

2008 Annual Status Report

Mississippi Coordinating Council for Remote Sensing and Geographic Information Systems



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Council Members

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Executive Director, Mississippi Department of Environmental Quality

David Litchliter, Vice-Chairman

Executive Director, Mississippi Department of Information Technology Services

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Executive Director, Mississippi Department of Information Technology Services

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Chuck Carr

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Mississippi State Senate

Representative Dannie Reed, Ed.D. (Non-voting member)

*Mississippi State House of
Representatives*

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Chairman, Mississippi State Tax Commission

Stephen B. Simpson (non-voting member)

Commissioner, Mississippi Department of Public Safety

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Director, GeoResources Institute, Mississippi State University

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Introduction

The Mississippi Coordinating Council for Remote Sensing and Geographic Information Systems (MCCRSGIS) was established by the 2003 Legislature to ensure coordination of the development, purchase, storing, and sharing of remote sensing and geographical information system data by state and local governmental entities. House Bill 861 established a clear purpose for the Council, as well as a specific list of responsibilities. The Council is directed to set and assure enforcement of policies and standards to make it easier for remote sensing and geographic information system users around the state to share information and to facilitate cost-sharing arrangements to reduce the costs of acquiring remote sensing and geographic information system data. The council's responsibilities include, but are not limited to:

- (a) Coordination of remote sensing and geographic information system activities within Mississippi;
- (b) Establishing policies and standards to guide Mississippi Department of Information Technology Services (MDITS) in the review and approval of state and local government procurement of both hardware and software development related to remote sensing and geographic information system;
- (c) Oversight of MDITS' implementation of these responsibilities;
- (d) Preparing a plan, with proposed state funding priorities, for Mississippi's remote sensing and geographic information system activities, including development, operation and maintenance of the Mississippi Digital Earth Model;
- (e) Oversight of the Mississippi Department of Environmental Quality's development and maintenance of the Mississippi Digital Earth Model, including establishing policies and standards for the procurement of remote sensing and geographic information system data by state and local governmental entities and establishing the order in which the seven (7) core data layers shall be developed;
- (f) Designating Mississippi's official representative to the National States Geographic Information Council and to any other national or regional remote sensing or geographical information system organizations on which Mississippi has an official seat;
- (g) Establishing and designating the members of an advisory committee made up of policy level officials from major state, local, regional and federal agencies, as well as members of the private sector;
- (h) Creating a staff level technical users committee
- (i) Coordinating with the State Tax Commission to assure that state and local governmental entities do not have to comply with two (2) sets of requirements imposed by different organizations.

The law also directed the Mississippi Department of Information Technology Services to work closely with the council to bring about effective coordination of policies, standards and procedures relating to procurement of remote sensing and geographic information systems (GIS) resources. In addition, MDITS is responsible for development, operation and maintenance of a delivery system infrastructure for geographic information systems data and is charged with providing a warehouse for Mississippi's geographic information systems data.

Additionally, the Mississippi Department of Environmental Quality (MDEQ), Office of Geology and Energy Resources, is given the responsibility for program management, procurement, development and maintenance of the Mississippi Digital Earth Model, which includes the following seven (7) core data layers of a digital land base computer model of the State of Mississippi:

- (a) Geodetic control;
- (b) Elevation and bathymetry;
- (c) Orthoimagery;
- (d) Hydrography;
- (e) Transportation;
- (f) Government boundaries; and
- (g) Cadastral

For all seven (7) framework layers, the Mississippi Department of Environmental Quality, Office of Geology and Energy Resources, is designated as the integrator of data from all sources and the guarantor of data completeness and consistency and shall administer the council's policies and standards for the procurement of remote sensing and geographic information system data by state and local governmental entities. Additionally, the Council will establish metadata standards that will apply to the seven framework layers.

Activities to Date

With collaboration and cooperation firmly set as its number one priority, the Coordinating Council has established seven key elements necessary to achieve this goal:

1. The Council developed and adopted a set of standards for the Mississippi Digital Earth Model (MDEM) that allows easy transfer of digital map information between state agencies, local government, and the private sector. MDEM is a three-dimensional representation of natural and man-made features in Mississippi comprised of these layers: geodetic control, digital orthoimagery, digital elevation model and contours, property ownership, hydrography, transportation, and governmental boundaries. The Council continues to monitor federal data standards and update state standards as necessary.
2. The Council developed express products list that will allow state agencies and local governments to easily obtain geographic information systems (GIS) hardware and software at the best prices. That dynamic list continues to be expanded and updated.

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3. The Council has led an effort to coordinate of data acquisition, a key element in achieving cost savings through economy of scale. Collaboration by state agencies, local government, and even federal agencies has produced better and cheaper products for everyone to utilize.
 4. The Council has developed of a warehouse/clearinghouse for GIS data.
 5. Despite the lack of direct state funding, development of the seven layers of MDEM continues through the cooperative efforts of state, local, and federal governmental entities. Council members and staff continue to pursue new and creative funding sources to allow for continued MDEM development.
 6. The Council continues development of a business model for funding and maintenance of the data development and delivery system.
 7. Education and outreach is a critical part of the overall plan for the Coordinating Council. The educational component serves to train, through formal and continuing education, the current and next generation of GIS professionals, as well as educating the various stakeholder groups on the value and power of GIS. Outreach utilizes the network of knowledgeable and experienced professionals. A coordinated outreach effort also leverages the Council's authority and effectiveness.

The Mississippi Coordinating Council for Remote Sensing and Geographic Information Systems will move forward with its strategic plan to accomplish these goals of collaboration and cooperation during the coming year.

Mississippi Geospatial Clearinghouse

The Mississippi Geospatial Clearinghouse (MGC) was placed in production in September, 2007 and serves as the state's premier portal for the Geographic Information System (GIS) community to search, discover, share and use a comprehensive warehouse of Mississippi's geospatial resources. Moreover, the MGC is the primary location for the Mississippi Digital Earth Model (MDEM). The seven framework layers comprising MDEM are the standard components of digital maps used by GIS communities throughout the world.

The goal of the MGC is to make the application of spatial information technologies within the state of Mississippi more efficient by eliminating the duplication of spatial data production and distribution through cooperation, standardization, communication and coordination.

State agencies, county government, city government and the public can download data that has been stored in the MGC. This data provides the foundation for applications to be developed using GIS technology to meet business needs of the governmental agencies and/or public interest.

MGC STATUS:

- ❖ Clearinghouse functionality (www.gis.ms.gov):
 - "One-Click" to content channels,
 - Contextual help and quick start tutorials,

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- Home page contains a comprehensive site description including search capabilities,
 - Three major functions (Map viewer, Advanced Search and Download) have been implemented,
 - Users have the ability to create an account for personalization. Also, users can be assigned to a group role for metadata publishing, channel stewardship, providing access to data and the ability to access secure data.
 - Site is accessible to the public through the Internet
- ❖ ITS is currently in the process of upgrading the ESRI software to version 9.3. As of November, 2008, the test and development environments have moved to 9.3. The production environment upgrade has discovered an issue with the Spatial Direct Downloading software. ITS is working with Spatial Direct and ESRI to resolve the issue.
- ❖ ITS has gathered statistics on the use of the MGC from 3/12/2008 to 10/2/2008 using Web Traffic Analyzer:
- Total number of visitors recorded: 129,430
 - Average daily hits to MGC: 25,094
 - Total number of MGC registered users: 849
 - Total number of published metadata records: 297
 - Total number of internet map services: 24
 - Total number of personalized saved maps: 528
 - Total number of unassisted data requests: 3,993
 - Most popular data: State wide 2-foot imagery
 - Estimated total of all data transferred: Over 36 TB
- ❖ Estimated MGC Costs To Date:
- Clearinghouse Development Costs: \$ 954,130
 - Clearinghouse Infrastructure Costs: \$ 767,983
 - Annual Operational Costs: \$ 500,000 - \$ 750,000

Applications

Mississippi Development Authority

The Mississippi Development Authority (MDA) Asset Development/Regional Services Division is in the process of developing a GIS application using the resources of ITS and the MGC. The application is being developed in phases and will display community assets in a geographical format.

Project Status:

- ❖ Phase 1 has been completed. This application consists of a viewer that was developed using ESRI tools at version 9.2 and can be viewed at www.gis.ms.gov/mda.
- ❖ Phase 2 is in the planning stage. The application will be moved to a FLASH viewer, and communities and assets will be continually added.

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- ❖ Phase 2 will identify data that can be served up to the “Mississippi Story” project described in the Mississippi Arts Council section below.

Mississippi Department of Archives and History

The Mississippi Department of Archives and History (MDAH) is in the process of developing a GIS application using the resources of ITS and the MGC. The application will allow the agency to present state historical information and assets in a geographical format. This application will have a secure internal component that will allow the agency to track assets and a public component that will allow the assets to be available to the public via the Internet. There will also be an e-government piece designed into the application that will allow the MDAH to collect fees from researchers.

Project Status:

- ❖ As of November 2008 the project is in the requirement-gathering phase.
- ❖ A scope document with a timeline and pricing will be delivered to MDAH in December 2008.
- ❖ The design phase will identify data that can be served up to the “Mississippi Story” project described in the Mississippi Arts section below.

ITS Telecommunication Division

The Mississippi Department of Information Technology Services (ITS) Division of Telecom Services is in the process of developing a GIS application using the resources of the MGC. The application will allow division management and staff to view the capital complex telecommunications resources in a geographical format.

Project Status:

- ❖ As of November 2008 the requirement-gathering phase of the project has been completed.
- ❖ A Scope document with a timeline and pricing have been delivered to the Director of Telecom Services at ITS.
- ❖ The Telecommunications staff is scheduled to collect geocoded data beginning in December.

Mississippi Arts Council

The Mississippi Arts Council (MAC), in coordination with MDA’s Division of Tourism, is in the process of developing a GIS application using the resources of ITS and the MGC. The vision of “The Mississippi Story” is to bring Mississippi state agencies together to create one geographical view of the resources, cultural assets and events available in the State.

Project Status:

- ❖ The requirement gathering stage is scheduled to begin in December 2008.
- ❖ A scope document with a timeline and pricing will be delivered to the MAC by January 2009.

Project Homeland

The purpose of the Mississippi Pilot project is to provide broader access to static and dynamic geospatial information between federal, state and local agencies by participating in a national homeland security service-oriented architecture that promotes the use of Web services. The Project Homeland Mississippi Pilot goals were defined in the ESRI Design Document as follows:

- ❖ Install state pilot GIS hardware, software and data as necessary at Mississippi Emergency Management Agency (MEMA) offices in Jackson, Mississippi, utilizing the Department of Homeland Security (DHS) Geospatial Data Model.
- ❖ Provide state users (OC, Critical Infrastructure Protection Office, Fusion Center and others) with the ability to view state data and information products via a customized user interface.
- ❖ Provide federal homeland security (HLS) community users with the ability to view/consume state data and information products via a viewer.

The hardware and software for Project Homeland was delivered on July 31, 2008. The following is a list of equipment/software that was delivered to the Fusion Center at no cost to the state of Mississippi:

- ❖ ArcGIS Server 9.2 Enterprise – Four Core Server Solution
- ❖ Failover Server
- ❖ SQL Database Server w/6 TB SATA Disk enclosure
- ❖ 72 inch Rack
- ❖ Additional licenses to ArcWeb Services (ESRI online datasets)

According to the ESRI Design Final document dated January 2008, the total purchase value of these items is \$96,264.

Project Status:

- ❖ The following has been delivered to the State of Mississippi at no cost:
 - Requirements and Design Document
 - Common Operational Picture (COP) Pilot Viewer
 - Training session for the COP viewer held in the Fusion Center at MEMA with attendees from Homeland Security and MEMA.

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- ❖ Due to many changes in GIS technology during the second half of 2008, ITS has agreed to take the project to the next level by delivering the following at no cost to the fusion center:
 - Installation of 9.3 ARC Server
 - An Executive Management Dashboard using FLEX that includes the following:
 - Mississippi Critical Infrastructure
 - Threat Data
 - Ability to enter threats remotely
 - Data feeds (such as weather service)

Express Products List (EPL)

Express Product Lists are multi-vendor awards that meet Mississippi requirements for legal purchases. The use of EPLs is governed under Procurement Instruments as stated in the ITS Procurement Handbook.

The GIS EPL was originally slated to expire September 30, 2008. A decision was made to keep the same vendor pool and extend the current GIS EPL to October 31, 2009. In order to extend the contract, each vendor had to update their product listing. The vendors were given minimum specifications for each of the product lines. The minimum specifications were developed by the EPL Team and approved by the Strategic Services Team.

Each vendor's update was then evaluated by the EPL Team and reviewed by the Strategic Services Team and ITS Management. Once approved by all parties, this new product list was moved to the ITS website.

The major changes this year were the addition of large format scanners and mobile laptop computers capable of performing GIS related tasks.

Mississippi Flood Map Modernization Initiative

The Mississippi Flood Map Modernization Initiative (MFMMI) is a partnership between the State of Mississippi and the Federal Emergency Management Agency which is in the process of modernizing and updating the nation's Flood Insurance Rate Maps used by FEMA to support the National Flood Insurance Program (NFIP). State agencies involved in the program are MEMA which handles the State NFIP and Floodplain Management Program, and MDEQ with its' contractor MGI, LLC which handles the engineering and mapping activities for the program. In August, 2008, FEMA's total funding for flood mapping in MS rose to over \$19,453,000.00 with the addition of FY08 FEMA MAP MOD funding of \$4,528,000.00.

Project Status:

- ❖ As of the end of 2008, eleven of Mississippi's 82 counties will have new countywide effective Digital Flood Insurance Rate Maps (DFIRMs) and 9 other Mississippi counties will have had Preliminary DFIRMs delivered to the local officials for review.
- ❖ During 2008, the pre-scoping and scoping of 41 counties was begun and completed with the final 20 county scoping reports being submitted in November to FEMA Region IV. A

part of the scoping process is the holding of “Countywide Scoping Meeting” with a particular county’s officials and officials from each incorporated town or city in that county. These meeting were usually located at the county courthouse or emergency operations center for the county.

- ❖ By late 2010, all 82 counties will have new countywide Digital Flood Insurance Rate Maps (DFIRMs).

SEE APPENDIX STATUS MAP

Education and Outreach

A coordinated outreach effort leverages the Coordinating Council’s authority and effectiveness. The GeoResources Institute at Mississippi State University has served as the education and outreach mechanism since 2004. They have provided training in geospatial technologies to local governments to improve the efficiency of daily routine tasks, such as tax mapping, as well as helping them prepare to provide services during natural or man-made disasters. By bringing classes, the GeoResources Institute has provided continuing education to the current and next generation of GIS professionals, as well as providing technical support on the local level. The outreaches by this network of knowledgeable and experienced professionals allow various stakeholder groups to see the value and power of GIS.

Project Status:

- ❖ To date, the GeoResources Institute has provided GIS classes to 1,136 students in 58 Mississippi counties under the Coordinating Council’s education and outreach program – an estimated savings to the state of over \$1.2 million.

SEE APPENDIX STATUS MAP

Emergency Preparedness

The Coordinating Council is charged with establishing and designating the members of an advisory committee made up of policy level officials from major state, local, regional and federal agencies, as well as members of the private sector. This Public Advisor Committee (PAC) receives research and development assignments from the Council.

The Council’s response after Hurricane Katrina demonstrated the applicability of geospatial information science and technology in a disaster response setting. Although prior emergencies and disasters in Mississippi utilized “hard copy” maps, this was the first event where GIS technology exhibited its potential for enhanced management technologies. Decision makers used

a standard suite of maps, as well as specific maps developed in response to specific questions. These maps were used in a variety of settings, including field operations, news conferences, and general information dissemination. Maps are mission-critical tools for emergency managers and first responders. The Coordinating Council assigned the PAC the task of preparing a GIS plan for disaster and emergency management in Mississippi.

Project Status:

The PAC has developed a draft plan in cooperation with the Mississippi Emergency Management Agency (MEMA) that addresses the basic mapping and support services for first responders during a disaster event. That plan includes:

- ❖ Specific roles of the GIS support groups:
 - Lead role group to coordinate GIS support for MEMA to provide maps, imagery, and geospatial analysis products for decision makers and emergency responders;
 - Logistics and administration group - tasked with logistics organization, personnel resource scheduling, project scheduling, acquisition of expendable supplies, transportation of support personnel and resources;
 - Data management group – tasked with enhancing existing geographic databases or creating new data sets and disseminating this information to all internal and external entities in a secure and recognizable format;
 - Cartography group – tasked with creating maps in sufficient number, format and size for either hardcopy output or for distribution on the internet;
 - Technical support group – responsible for servicing, support and maintenance of all GIS equipment including printers, generators, GPS units, and communication devices;
 - GPS and field operations group – to provide GIS support for MEMA activities in the field;
 - Special operations group – composed of experts from IHL member institutions and state agencies who have specialized knowledge and skills as they may relate to a specific event.

- ❖ Development of agreements with state agencies and universities that enable rapid deployment of GIS personnel to MEMA headquarters (or other locations as necessary).

- ❖ Develop and maintain a summary document containing all available GIS personnel that aid MEMA planners in the process of event planning for specific incidents (earthquake, flood, hurricane, terrorist act, etc.).

- ❖ Assist MEMA in establishing data requirements including:
 - Sources
 - Accuracy
 - Ownership
 - Process
 - Organization

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- ❖ Development of a standard list of map products that should be developed during the early stages of any event, especially catastrophic events, so that the requests and production of these products can be streamlined and therefore more effective.
 - ❖ Provide basic GIS training in various subjects including emergency management, map reading, national mapping standards, and other topics as needed.

Mississippi Digital Earth Model

The Mississippi Department of Environmental Quality, Office of Geology, is charged under state law to develop seven base layers of geographic information for the state. These seven layers are referred to as the Mississippi Digital Earth Model (MDEM). MDEM is a seamless, statewide, geospatially-referenced information management and mapping system. The seven key component layers include transportation, hydrography (rivers, streams, lakes, and other water bodies), geodetic control, geo-political boundaries, digital orthoimagery, and a three-dimensional topographic model of the ground surface. In the long term, the program will be largely self-sufficient through coordination of state and local government funding by the Mississippi Coordinating Council for Remote Sensing and Geographic Information Systems. In the near term, however, federal grant funding to help transition into an operational implementation of in developing the initial layers based on recently collected high-resolution digital orthoimagery is being used.

Project Status:

- ❖ Dissemination of all of the state-wide, seamless 2-foot pixel orthoimagery collected during the 2005 - 2006 flying season, as well as the 1-foot and 6-inch imagery collected in five Gulf Region counties (Hancock, Harrison, Jackson, Pearl River, and Stone) has been completed, and many counties are using that data as the basis for their new cadastral (tax) maps.
- ❖ One of the most pressing needs as far as MDEM framework data layer development is concerned, is high resolution digital contour maps for the state that are aligned and compatible with the state-wide orthoimagery base layer of MDEM. This project is developing these contours all counties above the coastal counties and outside the Delta region from the 2-foot pixel imagery collected in the 2005-2006 flying season.
- ❖ Through funding provided by the U. S. Department of Housing and Urban Development *Recovery Action Plan*, the remaining work to be accomplished in support of the Gulf Coast Regional Infrastructure Program is the integration of property ownership data within the five Gulf Region counties with previously acquired base mapping data. This work will support implementation of the water and wastewater infrastructure improvements, including developments that will ensue for years to come. The elements of this on-going work includes:
 - Public Land Survey System Improvement – the framework on which property ownership data and jurisdictional boundary data are based. This element will create an integrated, regional PLLS that will support accurate, georeferenced locations of the water and wastewater infrastructure improvements.

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- Parcel Publication – the element that creates the publication standard for parcel data and provides the resulting data sets for the State for distribution through the MS Geospatial Clearinghouse to those end users within the Gulf Region who most need the data
 - Parcel Improvement and Address Plan – resulting in data that will constitute a seamless, regional property ownership data set that can be used by the State in the infrastructure program, by Federal agencies, and by various units of local governments in their continuing recovery efforts
 - Building Footprint and Address Point Collection – complementing the contents of the county parcel record databases.
 - Jurisdictional Boundaries – resulting in a standard, uniform municipal and county boundary for each of the Gulf Regional counties, including the county utility authorities responsible for implementation of the infrastructure program
- ❖ Mississippi has created the necessary infrastructure to coordinate the collection and dissemination of geospatial data at all levels of government in the state. The Coordinating Council has aggressively pursued avenues to create a sustainable method for collection and dissemination of the framework data layers. The infrastructure is in place, demonstrations of the data utility have been given, training has occurred, and the time is right for development of a business plan that will allow the transition from reliance exclusively on federal funding to partnerships with state agencies and local government entities. This specific project will procure development of an initial draft of a business plan based on information collected from other states, combined with an understanding of the unique laws, policies, and agency responsibilities in Mississippi.
- ❖ In addition to continuing the Mississippi educational program being conducted by the Extension Service component of the GeoResources Institute at Mississippi State University, educational directions will be expanded to include relevant national organizations in an effort to expand the applicability of the MDEM program on a more national scale. As a first stage of this effort, the Northern Gulf Institute will partner with the NOAA Coastal Services Center and its Digital Coast program. NGI and CSC will work with the National Association of Counties (NACO), the National States Geographic Information Council (NSGIC), the Association of State Floodplain Managers (ASAFPM), The Nature Conservancy (TNC), and the Coastal States Organization (CSO) to organize and prioritize efforts on coastal digital geographic information. Funds will be provided to these organizations to collect input from their constituencies, meet with NGI and CSC to guide Digital Coast development, and to coordinate efforts to maximize benefits of the resulting efforts.
- ❖ As the additional data sets are developed for the Mississippi Digital Earth Model, the necessity to provide additional computational and data storage equipment becomes a priority. Under state statute, the Mississippi Department of Information Technology Systems is charged with development and maintenance of the MDEM data delivery system. Funding would be supplied to MDITS to expand the currently operational delivery system to provide adequate data storage for the three-dimensional topographic model being developed under this grant.

Office of Geology - Geospatial Resources Division

Flood Map Modernization



