COMT CI: Y3 in Review & Goals for Y4
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**Motivation**
- facilitate **collaboration** across various institutions and models
- enable **exploration**, presentation and archive of research results
- provide **community** access and tools to the COMT research

**Implementation/Tools**
- modelers upload data via FTP to central server
- CI works with modelers to make all data CF-compliant
- direct data access available via TDS (OPeNDAP and HTTP)
- visualization via Python based SCI-WMS for graphic display of data
  - handles structured, staggered and unstructured GRIDs
- user interface enables exploration of catalog and graphics for all projects
COMT Cyber-Infrastructure

Presentation/User Interface

Data Access (eg. OPeNDAP)

Services
Year 3 In Review

- Deployment of comt.ioos.us
- Addition of http://comt.sura.org/thredds to RPA ASA’s operational service monitoring system
- Model Viewer Improvements
Year 3 In Review

- Coordination with modeling teams & participation on team calls
- Demos and tutorials
- Development of Data Upload Tool
- Review of draft Data Management Plan
Challenge: Downloadable Publication Archives

- Create unique and stable (and now branded!) TDS catalog location for archiving publication model runs & related observations
Year 3 In Review: CB Hypoxia

- Added new model runs
  - ChesROMS
  - CBOFS
  - ROMS_RCA
- Organized model runs by project period
  - 2004-2005
  - 1984-2013
  - 2014-2015
- Re-organization of Model Viewer filters to allow multiple time periods per project
- Enabled water temperature variable in the model viewer
- Integrated the Chesapeake Bay Program observation data with the TDS catalog and Model Viewer
- Added CBIBS buoy data to the Model Viewer
Outstanding Requests:

- Process observation data
- Enable model-observation comparisons
- Enable inter-comparison of models with sigma coordinates at various depths
- Add additional biogeochemical variables (chlorophyll and nitrate)
- Integration of ‘Station’ data from simulations
- Allow Model Viewer to generate longer (2-yr) time-series
- Calculation of hypoxic volume
Challenge: Calculation of bottom boundary layer

- Boundary layer thickness, as compared to NGOFS, is a key diagnostic for inclusion of new models.
- Review existing Matlab code for boundary layer calculation provided by modeling team.
- Convert to Python and performed test integration with data ingest process as a post-processing step.

Potential Next Steps

- Testing!
- Add boundary layer thickness as 2D variable to model output files;
  - Requires discussion of CF convention for new variable.
- Determine best practices for visualization, color scheme, etc.
- Comparison with NGOFS.
Year 3 In Review: GoM Hypoxia

- Defined the model data expectations for Y3 and Y4 for all three models (ROMS, GEM, FVCOM)
  - Y3: (1) simple oxygen model and (2) the diagnostic run
  - Y4: full biogeochemical model results
- Created a stable TDS catalog link for use in publications
- Continued coordination with FVCOM group to work through topology and time variable issues
- Added first round of simple O2 models to the TDS catalog
Outstanding Requests:

• Process observation data
• Enable model-observation comparisons
• Add full biogeochemical model output
• Add bottom boundary layer thickness to UI
  • Perform a simple difference calculation between NGOFS and the testbed runs
Year 3 In Review: USWC Integration

Challenge: Integration of real-time simulations

- Primarily leveraging remotely served ongoing forecast products
- A single case study dataset has been added to the COMT TDS catalog: full aggregation available at http://comt.sura.org/thredds/dodsC/comt2/usw_integration/Exp16/roms.xml.html

Outstanding Requests:

- Add time-series of public buoys to compare with model
- Mechanism for analyzing past month of model performance
Challenge: Many, massive, model runs

- Pushing boundaries of fast & efficient integration of new model runs
- Datasets with millions of nodes too slow to draw in Model Viewer
- Leveraged a python-based tile cache for key model results
Year 3 In Review: PR Inundation

- Addition of Georges, Irene, and Sandy ADCIRC runs to the TDS Catalog
- Addition of Georges observation data to the TDS catalog
- Support of NOAA Testbed Conference abstract and presentation
- Continued coordination with PR team to work through SLOSH basin issues

**Outstanding Requests:**
- Integration of observation data
- Enable model-observation comparisons
- Continued coordination with NHC on SLOSH integration
- Difference calculation
Upload View/Creation Wizard allows local files to be uploaded (checks file hash before upload to see if this file has been processed)
Once uploaded, metadata is used to fill in initial dataset profile (standards such as ACDD and CF are initial targets).
Additional conventions/standards such as UGRID are presented
When required metadata is provided (e.g., id and naming_authority), OPeNDAP endpoint is dynamically created using provided metadata and IOOS compliance checker is run using DAP.
If sufficient metadata is provided (eg. CF + UGRID) a **sci-wms** dataset is created automatically allowing visual access to the data via WMS.
Model Viewer

- Web-based map view enabled rapid exploration of model output from large scale to local
- Inter-comparison of models regardless of grid or domain
- Time-series comparison across models available for any point within domain via OGC WMS GetFeatureInfo requests
Model Viewer
Model Viewer
Model Viewer
Model Viewer Updates

Simplified Project Filters & Addition of Search
Model Viewer Updates

Addition of Observations

[Image of a coastal ocean modeling viewer interface with various data layers and observations displayed.]
Model Viewer Updates

Addition of Observations
Web-based Catalog

Coastal and Ocean Modeling Testbed Viewer

Showing 1 to 10 of 25 entries
Y4 Draft Workplan

Landing Page/Catalog

- Intuitive & self-explanatory
- Discoverability & accessibility
Y4 Draft Workplan

sciWMS Enhancements
  • Improved color schemes/scales

Modeling Team Support
  • Identify key datasets for Y4
  • Launch data upload tool and provide training
  • Hands on facilitation of data ingest
  • Maintenance and oversight of TDS catalog
  • Finalize data management plan
  • Approach/Tools for deriving new parameters (e.g. BBL, Hypoxic Volume, Difference)

Model Viewer
  • Continued integration of observation data
  • Enhanced data comparison tools
  • Animations
  • Landing page/catalog view
  • Balance between sciWMS & tile services
  • Additional 3D visualization tools
Enables decision making
Fosters Advances in Science and Technology

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