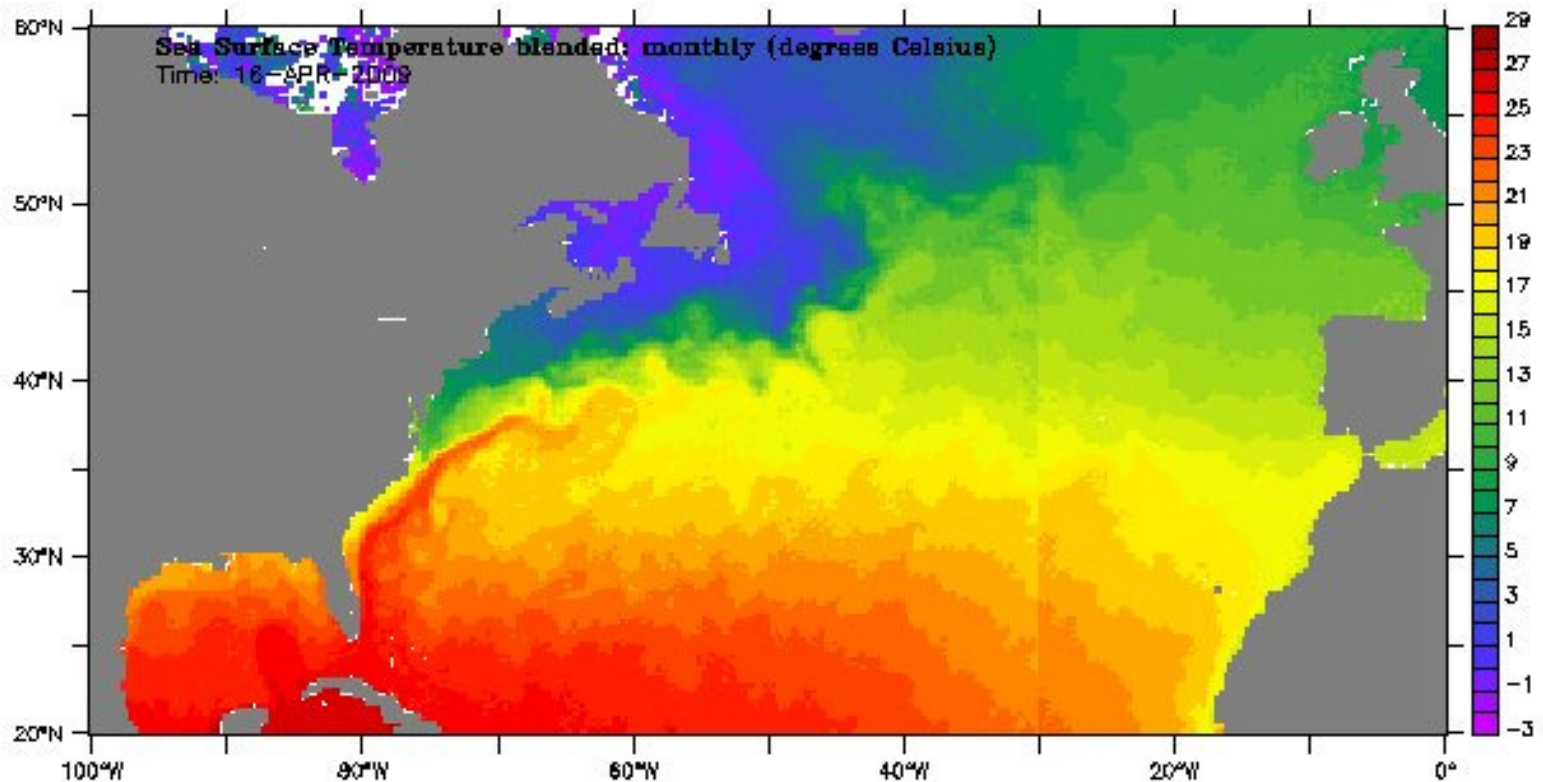
360

lat

20

Show Custom Region

Get Now



Apache Tomcat Servlet / JSP Container

(for Server Administrators Only)

Apache Tomcat

- Tomcat is a Java servlet and JavaServer Pages (JSP) container.
- It provides web server functionality for the OPeNDAP front end (OLFS).
- Tomcat was developed by the Apache Software Foundation.



Apache Tomcat/5.5.27



The Apache Software Foundation

<http://www.apache.org/>

Administration

[Status](#)

[Tomcat Administration](#)

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Documentation

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[Developers Mailing List](#)

[IRC](#)

If you're seeing this page via a web browser, it means you've setup Tomcat successfully. Congratulations!

As you may have guessed by now, this is the default Tomcat home page. It can be found on the local filesystem at:

```
#{CATALINA_HOME}/webapps/ROOT/index.jsp
```

where "\$CATALINA_HOME" is the root of the Tomcat installation directory. If you're seeing this page, and you don't think you should be, then either you're either a user who has arrived at new installation of Tomcat, or you're an administrator who hasn't got his/her setup quite right. Providing the latter is the case, please refer to the [Tomcat Documentation](#) for more detailed setup and administration information than is found in the INSTALL file.

NOTE: This page is precompiled. If you change it, this page will not change since it was compiled into a servlet at build time. (See `#{CATALINA_HOME}/webapps/ROOT/WEB-INF/web.xml` as to how it was mapped.)

NOTE: For security reasons, using the administration webapp is restricted to users with role "admin". The manager webapp is restricted to users with role "manager". Users are defined in `#{CATALINA_HOME}/conf/tomcat-users.xml`.

Included with this release are a host of sample Servlets and JSPs (with associated source code), extensive documentation (including the Servlet 2.4 and JSP 2.0 API JavaDoc), and an introductory guide to developing web applications.

Tomcat mailing lists are available at the Tomcat project web site:

- users@tomcat.apache.org for general questions related to configuring and using Tomcat
- dev@tomcat.apache.org for developers working on Tomcat

Thanks for using Tomcat!

TOMCAT WEB SERVER ADMINISTRATION T O O L

User Name

Password

Login

Reset

Commit Changes

Log Out

- Tomcat Server
 - Service (Catalina)
- Resources
 - Data Sources
 - Mail Sessions
 - Environment Entries
 - User Databases
- User Definition
 - Users
 - Groups
 - Roles

Commit Changes

Log Out

- Tomcat Server
 - Service (Catalina)
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 - Data Sources
 - Mail Sessions
 - Environment Entries
 - User Databases
 - User Definition
 - Users
 - Groups
 - Roles**

Roles List

Role Actions

----Available Actions----

Role Name	Description
admin	
manager	
role1	
tomcat	

Server Status

Manager

List Applications	HTML Manager Help	Manager Help	Complete Server Status
-----------------------------------	-----------------------------------	------------------------------	--

Server Information

Tomcat Version	JVM Version	JVM Vendor	OS Name	OS Version	OS Architecture
Apache Tomcat/5.5.27	1.5.0-b64	Sun Microsystems Inc.	Linux	2.6.18-ovz028stab039.1-smp	i386

JVM

Free memory: 3.92 MB Total memory: 10.51 MB Max memory: 63.56 MB

http-8080

Max threads: 150 Min spare threads: 25 Max spare threads: 75 Current thread count: 25 Current thread busy: 2

Max processing time: 445 ms Processing time: 4.671 s Request count: 52 Error count: 1 Bytes received: 0.00 MB Bytes sent: 0.41 MB

Stage	Time	B Sent	B Recv	Client	VHost	Request
S	2 ms	0 KB	0 KB	129.173.23.125	129.173.23.234	GET /manager/status HTTP/1.1
R	?	?	?	?	?	?
R	?	?	?	?	?	?

P: Parse and prepare request S: Service F: Finishing R: Ready K: Keepalive

Tomcat Web Application Manager

Message:	OK
-----------------	----

Manager

List Applications	HTML Manager Help	Manager Help	Server Status
-----------------------------------	-----------------------------------	------------------------------	-------------------------------

Applications

Path	Display Name	Running	Sessions	Commands
/	Welcome to Tomcat	true	<u>0</u>	Start Stop Reload Undeploy
/admin	Tomcat Administration Application	true	<u>0</u>	Start Stop Reload Undeploy
/balancer	Tomcat Simple Load Balancer Example App	false	<u>0</u>	Start Stop Reload Undeploy
/host-manager	Tomcat Manager Application	true	<u>0</u>	Start Stop Reload Undeploy
/jsp-examples	JSP 2.0 Examples	false	<u>0</u>	Start Stop Reload Undeploy
/manager	Tomcat Manager Application	true	<u>0</u>	Start Stop Reload Undeploy
/opendap	Hyrax	true	<u>0</u>	Start Stop Reload Undeploy
/servlets-examples	Servlet 2.4 Examples	false	<u>0</u>	Start Stop Reload Undeploy
/tomcat-docs	Tomcat Documentation	true	<u>0</u>	Start Stop Reload Undeploy
/webdav	Webdav Content Management	true	<u>0</u>	Start Stop Reload Undeploy



The Apache Tomcat 5.5 Servlet/JSP Container



The Apache Tomcat 5.5 Servlet/JSP Container

Manager App HOW-TO

Table of Contents

Introduction

Configuring Manager Application Access

Supported Manager Commands

- Deploy A New Application Remotely

- Deploy A New Application from a Local Path

- List Currently Deployed Applications

- Reload An Existing Application

- List OS and JVM Properties

- List Available Global JNDI Resources

- List Available Security Roles

Concluding Remarks

Concluding Remarks

- The functionality provided by OPeNDAP and LAS is being utilized by researchers and institutions world wide, to share and access scientific datasets via the Internet.
- The software packages are being actively developed and supported, are freely available, and are compatible with a wide range of hardware and operating systems.