IOOS Catalog and Service Requirements to Support Catalog-Driven Workflows

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Why not just use ERDDAP?

ERDDAP supports uniform grids, but doesn’t support:

Unstructured Grids (ADCIRC, FVCOM, SELFE, ...)

Curvilinear Grids (ROMS, SLOSH, HYCOM...)

Use OPeNDAP +CF, +UGRID conventions

Use OPeNDAP +CF (and +SGRID if staggered)
ncISO (NetCDF to ISO)

- https://github.com/Unidata/threddsIso
- Included in TDS 4.2.4+, but must be enabled
- Handles time, naming authority, properly in version 2.8 (and in TDS 4.6.1+)
- Standalone ncISO (http://www.ngdc.noaa.gov/eds/tds) is still at version 2.3
- Kevin O’Brien, Roland Schweitzer & Unidata team are working on integration of stand-alone ncISO into THREDDS ncISO (adding command line capabilities)
pycsw (Python-based CSW)

- https://github.com/geopython/pycsw
- Need version 1.10.3 or higher to support query by ServiceType (like OPeNDAP or SOS)
Catalog workflow for TDS data

- At least every day, providers update ISO metadata records in a WAF (web accessible folder):
  - Crawl THREDDS catalogs using Python script, extracting ISO metadata from ncISO TDS services
  - Crawl THREDDS catalogs using standalone ncISO jar file, generating ISO metadata from OPeNDAP services

- At least every day, use script to have pycsw harvest ISO metadata from list of WAFs, eliminating records no longer in WAFs
Standardized access to Unstructured Grid data

V: Array of 32 bit Reals [time2 = 0.383][sigma = 0.10][node = 0.592760]
  time2:     sigma:     node:
  long_name: Northward Water Velocity
  missing_value: -999.
  standard_name: northward_sea_water_velocity
  mesh: selfe_mesh
  location: node

selfe_mesh: 32 bit Integer
  cf_role: mesh_topology
  topology_dimension: 2
  node_coordinates: x y
  face_node_connectivity: ele

ugrid-conventions
Unstructured Grid Metadata Co
Updated on Apr 14

Description
Short description of this repository

Website
Website for this repository (optional)

60 commits, 1 branch, 1 release, 7 contributors

Removed Cython requirement from .travis.yml
SGRID Conventions: github/sgrid

Python tools for sgrid — Edit

GitHub repository: https://github.com/sgrid/pysgrid

- 294 commits
- 1 branch

Branch: master

- Merge pull request #53 from ayan-usgs/master
- ayan-usgs authored 17 hours ago

- pysgrid
- gitattributes
- gitignore
- .travis.yml
- MANIFEST.in
- README.md
- requirements-test.txt
- more readme changes

WRF (ARW version)

The WRF-ARW also uses a C-grid. In this case, models could also result in 3D grid topologies, structured (layered) grid in the vertical, but the possibilities are interesting to verify the result for W
Automated model comparison
US Integrated Ocean Observing System

Technical documentation and software supporting IOOS Data Management and Communications.

http://ioos.github.io

notebooks_demos
Notebook demonstrations and examples
Updated 9 days ago
IOOS demonstrations and examples notebooks

launch binder
There is some effort to integrate pygrid into iris to augment the cube object to be both CF and UGRID aware by adding convenience plotting methods with pygrid. You can see the full pygrid example [here](http://sgrid.github.io/sgrid/).

SGRID-0.3 (pysgrid)

http://sgrid.github.io/sgrid/

In [12]: import pysgrid

url = ('http://geoport.whoi.edu/thredds/dodsC/clay/usgs/users/')
Improving Reliability

• Monitor services
• Using conda and conda-forg for supporting the IOOS python environment
• Use Docker for deploying services: THREDDS Data Server, ERDDAP, pycsw, sci-wms
Next-Generation Models

- MODFLOW-USG Groundwater Model, USGS, USA
- MPAS Global Forecast Model, NCAR/LANL, USA
- Delft-Unstructured Ocean/Estuary/River Model (Deltares, Netherlands)
USGS Model and Time Series Portal
The IOOS Model Data Framework

Background

The IOOS model data framework provides standardized search, access and use of model data. The framework consists of standardized metadata and data services, which could be delivered with a number of different software components, but here we describe one collection of components that work: THREDDS Data Server, pycsw, sci-wms and Anaconda Python Distribution.

Modeling Group System Administrators

System administrators should install this collection of free software packages that will provide standardized data, image and catalog services used by the tools described in the section below.