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A GIS Enabled Data Library

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GIS has become an integral part of the multi-terabyte IRI Data Library of climatological datasets. We bring together geoscience datasets geo-located by latitude and longitude, social science datasets geo-located by geographic feature, and GIS vector representations of features. The Data Library becomes a framework for the integration of climate data and model results with geo- and social science information.

Open Geospatial Consortium (OGC) standards are used to store GIS data in an open-source PostGIS (GIS under PostGres) database. The Data Library makes queries and reads from this database. We can overlay the GIS layers on our datasets, and/or derive spatial averages of the data based on the polygons described in the GIS layers. OpenGL and postscript functions are used to view the GIS overlays and to make the spatial averages. We can do projection transformations on our GIS layers with the open-source Proj4 transformation library.

We have developed GIS functions and tools to help us analyze datasets from the perspective of geo-located political, hydrological, agricultural, and epidemiological boundary areas. This capability provides a powerful method of correlating geoscience data with social science data and data from other disciplines.

For example, gridded rainfall and temperature from models, and remotely sensed Normalized Difference Vegetation Index (NDVI) data have been successfully averaged over administrative boundaries in Africa, South America, and Asia. We generate time series of climatological data and model results that can be directly compared with agricultural and epidemiological data based on administrative boundaries. We also calculate time series of data over river basin areas, and climate zones. We provide

valuable information for epidemiologists, agronomists, water managers and disaster relief agencies.

A browser-based web interface is used to view, analyze, and extract data from the Data Library. We create topic focused GIS web tools for researchers from various disciplines.

Our Web Mapping Service (WMS) makes our GIS layers and data layers available to web-based clients, including NASA's SERVIR World Wind viewer. We are currently preparing to serve our GIS and data layers in Keyhole Markup Language (KML), so that other web-based clients like Google Earth can display them as well.