

2016 PROJECT OVERVIEW

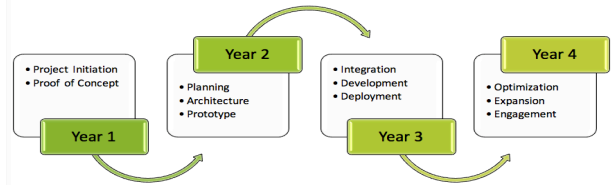
This DIBBs implementation project develops geospatial data analysis building blocks (**GABBS**) in the HUBzero Scientific Collaboration Platform to enable researchers and educators to create and share geospatial data sets and computational tools. The project builds upon open source geospatial capabilities that have been developed by IT experts and validated by the science community and brings such capabilities to the masses so that non-GIS specialists can create and deploy online, interactive geospatial tools with open source software.

The project's guiding principles are:

- Self service
- Support end-to-end data-driven work flow
- Produce tools that domain scientists and high school students could use
- Support "live" data presentation (interactive, visual)
- Accessible and available
- Science driven, co-development

GABBS focus areas:

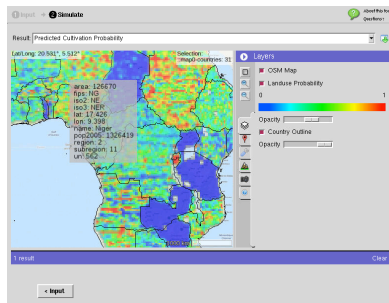
- Easy to use tools and web services for users to self-manage, annotate, share, visualize and publish geospatial data
- Extended Rapture Toolkit and map library Application Program Interfaces (APIs) to support rapid creation of GIS-enabled, interactive online tools
- Applications from scientific use cases of modeling, data analysis and visualization to demonstrate the general applicability of the GABBS software



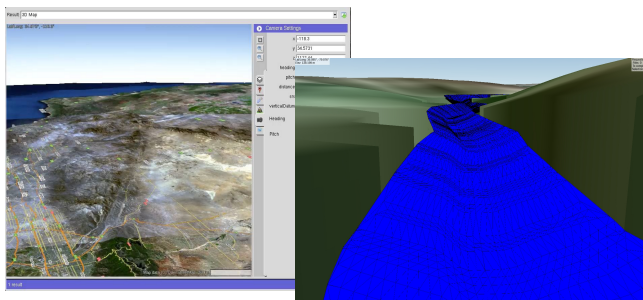
MAPPING & VISUALIZATION TOOLKIT

Our mapping capabilities are being integrated into HUBzero's **Rapture** toolkit. Rapture provides different types of input and output controls that researchers can use to build their own applications without having to know how to build graphical user interfaces.

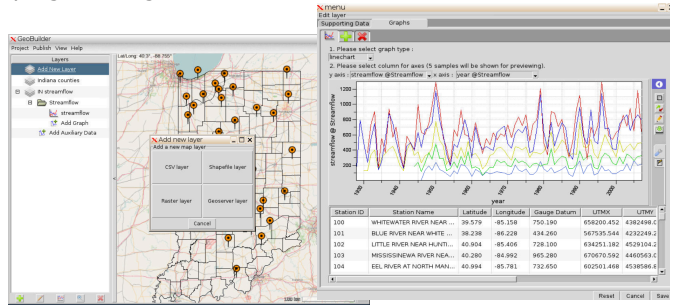
Here is an output panel with a map. The map shows three different datasets computed from a crop simulation model.



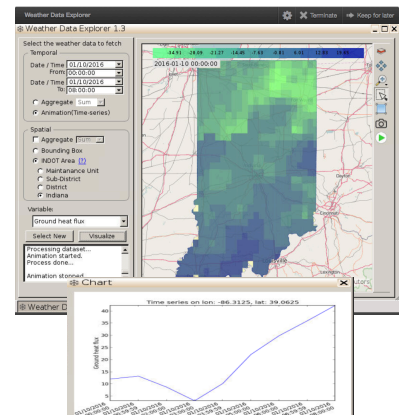
GABBS uses OSG Earth as a **rendering engine** for the more demanding mapping operations such as 3D data visualization. OSG Earth creates projected (flat) maps, as well as geocentric maps as you would see in Google Earth.



A scientist can use the **GeoBuilder** to assemble a map of multiple layers including geo-referenced CSV files and geospatial vector and raster data sets, and share this "data explorer" viewer with collaborators without any programming.

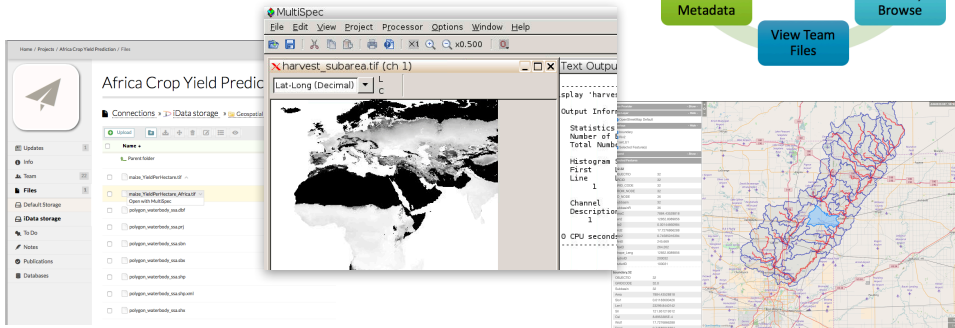
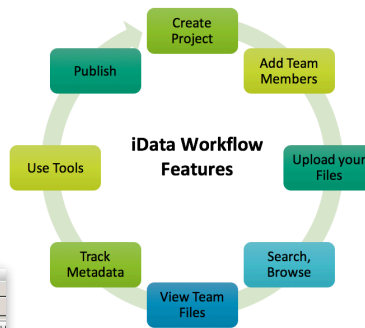


PyMapLib is a Python mapping library for geospatial data visualization. Built on open source software such as QGIS, PyQT, GDAL, pyMapLib has been used to GIS-enabled scientific applications based on meteorological data, agricultural and economic spatial data and models in HUBzero.



DATA MANAGEMENT

iData components are now integrated with HUBzero Project. Users can upload, manage and share their geospatial data sets in their projects. Metadata is extracted automatically upon load, and geospatial data preview, search, and publication are supported as well. Data sets can be "opened with" appropriate tools directly.



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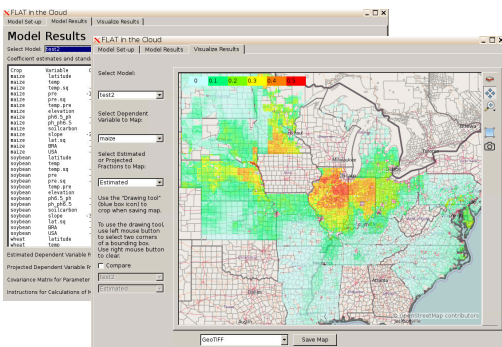
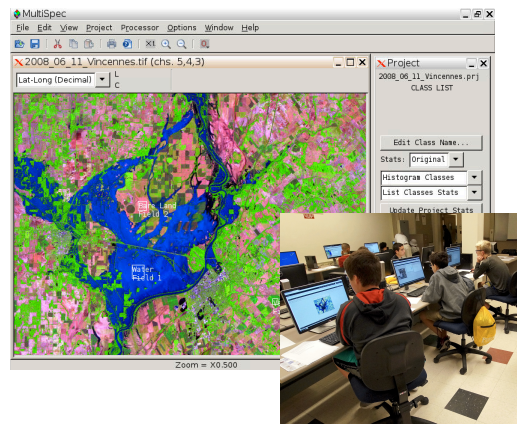
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For more information, visit:
mygeohub.org/groups/gabbs

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free at: mygeohub.org,
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to download the VM.

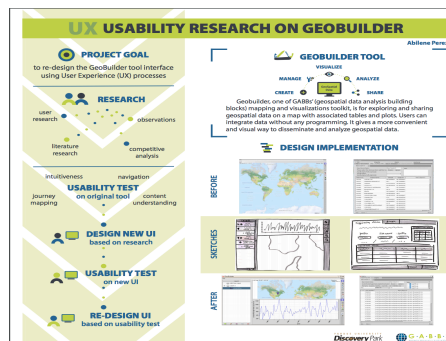
Engaging Science and Education Communities

MultiSpec is a processing system for interactively analyzing geospatial images data such as those collected by satellite and aircraft sensors, biomedical images, etc. The intent is to allow MultiSpec to be used in workflows for image preview and verification, creating pictures which can be displayed in the geoviewers being developed by GABBS from integer and real data types of 8 to 64-bit data values. MultiSpec has been used by researchers, classes, and middle-high school students in a summer camp.



The **Fine-scale Land Allocation Tool (FLAT)** created by Agricultural Economists encapsulates the idea of a user-driven land allocation process in an interactive tool able to handle spatial data coming in different formats and spatial resolutions. FLAT uses the pyMapLib library.

Graduate and undergraduate students are part of the GABBS science and software teams throughout the project. Three undergraduate students participated the 2016 summer **Undergraduate Research Internship Program** and made valuable contribution to improve usability, enhance functionality and explore interoperability.



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