



Model Data Interoperability for the United States Integrated Ocean Observing System (IOOS)

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Model data interoperability for the United States Integrated Ocean Observing System (IOOS) was initiated with a focused one year project. The problem was that there were many regional and national providers of oceanographic model data; each had unique file conventions, distribution techniques and analysis tools that made it difficult to compare model results and observational data. To solve this problem, a distributed system was built utilizing a customized middleware layer and a common data model. This allowed each model data provider to keep their existing model and data files unchanged, yet deliver model data via web services in a common form. With standards-based applications that used these web services, end users then had a common way to access data from any of the models. These applications included: (1) a 2D mapping and animation using a web browser application, (2) an advanced 3D visualization and animation using a desktop application, and (3) a toolkit for a common scientific analysis environment. Due to the flexibility and low impact of the approach on providers, rapid progress was made. The system was implemented in all eleven US IOOS regions and at the NOAA National Coastal Data Development Center, allowing common delivery of regional and national oceanographic model forecast and archived results that cover all US waters. The system, based heavily on software technology from the NSF-sponsored Unidata Program Center, is applicable to any structured gridded data, not just oceanographic model data. There is a clear pathway to expand the system to include unstructured grid (e.g. triangular grid) data.