

**NEW HAMPSHIRE GIS CONSERVATION COLLABORATIVE (NHGCC)
MASTER WORK PLAN AND ACTION STRATEGY 2003-2005 (FY04-FY06)**

July 2003 (Revised Spring 2004)

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I. EXECUTIVE SUMMARY

The New Hampshire GIS Conservation Collaborative (NHGCC) is a cooperative effort involving nonprofit, education, government, business, and grantmaking organizations that are focused on conservation and land use planning issues impacting New Hampshire. Members of NHGCC are concerned about the pattern of growth and development in New Hampshire and its impacts on land use and the state's natural resource base – its forestlands, farm soils, wildlife habitats, and drinking water supplies. NHGCC's mission is to provide leadership, coordination, and support for GIS and related geospatial technologies in order to enable sound land use planning and accelerate the pace of conservation in the Granite State. It believes that this mission will only be effectively achieved through genuine cooperation and collaboration among public and private organizations and institutions.

Over the past year, members of NHGCC have developed a Work Plan that articulates its mission, vision, goals, and objectives, and identifies a set of priorities that the group feels are critical to advancing geospatial technologies in the state for conservation and land use planning purposes. This Work Plan builds upon and incorporates key elements of two important documents – the Strategic Information Technology Plan for GIS developed by the NH GIS Advisory Committee, and the Geospatial Technologies Training and Resource Center Strategic Plan developed jointly by UNH Cooperative Extension and Complex Systems Research Center. NHGCC does not intend to duplicate either of these important initiatives, but rather to support and augment these efforts in order to build a robust GST infrastructure and a cadre of well trained citizens and resource managers working to protect the state's precious natural resources and its quality of life. The organizations involved in NHGCC recognize that GIS data and related decision support tools are but one important component of the many critical elements needed to promote smart conservation and sound land use planning in New Hampshire.

NHGCC has identified four goals as critical to achieving its purpose of providing leadership, coordination, and support for GIS and related geospatial technologies. These four goals are to:

1. Expand GST data and infrastructure development at the state, regional and municipal levels;
2. Broaden access to, application of, and utilizations of GIS data at the state, regional, municipal, and multi-state levels;
3. Increase education and training in geospatial technologies to expand the user base and enhance the skills of existing users; and
4. Increase advocacy, outreach, and funding to support goals 1-3.

A detailed description of NHGCC's goals, objectives, strategies, and action plans follow in this Work Plan document.

II. BACKGROUND

A) How We Got Here

In the fall of 2000, representatives from conservation groups, state resource and planning agencies, the university system, and private philanthropy met to explore ways of working together to accelerate the pace of Geographic Information System (GIS) data development and utilization for conservation purposes in New Hampshire. While there were various hubs of activity in the state working to expand data development, access, and utilization, including a state GIS Advisory Committee, the group saw value in creating an ongoing interdisciplinary, multi-sector forum. Thus was born the New Hampshire GIS Conservation Collaborative (NHGCC).

It is worth noting that NHGCC sees its mission and program activities as complementary and supportive of several other important GIS-related initiatives in New Hampshire, most notably the NH GIS Plan developed by the Strategic Plan subcommittee of the GIS Advisory Committee, and the Geospatial Technologies Training and Resource Center Strategic Plan developed by the University of New Hampshire Cooperative Extension and the University's Complex Systems Research Center.

The NH GIS Conservation Collaborative is a cooperative effort involving nonprofit, education, government, business, and grantmaking organizations that are focused on conservation and land use planning issues impacting New Hampshire. Members of NHGCC are concerned about the pattern of growth and development in New Hampshire and its impacts on land use and the state's natural resource base – its forestlands, farm soils, wildlife habitats, and drinking water supplies. Geospatial technologies¹ such as Geographic Information Systems and Global Positioning Systems are critical tools contributing to informed decision making. They greatly enhance the abilities of agencies, organizations and individuals to protect natural resources and practice wise land use planning. The NHGCC is committed to making the power of Geographic Information Systems (GIS) and other Geospatial Technologies (GST) available to individuals, organizations, and communities in New Hampshire to help achieve smart conservation and smart growth.

B) Need

New Hampshire is facing unprecedented growth and development pressures that are changing the character of the state in many ways. The latest decennial census figures indicate that the state's population grew by 11.4 % from the period 1990-2000, a rate far in excess of its sister states in New England. This growth has been fueled by the economic prosperity of the last decade, a favorable business climate in the state, and natural amenities, which are a draw for business, second homebuyers, and retirees.

¹ *Geospatial technologies in this document refer to Geographic Information Systems (GIS), Global Positioning Systems (GPS) and Remote Sensing/Image Processing (RS/IP). A GIS is a computer-based tool for mapping, managing, analyzing and displaying data that has a spatial or geographic dimension. It serves as the foundation of geospatial technologies, allowing one to integrate and map information from various sources. GPS is a satellite-based technology that allows one to accurately record positions on the surface of the earth. It can be used to determine the locations of roads, trails, historic structures, or any other features found on the landscape, and thus provides an important data source for GIS. RS/IP is the process of measuring and observing phenomena on the earth using remote instruments such as airborne cameras and satellite-based sensors. The results of this processing give us a "bird's eye" view of the earth which can be integrated into a GIS and is very useful for land cover and land use assessments.*

Growth has not come uniformly to the state, but rather has come intensely in some regions and not at all in others. Regions experiencing significant growth and development pressures include Southern New Hampshire along the I-93/Route 101 Corridor, the Coastal Region, and the Lakes Region, whereas many resource dependent communities of northern New Hampshire have witnessed economic decline and population out-migration.

Population increases and economic growth might be an entirely positive story for New Hampshire if it were not for the ways that the state is growing. Sprawl development patterns predominate, resulting in loss of open space and large increases in developed land, even in places experiencing modest, slow or negative growth. According to the USDA's Natural Resources Inventory, New Hampshire's population grew by nearly 24% in the period 1982-1997, whereas developed land increased by 55% during that same period. As a result, population growth and development are threatening the character of New Hampshire's natural and cultural landscape and impacting quality of life in this formerly rural state.

New Hampshire citizens, organizations, communities, and public agencies need access to spatial data to effectively tackle the many resource protection and land use decisions facing the state. NHGCC member groups are on the front lines of conservation and land use planning in New Hampshire and have documented time and time again the growing demand for data and information in the public, private, and nonprofit sectors, as well as among the general public.

New Hampshire has made impressive strides developing statewide data sets and providing access to the related technologies, thereby enhancing the public and private sectors' ability to describe, analyze and manage our increasingly complex environment. Over the past two decades, the state has developed the GRANIT System and data clearinghouse, comprising an extensive GIS framework, ambitious strategies for database development, tools for data access, and plans for enhanced GST education and training. The purpose of this work plan is to acknowledge the progress to date, but more importantly to recognize critical priorities for the future if New Hampshire is to effectively address the intense growth and land development pressures that call for an immediate and concerted response.

III. MISSION, VISION, GOALS, OBJECTIVES, & ACTION PLAN

A. Mission

NHGCC's mission is to provide leadership, coordination and support for GIS and related geospatial technologies in order to enable sound land use planning and accelerate the pace of conservation in New Hampshire. NHGCC believes that its mission will only be effectively achieved through genuine cooperation and collaboration among public and private organizations and institutions. We provide a bridge among public, nonprofit and private sector activities.

B. Vision:

Geospatial technologies will be broadly developed, maintained, supported, and utilized by diverse interest groups -- resource and planning agencies, the public interest community, the private sector, and the general public. Geospatial technologies and an expanded GIS database can contribute to improved decision making, more efficient uses of land, and better resource protection. NHGCC supports the accelerated development of GST capacity in New Hampshire to provide powerful tools for monitoring and inventorying present conditions as well as facilitating predictive land use analysis. Doing so will help New Hampshire achieve a balance among its green, built and social infrastructures, and ensure a high quality of life for its residents.

Ultimately, however, NHGCC recognizes that resource protection is dependent on the values, resolve, and actions of individuals, and the public, nonprofit, and private sectors.

C. Goals of the NHGCC

NHGCC has identified four goals as critical to achieving its purpose of providing leadership, coordination and support for GIS and related geospatial technologies. We will pursue a comprehensive effort to achieve the following goals:

GOAL 1: Expand GST data and infrastructure development at the state, regional and municipal levels.

GOAL 2: Broaden access to, application of, and utilization of GIS data at the state, regional, municipal, and multi-state levels.

GOAL 3: Increase education and training in geospatial technologies to expand the user base and enhance the skills of existing users.

GOAL 4: Increase outreach and public support for goals 1-3.

Figure 1 below illustrates our approach. Objectives, strategies, and action plan items for achieving these goals follow.

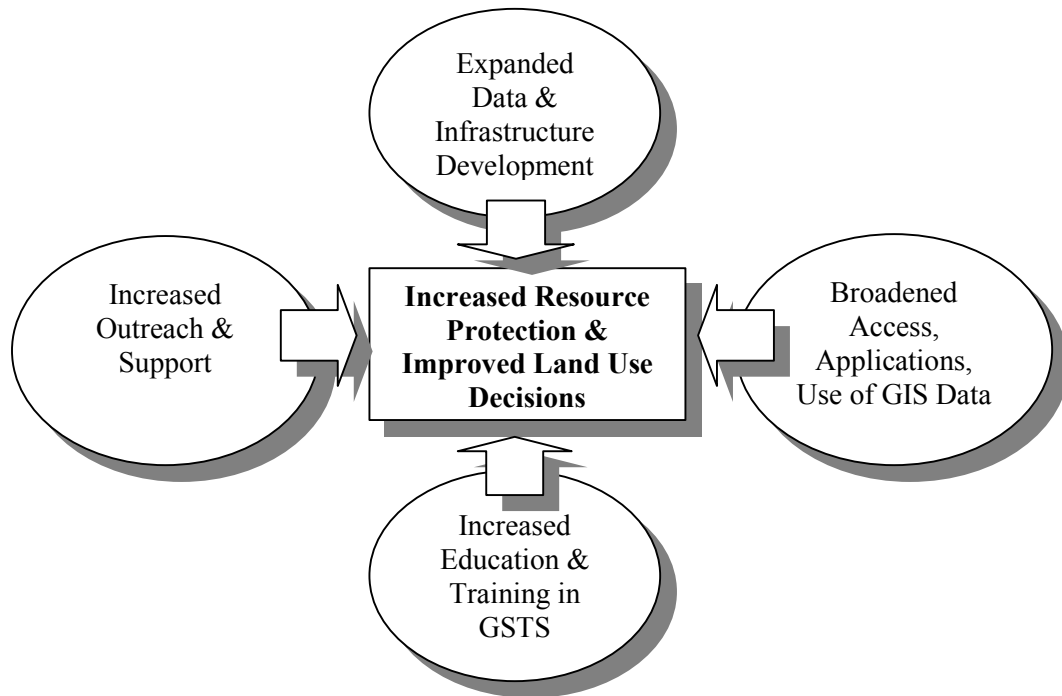


Figure 1.

D. Goals and Objectives/Action Plan

GOAL 1: EXPAND GST DATA AND INFRASTRUCTURE DEVELOPMENT

Objective 1: To improve the GST infrastructure and enhance its utilization in the state for conservation and land use planning purposes by increasing state agency engagement, significantly expanding capacity at GRANIT and at the municipal and regional levels, and developing critical additional data layers as outlined in the New Hampshire GIS Strategic Plan. (For further information see the NH GIS Plan, December 2002.)

Strategy:

- 1) Create NH GIS Coordinator position
- 2) Expand organizational capacity at GRANIT
- 3) Expand capacity at municipal level and at Regional Planning Commissions (RPCs)
- 4) Encourage development and maintenance of the following high priority data sets to be incorporated and maintained at GRANIT: large-scale statewide color orthoimagery, boundaries, road centerlines, parcels, zoning, enhanced surface water, contemporary and historic land use, plant and wildlife habitats and occurrence data, conservation lands, historic and cultural resources, and soils.

Objective 2: To enhance internet-based geospatial technology access by supporting the continued expansion of the GRANIT web site into a fully functional GIS clearinghouse, providing resource professionals as well as the general public with integrated access to a suite of geospatial data, technologies, and related resources in support of conservation and sound land use decision-making in the state and region.

Strategy:

- 1) Increase web access to spatial data and the tools to utilize the data on the GRANIT web site.
- 2) Develop web site as a two-way interface, which can accept data submissions from authorized parties, as well as serve as a data repository.

ACTION PLAN

Through the State of New Hampshire, Strategic Information Technology Plan – GIS (NH Office of State Planning, December 2002) the State GIS Advisory Committee has recommended three components directly related to this objective: creation of a State GIS Coordinator, major expansion of staff capacity and resources at GRANIT, and development and maintenance of critical new data layers for the GRANIT database. The NHGCC endorses these recommendations and incorporates them into our Work Plan. NHGCC further believes that an additional priority should be to enhance the capacity within municipalities and at the state's Regional Planning Commissions to utilize the state's GIS infrastructure in conservation and planning applications.

A. Creation of New Hampshire GIS Coordinator

Given the cooperative, multi-agency nature of geographic data development in the state, the NH GIS Advisory Committee believes it imperative that the state have a senior staff person coordinating the various GST development activities taking place under the auspices of GRANIT,

including within state agencies, regional planning commissions (RPCs), and at the UNH Complex Systems Research Center. The Strategic Information Technology Plan recommends that an official State GIS Coordinator be hired to implement the recommendations of the GIS Strategic Plan. GIS Coordinator responsibilities would include developing statewide GIS data standards, coordinating GIS data development activities, furthering the adoption and utilization of GSTs by state agencies and municipalities, and providing assistance in the development of a workforce skilled in GST use. The Coordinator would also serve as New Hampshire's point of contact for GST issues that relate to neighboring states and the federal government. NHGCC supports these recommendations of the NH GIS Advisory Committee. Given the stark fiscal realities of state Government, NHGCC believes state agencies should consider a number of options for achieving the functions of a GIS Coordinator, if sufficient funds are not currently available to hire a full-time staff person. Options might include increased support to GRANIT to provide greater coordination for GIS activities among state agencies.

Staff Resources Needed: The Office of State Planning has submitted the Strategic Information Technology Plan for adoption by state agencies and CORD. Once adopted, NHGCC would hope that resources would be made available to support the position or functions of a GIS Coordinator.

B. Expansion of Organizational Capacity at GRANIT

The GRANIT System managed by Complex Systems Research Center at the University of New Hampshire is the foundation of the state's GST infrastructure and the repository for data and standards. The Strategic Information Technology Plan recommends that funding be secured to significantly expand organizational capacity at GRANIT. Several new staff positions are recommended in order to ramp up the state's GST infrastructure, data layers, and applications, implementing many of the projects called for in the NH GIS Strategic Plan.

Staff Resources Needed: Three full-time positions are recommended for FY03, a major increase from the half-time GRANIT Project Manager position currently supported by state funding. These positions should be maintained and built into the state budget.

Next Steps: Secure private sector support to help make the case for this critical capacity expansion at GRANIT.

C. Expansion of Organizational Capacity at Municipal and Regional Levels

Increased organizational capacity at the municipal and regional level is needed to support routine use of GIS information to inform local land use decisions.

1. For municipalities that have in-house GIS capability the following is recommended :
 - access to a diverse curriculum of GIS training, especially training focused on the application of GIS to the areas of land use planning and resource analysis (ref. Goal 3);
 - easier access to GRANIT and other GIS coverages, and updates to those coverages;
 - access to pre-designed applications that make analytical use of GIS data (ref. Goal 2, Part D.)

Staff Resources and Funding: continued or expanded local funding for local GIS staff support; grant funding from state and federal agencies (Coastal Program & National Estuaries Program in coastal regions) and foundation support for training and applications support.

2. For municipalities that have no in-house GIS capability of access, the following is recommended:
 - low or no-cost access to a basic or introductory GIS training, including on-line or CD-ROM based tutorials (ref. Goal 3, Part A);
 - Internet browser based access to a standard set of GIS maps commonly needed in local community and resource planning efforts. It is recommended that this be facilitated through the further development and extension of the Conservation Lands Viewer implemented by GRANIT (ref. Goal 1, Part E);
 - access to more complex or analytical GIS applications through the community's regional planning agency (ref. Goal 2, Part D).

Staff Resources and Funding: local funding for PC workstation and internet access; grant funding from state and federal agencies (Coastal Program & National Estuaries Program in coastal regions) and foundation support for training and applications support.

Next Steps: Help secure private support for training and development of applications, including extension of the conservation lands viewer with work to be carried out at GRANIT.

3. At the regional level, it is recommended that adequate capacity and resources be made available at the regional planning agencies in order to:
 - provide basic planning maps to municipal planning boards and conservation commissions;
 - develop and/or apply more sophisticated GIS analyses as an aid to regional and local land use and natural resource planning (ref. Goal 2, Part D);
 - commit to a formal and recognized responsibility within GRANIT to maintain GIS layers for land use, zoning, municipal conservation lands and easements, and local priority conservation/preservation sites (and possibly others: critical facilities, local road centerlines, and road inventory data) [ref. Goal 1 Part D 5, 7, 9 (part)].

Staff Resources and Funding: local dues and grant funding to provide basic planning maps as needed; local, state and federal agencies (Coastal Program & National Estuaries Program in coastal regions; possibly I-93 Planning Mitigation funding for I-93 corridor communities) and foundation support for applications development and local implementation; expanded state agency funding (OSP, DES, NHDOT) and internal RPA funding for maintaining regional GIS layers.

Next Steps: Help secure private support for training and further development of conservation lands viewer at GRANIT, including producing a demo of the enhanced conservation viewer tool. GRANIT has applied to the Department of Transportation for funds to support mapping and GIS tools for communities impacted by the I-93 expansion.

D. GRANIT Data Layer Development

At its heart, New Hampshire's GST capacity, including the GRANIT System, is only as useful as the underlying data layers upon which it is built. The NH GIS Advisory Committee has recommended that the state obtain funding to begin development of a large-scale GIS database, from existing sources where possible, and otherwise by new mapping. NHGCC has identified the following priority data themes. (Please note that the NHGCC has incorporated most of the priority data layers identified in the Strategic Information Technology Plan.)

1. Large-Scale Statewide Color Orthoimagery

Large-scale, color (or color infrared) digital orthoimagery will provide the fundamental geographic base map for the state, serving as both a visual reference and providing the basis for the derivation of a suite of positionally accurate data themes. The GIS Advisory Committee has recommended 1:5,000 as an appropriate scale for a statewide image collection activity, as this scale will support applications ranging from statewide/regional in scope down to municipal.

The orthorectification activity will include the production of a high resolution statewide digital elevation model.

2. Boundaries

Accurate governmental boundaries, and particularly municipal boundaries, are required for a variety of GST related “business” applications, as well as for general orientation. Development of this data layer will require the perambulation with GPS units of each town boundary in the state.

3. Road Centerlines

Road centerline data is currently collected and maintained by the NH Department of Transportation. The new, large-scale imagery will provide a basis for improving the accuracy of the centerlines. In addition to the spatial data, richer attribute sets describing the roads have been identified as a priority. In particular, address ranges attached to each road segment are necessary to support geocoding activities.

4. Parcels

Parcel data is required for many types of operational/inventory applications, including land use planning, transportation planning, and site selection activities. It also provides a basic data set for geospatial analyses, ranging from developing land protection strategies to conducting traditional municipal build-outs. A statewide parcel layer will describe the spatial properties of each of the state’s estimated 650,000 ownership boundaries (NH Department of Revenue Administration, November, 2002), as well as link to the town-maintained assessor’s databases, yielding data on ownership, valuation, and related characteristics.

5. Zoning

A statewide zoning data set will yield important insights into how the landscape of the state may change as the population grows and development pressures continue to increase. While zoning ordinances vary considerably by town, a statewide “crosswalk” table is available to assist in generalizing the municipal data into a framework that may be applied on a statewide basis.

6. Enhanced Surface Water

The basic hydrographic data set provides a spatial representation of surface water features, including lakes, ponds, streams, rivers, etc. The features are typically encoded as polygons (lakes, ponds, and double-banked rivers) and/or lines (streams). The enhanced version of the data, a component of the National Hydrography Dataset, includes elements that ensure

the full connectivity of the hydrographic network by establishing centerlines through all polygons and further, combines surface water features to form reaches. This provides the framework to associate water-related data sets to the drainage network, thereby facilitating the use of watershed-based tools and models for water and land resource management.

7. Contemporary and Historic Land Use Data Layer

This data set will provide information on historic and contemporary land uses in New Hampshire going back to the early 1930's/1940's. Such data can provide a compelling picture of how land use and land development patterns have changed over the past 60-70 years, providing invaluable information for planning and resource protection purposes.

In addition to standard land use categories, access to spatial data representing impervious surface coverage is recommended to support watershed/water quality modeling activities.

8. Plant and Wildlife Habitats and Occurrence Data

These GIS data layers will identify core habitat for rare plant and animal species and exemplary natural communities. The data will supplement and enhance the Natural Heritage Inventory database of ecologically significant areas. Such science-based information and tools will strengthen existing information sources and advance our knowledge of ecological systems. These data layers will be integral to the development of a Comprehensive Wildlife Conservation Plan for New Hampshire, will focus and inform land conservation efforts aimed at protecting native biodiversity, and are a priority of the New Hampshire Living Legacy Project with its goal of conserving the biodiversity of the Granite State.

9. Conservation Lands

The current statewide conservation lands layer includes a mapping of parcels of land that are two or more acres in size, are mostly undeveloped, and are protected from future development. This data set is critical for the mission of the Collaborative, as it provides both an inventory of existing protected lands and a basis for identifying potential future land protection priorities.

10. Historic and Cultural Resources

This data layer, or collection of layers, will identify resources that represent the cultural heritage of the state – past or present. The data will comprise a variety of resources, possibly including landscapes, structures, historically important sites, and/or archaeological sites.

11. Soils

Digital soils data are available for 10 of the 12 counties in New Hampshire. Digital data must be developed for the two remaining areas – Belknap and Merrimack Counties – as the mapping is completed by the Natural Resources Conservation Service.

Staff Resources Needed: The data layers listed above will require considerable staff resources at individual state agencies and at Complex Systems Research Center.

Next Steps: As part of the development of the National Spatial Database Infrastructure, New Hampshire has created an I-Team to set priorities for state spatial data development and to coordinate those priorities with federal data development agencies. The I-Team will take the lead on GIS data development in the state. The State I-Plan does not include plant and wildlife habitats and occurrence data. NH Fish & Game will be developing a number of wildlife data layers as it develops its Comprehensive Wildlife Conservation Plan. There is a good chance that NH Fish & Game can support development of the data layers identified in #8 above.

E. Internet-based Technology Access

A key priority for NHGCC and the broader GST community in New Hampshire is to further develop and enhance the GRANIT web site to be a fully functional and user-friendly GIS clearinghouse for data, online mapping services, technical tools, and information regarding other GST resources and opportunities in the state. NHGCC has identified the following key action steps as necessary to achieve this capacity.

1. Site design to develop framework and identify hardware and software needs to expand and enhance the GRANIT web site to become an integrated clearinghouse for GSTs.

Staff Resources Needed: Consultant services to undertake system design. In-kind support from GRANIT staff and NH GIS Advisory Committee.

2. Web site enhancement implementation, specifics to be developed during web site design process. (Eg. additional data layers developed; online mapping, overlay and querying made available for key data sets; tools and networking for collection and maintenance of contact information, meeting schedules, etc.; links to other web sites; begin accommodating data submission by trained nonprofessionals.)

Staff Resources Needed: Web site developer/programmer and resource coordinator (content manager).

3. Extension of and further development of the existing GRANIT Conservation Lands Viewer to support local conservation and a broad set of planning applications. This would include the capability to overlay multiple data sets, query and analyze data sets, and create/print maps at the town and small watershed scale. Data sets necessary to support the Viewer would be developed through the initiatives described in Section D above.

Staff Resources Needed: Web site developer/programmer and resource coordinator (content manager).

GOAL 2: BROADEN ACCESS TO, APPLICATION OF, AND UTILIZATION OF GIS DATA

Objective 1: To inform citizens, nonprofits, and communities of the various options available to them to obtain GIS services in the state.

Strategy:

- 1) Gather and update information for public describing those organizations and companies that provide GST services, including needs assessments, data development, data analysis, and custom software development

Objective 2: To enhance the capacity of service providers offering conservation-related GIS services.

Strategy:

- 1) Facilitate communication and sharing of best practices and emerging science among service providers.
- 2) Encourage hands-on technology transfer.

Objective 3: To improve the ability of conservation organizations and non-profits to actively use GIS data with increasing independence.

Strategy:

- 1) Leverage ongoing advances in education levels realized from successful GOAL 3 implementation (Increase Education and Training) and access to data realized from GOAL 1 activities (Expand GST Data and Infrastructure Development) by increasing access to and/or funding for hardware and software to support in-house GIS in the non-profit sector, where appropriate. Coordinate this effort with sub-regional and electronic availability of shared GIS resources.

Objective 4: To encourage greater utilization of existing data analysis and decision support tools, and development of new and enhanced tools.

Strategy:

- 1) Link regional planning commissions and municipalities with existing data analysis resources similar to Community Viz and University of Connecticut's NAUTILUS program.
- 2) Encourage development of new analytic tools for planning in such areas as resource co-occurrence, alternative development impacts, pollutant flow modeling, build-out scenarios, landscape visualization, fiscal impact analyses, etc.

ACTION PLAN

A. Directory of New Hampshire GIS Service Providers

NHGCC recognizes that the number of public, private and nonprofit service providers has been mushrooming in the past few years. At the same time, the community of consumers (individuals, nonprofits, communities, and businesses) is becoming increasingly sophisticated about how spatial data can enhance their conservation-related activities. NHGCC believes it would be a valuable service to develop a directory of GIS Service Providers for the state would be available online and possibly in printed form. This directory would need to be updated on a regular basis.

Staff Resources Needed: Graduate-level intern supervised by NHGCC member.

Next Steps: With grant funds from the Pardoe Foundation, the Forest Society is conducting a statewide survey to identify GIS service providers and to build a database on their project interests and capabilities. It will publish the results of this survey on its website along with a directory of consultants offering various GIS services. This directory will be offered to other related web sites, such as GRANIT, statewide and regional land trusts, regional planning commissions, etc.

B. Network of GIS Service Providers

NHGCC believes that the natural resources protection and land use planning efforts would be advanced and strengthened with the development of an ongoing forum for communications, exchange, and information-sharing among service providers. Such a network could possibly be coordinated by staff at the Center for Land Conservation Assistance (CLCA), or by another organization or individual.

Staff Resources Needed: One quarter-time or half-time coordinator position.

Next Steps: As part of the above mentioned survey and directory, the Forest Society will test the idea of joining with colleagues and private consultants in developing a GIS service provider network or association. The Forest Society will organize and sponsor a poster session for GIS service providers at an upcoming conservation conference in the fall of 2003, hosted by the Center for Land Conservation Assistance (CLCA) or the NH Association of Conservation Commissions. Following this conference, the Forest Society will contact GIS service providers to explore interest in attending one or more informal gatherings hosted by CLCA, possibly in collaboration with UNH Cooperative Extension. The purpose of these informal meetings will be to identify individuals or organizations interested in helping organize and formalize a GIS service provider group.

C. Increased Capacity of Non-profits to Utilize GIS

NHGCC activities resulting in broad-based access to conservation GIS data and education is only made relevant if the targets of these efforts have in-house, electronic or locally accessible basic GIS tools. With continued educational outreach, ongoing improvements in technological savvy among users, expanding needs, and the increasing cost of fee-for-service GIS services, GIS applications will need to become part of the “desktop suite” of basic applications for conservation organizations in the future, much as desktop publishing has become for many nonprofits. In addition to software, processing power and output devices are requisite to even a limited GIS capability. Therefore, a plan to provide local or in-house access to adequate computers, plotters, presentation tools, and GIS software products (e.g. Arc View and its extensions) must be a key element to a statewide plan to accelerate the pace of GIS-supported conservation and sound land use planning. This flatter, more broad-based approach should complement the proposed service provider network, and at the same time building local capacity to use conservation GIS data.

Acquisition and distribution of group software licenses by the Center for Land Conservation Assistance (CLCA) could be a method of distributing software at an affordable cost. Access to output and presentation devices at active sub-regional locations throughout the state and/or the development of an improved upload/plot/mail-back service designed for broad-band users could reduce the need for every GIS center to have its own plotters. Funding programs that subsidize the acquisition of limited GIS hardware should be created.

Staff Resources Needed: Oversight of these strategies could be a supplementary duty of the proposed half-time coordinator position at CLCA.

D. Development of New Data Analysis Tools

The potential for geospatial technologies to improve land use planning decisions and to accelerate the pace of conservation will be further enhanced by the development and dissemination of specified GIS application and analysis tools. Such applications would include those that involve the analysis of multiple GIS data sets as are commonly used now (such as resource co-occurrence analysis, developable lands analysis, and favorable gravel well analysis, etc), as well as those that involve systems modeling and predictive analyses (such as build-out scenario analyses, impact simulations, visualization applications), which are less common. The latter type is likely to have the greatest potential to effect land use decision-making.

Although GIS application and analytical techniques are likely to be developed to serve specific agency or organizational needs and missions, they will involve application techniques, procedures, and knowledge useful to and reproducible by others.

To further this development, GRANIT could extend its role as clearinghouse/coordinator of GIS data to act in a capacity as developer/maintainer of a library of standardized GIS applications to be obtained, modified, and applied by various users. This would have the added benefit of helping to standardize “best practices” of both the applications and their required data sets. (An existing example of this is the Favorable Gravel Well Analysis developed by DES. The “application” involves the use of several GRANIT and local GIS data sets used in a prescribed sequence of steps which produce an analysis of favorable locations for the siting of public water supply wells. Community Viz (Orton Family Foundation) is another example, though quite different in that it is explicitly designed to help understand the implications of land use policies on a set of resources. Since it is already designed to be a predictive analysis tool, we may want to consider promoting and supporting its use as an element of this Work Plan.)

1. To establish an R&D effort within GRANIT to collect, create, disseminate, and support standardized GIS applications useful in land use planning, resource management, and conservation. This effort should emphasize applications that assist in the understanding and comparison of consequences of land use and resource management decisions.

Staff Resources Needed: One half-time position at Complex Systems Research Center collaborating with the web content manager identified under Goal 1, Section E.

GOAL 3: INCREASE EDUCATION AND TRAINING

Objective 1: To enhance and expand access to geospatial technologies education and training opportunities directed toward resource conservation and sound land use planning.

Strategy:

- 1) Develop a geospatial technology training and resource center.

ACTION PLAN

A. Geospatial Technology Training and Resource Center

NHGCC believes that New Hampshire’s GST Education and Training needs are best served by supporting development of the Geospatial Technology Training and Resource Center. The GSTTRC is a collaborative project led by UNH Cooperative Extension and the GRANIT Project, housed at Complex Systems Research Center. The Center’s five-year Strategic Plan (2003-2007) lays out its vision, goals, objectives, program priorities, and resource needs. The Plan envisions a two-phase implementation, with phase one focused on program expansion efforts for the period 2003-2004.

The strategic plan identifies the following five broad categories in which the training center will offer programs.

- Awareness and preparation training for the non-user
- Application-based training for new and current users
- Coordination of external training providers for current users
- Support programs
- Services

Detailed below are examples of programs within each of these categories that support the NHGCC mission:

1. Awareness and preparation training for the non-user

Title	User Level	Format	Goals/Description
<i>Preparation Programs: Windows Skills</i>	New user	Web or CD	To develop participants’ basic Windows skills before they participate in training.
<i>Introduction to Geospatial Tools and What They Can Do For You</i>	Non-user	Web and CD based / self-guided program	This self-paced, web-based course will enable anyone interested to learn what geospatial tools are and how they can be applied. Individual modules will be targeted to target audiences’ interests.

2. Application-based training for new and current users

Title	User Level	Format	Goals/Description
<i>GIS for Foresters</i>	New user	4-6 days of training over 1 month period	This program will teach consulting foresters GIS and GPS skills specific to their needs.
<i>Collecting Baseline Stewardship Information using GPS</i>	New user	1-2 day workshop	Land trusts and others who manage land can benefit from tools available to assist them in collecting and maintaining data.
<i>Special Topics Workshops:</i> <ul style="list-style-type: none"> • <i>Aquifers</i> • <i>Landcover</i> • <i>Land protection</i> • <i>Wildlife habitat</i> • <i>Other topics</i> 	User	1 day workshop per topic	These workshops will give users a greater understanding of particular data layers and/or provide them with technical skills to make them more effective GIS users.

Title	User Level	Format	Goals/Description
<i>identified in needs assessments</i>			
<i>Community Mapping</i>	New user	13 days	Participants combine learning about natural resources planning and protection with developing skills using GIS software. <u>Audience:</u> educators, community leaders and other interested people
<i>GPS trail mapping program</i>	New User and User	3 instructional sessions	Participants will learn to use a GPS to map trails and will create a trail guide with GPS data and desktop publishing tools.
<i>GIS for Community Decision Makers</i>	New user	12 evening sessions	Similar in content to <i>Community Mapping</i> , this course is designed to provide knowledge, skills and resources to help communities manage and protect their natural resources. <u>Audience:</u> planning board & conservation commission members, town planners, town employees. *currently limited to coastal communities

3. Coordination of external training providers for current users

Title	User Level	Format	Goals/Description
<i>Coordination of external trainings and advanced workshops/courses</i>	Users	Varied	Users will have access to advanced training locally including: -ArcIMS -Visual Basic Programming for GIS -SDE -ArcPAD -Converting Avenue code to Visual Basic -Managing a GIS for multiple users -Wildlife habitat identification and modeling

4. Support

Support	User Level	Format	Goals/Description
<i>Hot line / Help Desk</i>	Users		Resource people will be available to help with technical problems and questions
<i>Web site support</i>			-FAQs -links to helpful websites -bulletin board -Place where developers can submit tools that they have developed

5. Services

Service	User Level	Format	Goals/Description
<i>Publication Series</i>			Manuals and exercises developed for Center's custom programs and workshops
<i>Library</i>			Provide users access to Powerpoint presentations, manuals, exercises, books, etc.
<i>Access to resources: GPS units Large format plotters</i>			Clientele can borrow or access equipment related to geospatial technologies that may not be readily available or affordable to new users.
<i>Map Corps</i>	New Users	Volunteer program	This volunteer program will train and coordinate users to collect GPS data related to all of the focus areas.
<i>Project Planning and Consultation</i>		Project Specific Consultation	Participants will receive assistance in visualizing, planning, archiving and documenting their projects.

Staff Resources Needed: 2 full time Extension Specialists in Geospatial Technologies, half-time time Extension Specialist in GPS.

GOAL 4: INCREASE OUTREACH AND PUBLIC SUPPORT

Objective 1: To have GST's better understood, coordinated, and utilized by state and municipal agencies, and elected officials.

Strategy:

- 1) Build an understanding of GST benefits and needs among key stakeholders in New Hampshire and the broader region.

Objective 2: To generate increased support and financial resources from both public and private sources to greatly expand GSTs in New Hampshire for resource conservation and sound land use decision-making.

Strategy:

- 1) Engage state agency heads and senior management in efforts to ramp up GST development and utilization in New Hampshire.
- 2) Develop a proactive strategy to secure an expanded state commitment to fund GST activities in New Hampshire.
- 3) Develop a fundraising strategy to secure national, regional and local private support for expanded GST capacity in New Hampshire.

ACTION PLAN

A. Building the Case

Build a case for the need for aggressive GST development in NH, to be presented to key decision-makers, and public and private sector funders: the Legislature, individual state agencies, regional planning commissions (RPCs), New Hampshire's congressional delegation, federal agency staff,

and private funders. Identify current GST capacity and resources, a vision of where the state wants to be, and the resources needed to get there. (Road Map)

Staff Resources Needed: Time of communications consultant working with NHGCC coordinator.

B. Outreach to Key Stakeholders

Conduct outreach to key stakeholders and funders through a staged series of meetings including:

- a. Meeting with state agency heads/budget directors
- b. Executive briefing for state agencies, legislators, RPCs, UNH, funders and other key associations;
- c. Day-long workshop and GST Exhibition for state agency personnel, RPCs, NGO's, university reps, municipalities, funders, other key associations

Staff Resources Needed: Time of consultant, NHGCC coordinator, NHGCC members

C. Developing/Implementing Education and Outreach Strategy

Working in partnership with key stakeholders, develop and implement an education and outreach strategy to aggressively secure funding for GST enhancement in New Hampshire.

Staff Resources Needed: Time of several NHGCC members.

IV. TIMELINE

We will update and incorporate the timeline/activity matrix developed initially for the May 2002 meeting. (Not included in document at this time.)

V. BUDGET

An overall budget needs to be developed that outlines each of the proposed costs of the various action plan priority components. (Not included in document at this time.)

VI. SUMMARY

Through remarkable collaboration and planning efforts between the public and nonprofit sectors in the past two years, New Hampshire is poised to develop a comprehensive and integrated model for applying geospatial technologies for natural resource and land use decision-making at the statewide level. Realizing this potential is fundamental to New Hampshire's future. The State cannot solve 21st Century problems with 20th Century tools. It is essential that public and private sector decision-makers and funders recognize the groundswell of interest in these technologies and tools, and the great benefits that they can provide to citizens, communities, and resource managers working to protect the unique character and natural wealth of the Granite State.