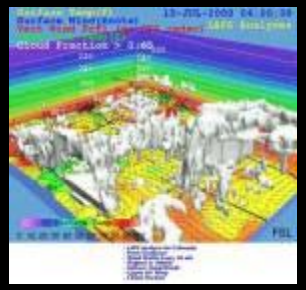
Unified Access Framework

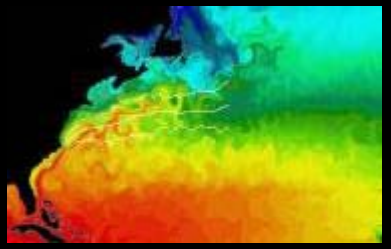
Kevin O'Brien
Joint Institute for the Study of the Atmosphere and Ocean
University of Washington

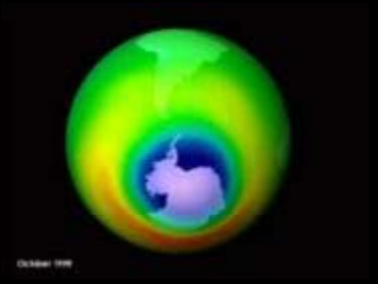
The Unified Access Framework (UAF)

- A Global Earth Observation Integrated Data Environment (GEO-IDE) project
- Spawned from NOAA's Data Management and Integration Team (DMIT)
- An attempt to improve scientific data management and access

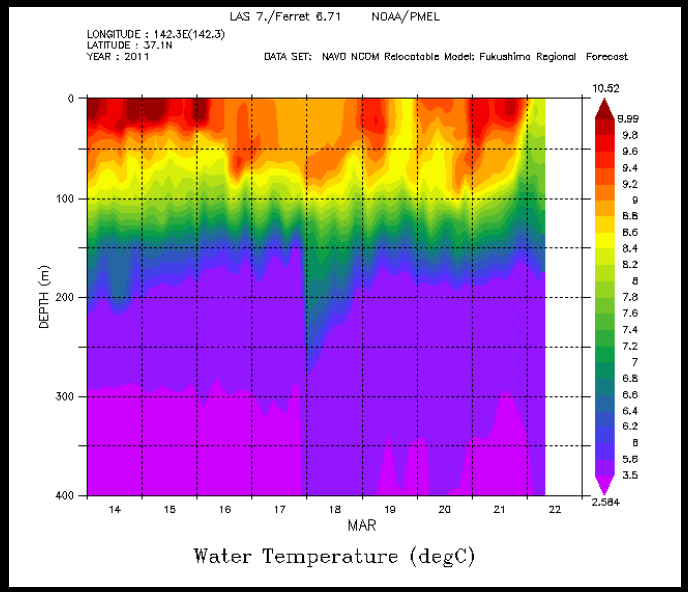
NOAA has LOTS of data

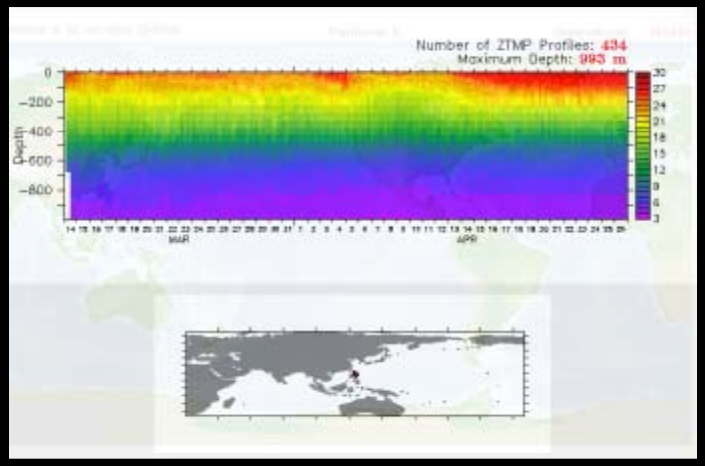


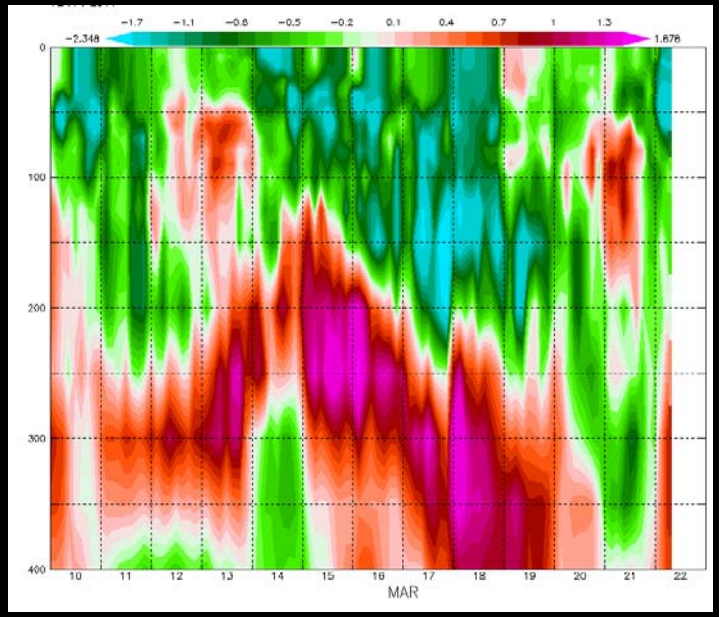




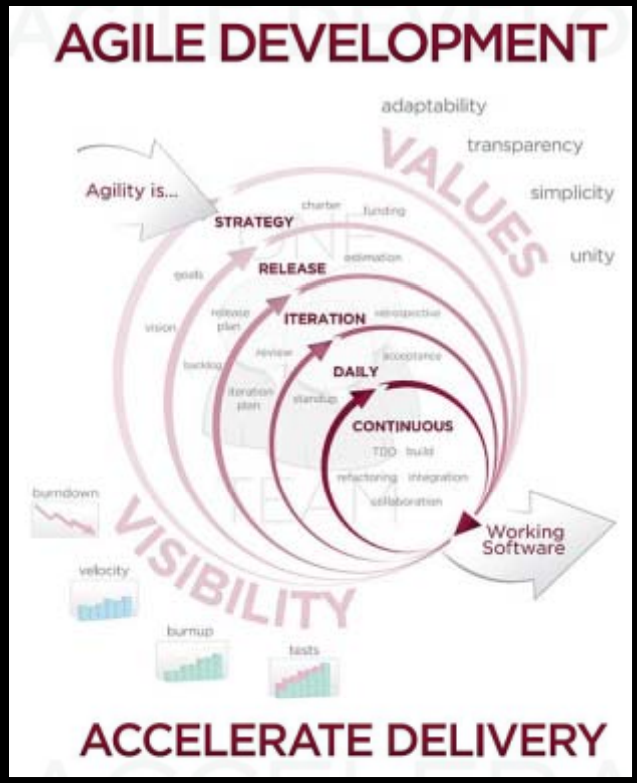
- Where can I find recent SST data?
- What exactly is in this SST dataset?
- What the $#&@ is grib format?
- Can I explore the data?

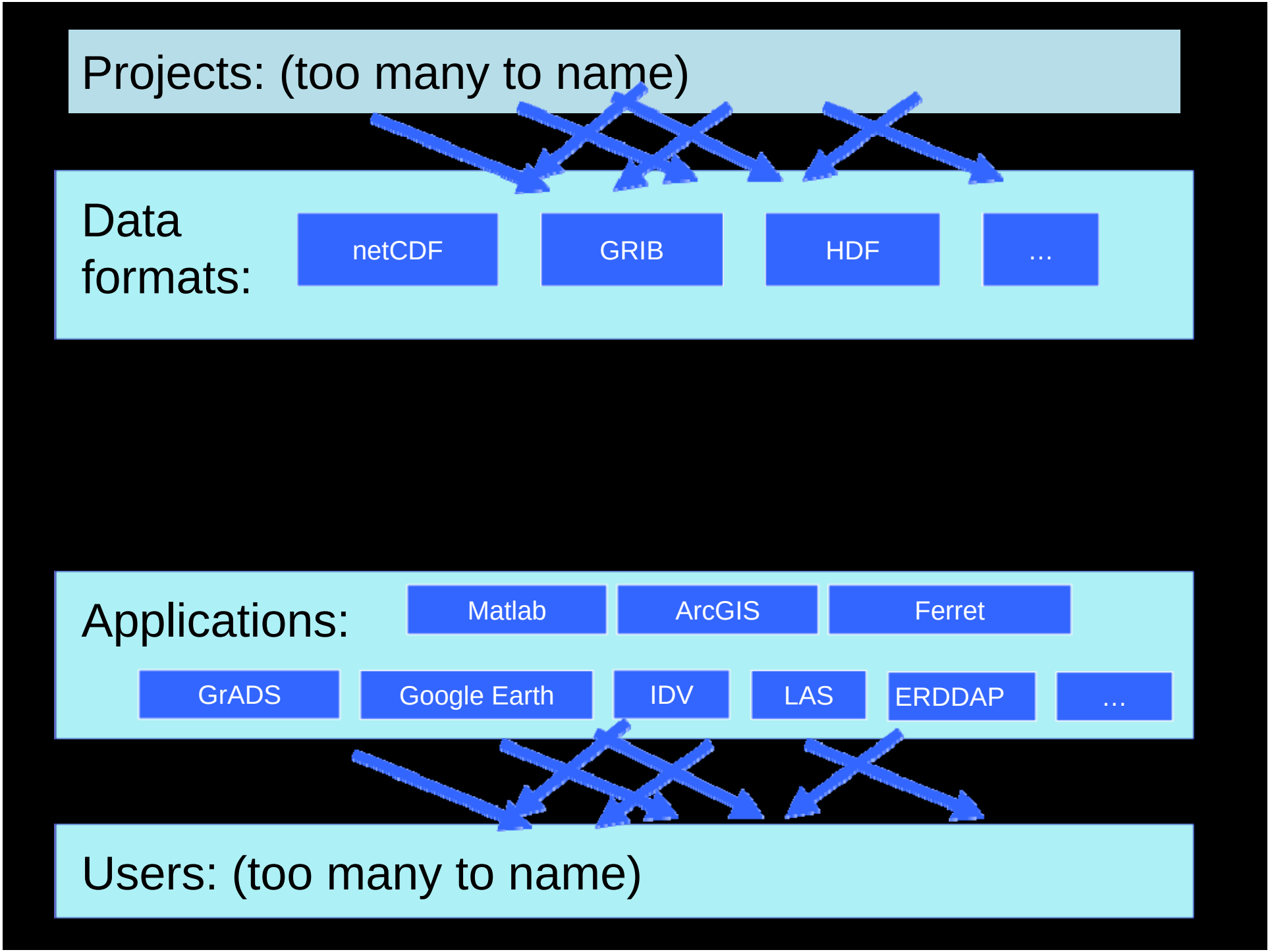

LAS 7./Ferret 6.71 NOAA/PMEL
LONGITUDE : 142.3E(142.3)
LATITUDE : 37.1N
YEAR : 2011
DATA SET: NAVO NCOM Relocatable Model: Fukushima Regional Forecast
DEPTH (m)
MAR
Water Temperature (degC)

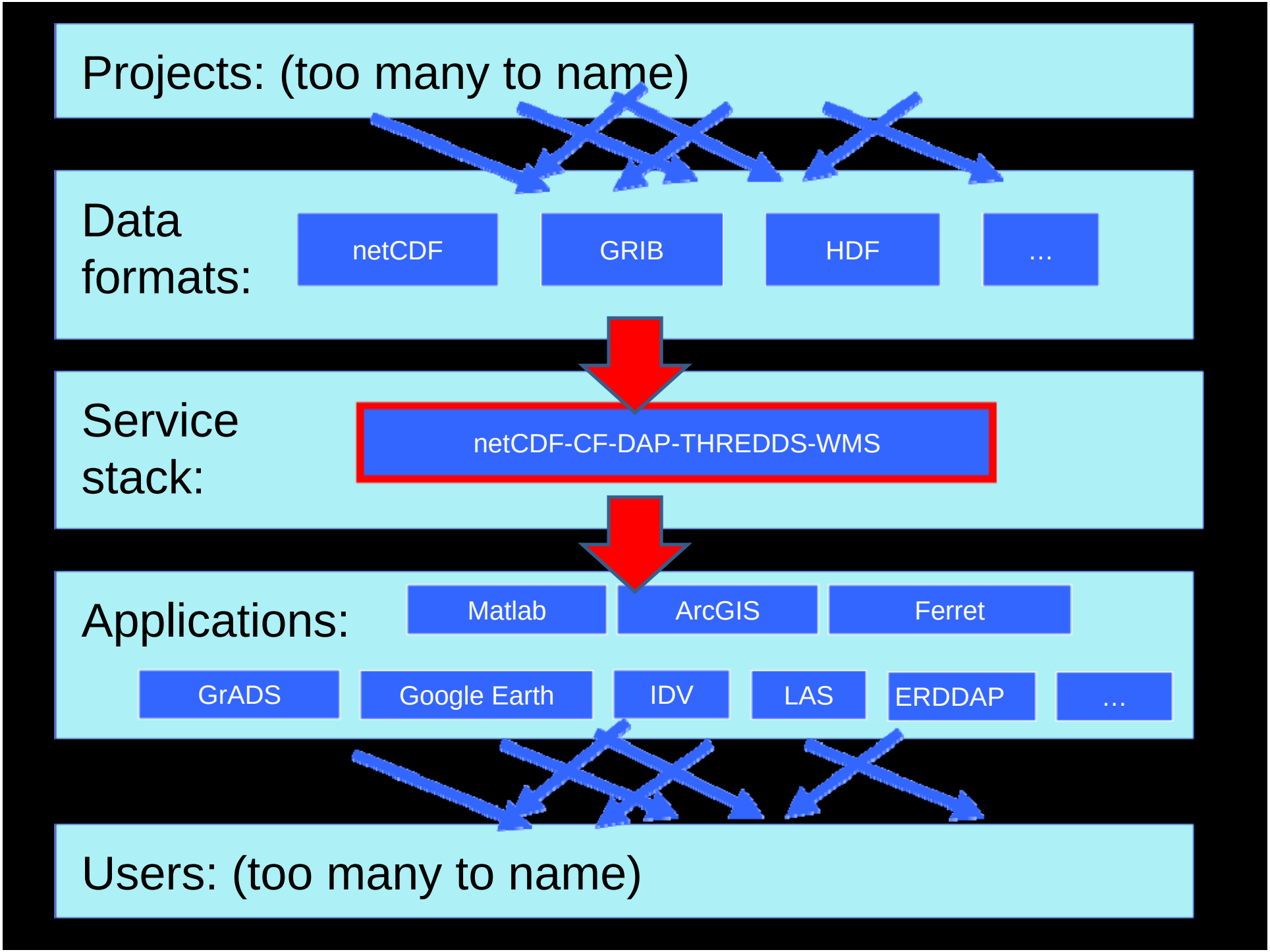

Number of ZTMP Profiles: 434
Maximum Depth: 993 m
Depth
MAR
APR

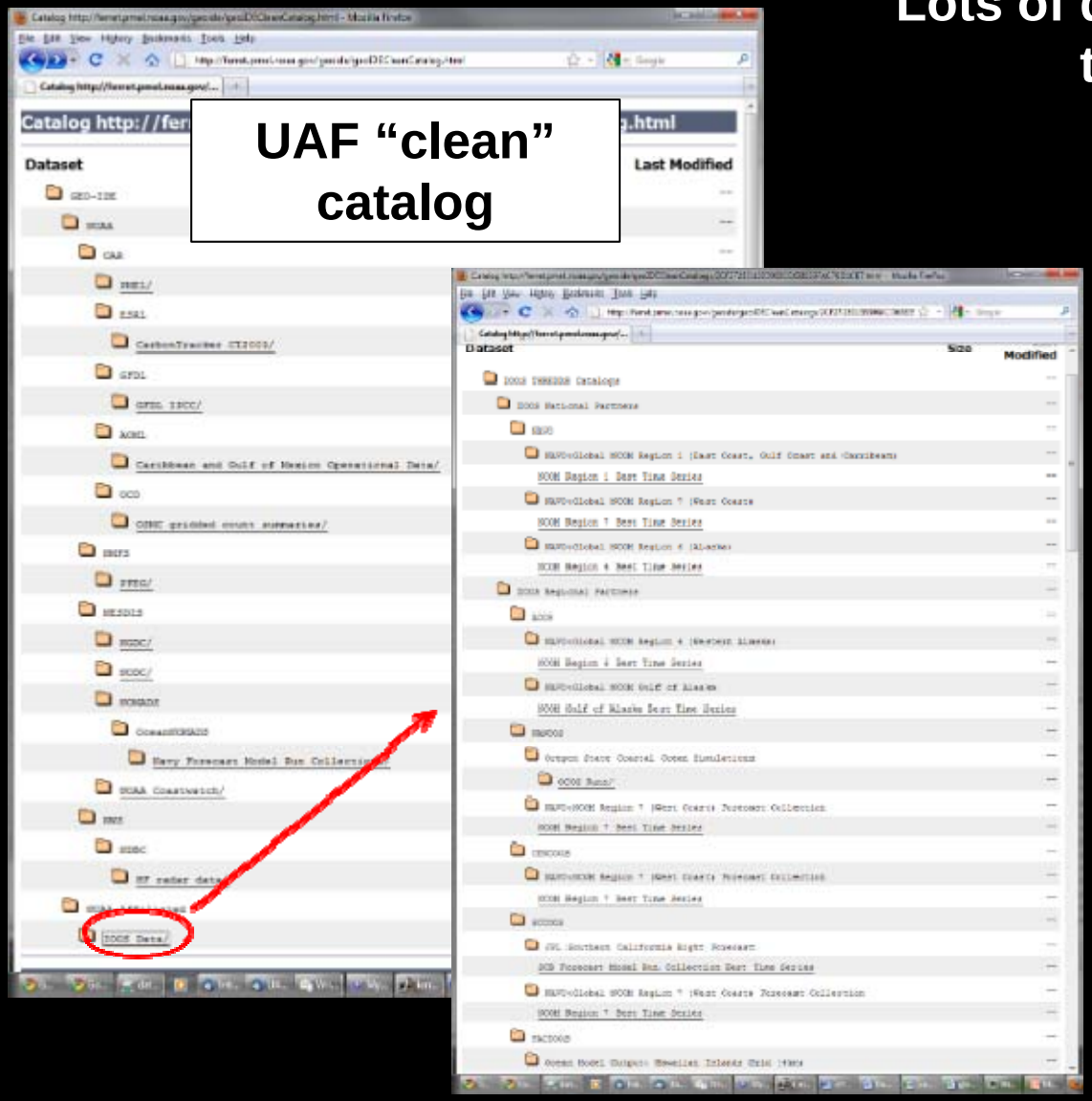

MAR

- UAF is taking a “modern” approach
- An ‘agile’ approach
- Don’t solve problems, copy success
- Do proven solutions exist?




Projects: (too many to name)
Data formats:
netCDF
GRIB
HDF
...
Applications:
Matlab
ArcGIS
Ferret
GrADS
Google Earth
IDV
LAS
ERDDAP
...
Users: (too many to name)


Projects: (too many to name)
Data formats:
netCDF
GRIB
HDF
...
Service stack:
netCDF-CF-DAP-THREDDS-WMS
Applications:
Matlab
ArcGIS
Ferret
GrADS
Google Earth
IDV
LAS
ERDDAP
...
Users: (too many to name)



Lots of data already being served through this stack

5000+ OPeNDAP URL’s (Datasets) available through master catalog

Have no fear of perfection - you'll never reach it
Salvador Dali

- compliance with CF conventions is inconsistent
- files commonly are not aggregated into logical datasets
- metadata are often in need of enhancement

Perspective – this is not an unusual situation:

- Standards compliance problems are *the norm*
- Divergent dialects often pile up (e.g. GRIB, BUFR)

UAF tools offer a solution …

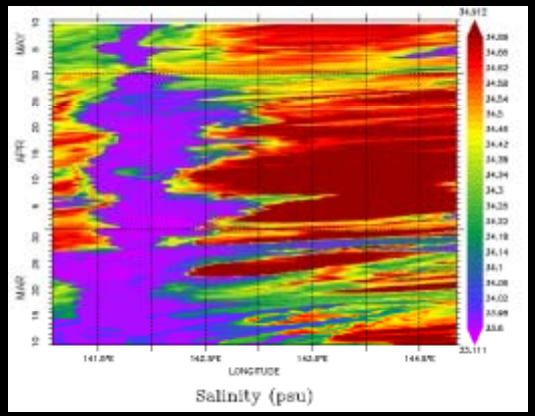
‘NcML’ CAN BE USED TO REPAIR PROBLEMS

Improve CF compliance by adding “standard_name”

```
<variable name="vorticity">
  <attribute
    name="standard_name"
    value="atmosphere_absolute_vorticity“
   />
</variable>
```

Improve dataset utility by aggregating where feasable

```
<aggregation type="joinExisting" dimName="TimeAxis">
    <netcdf location=“year1.nc" ncoords=“365"/>
    <netcdf location=“year2.nc" ncoords=“365"/>
    <netcdf location=“year3.nc" ncoords=“365"/
</aggregation>
```



Using *existing* technology:

- Data providers make their data available
- Data centers can harvest discovery metadata
- Users can:
  - Search for data
  - Browse data holdings
  - Explore data
  - Immediately begin to interact with data

(JPEG Image, 1309 × 914 pixels) - Mozilla Firefox

File Edit View History Bookmarks Tools Help

(JPEG Image, 1309 × 914 pixels)

googleusercontent.com https://mail-attachment.googleusercontent.com/attachment/?ui=2&ik=c98028c554&view=att&th=13727f81

Google

Login Help

Global Earth Observation Integrated Data Environment

Unified Access Framework for Environmental Data

UAF HOME | SEARCH | BROWSE | SEARCH TIPS

Search

Search metadata content, e.g. title:SST; use + to require keywords, e.g. +water +temperature;
use "" to search for an exact phrase, e.g."water temperature"

Cornillon Climatology, 0.1 degrees, Global, test | Search | Clear All

Additional Options

WHEN

Dates overlap range Dates within range

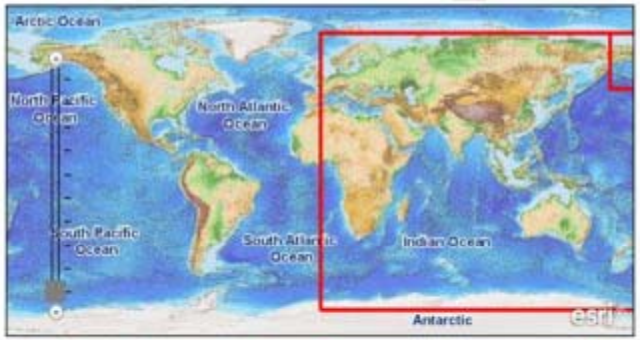
From: (yyyymmdd)

To: (yyyymmdd)

WHERE

Zoom the map to desired area and choose "intersecting" or "fully within"
You can zoom the map by shift-click-dragging a bounding box

Anywhere Intersecting Fully within



Results 1-25 of 1646 record(s) 1 2 3 4 5 > Last

Expand results Zoom To Results Zoom To Searched Area

SST Anomaly, NOAA POES AVHRR, Casey and Cornillon Climatology, 0.1 degrees, Global, t

NOAA CoastWatch distributes SST anomaly data using a combination of the POES AVHRR Global Area Cover and data from a climatological database by Casey and Cornillon. AVHRR SST is compared with the climatolo for the region and time period...

Open Preview Website Details Metadata WMS ERDDAP WCS LAS WCT OPeNDAP Zoo

SST Anomaly, NOAA POES AVHRR, Casey and Cornillon Climatology, 0.1 degrees, Global

NOAA CoastWatch distributes SST anomaly data using a combination of the POES AVHRR Global Area Cover and data from a climatological database by Casey and Cornillon. AVHRR SST is compared with the climatolo for the region and time period...

Open Preview Website Details Metadata WMS WCS WCT OPeNDAP Zoom To

SST Anomaly, NOAA POES AVHRR, Casey and Cornillon Climatology, 0.1 degrees, Global

NOAA CoastWatch distributes SST anomaly data using a combination of the POES AVHRR Global Area Cover and data from a climatological database by Casey and Cornillon. AVHRR SST is compared with the climatolo for the region and time period...

Open Preview Website Details Metadata WMS WCS WCT OPeNDAP Zoom To

SST Anomaly, NOAA POES AVHRR, Casey and Cornillon Climatology, 0.1 degrees, Global

NOAA CoastWatch distributes SST anomaly data using a combination of the POES AVHRR Global Area Cover and data from a climatological database by Casey and Cornillon. AVHRR SST is compared with the climatolo for the region and time period...

Open Preview Website Details Metadata WMS WCS WCT OPeNDAP Zoom To

SST Anomaly, NOAA POES AVHRR, Casey and Cornillon Climatology, 0.1 degrees, Global

NOAA CoastWatch distributes SST anomaly data using a combination of the POES AVHRR Global Area Cover and data from a climatological database by Casey and Cornillon. AVHRR SST is compared with the climatolo for the region and time period...

Open Preview Website Details Metadata WMS WCS WCT OPeNDAP Zoom To

(JPEG Image, 1309 × 914 pixels) - Mozilla Firefox

File Edit View History Bookmarks Tools Help

(JPEG Image, 1309 × 914 pixels)

googleusercontent.com https://mail-attachment.googleusercontent.com/attachment/?ui=2&ik=c98028c554&view=att&th=13727f81

Google

Login Help

Global Earth Observation Integrated Data Environment

Unified Access Framework for Environmental Data

UAF HOME | SEARCH | BROWSE | SEARCH TIPS

Search

Search metadata content, e.g. title:SST; use + to require keywords, e.g. +water +temperature;
use "" to search for an exact phrase, e.g."water temperature"

Cornillon Climatology, 0.1 degrees, Global, test | Search | Clear All

Additional Options

WHEN

Dates overlap range Dates within range

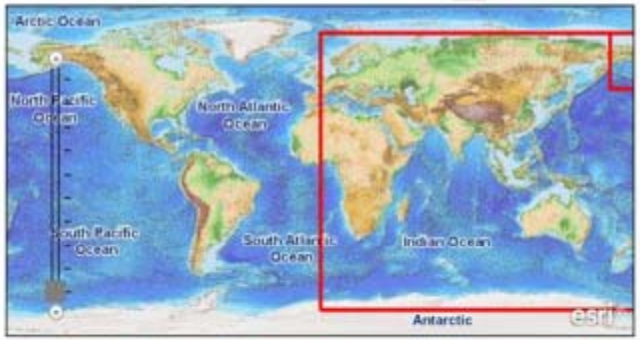
From: (yyyymmdd)

To: (yyyymmdd)

WHERE

Zoom the map to desired area and choose "intersecting" or "fully within"
You can zoom the map by shift-click-dragging a bounding box

Anywhere Intersecting Fully within



Results 1-25 of 1646 record(s) 1 2 3 4 5 > Last

Expand results Zoom To Plot. AVHRR SST is compared with the clim

SST Anomaly, N

NOAA CoastWatch

and data from a cli

for the region and tim

WMS ERDDAP WCS LAS WCT OPeNDAP Zoo

Open Preview Websi

Climatology, 0.1 degrees, Gl

SST Anomaly, NOAA POES AVHRR, Casey and Cornillon Climatology, 0.1 degrees, Global

NOAA CoastWatch distributes SST anomaly data using a combination of the POES AVHRR Global Area Cover and data from a climatological database by Casey and Cornillon. AVHRR SST is compared with the climatolo for the region and time period...

Open Preview Website Details Metadata WMS WCS WCT OPeNDAP Zoom To

SST Anomaly, NOAA POES AVHRR, Casey and Cornillon Climatology, 0.1 degrees, Global

NOAA CoastWatch distributes SST anomaly data using a combination of the POES AVHRR Global Area Cover and data from a climatological database by Casey and Cornillon. AVHRR SST is compared with the climatolo for the region and time period...

Open Preview Website Details Metadata WMS WCS WCT OPeNDAP Zoom To

SST Anomaly, NOAA POES AVHRR, Casey and Cornillon Climatology, 0.1 degrees, Global

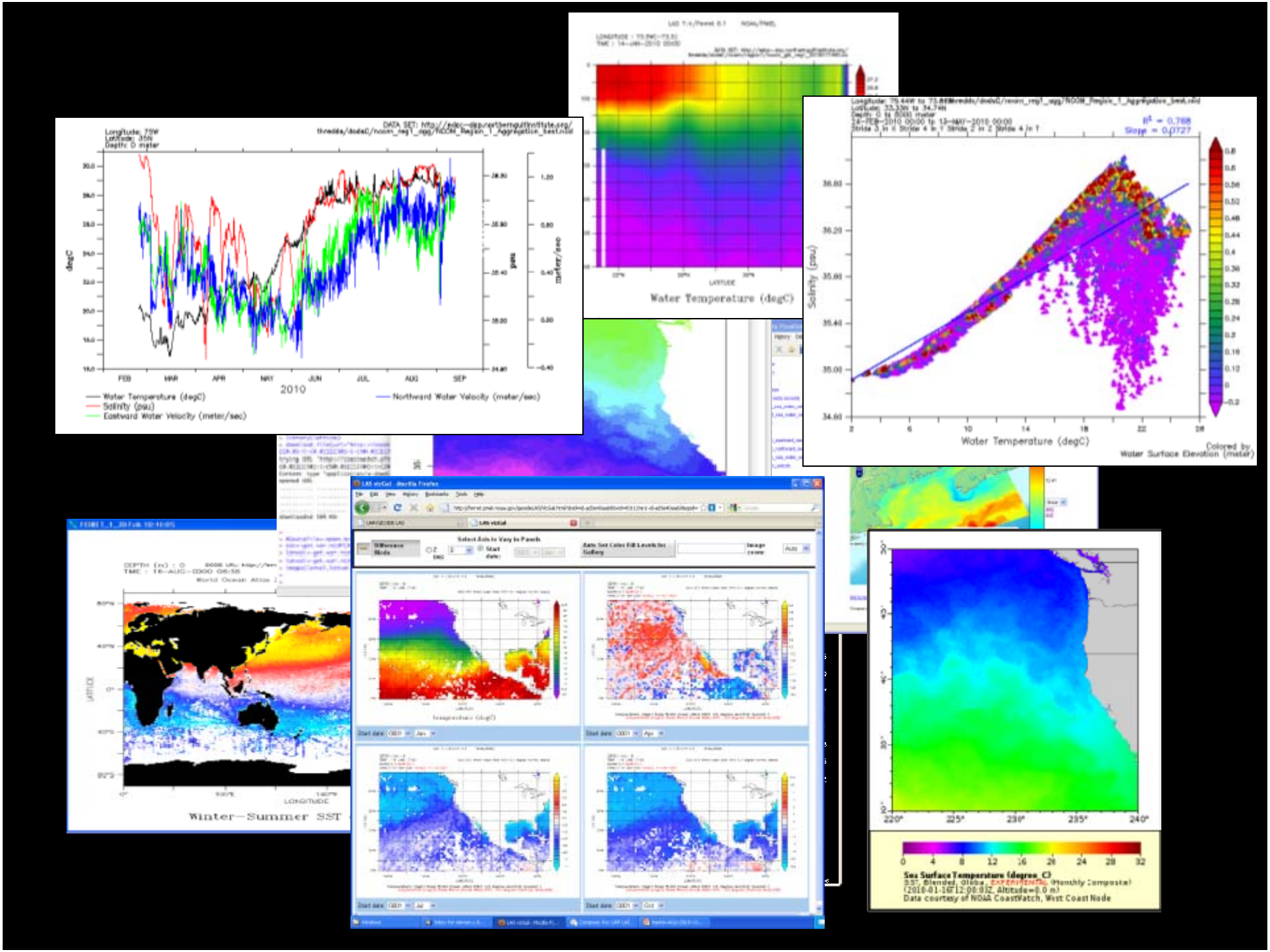
NOAA CoastWatch distributes SST anomaly data using a combination of the POES AVHRR Global Area Cover and data from a climatological database by Casey and Cornillon. AVHRR SST is compared with the climatolo for the region and time period...

Open Preview Website Details Metadata WMS WCS WCT OPeNDAP Zoom To

SST Anomaly, NOAA POES AVHRR, Casey and Cornillon Climatology, 0.1 degrees, Global

NOAA CoastWatch distributes SST anomaly data using a combination of the POES AVHRR Global Area Cover and data from a climatological database by Casey and Cornillon. AVHRR SST is compared with the climatolo for the region and time period...

Open Preview Website Details Metadata WMS WCS WCT OPeNDAP Zoom To


Longitude: 75W
Latitude: 35N
Depth: 0 meter
degC
psu
meter/sec
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
2010
Water Temperature (degC)
Salinity (psu)
Eastward Water Velocity (meter/sec)
Northward Water Velocity (meter/sec)
LATITUDE
Water Temperature (degC)
Salinity (psu)
Water Temperature (degC)
Colored by
Water Surface Elevation (meter)
LONGITUDE
Winter—Summer SST
Sea Surface Temperature (degree_C)
Data courtesy of NOAA CoastWatch, West Coast Node

Create an interoperable system for all NOAA data

Improve NOAA data offerings:

- **standards compliant**
- **complete metadata**
- **available via data services**

Thank you!

Kevin.M.O'Brien@noaa.gov
UAF: http://geo-ide.noaa.gov/