Using Data Visualization Software to Aid in the Analysis of Geographical Data
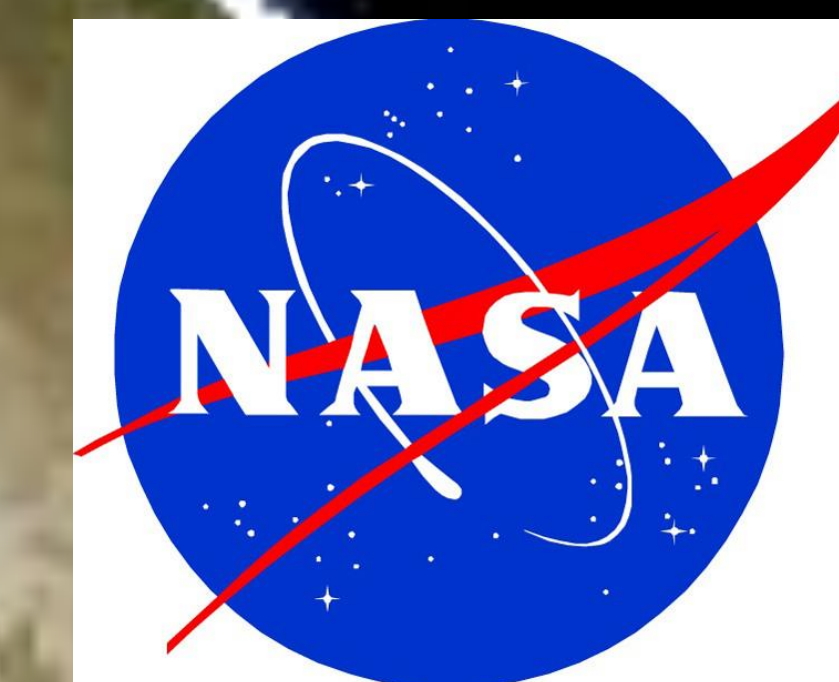
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STAR

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Abstract

NASA Web World Wind (Web WW) is designed to visualize and manage geographical data. As a first implementation of visualization and analysis, we designed an application to map earthquake data onto the globe. Portions of this code were merged with application monitoring magnetic field anomalies possibly associated with earthquake precursor activity. Web WW enabled the visualization of the directional vectors from this data to point to the source location of the earthquake. We also developed a prototype urban management application which utilizes OpenStreetMaps to provide simple features such as route navigation, geographical and services information in an area of interest. This application also enables a graphical method for handling other data pertaining to the area. Finally, Light Detection And Ranging (LiDAR) data was mapped onto the globe using Web WW. The data was then used to model the progression of flood water in an area. The method developed to map the LiDAR data onto the globe also enabled handling of massive data sets. This includes data sets which contain hundreds of thousands of points, each with multiple values associated with it.
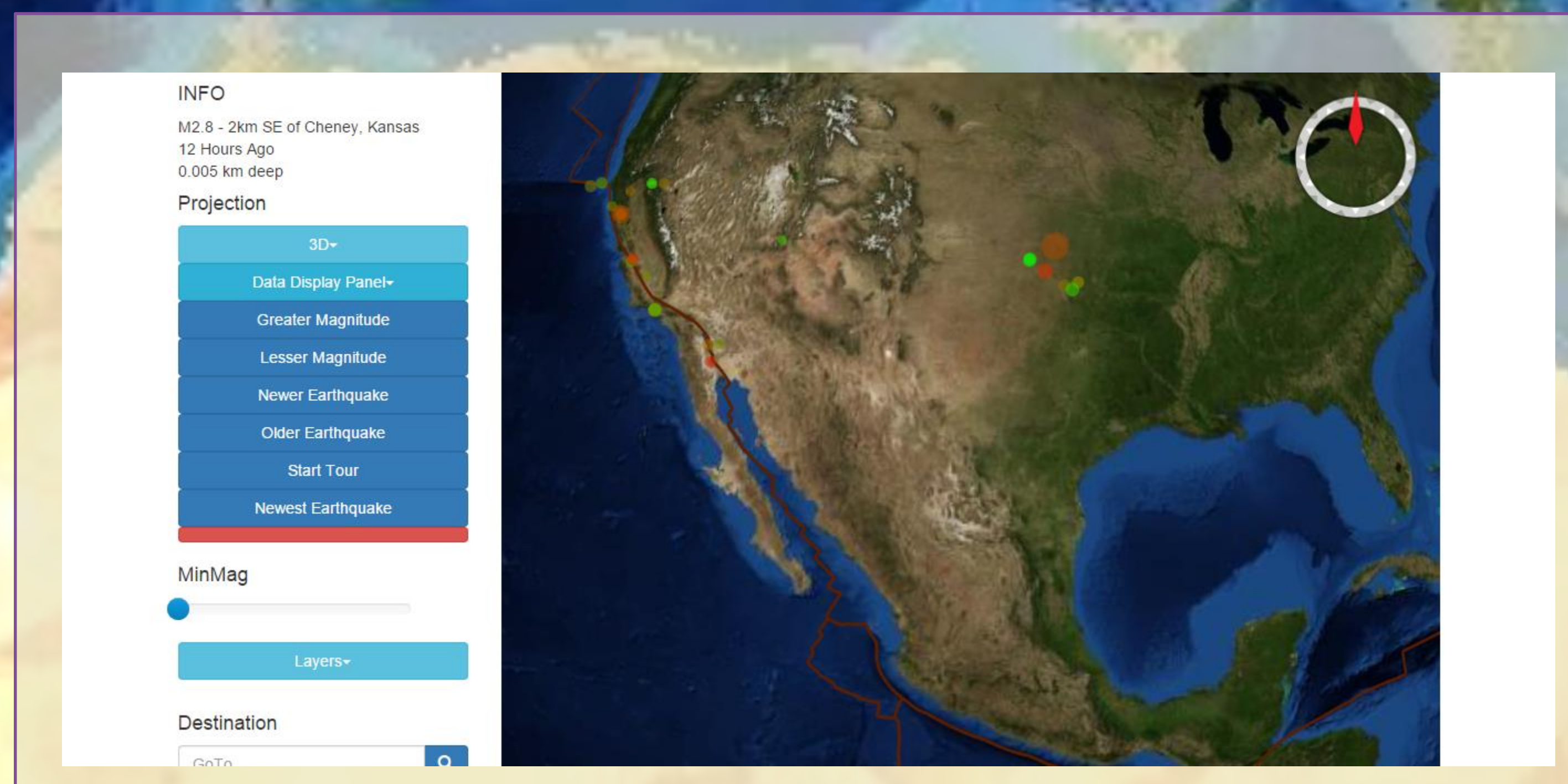
Above is a picture of a very basic application of world wind. This is simply an application that plots all the earthquakes from the US Geological Survey RSS feed onto the globe.

What is NASA World Wind

Web World Wind is a NASA open source project for visualizing and managing geographical data. World Wind provides the platform for any desired functionality serving spatial and information management needs. World Wind is different from a 3D globe like Google Earth because it is not a completed application targeted at end users. Instead, it is a software development kit that software engineers can use to build their own applications. World Wind provides a geographic rendering engine for powering a wide range of projects, from satellite tracking systems to flight simulators. With World Wind taking care of the hard work of visualizing geographic data, software engineers are free to focus on the solving the problems specific to their own domains and quickly building whatever geospatial applications they choose. (http://goworldwind.org/about/)

Development of Web World Wind

Web World Wind is the port of Java World Wind to the Web Browsers. Web World Wind enables developers to build applications with the accessibility of the web browser. Web World Wind is relatively new so efforts have been made to call developers to the platform. With our work on LiDAR integration and OpenStreetMaps integration, we are showcasing the utility of We Web Wind. Additionally, the World Wind Europa Challenge calls developers to create solutions with World Wind for 'European and greater world community.' With the addition of Web World Wind to the World Wind kits, many Web World Wind applications have been submitted to the 2015 Europa Challenge.

Acknowledgements

Patrick Hogan, Mentor and World Wind Project Manager

References

Web World Wind Web Page
(http://webworldwind.org/about/)
World Wind Web Page
(http://goworldwind.org/about/)
NASA World Wind Europa Challenge
(http://eurochallenge.como.polimi.it/)

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