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SCI-WMS: A PYTHON-BASED WEB MAP SERVICE FOR VISUALIZING GEOSPATIAL DATA

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***Abstract*—This abstract outlines the implementation and technology stack for visualizing geo-registered coastal forecasting (CF) data using sci-wms [1].[1] Specifically, discussing the deployment of sci-wms for visualizing model data and simulations within the scope of the U.S. IOOS Costal and Ocean Modeling Testbed cyberinfrastructure as an extensible visualization tool for qualitativly assessing society-critical oceanagraphic applications including: forecasts, risk assessment, model comparison and algorithmic/parameter selection. [?]**

I. MOTIVATION

The U.S. IOOS Coastal and Ocean Modeling Testbed (COMT) was formed to unify otherwise disparate entities in government, academia and industry to leverage ubiquity of computing hardware and the proliferation of coastal and oceanagraphic models and data to combat natural and man-made stressors by accelerating the turnaround from research and development to operational application of society critical applications, including forecasting, model comparison, model skill assessment and algorithmic/parameterization improvements [2]. Key to the U.S. IOOS COMT mission is an extensible tool for quickly visualizing and assessing coastal data.

The OpenGIS Web Map Service (WMS) [1] is a standard describing a http interface for visualizing geospatial data. Sci-wms implements the OpenGIS-WMS standard in python using Django as a web framework and standard cross platform numerical software, Numpy and Matplotlib [3], [4] for generating rasterized visual content.

sci-wms is a software solution able to visualize meterological simulations regardless of the underlying methodology by abstracting a data set into two distinct objects: the simulation topology and simulation variables. Model topology refers to a geo-referenced set of geometrical objects which define the positions and connectivity that variables in the data set may occupy. The types of topologies are just a numerous as the quantity of standard forecasting models, with some models able to generate multiple topologies. For example, there are curvelinear, rectilinear, regular, or unstructured triangular grids which can be in the planar 2D or volumetric 3D varieties.

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[1]https://github.com/asascience-open/sci-wms

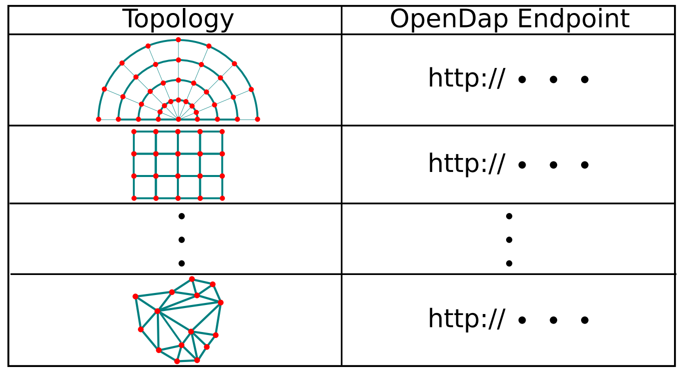

Fig. 1. sci-wms Topology and Endpoint Datastore.

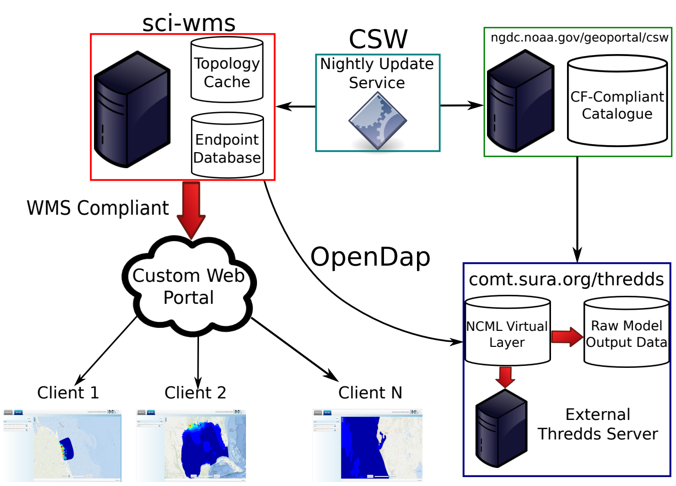

Fig. 2. COMT-SURA deployment of sci-wms for oceanagraphic modeling visualization.

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