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MyGeoHub : A Collaborative Geospatial Research and Education Platform

<https://mygeohub.org>

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shared
Research
Project
Hosting

GLASS
Global to local analysis of systems sustainability to meet the Sustainability Development Goals on a changing planet with limited land and water resources.

Global Food Security

Water hub

Water HUB is an open platform for connecting hydrologists through sharing of hydrologic information, data, models and simulation tools, connecting researchers and students to high-performance computation and data resources, and connecting science and people through shared knowledge and decision making tools and information.

Hydrology

Useful to Usable (U2U)
Transforming Climate Variability and Change Information for Cereal Crop Producers, is an integrated research and extension project working to improve farm resilience and profitability in the North Central Region by transforming existing climate information into usable knowledge for the agricultural community.

Crop, Climate Research

drINET
drINET is a research environment for collecting and disseminating local to regional scale drought information from several sources including the drought monitor, precipitation, soil moisture and more. The site also provides access to models such as the HMM (probabilistic method) Analysis tool and the Drought Impact Viewer.

Drought Research

Geospatial Research Data Management

Crop Yield Modeling Project

- ❖ Web manage, share geospatial data
- ❖ Annotate, extend automatically extracted metadata
- ❖ Keyword + geospatial bounds search

Web preview of spreadsheet, geospatial (raster, vector) data

- ❖ Support for point data exploration, multiple base maps
- ❖ Files processed on-demand

Crop Yield Modeling Project

- ❖ Publish any set of files; metadata automatically bundled as RDF document
- ❖ DOI generated automatically

Geospatial Research Data Management

User, community management

Instruction, resource publication

Collaborative research, web applications, tools

Content Management System

Tool Containers

Execution Hosts

Middleware

MyGeoHub

hubzero

Cyberinfrastructure Framework

External Resources

Outreach

❖ MultiSpec tool used in Purdue's TOTAL (Turned Onto Technology and Leadership) Camp for middle school students in 2016, 2017

❖ Students performed flood extent classification task on Landsat 5 data

- ❖ MultiSpec used in outreach efforts by the GLOBE program and USGS
- ❖ MultiSpec used in AmericaView states for laboratory exercises on remote sensing applications

- ❖ TOTAL camp students used GeoBuilder to visualize City of Chicago service request public data repository
- ❖ GeoBuilder used to visualize water quality testing locations, associated time series precipitation data

Geospatial Processing & Visualization Tools

- ❖ Launch tools from data management interface
- ❖ Uniformly accessible data storage
- ❖ **MultiSpec**: Visualize, process multi, hyperspectral geospatial data
- ❖ **GeoBuilder**: Explore, visualize, filter geo-located spreadsheet data
- ❖ Source agnostic metadata processing

Interoperability

- ❖ Data service API for interoperability
- ❖ iOS, Android mobile app software for field devices
- ❖ OAuth authentication, resource authorization

Education

❖ Self-paced courses using MyGeoHub tools and applications

❖ Jupyter, RStudio ideal for follow-along courses, tutorials

❖ Rapid tool development using MyGeoHub geospatial toolkits

❖ Inline visualization provides instant feedback

Carol X. Song, Larry Biehl, Venkatesh Merwade, Nelson Villoria, Adnan Rajib, Betsy Hillery, Carolyn Ellis, Derrick Kearney, Erich Heubner, Hou-Jen Ko, I Luk Kim, Jaewoo Shin, Kevin Wojkovich, Lan Zhao, Leif Delgass, Rajesh Kalyanam, Rob Campbell

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