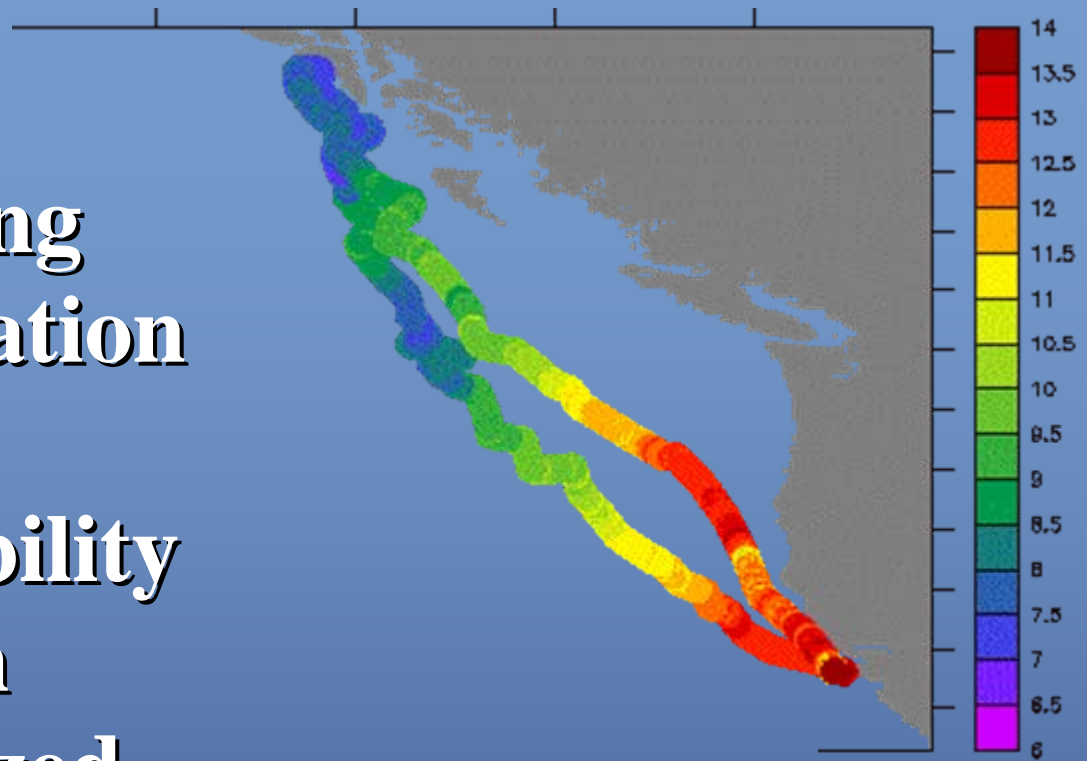


**Simplifying  
data integration  
and  
interoperability  
through  
standardized  
data access  
and  
transport protocols**



**Environmental  
Research Division**

**Southwest Fisheries  
Science Center**

# Project Budget



## Data acquisition

- Ship time
- Equipment
- Travel
- Scientist hours
- Careful sampling

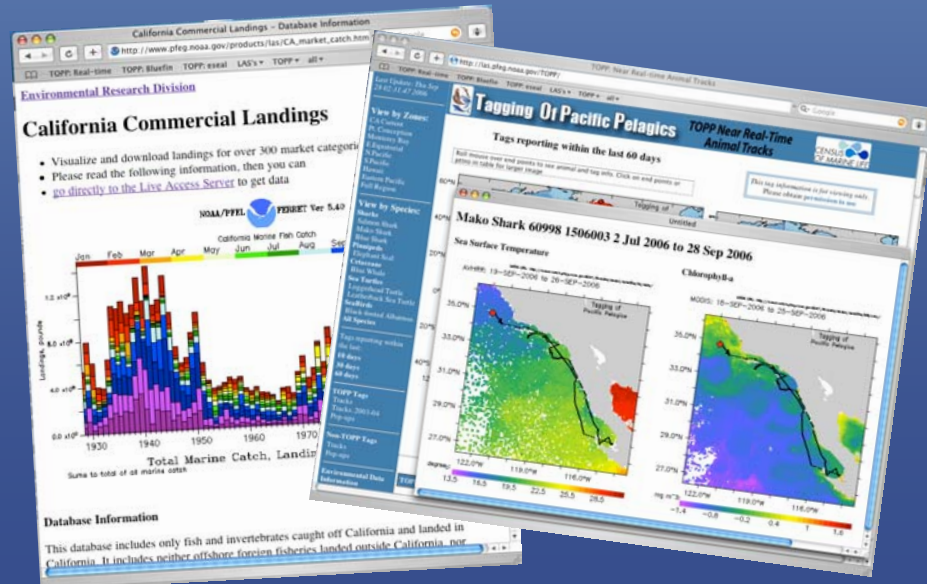
# Project Budget



## Data display

- Web pages
- plots
- Some way to get some data

## Data acquisition



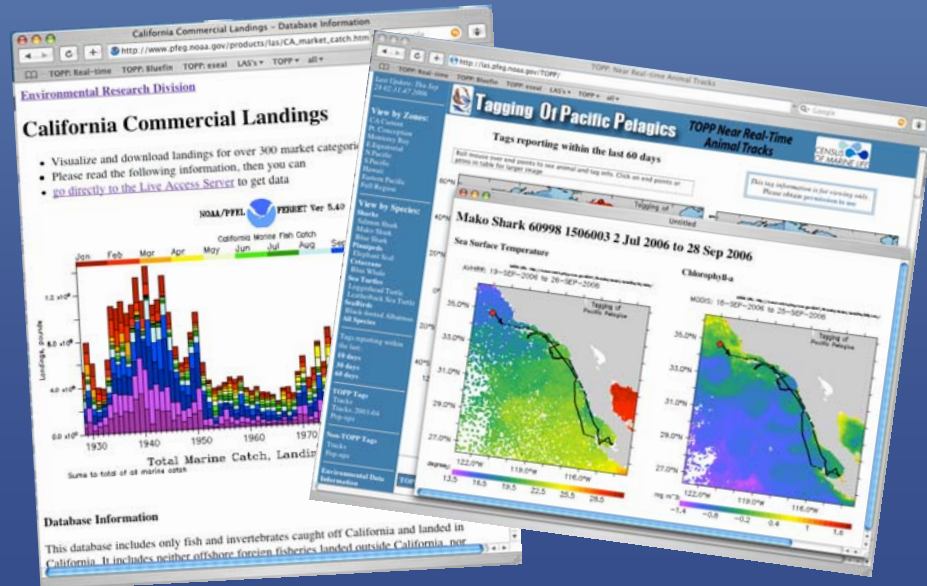


# Project Budget



# Data display

# Data acquisition







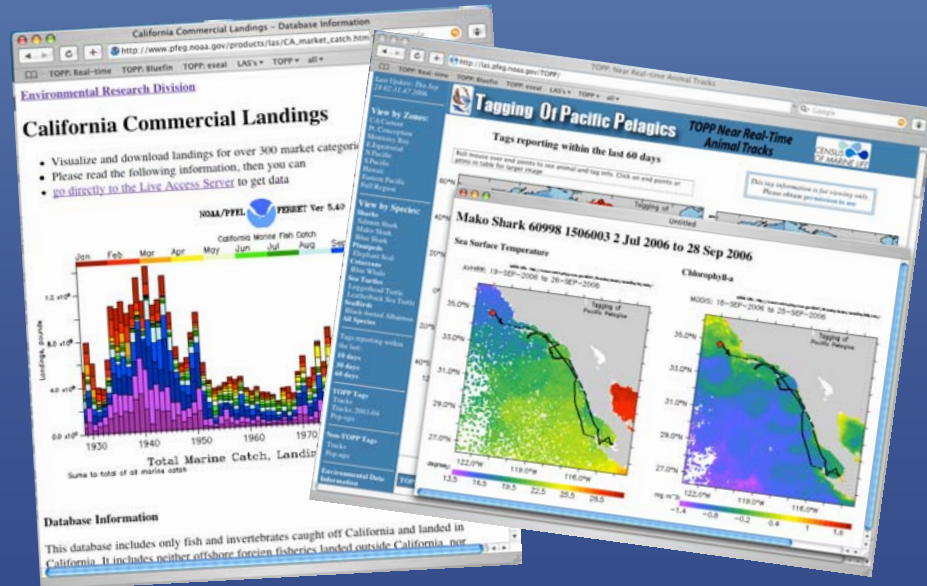
# Project Budget



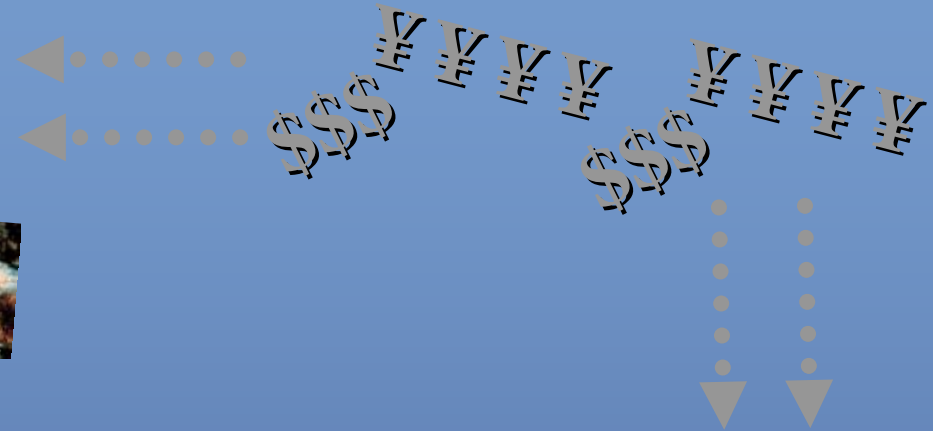
# Data display (serving?)

# Data acquisition

Can researchers get the data they need?



# Project Budget



## Data display (serving?)

- Images may or may not be an actual representation of the raw data
  - interpolated, smoothed, “shape files”
- Data formats vary from project to project – difficult to integrate.
- Often difficult to use the data in a different type of scientific analysis - constrained to parameters set up for web display
- Simple things like different time/date/location formats can take hours of unraveling (if available along with the data at all).



## Data acquisition

A small amount of time spent setting up efficient data transport can greatly reduce the time spent on serving data.

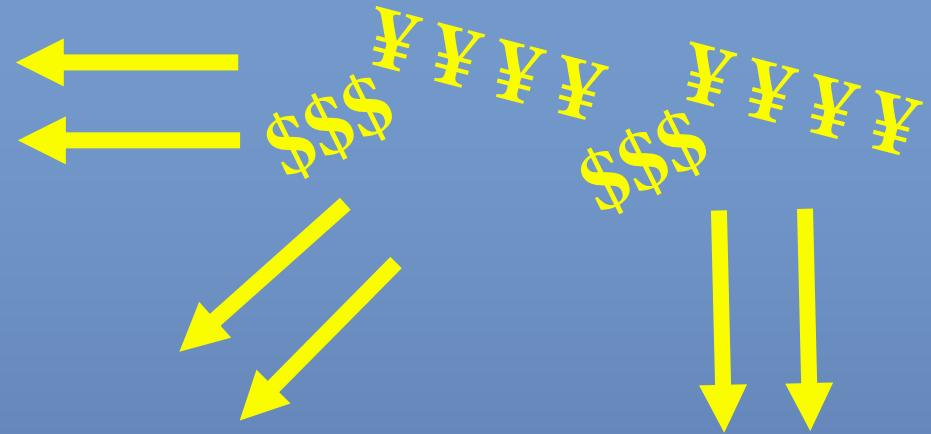
Why is data transport ignored?

Boring

Don't know how

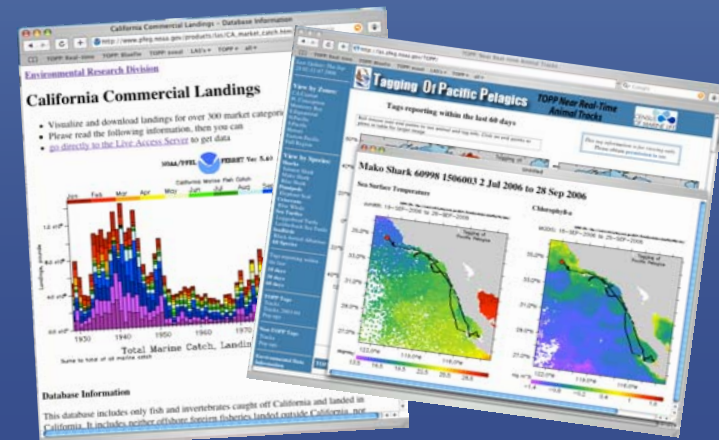
Don't have a programmer

## Project Budget



## Data transport

## Data serving





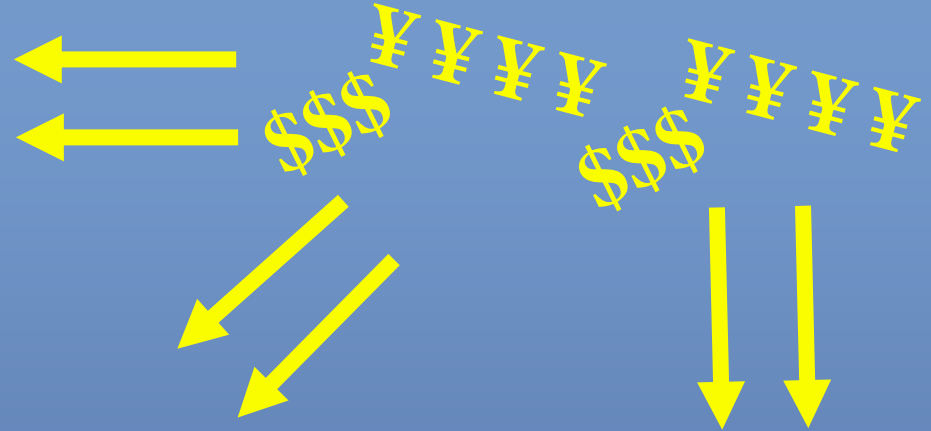


## Data acquisition

A small amount of time spent setting up efficient data transport can greatly reduce the time spent on serving data.

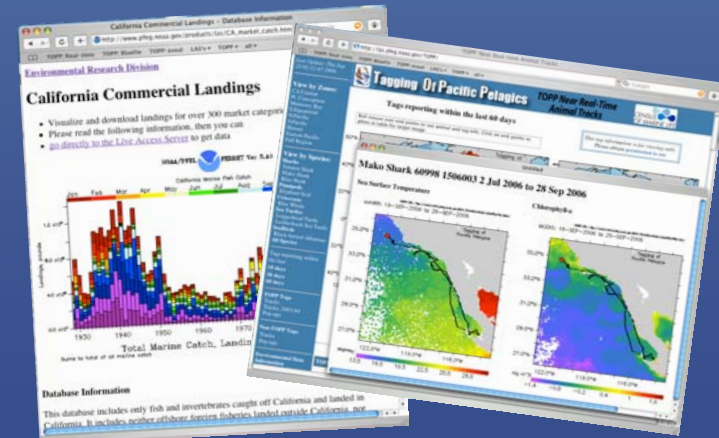
Technology for data transport has improved and will continue to improve at a rapid pace. Many in the community have recognized the importance of efficient data transport for serving and sharing data so the task isn't as arduous as it once was.

## Project Budget



## Data transport

## Data serving





# Environmental Research Division

Southwest Fisheries Science Center

National Marine Fisheries Service

National Oceanographic and  
Atmospheric Administration

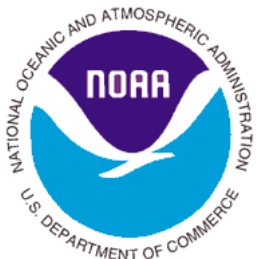
Pacific Grove, California USA

<http://swfsc.noaa.gov/>

Host the NOAA West Coast  
Regional Node of  
CoastWatch

<http://coastwatch.pfel.noaa.gov/>

(formerly PFEL: Pacific Fisheries  
Environmental Laboratory)



# ***ERD Data Products***

~ 30 GB of data per day ingested into ERD servers

Primary focus:

**Provide fisheries-related environmental data for**

- **data integration to support ecosystem based management**
- **research on marine mammals and protected species**
- **studies in climate change and environmental variability**

Goal for our data service:

- **Reduce time investigators spend preparing data for analysis**
- **Provide consistent, easy to use formats that comply with recognized standards (IOOS)**
- **Provide ability to subset data rather than having to get the entire data set**

# *Who uses ERD data?*

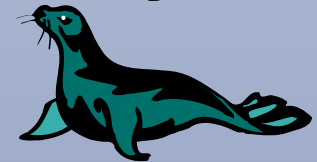
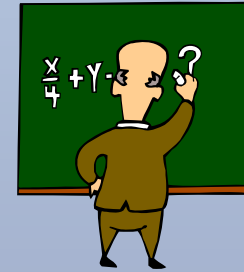
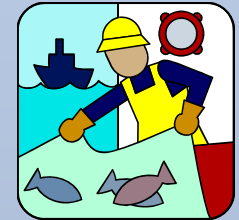
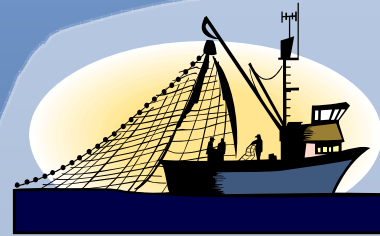
... many types of users with

- varying interests
- differing data requirements
- all levels of technological skill

## **Users include:**

fisheries biologists  
physical oceanographers  
researchers in other fields  
students  
fishermen  
general public

**Numerous countries and affiliations**





# *Why is **ERD** unique among data providers?*

- **Maintain long, continuous time series of environmental variables and indices**
  - Upwelling index
- **Research to provide quality products and create new ones**
- **Tailor access to the average scientific investigator**
  - Provide a user friendly delivery service on the Web
  - Provide data in forms that make it easy to access and subset
- **Encourage and use recommended IOOS standards for data formats and service**
  - OPeNDAP, Live Access Server , THREDDS
  - Roy Mendelssohn - member of the User Outreach Team of the Data and Communications Steering Committee for IOOS
- **Collaboration with other data centers and research programs**
  - Integration of environmental data with marine mammal and fisheries data
  - Interoperability of data systems within our organization and with outside partners

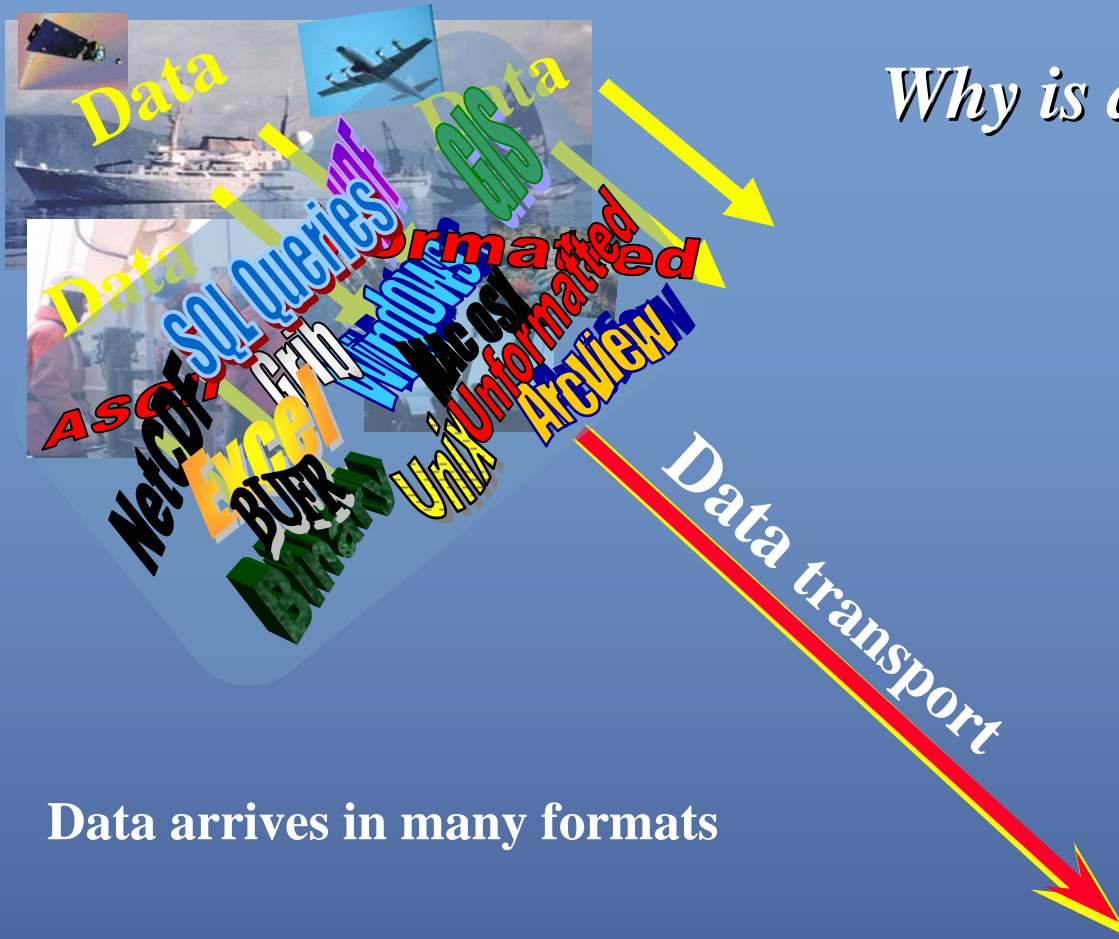


*Why is data transport layer so important?*

*Data transport*

A small amount of time spent setting up efficient data transport can greatly reduce the time spent on serving data.

*Why is data transport layer so important?*



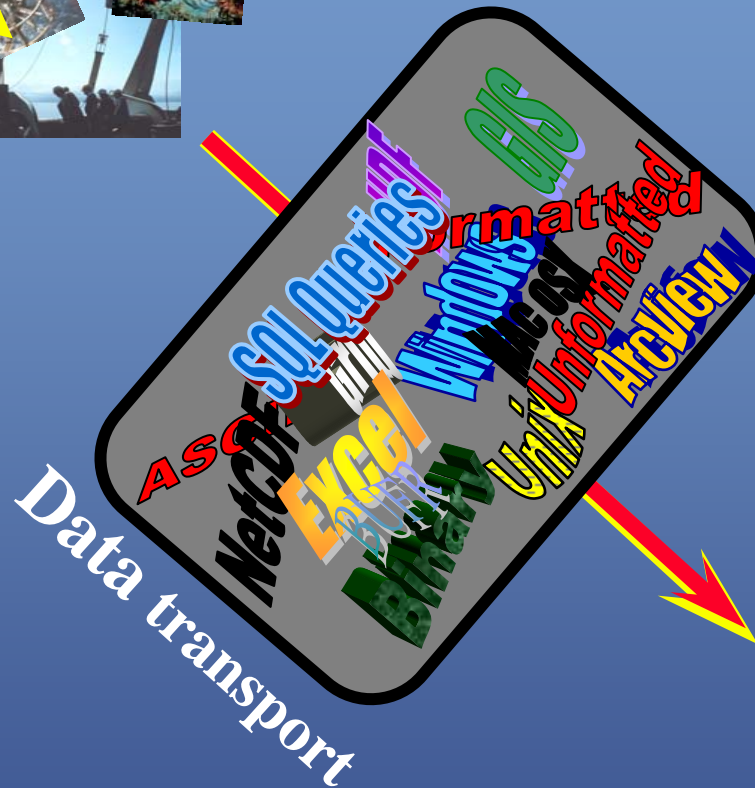
Data arrives in many formats





## *Why is data transport layer so important?*

Put all the data into a “black box”. Users and applications can make requests for data without needing to know the format of the data.





Data

Data

Data

Data

Data transport

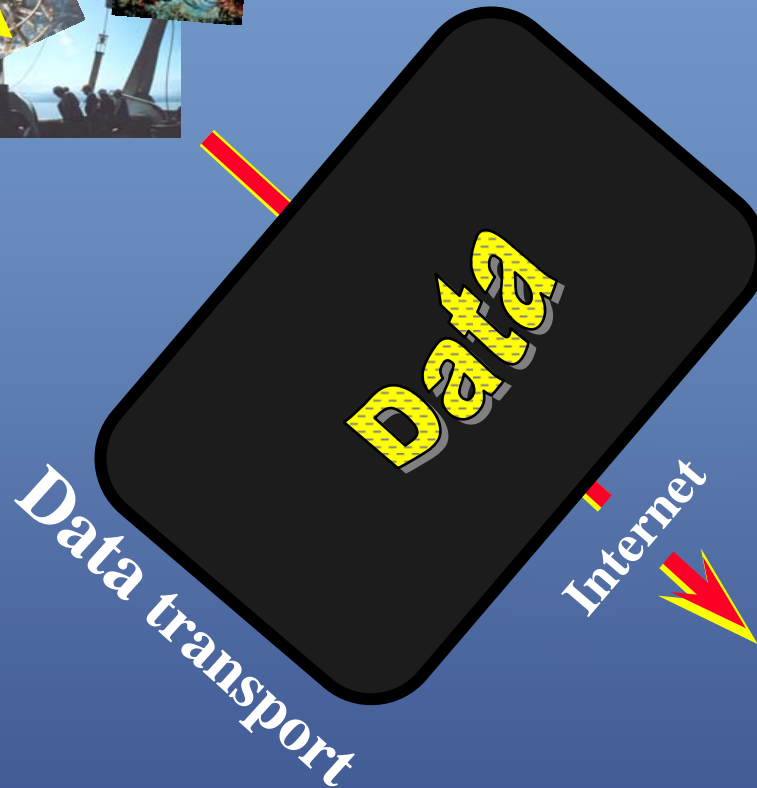
Internet

*Why is data transport layer so important?*

Put all the data into a “black box”. Users and applications can make requests for data without needing to know the format of the data.



*Why is data transport layer so important?*

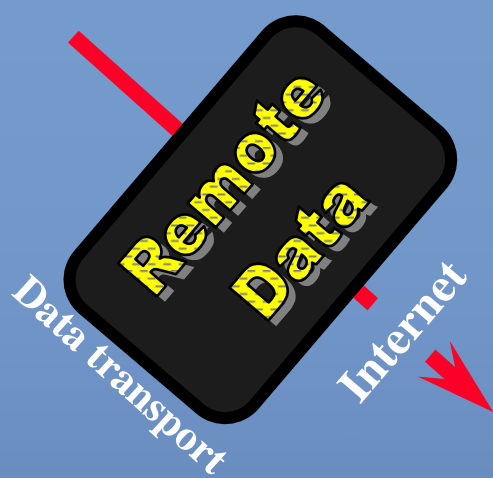


Users can use their favorite **application** to access data at their desktop

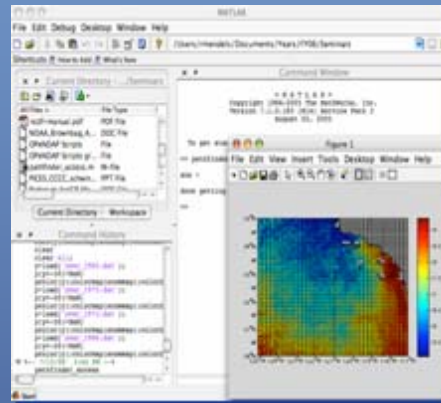
**Developers** can remotely access data directly in their code

**Web browsers** can access and subset remote data

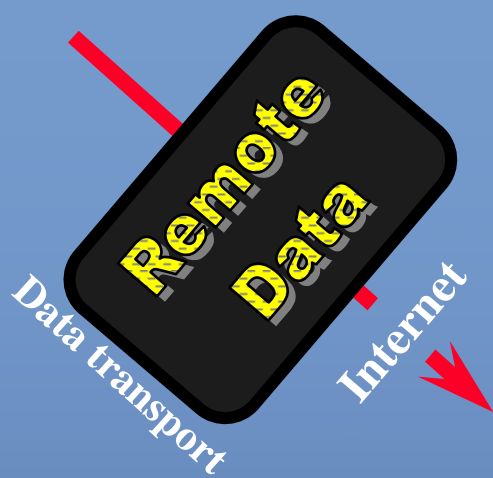




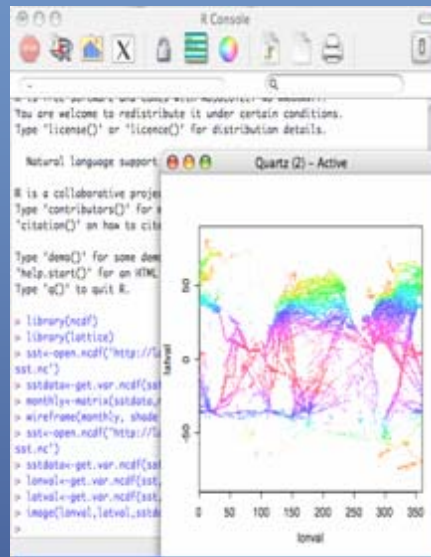
# Matlab



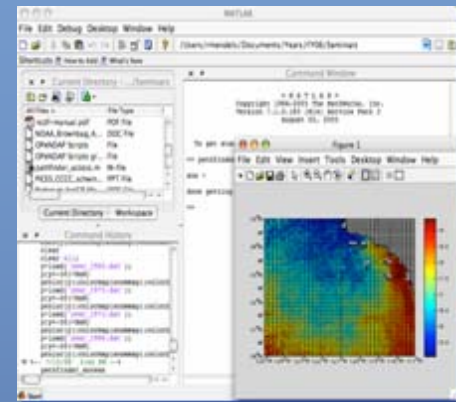
Users can use their favorite **application** to access data at their desktop



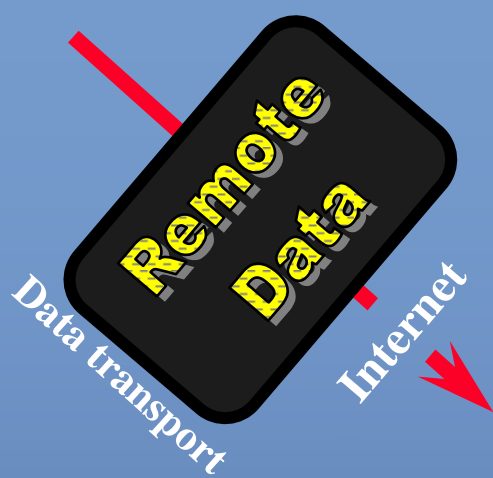
R



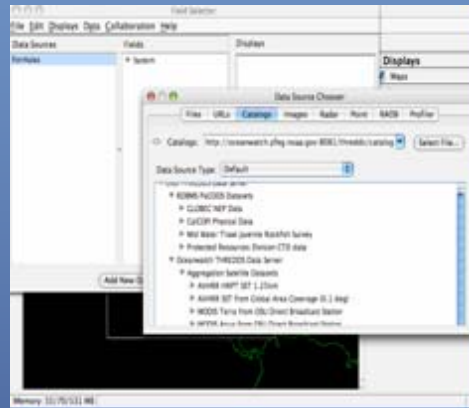
Matlab



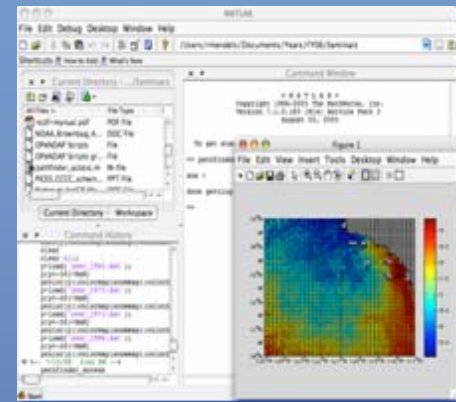
Users can use their favorite **application** to access data at their desktop



IDV

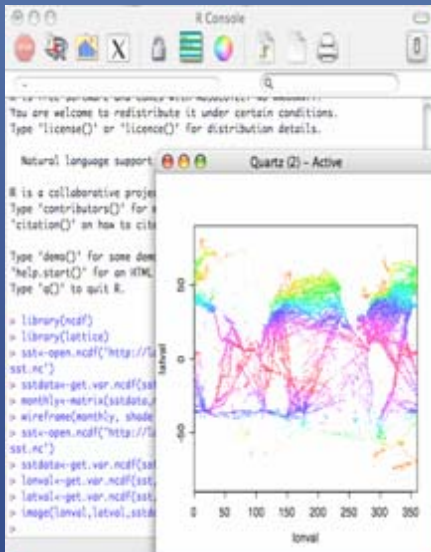


Matlab



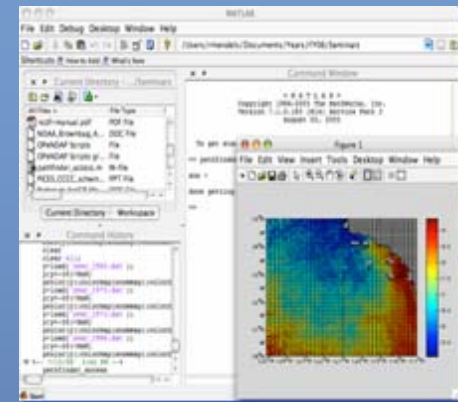
Users can use their favorite **application** to access data at their desktop

R



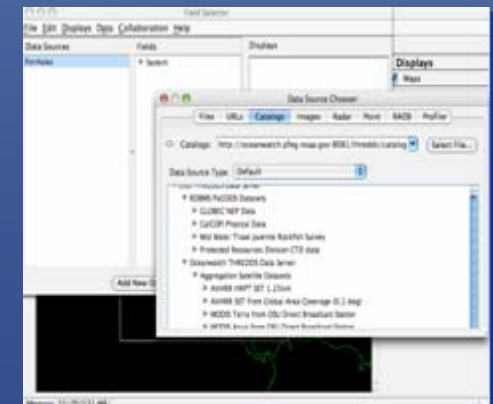


# Matlab

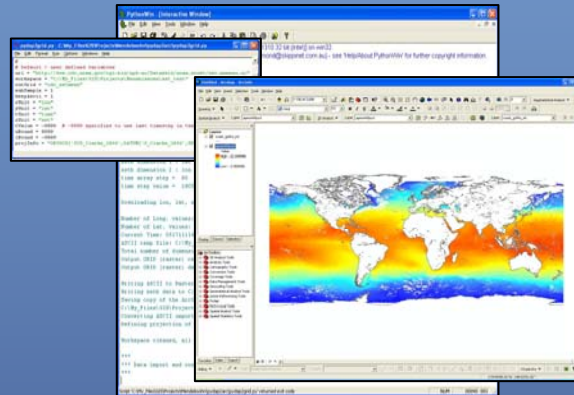


Users can use their favorite **application** to access data at their desktop

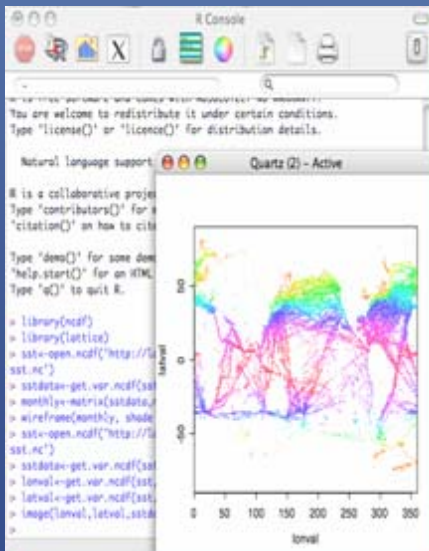
# IDV



# ArcGIS



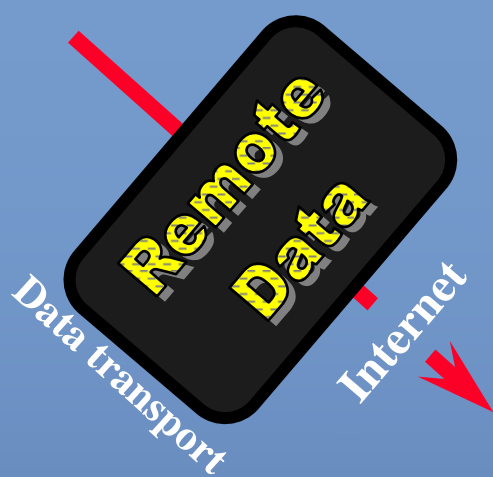
# R



Data transport

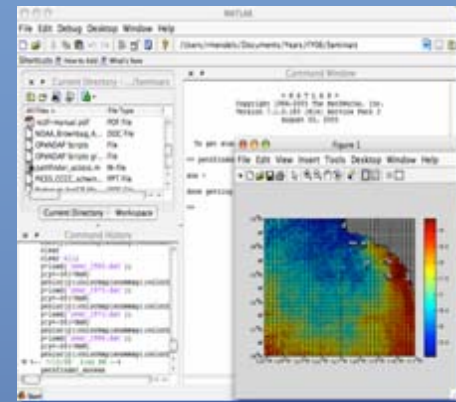
Internet

Remote Data



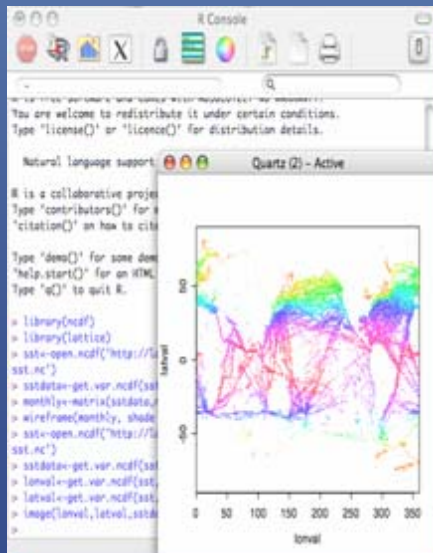
Any other  
OPeNDAP-enabled  
application such as  
Ferret, GRADS, etc.

# Matlab

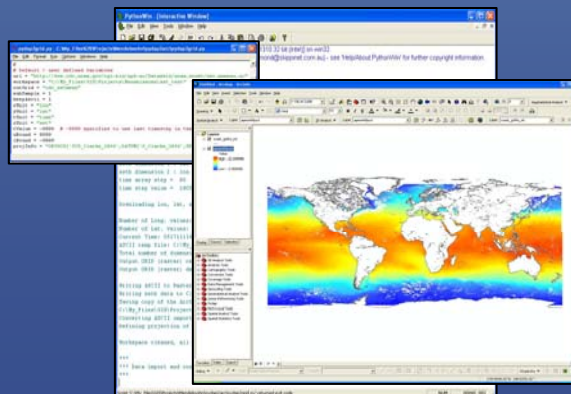


Users can use their  
favorite **application** to  
access data at their  
desktop

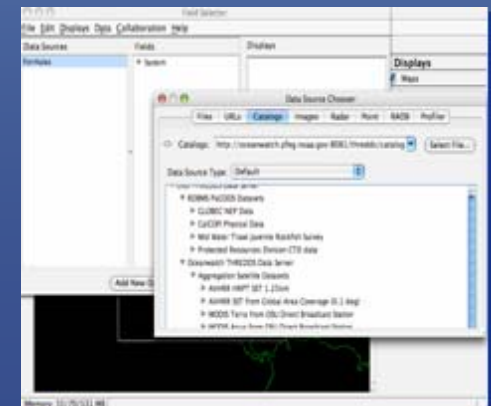
# R



# ArcGIS



# IDV





# Andrew Leising , ERD GUI for importing OPeNDAP data directly into Matlab

NOAA

## PFEL CALCOFI DODS SERVER

NOAA

7.0.

Start

Start Year	1949
End Year	2001
Start month	1
End month	12
Start line	10
End line	150
Start Station	0
End station	150
Start depth	0
End depth	200
Start lat	0
End lat	180
Start lon	0
End lon	180

Plot Type

Var X vs Var Y

X vs Y vs Z

X Var	Y Var	Z Var
depth	depth	depth
temperature	temperature	temperature
salinity	salinity	salinity
pressure	pressure	pressure
oxygen	oxygen	oxygen
phosphate	phosphate	phosphate
silicate	silicate	silicate
no3	no3	no3
nh4	nh4	nh4
chlA	chlA	chlA
primary prod	primary prod	primary prod
dark	dark	dark
secchi	secchi	secchi

Make Graph

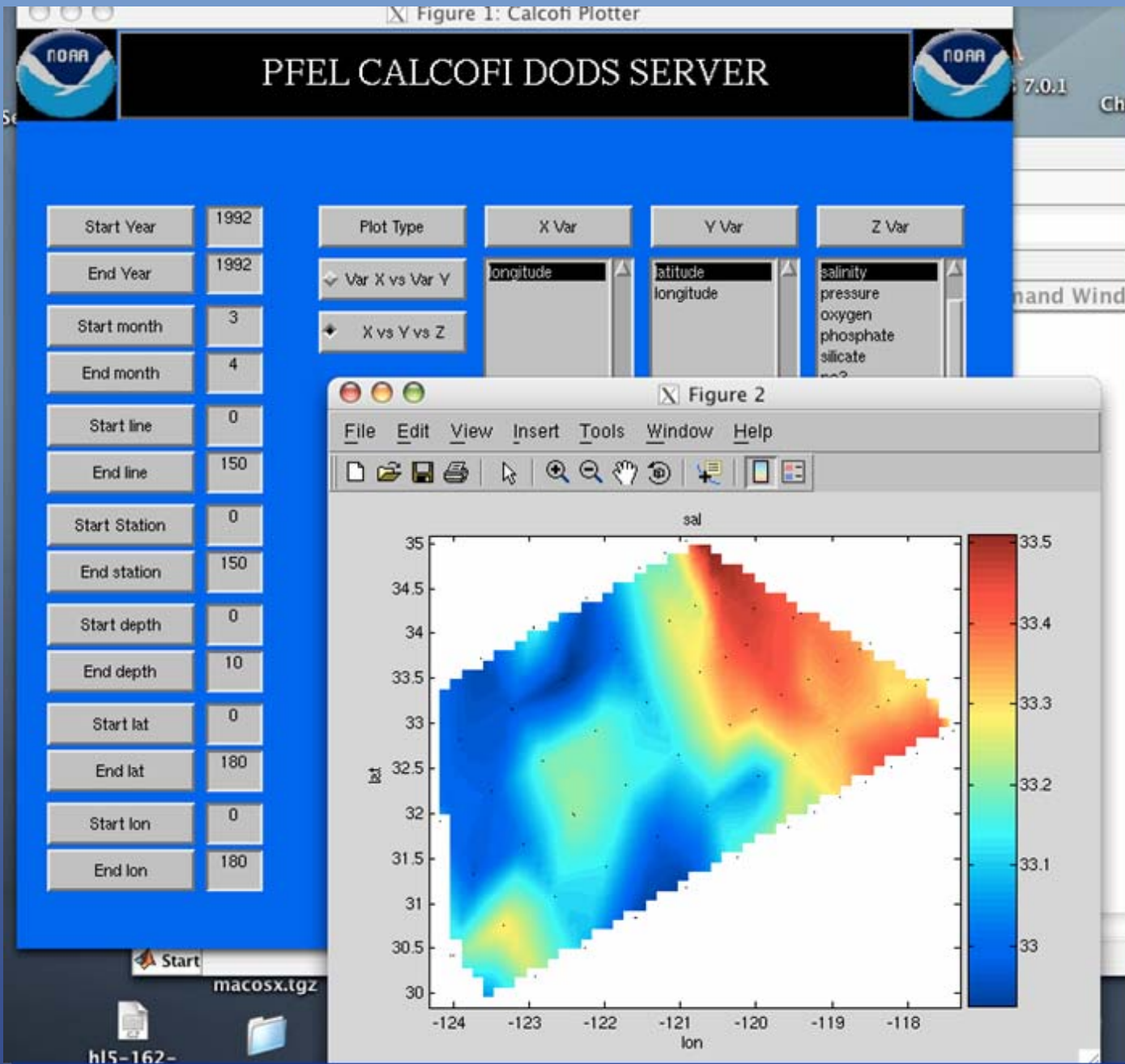
Export Data

Example 1 Example 2 Example 3 Example 4

Start

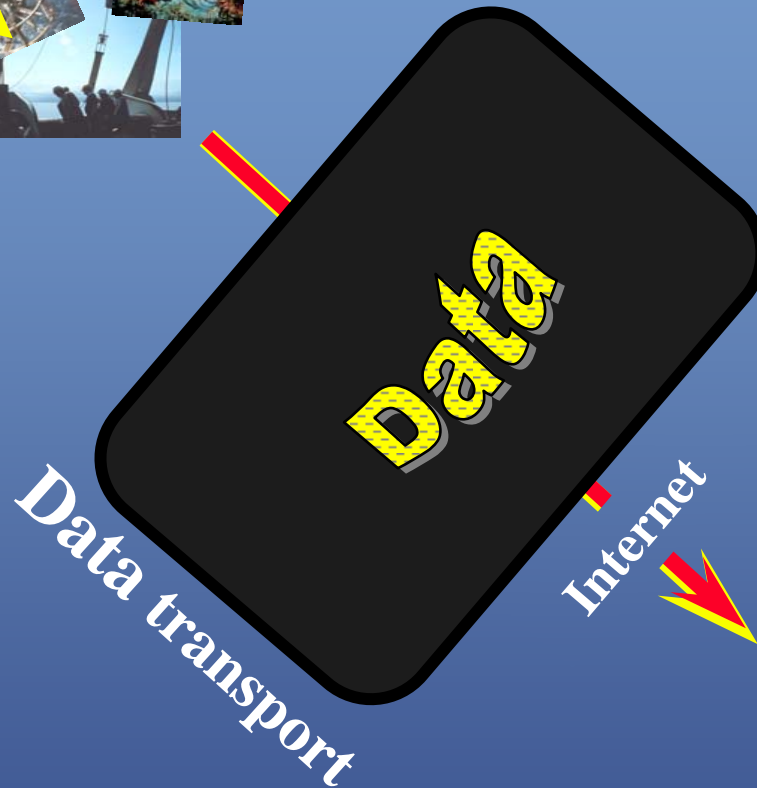


Figure 1: Calcofi Plotter





*Why is data transport layer so important?*

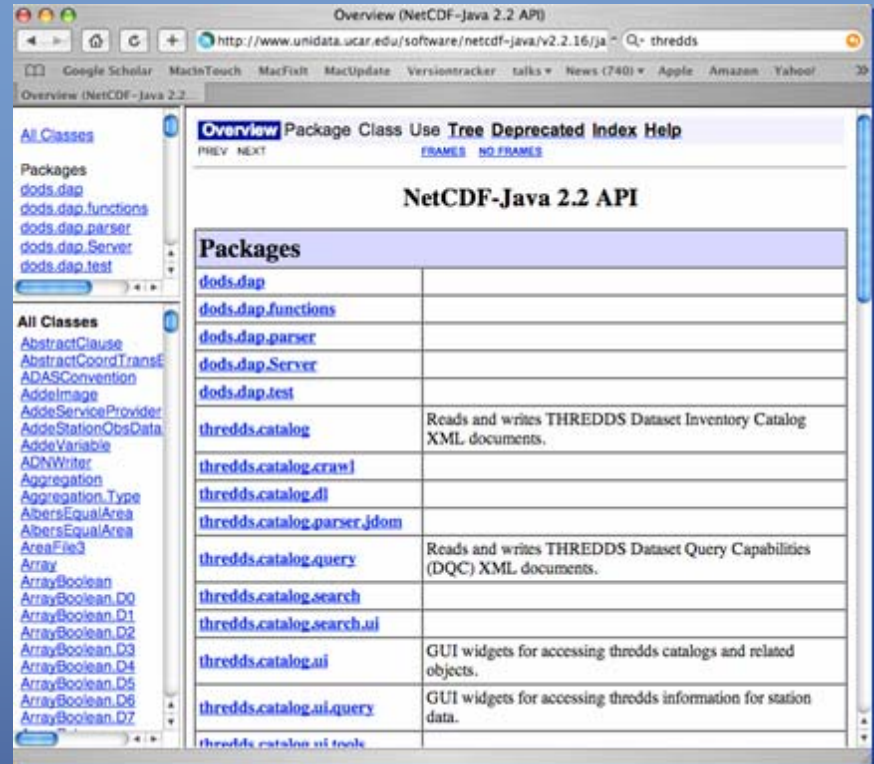
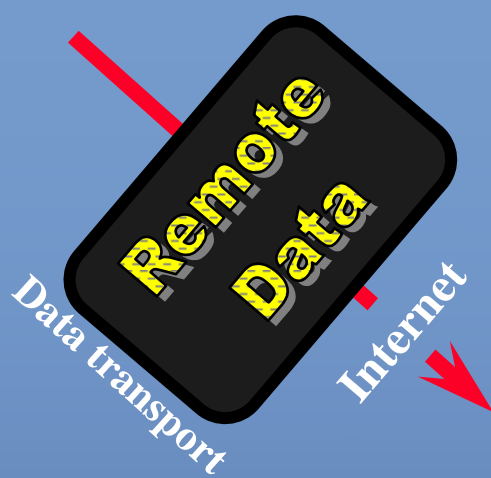


Users can use their favorite **application** to access data at their desktop

**Developers** can remotely access data directly in their code

**Web browsers** can access and subset remote data

# Java



**Developers** can remotely access data directly in their code

# Java Development

<http://coastwatch.pfeg.noaa.gov/coastwatch/CWBrowser.jsp>



[Home](#) | [Data Browser](#) | [Browser](#) | [Data](#) | [Information](#) | [Software](#) | [El Niño](#) | [Sites](#) | [Feedback](#)

## CoastWatch Browser - Create custom maps and download near-real-time satellite data.

[\[Help\]](#)

Edit: ☒ The Map ☐ Main Data ☐ Bathymetry ☐ Contour Data ☐ Vector Data

1) Select a region: ☒ US+Mexico ☐ West US ☐ N ☐ N1 ☐ N2 ☐ N3 ☐ C ☐ C1 ☐ C2 ☐ C3 ☐ S ☐ S1 ☐ S2 ☐ M ☐ M1 ☐ M2

(or specify ...)

Max Y: 50  -  +

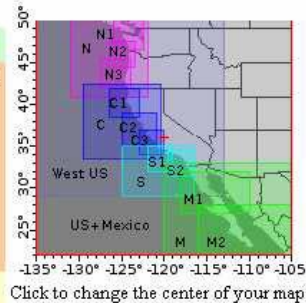
Min X: -135  -  + Max X: -105  -  +

Min Y: 22  -  +

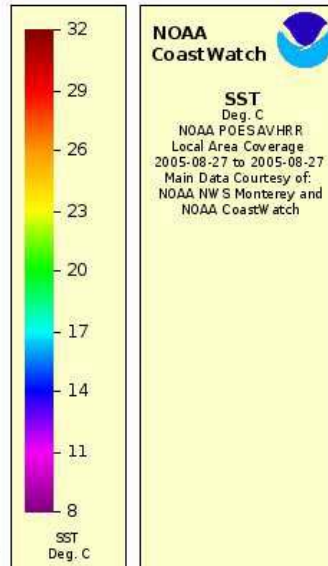
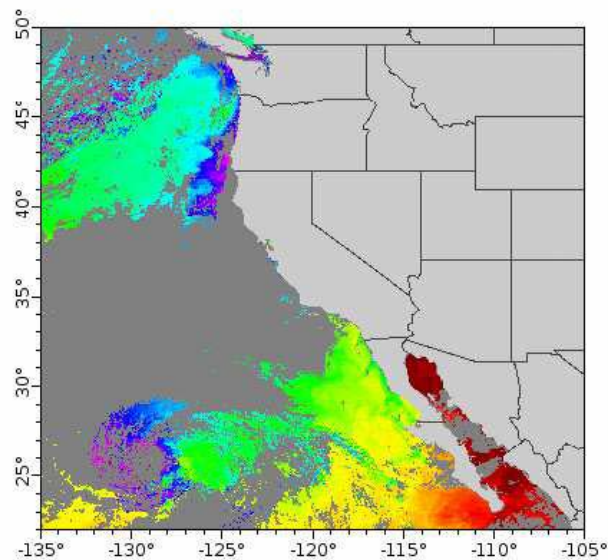
(or ...)

2) Select a size:

3) Download the map:




Click to change the center of your map.



Bob Simons, ERD



<http://coastwatch.pfeg.noaa.gov/coastwatch/CWBrowser.jsp>CoastWatch

CoastWatch

[\[Help\]](#)

Edit:

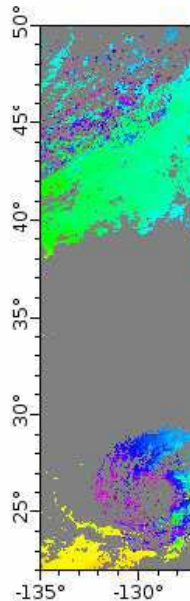
1) Select a region:

(or specify ...)

(or ...)

2) Select a size:

3) Download the map



## CoastWatch Browser - Create custom maps and download near-real-time satellite data. [\[Help\]](#)

Edit:

☐ The Map ☒ Main Data ☐ Bathymetry ☐ Contour Data ☐ Vector Data

1) Select a data set:

☐ None ☒ SST 1km ☐ SST 11km\* ☐ SST Anom.\* ☐ Pathfinder SST ☐ GOES SST ☐ NASA Aqua Chl-*a*  
☐ OSU Aqua Chl-*a* ☐ SeaWiFS Chl-*a* ☐ Zonal Wind\* ☐ Merid Wind\* ☐ Div Wind\* ☐ Mod Wind\*  
☐ Zonal Wind Stress\* ☐ Merid Wind Stress\* ☐ Mod Wind Stress\* ☐ Stress Curl\* ☐ Ekman Upwelling\*  
☐ Zonal Ekman\* ☐ Merid Ekman\* ☐ Mod Ekman\*

2) Select a time period:

☐ pass ☐ 1 day ☐ 3 day ☒ 8 day ☐ 14 day

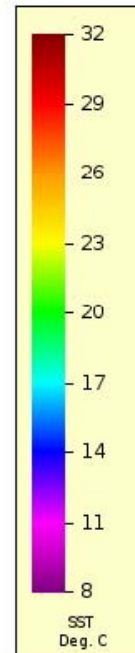
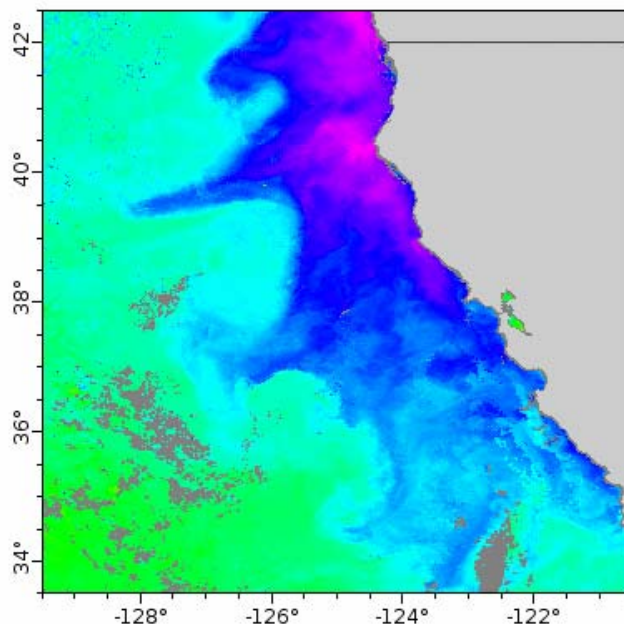
3) Select an ending date:

2005-08-27      

4) Select a palette:

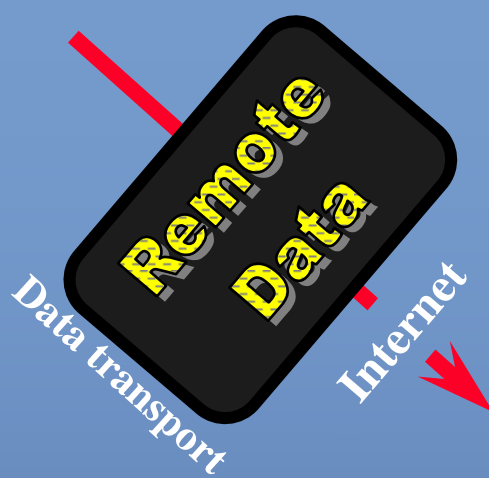
Rainbow  Scale: Linear  Min: 8.0   Max: 32.0  

5) Download the data:

      [\[Help\]](#)NOAA  
CoastWatchSST  
Deg. C

NOAA POES AVHRR  
Local Area Coverage  
2005-08-20 to 2005-08-27  
Main Data Courtesy of:  
NOAA NW S Monterey and  
NOAA CoastWatch

# Java



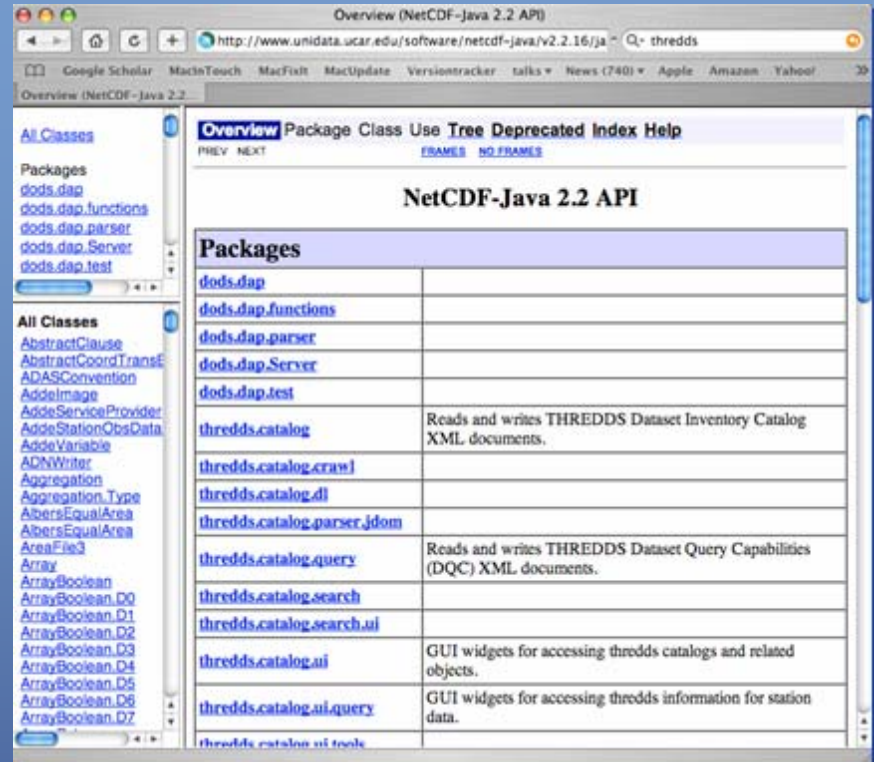
Python

```
Python Shell

File Edit Shell Debug Options Windows Help

*****
Personal firewall software may warn about the connection IDLE
makes to its subprocess using this computer's internal loopback
interface. This connection is not visible on any external
interface and no data is sent to or received from the Internet.
*****

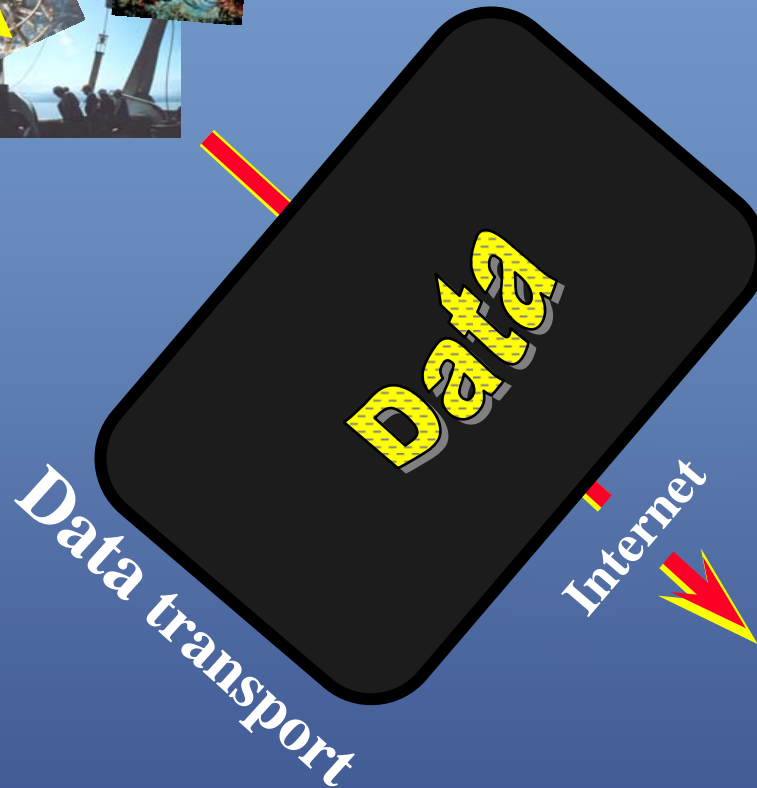
IDLE 1.1.2
>>> from numpy import *
>>> from dap.client import open
>>> from dap.client import open
>>> from dap.client import open
>>> from dap.client import open
>>> import biggles
>>> dataset=open('http://las.pfeg.noaa.gov/cgi-bin/nph-dods/data/GTS/sst.nc')
>>> sst=data[et['SST_RAW']]
>>> time=dataset['TAXI']
>>> sstdata=ravel(sst[:, 124, 134])
>>> timedata=time[:]
>>> y=greater(sstdata, -5)
>>> x=p[0:110].tolist()
>>> loop = 0
>>> sst_len = len(sstdata)
>>> p = biggles.FramedPlot()
>>> while (1 in x[loop:]):
>>>     j=x[loop:].index(1)
>>>     i=x[loop+j:].index(0)
>>>     xax=timedata[loop+j:loop+j+i]
>>>     yax=sstdata[loop+j:loop+j+i]
>>>     p.add(biggles.curve(xax,yax))
>>>     loop=loop+i+j
>>> p.show()
>>>
```



Developers can remotely access data directly in their code



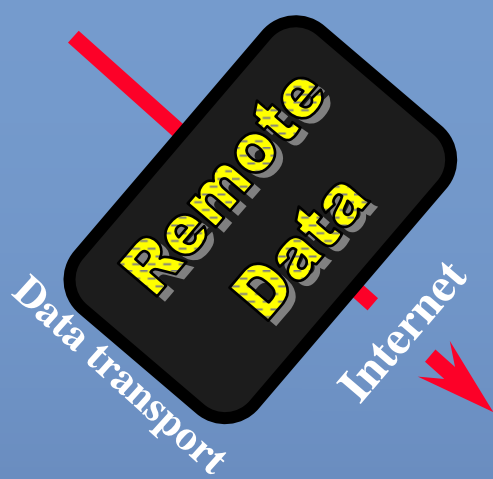
*Why is data transport layer so important?*



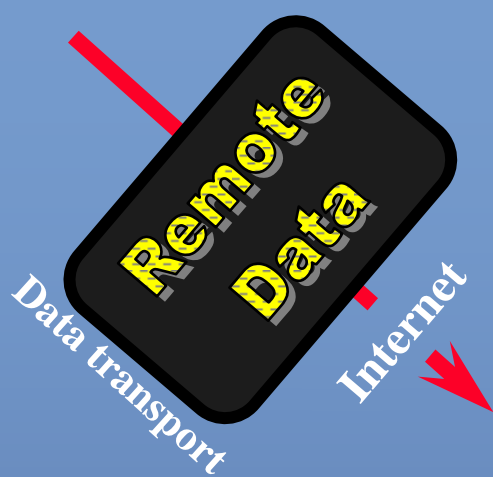
Users can use their favorite **application** to access data at their desktop

**Developers** can remotely access data directly in their code

**Web browsers** can access and subset remote data



**Web browsers** can  
access and subset  
remote data



**Web browsers** can  
access and subset  
remote data

Most basic method of  
access:  
**DODS Dataset Form**

**DODS Dataset Query Form - Microsoft Internet Explorer**

Address http://oceanwatch.pfeg.noaa.gov:8081/thredds/dodsC/satellite/PH/ssta/1day.html

File Edit View Favorites Tools Help

---

## DODS Dataset Access Form

---

Tested on Netscape 4.61 and Internet Explorer 5.00.

---

**Action:**

**Data URL:**

---

**Global Attributes:**

acknowledgement: "NOAA NESDIS"
cdm_data_type: "Grid"
cols: 7201
composite: "true"
contributor_name: "NOAA NODC"

---

**Variables:** ☐ **altitude:** Array of 32 bit Reals [altitude = 0..0]

altitude:

actual_range: 0.0, 0.0
fraction_digits: 0
long_name: "Altitude"
standard_name: "altitude"
units: "m"

---

☐ **lat:** Array of 32 bit Reals [lat = 0..3000]

lat:

actual_range: -75.0, 75.0
coordsys: "geographic"
fraction_digits: 2



Data transfer

Remote  
Data

Internet

# DODS Dataset Query Form - Microsoft Internet Explorer

Address <http://oceanwatch.pfeg.noaa.gov:8081/thredds/dodsC/satellite/PH/ssta/1day.html>

File Edit View Favorites Tools Help

## DODS Dataset Access Form

Tested on Netscape 4.61 and Internet Explorer 5.00.

☐ **lon:** Array of 32 bit Reals [lon = 0..7200]

lon:

actual\_range: 0.0, 360.0

coordsys: "geographic"

fraction\_digits: 2

long\_name: "Longitude"

point\_spacing: "even"

dsC/satellite/PH/ssta/1 d

☐ **time:** Array of 64 bit Reals [time = 0..729]

time:

actual\_range: 1.041379199E9, 1.041379199E9

fraction\_digits: 0

long\_name: "End Time"

standard\_name: "time"

units: "seconds since 1970-01-01T00:00:00Z"

= 0.0]

☐ **PHssta:** Grid

time:  altitude:  lat:  lon:

\_FillValue: -1.0E32

actual\_range: -2.925, 32.775

coordsys: "geographic"

fraction\_digits: 1

long\_name: "SST, Pathfinder Ver 5.0, Day and Night"



☒ **lat:** Array of 32 bit Reals [lat = 0..3000]

lat: 1910:1:1915

actual\_range: -75.0, 75.0

coordsys: "geographic"

fraction\_digits: 2

long\_name: "Latitude"

point\_spacing: "even"

☒ **lon:** Array of 32 bit Reals [lon = 0..7200]

lon: 3515:1:3520

actual\_range: 0.0, 360.0

coordsys: "geographic"

fraction\_digits: 2

long\_name: "Longitude"

point\_spacing: "even"

☒ **time:** Array of 64 bit Reals [time = 0..729]

time: 600:1:600

actual\_range: 1.041379199E9, 1.041379199E9

fraction\_digits: 0

long\_name: "End Time"

standard\_name: "time"

units: "seconds since 1970-01-01T00:00:00Z"

☒ **PHssta:** Grid

time: 500:1:500

altitude: 0:1:0

lat: 1910:1:1915

lon: 3515:1:3520

\_FillValue: -1.0E32

actual\_range: -2.925, 32.775

coordsys: "geographic"

fraction\_digits: 1

long\_name: "SST, Pathfinder Ver 5.0, Day and Night"

## Dataset Access Form

[Download Help](#)[1/thredds/dodsC/satellite/PH/sssta/1day.html](#)

IS"

3"

ls [altitude = 0..0]

= 0..3000]

☒ **lat:** Array of

lat: 1910:1:1915

actual\_range:

coordsys: "geographic"

fraction\_digits:

long\_name: "Latitude"

point\_spacing:

☒ **lon:** Array of

lon: 3515:1:3520

actual\_range:

coordsys: "geographic"

fraction\_digits:

long\_name: "Longitude"

point\_spacing:

☒ **time:** Array of

time: 600:1:600

actual\_range:

fraction\_digits:

long\_name: "Time"

standard\_name:

units: "seconds"

☒ **PHssta:** Grid

time: 500:1:500

FillValue: -


actual\_range:

coordsys: "geographic"

fraction\_digits:

long\_name: "Sea Level Pressure"


## DODS Dataset Query Form - Microsoft Internet Explorer

Address  http://oceanwatch.pfeg.noaa.gov:8081/thredds/dodsC/satellite/PH/ssta/1day.html

File Edit View Favorites Tools Help

## DODS Dataset Access Form

Tested on Netscape 4.61 and Internet Explorer 5.00.

**Action:** Get ASCII

Get Binary

Show Help

**Data URL:**

http://oceanwatch.pfeg.noaa.gov:8081/thredds/dodsC/satellite/PH/ssta/1day.html

**Global Attributes:**

acknowledgement: "NOAA NESDIS"

cdm\_data\_type: "Grid"

cols: 7201

composite: "true"

contributor\_name: "NOAA NODC"

**Variables:** ☐ **altitude:** Array of 32 bit Reals [altitude = 0.0]

altitude:

actual\_range: 0.0, 0.0

fraction\_digits: 0

long\_name: "Altitude"

standard\_name: "altitude"

units: "m"

☐ **lat:** Array of 32 bit Reals [lat = 0.3000]

lat:

actual\_range: -75.0, 75.0

coordsys: "geographic"

fraction\_digits: 2

# DODS Dataset Query Form - Microsoft Internet Explorer

Address <http://oceanwatch.pfeg.noaa.gov:8081/thredds/dodsC/satellite/PH/ssta/1day.html>

File Edit View Favorites Tools Help

## DODS Dataset Access Form

[http://oceanwatch.pfeg.noaa.gov:8081/thredds/dodsC/satellite/PH/ssta/1day.ascii?lat\[1910:1:1915](http://oceanwatch.pfeg.noaa.gov:8081/thredds/dodsC/satellite/PH/ssta/1day.ascii?lat[1910:1:1915) - Microsoft In...

Address [http://oceanwatch.pfeg.noaa.gov:8081/thredds/dodsC/satellite/PH/ssta/1day.ascii?lat\[1910:1:1915\],lon\[3515:1:3520\],time\[60C](http://oceanwatch.pfeg.noaa.gov:8081/thredds/dodsC/satellite/PH/ssta/1day.ascii?lat[1910:1:1915],lon[3515:1:3520],time[60C) Go

File Edit View Favorites Tools Help

Links >>

```

/ satellite/PH/ssta/1day,
-----
lat[6]
20.5, 20.55, 20.6, 20.65, 20.7, 20.75

lon[6]
175.75, 175.8, 175.85, 175.9, 175.95, 176.0

time[1]
1.030233599E9

PHssta.PHssta[1][1][6][6]
[0][0][0], 24.525, 24.75, 24.75, 24.75, 24.825, -1.0E32
[0][0][1], 24.6, 24.6, 24.675, 24.75, 24.525, 24.3375
[0][0][2], 24.675, 24.525, 24.45, 24.45, 24.3, 24.6
[0][0][3], 24.6, 24.525, 24.375, 24.525, 24.375, 24.4125
[0][0][4], 24.1125, 24.1125, 24.075, 24.3, 24.4875, 24.525002
[0][0][5], 24.0, 24.225, 24.225, 24.225, 24.3, 24.375

PHssta.time[1]
1.021503500E9
    
```

Done

Internet

☒ **lat:** Array of  
lat: 1910:1:1915  
actual\_range:  
coordsys: "ge

\_FillValue: -  
actual\_range:  
coordsys: "ge  
fraction\_digi  
long\_name: "S

units: "m"

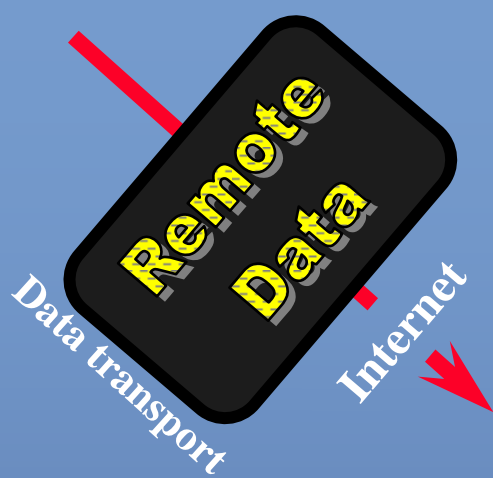
☐ **lat:** Array of 32 bit Reals [lat = 0..3000]

lat:

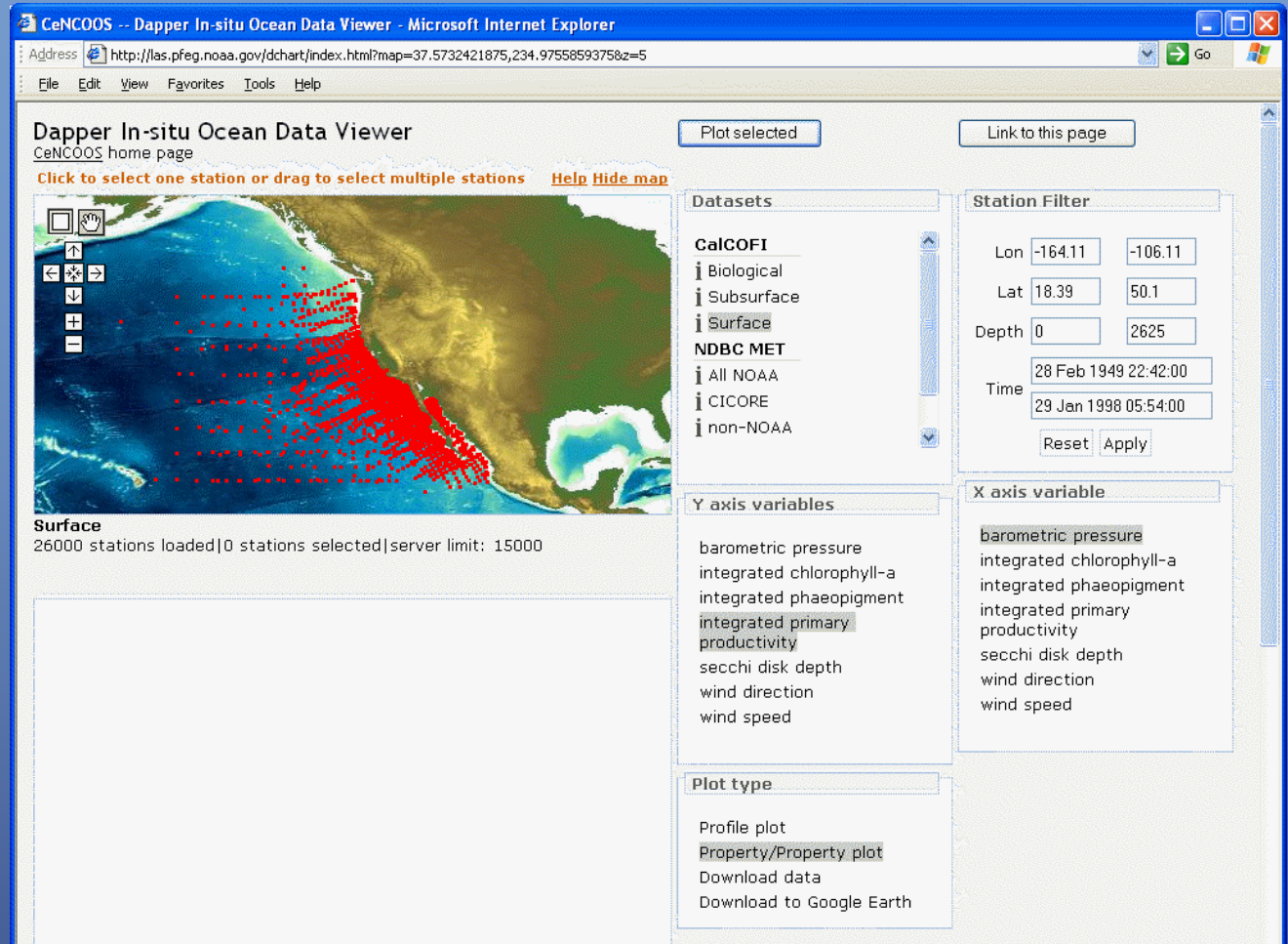
actual\_range: -75.0, 75.0  
coordsys: "geographic"  
fraction\_digits: 2

Enter start, stride and stop for the array dimension.





**Web browsers** can access and subset remote data



## DChart

A Web interface for OPeNDAP/dapper in-situ data collections, Free/Open Source  
Joe Sirott, PMEL, NOAA

Dapper: OPeNDAP web server developed by the EPIC group at PMEL that provides networked access to in-situ and gridded data

<http://www.epic.noaa.gov/epic/software/dchart/index.html>



Data transport

Remote  
Data

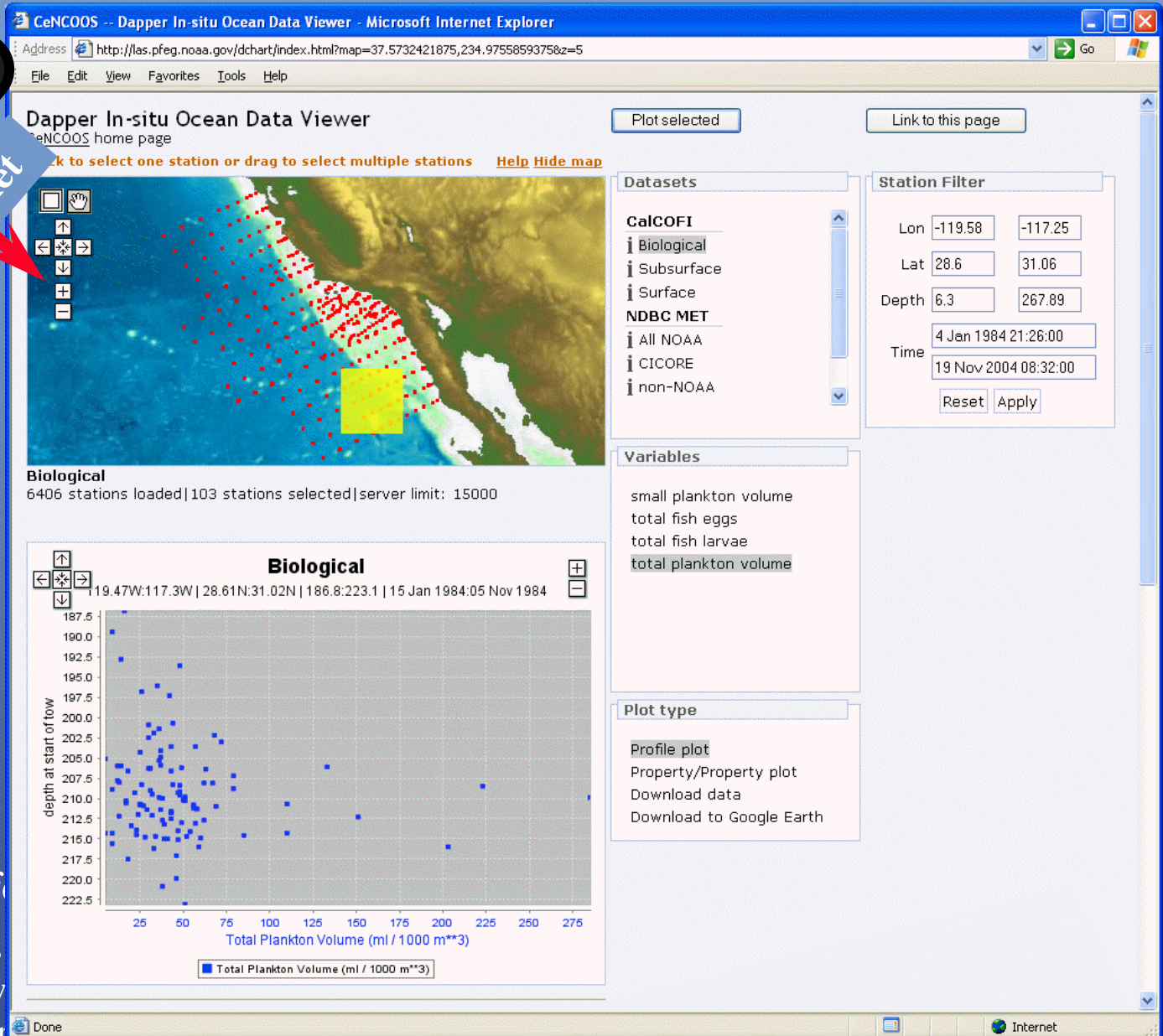
Internet

Web browsers can  
access and subset  
remote data

## Dchart

A Web interface for  
Joe Sirott, PMEL,  
Dapper: OPeNDAP with  
access to in-situ and gridded

<http://www.epic.noaa.gov/epic/software/dchart/index.html>



Data transport

Remote  
Data

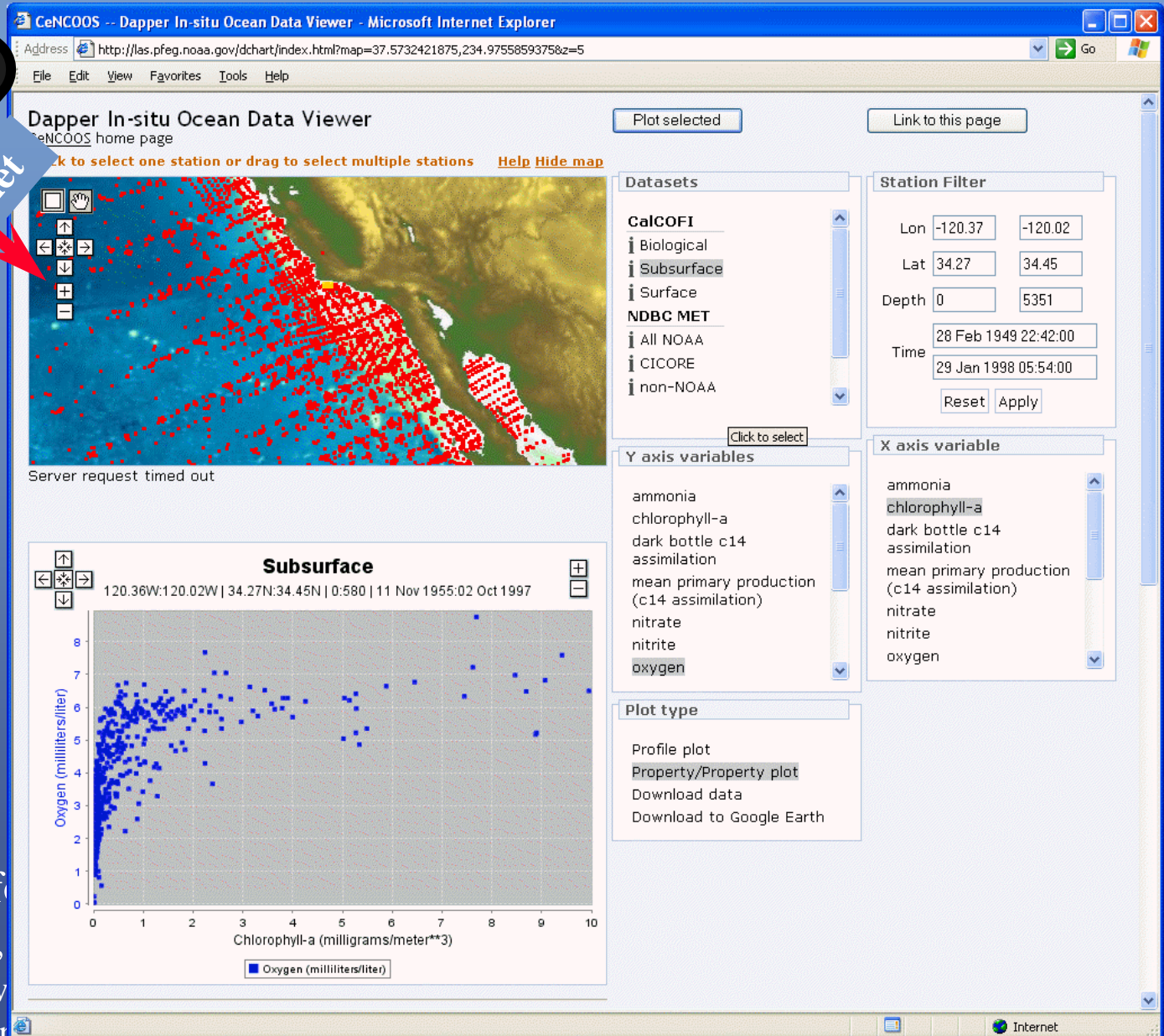
Internet

Web browsers can  
access and subset  
remote data

## Dchart

A Web interface for  
Joe Sirott, PMEL,  
Dapper: OPeNDAP with  
access to in-situ and gridded

<http://www.epic.noaa.gov/epic/software/dchart/index.html>





Data transport

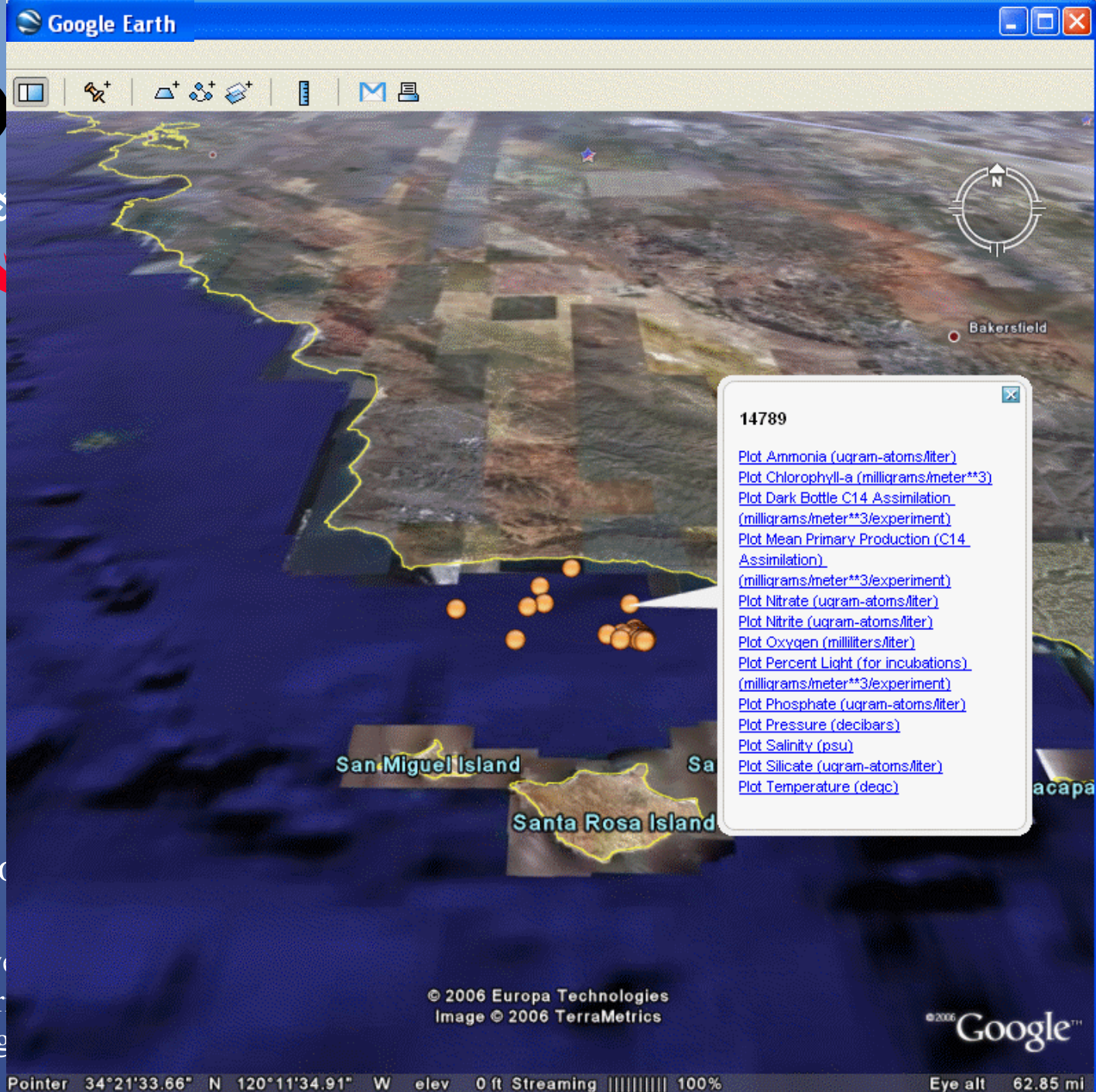
Remote  
Data

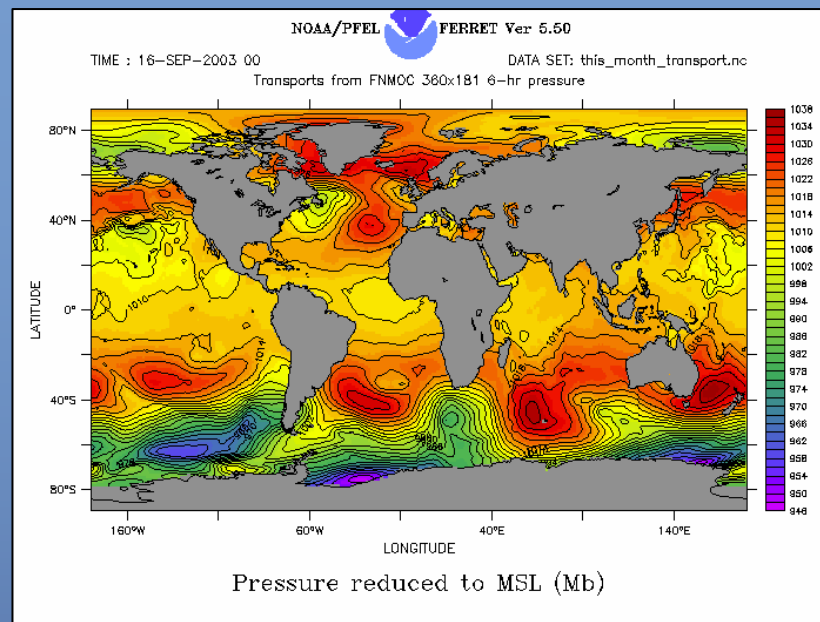
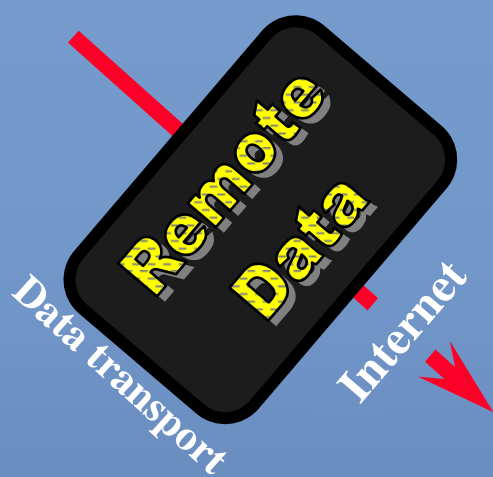
Internet

Web browsers can  
access and subset  
remote data

## Dchart

A Web interface for  
Joe Sirott, PMEL,  
Dapper: [OPeNDAP](http://www.epic.noaa.gov) web  
access to in-situ and gridded data  
<http://www.epic.noaa.gov>





Map

Time Series

## Live Access Server

LAS Software developed at NOAA/PMEL

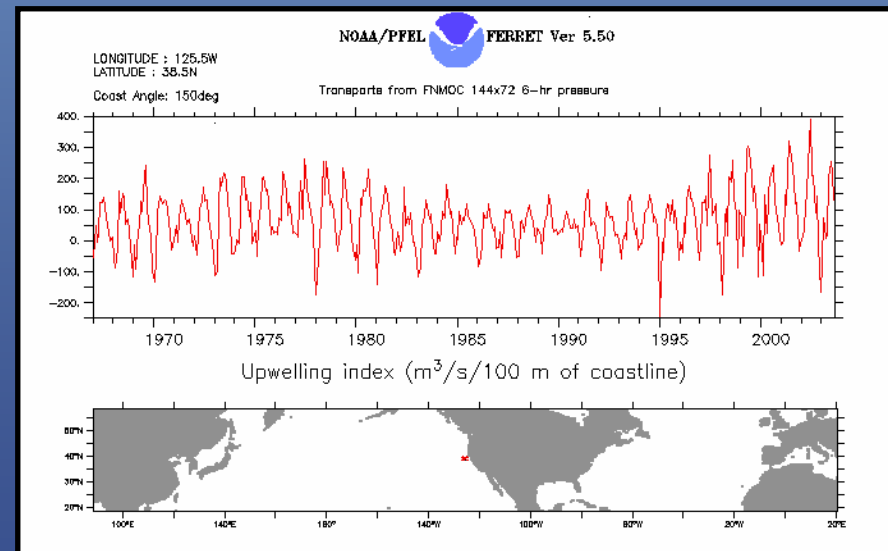
Jonathan Callahan, Steve Hankin

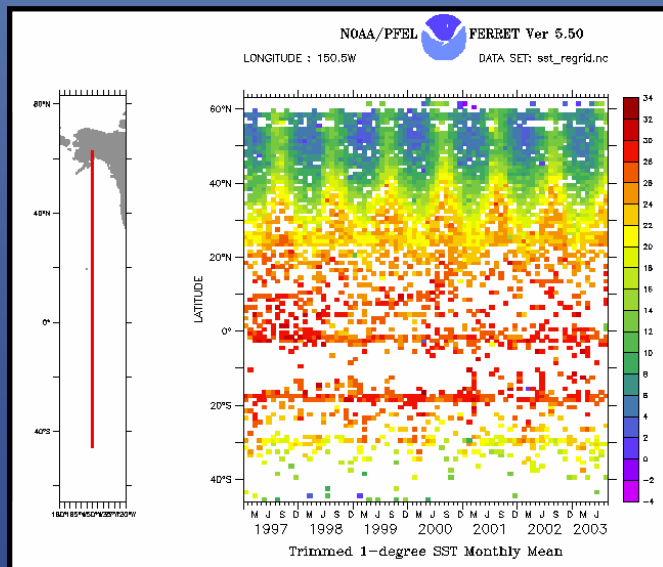
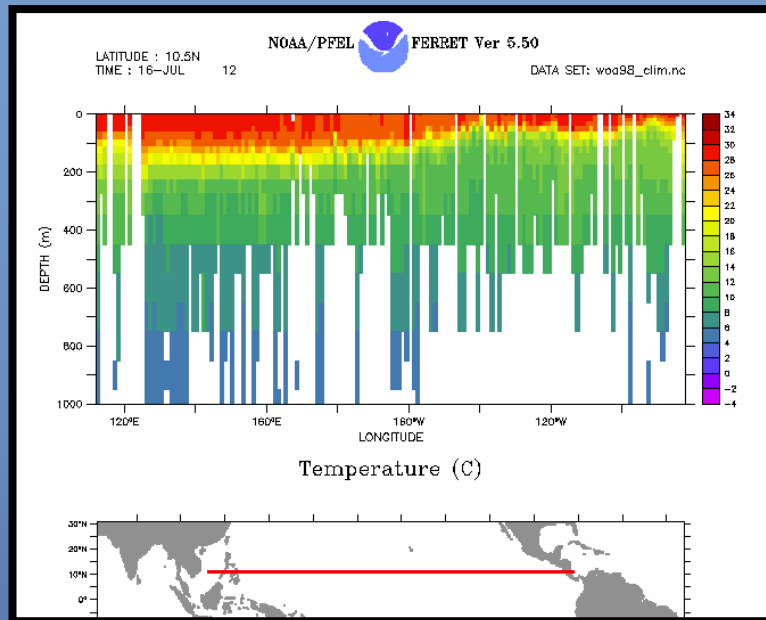
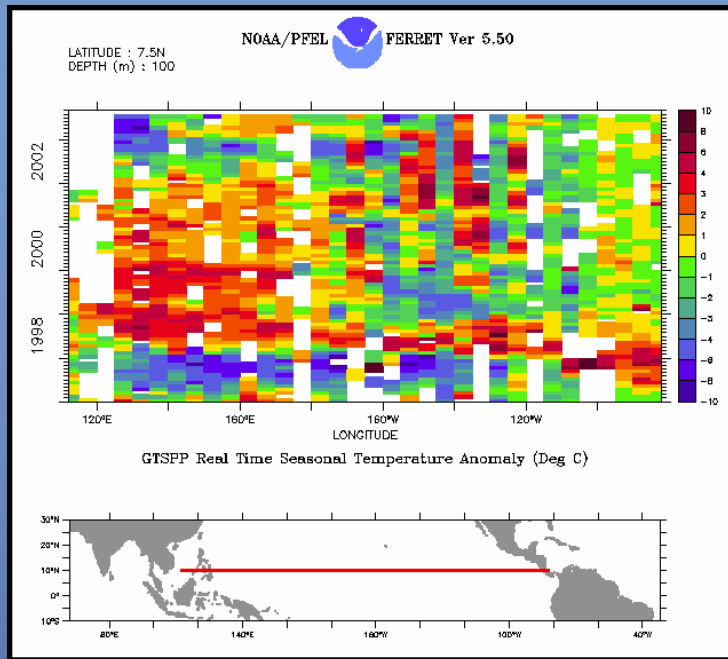
Free, open source software

Appearance and output can be customized for  
project or dataset

*Users can obtain*

- Custom subsets in time and space
- Custom graphics and file formats





Slice/subset data in a multitude of ways and download in various user-friendly formats



# Live Access Server can be customized to serve a variety of data

**Live Access Server:**

# Ocean Watch

North Pacific Demonstration Project

[single data set](#)

[compare two](#)

**Lost?** [Click here to return to the main menu and choose another dataset.](#)

**Follow these steps:**

- Datasets
- 2. Select times/regions/ output type**
3. Get Output

**Optional:**

- Output Options
- Previous Output
- Define variable
- About

LAS UI Version 6.3

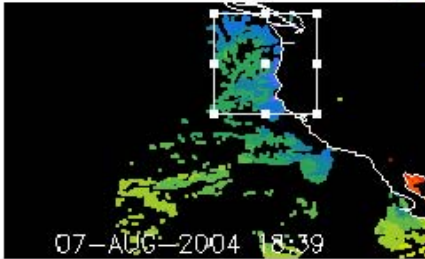
[Datasets](#) > [Near Real Time Satellite Data](#) > [Ocean Surface Temperature](#) > Variable(s): **Sea Surface Temperature night and day: pass**

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

**Select view:**

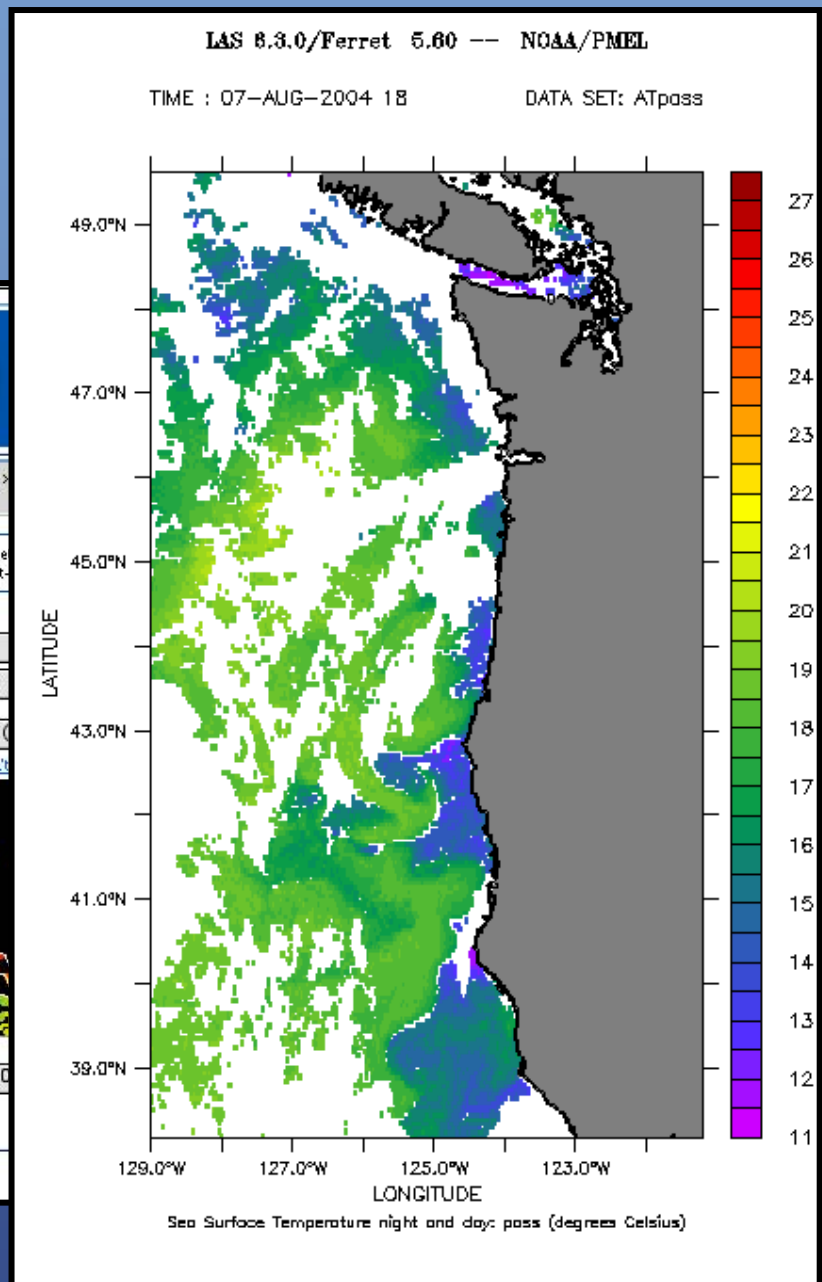
**Select output:**

**Select region:**



07-AUG-2004 18:39

**Select time:**



**Live Access Server**  
can be customized to  
serve a variety of data

## OSCURS Model

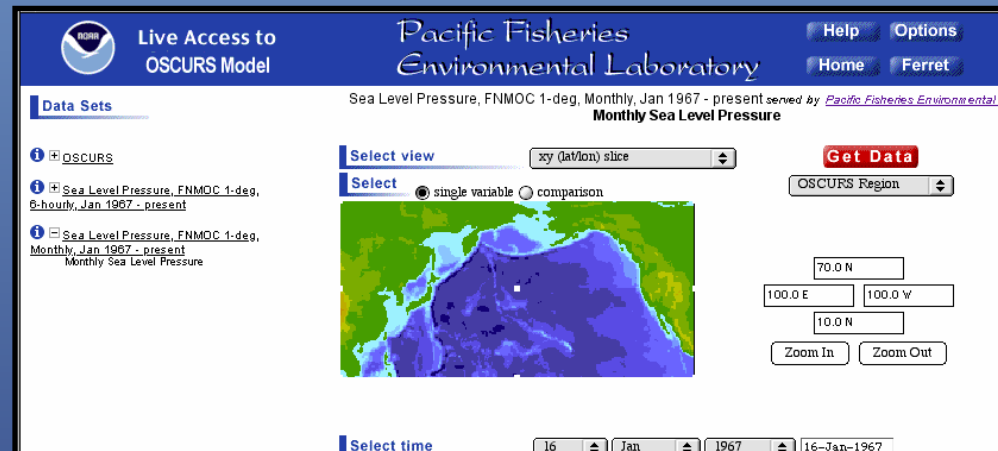
Ocean Surface Current Simulator

- Developed by Jim Ingraham

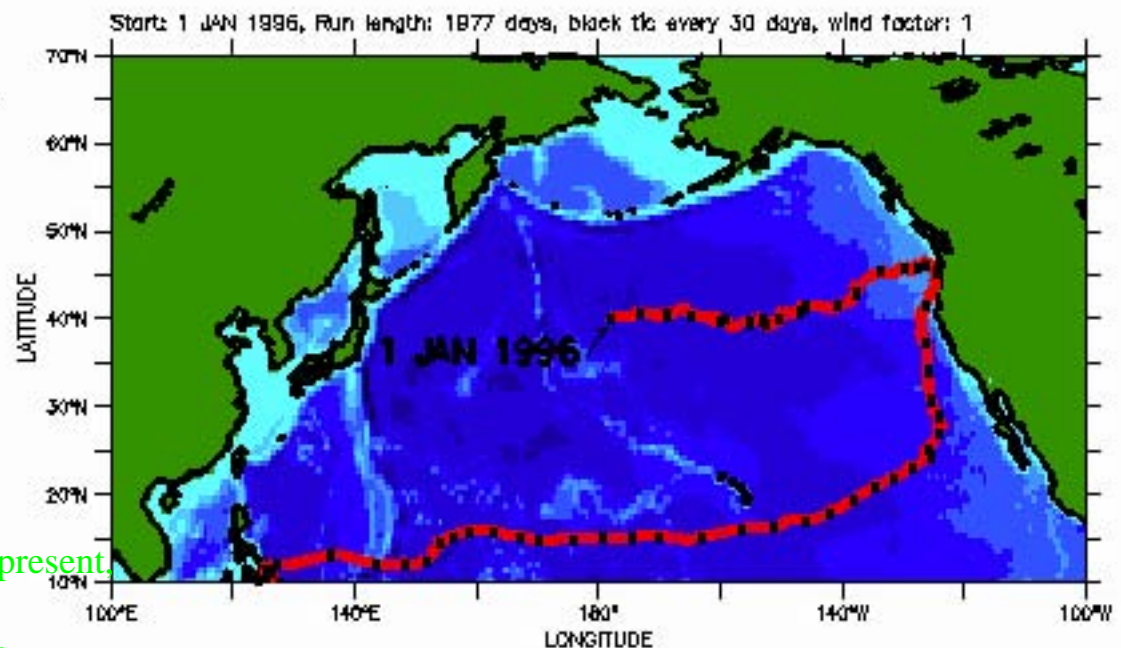
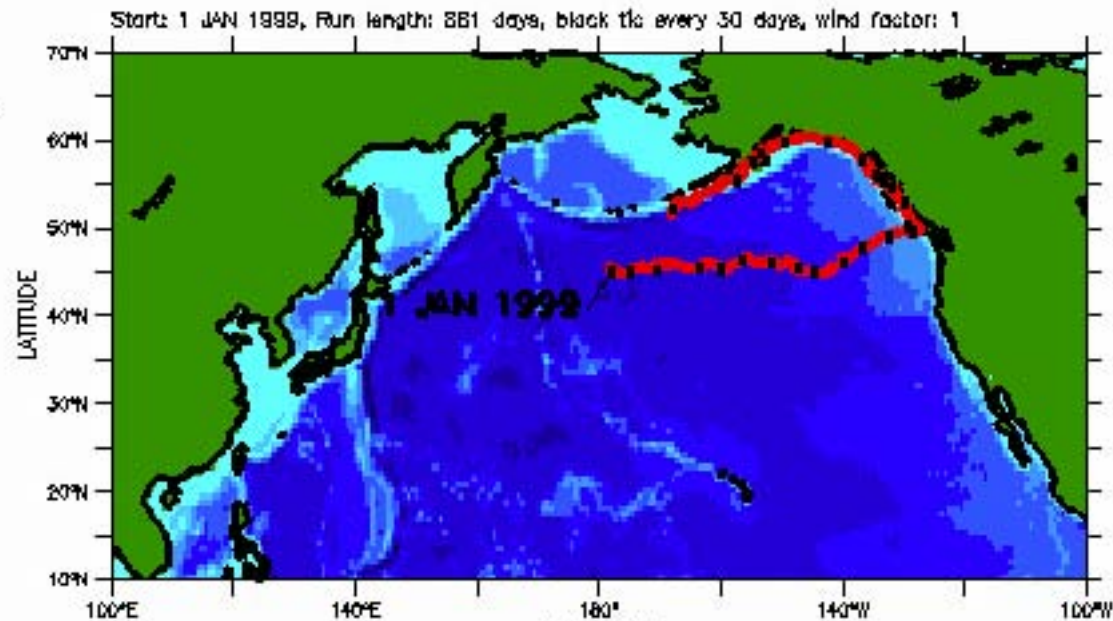
*Alaska Fisheries Science Center*

*Resource Ecology and Fisheries Management*

- Input: daily FNMOC pressure, 1967 - present, updated monthly
- [http://las.pfeg.noaa.gov/las\\_oscurs](http://las.pfeg.noaa.gov/las_oscurs)
- Model info: <http://www.refm.noaa.gov/oscurs>



Live Acc  
can be cus  
serve a var



OSCURS Model, Release: 178 W, 40 N

## OSCURS Model

Ocean Surface Current Simulator

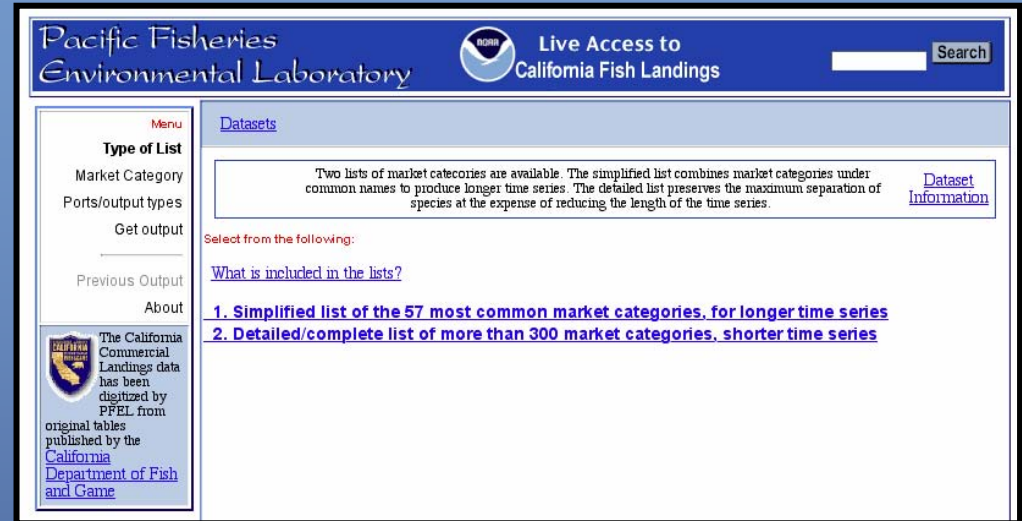
- Developed by Jim Ingraham

*Alaska Fisheries Science Center*

*Resource Ecology and Fisheries Management*

- Input: daily FNMOC pressure, 1967 - present, updated monthly
- [http://las.pfeg.noaa.gov/las\\_oscurs](http://las.pfeg.noaa.gov/las_oscurs)
- Model info: <http://www.refm.noaa.gov/oscurs>

# Live Access Server can be customized to serve a variety of data



- **California Fish Landings data 1928-2002 (PaCOOS)**
  - Historical time series of monthly regional commercial fish and shellfish landings in California from 1928 to 2002.
  - collected and compiled by California Department of Fish and Game
  - provide the longest possible time series of California fish landings for analysis of the effect of climate variability on fishes.
  - Available at six California port locations
  - Jan Mason, ERD





Menu

Type of List

**Market Category**

Ports/output types

Get output

Previous Output

About



The California  
Commercial  
Landings data  
has been  
digitized by  
PFEL from

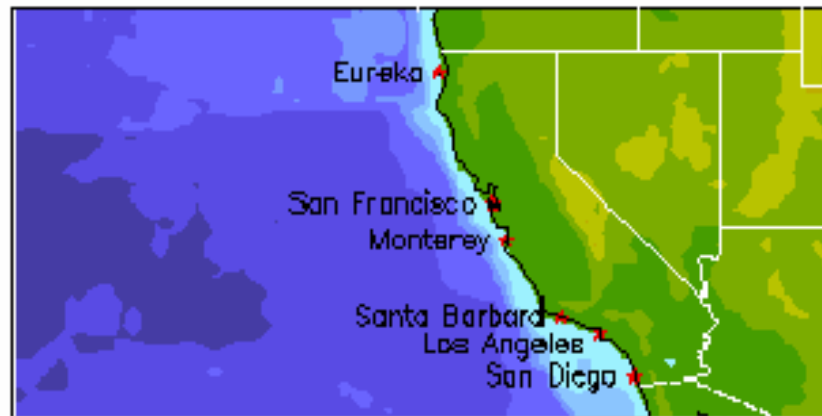
original tables  
published by the  
[California  
Department of Fish  
and Game](#)

[Datasets](#) > [1. Simplified list of the 57 most common market categories, for longer time series](#) > [1. Fish, Marine](#)  
[Anadromous](#)

Select a market category and then click **Next >** to choose ports, time span, and output type.

### Select a market category:

- ☐ ANCHOVY, NORTHERN
- ☐ BARRACUDA, CALIFORNIA
- ☐ BASS, GIANT SEA
- ☐ BASS, ROCK
- ☐ BONITO, PACIFIC
- ☐ CABEZON
- ☐ CROAKER, WHITE
- ☐ FLOUNDER
- ☐ FLYINGFISH
- ☐ GREENLING, KELP
- ☐ GRENADIERS
- ☐ HALIBUT, CALIFORNIA
- ☐ HERRING, PACIFIC
- ☐ LINGCOD
- ☐ MACKEREL, JACK



- Available at six California port locations
- Jan Mason, ERD



# Pacific Fisheries Environmental Lab

Menu

Type of List

**Market Category**

Ports/output types

Get output

Previous Output

About



The California Commercial Landings data has been digitized by PFEL from

original tables published by the [California Department of Fish and Game](#)

Datasets > 1. S  
[Anachronous](#)

Select a ma

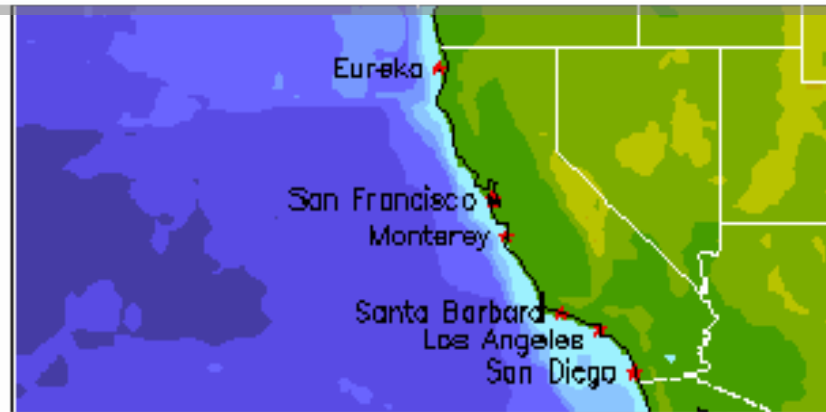
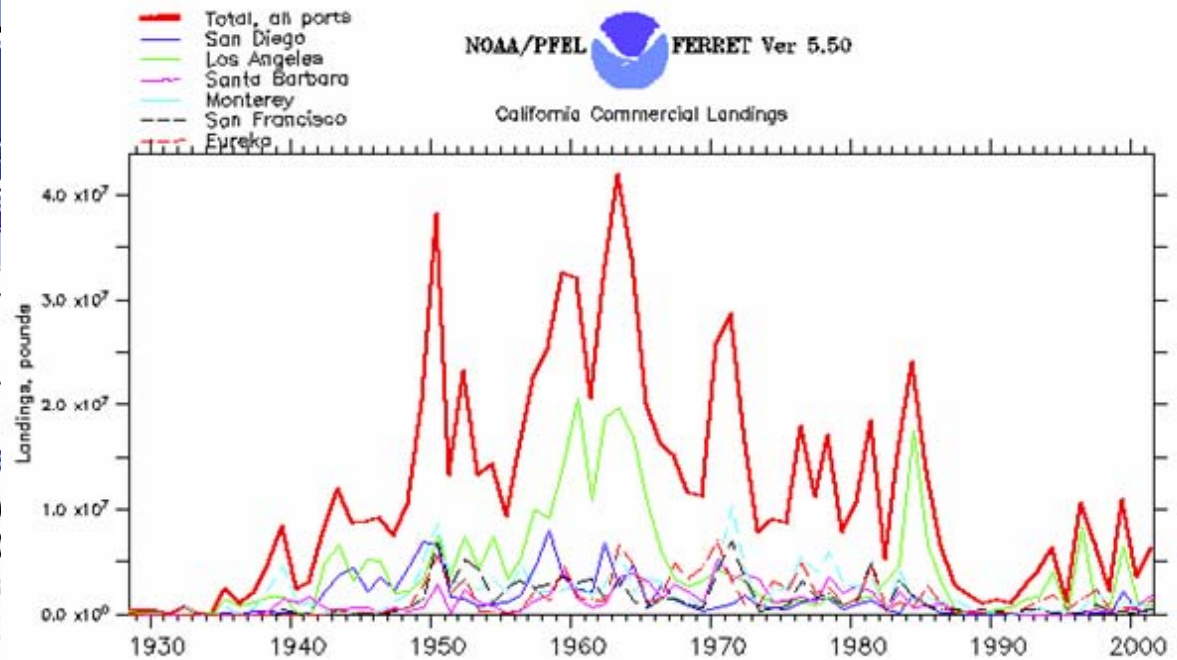
- ☐ ANCHOV
- ☐ BARRAC
- ☐ BASS, G
- ☐ BASS, R
- ☐ BONITO
- ☐ CABEZO
- ☐ CROAKER, WHITE
- ☐ FLOUNDER
- ☐ FLYINGFISH
- ☐ GREENLING, KELP
- ☐ GRENADIERS
- ☐ HALIBUT, CALIFORNIA
- ☐ HERRING, PACIFIC
- ☐ LINGCOD
- ☐ MACKEREL, JACK

NOAA/PFEL



FERRET Ver 5.50

California Commercial Landings



- Available at six California port locations
- Jan Mason, ERD

# Pacific Fisheries Environmental Lab

Menu

Type of List

Market Category

Ports/output types

Get output

Previous Output

About

The California

Datasets > 1. S  
Anachronous

Select a ma

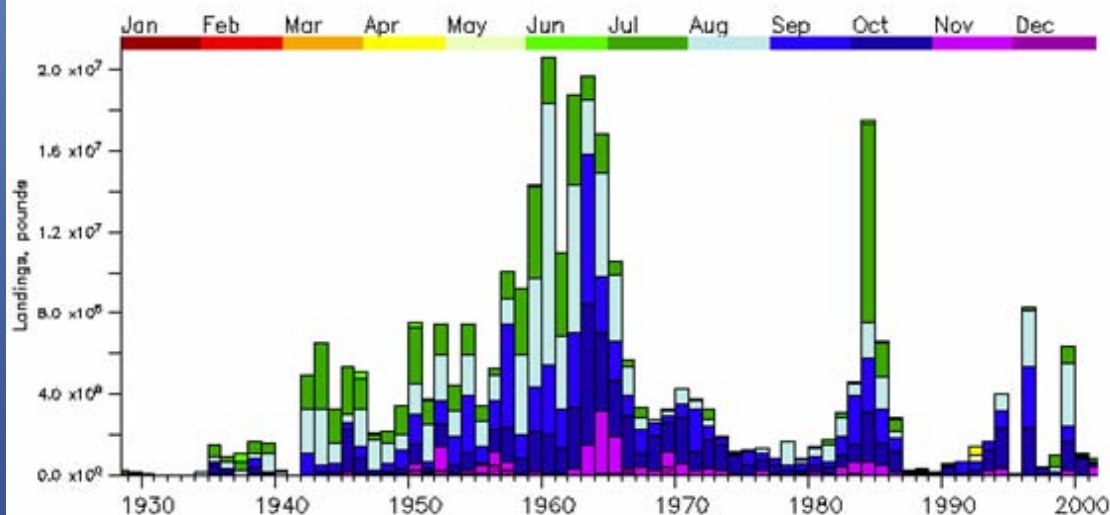
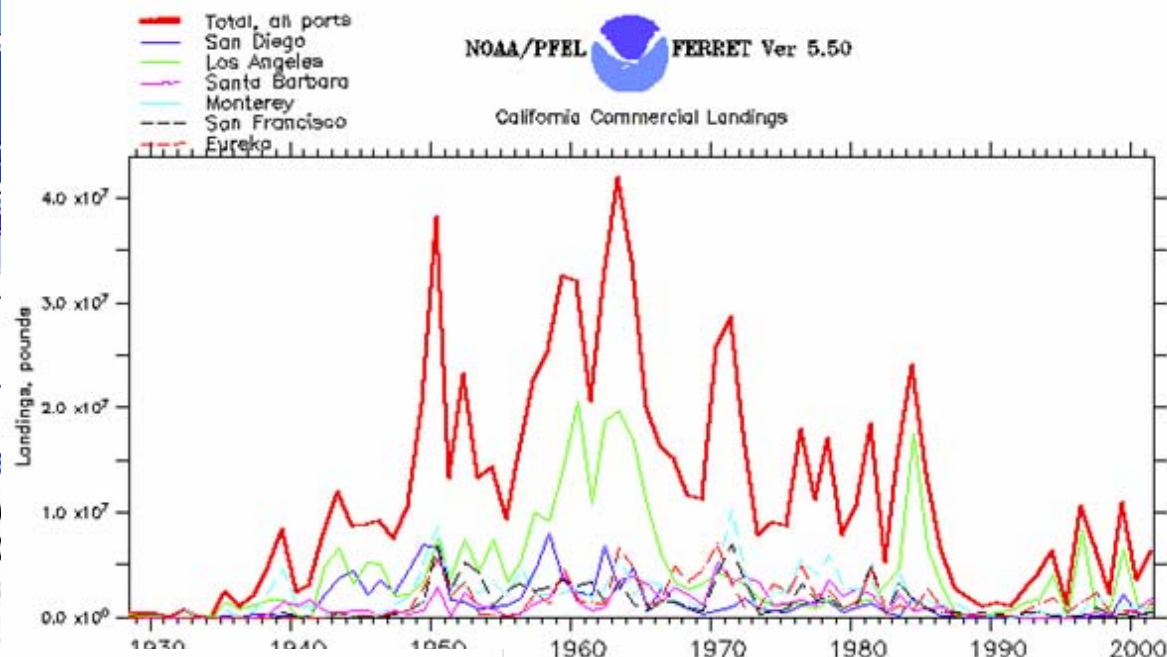
- ☐ ANCHOV
- ☐ BARRAC
- ☐ BASS, G
- ☐ BASS, R

NOAA/PFEL



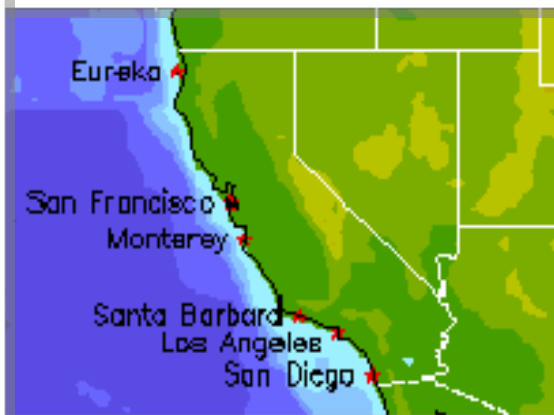
FERRET Ver 5.50

California Commercial Landings



Market Category: TUNA, ALBACORE Landings in Los Angeles region

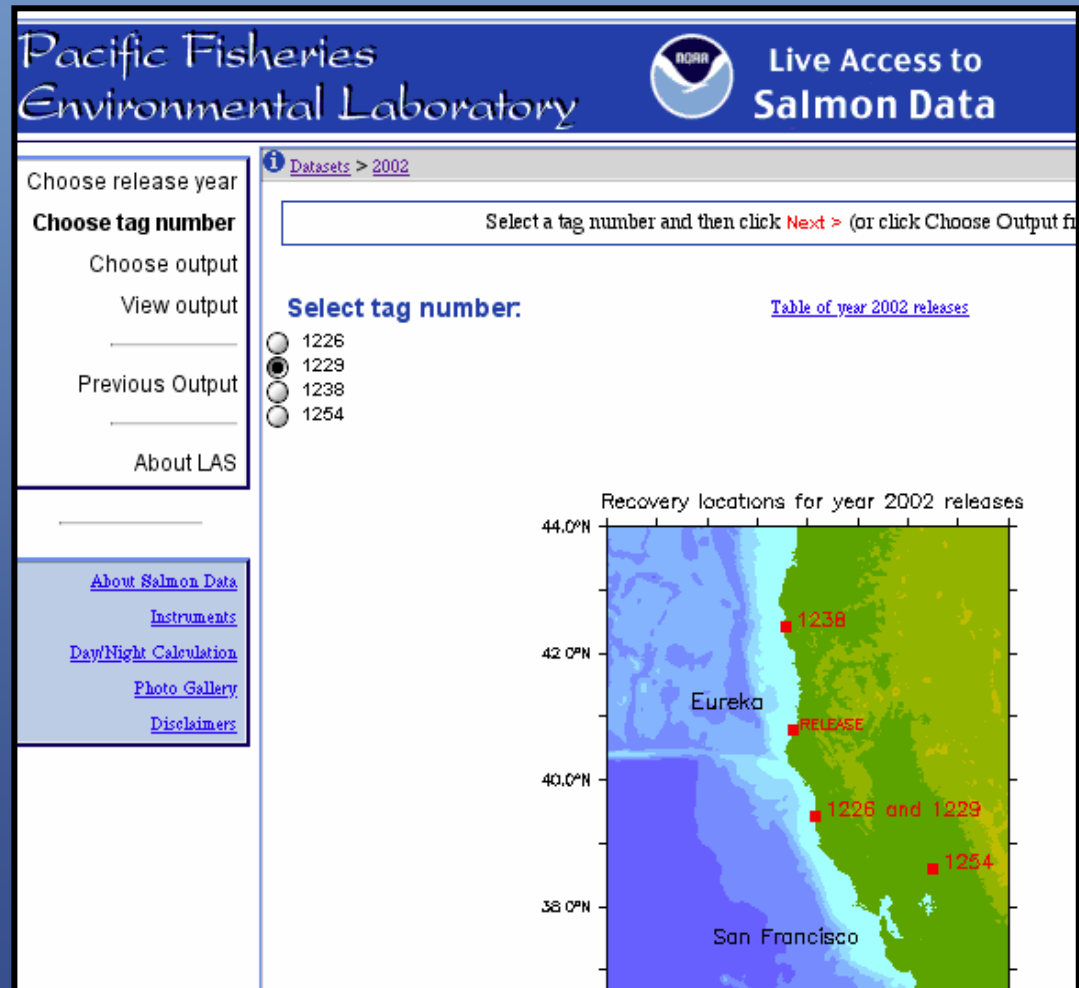
All albacore from California waters



# Live Access Server can be customized to serve a variety of data

## Salmon Tag Data

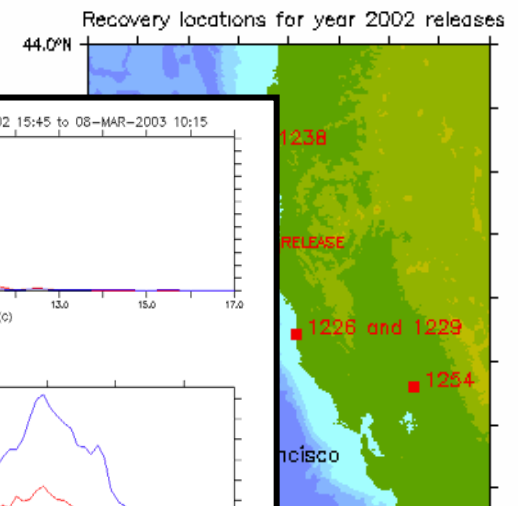
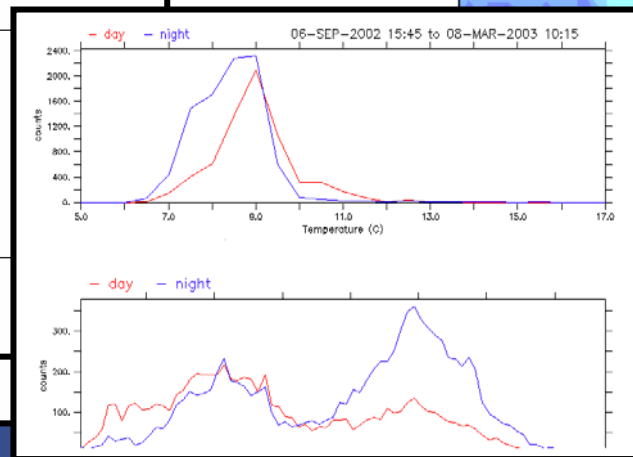
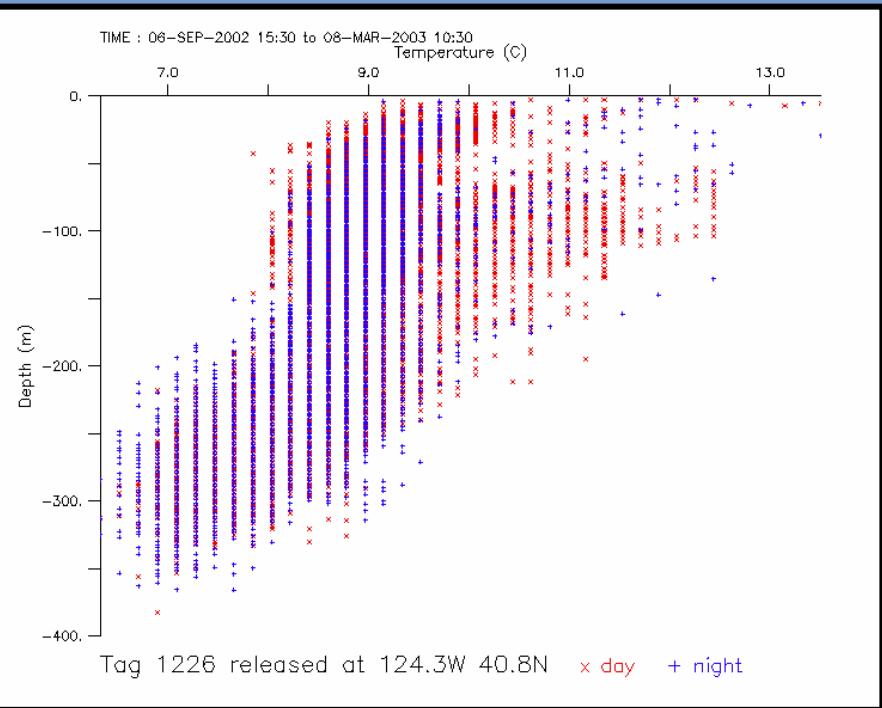
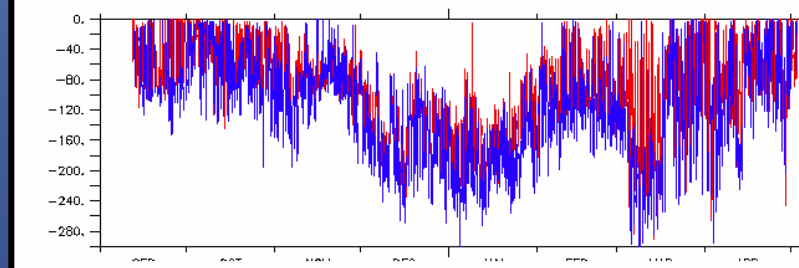
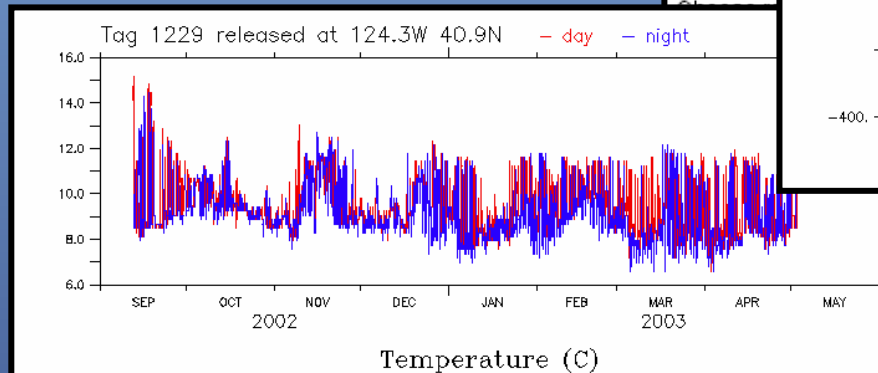
George Watters, ERD



# Live Access Server can be customized to serve a variety of data

## Salmon Tag Data

George Watters, ERD



**Live Access Server**  
can be customized to  
serve a variety of data

- **Tagging of Pacific Pelagics (TOPP) PACOOS Partner**

- aimed at understanding the migration patterns of large open-ocean animals in the North Pacific basin
- part of Census of Marine Life
- 4000+ tags/ 20+ species



Last Update: Mon Aug  
29 02:30:27 2005



# Tagging Of Pacific Pelagics

TOPP Near Real-Time  
Animal Tracks



## View by Zones:

California/Baja  
Pt. Conception  
Monterey Bay  
OR/WA/BC  
E.Equatorial  
Gulf of Alaska  
Aleutians  
Hawaii  
Eastern Pacific  
Full Region

## View by Species:

### Sharks

Blue Shark  
Mako Shark  
Salmon Shark  
Common Thresher

### Pinnipeds

Elephant Seal  
California Sea Lion

### Cetaceans

Blue Whale  
Humpback Whale

### Sea Turtles

Leatherback Sea Turtle

### Sea Birds

Sooty Shearwater

### All Species

Tags reporting within  
the last:

10 days

30 days

60 days

## TOPP Tags

Tracks  
Pop-ups

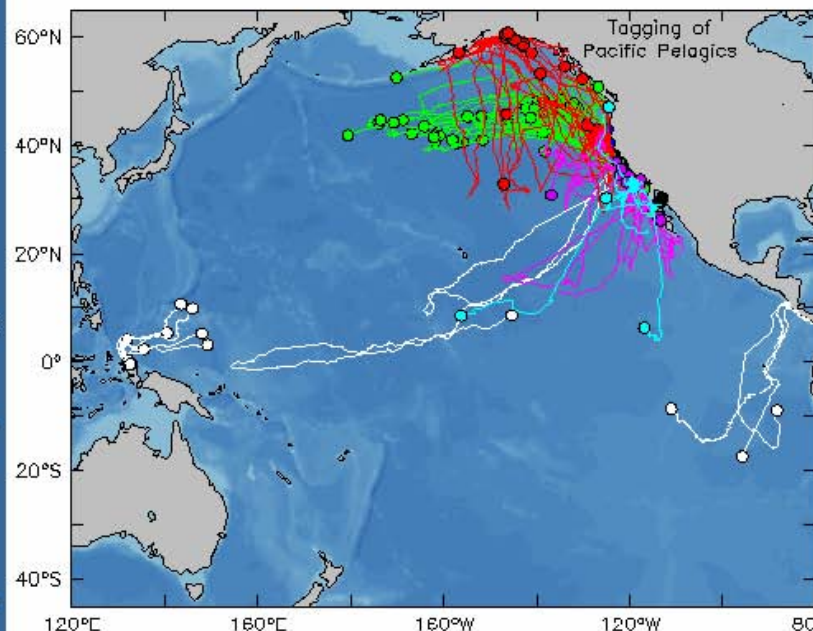
## Non-TOPP Tags

Tracks  
Pop-ups

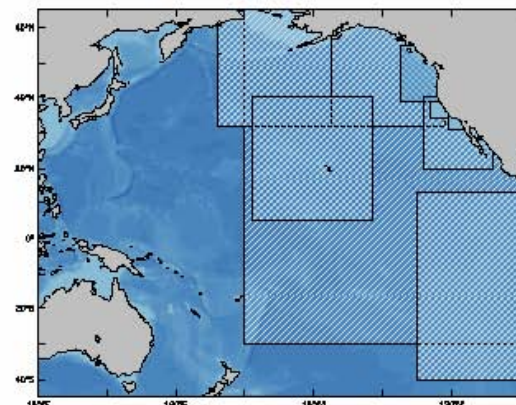
## Environmental Data

## Tags reporting within the last 60 days

Roll mouse over end points to see animal and tag info.  
Click on end points or pttno in table for larger image

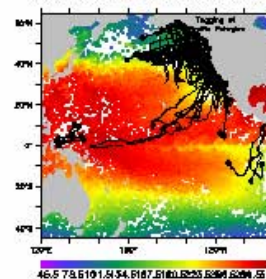


Browse near-realtime TOPP data  
with environmental data  
Updated nightly (automatically)



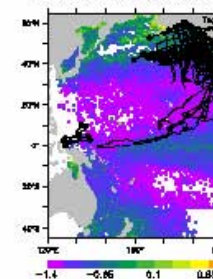
## AVHRR SST

AVHRR: 18-AUG-2005 to 27-AUG-2005



## MODIS Chlorophyll

MODIS: 20-AUG-2005 to 26-AUG-2005



<http://las.pfeg.noaa.gov/TOPP>



# Tagging Of Pacific Pelagics

## TOPP Data Access



OPeNDAP (FDS) | THREDDS | Index

Search

### Species

Tags

Constraints

Output

Previous Output

About LAS

LAS UI Version 6.5

[About TOPP](#)

[About the Animals](#)

[Instruments](#)

[TOPP Partners](#)

### Datasets

Welcome to LAS.

You must have pop-ups enabled for this site in order to see your output.

This session will expire after 180 minutes of inactivity.

Click on a dataset to continue or an **i** for information about a dataset.

[Help](#)

### Select species:

- i** [black-footedAlbatross](#)
- i** [Blue Shark](#)
- i** [Blue Whale](#)
- i** [California Sea Lion](#)
- i** [Common Thresher](#)
- i** [Elephant Seal](#)
- i** [Fin Whale](#)
- i** [Humpback Whale](#)
- i** [laysanAlbatross](#)
- i** [Leatherback Sea Turtle](#)
- i** [Mako Shark](#)
- i** [Salmon Shark](#)
- i** [Sooty Shearwater](#)
- i** [White Shark](#)

Choose a species



# Tagging Of Pacific Pelagics

## TOPP Data Access

### Species

Tags

Constraints

Output

Previous Output

About LAS

LAS UI Version 6.5

[About TOPP](#)

[About the Animals](#)

[Instruments](#)

[TOPP Partners](#)

### Datasets

Welcome to LAS.

You must have pop-ups enabled for this site in order to see this.  
This session will expire after 180 minutes of inactivity.

Click on a dataset to continue on

### Select species:

- ① [black-footedAlbatross](#)
- ① [Blue Shark](#)
- ① [Blue Whale](#)
- ① [California Sea Lion](#)
- ① [Common Thresher](#)
- ① [Elephant Seal](#)
- ① [Fin Whale](#)
- ① [Humpback](#)
- ① [LaysanAlb](#)
- ① [Leatherba](#)
- ① [Mako Sha](#)
- ① [Salmon Shark](#)
- ① [Sooty Shearwater](#)
- ① [White Shark](#)

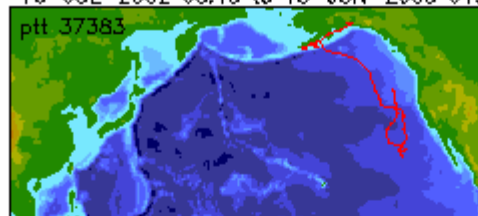
Choose an individual animal

### Deployment Table

01

16-JUL-2002 05:15 to 18-JUN-2003 01:2

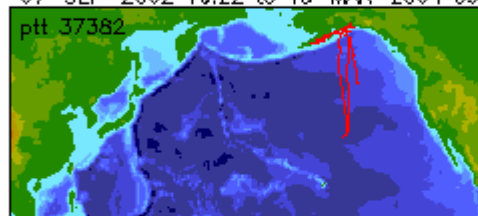
ptt 37383



02

07-SEP-2002 16:22 to 13-MAR-2004 09:2

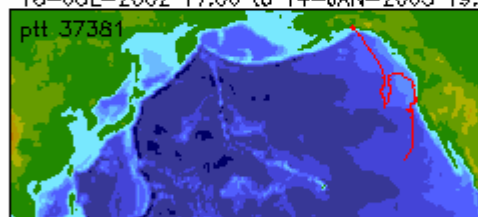
ptt 37382



03

18-JUL-2002 17:00 to 14-JAN-2003 19:2

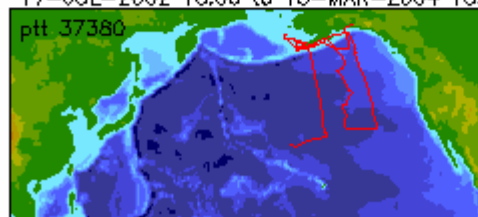
ptt 37381



04

17-JUL-2002 18:06 to 13-MAR-2004 13:2

ptt 37380



05

11-SEP-2002 18:55 to 21-FEB-2003 10:2





Funded by:



## Tagging of Pacific Pelagics

Live Access to  
TOPP Data

Search

Species  
Individuals  
**Times/Regions**  
Get Output  
Output Options  
Previous Output  
About

About TOPP  
Instruments  
About the Animals  
Other Information  
Disclaimers

### [Datasets](#) > [Salmon Shark](#)

Variable(s): 04

Choose type of plot

Select your plot type and region and time limits for the download.

Track plots  
Lagrangian Time Series plots  
Text Output

[Help](#)

Select type of output:

Track plots

Next >

Select environmental data to display with track:

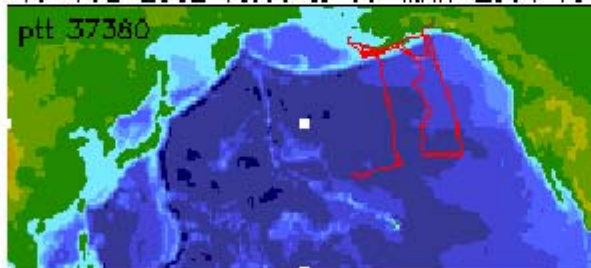
with bathymetry

Select region using menu or map (track plot only):

Gulf of Alaska

[\(Click here to disable map applet\)](#)

17-JUL-2002 18:06 to 13-MAR-2004 13:35  
ptt 37380



Choose environmental data

with bathymetry  
with Pathfinder SST 8-day  
with SeaWiFS Chlorophyll-a 8-day  
with Sea Level Pressure  
with Surface Wind

Select time range:

01 Jan 2002 01-Jan-2002 to 31 Dec 2004 31-Dec-2004

Choose time and  
region for subset



Funded by:



Tagging of  
Pacific Pelagics

Live Access to  
TOPP Data

Search

Species

Individuals

Times/Regions

Get Output

Output Options

Previous Output

About

[About TOPP](#)

[Instruments](#)

[About the  
Animals](#)

[Other  
Information](#)

[Disclaimers](#)

[Datasets](#) > [Salmon Shark](#)

Variable(s): 04

You may modify the appearance of plots through the "Options" page.  
You may also link directly to any LAS page.

[Help](#)

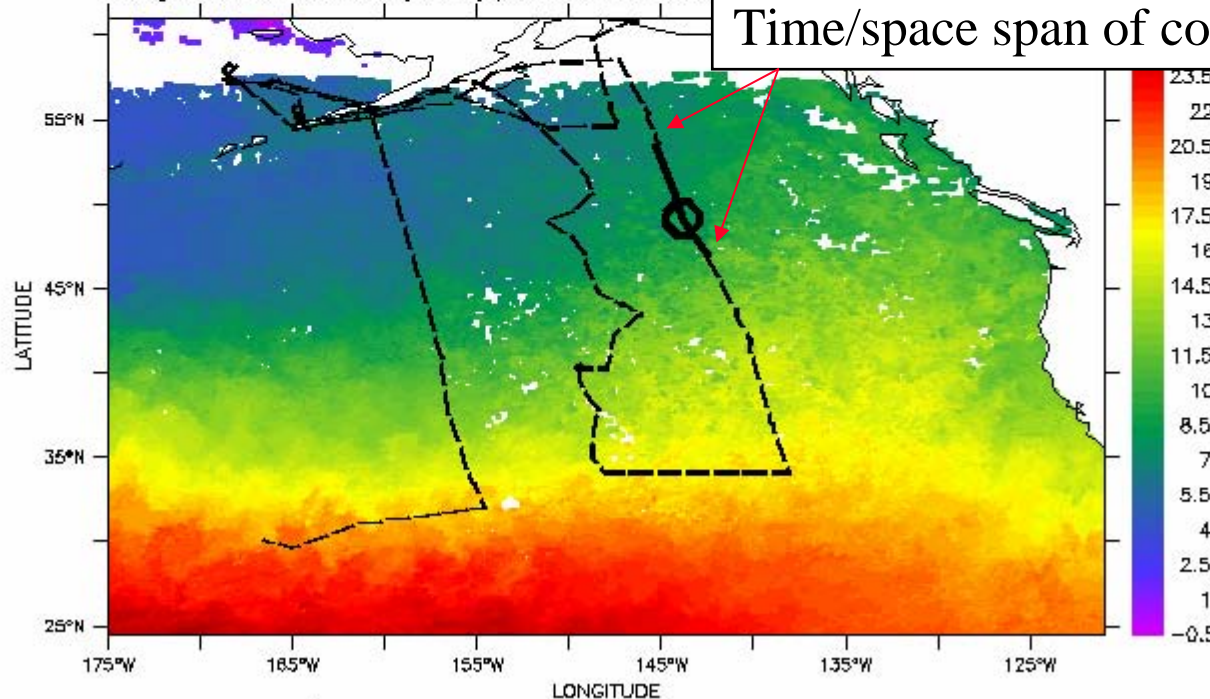
Salmon Shark track with SST

[Start Over >](#)

NOAA/PFEL  FERRET Ver 5.53

Tag position on 09-DEC-2002 00:24

background Pathfinder 8-day SST (C) at TIME : 12-DEC-



salmonshark/37380\_0T00s.pot.tab





Funded by:



# Tagging of Pacific Pelagics

Live Access to  
TOPP Data

Search

Species

Individuals

Times/Regions

Get Output

Output Options

Previous Output

About

About TOPP

Instruments

About the

Animals

Other

Information

Disclaimers

[Datasets](#) > [Salmon Shark](#)

Variable(s): 04

You may modify the appearance of plots through the "Options" page.  
take you directly to any LAS page.

[Help](#)

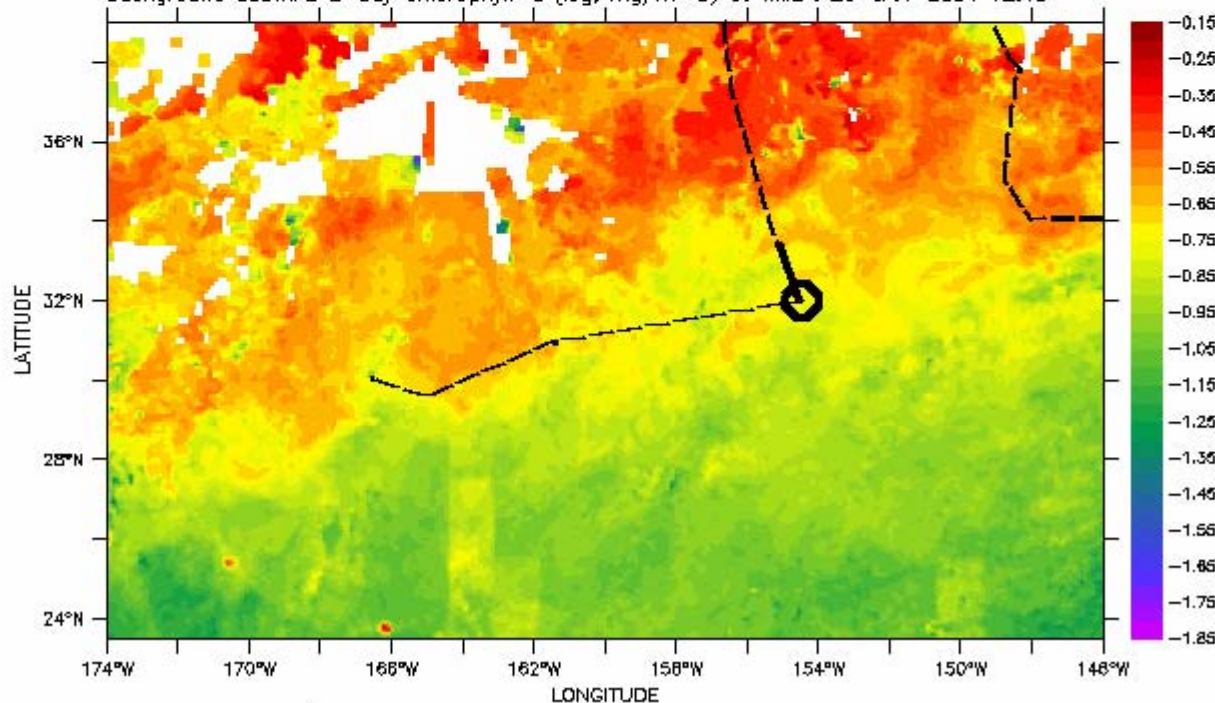
Subset region of interest

[Start Over >](#)

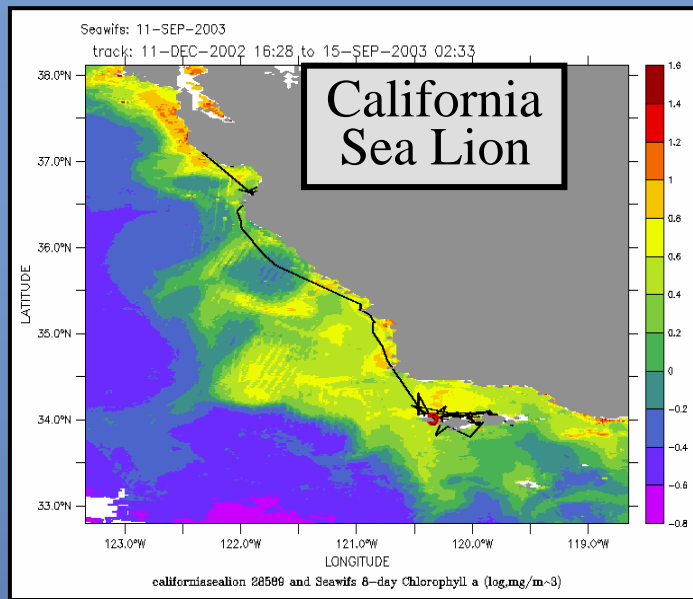
NOAA/PFEL  FERRET Ver 5.53

Tag position on 31-JAN-2004 13:07

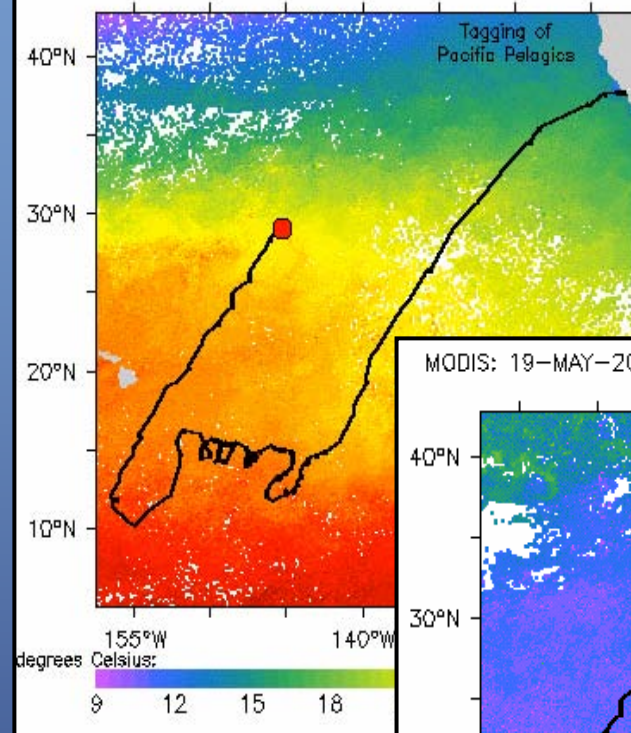
background SeaWiFS 8-day Chlorophyll-a (log, mg/m\*\*3) at TIME : 29-JAN-2004 12:15



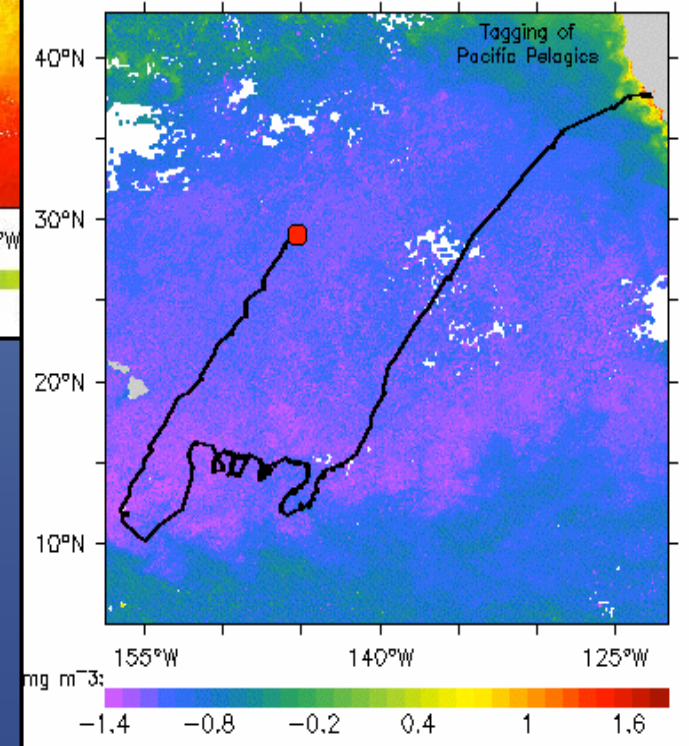
salmonshark/37380\_0106.pot.tab



AVHRR: 19-MAY-2005 to 27-MAY-2005

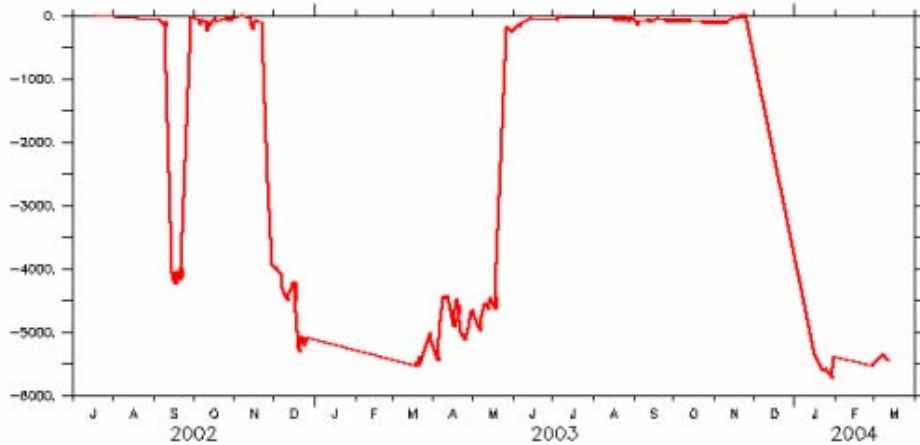


MODIS: 19-MAY-2005 to 27-MAY-2005



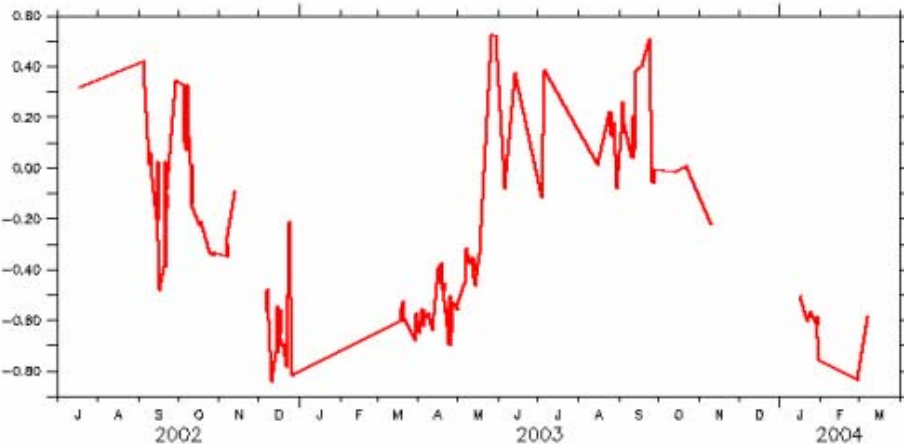
# Lagrangian Time Series

NOAA/PFEL FERRET Ver 5.53



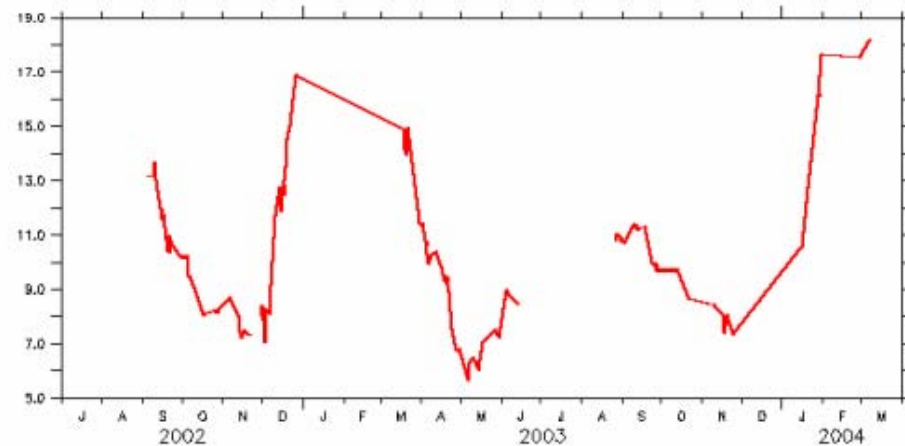
Water Depth (m) salmonshark/37380\_0\_To\_0\_spot.tab

NOAA/PFEL FERRET Ver 5.53



SeaWiFS 8-day Chlorophyll-a (log. mg/m³) salmonshark/37380\_0\_To\_0\_spot.tab



NOAA/PFEL FERRET Ver 5.53




Pathfinder 8-day SST (C) salmonshark/37380\_0\_To\_0\_spot.tab



# Text download



## Tagging of Pacific Pelagics

**Live Access TOPP**

Species

Individuals

Times/Regions

**Get Output**

---

Output Options

Previous Output

---

About

[About TOPP](#)

[Instruments](#)

[About the Animals](#)

[Other Information](#)

[Disclaimers](#)

**1 Datasets > [Blue Shark](#)**

Variable(s): 2

You may modify the appearance of the data table.  
The navigation bar on the left side of the page.

blueshark/37608\_2003-06-24\_To\_0\_spot.tab

TIME: 25-JUN-2003 23:48 to 31-JUL-2003 03:54

Column 1: LON[D=blueshark2.nc] is Longitude (degrees)

Column 2: LAT[D=blueshark2.nc] is Latitude (degrees)

Column 3: WSPD[D=temp.txt] is Wind Speed, FNMOC 1-deg 6hr (m/s)

Column 4: U[D=temp.txt] is E-W Wind Component (m/s)

Column 5: V[D=temp.txt] is N-S (Wind Component m/s)

				LON	LAT	WSPD	U	V
26-JUN-2003	22:08:01	/	1:	-119.455	33.9710	4.65268	4.64300	0.30000
28-JUN-2003	18:46:59	/	2:	-120.711	33.2880	3.03783	3.03500	-0.13100
30-JUN-2003	13:23:01	/	3:	-120.765	32.2550	8.14922	3.26400	-7.46700
30-JUN-2003	18:02:59	/	4:	-120.851	32.1290	6.80873	3.25000	-5.98300
01-JUL-2003	11:29:00	/	5:	-121.521	31.8730	6.03930	1.96700	-5.71000
01-JUL-2003	21:11:00	/	6:	-121.123	31.8350	4.80306	1.89600	-4.41300
02-JUL-2003	00:41:00	/	7:	-120.922	31.8510	4.82202	2.22500	-4.27800
02-JUL-2003	06:14:00	/	8:	-121.297	31.7950	5.11020	3.06900	-4.08600
02-JUL-2003	09:34:58	/	9:	-121.154	31.6950	4.70585	3.26700	-3.38700
02-JUL-2003	22:36:58	/	10:	-121.407	31.5110	5.38212	1.92000	-5.02800
03-JUL-2003	11:15:00	/	11:	-121.728	31.1760	6.53122	1.78700	-6.28200
04-JUL-2003	10:59:00	/	12:	-122.173	31.4260	7.56396	1.83100	-7.33900
05-JUL-2003	19:56:00	/	13:	-122.347	30.9920	6.99481	0.45500	-6.98000
07-JUL-2003	14:00:59	/	14:	-123.405	30.5570	6.41800	0.00100	-6.41800
08-JUL-2003	13:51:58	/	15:	-122.945	30.3630	8.07974	0.66900	-8.05200
08-JUL-2003	21:33:59	/	16:	-123.763	30.6110	7.78600	-1.25000	-7.68500

**Start Over >**

## Other types of data downloads:


- NetCDF
- ArcView grid
- spreadsheet formats



**BEC NEP LAS v1.1** [OPeNDAP \(FDS\)](#) | [THREDDS](#) | [Index](#) | Search:

[Datasets > GLOBEC](#)

Welcome to LAS.  
You must have pop-ups enabled for this site in order to see your output.  
This session will expire after 180 minutes of inactivity.




## GLOBEC NEP Data (1997-2002)

- [Vertical Plankton Tow \(1997-2001\)](#)
- [MOCNESS-1 Plankton Abundance \(2000-2002\)](#)
- [Bottle Data \(2002\)](#)

An index of all GLOBEC NEP variables available through this LAS

[GLOBEC NEP cruise plans](#)  
[GLOBEC NEP plot examples](#)



Download vpt, MOC1 and bottle data through the [OPeNDAP server](#)  
[OPeNDAP HTML form to retrieve vpt data](#)  
[OPeNDAP HTML form to retrieve MOC1 data](#)  
[OPeNDAP HTML form to retrieve bottle data](#)

Data provided by Hal Batchelder with the [GLOBEC NEP program](#)


# PaCOOS LAS

Pacific Coast  
Ocean Observing System  
*Live Access Servers: work of*  
Jerome King, ERD

**PaCOOS CalCOFI Beta v1.2** [OPeNDAP \(FDS\)](#) | [THREDDS](#) | [Index](#) | Search:

[Datasets > CalCOFI](#)

Welcome to LAS.  
You must have pop-ups enabled for this site in order to see your output.  
This session will expire after 180 minutes of inactivity.



## CalCOFI Data (1949-2002)

[Report Data](#)

An index of all CalCOFI variables available through this LAS can be found on left top corner.

[CalCOFI map areas](#)  
[CalCOFI plot examples](#)

single data set | compare two

**Datasets**

Variables

Constraints

Output

---

Previous Output

---

Define variable

---

About

---

LAS UI Version 6.5

State, Academic, and NGO partners  
IOOS Regional Associations

Ecosystem approach to the CCS

ICOOS Data Integration Grant

BEC NEP LAS v1.1

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

Go

[Datasets](#) > [GLOBEC](#)

Welcome to LAS.

You must have pop-ups enabled for this site in order to see your output.

This session will expire after 180 minutes of inactivity.



## GLOBEC NEP Data (1997-2002)

- [Vertical Plankton Tow \(1997-2001\)](#)
- [MOCNESS-1 Plankton Abundance \(2000-2002\)](#)
- [Bottle Data \(2002\)](#)

An index of all GLOBEC NEP variables available through this LAS

[GLOBEC NEP cruise plans](#)

[GLOBEC NEP plot examples](#)



Download vpt, MOC1 and bottle data through the [OPeNDAP server](#)

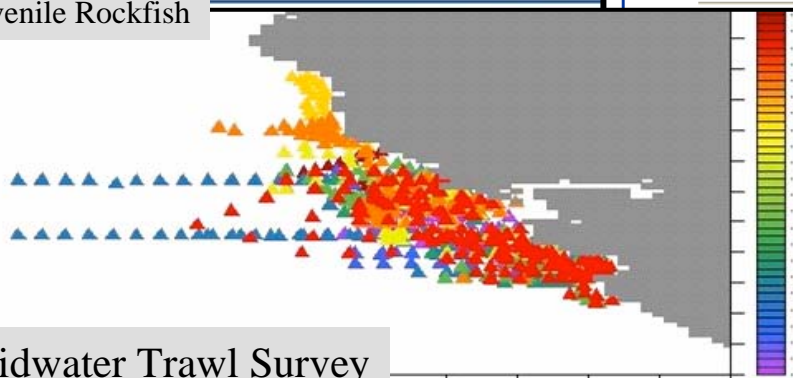
[OPeNDAP HTML form to retrieve vpt data](#)

[OPeNDAP HTML form to retrieve MOC1 data](#)

[OPeNDAP HTML form to retrieve bottle data](#)

Data provided by Hal Batchelder with the [GLOBEC NEP program](#)

Juvenile Rockfish



Midwater Trawl Survey

# PaCOOS LAS

Pacific Coast  
Ocean Observing System  
*Live Access Servers: work of*  
Jerome King, ERD

PaCOOS CalCOFI Beta v1.2

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

Go

single  
data  
set

com-  
pare  
two

[Datasets](#) > [CalCOFI](#)

Welcome to LAS.

You must have pop-ups enabled for this site in order to see your output.

This session will expire after 180 minutes of inactivity.



## CalCOFI Data (1949-2002)

[Report Data](#)

An index of all CalCOFI variables available through this LAS can be found on left top corner.

[CalCOFI map areas](#)

[CalCOFI plot examples](#)

ICOOS Data Integration Grant

BEC NEP LAS v1.1

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

Go

[Datasets > GLOBEC](#)

Welcome to LAS.

You must have pop-ups enabled for this site in order to see your output.

This session will expire after 180 minutes of inactivity.



## GLOBEC NEP Data (1997-2002)

- [Vertical Plankton Tow \(1997-2001\)](#)
- [MOCNESS-1 Plankton Abundance \(2000-2002\)](#)
- [Bottle Data \(2002\)](#)

An index of all GLOBEC NEP variables available through this LAS

[GLOBEC NEP cruise plans](#)

[GLOBEC NEP plot examples](#)



Download vpt, MOC1 and bottle data through the [OPeNDAP server](#)

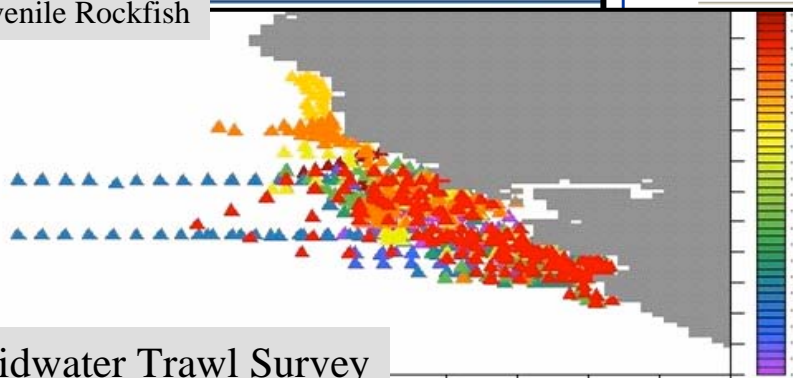
[OPeNDAP HTML form to retrieve vpt data](#)

[OPeNDAP HTML form to retrieve MOC1 data](#)

[OPeNDAP HTML form to retrieve bottle data](#)

Data provided by Hal Batchelder with the [GLOBEC NEP program](#)

Juvenile Rockfish



Midwater Trawl Survey

PaCOOS CalCOFI Beta v1.2

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

Go

[Datasets > CalCOFI](#)

Welcome to LAS.

You must have pop-ups enabled for this site in order to see your output.

single  
data  
set

com-  
pare  
two

Datasets

Variables

Constraints

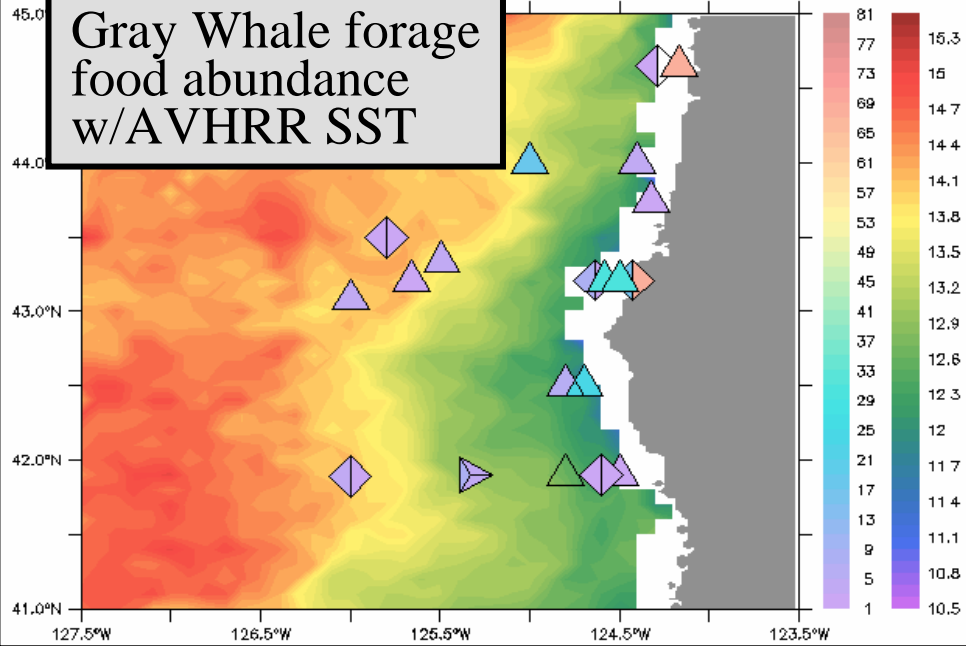
Output

Previous Output

Define variable

About

Gray Whale forage  
food abundance  
w/AVHRR SST



ICOOS Data Integration Grant



# Tagging Of Pacific Pelagics

CENSUS OF MARINE LIFE

## TOPP Data Access

**Species**

Tags

Constraints

Output

Previous Output

About LAS

LAS UI Version 6.5

**Datasets**

Welcome to LAS.  
You must have pop-ups enabled for this site in order to see your output.  
This session will expire after 180 minutes of inactivity.

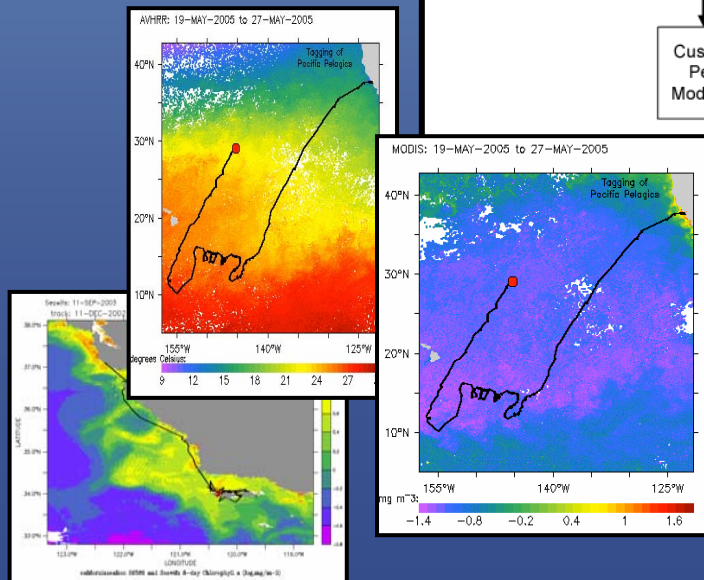
Click on a dataset to continue or an  for info

**Select species:**

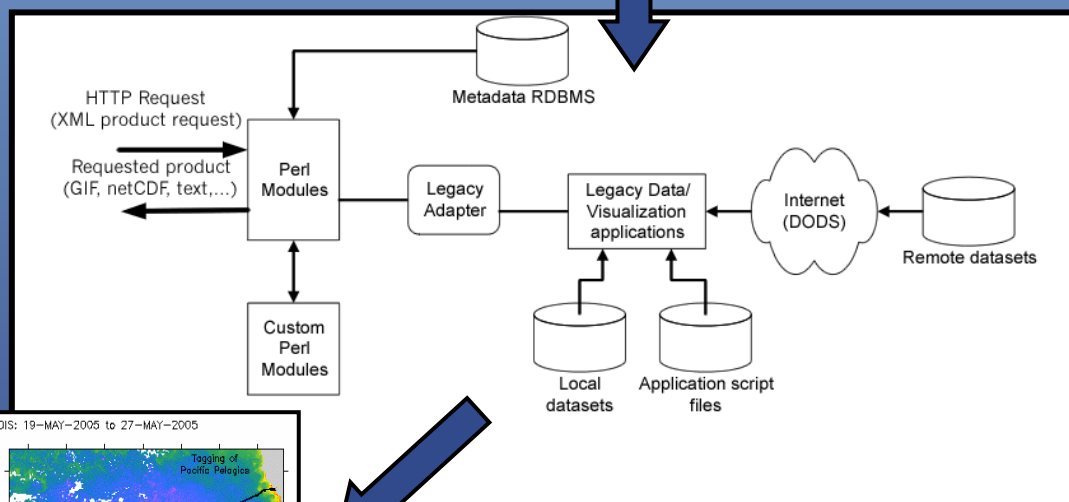
- [black-footedAlbatross](#)
- [Blue Shark](#)
- [Blue Whale](#)
- [California Sea Lion](#)
- [Common Thresher](#)
- [Elephant Seal](#)
- [Fin Whale](#)
- [Humpback Whale](#)
- [LaysanAlbatross](#)
- [Leatherback Sea Turtle](#)
- [Mako Shark](#)
- [Salmon Shark](#)
- [Sooty Shearwater](#)
- [White Shark](#)

[About TOPP](#)  
[About the Animals](#)  
[Instruments](#)  
[TOPP Partners](#)

## User Interface



**XML Request**



**Product Server**





# Tagging Of Pacific Pelagics

CENSUS OF MARINE LIFE

## TOPP Data Access

**Species**

Tags

Constraints

Output

Previous Output

About LAS

LAS UI Version 6.5

**Datasets**

Welcome to LAS.  
You must have pop-ups enabled for this site in order to see your output.  
This session will expire after 180 minutes of inactivity.

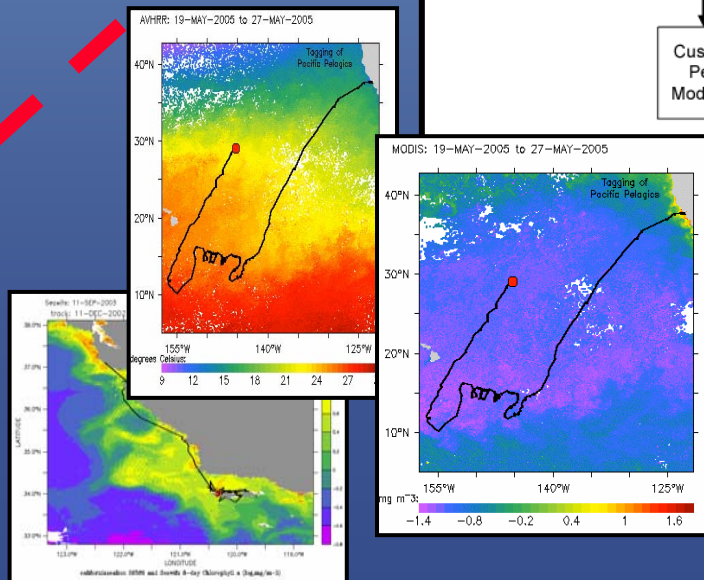
Click on a dataset to continue or an  for info

**Select species:**

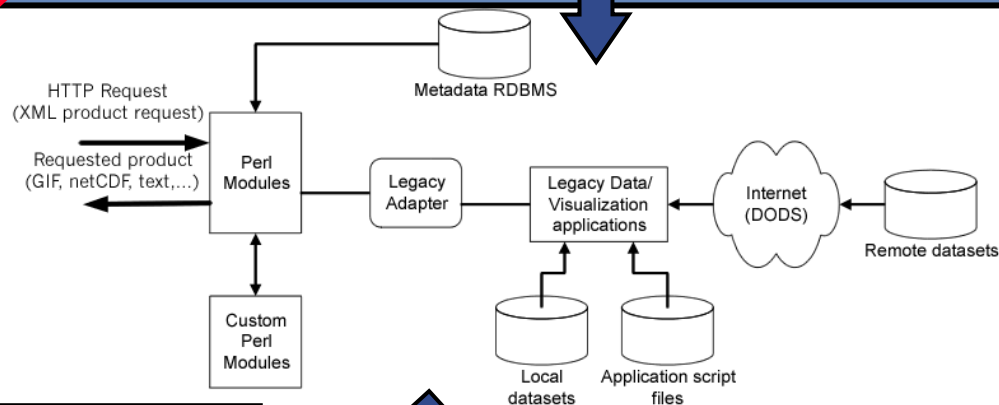
- [black-footedAlbatross](#)
- [Blue Shark](#)
- [Blue Whale](#)
- [California Sea Lion](#)
- [Common Thresher](#)
- [Elephant Seal](#)
- [Fin Whale](#)
- [Humpback Whale](#)
- [LaysanAlbatross](#)
- [Leatherback Sea Turtle](#)
- [Mako Shark](#)
- [Salmon Shark](#)
- [Sooty Shearwater](#)
- [White Shark](#)

[About TOPP](#)  
[About the Animals](#)  
[Instruments](#)  
[TOPP Partners](#)

## User Interface



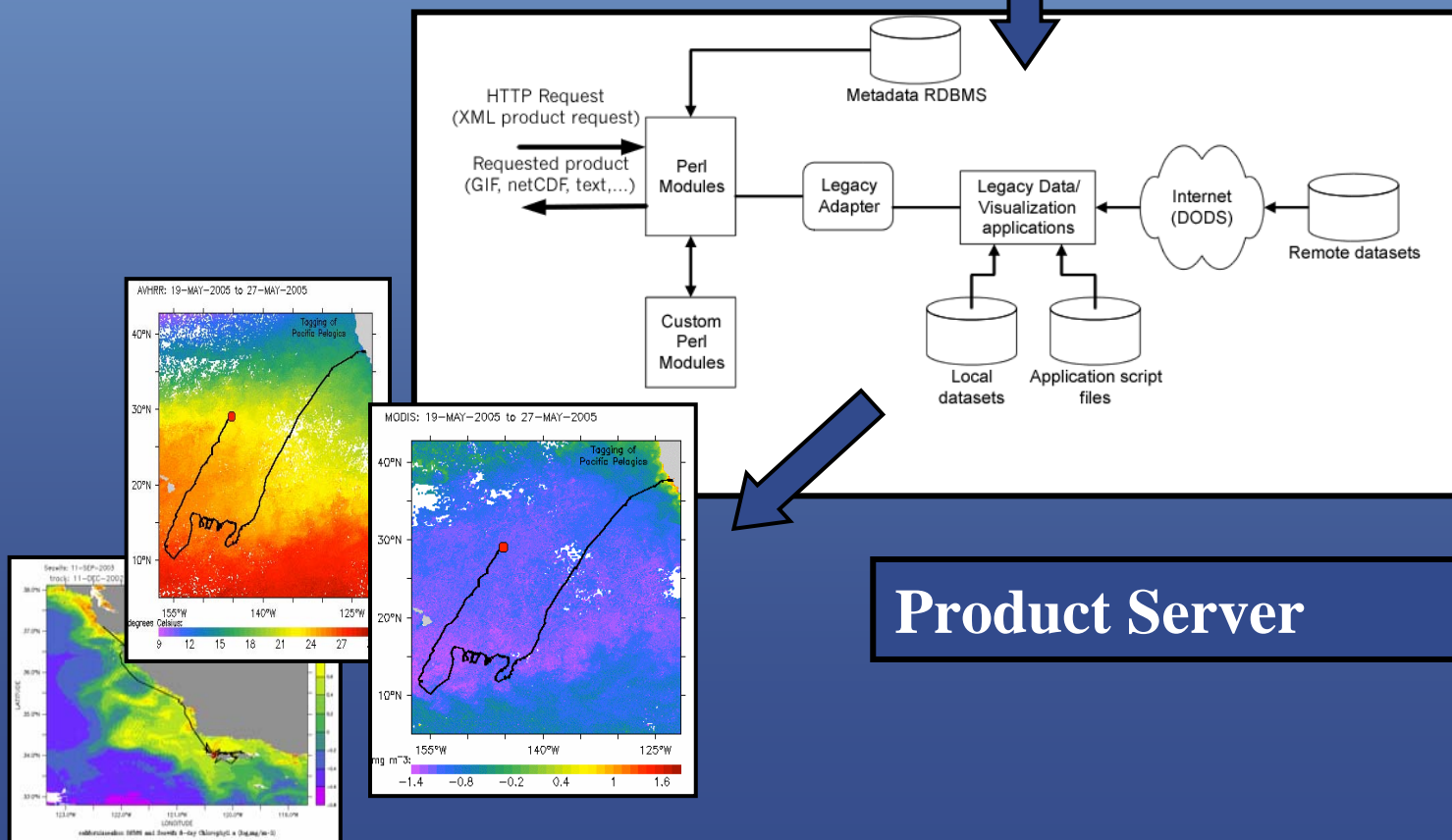
# XML Request



## Product Server

# JavaScript

## XML Request



# Product Server

Javascript, PHP  
xml requests  
sent to LAS  
Product server

Ocean Watch: LAS Demonstration Project - Microsoft Internet Explorer

Address <http://las.pfeg.noaa.gov/oceanWatch/oceanwatch.php>

File Edit View Favorites Tools Help

**Live  
Access  
Server:**

# Ocean Watch

North Pacific Demonstration Project

*Presented by:  
Coastwatch and  
SWFSC/Environmental Research Division*

### Near Real Time Satellite Data

**Ocean Surface Temperature**

Dataset	Coverage	Resolution
<a href="#">AVHRR</a>	Global	11 km
<a href="#">AVHRR (composites)</a>	North American West Coast	1.25 km
<a href="#">AVHRR (individual images)</a>	N. American W. Coast	1.25 km
<a href="#">GOES (individual images)</a>	N. American W. Coast	0.05 deg
<a href="#">GOES (composites)</a>	Western Hemisphere	5.5 km

**Ocean Surface Chlorophyll-a**

Dataset	Coverage	Resolution
<a href="#">MODIS on Terra OSU DB</a>	US West Coast	1.25 km
<a href="#">MODIS on Aqua OSU DB</a>	US West Coast	1.25 km
<a href="#">MODIS on Aqua</a>	Western Hemisphere	2.5 km
<a href="#">MODIS on Aqua</a>	US West Coast	1.25 km

**Ocean Surface Winds**

Dataset	Coverage	Resolution
<a href="#">QuikSCAT</a>	Global	0.25 deg

**Ocean Surface Currents**

Dataset	Coverage	Resolution
<a href="#">HF Radar SF Bay</a>	San Francisco Bay	0.03 deg
<a href="#">HF Radar Golden Gate</a>	San Francisco Bay Entrance	0.03 deg
<a href="#">HF Radar Monterey Bay</a>	Monterey Bay	0.03 deg
<a href="#">Jason-1</a>	Global	0.25 deg

**Ocean Surface Height**

Dataset	Coverage	Resolution
<a href="#">Jason-1</a>	Global	0.25 deg

**Derived Quantities**

Dataset	Coverage	Resolution
<a href="#">Primary Productivity</a>	Global	0.1 deg
<a href="#">Frontal Probability Index</a>	Western Hemisphere	5.5 km

Currently Selected Dataset

**Ocean Surface Chlorophyll-a**

Title: **MODIS on Aqua**

Coverage: **US West Coast**

Resolution: **1.25 km**      Most recent image:

**Central California**      07-OCT-2006 23:00

Chlorophyll-a (log mg m<sup>-3</sup>)

Choose a variable:  
  
used for sub-variables

Choose a composite:  
  
Choose a time:  
  
Used for time series

Select Type of Download:

Choose a region:  
  
or enter a region:  
lat  
  
lon  
      lon  
  
lat

<http://oceanwatch.pfeg.noaa.gov>

Javascript, PHP  
xml requests  
sent to LAS  
Product server

**Ocean Watch: LAS Demonstration Project - Microsoft Internet Explorer**

Address <http://las.pfeg.noaa.gov/oceanWatch/oceanwatch.php>

File Edit View Favorites Tools Help

**Primary Productivity** Global 0.1 deg

**Frontal Probability Index** Western Hemisphere 5.5 km

**Delayed, Science-Quality Satellite Data**

Served by THREDDS

**Ocean Surface Temperature**

Dataset	Coverage	Resolution
<a href="#">Blended SST</a>	Global	0.1 deg
<a href="#">AVHRR Pathfinder V5</a>	Global	0.05 deg
<a href="#">MODIS on Aqua</a>	Global	0.05

**Ocean Surface Chlorophyll-a**

Dataset	Coverage	Resolution
<a href="#">MODIS on Aqua</a>	Global	0.05 deg

**Ocean Surface Winds**

Dataset	Coverage	Resolution
<a href="#">QuikSCAT</a>	Global	0.25 deg

**Ocean Surface Currents**

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

**Ocean Surface Height**

Dataset	Coverage	Resolution
<a href="#">AVISO SSH</a>	Global	0.25

**Delayed, Science-Quality Satellite Data**

Served from old LAS interface

**Ocean Surface Chlorophyll a**

[SeaWiFS Global Area Coverage, 0.1 degree resolution](#)  
(Sept 1997 - Dec 2005)  
8 day monthly

[OCTS Global Area Coverage, 0.1 degree resolution](#)  
(Nov 1996 - Jun 1997)  
8 day monthly quarterly mean quarterly stdev DODS

Select Type of Download:  
Map (xy)

Select Output format:  
Image

Get Now

35.4609  
Show Custom Region

LAS 6.5/Ferret 5.81 -- NOAA/SWFSC/ERD  
Z (m) DODS URL: <http://oceanwatch.pfeg.noaa.gov/8081/thredds/catalog/satellite/AN/chr1a/>  
TIME : 07-OCT-2006 23 DATA SET: 14-day  
Chlorophyll-a: Aqua MODIS MPF, Q0125 degrees, West Coast of US, EXPERIMENTAL PRODUCT

Chlorophyll a : 14-day (log, mg m<sup>-3</sup>)

More information about this dataset:  
[Dataset Summary](#)  
[OPeNDAP html info dds das](#)  
[Thredds catalog](#)  
[FGDC Metadata](#)

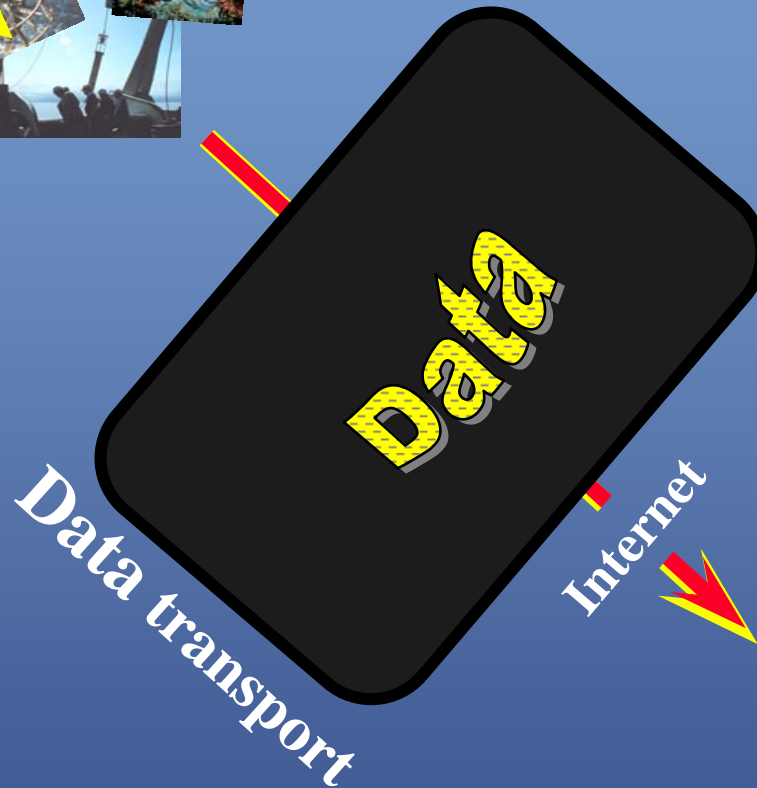
**Traditional Live Access Server Interface**

<http://oceanwatch.pfeg.noaa.gov>





*Why is data transport layer so important?*



Users can use their favorite **application** to access data at their desktop

**Developers** can remotely access data directly in their code

**Web browsers** can access and subset remote data

Data transport

Internet

Remote Data

Simplifies all aspects of scientific data networking, allowing simple access to remote data

Protocol for requesting and transporting data across the web

<http://www.opendap.org>

What is OPeNDAP? - Microsoft Internet Explorer

Address <http://opendap.org/faq/whatIsDods.html>

File Edit View Favorites Tools Help

home download documentation & support developers about us

search OPeNDAP:  go

## OPeNDAP

- Support
- FAQs
- What is the OPeNDAP Software?
- What servers are available?
- What clients are available?
- How do I build DODS/OPeNDAP software?
- Supported platforms
- Special issues for the SGI/IRIX platform
- Servers that limit access

## What is OPeNDAP?

**OPeNDAP is a software framework** that simplifies all aspects of scientific data networking, allowing simple access to remote data. Local data can be made accessible to remote locations regardless of local storage format by using [OPeNDAP servers](#). Existing, familiar data analysis and visualization applications can be transformed into [OPeNDAP clients](#) (i.e., applications able to access remote OPeNDAP served data).

Take a look at our answer to the question ["What Will OPeNDAP Do For Me?"](#).

---

**OPeNDAP is a protocol** for requesting and transporting data across the web. The current OPeNDAP Data Access Protocol (DAP) uses HTTP to frame the requests and responses. For details on the OPeNDAP DAP, see our ["OPeNDAP Data Access Protocol--DAP 2.0 -- DRAFT"](#) document.

---

**OPeNDAP is a community of users** working together to use, improve, and extend the OPeNDAP protocol and software.



<http://www.opendap.org>

Available DAP Servers - Microsoft Internet Explorer

Address <http://opendap.org/faq/whatServers.html> Go

File Edit View Favorites Tools Help

home download documentation & support developers about us

search OPeNDAP:  go

# OPeNDAP

## Available DAP Servers

Currently available DAP servers:

<a href="#">OPeNDAP netCDF Server</a>	makes netCDF data available
<a href="#">OPeNDAP HDF Server</a>	makes HDF 4 data available
<a href="#">OPeNDAP RDBS Server</a>	makes RDBMS data available (requires JDBC)
<a href="#">OPeNDAP Test Server</a>	The test server serves pseudo-data. Very useful when you want to test client software on a data structure for which you don't have an example.
<a href="#">OPeNDAP JGOFS Server</a>	makes JGOFS data available
<a href="#">OPeNDAP FreeForm Server</a>	Makes data available via DODS using the FreeForm software package. It is easy to use this to serve home-grown data formats.
<a href="#">Unidata Aggregation Server</a>	Use this to aggregate multiple data sources. This server works with local netCDF file as well as data accessible from a DAP-compliant server.
<a href="#">COLA GrADS Data Server (GDS)</a>	The GDS makes data available using GrADS. The types of data that can be served include GRIB, netCDF, HDF, and GrADS binary.
<a href="#">OPeNDAP Matlab Server</a>	makes Matlab binary data available
<a href="#">OPeNDAP DSP Server</a>	makes DSP data available
<a href="#">NOAA/PMEL/EPIC Dapper Server</a>	makes in-situ data in various netCDF formats available

Support

FAQs

What is the OPeNDAP Software?

What servers are available?

What clients are available?

How do I build DODS/OPeNDAP software?

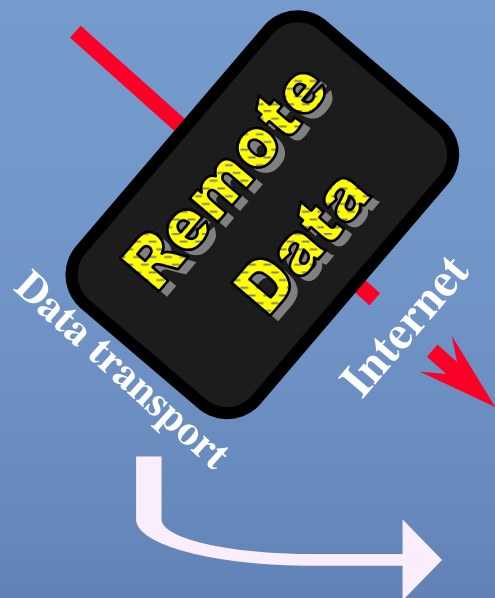
Supported platforms

Special issues for the SGI/IRIX platform

Servers that limit access

Internet





# THREDDS

## Thematic Realtime Environmental Distributed Data Services

goal is to simplify the discovery and use of scientific data and to allow scientific publications and educational materials to reference scientific data.

THREDDS (Thematic Realtime Environmental Distributed Data Services) - Microsoft Internet Explorer

Address <http://www.unidata.ucar.edu/projects/THREDDS/>

File Edit View Favorites Tools Help

### Unidata

Providing data, tools, and community leadership for enhanced Earth-system education and research

Data Tools Community Downloads Support Projects About Us Login Search advanced

#### Community Corner

- Director's Page
- CommunitE-letter
- Unidata Seminar Series
- Unidata Events
- Community Announcements
- Job Opportunities

#### ToolBox

- Downloads
- Data
- Software Tools
- Support
- Mailing Lists
- RSS Feeds

#### Display/Analysis

- GEMPAK
- McIDAS
- IDV

#### THREDDS

The THREDDS (Thematic Realtime Environmental Distributed Data Services) project is developing middleware to bridge the gap between data providers and data users. The goal is to simplify the discovery and use of scientific data and to allow scientific publications and educational materials to reference scientific data. The mission of THREDDS is for students, educators and researchers to publish, contribute, find, and interact with data relating to the Earth system in a convenient, effective, and integrated fashion. Just as the World Wide Web and digital-library technologies have simplified the process of publishing and accessing multimedia documents, THREDDS is building infrastructure needed for publishing and accessing scientific data in a similarly convenient fashion.

#### THREDDS News and Announcements

Posted: 2006-08-14  
**New THREDDS Data Server (TDS), Version 3.12**  
 A new, stable release of the THREDDS Data Server (3.12) is now available. This is mainly a bug fix and performance release. We now recommend that you upgrade to Tomcat 5.5/JDK 1.5, as this is reputedly more stable in a production environment. However, you can still use Tomcat 5.0/JDK 1.4. Please see the change log for a list of new features.

Posted: 2005-10-24  
**New Unidata THREDDS/IDD Server available**  
 Access the data catalog as [HTML](#) or [XML](#).

Posted: 2005-07-12  
**NcML-G and NcML-Gml is now available**  
 The NcML GIS extensions have been developed to facilitate interoperability between the earth sciences and the GIS communities.

[more ...](#)

#### Current Status

- [Technical Status Page](#)
- [Community Status Page](#) (operational data and catalog services and clients)
- The modest THREDDS staff at the UPC is not attempting to solve this huge problem on its own. A large and important set of [collaborating partners](#) has joined in the effort.

#### Get Involved

- [Subscribe](#) to the THREDDS mailing list
- [Search](#) or [browse](#) the THREDDS mailing list archives

#### THREDDS Publications

- "THREDDS Incorporating Real-time Environmental Data and Interactive Analysis Tools Into NSDL" in the [Journal of Online Digital Information](#).
- IDV enabled compound documents


Internet

<http://www.unidata.ucar.edu/projects/THREDDS/>



Catalog Services - Microsoft Internet Explorer

Address <http://oceanwatch.pfeg.noaa.gov:8081/thredds/Satellite/aggregsatAT/ssta/catalog.html?dataset=satellite/AT/ssta/1day> Go



**THREDDS Data Server**

unidata

## Catalog

<http://oceanwatch.pfeg.noaa.gov:8081/thredds/Satellite/aggregsatAT/ssta/catalog.html?dataset=satellite/AT/ssta/1day>

### Dataset: Composites of cloud-masked surface temperatures/1-day

- *Data format:* NetCDF
- *Data type:* Grid
- *Naming Authority:* gov.noaa.pfel.coastwatch
- *ID:* satellite/AT/ssta/1day

### Documentation:

- **Summary:** NOAA CoastWatch provides sea surface temperature (SST) products derived from NOAA's Polar Operational Environmental Satellites (POES). This data is provided at high resolution (1.47km) for the North Pacific Ocean. Measurements are gathered by the Advanced Very High Resolution Radiometer (AVHRR) instrument, a multiband radiance sensor carried aboard the NOAA POES satellites. The units of the data are degree C.
- **Rights:** The data may be used and redistributed for free but is not intended for legal use, since it may contain inaccuracies. Neither CoastWatch, NOAA, nor the United States Government, nor any of their employees or contractors, makes any warranty, express or implied, including warranties of merchantability and fitness for a particular purpose, or assumes any legal liability for the accuracy, completeness, or usefulness, of this information.
- [Dataset Summary](#)
- [Oceanwatch Live Access Server](#)

### Access:

1. **WCS:** <http://oceanwatch.pfeg.noaa.gov:8081/thredds/wcs/satellite/AT/ssta/1day?request=GetCapabilities&version=1.0.0&service=WCS>
2. **OPENDAP:** <http://oceanwatch.pfeg.noaa.gov:8081/thredds/dodsC/satellite/AT/ssta/1day>

### Creators:

- **West Coast Regional CoastWatch Node**
  - email: [dave.foley@noaa.gov](mailto:dave.foley@noaa.gov)
  - <http://coastwatch.pfel.noaa.gov>

### Variables:

- CF-1.0 vocabulary:
  - **time** = time = time (seconds since 1970-01-01)

Done Internet

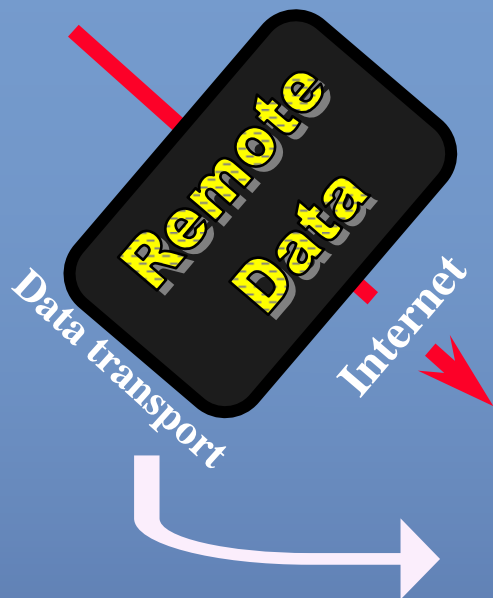
Catalog <http://oceanwatch.pfeg.noaa.gov:8081/thredds/catalog.xml> - Microsoft Internet Explorer

Address <http://oceanwatch.pfeg.noaa.gov:8081/thredds/catalog.html> Go

## Catalog <http://oceanwatch.pfeg.noaa.gov:8081/thredds/catalog.xml>

Dataset	Size	Last Modified
ERD THREDDS Data Server		--
RDBMS PaCOOS Datasets		--
<a href="#">GLOBEC NEP Data/</a>		--
<a href="#">CalCOFI Data/</a>		--
<a href="#">Mid Water Trawl Juvenile Rockfish Survey/</a>		--
<a href="#">Protected Resources Division CTD data/</a>		--
NWFSC Data		--
<a href="#">Hake Survey ADCP data/</a>		--
<a href="#">HUD data/</a>		--
Oceanwatch THREDDS Data Server		--
Aggregation Satellite Datasets		--
AVHRR HRPT SST 1.25km		--
<a href="#">Composites of cloud-masked surface temperatures/</a>		--
<a href="#">Day Time pass masked temperatures/</a>		--
<a href="#">Night Time pass cloud-masked surface temperatures/</a>		--
<a href="#">Night Time pass all surface temperatures/</a>		--
<a href="#">Day Time pass all surface temperatures/</a>		--
<a href="#">Night Time pass CLAVR-1 cloud flag/</a>		--
<a href="#">Day Time pass CLAVR-1 cloud flag/</a>		--
Alaska AVHRR HRPT SST 1.25km		--
<a href="#">Composites of cloud-masked surface temperatures/</a>		--
<a href="#">Day Time pass masked temperatures/</a>		--
<a href="#">Night Time pass cloud-masked surface temperatures/</a>		--
<a href="#">Night Time pass all surface temperatures/</a>		--

Internet



## THREDDS Aggregation

THREDDS (Thematic Realtime Environmental Distributed Data Service)

Address: <http://www.unidata.ucar.edu/projects/THREDDS/>

File Edit View Favorites Tools Help

### Unidata

Providing data, tools, and community leadership for enhanced environmental research

Data Tools Community Downloads Support Projects About

#### Community Corner

- Director's Page
- CommunitE-letter
- Unidata Seminar Series
- Unidata Events
- Community Announcements
- Job Opportunities

#### ToolBox

- Downloads
- Data
- Software Tools
- Support
- Mailing Lists
- RSS Feeds

#### Display/Analysis

- GEMPAK
- McIDAS
- IDV

#### Data Access

#### THREDDS

The THREDDS Services provides scientific materials students interact v and integ technol multimed publishing

#### THREDDS News and Announcements

Posted: 2006-08-14  
**New THREDDS Data Server (THREDDS Version 3.12)**  
 A new, stable release of the THREDDS Data Server (3.12) is now available. It is mainly a bug fix and performance improvement. We now recommend that you upgrade to Tomcat 5.5/JDK 1.5, as this is more stable in a production environment. However, you can still use Tomcat 5.0/JDK 1.4. Please see the change log for more details.

CM2006171\_230000h\_u25h.nc  
 CM2006172\_000000h\_u25h.nc  
 CM2006172\_010000h\_u25h.nc  
 CM2006172\_020000h\_u25h.nc  
 CM2006172\_030000h\_u25h.nc  
 CM2006172\_040000h\_u25h.nc  
 CM2006172\_050000h\_u25h.nc  
 CM2006172\_060000h\_u25h.nc  
 CM2006172\_070000h\_u25h.nc  
 CM2006172\_080000h\_u25h.nc  
 CM2006172\_090000h\_u25h.nc  
 CM2006172\_100000h\_u25h.nc  
 CM2006172\_110000h\_u25h.nc  
 CM2006172\_120000h\_u25h.nc  
 CM2006172\_130000h\_u25h.nc  
 CM2006172\_140000h\_u25h.nc  
 CM2006172\_150000h\_u25h.nc  
 CM2006172\_160000h\_u25h.nc  
 CM2006172\_170000h\_u25h.nc  
 CM2006172\_180000h\_u25h.nc  
 CM2006172\_190000h\_u25h.nc

<http://oceanwatch.pfeg.noaa.gov:8081/thredds/Satellite/aggregcodarCM/usfc/catalog.html?dataset=satellite/CM/u25/hday>

Access with single URL

Updates automatically when file added to directory

<http://www.unidata.ucar.edu/projects/THREDDS/>

CM2006172\_220000h\_u25h.nc  
 CM2006172\_230000h\_u25h.nc  
 CM2006173\_000000h\_u25h.nc  
 CM2006173\_010000h\_u25h.nc  
 CM2006173\_020000h\_u25h.nc  
 CM2006173\_030000h\_u25h.nc  
 CM2006173\_040000h\_u25h.nc  
 .....

# WCS - Web Coverage Services

<http://oceanwatch.pfeg.noaa.gov:8081/thredds/wcs/satellite/AG/ssta/14day?request=GetCoverage&version=1.0.0&service=WCS&format=GeoTIFF&coverage=AGssta&Vertical=.0&time=2006-01-09T23:59:59Z&bbox=220,20,250,50>





# Summary

**A small amount of time spent setting up a standardized, efficient data transport layer can greatly reduce the time spent on serving data.**

**An OPeNDAP Server immediately provides (without any further work) access to the data for :**

- desktop applications (Matlab, IDV, ArcGIS, R, Ferret, others?)
- developers in Java, Python, others?
- basic web access with OPeNDAP form

**Installation of an open-source application such as DChart or Live Access Server further provides:**

- powerful web-based access to the data with a community-familiar interface
- customization of display (open-source software )

**Remote users and web interfaces can have standardized access to the data, facilitating interoperability of data systems and integration of data from varying sources.**

Once basic access has been supplied, researchers can get the data they need, web developers can focus on web pages rather than data format issues.