4th International Workshop on Climate Informatics
September 25-26, 2014
Hosted by the National Center for Atmospheric Research in Boulder, CO

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

Brandon A. Mayer[1,2], Brian McKenna[2], Kelly Knee[2]

***Abstract*—This paper outlines the implementation and technology stack for visualizing geo-registered meterological forecasting data using sci-wms [?].[1] Specifically, we consider a use case in which sci-wms was used as a back end to create a custom web-portal for visualizing externally hosted data sets indexed by the National Geophysical Data Center (NGDC) [1] [2]. By separating model topology and variable values, sci-wms is able to serve custom generated content for a diverse range of models, including SELFE, FVCOM, SLOSH and ADCIRC in real time to many simultaneous clients in response to standard http GET requests.**

I. MOTIVATION

The ubiquity of computing hardware, interconnected by the world-wide-web, has lead to the proliferation of both meterological data and the development of models for the interpretation of said data. As scientists continue to refine and develop models to simulate and analyze storm data, an simple and efficient work flow for model aggregation and comparison, whether for forecasting purposes or retrospective model evaluation is essential for streamlining the scientific process.

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.

Brown University School Of Engineering[1], RPS-Applied Science Associates, South Kingston RI[2], Brandon_Mayer@brown.edu, BMcKenna@asascience.com, KKnee@asascience.com

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

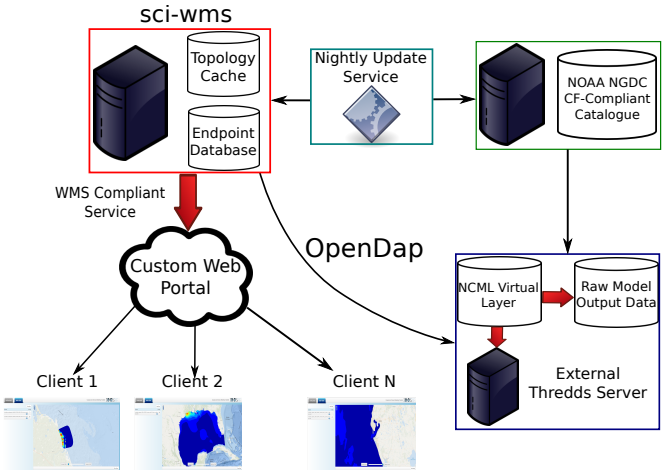

Fig. 1. COMT-SURA deployment of sci-wms for oceanagraphic modeling visualization.

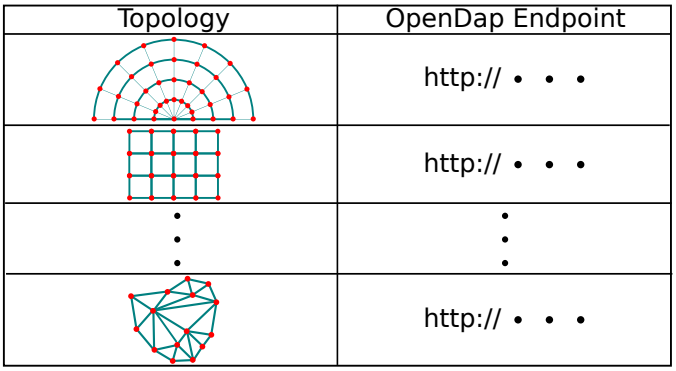

Fig. 2. sci-wms Topology and Endpoint Datastore.

REFERENCES

[1] R. A. Luettich, L. D. Wright, R. Signell, C. Friedrichs, M. Friedrichs, J. Harding, K. Fennel, E. Howlett, S. Graves, E. Smith, G. Crane, and R. Baltes, "Introduction to special section on the U.S. IOOS Coastal and Ocean Modeling Testbed," *Journal of Geophysical Research: Oceans*, vol. 118, no. 12, pp. 6319–6328, 2013.

[2] R. A. Luettich, L. D. Wright, and S. Elizabeth, "SURA Final Report: A super-regional testbed to improve models of environmental processes on the U.S. atlantic and gulf of mexico coasts," tech. rep., SURA, May 2012.