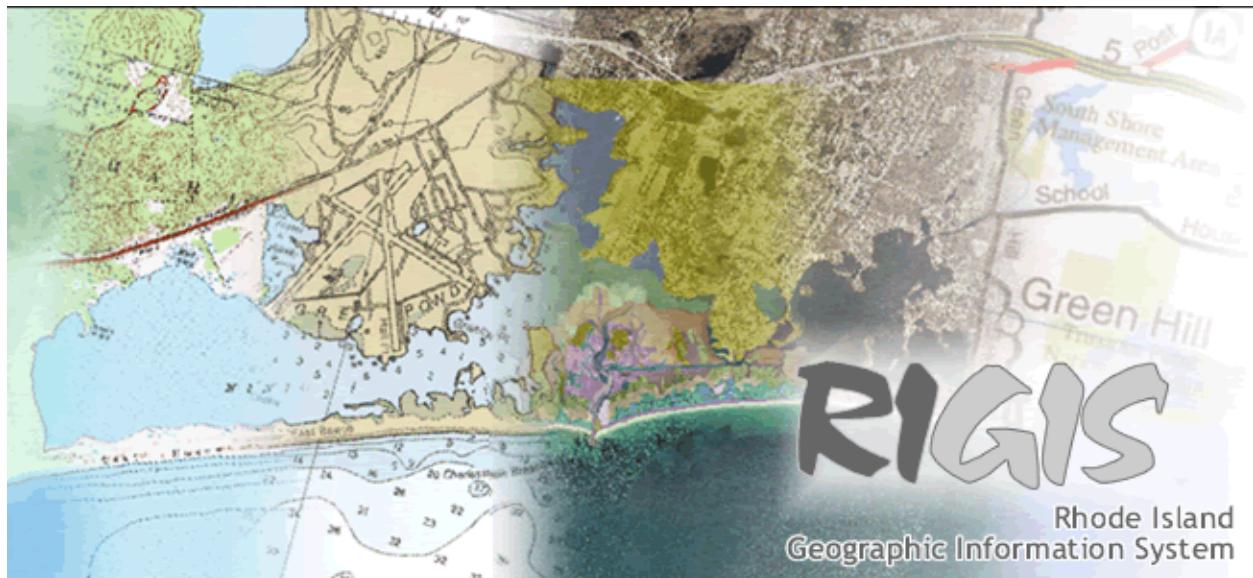# FY2012 - FY2016 STRATEGIC MANAGEMENT PLAN

FOR THE

RHODE ISLAND GEOGRAPHIC INFORMATION SYSTEM

State of Rhode Island, Department of Administration,
Division of Planning - RIGIS
One Capitol Hill
Providence, Rhode Island 02908-5872

As Reaffirmed by the RIGIS Executive Committee on June 16, 2011
As Approved by the Technical Committee on August 12, 2011
As Approved by the State Planning Council on August 18, 2011

FY2012 - FY2016 STRATEGIC MANAGEMENT PLAN
FOR THE
RHODE ISLAND GEOGRAPHIC INFORMATION SYSTEM

EXECUTIVE SUMMARY

The purpose of this strategic planning document is to provide a direction for the future development and use of Geographic Information Systems **(GIS)** in Rhode Island for the period from July 1, 2011 through June 30, 2016.

The document traces the background of the Rhode Island Geographic Information System (RIGIS) from its inception by the Director of the Rhode Island Department of Environmental Management and the University of Rhode Island in 1985 and the further evolution of the organization through increased participation by other public, private and academic organizations. The existence of a common GIS database and its management by the Department of Administration and the University of Rhode Island were recognized in state law in 1990. The same enabling legislation established the RIGIS Executive Committee (RIGIS EC) as an oversight management body for the system.

Procedures concerning the contribution of material into the RIGIS database as well as general policies regarding its maintenance and accessibility are recognized and have been detailed through the acceptance of standards and guidelines. Education and outreach activities within the state are continuing efforts by and for the GIS community. This includes participation in and contributions by RIGIS members in regional and national organizations.

An assessment of this document including a review and evaluation of its elements will be conducted on an annual basis to confirm that goals, objectives and strategies remain appropriate or that modifications or adjustments may be in order. Currently this plan outlines five goals and objectives related to the development and use of geospatial information in Rhode Island.

1. **RIGIS Administration**: Strengthen RIGIS by supporting the RIGIS EC, establishing a RI State Enterprise GIS, coordinating with Federal and State governments, collaborating with municipal governments, private and non-profit GIS partners, and increase geospatial funding options.

2. **Database Management**: Improve the RIGIS database by developing and implementing procedures and methods for examining data contents, locating other data available, and obtaining high-quality geospatial data contributions.

3. **Technical Standards**: Develop templates for standard key components, and improve existing or adopt new standards and best practices related to GIS data and metadata development, data distribution, web applications, cartography, and other related technologies (GPS, CAD, etc.)

4. **Database Access and Distribution**: Provide GIS users with free, user-friendly, efficient access to RIGIS data and derived maps. Review and improve how RIGIS distributes data to both outside organizations and internal state agencies.

5. **Education, Training, & Outreach**: Promote the use of geospatial technologies in Rhode Island by creating a RIGIS Community Directory for outreach needs; encouraging GIS in educational institutions; publicizing training programs and learning opportunities; assisting in organizing, participating, and contributing to geospatial events; and promoting RIGIS and geospatial events through various media.

2011 - 2016 STRATEGIC MANAGEMENT PLAN
FOR THE
RHODE ISLAND GEOGRAPHIC INFORMATION SYSTEM

STATEMENT OF PURPOSE

The purpose of this plan is to present a management strategy for the Rhode Island Geographic Information System (RIGIS) for the five year period from July 1, 2011 through June 30, 2016 to align with the State of RI fiscal years (FY2012 – FY2016). It is intended to outline a direction for the comprehensive development, use and availability of Geographic Information Systems (GIS) technology and geospatial information in Rhode Island. This includes the interests of the present RIGIS participants as well as other organizations or special interest groups that are either currently involved with or might benefit from this technology in the future. A primary goal of the RIGIS is to coordinate common efforts among existing and potential participants in the state. In addition, RIGIS participants provide technical counsel on the implementation of GIS technologies and use of geospatial information.

INTRODUCTION

A geographic information system (GIS) is an organizational structure, a suite of technical tools, and a geographically related database used to assimilate, analyze and depict location-related or geospatial information. The Rhode Island Geographic Information System (RIGIS) is a consortium of government entities, academic institutions and private organizations that employ GIS technology and use geospatial information.

VISION

RIGIS will be the acknowledged coordinator of efforts to implement and employ GIS technology throughout the state and the accepted source for quality geospatial information in Rhode Island.

RIGIS MISSION

To monitor, coordinate, and provide leadership for activities related to the use of geographic information system technology in Rhode Island; to support initiatives that implement or use this technology; and to manage and provide access to a common and comprehensive database of geographically referenced information that conforms to RIGIS-accepted minimum standards for accuracy, completeness and documentation.

VALUES

The RIGIS and its participants will preserve and rely upon an open and honest exchange of knowledge related to the use of geospatial information in Rhode Island.

BACKGROUND

1985

The Director of the State of Rhode Island Department of Environmental Management (RIDEM) started the precursor to the RIGIS through an agreement between with the University of Rhode Island (URI). That agreement established a GIS for the management and analysis of environmental data in Rhode Island.   The Rhode Island Department of Transportation (RIDOT), the Rhode Island Department of Administration - Division of Planning (RIDOP), and the RI Solid Waste Management Corporation (RISWMC, now RIRRC) joined this effort shortly thereafter. Each supported the concept of a unified, centrally-managed database of geospatial information. An informal committee of top-level management from each of these five organizations met on an ad hoc basis to provide overall coordination. The University of Rhode Island provided technical management of the database.

From the beginning, GIS in the State of Rhode Island involved four state government organizations plus the URI Environmental Data Center (URI-EDC) supporting their own internal GIS efforts through various forms of funding including contractual awards or grants. These efforts included the purchase of computer hardware and software, the assignment of operating personnel, and funding for the development of information applicable to their own agencies' or institution's needs. Realizing the benefits of an open, accurate, and accessible information resource, these partnering organizations contributed considerable data into a common RIGIS database. Early on, the Rhode Island office of the USDA-SCS (now NRCS) and the Narragansett Bay Commission (NBC) also significantly contributed to the database building effort. Initially this RIGIS database was housed at the URI-EDC. Until 1991 the URI-EDC used internal staff to perform all database management functions including assimilation of data, cataloging and distribution.

1989

RIGIS database copyright privileges under U.S. law were applied for and established in 1989.

1990

In 1990, legislation was enabled to amend the *General Laws of Rhode Island* to include language pertaining to a statewide geographic information system.

> ### Chapter 42-11-2
>
> **(20)** The <u>Department of Administration</u> shall have the power and duty "To devise, formulate, promulgate, supervise, and control a comprehensive and coordinated statewide information system designed to improve the database used in the management of public resources, to consult and advise with other state departments and agencies and municipalities to assure appropriate and full participation in this system, and to encourage the participation of the various municipalities of this state in this system by providing technical or other

appropriate assistance toward establishing, within those municipalities, compatible information systems in order to obtain the maximum effectiveness in the management of public resources;

(i) The comprehensive and coordinated statewide information system may include a Rhode Island geographic information system of land-related economic, physical, cultural and natural resources.

(ii) In order to ensure the continuity of the maintenance and functions of the geographic information system, the general assembly may annually appropriate such sum as it may deem necessary to the department of administration for its support."

Chapter 42-11-10

(f) (6) Pertaining to the Statewide Planning Program, the State Planning Council will "establish and appoint members to an executive committee consisting of major participants of a Rhode Island geographic information system with oversight responsibility for its activities."

(g) (3) "The Division of Planning shall manage and administer the Rhode Island geographic information system of land related resources, and shall coordinate these efforts with other state departments and agencies, including the University of Rhode Island, which shall provide technical support and assistance in the development and maintenance of the system and its associated database."

Chapter 16-32-30

Language was added for the University of Rhode Island whereby, it was "authorized and empowered to establish in connection with the University and within the Department of Natural Resource Sciences a geographic information system laboratory with suitable facilities for developing and maintaining a level of scientific and technical expertise in the use of computer technology in the management of land-related natural resources. This will include maintaining a statewide database of land related economic, physical, cultural, and natural resources and providing for controlled access of this database to the university community; other state, municipal and federal departments and agencies; and the general public." … "The University shall cooperate with and provide technical assistance to the Division of Planning of the Department of Administration in the management of the statewide geographic information system and shall advise other state, municipal and federal departments and agencies and the general public in its use."

Chapter 16-32-31

This next section of the General Laws addressed the University of Rhode Island's authorization to fund the GIS laboratory: "The general assembly may annually appropriate such sum as it may deem necessary for maintaining the geographic information system laboratory within the department of natural resource sciences, and the state controller is hereby authorized and directed to draw his or her orders upon the general treasurer for the

payment of said sum, or so much thereof as may from time to time be required, upon receipt by the controller of properly authenticated vouchers."

1991

The RIDOP assumed responsibilities for database administration and external data distribution in 1991. RIGIS data was exchanged between participants and made available to the public on magnetic tape media.

1996

In 1996 a computer data server was established at the URI-EDC for electronic data download over the Internet for RIGIS participants and the general public.

1997-2007 (The Next Decade)

Rapid development and use of GIS in Rhode Island and participation in the RIGIS occurred over the years. This was due not only to the realization of the benefits and advantages of using GIS tools, but also to the efforts of the GIS community at large in showcasing this technology. In this state, RIGIS has always been a proponent of this effort and has sponsored or participated in many technical assistance efforts and outreach activities. As a result, the use of GIS technology permeated into all levels of government and was heavily employed by many private sector companies and organizations. This was accompanied by rapid expansion and heavy use of the spatial information in the RIGIS database.

In its desire to foster the development and use of GIS, the RIGIS EC expanded its membership to include GIS users from many different disciplines and organizations including public and private educational institutions, health and public safety and a rapidly expanding interest by municipal government.

2008

To back up enacted legislation set for the URI-EDC to support the RIDOP with the development, distribution and support of the RIGIS database, an annually-renewed contractual funding agreement was established. To-date, these funds have been sufficient to cover roughly 50% of the salary and expenses of one staff person at the URI-EDC for the purpose of maintaining the RIGIS website, database and map services.

2009

In response to a long-term desire of GIS users in Rhode Island to be able to view the RIGIS database information without first having to download its layers and load them into a GIS software viewer, the Rhode Island Digital Atlas was created. Using this online tool through the RIGIS website, along with map services developed to support it, GIS users can view the latest version of key RIGIS data sets before choosing to download them.

The RIGIS website was enhanced to include a blog, and an event calendar. As an augmentation to the RIGIS-L listserv, these two other tools are utilized to inform the RIGIS community of changes to the database and of key dates of upcoming events.

Working groups were created for the RIGIS EC. These working groups were formed from the four major tenets of RIGIS: database maintenance, data distribution, standards creation and outreach. Each group was tasked with identifying goals and establishing priorities coordinated with this document. It was decided that action items created from this process would be presented at RIGIS EC meetings for discussion, and when appropriate, subcommittees would be created to focus on their completion.

The RIGIS User Group (RIGIS UG) was reestablished to give RIGIS members an opportunity to show off their accomplishments to their peers, and to give the opportunity for vendors to highlight recent accomplishments in RI. Both the RIGIS EC and RIGIS UG meetings occur quarterly so that both sets of meetings fall approximately 1.5 months apart. RIGIS EC meetings are held at a constant location, while RIGIS UG meetings rotate around the state to encourage local participation.

2010

Due to a lack of sustainable funding for the urgent ongoing maintenance needs of the RIGIS database, including its many data sets, a need was identified to focus on a sustainable funding mechanism for RIGIS. Current funding mechanisms are primarily used to create new snapshots for the most requested statewide datasets for the RIGIS database. This leaves the majority data sets in the RIGIS database without a regular, business-process driven (and therefore operating budget funded) update mechanism.

At NSGIC conferences, the majority of state GIS coordinators identified the lack of sustainable funding as their biggest concern. Collectively NSGIC, representing all state GIS programs, has identified several "For the Nation" (FTN) initiatives that focus on the standardization and national collection of geospatial information related to Imagery, Transportation, Addresses, Cadastral (Parcel) and Elevation. RIGIS fully supports these initiatives.

A vision was developed through which information would be created and maintained closest to its source (primarily by municipalities or state agencies) using industry standards and then incorporated into the RIGIS database to be consumed by federal government agencies. All future RIGIS activities will support this vision.

ORGANIZATION

RIGIS Executive Committee

Oversight policy and guidance of the collective efforts of RIGIS participants was formulated by an executive committee of representatives of organizations using GIS technology in Rhode Island. From its inception, the RIGIS EC was made up of representatives from federal, state and municipal government, academic institutions, non-profit, and the private sector. (See *Appendix A: RIGIS Executive Committee Membership – 2011*)

Members are appointed by the State Planning Council, the legislatively authorized central planning organization for the state. There are no specified term limits for its members. A member of the RIGIS EC selected by majority vote chairs this body at quarterly meetings held throughout the year in public session. The RIGIS Coordinator, an employee from the Rhode Island Department of Administration's Division of Planning, provides staff support for this body and acts as the principal liaison among participants and with outside organizations within the state, the Northeastern US, and nationally. Additional staff support for the Executive Committee is provided on a voluntary basis by its individual members and their organizations.

The Executive Committee deliberates on policy issues pertaining to the content and maintenance of a common and consolidated GIS digital database and sets distribution policy for RIGIS database products. There is no binding authority for its individual members to conform to Committee decisions or actions. Neither the RIGIS organization, nor its participants are currently funded as a separate state entity or governmental unit to carry out the functions of this Executive Committee.

RIGIS Database

The RIGIS database consists of *several hundred* individual spatial databases, or data sets, in vector (point, line, polygon) and raster image format. Although originally conceived and built as an information system for the state's coastal and terrestrial natural resource data, it presently includes extensive data in many disciplines.

    These include:

- Administrative and Political Boundaries
- Biology and Ecology
- Business and Economic
- Cultural, Society, and Demography
- Elevation and Derived Products
- Environment and Conservation
- Facilities and Structures
- Geological and Geophysical
- Human Health and Disease
- Imagery and Base Maps

- Inland Water Resources
- Locations and Geodetic Networks
- Oceans and Estuaries
- Planning and Cadastral
- Transportation
- Utilities and Communication

Contributors and users have and continue to add information to the RIGIS database through formal and informal data sharing agreements, data exchange transactions, and in-house enhancements of existing data sets.

Overall database management is performed jointly by the **RIGIS Coordinator** at the RI Statewide Planning Program and the **RI Geospatial Extension Specialist** at the University of Rhode Island.   New additions submitted by individuals or groups are assimilated, and a preliminary check of their data integrity and completeness is performed. (Note: The contributing organization is relied upon to provide metadata and quality assurance procedures prior to submission of data to the RIGIS.) The data documentation or metadata is inspected, and if found acceptable, the data set is added to the list of RIGIS data. Maintenance of data in the form of updates and corrections is left to the organization that originally developed it. Custodial responsibility or stewardship of individual data sets resides with the organization developing those data and with a primary interest and expertise in its thematic content. For instance, the RI Department of Transportation maintains highway infrastructure information and the RI Department of Environmental Management delineates wetland resources.

All contributors to the RIGIS database are encouraged to follow standards, and when available, specifications for developing data. Standards and specifications for digital data entry and the writing of metadata files have been accepted by RIGIS members, and are in general use. National Map Accuracy Standards are generally referred to in data development proposals. In the absence of formally accepted specifications, manufacturers' guidelines for hardware and software products are commonly followed. As resources are made available, RIGIS members continue to develop or adopt standards and specifications for use with GIS tools and related technology. (See **Appendix B: RIGIS Standards and Guidelines Documents**)

Information from the RIGIS database is made available through a managed access licensing policy. The consolidated RIGIS database is stored and maintained at the Environmental Data Center at the University of Rhode Island and is considered intellectual property of the RI Board of Governors for Higher Education. All data are distributed under license agreements. An intent of this policy is to preserve the integrity of information emanating from the RIGIS database by limiting secondary distribution.   This also serves to alleviate concerns by data contributors that others may take undo credit or make unreasonable profits from an originator's work. This managed, or in some cases restricted, access also lessens security or liability concerns of data developers who are concerned that their data may be changed, improperly interpreted, or misused by others.

Information from the RIGIS database is distributed through electronic download from a server maintained by the Environmental Data Center at the University of Rhode Island. The downloading of individual data sets and metadata by electronic transfer is accomplished at no cost using commercial Internet browsers after agreement to the standard RIGIS license document.

Outreach Through Education

The RIGIS Consortium believes that institutions of higher education should offer introductory or advanced courses in geospatial technology and its application as part of regular departmental curricula.

The Department of Natural Resources Sciences at URI regularly provides formal course work at the undergraduate level in the use of GIS technology. In addition, graduate level courses and seminars are offered as part of programs leading to master's degrees. The Geospatial Extension Program at the URI offers short courses in the use of GIS tools for all Rhode Islanders. These courses generally concentrate on the usage of desktop mapping software and its applications to various disciplines. In addition, the Cooperative Extension program assists Rhode Island municipalities with GIS mapping support for specific activities such as the Watershed Watch Program and other ongoing natural resource related studies.

As it is a virtual requirement for employment these days, RIGIS participants at the state and municipal agency levels consistently support internship programs offered for students. RIGIS participating agencies at the state government level offer internship opportunities for undergraduate and graduate students from Brown University, Bryant University, Johnson and Wales University, Rhode Island College, the University of Rhode Island, as well as Clark University in Worcester, MA.

Short conferences and seminars are offered in the state by RIGIS participants on a special interest basis from time to time. Brown University has offered workshops for organizations not affiliated with that university. The Geospatial Extension Specialist at URI is key to the organization and management of events at that university. Events are often associated with particular applications where GIS tools may be beneficial, such as wetlands interpretation, the use of automated spatial information for utilities infrastructure management, or GIS in business or for economic development opportunities.

RIGIS members regularly participate and actively support regional conferences such as the Northeast Arc (NEARC) Users Group , the NorthEast chapter of the Urban and Regional Information Systems Association (NEURISA), the Geospatial Information & Technology Association – NorthEast chapter (GITA-NE). RIGIS members regularly participate in national organizations concerned with geospatial issues such as the AAG, ACSM, ASPRS, Esri Users Conference, GITA, NSGIC, and URISA. Rhode Island GIS users often contribute to these events by giving presentations, providing graphic displays, or otherwise assisting their organization.

FIVE YEAR STRATEGIC MANAGEMENT PLAN

GOALS AND OBJECTIVES (GO-) *(What we want to do)*
    STRATEGIES (S-) *(How we're going to get there)*
      ACTIONS (A-) (What are we going to do)

GO-1: **RIGIS Administration:** Strengthen RIGIS by supporting the RIGIS Executive Committee, establishing a RI State Enterprise GIS, coordinating with Federal and State governments, collaborating with municipal governments, private and non-profit GIS partners, and increase geospatial funding options.

    S-1: **Support the RIGIS Executive Committee (EC)** administrative responsibilities by maintaining and encouraging membership, scheduling, developing and posting quarterly agendas, recording and summarizing quarterly meetings, and maintaining a digital document inventory.

      A-1: Maintain membership representation by soliciting, documenting, and proposing a membership list to the current RIGIS EC for vote and obtaining final approval through the State Planning Council.

      A-2 Encourage membership participation by sending meeting reminders, encouraging membership envolement in working group of interest, and requiring attendance to at least one RIGIS EC meeting per year.

      A-3: Schedule and secure regular quarterly meetings and space.

      A-4: Develop quarterly agendas based on RIGIS geospatial needs, advancements, and trends relating to RIGIS coordination and working group topics such as database maintenance and acquisition, technical standards and best practices, database access and distribution, and education, training, and outreach activities.

      A-5: Post quarterly agendas on the Rhode Island Secretary of State's website following open government guidelines.

      A-6: Record quarterly meetings to document discussion, votes, action items, and future agenda items.

      A-7: Summarize quarterly meeting minutes to be reviewed by EC members and approved at the following scheduled meeting.

      A-8: Maintain digital inventory of all documents viewed and distributed at RIGIS EC meetings.

    S-2: **Establish a Rhode Island State Enterprise GIS,** working with appropriate geospatial vendors and state stakeholders, by inventorying, modeling, prioritizing, and implementing a enterprise GIS system within the State's IT enterprise.

      A-1: Inventory current, needed, and planned geospatial hardware, software, applications, networking, and databases within State government departments, agencies, and institutions including but not limited to the following information.

Hardware:	Server name, function, capacity, installed software, type of security, operating system used, etc.
Software:	Type of software and vendor, number and utilization of licenses, and maintence cost and schedule, etc.
Applications:	Platform (web, desktop, mobile, etc.), database technology, and development environment, etc.
Networking:	Internet connection and availability, data transfer rate, and type of security, etc.
Databases:	Theme, contents, size, source organization, database software, completeness, sensitivity and restrictions, intended use, etc.

A-2: ***Model geospatial inventory*** to identify necessary acquisitions or improvements to hardware, software, applications, networking, and databases, and determine where resources can be pooled, reallocated, and purchased.

A-3: ***Prioritize needs and resources*** by consulting with appropriate geospatial vendors and working with state stakeholders to enhance the capabilities of storing, sharing, and accessing geospatial data and resources within Rhode Island State government.

A-4: ***Implement an enterprise GIS*** based on needs and resources in the order of priority and feasibility to establish a common data repository and recovery system, server systems for core RIGIS and State agency geospatial applications and services, and a common geospatial enterprise architecture within the State's IT enterprise

S-3: **Coordinate with Federal government liasons and agencies** through engaging, researching then implementing, bidirectional sharing, collaborating, entering, and assisting with common needs and goals.

A-1: ***Engage in liaison activities*** (NSGIC, DHS, FGDC, etc) through attendance and participation in national conferences, seminars, and workshops.

A-2: ***Research then implement*** federal standards, models, and best practices of geospatial uses most appropriate for RI needs.

A-3: ***Bidirectionally share*** existing data and associated metadata between appropriate Federal and State agencies.

A-4: ***Collaborate on joint ventures*** with Federal agencies and geospatial experts to acquire common interest data utilizing federal funding when available.

A-5: ***Enter existing RIGIS database metadata*** into federal GIS inventory systems (NSGIC GIS Inventory, USGS - The National Map, Geodata.gov, etc.)

A-6: ***Assist Federal agencies*** with GIS related needs in emergency planning, response and recovery efforts for drills and events affecting Rhode Island.

S-4: **Coordinate State government and regional GIS activities** by collaborating, engaging, inventorying, supporting, coordinating resources, and providing a Master Price Agreement for geospatial technology and services.

A-1: ***Collaborate with other states*** through joint project ventures relating to common data themes, applications, standards and best practices.

A-2: ***Engage in liaison activities*** through attendance and participation in regional (NEARC, NEURISA, GITA-NE, etc.) and state (RISPLS, RIGIS User Group, etc.) conferences, seminars, and workshops.

A-3: ***Inventory Rhode Island State government agencies, commissions and boards*** actively using or seeking to take advantage of GIS technology by collecting and adding appropriate information (GIS and/or technical contacts, department, geospatial focus, etc) to an on-line RIGIS Community Directory.

A-4: ***Support Rhode Island State government*** with establishing and implementing GIS capabilities through policy guidance, technical support, standards and best practices, involvement with the RIGIS community, updating their inventory, and other GIS resources.

A-5: ***Coordinate State government GIS resources and activities*** to maximize advantageous cooperative ventures, minimize redundancy of effort, and increase efficiency with respect to the development, contribution, and updating of geospatial information and applications utilizing the RIGIS database.

A-6: ***Provide and encourage the use of Master Price Agreements*** for geospatial technology and service offerings through the Rhode Island Department of Administration, Division of Purchasing.

S-5: **Collaborate with Municipal government** by engaging, inventorying, providing, informing, supporting, encouraging, and assisting with GIS activities, efforts, and resources.

A-1: ***Engage in liaison activities*** (RILOCAT, RIAAO, RI-GMIS, etc.) through attendance and participation in local conferences, seminars, workshops, and meetings.

A-2: ***Inventory Municipal government departments*** actively using or seeking to take advantage of GIS technology. Including but not limited to the following information: primary geospatial and subject area contacts (parcels, zoning, addressing, land use, etc.), software and database technology, stage of GIS development, number of GIS users, and resources available (desktop, mobile, web applications, etc.)

A-3: ***Provide an online GIS resource library*** for Municipalities to make their geospatial data and capabilities known, and add department contact information to the RIGIS Community Directory.

A-4: ***Inform existing and interested municipalities*** of available GIS resources including the RIGIS Community Directory of state and municipal contacts, statewide initiatives, regional data acquisition efforts, online mapping tools and training, applications, standards and best practices, etc.

A-5: ***Support GIS activities*** in Rhode Island's municipalites by providing technical guidance, implementation ideas, letters of support, and best practices.

A-6: ***Encourage the creation of Municipal GIS user groups*** or by adding GIS focus to existing groups by presenting advantages, lessons learned, current initiatives, efficiencies, improvements, future project planning for collaborating opportunities (database development, imagery, applications, and emergency planning, etc.) with common standards and specifications leading to possible joint ventures and cost savings.

A-7: ***Assist Municipalities with comprehensive plan mapping needs*** by providing mapping guidelines and best practices, map templates, technical support, and web mapping applications that utilize RIGIS data.

S-6: **Collaborate with private and non-profit GIS partners** by engaging, providing, exploring and engaging, and facilitating GIS ventures, activities and efforts.

A-1: ***Engage in liaison activities*** (ESRI, Pictometry, BroadbandRI, etc.) through attendance and participation in private and non-profit conferences, seminars, workshops, and meetings.

A-2: ***Provide an online GIS resource library*** for private and non-profit companies, organizations, and individuals to make their geospatial data and capabilities known in a fair and unbiased manner, and add company contact information to the RIGIS Community Directory.

A-3: ***Explore and engage in the assimilation or incorporation of data*** developed by private and non-profit partners, to maximize the use of existing efforts and products. Include the results of this effort to the online GIS resource library.

A-4: ***Facilitate cost sharing ventures and partnering opportunities*** between public, private, and non-profit organizations with mutual interests in performing GIS related projects such as data and application development, implementation planning, etc.

S-7: **Increase geospatial funding** options by establishing, exploring, facilitating, and identifying and publicizing availability of cost-sharing and funding opportunities.

A-1: ***Establish long term funding*** of RIGIS at RIDOA and continued support from the URI-EDC.

A-2: ***Explore cost-sharing opportunities*** with Federal, State, and Municipal government entities, and private and non-profit partners with mutual interests in developing GIS related capabilities, data, or products.

A-3: ***Facilitate partnering opportunities*** with Federal, State, and Municipal government entities, and private non-profit partners to develop cost-sharing ventures.

A-4: ***Identify and publicize the availablility of grants and other funding sources*** (Grants.gov, RI SPP Challenge Grants, FGDC NSDI CAP Grants, etc.) open to RIGIS participants to encourage the adoption of standards, GIS needs assessment, implementation planning, data development and to improve the GIS curriculum within educational institutions.

GO-2: <u>Database Management:</u> Improve the RIGIS database by developing and implementing procedures and methods for examining data contents, locating other data available, and obtaining high-quality geospatial data contributions.

S-1: Develop and implement procedures and methods for cataloging, identifying, and reviewing RIGIS database contents.

A-1: Catalog the RIGIS database based on date last modified, sources, custodial responsibility, and priority need.

A-2: Identify missing datasets and attributes by comparing the RIGIS database to the NSGIC GIS Inventory, and industry accepted data models.

A-3: Review each RIGIS dataset to determine its quality based upon its respective metadata, particularly attribute completeness, currentness, positional accuracy, and accepted data standards.

S-2: Locate other data sources and datasets available by identifying, reviewing, cataloging, publishing, and displaying other available data.

A-1: Identify local, regional, and private sector datasets.

A-2: Review data for minimum quality and accuracy standards.

A-3: Catalog local, regional, and private sector datasets with a brief description, date last modified, fees, and contact information.

A-4: Publish catalog to the RIGIS website for user reference to other data available outside of the RIGIS data catalog.

A-5: Display maps or graphics showing what types of data are available by source and location.

S-3: Solicit high-quality geospatial data contributions for the RIGIS database through collaboration, acquisition, development, and maintenance procedures and methods.

A-1: Collaborate on funding, specifications, or development of missing or outdated RIGIS datasets with interested stakeholders.

A-2: Acquire existing data and encourage development of new data from local, regional, and private sources into the RIGIS database.

A-3: Establish procedures and methods for database maintenance usable by RIGIS participants, including the ability to directly transfer updated data into the RIGIS database.

GO-3: Technical Standards: Develop templates for standard key components, and improve existing or adopt new standards and best practices related to GIS data and metadata development, data distribution, web applications, cartography, and other related technologies (GPS, CAD, etc.)

S-1: **Improve existing and adopt new standards and best practices** by compiling, identifying and prioritizing, exploring, comparing, and developing standards.

A-1: *Compile* a list of existing standards and best practices in RI.

A-2: *Identify and prioritize* which new standards and best practices are needed in RI by polling the RI GIS community.

A-1: *Explore* applicable and advantageous national (NSDI, FGDC, etc.), local (MassGIS, NSGIC, etc.), and industry (OGC, ISO, etc.) open standards and best practices for geospatial data to determine the best source.

A-4: *Compare* local standards and best practices to the national level.

A-5: *Develop* and adopt new standards and best practices as appropriate in the order of priority by amending existing national standards as necessary to meet RI's needs.

S-2: **Develop templates for the following key components** of every database standard identified above: coordinate system, positional measurement, database models, spatial topology, metadata. Also develop a standard for RI map content.

A-1: *Coordinate System:* Determine what the RIGIS standard coordinate system should be based on emerging coordinate systems and state agency mapping requirements.

A-2: *Positional Measurement Categories:* Research, then develop, a list of positional measurement accuracy levels based on unique combinations of data source, map scale, device, measurement accuracy, survey level, and license certification.

A-3: *Database Models:* Research, then develop, database models for the most highly utilized geospatial data layers (hydrography, transportation, parcels, etc.). Include file and field naming, and coding standards.

A-4: *Spatial Topology:* Determine appropriate data layer topology rules (no gaps or overlaps, must be covered by endpoint, must not intersect, etc.) for each type of geospatial database model.

A-5: *Metadata:* Periodically research the most current geospatial metadata standards. Endorse a geospatial metadata standard. Create and publish a template that may be used as the basis for new metadata records. Make sure to include process steps lineage, and feature level metadata.

A-6: *Map Content:* Determine required and recommended map contents such as north arrow, scale, date, appropriate legend, standard symbology, creator, file name, and RIGIS/source logos.

GO-4: **<u>Database Access and Distribution:</u>** Provide GIS users with free, user-friendly, efficient access to RIGIS data and derived maps. Review and improve how RIGIS distributes data to both outside organizations and internal state agencies.

S-1: Data Access: Maintain and improve access to current and archived RIGIS data, map services, and static map products by reviewing, researching, incorporating, adopting, amending, and automating how the RIGIS web portal operates.

A-1: *Review current web access methods* and determine what works, what is missing, or needs improvement.

A-2: *Research hardware and software solutions and security methods* currently used by other organizations for accessing and displaying map products, and archiving historical data and information.

A-3: *Incorporate, adopt, and/or amend hardware and software solutions and security methods* that will provide the best end user experience given the resources available.

A-4: *Automate* tasks essential to the RIGIS data distribution process by taking advantage of emerging hardware and software solutions.

S-2: **Data Distribution:** Improve how RIGIS distributes data by reviewing, researching, investigating, improving, and contributing to the accessibility of data and online map services available from RIGIS, RIGIS partners, and other websites.

A-1: *Review current mechanisms and policies* for how RIGIS distributes data and shares online map services.

A-2: *Research emerging software tools and technologies* for data distribution to improve the RIGIS data distribution website.

A-3: *Investigate software tools and technologies* for publicizing RIGIS data and online map services through other resources such as the Geospatial One-Stop, The National Map, and ArcGIS.com.

A-4: *Improve the RIGIS data distribution website* by incorporating emerging software tools and technologies, and create links on the RIGIS website to other data clearinghouses such as NarrBay, and Data.gov.

A-5: *Contribute to the FGDC National Spatial Data Infrastructure* by providing new and ongoing data updates from the RIGIS database.

GO-5: <u>**Education, Training, and Outreach Activities:**</u> Promote the use of geospatial technologies in Rhode Island by creating a RIGIS Community Directory for outreach needs, encouraging GIS in educational institutions, publicizing training programs and learning opportunities, assisting in organizing, participating, and contributing to geospatial events, and promoting RIGIS and geospatial events through various media.

S-1: Create and maintain the RIGIS Community Directory to be used in outreach activities by creating online surveys, identifying and collecting contact information, collecting contact lists of geospatial users, and compiling a community directory.

A-1: Create online surveys, in order to inventory the contact information for the Rhode Island geospatial community, understand their needs, technology use, expertise and activities, geospatial resources and data, possible contributions to the RIGIS data repository, and to determine how best to inform them about future activities. The results of the surveys can also target presentations for future events, and assist with the goals and needs of other RIGIS working groups.

A-2: Identify and collect contact information from agencies, educational institutions, and non-profit/for-profit service providers with geospatial capabilities through surveys and other resources. Examples of other types of information collected include professional organizations they participate in, Listserves they have joined, and other websites or resources they find useful.

A-3: Collect geospatial contact lists from user groups, municipalities, Listserves, and other types of geospatial events.

A-4: Compile a RIGIS Community Directory from survey results; agencies, educational institutions, and service providers; and geospatial contact lists in order to be used in various types of outreach activities, and promote future RIGIS activities and resources to a greater audience.

S-2: Encourage and promote geospatial curriculum in Rhode Island public and private educational institutions through the creation and expansion of geospatial curriculum, researcher and geospatial practitioner participation at educational institutions, and internship/mentor opportunities.

A-1: Encourage the creation and expansion of geospatial curriculums at institutions of higher education and K-12 schools by creating and distributing data/demo software packages, lesson plan examples, presenting RIGIS talks in classrooms on real world project examples, and offering projects to school classrooms for more involvement and added interest.

A-2: ***Encourage the involvement of educators, educational institution researchers, geospatial practitioners, and GIS Professionals (GISP)*** in geospatial projects of public or private sector entities, guest speakers, workshops, and programs such as the Geography Education Alliance, Annual Geography Bee, K-12 Career Day, and GIS Day**.**

A-3: ***Provide and encourage geospatial technology internship and mentor opportunities*** to supplement knowledge acquired through formal course work with that gained through project work experiences.

S-3: **Publicize GIS and related geospatial technology training and workshops** by establishing introductory presentations; designing workshops and presentations; and facilitating, collaborating, and publicizing training opportunities and workshop announcements to the RIGIS community.

A-1: ***Encourage the introduction of GIS concepts and the use of geospatial information throughout the state*** by establishing an Introduction to GIS presentation to be presented to state/local governments, and educational facilities interested in learning more about the uses of geospatial technologies and how it can be incorporated into work processes.

A-2: ***Facilitate the collaborative design of workshops and presentations*** to encourage and promote the use of RIGIS data, web services, pilot projects, and technical standards and best practices established by RIGIS.

A-3: ***Publicize training opportunities and workshop announcements*** using resources such as Listserves, web pages, and newsletters.

S-4: **Assist in the organization of, and encourage the participation in, special interest group meetings, events, conferences, and seminars** in areas related to the use of GIS and geospatial technology.

A-1: ***Organize, promote, and hold periodic GIS meetings*** about geospatial information and applications for users and special interest groups, such as RIGIS User Group and municipal GIS meetings. Where appropriate provide proof of participation for professional credit.

A-2: ***Organize, promote, and hold an annual Rhode Island geospatial event***, such as GIS Day or a conference, to showcase successful implementations and to encourage the use of geospatial technology.

A-3: ***Promote participation in national, regional, state/local conferences, seminars and meetings*** using resources such as Listserves, web pages, and newsletters.**.**

S-5: Promote RIGIS (geospatial technologies, events, opportunities, etc.) via digital and print media by maintaining the RIGIS Blog and Listserv, creating brochures and newsletters, announcing opportunities, posting public announcements, and keeping the RIGIS web site up-to-date.

   A-1: Maintain RIGIS social media outlets (Blog, Listserv, etc.) with announcements, events, and website updates.

   A-2: Create and make available a printed RIGIS brochure which can be distributed at various agency waiting areas, events, meetings, etc.

   A-3: Create and deliver a digital RIGIS newsletter related to items such as events, opportunities, geospatial projects, and technology uses.

   A-4: Announce the availability of job opportunities, internships, and grants available throughout southern New England utilizing various media.

   A-5: Provide state/local public service announcements via TV, radio, and newspapers related to geospatial events.

   A-6: Continue to manage, maintain, and update the RIGIS Web Site for education, training, outreach activities, and related resources links.

STRATEGIC PLAN REVIEW, EVALUATION & CONFIRMATION

1. **Produce an annual report** highlighting accomplishments or failings of the actions taken over the past year. The successive annual reports will be considered addendums to the Strategic Plan.

2. **On an annual basis** update or modify listed actions to implement the strategies for the coming year(s).

3. **On a two-year basis,** where necessary, redirect or modify strategies intended to reach goals and objectives.

4. **On a three-year basis** review the Strategic Plan to validate individual goals and objectives.

5. **On a five-year basis** reconfirm and/or revise the overall Strategic Plan

APPENDIX A: RIGIS Executive Committee Membership – 2011

State Agencies	Representative
RI Department of Administration – Statewide Planning Program	Shane White, GISP
RI Department of Environmental Management – Division of Planning and Development	Paul Jordan, GISP
RI Department of Health – Center for Health Data and Analysis	Steve Sawyer
RI Department of Transportation – GIS and MIS	Steve Kut
RI Emergency Management Agency	Emily Pysh
RI Enhanced 911 Uniform Emergency Telephone System	Greg Scungio

Cities and Towns	Representative
City of Cranston – Information Technology	Maria Giarrusso
Town of Charlestown – GIS Department	Stephen McCandless
Town of East Greenwich – Tax Assessor	Janice Peixinho
Town of Smithfield – Tax Assessor	Suzanne Kogut
Town of South Kingstown – GIS Department	Carol Baker

Federal Government Agencies	Representative
US Department of Agriculture – Natural Resource Conservation Service	James Turenne
US Department of the Interior – US Geologic Survey	Peter Steeves
US Department of Defense – RI Air National Guard	Melanie Benda-Joubert

Educational Institutions	Representative
Brown University – Environmental & Remote Technologies Lab	Lynn Carlson, GISP
Coventry High School – Environmental Science	Peter Stetson
The University of Rhode Island – Department of Geosciences, RI State Geologist	Jon Boothroyd, PhD
The University of Rhode Island – Environmental Data Center	Gregory Bonynge, GISP

Private Enterprises and Organizations	Representative
Applied Geographics, Inc. – Boston, MA	Michele Giorgianni
Applied Science Associates – Narragansett, RI	Christopher Galagan
The Beta Group – Lincoln, RI	Tony Garro
Fuss and O'Neil Inc. – Manchester, CT	Michael Doyle, GISP
Mapping and Planning Services – Jamestown, RI	Mary Hutchinson, GISP
RI Society of Professional Land Surveyors – East Greenwich, RI	Edward J. O'Brien, PLS

Private Utilities	Representative
Providence Water Supply Board – Providence, RI	Christopher Laboissiere

Non-Profit Organizations	Representative
The Nature Conservancy – Providence, RI	Kevin Ruddock
The Providence Plan – Providence, RI	James Lucht

APPENDIX B: RIGIS Standards and Guideline Documents

1. Digital Database Standards for the Rhode Island Geographic Information System, Version 1.1, The Environmental Data Center, Department of Natural Resources Science, The University of Rhode Island, Kingston, RI, 1989

2. Rhode Island Geographic Information System License Agreement, The University of Rhode Island Foundation, Kingston RI, 1990

3. Metadata Standards and Specifications for the Rhode Island Geographic Information System, Division of Planning, RI Department of Administration, Providence RI. 1993 (*superceded by FGDC Content Standard in 2001*)

4. Content Standard for Digital Geospatial Metadata, Federal Geographic Data Committee, Reston VA, April 1997

5. RIGIS Data Catalog January 2008 - Electronic Lising Program, The University of Rhode Island, Environmental Data Center, Kingston, RI. **www.edc.uri.edu/rigis**

6. RIGIS Standards for Digital Parcel Data Sets for Use in a Geographic Information System, Statewide Planning Program, RI Department of Administration, Providence RI, December 2003

APPENDIX C: List of Acronyms

AAG – The Association of American Geographers is a nonprofit scientific and educational society which conducts educational and research projects that advance geographic understanding, geographic literacy, and geographic learning.

ACSM – The American Congress on Surveying and Mapping is a non-profit association dedicated to advancing the national interests of the surveying and mapping community.

ASPRS – The American Society for Photogrametry and Remote Sensing is a non-profit national association dedicated to the interests of the photogrametry and remote sensing community.

Blog – A journal or diary written for public viewing on a website and consisting typically of personal reflections, commentary on current events, etc. arranged chronologically

CAD – Computer-aided design, also known as computer-aided design and drafting (CADD) is the use of computer technology for the purpose of streamlining design processes; drafting, documentation, and manufacturing processes.

DHS – The Department of Homeland Security has a vital mission: to secure the nation from the many threats we face. This requires the dedication of more than 230,000 employees in jobs that range from aviation and border security to emergency response, from cybersecurity analyst to chemical facility inspector. Our duties are wide-ranging, but our goal is clear - keeping America safe.

Challenge Grants (RISPP) – Planning Challenge Grants are administered by the Statewide Planning Program and funded with Federal Highway Administration Metropolitan Planning funds. The purpose of the grant program is to provide funding for statewide, regional and local planning studies leading to the implementation of the State Guide Plan.

EDC – The Environmental Data Center is a research and GIS applications facility in the Department of Natural Resources Science at the University of Rhode Island.

ESRI – The Environmental Systems Research Institute is a private company with headquarters in Redlands, CA developing and supplying GIS applications software.

FGDC – The Federal Geographic Data Committee is a 19 member interagency committee composed of representatives from the Executive Office of the President, Cabinet-level and independent agencies.

FGDC NSDI CAP Grants - The Federal Geographic Data Committee (FGDC) National Spatial Data Infrastructure Partnership Program (NSDI) Cooperative Agreements Program (CAP) is an annual program to assist the geospatial data community through funding and other resources in implementing the components of the NSDI. This program is open to State, local and Tribal governments, academia, commercial, and non-profit organizations. This program provides small seed grants to initiate sustainable on-going NSDI implementations. The program emphasizes partnerships, collaboration and the leveraging of geospatial resources in achieving its goals

GIS – A Geographic Information System(s) is a collective combination of computer hardware, specialized software, a managed database of spatial and related information, and a core of trained professionals versed in geospatial technology.

GITA – The Geospatial Information and Technology Association is a global nonprofit educational association serving the global geospatial community.

GITA-NE – The New England States chapter of GITA.

GOS – The Geospatial One Stop is an initiative of the federal government that implements the basic elements of the NSDI by providing an Internet portal (www.geodata.gov) to facilitate data sharing throughout the nation.

GPS – The Global Positioning System (GPS) is a space-based global navigation satellite system (GNSS) that provides location and time information in all weather, anywhere on or near the Earth, where there is an unobstructed line of sight to four or more GPS satellites. It is maintained by the United States government and is freely accessible by anyone with a GPS receiver.

IMS (WMS) – An Internet or Web Map Service is an application technology for providing access to GIS information through an interactive mapping interface via the World Wide Web electronic communcaitons network.

ISO – International Organization for Standardization is a non-governmental organization (federation of approximately 163 countries) that develops high quality voluntary International Standards which facilitate international exchange of goods and services, support sustainable and equitable economic growth, promote innovation and protect health, safety and the environment

Listserv – List server, is a small program that automatically sends messages to multiple e-mail addresses on a mailing list.

MassGIS – MassGIS is the Commonwealth's Office of Geographic Information, within the Information Technology Division (ITD) of the Administration and Finance Secretariat. Through MassGIS, the Commonwealth has created a comprehensive, statewide database of geospatial information.

NarrBay – NarrBay.org is the one stop portal for researchers interested in Narragansett Bay, Rhode Island. NarrBay is home to specialized coastal and marine datasets which can be downloaded in a variety of formats.

NBC – The Narragansett Bay Commission (RI State) is a quasi-state government organization serving as a regional wastewater utility provider.

NEARC – The Northeast Arc (users group) is a regional organization of users of ESRI GIS software from New York, New Jersey, and the six New England states with some participation from Pennsylvania and Delaware. The organization is self-funded and is independent of ESRI for its support and operations.

NEURISA – The New England Chapter of the Urban & Regional Information Systems Association (NEURISA) is a not-for-profit professional organization that represents the interests of Geographic Information System (GIS) practitioners and Information Technology professionals across the New England region.

NRCS – The National Resources Conservation Service of the US Dept. of Agriculture (Formerly SCS) is an agency of the federal government that provides leadership in efforts to conserve, maintain and improve natural resources and the environment.

NSDI – The National Spatial Data Infrastructure is an initiative developed by the Federal Geographic Data Committee that encompasses policies, standards, and procedures for organizations to cooperatively produce and share geographic data.

NSGIC – The National States Geographic Information Council is a private nonprofit organization consisting of representatives from the fifty states committed to efficient and effective government through the prudent adoption of geospatial information technologies.

OGC – The Open Geospatial Consortium (OGC) is an international industry consortium of **over 400** companies, government agencies and universities participating in a consensus process to develop publicly available interface standards.

RIAAO – The Rhode Island Association of Assessing Officers (RIAAO) is an organization of, for and by the Tax Assessors of each city and town in Rhode Island. It is a chapter of the IAAO.

RIDEM – The RI Department of Environmental Management is a department of the executive branch of Rhode Island state government.

RIDOA – The RI Department of Administration is a department of the executive branch of Rhode Island state government.

RIDOH – The RI Department of Health is a department of the executive branch of Rhode Island state government.

RIDOT – The RI Department of Transportation is a department of the executive branch of Rhode Island state government.

RIGIS – The Rhode Island Geographic Information System is a consortium of public, private and academic organizations jointly participating to further the knowledge and use of GIS in Rhode Island.

RIGIS EC – The Rhode Island Geographic Information System Executive Committee, which reports to the State Planning Council administered by the RISPP.

RI-GMIS – In 1971, a group of computer leaders, realizing all of us need help from time to time, organized GMIS International to foster sharing among all levels of government involved in our endless world of technology. Not to be confused with other user groups, GMIS focuses solely on sharing situations related to government information processing. Rhode Island chapter.

RILOCAT – The Rhode Island League of Cities and Towns. As a private, non-partisan membership association of local governments in Rhode Island, our mission is to represent the interests of municipal officials and to provide them services which enhance the effectiveness and efficiency of city and town services.

RIRRC – The RI Resource Recovery Corporation (formerly RISWMC) is a quasi-state organization responsible for management of solid waste in the state.

RISPP – The Rhode Island Statewide Planning Program within the State of Rhode Island, Department of Administration, Division of Planning.

RISPLS – The Rhode Island Society of Professional Land Surveyors exists to promote the profession of surveying, mapping, land information systems and related fields to support the

advancement of technologies, and to help ensure that these professional activities provide for the safety and welfare of the general public.

RISWMC (see RIRRC) – Formerly known as the RI Solid Waste Management Corporation.

URI-EDC – The University of Rhode Island, Environmental Data Center (EDC) is a geographic information system (GIS) laboratory in the URI Department of Natural Resources Science, College of Environmental and Life Sciences (CELS).

URISA – The Urban and Regional Information System Association is a non-profit international association furthering the use of GIS and other information systems technology for the improvement of decision-making in national, state, regional and municipal government. URISA is the founding member of the GIS Certification Institute and the GISCorps volunteer program. international organization

USDA-NRCS – The US Department of Agriculture, Natural Resources Conservation Service (NRCS) works with landowners through conservation planning and assistance to benefit the soil, water, air, plants, and animals for productive lands and healthy ecosystems.

USDA-SCS (see USDA-NRCS) – Formerly known as the Soil Conservation Service of the US Dept. of Agriculture.

USGS – The US Geological Survey is a component of the US Department of the Interior, an agency of the federal government.