

iGlobe Weather App

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1 Introduction

iGlobe is a unified framework that allows integration of disparate geospatial data sources that include remotely sensed observation data, climate model outputs, population and critical infrastructure data, and provide an interface for both client visual analytics and the sever-side data mining capabilities. We see several benefits of such unified framework for both scientists and policy makers. First, it hides complex transformations that are required to overlay climate variables on geospatial data layers like land use and land cover. Second, it allows visual analytics capabilities where users can directly observe and correlate disparate events, for example, proximity of temperature extremes to the population and precipitation extremes over croplands. Thus the tool is invaluable to scientists, policy makers and general public alike.

1.1 Worldwind and NetCDF

The biggest advancement that iGlobe brings to NASA Worldwind is the *support for NetCDF*. NetCDF or *Network Common Data Format* is a ubiquitous data format used to store scientific data. This includes data generated by climate models, weather forecast models, and even observation data such as radar, satellite imagery, etc. iGlobe allows access to NetCDF data through various access mechanisms and then visualization and analysis of such data. Forecast data is available every 6 hours for next 180 hours. The application chooses the most recent data and allows users to select the appropriate weather variable(s), spatial regions and the forecast time horizon.

The key reason for working with the raw NetCDF data within the app, instead of accessing data as images, is to allow analysis of this data within the application itself.

2 iGlobe Weather App

Using the NetCDF capabilities of iGlobe, we have created a weather application which allows integration of weather forecast data into NASA worldwind. The application is

developed in a manner such that it can be easily integrated into any other application that is based on NASA WorldWind.

2.1 Source of Data

The weather app uses data from NOAA's National Climatic Data Center (NCDC). The data is hosted at NOAA and catalogued using a *Thredds Data Server* which is a standard mechanism to serve NetCDF data.

3 Online Demonstration Guide

The demonstration video is available at <http://youtu.be/Gfi0HCcSnXE>. The features demonstrated in the video are as follows:

- 00:12 - 00:29 Accessing NetCDF data available locally.
- 00:30 - 00:35 Visualizing the time varying data as an animation.
- 00:36 - 00:47 Visualizing time varying data as a time series plot. Also demonstrates time series analysis capabilities built into the time series plot interface.
- 00:48 - 01:17 Accessing NetCDF data available as a THREDDS Data Server (TDS).
- 01:18 - 01:46 iGlobe Weather App allowing access to weather forecast data available from NOAA NCDC.
- 01:47 - 02:12 Visualizing forecast data (upto 180 hours of forecast data is available) as an animation.
- 02:13 - 02:38 Visualizing and analyzing weather forecast data through the timeseries interface.
- 02:38 - 03:05 Accessing weather forecast data for a specific region.