ncISO, Metadata, Discovery and GIS in Disaster Response

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Fukushima Daiichi Nuclear Plant

Japan's largest ongoing threat is at this nuclear power plant. There have been explosions at four of its six reactors and all four have released some radioactive material.

NYTimes/GeoEye

What do we need to do?

Locate relevant data

Make informed **decisions** based on analysis of the data

Metadata supports both!

Where will the radiation go?

- ✓**Find relevant datasets.**
  - ISO 19115-2 multiple extents
  - Responsible Party
  - Keywords
- ✓**Run models on top of the data**
  - Temporal dimensions
  - Services
- ✓Visualize/communicate results.
  - **Lineage and uncertainty**

Tools to find relevant datasets?

- ✓**Metadata catalogs** can be used to locate observation based and ancillary datasets needed in the analysis

- ✓Scientific data for the ocean and climate modeling often stored as **NetCDF** and Served via **THREDDS**

- ✓**nclSO** generates ISO metadata from THREDDS

THREDDS/NetCDF

CIRES

‘NetCDF (network Common Data Form) is a set of software libraries and machine-independent data formats that support the creation, access, and sharing of array-oriented scientific data.’

Data Storage:

- In-situ measurements - POINT/LINE/POLY
- Model results - GRID/RASTER

Communities:

- Atmospheric
- Oceanographic

THREDDS/NetCDF

NetCDF is an accepted standard by the Open Geospatial Consortium (OGC)

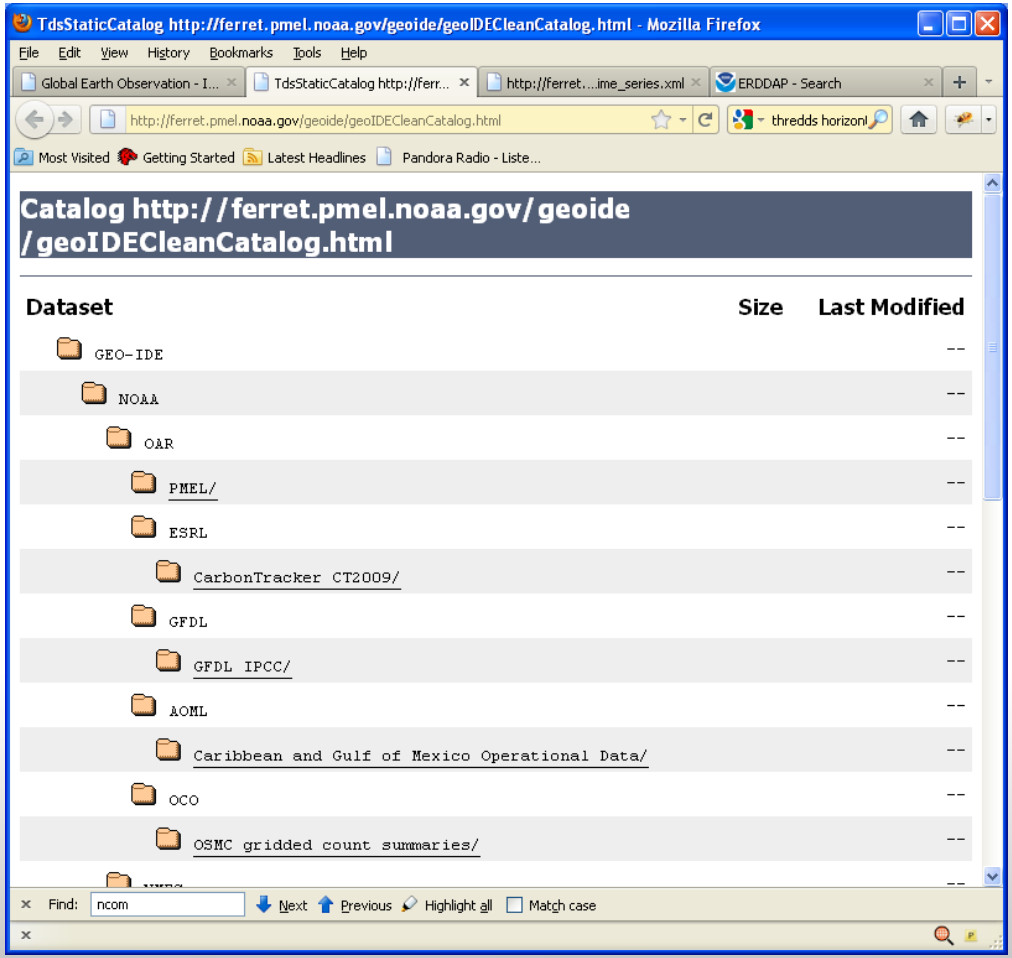
Client Software

- NetCDF library for reading and writing programmatically
- GeoSpatial Data Abstraction Library (GDAL) support
- Integrated Data Viewer (IDV) client viewer application
- ArcGIS

Server Applications – Data Distribution

- Thematic Realtime Environmental Distributed Data Services (THREDDS)
- Open-source Project for a Network Data Access Protocol (OpeNDAP)

NOAA's Global Earth Observation Integrated Data Environment



- A framework for serving NOAA's environmental data

http://ferret.pmel.noaa.gov/geoide/geoIDECleanCatalog.html

ncISO

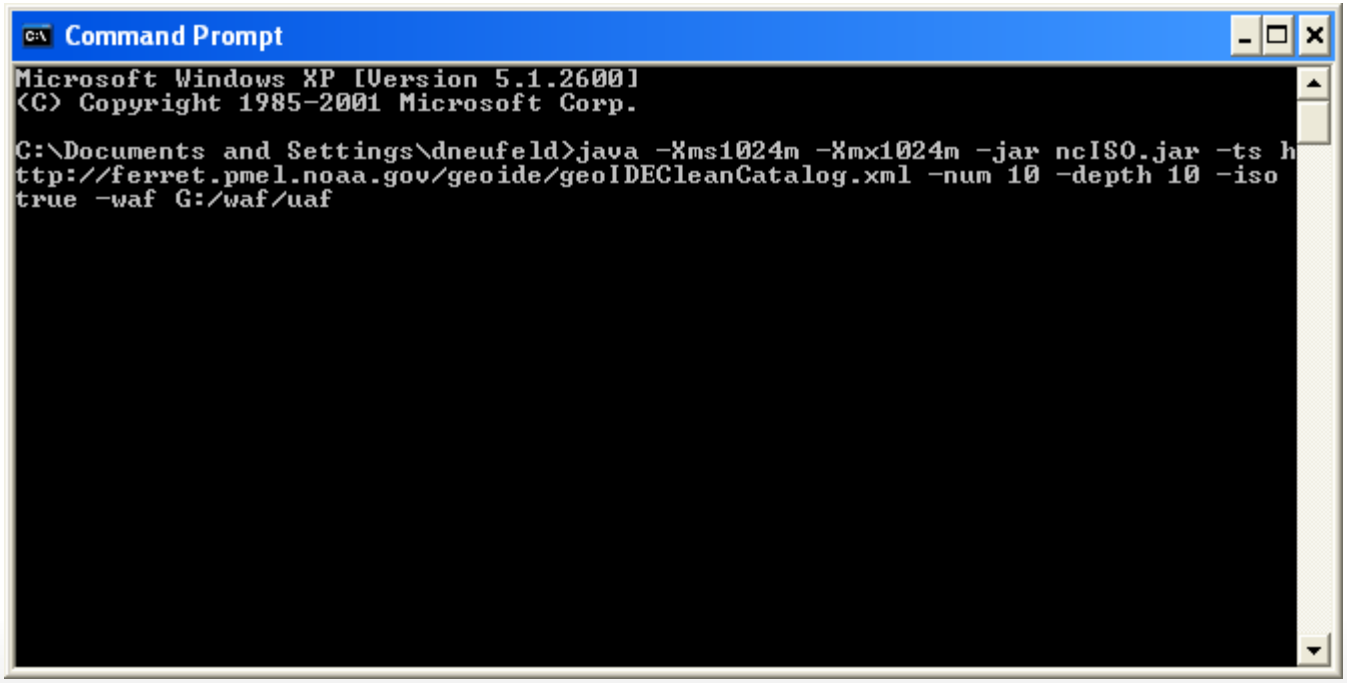
- Translates NCML, file and catalog metadata into ISO 19115-2
- Provides metadata services for THREDDS
- Provides export to WAF capability

Running ncISO

- ✓Download ncISO
- ✓Point to a THREDDS catalog with datasets of interest
- ✓Generate a Web Accessible Folder containing ISO Metadata and review its content
- ✓Explore options to improve metadata and rerun ncISO

Rubrics and ISO

NCOM/Fukushima dataset example



NCML

Rubric

ISO

more info - http://www.ngdc.noaa.gov/eds/tds/

Geoportal

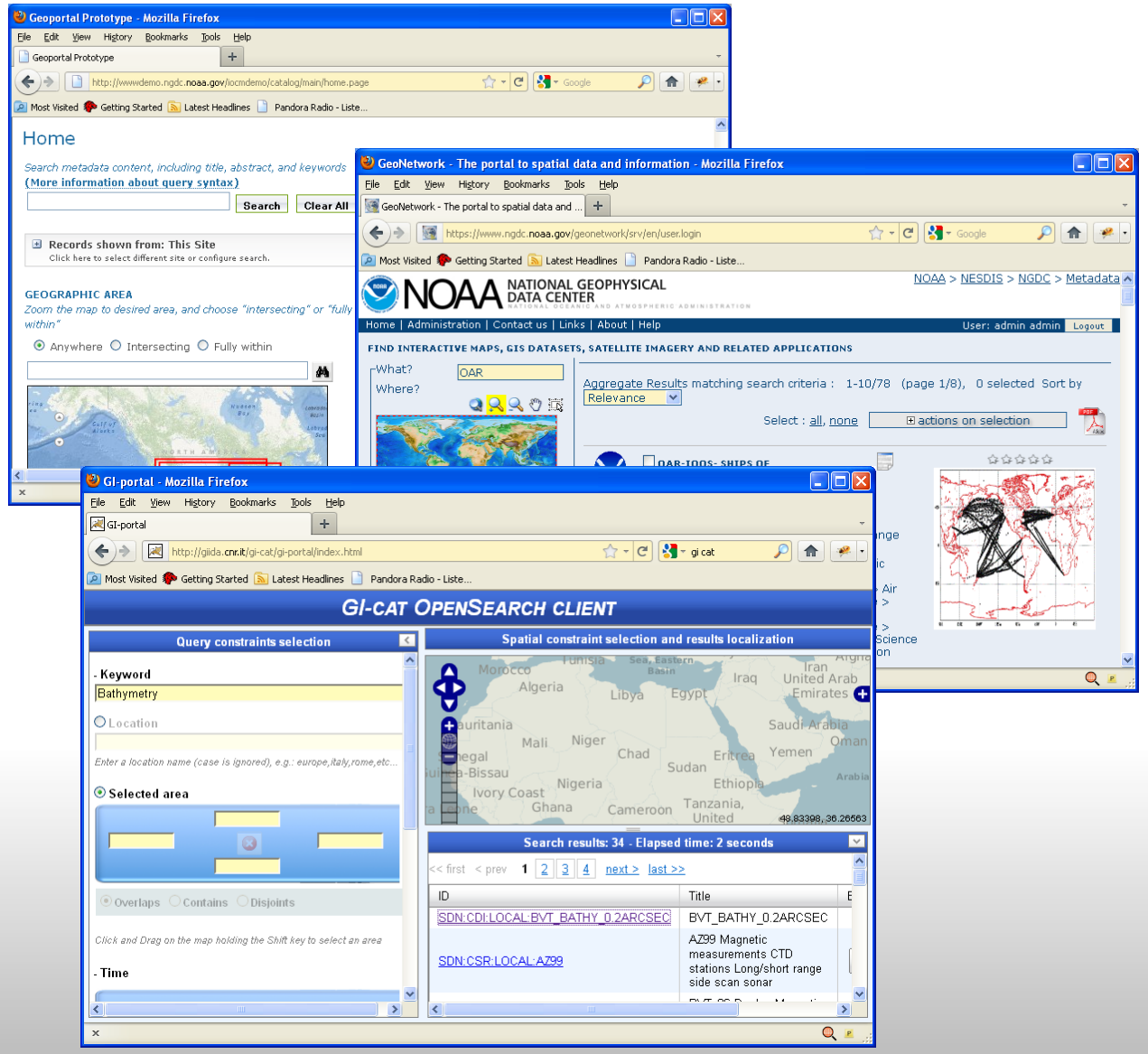
- Supports a variety of metadata formats
- ISO, FGDC, Dublin Core
- Populate catalog
  - harvesting from internal and external metadata WAFs
  - services

Open Source Metadata Catalogs

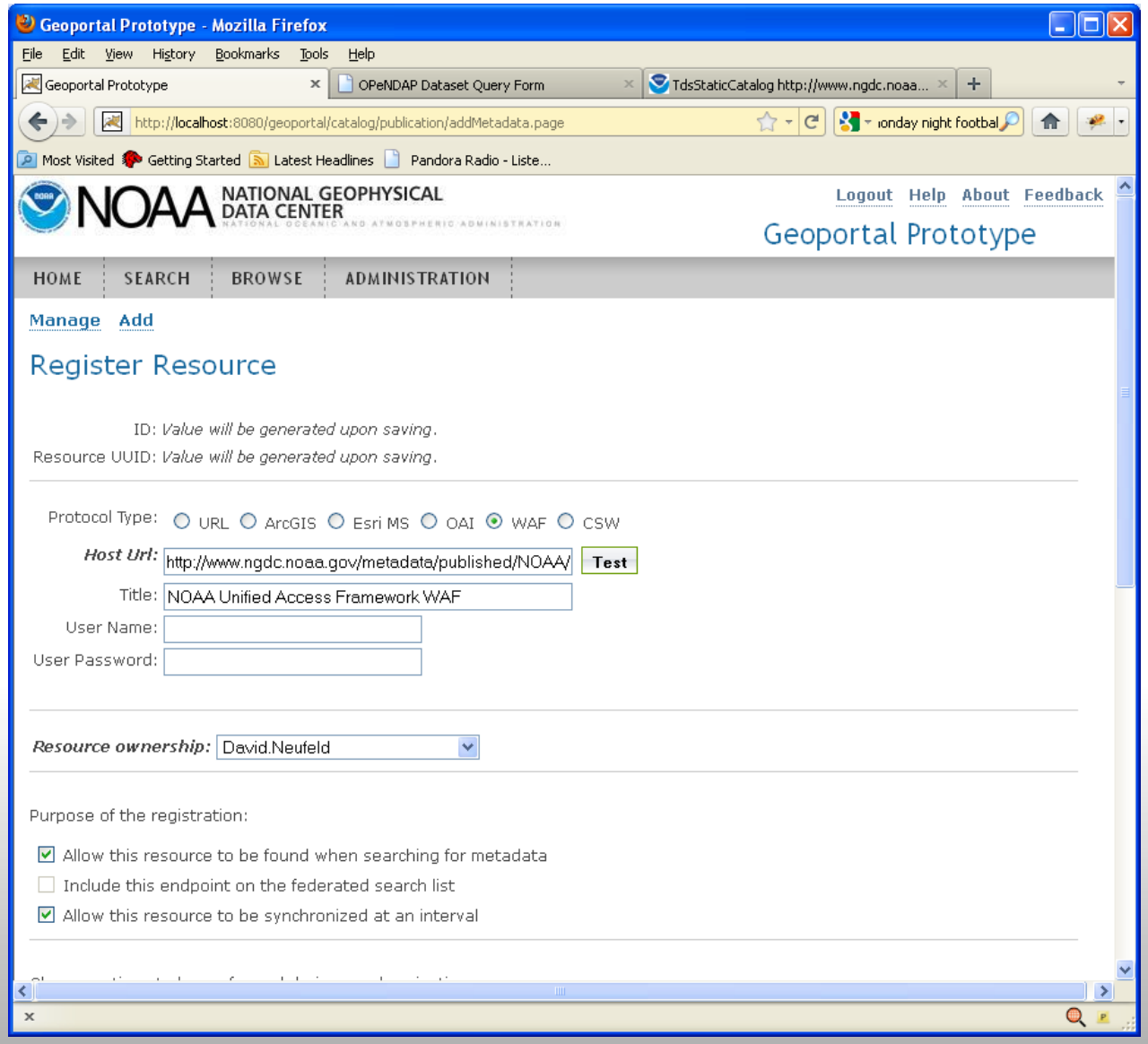
Geoportal

GeoNetwork

GI-Cat



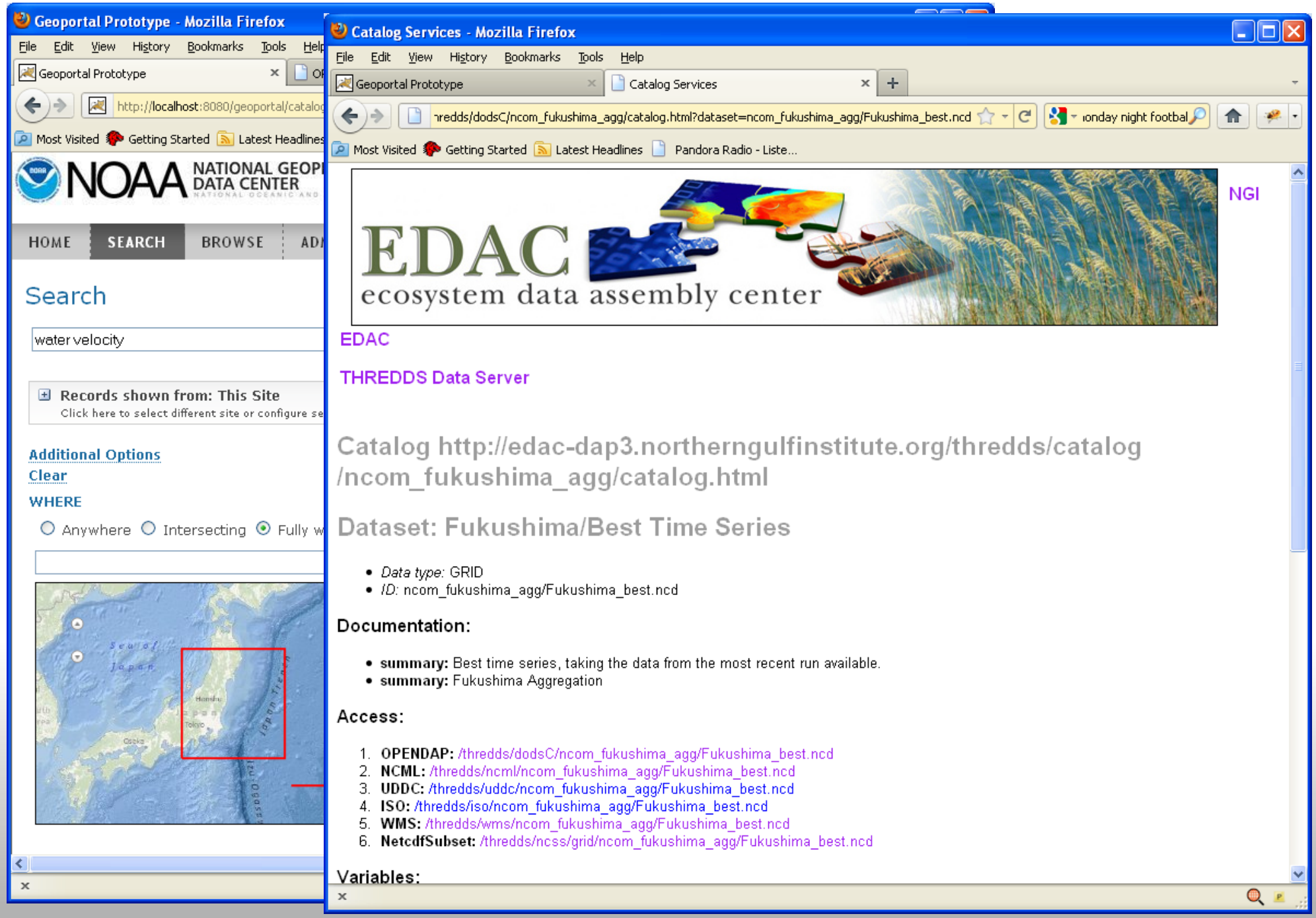
Harvest Metadata into Geoportal



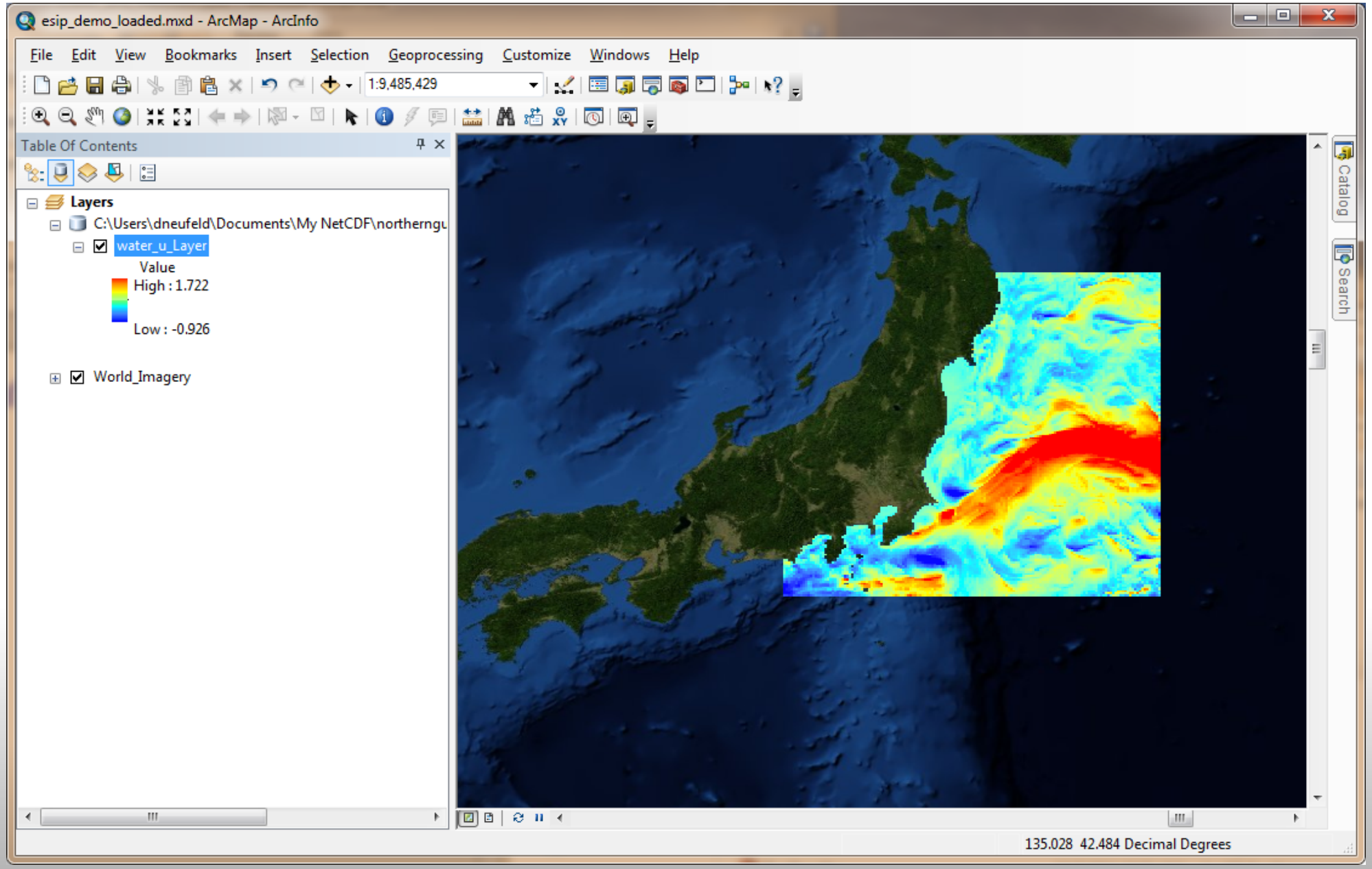
Make Decisions

- ✓Search catalog
- ✓Download dataset of interest
- ✓Use data to forecast radiation dispersal using GNOME, or ArcMap

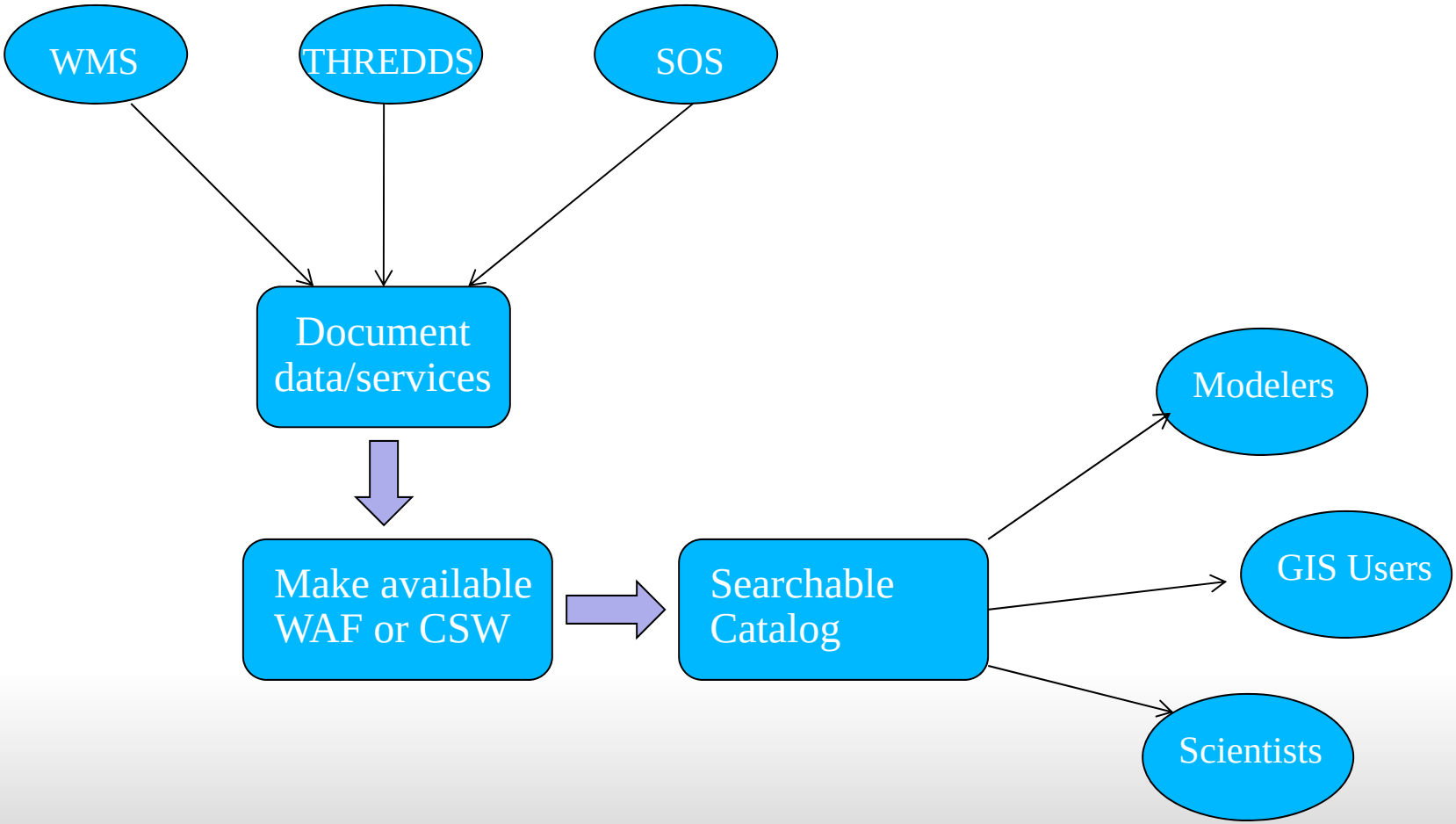
Search & Download



Visualize Radiation Dispersal



Workflow diagram:
Pulling it all together for improved response



Next Steps for ncISO

- Differentiate between model and in-situ data
- Allow metadata caching to improve performance

Questions?