

**NSDI Cooperative Agreements Program
Clearinghouse Integration with Web Mapping Services
Final Project Summary**

Agreement Number: 03HQAG0145

Final Report

Organization:

Indiana Geological Survey
Indiana University
611 North Walnut Grove
Bloomington, Indiana 47405
Phone: 812 855-7636
Web: <http://igs.indiana.edu>

Collaborating Organizations and Contacts:

Richard Hill, Indiana Geological Survey, 812 855-9583, Project Leader
Larry Stout, Hamilton County, Indiana, 317 776-8254
Phil Worrall, Innovative Mapping, LLC, 317 377-7119

Project Description

The Indiana Geological Survey, as an institute of Indiana University, views accessibility to digital data of the state of Indiana to be an important service that we can provide to the citizens of the state. We primarily serve data layers related to resources of the state, as it relates to geology, natural resources, industrial minerals, environmental concerns, and natural hazards, among others. To support these themes, we also serve framework data layers such as the public land survey system (PLSS), digital raster graphs (DRGs), and digital orthophoto quarter quadrangles (DOQQs). The software that used to create and serve these layers is from Environmental Systems Research Institute (ESRI).

As part of this project, IGS will work with Hamilton County, Indiana officials to facilitate their hosting of OGC-compliant Web services. Hamilton County already has an Autodesk-based Web map service on their internet site. They serve data layers such as parcels, elevation contour layers, orthophotography, and a very detailed planimetric base map. The Hamilton County GIS Web service was designed and funded by the Hamilton County Council and is overseen by Larry Stout, Hamilton County GIS Manager. The county is sharing data with other cities and towns at no cost. Data updates are scheduled every six months.

Metadata from the IGS and Hamilton County interoperable Web map services will be posted to the IndianaMap Data Clearinghouse, the NSDI metadata clearinghouse node running on ESRI Metadata Explorer. The IndianaMap Data Clearinghouse is hosted at the Indiana University Purdue-University at Indianapolis (IUPUI) University Library for the Indiana Geographic Information Council. Plans are also in place with IGIC, ESRI, and Geospatial One-Stop (GOS) to integrate the node with the GOS interface.

Final Report

Part 1: Richard Hill, Indiana Geological Survey:

The Indiana Geological Survey hosts a Web site (<http://igs.indiana.edu>) that includes several Internet mapping services (<http://igs.indiana.edu/arcims/index.cfm>). The “IndianaMap Spatial Data Framework” site was created and installed on our production Web site. We also installed and configured the Open GIS Consortium –World Mapping Services (OGC-WMS) connector on our production Web server for the “IndianaMap Spatial Data Framework” and “A GIS Atlas for Indiana” Internet mapping services, as outlined in our project proposal. Additionally, we have added more than 200 metadata records to the IndianaMap Data Library (<http://www.state.in.us/ingisi/>).

These new spatial data sets, which total more than 200 separate data files and exceed 1 terabyte of disk storage, are being stored and managed in an ESRI ArcSDE database. These data are accessed through our Web server using ESRI ArcIMS, from a custom Web application. Owing to the popularity of our Internet mapping services Web site, it was necessary to add a second spatial server to process the many ArcIMS spatial data requests. We also configured the OGC-WMS connector in ESRI ArcIMS for these map services. Each of these data sets includes fully compliant Federal Geographic Data Committee (FGDC) metadata, which we registered and copied to the IndianaMap Data Library Metadata service for public access. In addition, all the data sets and metadata from these mapping services are available for free download from the IGS Web site.

As a result of the funding provided by the NSDI Cooperative Agreements Program, we were able to complete this project. Our Internet mapping services Web activity has increased by more than 200 percent from the start of this project in 2003, owing in part, we believe, to this project. In the future, we will continue to add additional data sets, as they become available, to both the “IndianaMap Spatial Data Framework” and “A GIS Atlas for Indiana” Web sites. We also will continue to register metadata with the IndianaMap Data Library for public access.

Web Activity:

Indiana Geological Survey’s total Web activity for calendar year 2005 (approximately 75 percent of total Web activities are requests for Internet mapping services):

Visits	757,536
Page Views	10,333,243
Hits	30,351,489

Part 2: Larry Stout, Hamilton County, Indiana, Phil Worrall, Innovative Mapping

In Hamilton County, we use Autodesk MapGuide as our Web mapping software. MapGuide requires a plug-in for Netscape or FireFox browsers or an ActiveX control for Internet Explorer. A companion product, Autodesk MapGuide Liteview is a server-side technology (Java servlet) that delivers raster-based maps to end users. This lightweight application eliminates the need to download and install a viewer and also supports OGC-WMS 1.1.1. Prior to the NSDI Cooperative Agreements Program grant project, Hamilton County was not using MapGuide LiteView, so for this project, Innovative Mapping Solutions configured and installed a new server running MapGuide LiteView and the WMS 1.1.1 extension.

As a result of this implementation, the Upper White River Watershed Alliance has been able to establish a regional GIS Web site (<http://www.whiteriveralliance.org/>) that streams in WMS data from Hamilton, Madison, and Marion Counties. Very little GIS data is actually present on the server that hosts this Web site, eliminating data transfer, data conversion, data updates, and a lot of time and effort by all three counties.

The implementation of WMS on our MapGuide platform was not elegant. It required two servers (one for MapGuide and one for MapGuide Liteview) running two different application server packages (Microsoft IIS and Apache Tomcat). Serving WMS data was obviously an afterthought for the MapGuide product first developed in the 1990s, before the WMS specification was developed.

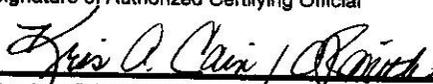
Autodesk has recently announced the successor to Autodesk MapGuide, Autodesk MapGuide Enterprise 2007 (MapGuide Open Source in the open source incarnation). This new product does not require a plug-in nor ActiveX control for viewing from a browser, partly in response to an increasing demand for compliance with OGC standards such as WMS, which it supports natively.

In summary, as a result of the NSDI Cooperative Agreements Program Grant, Hamilton County is able to serve GIS data in OGC-WMS format which supports at least one mission critical application: serving our data to the Upper White River Watershed Alliance Web site. We are now committed to serving OGC-WMS data for the foreseeable future.

FINANCIAL STATUS REPORT

(Short Form)

(Follow instructions on the back)

1. Federal Agency and Organizational Element to Which Report is Submitted DOI-USGS		2. Federal Grant or Other Identifying Number Assigned By Federal Agency 03HQAG0145		OMB Approval No. 0348-0039	Page 1	of 1	Pages
3. Recipient Organization (Name and complete address, including ZIP code) INDIANA UNIVERSITY P.O. BOX 1847 BLOOMINGTON, IN 47402							
Employer Identification Number 35-6001673		5. Recipient Account Number or Identifying Number 43-428-40 - R.Hill			6. Final Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	7. Basis <input checked="" type="checkbox"/> CASH <input type="checkbox"/> ACCRUAL	
8. Funding/Grant Period (See instructions) From: (Month, Day, Year) 09/22/03			To: (Month, Day, Year) 09/30/04		9. Period Covered by this Report From: (Month, Day, Year) 09/22/03		To: (Month, Day, Year) 09/30/04
10. Transactions:				I Previously Reported	II This Period	III Cumulative	
a. Total Outlays				\$0.00	\$40,233.91	\$40,233.91	
b. Recipient share of outlays				\$0.00	\$15,233.91	\$15,233.91	
c. Federal share of outlays				\$0.00	\$25,000.00	\$25,000.00	
d. Total unliquidated obligations						\$0.00	
e. Recipient share of unliquidated obligations						\$0.00	
f. Federal share of unliquidated obligations						\$0.00	
g. Total Federal share (Sum of lines c and f)						\$25,000.00	
h. Total Federal funds authorized for this funding period						\$25,000.00	
i. Unobligated balance of Federal funds (line h minus line g)						\$0.00	
11. Indirect Expense							
a. Type of Rate (Place 'X' in appropriate box)							
<input type="checkbox"/> Provisional <input checked="" type="checkbox"/> Predetermined <input type="checkbox"/> Final <input type="checkbox"/> Fixed							
b. Rate 32%		c. Base \$25,981.47		d. Total Amount \$8,313.80		e. Federal Share \$4,620.73	
12. Remarks: Attach any explanations deemed necessary or information required by Federal sponsoring agency in compliance with governing legislation.							
	<u>Base</u>	<u>Rate</u>	<u>IC</u>				
USGS	14,440.63	32%	4,620.73				
Match	11,540.84	32%	3,693.07				
	<u>25,981.47</u>		<u>8,313.80</u>				
13. Certification: I certify to the best of my knowledge and belief that this report is correct and complete and that all outlays and unliquidated obligations are for the purposes set forth in the award documents.							
Typed or Printed Name and Title Kris A. Cain Financial Administrator kacain@indiana.edu				Telephone (Area code, number and extension) 812/856-3028			
Signature of Authorized Certifying Official 				Date Report Submitted January 20, 2005			

Previous Editions not Usable