



## **Interactive Visualization and Analysis of Geospatial Data Sets - TrikeND-iGlobe**

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The visualization of scientific datasets is becoming an ever-increasing challenge as advances in computing technologies have enabled scientists to build high resolution climate models that have produced petabytes of climate data. To interrogate and analyze these large datasets in real-time is a task that pushes the boundaries of computing hardware and software. But integration of climate datasets with geospatial data requires considerable amount of effort and close familiarity of various data formats and projection systems, which has prevented widespread utilization outside of climate community. TrikeND-iGlobe is a sophisticated software tool that bridges this gap, allows easy integration of climate datasets with geospatial datasets and provides sophisticated visualization and analysis capabilities.

The objective for TrikeND-iGlobe is the continued building of an open source 4D virtual globe application using NASA World Wind technology that integrates analysis of climate model outputs with remote sensing observations as well as demographic and environmental data sets. This will facilitate a better understanding of global and regional phenomenon, and the impact analysis of climate extreme events. The critical aim is real-time interactive interrogation.

At the data centric level the primary aim is to enable the user to interact with the data in real-time for the purpose of analysis – locally or remotely. TrikeND-iGlobe provides the basis for the incorporation of modular tools that provide extended interactions with the data, including sub-setting, aggregation, re-shaping, time series analysis methods and animation to produce publication-quality imagery. TrikeND-iGlobe may be run locally or can be accessed via a web interface supported by high-performance visualization compute nodes placed close to the data. It supports visualizing heterogeneous data formats: traditional geospatial datasets along with scientific data sets with geographic coordinates (NetCDF, HDF, etc.). It also supports multiple data access mechanisms, including HTTP, FTP, WMS, WCS, and Thredds Data Server (for NetCDF data and for scientific data, TrikeND-iGlobe supports various visualization capabilities, including animations, vector field visualization, etc.

TrikeND-iGlobe is a collaborative open-source project, contributors include NASA (ARC-PX), ORNL (Oakridge National Laboratories), Unidata, Kansas University, CSIRO CMAR Australia and Geoscience Australia.