

GIT GOVERNANCE

State Models and Best Practices

Massachusetts

Prepared for
Wisconsin Geographic Information Office
Wisconsin State Cartographer's Office

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The **Wisconsin Geographic Information Office (GIO)** has the responsibility to coordinate Wisconsin's geospatial information activities, to implement standards to facilitate interoperability of information related to homeland security, to make recommendations on awarding grants to fund geospatial data, and to create information sharing agreements with state, local and tribal governments.

The **Wisconsin State Cartographer's Office (SCO)** is a unit within the Department of Geography at the University of Wisconsin-Madison. With an outreach mission, the SCO gathers, maintains and disseminates information about mapping and geo-spatial data in the state.

The **Land Information & Computer Graphics Facility (LICGF)** of the University of Wisconsin-Madison provides research, training, and outreach in the use of land and geographic information systems while focusing on land records modernization, land and natural resource management applications, and the use of information for land-use decision-making.

The **US Geological Survey (USGS)** has realigned its spatial programs into a National Geospatial Program Office (NGPO), bringing The National Map, Geospatial One-Stop, and the Federal Geographic Data Committee into a single program office. With the creation of the NGPO, the essential components of delivering the National Spatial Data Infrastructure (NSDI) and capitalizing on the power of place will be managed as a unified portfolio that benefits the entire geospatial community.

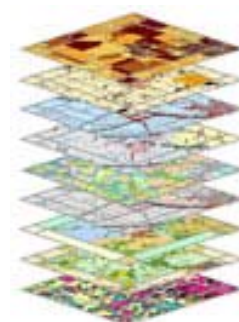
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Massachusetts GIT Governance

GEOSPATIAL COORDINATION STRUCTURES AND PROCEDURES

The Executive Office of Environmental Affairs (EOEA), a cabinet level office responsible for the coordination of four environmental and natural resource departments, identified the need for GIS coordination and development in 1989. After conducting three feasibility studies and developing a strategic plan, EOEA implemented the Massachusetts Geographic Information System (MassGIS) over a five year period.¹ Contemporaneously, the Massachusetts Geographic Information Council, an informal professional association of GIS users, formed to promote GIS data sharing and coordination through the sponsorship of a professional seminar series.

GIS coordination efforts gained legislative support by the late-1990s. In 1998, the Legislature passed the Open Space Bond Bill, which provided \$20 million “[f]or the development and implementation of a shareable and useful Massachusetts GIS and related database and infrastructure development activities.” A year later, the Legislature authorized the creation of the Office of Geographic and Environmental Information within the EOEA (M.G.L. Ch. 21A § 4B). This law extended EOEA’s responsibilities to include statewide GIS coordination.^{2,3} and mandated the formation of “a geographic information advisory committee[,] comprised of representatives from state agencies, regional and local entities, academic institutions, nonprofit

¹ MassGIS Website, What is MassGIS? <http://www.mass.gov/mgis/whatis.htm>, accessed September 1, 2006.

² 1993 NSGIC State Profiles: Massachusetts, p. 75. NSGIC Website: <http://www.nsgic.org>, accessed September 1, 2006.

³ MassGIS Website, Municipal GIS Resources: <http://www.mass.gov/mgis/munigis.htm>, accessed September 1, 2006.

organizations and the private sector[,] which shall provide an annual report for strengthening the geographic information system to the joint committee on natural resources and agriculture and the office [EOEA]" (M.G.L. Ch 21A § 4B(k); see Appendix). Draft language specifically enumerated the composition of the newly created Statewide Geographic Information Advisory Committee and its operational structure, but this language was removed from the final legislation.

Recently, the Statewide Geographic Information Advisory Committee, the main GIS coordination body for the state, renamed itself the Massachusetts Geographic Information Council (MGIC), adopting the earlier user group's name. The user group, on the other hand, now serves as a subcommittee of the Council for the organization of its seminar series. The MGIC meets regularly to advise the Office of Geographic and Environmental Information, commonly known as Mass GIS, on current and proposed initiatives. MassGIS, in turn, provides administrative and technical support for Council activities. MassGIS also provides administrative support to the CommGIS Group, a forum enabling state agency staff to network, share information, coordinate GIS projects, and provide feedback on Mass GIS activities (see Figure 1).

Office of Geographic and Environmental Information

Reporting to the CIO of the Massachusetts Executive Office of Environmental Affairs (EOEA), the Office of Geographic and Environmental Information, also known as MassGIS,⁴ serves as the primary geographic information coordination office for the state. MassGIS "promotes and guides spatial data development, supports GIS users throughout EOEA's departments and offices, coordinates GIS activity with other state and regional agencies, and provides communities with assistance in GIS development."⁵ MassGIS administers a comprehensive, statewide GIS database for environmental planning and management, as well as the award-winning MassGIS Web Mapping Services,⁶ which enables online access to the state's GIS

⁴ MassGIS Website: <http://www.mass.gov/mgis/massgis.htm>, accessed September 1, 2006.

⁵ MassGIS Website, About MassGIS: <http://www.mass.gov/mgis/whatis.htm>, accessed September 1, 2006.

⁶ Jacqz, Christian, 2006. Commonwealth of Massachusetts MassGIS Web Mapping Services (2005 – Enterprise System). In Exemplary Systems in Government, Special Issue Part 2, *URISA Journal*, 18(1):55-61.

database. In addition, MassGIS provides administrative and technical support for the newly renamed Massachusetts Geographic Information Council (MGIC), the state's primary GIS coordinating body, and its outreach and education activities, notably a regular professional seminar series, as well as for the CommGIS Group, a state agency forum.

Section 63 of the FY99 state budget, which was incorporated into Massachusetts General Law Ch. 21A § 4B, established MassGIS and directed it “to collect, consolidate, store and provide geographic and environmental information in order to improve stewardship of natural resources and the environment, [to] promote economic development and [to] guide land-use planning, risk assessment, emergency response and pollution control.” MassGIS's statutorily defined duties specifically include (M.G.L. Ch. 21A § 4B; see Appendix):

- “fostering cooperation among local, state, regional and federal government agencies, academic institutions and the private sector in order to improve the quality, access, cost-effectiveness and utility of geographical and environmental information as a strategic resource for the state;
- coordinating data sharing and executing data sharing agreements among all levels of government and private users;
- identifying, developing, correcting, updating, distributing and assembling geographical and environmental data;
- setting standards for the acquisition and management of geographical and environmental data by any agency, authority or other political subdivisions of the commonwealth;
- providing technical assistance, training and computer hardware, software and programming to municipalities, regional agencies or political subdivisions of the commonwealth;
- archiving and serving as a depository for geographical and environmental information and developing public access to and distribution of such information;
- creating a network of regional service centers, subject to appropriation, to assist commonwealth, its political subdivisions and the public in developing and using GIS technology and data;

- requiring that all GIS data funded through grants in any part by the commonwealth shall conform to standards developed by the office and be made available for distribution;
- creating a category of commonwealth resources of the natural, cultural and historical resources in need of protection;
- establishing a competitive grants program, subject to appropriation, for municipalities and regional agencies;
- setting up a geographic information advisory committee comprised of representatives from state agencies, regional and local entities, academic institutions, nonprofit organizations and the private sector which shall provide an annual report for strengthening the geographic information system to the joint committee on natural resources and agriculture and the office; and,
- coordinating the development and dissemination of scientific and technical expertise to support an interagency, cross-disciplinary approach to natural resource management.”

Of note, this legislation required MassGIS to create “a network of regional service centers...to assist commonwealth, its political subdivisions and the public in developing and using GIS technology and data” as funding permits. The immediate result of this was a round of contracts to the state’s regional planning agencies to support technical assistance to communities. In the following year, the Community Preservation Initiative of EOEA funded the regional planning agencies for GIS data development and build-out analyses to project future growth for each of the state’s 351 cities and towns;⁷ however, funds were to be used specifically for this initiative, and were not provided to meet the general technical assistance and data development needs of municipalities. Regional planning agencies also are supported by local funds for technical assistance and GIS services related to planning, transportation, environmental management and public safety.

To target the specific concerns of municipal governments, MassGIS provides GIS instructional materials and resources on its website, including links to funding sources, to introductory

⁷ 2003 NSGIC State Summaries: Massachusetts, p. 76. NSGIC Website: <http://www.nsgic.org>, accessed September 1, 2006.

materials on GIS, and to guides on project start-up, GIS and assessors, GIS and public records law, and standards.⁸ MassGIS also has an ongoing online survey of municipal GIS data development and activities.

MassGIS has a staff of fifteen (15), including the Director, twelve FTEs and two staff to support interagency service agreements. Two of the twelve FTEs specifically support statewide GIS coordination activities and roughly half of the others support infrastructure and services that are broadly available to other state agencies and to the public.

Massachusetts Geographic Information Council

As noted earlier, Section 63 of the FY99 state budget, which was incorporated into Massachusetts General Law Ch. 21A § 4B, authorized MassGIS to establish “a geographic information advisory committee comprised of representatives from state agencies, regional and local entities, academic institutions, nonprofit organizations and the private sector which shall provide an annual report for strengthening the geographic information system to the joint committee on natural resources and agriculture and the office...” (see Appendix). The Massachusetts Geographic Information Council,⁹ formerly known as the Statewide Geographic Information Advisory Committee, meets every-other-month, except in August, to learn about and to provide feedback on current MassGIS projects. Topics addressed by the Committee include strategic planning, coordination and outreach, standards, data development, and funding.¹⁰ Members serve as liaisons to their respective organizations and work to build the support of their organization’s decision-makers, often resulting in cooperatively funded GIS initiatives.

Draft language described the representation on the advisory committee and its operational structure, but this language did not appear in the final legislation. The Council currently is comprised of nineteen (19) members, including representatives from:

⁸ MassGIS Website, Municipal GIS Resources: <http://www.mass.gov/mgis/munigis.htm>, accessed September 1, 2006.

⁹ Massachusetts Geographic Information Advisory Committee, MassGIS Website: <http://www.mass.gov/mgis/mgiac.htm>, accessed September 1, 2006.

¹⁰ 2003 NSGIC State Summaries: Massachusetts, p. 74. NSGIC Website: <http://www.nsgic.org>, accessed September 1, 2006.

- Six (6) state agencies;
- Two (2) local governments;
- One (1) federal agency;
- Two (2) educational institutions;
- Two (2) regional planning associations;
- One (1) utility;
- Three (3) private companies;
- One (1) not-for-profit organization; and,
- One (1) professional mapping organization.

Originally, members were appointed by the Secretary of Environmental Affairs. Today, any organization or individual is welcome to attend the Council meetings. Most members are mid-level GIS managers and staff.

Standing committees under MGIC include the Statewide Mapping Advisory Committee to the State Geologist, CommGIS, the MGIC Education and Outreach Committee, and the MGIC Seminar Series Committee. Ad-hoc working groups perform tasks and projects under the direction of the Council; additional standing committees may be considered in the future to address specific data layers and standards. MassGIS provides administrative and technical support for Council activities.

CommGIS Group

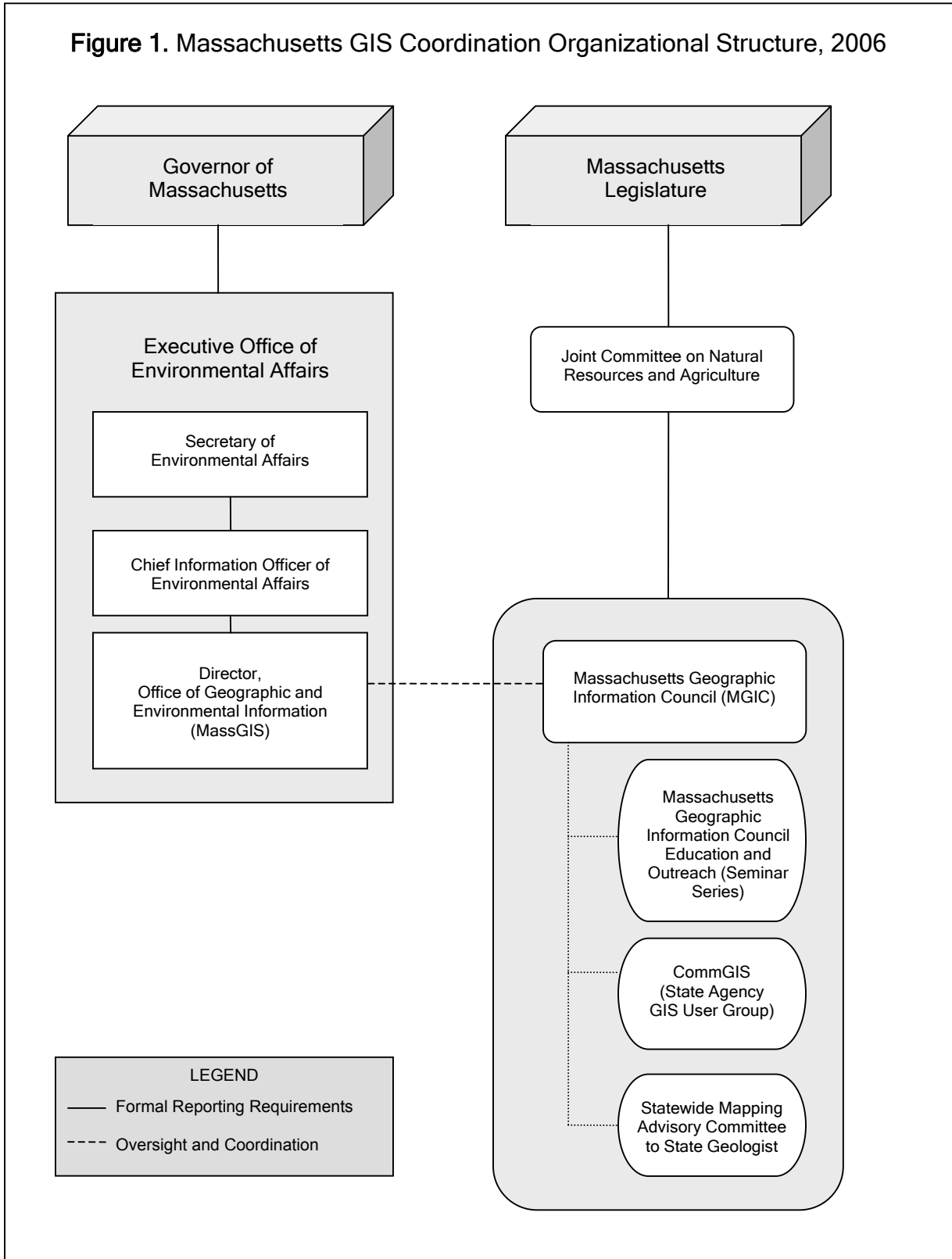
The CommGIS Group, a subcommittee under the Massachusetts Geographic Information Council, provides an informal forum for state agency staff to share information about upcoming and ongoing GIS projects and initiatives being conducted by Massachusetts' state agencies. CommGIS maintains an email listserver to enhance communication. Membership is open to state agency staff by invitation. MassGIS provides administrative support for CommGIS.

MGIC Seminar Series

The MGIC Seminar Series¹¹ subcommittee offers a monthly professional seminar series from September through May. Representatives from a broad spectrum of professionals who have an interest in geographic information technologies and applications are invited to participate.

¹¹ Massachusetts Geographic Information Council, What is MGIC: http://www.mass.gov/mgis/mgic_ix.htm, accessed September 1, 2006.

Figure 1. Massachusetts GIS Coordination Organizational Structure, 2006



FUNDING AND SUPPORT

The Office of Geographic and Environmental Information (MassGIS) is funded in part by general revenue through the Massachusetts Executive Office of Environmental Affairs (EOEA), which covers operating expenses. Other funding sources include capital budget funds, bond funding, retained revenue, and federal grants. From Fiscal 2000 - 2004, the MassGIS average budget from all sources, including capital, was \$2,460,233.¹² In any given year, about \$1,500,000 of this funding used for data development projects. In Fiscal 2007, the budget is nearly \$1.8 million; this total includes:

- \$670,000 earmarked for annual appropriation from the legislature, including \$275,000 general revenue for operating expenses, and \$400,000 general revenue, one-time, for capital expenditures;
- \$660,000 bond funding for capital expenditures;
- Roughly \$95,000 through an internal mechanism within EOEA to recover ongoing maintenance costs from EOEA departments that directly access MassGIS's database and services;
- Roughly \$350,000 from inter-agency service agreements (ISA) with outside state agencies for project management and GIS data and application development; and,
- Roughly \$50,000 in retained revenue from fees to the general public and private sector for the provision of products and services; and,
- A \$45,000 grant from the USGS for strategic planning.

As noted earlier, MassGIS has a total staff of fifteen FTEs, including the Director (1 FTE), which are tasked as follows: two (2) FTEs specifically support interagency service agreements; roughly six (6) FTEs support infrastructure and services that are broadly available to other state agencies and to the public; and two (2) FTEs are allocated per year to conduct statewide GIS coordination activities, including administratively supporting the GIS governance council,

¹² 2005 NSGIC State Summaries: Massachusetts, p. 42. NSGIC Website: <http://www.nsgic.org>, accessed September 1, 2006.

coordinating with local, state, and federal agencies in Massachusetts, and communicating with national GIS coordination organizations.

The cost associated with providing administrative support related to the Massachusetts Geographic Information Council is roughly \$10,000 per year; the Committee is not compensated for their time or reimbursed for travel expenses. The total cost for all statewide GIS coordination efforts is roughly \$70,000, including at least one (1) FTE.

CHALLENGES AND OPPORTUNITIES

A major challenge for Massachusetts is a lack of stable funding and official recognition and support for the ongoing data acquisition and data repository functions of MassGIS.¹³ The legislature annually budgets general revenue for MassGIS, but the level of funding has declined by almost 50% since the program's inception. Since operational funds do not cover the full range of program activities, bond funding is used for support, thus reducing the amount available for new data development and data maintenance. What is more, bond funding can vary wildly from year to year and is project specific. Interagency agreements or mechanisms that would provide sustainable funding for the development and maintenance of GIS infrastructures and core data layers have not been institutionalized. For example, MassGIS received bond funding in two different budget cycles to provide grant awards to local communities for digital parcel mapping. Ideally, however, MassGIS would like to develop a sustainable program, such as Wisconsin's Land Information Program (WLIP), which collected a segregated fee for transactions in local deeds registries to support local land records modernization. MassGIS sees a need for legislation that identifies the whole range of constituents for GIS data layers and explicitly allocates funding for maintenance of those GIS data layers identified as core or "framework" layers.

Secondly, the governance structure of the Massachusetts Geographic Information Council does not have a formal charter or by-laws. The informal structure offers flexibility and opens participation to a broader spectrum of GIS data users and producers, but specific enabling

¹³ 2005 NSGIC State Summaries: Massachusetts, p. 42. NSGIC Website: <http://www.nsgic.org>, accessed September 1, 2006.

legislation is needed to bolster the Council's coordination authority and to engage more policy and budgetary-level decision-makers in its activities. In addition, representation on the Council could be expanded to include more professional organizations that have an advocacy function.

Thirdly, eight of the fourteen county governments in Massachusetts were abolished or transformed in the late-1990s,¹⁴ making statewide GIS coordination more difficult as there are no central points of contact below the state level other than regional planning agencies, whose funding is project specific and does not generally cover GIS coordination. MassGIS must coordinate directly with 351 municipalities, towns and villages or else provide funding for the state's regional planning agencies to take on this responsibility. Furthermore, applying for federal grant programs is often complicated by the lack of counties as many grant programs are based on the assumption of a county structure.

Even with these limitations, however, Massachusetts has achieved a great deal in the sixteen years since MassGIS was established. Support for GIS coordination and development activities is fostered, in part, through the efforts of the Massachusetts Geographic Information Council members, who reach out to their respective organizations and build collaborative partnerships. To build support within the legislature for GIS coordination, MassGIS organizes an annual informational event associated with GIS Day that highlights recent accomplishments and ongoing initiatives. Strengths of the current coordination structure include: 1) effective data sharing; 2) strong technical coordination and the provision of technical support to all state and regional agencies; 3) a common GIS platform; 4) mandated conformance to standards set by MassGIS under state grants; and, 5) the availability of both data and applications over the Internet through MassGIS's Web Mapping Services,^{15,16} including high quality base map information, such as roads, hydrography, orthophotography, and state agency layers.

¹⁴ Mass.Gov Website, Your Government, Massachusetts Government: County Government: <http://wwma.org/govcounty.shtml>, accessed September 1, 2006.

¹⁵ MassGIS Website, Web Mapping Services Documentation: <http://www.mass.gov/mgis/websrv.htm>, accessed September 1, 2006.

¹⁶ MassGIS Website, Online Mapping: <http://www.mass.gov/mgis/mapping.htm>, accessed September 1, 2006.

Notably, in 2005, MassGIS's Web Mapping Services received both the Urban and Regional Information Systems Association (URISA) Exemplary Systems in Government (ESIG) Award and the Geospatial Information Technology Association's (GITA) Innovator Award. This shared, interoperable GIS service enables the fourteen participating state agencies to incorporate maps, data and applications into their own websites; so, agencies do not have to purchase or maintain the necessary hardware and software, recreate the data, or train their staff, thus reducing overall costs and duplication of effort. Furthermore, the provision of this web service increased inter-agency data sharing and generated outside agency funding. It enticed agencies to provide their GIS data so they too could display and download it over the Internet, and encouraged additional funding so that the capabilities of the Web-mapping services could be extended.¹⁷

¹⁷ Jacqz, Christian, 2006. Commonwealth of Massachusetts MassGIS Web Mapping Services (2005 – Enterprise System). In Exemplary Systems in Government, Special Issue Part 2, *URISA Journal*, 18(1):55-61.

Appendices

A. CHAPTER 21A SECTION 4B OFFICE OF GEOGRAPHIC AND ENVIRONMENTAL INFORMATION

Massachusetts Legislature, The General Laws of Massachusetts:
<http://www.mass.gov/legis/laws/mgl/21a-4b.htm>

PART I. ADMINISTRATION OF THE GOVERNMENT

TITLE II. EXECUTIVE AND ADMINISTRATIVE OFFICERS OF THE COMMONWEALTH

CHAPTER 21A. EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS

Chapter 21A: Section 4B. Office of geographic and environmental information

Section 4B. There is hereby established within the executive office of environmental affairs an office of geographic and environmental information. Subject to appropriation, it shall be the responsibility of said office to collect, consolidate, store and provide geographic and environmental information in order to improve stewardship of natural resources and the environment, promote economic development and guide land-use planning, risk assessment, emergency response and pollution control. In order to accomplish such purposes, the duties of said office shall include, but not be limited to:

- (a) fostering cooperation among local, state, regional and federal government agencies, academic institutions and the private sector in order to improve the quality, access, cost-effectiveness and utility of geographical and environmental information as a strategic resource for the state;
- (b) coordinating data sharing and executing data sharing agreements among all levels of government and private users;
- (c) identifying, developing, correcting, updating, distributing and assembling geographical and environmental data;
- (d) setting standards for the acquisition and management of geographical and environmental data by any agency, authority or other political subdivisions of the commonwealth;
- (e) providing technical assistance, training and computer hardware, software and programming to municipalities, regional agencies or political subdivisions of the commonwealth;
- (f) archiving and serving as a depository for geographical and environmental information and developing public access to and distribution of such information;
- (g) creating a network of regional service centers, subject to appropriation, to assist commonwealth, its political subdivisions and the public in developing and using GIS technology and data;
- (h) requiring that all GIS data funded through grants in any part by the commonwealth shall conform to standards developed by the office and be made available for distribution;
- (i) creating a category of commonwealth resources of the natural, cultural and historical resources in need of protection;
- (j) establishing a competitive grants program, subject to appropriation, for municipalities and regional agencies;

(k) setting up a geographic information advisory committee comprised of representatives from state agencies, regional and local entities, academic institutions, nonprofit organizations and the private sector which shall provide an annual report for strengthening the geographic information system to the joint committee on natural resources and agriculture and the office; and

(l) coordinating the development and dissemination of scientific and technical expertise to support an interagency, cross-disciplinary approach to natural resource management. Since the late 1970s, the State of Wisconsin has been a leader in the adoption and use of geographic information system (GIS) technology...