

**New Jersey Geospatial Forum
Partnership and Information Task Force**

Final Report

March 23, 2007

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Introduction

The Partnership and Information task force was formed to identify sources of information and document successful partnerships as well as provide information pertaining to the establishment of future potential partnerships. This final report is a compilation of the information gathered by its members and provide further recommendations.

Tasks

The task force established a six (6) tasks which are identified as critical entities that are vital to establishing partnerships or important sources of information required. They are:

- ❑ Increase awareness of available partnerships or projects
- ❑ Improve internal cooperation
- ❑ Identify roadblocks to sharing information affecting partnerships
- ❑ Share technical skills of partnerships
- ❑ Compile agency contacts list
- ❑ Identify funding sources

Goals or specific topics for each task have been identified in order to fulfill each task. The goal or topics are stated throughout the report which comprises the majority of this report. Due to lack of information, time restraints, and lack of interest, not all tasks have been completed.

Partnerships and Projects

The following are examples of varying levels of GIS partnerships in New Jersey as well as several from New York State.

NJMapp

NOTE: For a program to be a true partnership, all participants should put something in to the project and get something out. Few partnerships meet these criteria. The NJMapp partnership, including NJMapp ICAT, is about the closest. Unfortunately, NJMapp has been suspended because of a lack of funding and most ICAT participants were unable to fulfill their partnership requirements.

NJMapp was created by the NJ Office of GIS to help local governments expand their own GIS capabilities through an incentive program that would establish spatial data nodes on the NJ Geographic Information Network (NJGIN).

NJMapp participating counties and municipalities entered into formal partnership agreements with the State and were encouraged to initiate similar partnerships with interested municipalities within their jurisdictions.

The State provided hardware and software to create a local node on NJGIN as well as training and technical support and several web applications . In return, the local partners were to post their metadata on the NJGIN Explorer and host local geospatial data.

NJMapp participants: City of Newark, Atlantic County, Bergen County, Cape May County, Mercer County, Somerset County, Sussex County, and the New Jersey Department of Environmental Protection.

Meadowlands Environmental Research Institute (MERI) Municipal Assistance Program (MAP)

Participants: MERI, Bergen County Municipalities: Carlstadt, E. Rutherford, Lyndhurst, Little Ferry, Moonachie, North Arlington, Ridgefield, South Hackensack, Rutherford, Teterboro; and Hudson County Municipalities: Jersey City, North Bergen, Kearny, Secaucus.

The Municipal Assistance Program (MAP) is an initiative developed by the New Jersey Meadowlands Commission (NJMC) to assist District Municipalities. A component of this program is to transfer Geographical Information System (GIS) technology and data sets to participating Municipalities. This program is administered through the Meadowlands Environmental Research Institute. District municipalities receive a GIS system that includes current and relevant datasets such as: property boundaries, roads, land use, zoning, census data, municipal infrastructure, and satellite images. In addition, a comprehensive training program for municipal staff followed by technical support and refresher seminars is also part of the program. Services to municipalities under this MAP component include the following:

Database Development and Design

Municipal database use ESRI's Spatial Database Engine (ArcSDE) and Oracle 9i to create and manage GIS layers from coverages/ shape files to geodatabase format.

Custom ArcIMS Development

MERI-GIS will customize ArcIMS applications to fit the need of the municipality. A user-friendly application is available on the Internet for users to access critical GIS datasets for each municipality. Refer to Interactive Maps.

Interactive Map Training

Manuals and training are available to municipal staff for use of the GIS.

Data Automation and Integration

MERI-GIS is continually updating the State's parcel data (MOD4) for all municipalities.

Spatial Analysis and Modeling

Capabilities in various modeling and spatial analysis of the Hackensack Meadowlands

District and its 14 municipalities. This includes various raster datasets, from Landsat, hyperspectral imagery, to high-resolution orthophotos.

In addition to the data collection and field work provided, an array of web applications are created for the municipalities to view geo-spatial information on the web. The data can be accessed through the following URL at <http://meri.njmeadowlands.gov/gis/maps.html>

The New Jersey Nonprofit GIS Community

Background

The New Jersey Nonprofit GIS Community (NGC) is a Geographic Information Systems (GIS) users group for nonprofit organizations operating in New Jersey. It was implemented at the Upper Raritan Watershed Association (URWA) in 1996 as part of an initiative proposed by Jack Dangermond, President of Environmental Systems Research Institute (ESRI), for which he pledged up to 500 free copies of ArcView GIS software to nonprofit organizations, environmental commissions and libraries in New Jersey.

At the time of the announced ArcView donation program, Mr. Dangermond also donated ArcInfo to URWA with the understanding that URWA would take a leadership role among nonprofit organizations in New Jersey using GIS technology. Subsequently, URWA was able to obtain funding from the Victoria Foundation to implement the NGC.

URWA hosted the NGC through the end of 2000. The Stony Brook-Millstone Watershed Association (SBMWA) reconvened the group's operations in October 2006 by hosting its first meeting in several years. It is the intention of SBMWA to continue operations.

NGC Membership

Many NGC members came from a list of nonprofit organizations that had previously received a donation of ArcView GIS software from ESRI. Personal contacts made at conferences, meetings, and through member referrals helped increase the NGC membership to 57 organizations in September 2000. In addition, the New Jersey Department of Environmental Protection's (NJDEP) GIS web page had a link to the NGC web site. This link increased awareness of the NGC, prompting inquiries from all levels of government; academia, nonprofits, prospective interns and those merely seeking GIS related information.

Member organizations became more diverse over time. Environmental organizations dominated the membership, but other types of nonprofits became more active in the GIS community and the NGC. Nonprofit organizations in the NGC included the following: Community Development, Education, Environmental, Health, Historic Resources Preservation, Regional Planning and Transportation Planning.

NGC Facilities

NGC facilities were made available to member organizations at the offices of URWA in December 1996. Demand for use of the facilities was high by February 1997. Most

organizations used the facility to develop data and print maps. Other uses included the creation, transfer and conversion of data, GPS and digitizer training, and workshops. In addition, a LCD projector was acquired with funding from the Klipstein Foundation for the use of NGC members at conferences and meetings.

Providing Additional Support

In addition to using NGC facilities, many members called with questions about how to overcome software problems, perform GIS operations and inquire as to the availability of data to help complete a project, among many other questions. Approximately ten to fifteen calls were answered each week.

Many organizations sent plot files via email, floppy disk or zip disk to print for them on the large format color plotter at NGC facilities. The plots were then sent or delivered back to the organization. This service provided great convenience to many NGC members.

Also, the NGC twice collaborated with NJDEP and ESRI to distribute upgrades of ArcView to the membership at meetings or by special arrangement.

Data Clearinghouse

As a function of the leadership role within the GIS community and as an advocate for the distribution of data, the NGC also evolved into a data clearinghouse for nonprofit organizations. The NGC worked with the NJDEP-Bureau of Geographic Information and Analysis (BGIA, currently NJDEP-Bureau of GIS) and NJDEP-Green Acres to release data to nonprofits not widely distributed elsewhere. The release of data to the NGC eased the agency's workload and provided distribution in a quick and efficient manner.

The NGC continued to work with government agencies and nonprofit organizations to enhance the data distribution process in New Jersey. This function also provided a large degree of goodwill between government agencies and nonprofit organizations.

Software

While nonprofit organizations received free ArcView software upgrades from ESRI, the NGC also received ArcInfo software upgrades to function as a center of professional GIS use and expertise among the nonprofit community. This arrangement made high-level use of GIS possible for many nonprofit organizations operating in New Jersey.

Meetings

Meetings provided an important forum to disseminate information and create dialog among NGC members and guests, including all levels of government agencies. NJDEP-BGIA, NJDEP-Green Acres, NJ Geological Survey, NJ Office of State Planning (currently Office of Smart Growth), Natural Resources Conservation Service (NRCS), Hunterdon County GIS, ESRI and several nonprofit organizations gave presentations over the years.

NGC meetings and workshops were well attended. In April 1999 the NGC hosted a morning open space mapping workshop with NJDEP-Green Acres and afternoon meeting that included presentations by NJDEP-BGIA, NJDEP-Green Acres, Hunterdon County GIS, NRCS and the Ridge and Valley Conservancy. 41 guests attended the workshop and 53 guests attended the meeting.

NRCS, Great Swamp Watershed Association, NJDEP-BGIA and ESRI gave presentations at a NGC meeting in December 1999 that was similarly well attended. Attendance rose steadily from the first meeting in November 1996 as the amount of members rose from approximately thirty representing twenty organizations to 83 members representing 57 organizations.

NGC members also participated in other conferences, meetings and workshops such as the Northeast ARC Users Group Conference, MAC/URISA Conference, ANJEC Congress, NJ Land Trust Rally and at State Mapping Advisory Committee (SMAC) meetings.

NGC Internet Web Site

The NGC web site was online from September 1997 through 2001. It featured links leading to information about activities and events concerning nonprofit organizations and GIS. *Princeton On-Line*, an Internet Service Provider, hosted the web site for free. The site was updated as necessary.

Interns

Interns and volunteers were able to work with the NGC or member organizations and gain valuable GIS, GPS and fieldwork experience. Several NGC interns and volunteers obtained full-time employment at member organizations.

Program Accomplishments

Based on URWA's experience, it was apparent that numerous problems must be overcome if GIS technology was to fulfill its promise in the nonprofit community. Identified problems, and the solutions with which the NGC tried to rectify them, included the following:

Hardware Acquisition and Sharing (Capital Efficiency)

Significant confusion existed among potential users as to what equipment was necessary to support their own in-house operations and be compatible with other users. NGC members benefited from having shared access to a network of computer hardware and software that were cost-prohibitive, and an inefficient use of capital for small nonprofit operations to purchase themselves. For those organizations needing to use GIS in-house, the NGC provided specifications for equipment acquisition.

Operator Proficiency (Training and Troubleshooting)

While ArcView software was designed to be much more user friendly than previous GIS software, it still presented problems for those to whom computer software was not intuitive. This was in addition to many first time users' difficulties in grasping basic GIS

concepts. Inexpensive training was available from several sources, including Cook College, but could be overwhelming for novices.

While the NGC did not provide formal GIS training sessions, many members came to NGC facilities to go through online tutorials. Also, many members called or emailed correspondence when trying to overcome problems. If a problem proved to be too difficult, the member was referred to someone who could help.

Formal training was provided for Global Positioning Systems technology. Members worked directly in the field with NGC interns.

Data Acquisition

Although much information about data was available through the New Jersey GIS Resource Guide, other channels of information came through contact with the greater GIS community. The NGC kept its members apprised of data development through correspondence and at meetings. The NGC also acted as a clearinghouse for data created by group members or data from government agencies not released through regular bureaucratic channels.

Project Conceptualization and Development

Many nonprofit organizations were often unaware of the relative ease and power of available analyses using GIS (opportunities) and requirements imposed by the technology (constraints). This led to project proposals that were either overly ambitious or lacked ambition. Group consulting and discussion at the formative stages of project development helped members better define their projects; promoting creativity, while being realistic.

Coordination and Collaborative Project Development

Organizations usually develop programs and areas of expertise independently of others. Skill sets differ by organization and specialization. Given these conditions, considerable potential existed to integrate compatible and complementary skills among organizations. NGC member organizations were encouraged to collaborate on projects and share data at NGC meetings and through correspondence.

Evaluation Statement

The following is a list describing how the effectiveness of NGC activities was assessed.

- Member organizations actively using GIS took leadership positions within the nonprofit and larger GIS communities by participating in SMAC, conferences, workshops and seminars.
- Member organizations not actively using GIS overcame obstacles preventing them from integrating GIS into their operations and increased participation in the nonprofit and larger GIS communities.
- Increased use of NGC facilities, and technical and conceptual support for member organizations' projects.

- Increased members' Global Positioning Position technology proficiency and use to create data.
- Increased interactions among member organizations through attendance at NGC meetings.
- Increased project collaborations and data sharing among member organizations.
- Member organizations provided increased GIS expertise and services to local government.
- Member organizations actively sought funding for GIS related projects.
- Member organizations advocated to government agencies to produce data usable and appropriate for nonprofit use.
- Member organizations used GIS to provide input into revisions of the State Development and Redevelopment Plan.

Sussex County GIS Data Cooperative

The Sussex County Data Cooperative is a mechanism that encourages county, local governments and not-for-profit organizations in Sussex County to share in the creation, use, and maintenance of GIS datasets at the least possible cost while providing data for non-commercial uses.

The GIS Cooperative is a voluntary, cooperative effort among the County and its governmental and non-profit partners. The goal of the cooperative is to share benefits accruing from GIS technology. Benefit sharing arises from mutually agreed upon data sharing and joint application utilization. A key goal of the cooperative is to help share critical data of common interest. The data created through this cooperative agreement will be data for public consumption as part of the NJMapp program, unless, due to the sensitive nature of the data will be utilized only by the Partner and the County. Data may include but not limited to such items as ownership, address, permit and zoning data/information.

The agreement is for a membership year. A membership year is based on the 12-month period following the execution date. The Cooperative is project based with no minimum hourly requirement at a rate of approximately \$30.00/hour.

Staff time will be allotted throughout the year, based on an agreed upon work plan, developed by the Partner and Sussex County GIS. The work plan will describe, in general terms, some of the specific tasks projected for the calendar year. The work program will describe specific tasks, with necessary milestones and identified deliverables. An estimate of expected workload intensity throughout the year will also be projected, so expectations are leveled against staff availability. The work program will be essential in determining expectations of the Partners, while allowing for an effective working relationship.

Cooperative members Interactive GIS websites:

Borough of Hopatcong: <http://njgin.sussex.nj.us/hopatcongmain>

Vernon Township: <http://njgin.sussex.nj.us/vernonmain>

Wallkill River/Upper Delaware Watershed: <http://njgin.sussex.nj.us/udww>

County of Sussex: <http://njgin.sussex.nj.us>

Sussex County Stormwater Inlet Mapping Project

INTRODUCTION

An accurate stormwater inventory for county and local governments is vital for stormwater management, mosquito control and the control of West Nile Disease. A countywide inventory of all stormwater inlets will assist the County and local municipalities in complying with the new stormwater regulations. The Sussex County Office of Mosquito Control treats every stormwater inlet in the County to control the mosquito population and the spread of West Nile Disease and an accuracy inventory of these inlets will assist the Office of Mosquito Control with their treatments in a timely and efficient manner.

Since the exact number of stormwater inlets is unknown and the number of inlets is most like in the thousands and the inventory will benefit numerous county divisions, municipal departments and not-for profits, the Office of GIS Management has developed a team of various county departments, municipalities, and not-for-profits. The participating parties are:

- ❑ Sussex County Department of Engineering and Planning, Division of Engineering, Office of GIS Management
- ❑ Sussex County Department of Health and Human Services, Division of Health, Office of Mosquito Control
- ❑ Sussex County Vocational High School, Engineering
- ❑ Hardyston Township
- ❑ Hopatcong Borough
- ❑ Sparta Township
- ❑ Wallkill Watershed
- ❑ Upper Delaware Watershed
- ❑ Lake Hopatcong Commission

Each participating party is providing either technical expertise, field crews for data collection, or hardware/software. The Office of GIS Management is providing data processing, data warehousing, data distribution, and overall project management.

METHOD

This portion of the project will concentrate on the stormwater inlets. The exact number of inlets is unknown, but since many of the inlets are along roadways, there are approximately 1,680 miles of state, county, and municipal roads within Sussex County.

The location of all inlets will be obtained through the use of Trimble Pro XR or Geo CE XT gps units with a horizontal accuracy of < 1 meter following the Sussex County GPS Standards for Data Collection. In addition to collecting the location of the inlet, attributes about the inlet will be collected. A data dictionary for the Pro XR and the Geo CE XT has been developed, which allows the field crews to collect specific information pertaining to the inlet, such as: inlet type, grate style, physical condition, etc., while collecting its spatial location (x,y coordinates). After the information is collected, the data is transferred from the GPS unit onto a workstation, processed, and then exported into a GIS database. An example of the data exported into the GIS database can be found at the end of this document.

The Sussex County Office of GIS Management has developed a custom application, which will allow field crews to obtain the spatial location as well as information pertaining to the outfall using a handheld computer with an integrated GPS unit (see Figure 1).

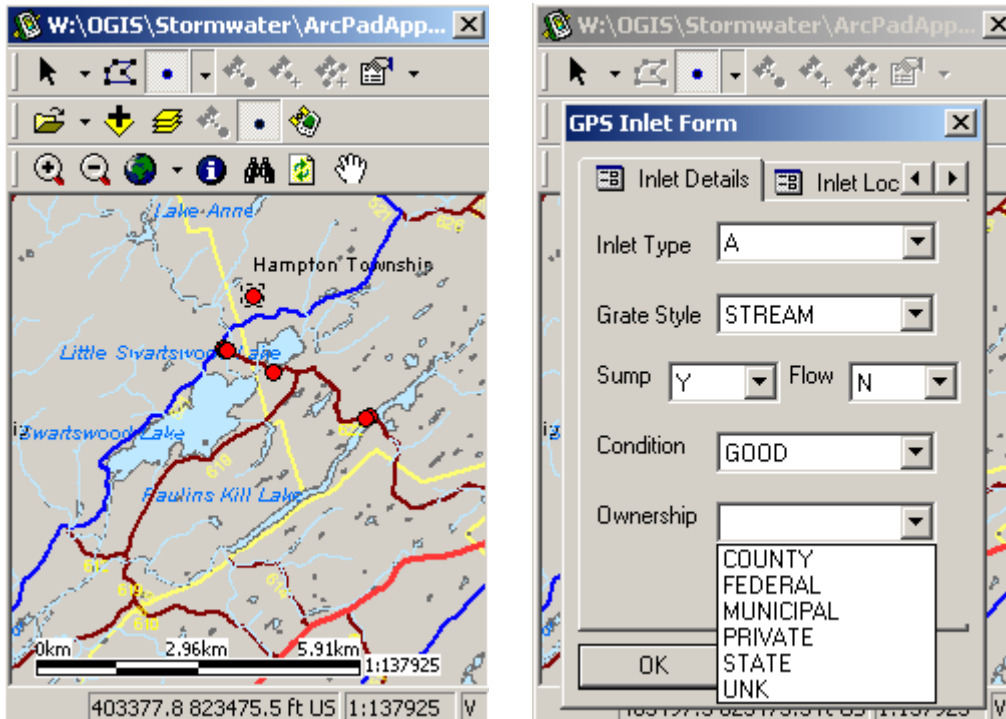


Figure 1 - Stormwater Inlet Application

A help document has also been created to assist the field crews in data collection. In addition to the help document, the Office of GIS Management will provide any GPS training for the field crews (if needed), and any training such as roadside safety and the

ability to recognize stormwater type, grate style, etc. will be provided by the Sussex County Division of Engineering.

In order to efficiently collect the locations of all of the inlets, field teams will be given a county atlas, which, is divided into 54 “grids”. Each field team will be assigned a block of grids and is responsible to locating and mapping all inlets found along the roads in each grid. On a weekly basis or as “grids” are completed the data will become available on the future Sussex County Internet GIS website or on CD.

NY State Partnerships – A full listing of NY State partnerships can be found at: <http://www.nysgis.state.ny.us/coordinationprogram/reports/partnerships/index.html>

GIS Ahead

The GIT Ahead project focuses on workforce preparation in Geospatial Information Technology (GIT) fields through teacher professional development, educational software development, and provision of internships, job shadowing, and career preparation experiences for high school students in urban and rural schools. GIT represents a broad category of tools that are becoming increasingly available to help with regional problem-solving, but there is a shortage of technicians trained to apply these tools.

The goals of the GIT Ahead Project are to:

- ❑ Provide teachers with ongoing professional development focused on science teaching and learning and Geospatial Information Technology (GIT)
- ❑ Engage teachers in interdisciplinary teams to develop project-based lessons and units that focus on significant environmental issues in the Finger Lakes region
- ❑ Create the Internet-based Finger Lakes GIS Explorer software based on existing professionally-used technologies at the Institute for the Application of Geospatial Technology (IAGT)
- ❑ Engage high school science students in Finger Lakes watershed-focused inquiry projects using the Finger Lakes GIS Explorer software and desktop-based GIS
- ❑ Provide high school students with visions of career possibilities through participation in GIT lessons and units, summer internships, and job shadowing opportunities
- ❑ Provide pathways for rural and urban high school students to enter the GIS Associate’s Degree program at Cayuga Community College and/or see geospatial technology as a viable career option
- ❑ Develop collaborative relationships among organizations, institutions, and businesses in the Finger Lakes Region who have a vested interest in the regional GIT workforce and its capacity

The ultimate goals of the GIT Ahead project are a) to help rural and urban high school students envision careers using geospatial technologies, and b) to create higher education pathways for students who might not otherwise pursue such goals, especially those in lower track science courses. These goals will be accomplished through teacher professional development and a series of student learning opportunities focusing on GIT as outlined above.

**NYS Office of Cyber Security and Critical Infrastructure Coordination (CSCIC)
Local Government GIS Web Hosting Pilot Project**

The pilot included the development of a powerful and easy-to-use, web-based GIS application as well as web hosting services for four local governments for a one year period. This application included a set of high priority functionality selected to provide tangible and direct benefits to users in support of many of their common business requirements. The goal of the pilot was to demonstrate the usefulness of these types of sites so that development costs could be offered to municipalities on the New York State Procurement Contract for a discounted price to state and local government organizations. The focus for the application was to support everyday business uses for people accessing/utilizing parcel (land records) data.

Each of the web-based GIS applications included an extensive set of spatial data layers provided by CSCIC and other NYS agencies and up to 10 data layers provided by the local government. In particular, tax parcel boundaries, provided by the local governments, were a pivotal data layer on which much of the applications key functionality was based.

Overall, the partnership was a great success, as measured by monitoring of the number of “hits” to each public access site and through the feedback provided through an anonymous online feedback form. Between the four local government websites, more than 2.9 million hits were registered during the 1-year period. At the conclusion of this pilot project, CSCIC has gained valuable experience and feedback that will be evaluated when establishing potential future directions for this important initiative.

In addition, the online application has been a great success for the participating local governments. Delaware County, in particular, has secured funding for the continued support of the application beyond the CSCIC contract period and plans to grow the application to accommodate user needs.

***Delaware County:** staff, data for the application

***Tioga County:** staff, data for the application

***Town of Brunswick:** staff, data for the application

fountains spatial (Applied GIS): hardware, software, technical staff, hosting, end user training

Date Partnership Began: June, 2005

Completed: June, 2006

Public – Private partnerships

This type of partnership is surprising hard to find through out the state. There are a number of relationships between private and public organizations but few if any meet the definition of a partnership.

Improve internal cooperation

Many governmental organizations require formal agreements in order to share data or establishment partnerships. Agreements can be created on a project by project basis or created under an “umbrella” agreement. Examples of data sharing agreements, interlocal agreements, and resolutions can be found in Appendix A through Appendix C.

Funding Sources

The following is a list and summary of sources for grants and grant writing.

Grant Writers

Council of New Jersey Grantmakers www.cnjr.org

Grant Lists

ESRI Grants Listing

ESRI researches and promotes grants that will fund GIS or geospatial projects. The ESRI Grant Notification System allows GIS users to register for notices regarding non-ESRI federally funded grants in specific areas of interest. Visit www.esri.com/grants/index.html for more information or to register for e-mail notification from ESRI of future funding opportunities. ESRI software grants are also available periodically for specific areas of interest.

The Foundation Center's Philanthropy News Digest - Request for Proposals

<http://foundationcenter.org/pnd/rfp/>

NJ Commission of Environmental Education Funding, grants & Scholarships

<http://www.nj.gov/dep/seeds/njcee/grants.htm>

Hardware Grants

Norcross

OEM/Homeland Security

TechSoup

TechFoundation

Project Grants

Battlefield Grants: Grant applications are now being sought by the American Battlefield Protection Program (ABPP) for battlefield preservation, protection, planning, interpretation, education and tourism. These grants are reserved for non-profit groups, community groups, and local, regional, and state officials. The deadline for grant applications is 12 January 2007. For more information, please contact Grants Manager Kristen Stevens at (202) 354-2037 or visit the website of the ABPP.

LEADS TO FOLLOW...

- [Geomagic](#), a software and services company, has won a 2006 Tibbetts Award from the [Small Business Technology Council](#), a nonpartisan, nonprofit industry association of companies dedicated to promoting the creation and growth of research-intensive, technology-based U.S. small business. Tibbetts Awards are given annually to companies, projects, organizations and individuals judged to exemplify the best in SBIR (Small Business Innovative Research) Program achievement. Geomagic has been awarded several SBIR grants for its technology leadership in digital shape sampling and processing over the years, the company reports.
- Saarland University, located in southwest Germany, is offering a novel interdisciplinary [master course of study](#) entirely devoted to visual information processing. Potential students holding a bachelor's degree in computer science, mathematics, physics, electrical engineering, mechatronics or a related field can apply. The program is coordinated by the Computer Science Department of Saarland University and is supported by the Departments of Mathematics, Mechatronics and Physics, as well as by the Max Planck Institute of Computer Science and the German Research Centre for Artificial Intelligence. The research-oriented international course of studies can be completed entirely in English. The normal duration of studies is two years (four semesters) with students starting in the winter or summer. Some grants for very gifted students are available.

American Association of University Women Educational
Foundation Accepting Applications for Community Action
Grants

One of the world's largest sources of funding exclusively for graduate women, the American Association of University Women (<http://www.aauw.org>) Educational Foundation supports aspiring scholars around the globe, teachers and activists in local communities, women at critical stages of their careers, and those pursuing professions where women are underrepresented.

In 2007-08, the foundation's Community Action Grants program will award one- and two-year grants.

One-year grants (\$2,000 to \$7,000) provide seed money for new

projects. Topic areas are unrestricted, but should include a clearly defined activity that promotes education and equity for women and girls.

Two-year grants (\$5,000 to \$10,000) provide start-up funds for longer-term programs that address the particular needs of the community and develop girls' sense of efficacy through leadership or advocacy opportunities. Topic areas are unrestricted, but should include a clearly defined activity that promotes education and equity for women and girls

Applicants must be women who are U.S. citizens or permanent residents. Grant projects must have direct public impact, be nonpartisan, and take place within the United States or its territories.

Visit the AAUW Educational Foundation Web site for complete program information, application procedures, and the database of school and community projects for women and girls that highlights promising practices, exemplary materials, and lessons learned from the Foundation's Community Action Grants.

RFP Link:

<http://fconline.foundationcenter.org/pnd/10004025/auw>

For additional RFPs in Women, visit:

http://foundationcenter.org/pnd/rfp/cat_women.jhtml

The National Fish and Wildlife Foundation

The National Fish and Wildlife Foundation (the Foundation), in cooperation with the Partnership for the Delaware Estuary (the National Estuary Program), are pleased to announce a Request for Proposals for approximately \$800,000 in new funds under the 2006 Delaware Estuary Watershed Grants (DEWGP) Program. In its first three years, the DEWGP has awarded 87 grants, providing over \$1.7 million in federal and private funds which were leveraged with an additional \$6.5 million in matching contributions raised by grantees working to restore living resources in Delaware, New Jersey, and Pennsylvania -- the three states that share the land and water in the 6,700-square mile Delaware Estuary.

Additional information on this funding opportunity is available at the program website: <http://www.nfwf.org/programs/delaware.cfm>

GIS Grant Opportunities

Federal grant email "notifier" -

<http://fedgrants.gov/ApplicantRegistration.html>

Grants "How To" -

www.federalfundingsources.com

General GIS grants -

www.technologygrantnews.com/grantindex-by-type/federal-grants.html

www.technologygrantnews.com/grant-index-by-type/city-grants.html

www.esri.com/grants/index.html

www.fema.gov

www.fgdc.gov/funding/funding.html

www.census.gov/geo/www/tiger/index.html

www.nationalmap.usgs.gov

How to Obtain Funding

Special grant applications in Geographic Information Systems are not currently being solicited by the Statistical Research and Applications Branch or by the National Cancer Institute. When there are solicitations, notice of them will be posted here.

Interested researchers may submit unsolicited applications for R01 (investigator-initiated) or R03 (small) grants. Researchers who are new to the NIH grant application process should see the [NIH Grants and Funding Opportunities](#) Web site, particularly the ["Welcome Wagon" letter](#), to learn more.

For a general listing of currently funded NCI grants in biostatistics, along with information on how to obtain grants, see the statfund.cancer.gov Web site. For a specific listing of currently funded NCI grants in GIS-related areas, see the [Funded Statistical Grants -- Spatial/GIS Models](#) section of that site.

Past Announcements

NCI has previously solicited grant applications in GIS under the Program Announcements [PAS-00-120](#) and [PAS-00-121](#).

The following sites are good starting places to look for GIS grant opportunities:

- [ESRI Grant Assistance Program](#): Provides links to GIS grants sponsored by the Environmental Systems Research Institute and also to non-ESRI GIS grants from federal, state and local governments, foundations and various industries.
- [National Spatial Data Infrastructure Cooperative Agreement Program \(CAP\) Grants](#): An annual program from the Federal Geographic Data Committee (FGDC) to assist the geospatial data community through funding and other resources in implementing the components of the NSDI.
- [Grants.gov](#): This website managed by the U.S. Department of Health and Human Services is THE single access point for over 1,000 grant programs offered by all Federal grant making agencies. Organizations can electronically find and apply for more than \$400 billion in Federal grants, some of which are related to GIS.

In addition to government agencies, many private philanthropic organizations and foundations are interested in information technology and improving the functioning of

government. The site below provides a starting point for locating government agencies and private organizations that are interested in these areas but which may not have specific funding programs related to GIS.

[FirstGov.gov for Nonprofits](#): A network of links to Federal government information and services, including links to the grants programs of Federal agencies, state and local funding directories, and a guide on writing successful grant proposals.

Educational Sources

The following is a list of GIS educational institutions and course descriptions. This task was added to the existing list of tasks. The suggestion of adding educational sources was a result of discussions during a task force meeting.

As a task of the Partnership & Information Sharing taskforce the Post Secondary academic GIS programs and course have been accumulated in a single document, for the greater NJ region. An attempt was made, to format each school's content detail in a similar fashion, using material on their respective public websites. Included are school name, links, type degree, and credits.

Masters

PSU
Univ. of Delaware
NJIT
West Chester - PA
Shippensburg - PA

Post-Baccalaureate Certificate

PSU
Hunter - NY

Undergraduate

Rutgers Univ.
Univ. of Delaware
West Chester - PA
Shippensburg - PA
Kutztown -PA

Undergraduate Minor

PSU
Monmouth Univ.
West Chester – PA
Shippensburg - PA

Associates

Burlington County College
Community College of Baltimore

GIS Certificate

Rutgers Univ.
Lehman – NY
Shippensburg – PA
Richard Stockton College of NJ

Essex County College

Note, Rutgers Univ. also offers an Adult Ed Geomatics Program, while Princeton Univ. offers internal only online course and training.

HUNTER COLLEGE (NY)
Post-Baccalaureate Certificate

http://www.geography.hunter.cuny.edu/programs/gis_cert.html

General Information

15 credit non-degree program

This program offers advanced training in GIS to individuals who do not wish to pursue a Master of Arts degree. It is a non-degree program and students who apply to Hunter College only to get the GIS Certificate are no matriculated students. As such, they are not eligible for financial aid and they cannot apply for a student visa under current INS guidelines. However, a student may be enrolled concurrently in a degree-granting program and therefore meet these requirements.

Required Course (3 credits)

GTECH 732 Geographic Information Systems (3)

**Core Courses (a minimum of two courses
chose from the following)**

GTECH 705 Spatial Data Analysis (3)

GTECH 722 Automated Cartography (3)

GTECH 731 Computer Programming for Geographic Applications (4)

GTECH 733 GIS Modeling and Problem Solving (3)

Electives

GEOG 705.72 GIS Law (3)

GTECH 702 Quantitative Methods in Geography (3)

GTECH 711 Principles of Photogrammetry and Air Photo Interpretation (4)

GTECH 712 Remote Sensing (4)

GTECH 713 Digital Image Processing (3)

GTECH 721 Advanced Cartography (4)

GTECH 731 Computer Programming for Geographic Applications (4)

GTECH 733 GIS: Modeling and Problem Solving (3)

GTECH 785 GIS Applications (3)

LEHMAN COLLEGE (NY)
GIS Certificate Program

http://www.lehman.edu/deannss/geography/gis_cer_prog.html

Program Description (17 Credits)

Geographic Information Science (GIS) is a fast-growing computer technology field involving mapping and analysis of spatial data. Geographic Information Systems (GIS) enable us to assess and manage existing conditions, and also help predict future conditions, ranging from monitoring disease occurrences, to endangered species preservation, to managing water supplies, to tracking real estate values, to crime solving.

GIS is used today in fields as diverse as law enforcement, marketing, economic development, public health administration, environmental analysis, ecology, urban planning, real estate, government, education, geology, anthropology, and archaeology. GIS is an expanding field with good career opportunities, and GIS professionals are in high demand in many fields. People with GIS skills can also be more marketable as managers and analysts in their own fields. A Certificate in GIS can be advantageous by itself or in augmenting a Masters, Bachelors or Associates Degree.

The Certificate in GIS consists of a sequence of 4 courses, equaling 14 credits, plus one 3-credit Geography elective course, for a total of 17 credits. Courses are offered in the evenings and some via e-mail. The courses can be taken for credit at either the undergraduate or graduate level, leading to the Certificate.

Required Coursework (14 credits):

GEP 204 / GEP 504 Basic Mapping: Applications and Analysis (3 credits);
GEP 205 / GEP 505 Principles of Geographic Information Science (GIS) (3 credits);
GEP 350 / GEP 605 Special Projects in GIS* (4 credits);
GEH 490 / GEP 690 Workshop in GIS (4 credits);

*Note: Recent topics in the "Special Projects in GIS" course include "Environmental Planning with GIS," and "Spatial Analytical Methods in GIS." Topics planned for the future are "GIS for Public Health," and "Using GIS in Ecology."

Geography Elective (3 credits), to be selected from among:

GEH 101 / GEH 501 Introduction to Geography: People, Places, and Environment, (may be taken via e-mail);
GEH 230 / GEH 530 Human Geography (may be taken via e-mail);
GEP 230 / GEP 530 Urban Environmental Management;
GEH 235 / GEH 613 Conservation of the Environment;
GEH 240 / GEH 540 Urban Geography;

GEH 266 / GEH 566 Geography of Development, (may be taken via e-mail);
(Other geography courses may be substituted for the elective requirement with
department permission.)

TOTAL FOR GIS CERTIFICATE: 17 credits

Prerequisite for entering GIS Certificate Program: An Associates Degree, or completion
of 60 college credits with at least a 2.0 GPA (C average). To take courses at the Graduate
level, you must have a Bachelors Degree with a 3.0 GPA (B average).

GIS Minor

The Minor in Geographic Information Science (GIS) requires a total of 14 credits, and is
satisfied by the sequence of coursework outlined below. The program includes
opportunities for both internships and independent studies in GIS.

10 credits in:

- GEP 204** Basic Mapping - Applications and Analysis (3 credits)
- GEP 205** Principles of GIS (3 credits)
- GEP 350** Special Projects in GIS (4 credits - may be taken twice for a total of 8 credits*)

4 credits to be selected from:

- GEP 470** Internship in GIS (4 credits)
- GEH 490** Honors in Geography (4 credits - requires a GIS research topic)

* Recent topics in the Special Projects in GIS course include "Environmental Planning
with GIS," and "Spatial Analytical Methods in GIS." Topics planned for the future are
"GIS for Public Health," and "Using GIS in Ecology."

THE RICHARD STOCKTON COLLEGE OF NEW JERSEY (NJ)

Geographic Information Systems Certification

<http://loki.stockton.edu/~wwwgis/index.html>

Program Information

18 Credits

The program objective is to certify a student's satisfactory completion of a series of courses designed for professional GIS training and education at Richard Stockton College of New Jersey. GIS is becoming increasingly important as a cost-effective means of data analysis and presentation in a wide range of specialties. In addition to Environmental professionals, GIS is being used by Public Health officials, Planning Departments, Police and Fire Departments, Business Marketing professionals, and others. According to recent figures mentioned in the UCGIS's most recent report, *UCGIS Education White Paper*, the annual demand by professionals for GIS course work is estimated at 75,000. There are presently about 200 programs in the US that offer a certificate in GIS, with an annual graduation rate of 4000. The difference may be made up by you who are willing to join GIS Certificate Program at Richard Stockton College.

GEOGRAPHIC INFORMATION SYSTEMS (GIS)

18 Credits

Prerequisites (for non-ENVL majors):

GNM 2131, Geographic Information Concepts

(3 or 4)

ENVL 2400, Intro to Statistics and Computers, or equivalent (4)

Common Core: 10-12

ENVL 3302, Geographic Information Systems or equivalent(4 or 5)

ENVL 3303, Advanced GIS (Spring) (4 or 5)

ENVL 4622, Global Positioning Systems for GIS (Fall) (2)

Select one or two from the following courses:

ENVL 3304, Remote Sensing (4)

ENVL 3307, GeoDatabase (4)

ENVL 4201, Spatial Statistics (2)

CSIS 3222, Database Systems (4)

ENVL 3306, GIS Internet Map Server (2)

GIS Senior Project or Internship: 4

ENVL49/4800, GIS projects(4)

RUTGERS UNIVERSITY (NJ)

http://catalogs.rutgers.edu/generated/nb-ug_0507/pg21107.html

http://catalogs.rutgers.edu/generated/nb-ug_0507/pg21146.html

1-Courses in GIS at Rutgers

2- Environmental Geomatics Certificate (19 credits)

3- Environmental Planning and Geomatics 372 (Undergraduate)

Courses in GIS at Rutgers

There are several GIS short courses conducted at Rutgers through the Cook College Office of Continuous and Professional Education

3D Analyst Extension

ArcGIS: Editing and Data Development

ArcGIS: Introduction

Cartography for GIS Users

Creating Metadata with ArcCatalog

Design & Implementation of GIS

Design & Management of Spatial Databases

Fundamentals of GIS

Fundamentals of Remote Sensing

GIS Programming I: VBA and ArcObjects

GIS for Water/Wastewater Operations

GPS Mapping & GIS Data Collection

Introduction to Database Design with Access

MAC URISA's 2006 Regional GIS Conference

Network Analyst Extension

Spatial Analyst Extension

Working with Geodatabases

**Environmental Geomatics Certificate
(19 credits)**

The regional and global scope of environmental problems is now well established. Satellite remote sensing provides the only feasible means of monitoring large regions of the earth and its land and water resources in a timely fashion. Remotely sensed data can be combined with other resource data in a computerized geographic information system (GIS). The GIS provides a powerful set of tools to store, integrate, analyze, and graphically display vast amounts of environmental data. The Environmental Geomatics

Certificate is designed to give students, regardless of major, an understanding and working knowledge of remote sensing and GIS technology and its application to environmental resource monitoring and management.

11:372:232 Fundamentals of Environmental Geomatics (3)

11:372:233 Fundamentals of Geomatics Laboratory (1)

11:372:362 Intermediate Environmental Geomatics (3)

11:372:369 Analytical Methods for Environmental Geomatics (3)

11:372:371 Air-Photo Interpretation (3)

11:372:462 Advanced Environmental Geomatics (3) or 11: 372:474 Advanced Remote Sensing (3)

01:960:401 Basic Statistics for Research (3) or equivalent

Environmental Planning and Geomatics 372 (Undergraduate)

11:372:202 ENVIRONMENTAL ISSUES IN THE UNITED STATES (3)

Major trends in contemporary environmental concerns. Analysis of environment as a system of interrelated natural and man-made resources, people, and social institutions. Public policies designed to cope with environmental-human needs.

11:372:231 FUNDAMENTALS OF ENVIRONMENTAL PLANNING (3)

Principles of environmental planning related to the planning process. Special emphasis on natural principles, policy issues, and social concerns impacting land use outcomes

11:372:232 FUNDAMENTALS OF ENVIRONMENTAL GEOMATICS (3)

New technologies to make better use of geospatial data for environmental and natural resource analysis and management. Basic concepts, definitions, and examples of different applications used in an environmental planning and management context.

11:372:233 FUNDAMENTALS OF ENVIRONMENTAL GEOMATICS LABORATORY (1)

An optional laboratory to accompany **11:372:323**. Experience in the basics of GIS using ArcView. **Corequisite: 11:372:232 or by permission.**

11:372:322 LAND MEASUREMENT AND MAPPING (3) Principles of surveying and mapping. Measurement of distances, angles, and direction. Use of tripod level, transit, compass, plane table, and personal computer. **Lec./rec. 2 hrs., lab. 3 hrs. Prerequisites: Algebra and trigonometry.**

11:372:362 INTERMEDIATE ENVIRONMENTAL GEOMATICS (3)

Concepts and techniques for the manipulation and analysis of geospatial data. Emphasis on environmental and natural resource management applications. Instruction in desktop geographic information system software. **Prerequisite: 11:372:232.**

11:372:369 ANALYTICAL METHODS FOR ENVIRONMENTAL GEOMATICS (3)

Statistical concepts and related quantitative techniques for the analysis of problems in environmental and natural resource management, with emphasis on gathering,

processing, and analyzing spatial information. ***Prerequisites: 01:198:110 or equivalent, 01:960:401 or equivalent, or permission of instructor.***

11:372:371 *AIR-PHOTO INTERPRETATION (3)* Interpretation and analysis of aerial photography and remotely sensed imagery for environmental and natural resource management. Photogrammetry, mapping, geology, land forms, hydrology, soils, vegetation, and cultural features. ***Prerequisite 11:372:232 or permission of instructor.***

11:372:374 *GLOBAL POSITIONING SYSTEMS (1.5)*
Use of Global Positioning Systems (GPS) to capture and integrate field data into a Geographic Information Systems (GIS) database for environmental analysis.
Prerequisite: 11:372:232 or permission of instructor.

11:372:381 *INTRODUCTION TO SYSTEMS THINKING AND THE SYSTEMS APPROACH (3)*
The use of systems thinking and the systems approach for developing comprehensive understandings of and improving complex problem situations. Consideration of both hard and soft systems approaches. Application to a broad range of problems involving environmental and human activity systems. ***Not open to first-year students.***

11:372:384 *A SYSTEM APPROACH TO ENVIRONMENTAL AND AGRICULTURAL ISSUES (3)*

Exploration of the complexities of environmental and agricultural issues, using a system approach. The use of both hard and soft systems methods in addressing complex problem situations involving the environment and agriculture.

Prerequisite: *11:3372:381 or permission of instructor*

11:372:409 *NEW JERSEY PLANNING PRACTICE (3)*

Practice of planning, including land use, environmental, transportation, and other planning fields; structure of planning for all levels of government, covering planning history, legislation (with a focus on the Municipal Land Use Law), intergovernmental relationships, and the various participants in the planning process. Includes a team-based field project.

Prerequisites: *11:372:231 or equivalent.*

11:372:411 *ENVIRONMENTAL PLANNING AND THE DEVELOPMENT PROCESS (3)*

Comprehensive examination of the relationship of environmental planning to land development; fundamental principles of environmental planning and assessment; analysis of environmental considerations critical to the land-development process using case studies. Includes a team-based field project.

Prerequisites: *11:372:231 and 232, or equivalent.*

11:372:442 *APPLIED PRINCIPLES OF HYDROLOGY (3)*

Basic hydrologic concepts and processes and related quantitative techniques appropriate to planning, management, and design considerations; hydrologic cycle, hydrology as a quantitative science, probability and statistics, the drainage basin, precipitation, infiltration, evaporation and evapotranspiration, surface water, hydrographs, soil moisture, groundwater, and managing water and watersheds.

Prerequisite: *01:640:115 or equivalent. Not open to first-year students*

11:372:462 *ADVANCED ENVIRONMENTAL GEOMATICS (3)* Advanced and applied analysis of geospatial data. Emphasis on environmental- and natural resource-management applications. Instruction in state-of-the-art geographical information system software.

Prerequisites: *11:372:362 and 369.*

11:372:474 *ADVANCED REMOTE SENSING (3)* Principles of satellite remote sensing and digital image analysis for environmental and natural resource applications. Instruction in state-of-the-art digital image processing/analysis software. **Prerequisites:** *11:372:369 and 371.*

11:372:493,494 *SPECIAL PROBLEMS IN ENVIRONMENTAL RESOURCES (BA,BA)* Special problems in environmental resources involving original work. **Prerequisite:** *Permission of chairperson of the Department of Ecology, Evolution, and Natural Resources.*

BURLINGTON COMMUNITY COLLEGE (NJ)
Associate of Applied Science
Geospatial Technology

<http://www.bcc.edu/pages/277.asp>

Description (64 credits)

This program consists of a sequence of introductory courses in geographic information systems (**GIS**), global positioning systems (**GPS**) and remote sensing (**RS**).

These courses will emphasize the practical use of geospatial technology to a broad range of issues such as sustainable populations growth, land use management, transportation route planning, and water-quality management.

Graduates of this program will be able to:

- Demonstrate an understanding of geographic information systems and how they can be used to manage and analyze spatial information
- Demonstrate an understanding of the principle of remote sensing and image processing.
- Explore geospatial technology's role in social, behavioral, life, and physical sciences
- Apply critical thinking and communications skills through problem-solving projects

General Education Courses: (24)

Written Communications (3)

Mathematics (MTH 130 required) (4)

Computer Science (CSE 110 required) (4)

Natural Science (4)

Arts and Humanities (3)

Social Science (6)

Program Courses: (31)

CSE 213 Database Systems (3)

GEO 102 Principles of Geography (3)

GIS 101 Fundamentals of Geographic Information Systems (3)

This introductory course includes an overview of maps and computer systems, a look at models for attribute and spatial data, the organization of information in a GIS, how a GIS can be used, and future trends for this technology. Geographic Information Systems (GIS) deals with the development and use of maps and data. GIS integrates the display capabilities of a computerized map with the information management tools of a spreadsheet.

GIS 201 Advanced Applications in Geographic Information Systems (3)

This course provides skills and knowledge to explore problems using a GIS. Students learn how to convert data to digital format; import digital data; edit digital data; create and manipulate databases; analyze spatial relationships; provide map outputs; and create program user interfaces.

GIS 202 Fundamentals of Remote Sensing (3)

This course focuses on the principles of remote sensing and image processing and their applications. It concentrates on aerial photography, but includes satellite imagery. It details the physical principle upon which a variety of photographic and non-photographic sensors operate, describes the existing satellite systems used for remote sensing, describes the principles behind image interpretation, and provides instruction with computer programs.

GIS 203 Fundamentals of Global Positioning Systems (3)

This course introduces the Global Positioning System (GPS), including the conceptual basis for GPS and hands-on operation of the technology, including computer interfaces, GIS software, and real-world applications.

GIS 291 Geospatial Technology Projects/Internship 1 cr.

GIS 292 Geospatial Technology Projects/Internship 2 cr.

GIS 293 Geospatial Technology Projects/Internship 3 cr.

These courses enable students to complete a series of projects supervised by a faculty member or to complete an internship with a company or government agency. Both options provide experience in using GIS, GPS, and remote sensing technologies together to solve a variety of problems in areas such as mapping, marketing, environmental studies, town and regional planning, and facility management. Students use GIS, GPS, and image processing software to complete projects during the semester.

Select 10 credit hours from the following:

HIS 103 Human Ecology (3)

HIS 108 Human Ecology Laboratory (1)

HIS 108 Chemical Data Acquisition and Processing (2)

HIS 108 Programming in BASIC (3)

HIS 108 Introduction to Visual BASIC (3)

HIS 108 Architectural Computer Graphics and Design (3)

HIS 108 Civil Computer Graphics (3)

HIS 108 Principles of Macroeconomics (3)

HIS 109 Physical Geology (3)

HIS 203 Physical Geology Laboratory (1)

HIS 204 Introduction to Statistics (3)

Electives: 9 credit hours

Total required for the degree: 64 credit hours

New Jersey Institute of Technology (NJ)

Masters Level

<http://web.njit.edu/~sima/course.html>

Remote Sensing/Geographic Information Systems Options in **Engineering Science Program**

This is an interdisciplinary program designed for those individuals who seek advanced knowledge in Remote Sensing/Geographic Information Systems, particularly related to the study of the Earth from space. The main objective of creation of this specialization is to educate the professionals to make well informed decisions in solving environmental problems utilizing combined technology of Remote Sensing/Geographic Information Systems.

Degree RequirementCore/Required Courses:

CE 506 Remote Sensing of Environment

This course covers principles of remote sensing, general concepts, data acquisition procedures, data analysis and role of remote sensing in terrain investigations for Civil/Environmental Engineering practices. Data collection from airborne and satellite platforms are emphasized. Photographic and non-photographic sensing methodologies are covered as well as manual and computer assisted data analysis techniques for site investigations and examination of ground conditions. The lab component of the course covers an introduction on ERDAS/Imagine interface including: digital data entry, data viewing, basic image enhancement and georeferencing.

CE601 Advanced Remote Sensing

Principles of Computer processing of satellite and aircraft remote sensing data will be covered as well as image enhancement, image transformation and image classification techniques using advanced image analysis system -- ERDAS in the interactive mode. Multiple applications on land use/land cover, water quality assessment and terrain evaluation will be emphasized. During final weeks of the semester students will apply the acquired techniques to specific projects.

CE602 Geographic Information Systems

Covers the Principles of GIS. The Lecture and reading components provide a background on the development of GIS and present alternative perspectives for spatial data analysis. The practical component of the course provides for direct contact with the analysis of spatial information through the commercial software packages ~ Arcview. The "GIS Resources" web page developed for this course provides information on all aspects of GIS including access to data archives, information on professional societies and journals as well as numerous links to other GIS related programs or centers of expertise. A Student Project is required of all students. CE 643 Digital Image Processing I

MATH 661 Mathematical Statistics I

MATH 658 Operational Analysis I

CE603 Research Methods in Remote Sensing

Major component of RS data acquisition systems, overview of image processing techniques with emphasis on neural network and traditional pattern recognition, principal component transformations, and data reduction will be covered. Geometric and mapping aspects of RS/GIS techniques for linking RS image with spatial data, sources of errors, and accuracy assessment techniques will be emphasized. Hands on experiences with existing hardware/software(ERDAS &GENISIS) will be utilized.

CE604 Environmental Modeling in Remote Sensing/Geographic Information System

This course provides a review of current research and literature dealing with environmental RS/GIS. Applied and Computer Modeling of land and ocean will be emphasized. Case studies in RS/GIS applications, with emphasis on "real world" environmental problems, will be presented by outside experts. Particular emphasis will be given to incorporating these modeling techniques into student projects.

Elective Courses

Geol 577 Environmental Geology (Rutgers-Newark)

EvSc 610 Environmental Chemical Science

EvSc 613 Environmental Problem Solving

EnE 660 Introduction to Solid & Hazardous Waste Problems

EvSc 615 Global Environmental Problems

CI 657 Principles of Interactive Computer Graphics

CE 644 Geology In Engineering

CE 618 Applied Hydrogeology

Undergraduate Courses Related to Remote Sensing/GIS Program:

SET 303 Photogrammetry and Aerial Photo Interpretation

The course is designed to give the students a broad view of the field of photogrammetry and airphoto interpretation concentrating on the measuring and mapping aspects. The lab component includes the use of mirror stereoscope, parallax bar and hands-on training with DVP (soft copy/digital photogrammetric system).

SET 420 Land Information System

SET 420 is an introductory course which covers the principles of GIS/LIS systems. The lecture and reading components provide a background on the development of LIS/GIS and present alternative perspectives for spatial data analysis. The practical component of the course provides for direct contact with the analysis of spatial information through the commercial software packages -- Arcview

CE 342 Geology

An introductory course in the study of Planet Earth: its origin, its history, its materials, its processes and the dynamics of how it changes. Topographic(TOPO-USA), geologic maps as well as stereo aerial photographs and satellite images are used to enhance reading material. Related web sites, and CD-ROMs are used as interactive learning experience.

COMMUNITY COLLEGE OF BALTIMORE COUNTY (MD)

**Associate of Applied Science
Geospatial Applications**

http://www.ccbcmd.edu/catalog/programs/geospatial_aas.html

Description (65 credits)

The Geospatial Applications program provides comprehensive instruction in Geographic Information Systems (GIS), photogrammetry and remote sensing and Global Positioning Systems (GPS). Geospatial techniques are used to aid in decision making in fields as diverse as business, marketing, homeland security, public policy, environment, engineering, public health, archeology and criminal justice by identifying patterns between graphical information (maps) and data. A unique aspect of the CCBC Geospatial program is the incorporation of real-world situations in all courses, starting at the introductory level. Students learn software and development techniques in a realistic environment.

The Associate of Applied Science degree is offered for students planning to transfer to a four year institution to complete a bachelor's degree. A certificate option is focused on core courses and for immediate employment in the field and for those already working in the field to enhance/expand their Geospatial skills. The sequence of courses may be taken full or part time. Courses are offered both day and evening. Students may enter the program at a level commensurate with their experience.

General Education Requirements:

<u>SPCM 101</u>	Fundamentals of Speech Communication	3
<u>ENGL 101</u>	College Composition I	3
<u>MATH 135</u>	Applied Algebra and Trigonometry	3
<u>CINS 120</u>	Diversity in a Technological Society	3

General Education Electives;

<u>Biological/Physical Science</u>	3-4
<u>Arts and Humanities or Social and Behavioral Sciences</u>	3
<u>Social and Behavioral Sciences</u>	3

Total General Education Requirements : 21-22

Program Requirements:

<u>GEOG 101</u>	Introduction to Physical Geography	3
<u>GEOG 102</u>	Introduction to Cultural Geography	3
<u>GEOA 101</u>	Introduction to Geographic Information Systems	3
<u>GEOG 111</u>	World Regional Geography	3
<u>GEOA 110</u>	Intermediate Geographic Information Systems	4
<u>GEOA 150</u>	Remote Sensing and Global Positioning	3
<u>GEOA 210</u>	Geospatial Analysis and Decision Making	4
<u>GEOA 250</u>	Advanced Geospatial Applications	3
<u>ENGL 102</u>	College Composition II	3
<u>ENGL 213</u>	Technical Writing	3
<u>CADD 101</u>	Introduction to CADD	3

Program Electives:

Computer Electives (2 courses) 6 credits

Biological and Physical Science w/lab 3 credits

Total Program Requirements and Electives: 44

Total Credits for Degree: 65-66

HARRISBURG UNIVERSITY (PA)
B.A in Geography and Geospatial Imaging 124 CREDITS

<http://www.harrisburgu.net/academics/undergrad/gis/>

<http://www.harrisburgu.net/academics/courses/#geo>

General Information: 59 Credits

Freshman

**Science, Technology, Math and
Society (6) GS110**

Integrative Sciences I

Discrete Mathematical Structures

Programming Fundamentals (4)

GGSI 120

The Creative Mind (6) GS100

English Composition

Programming Fundamentals (4)

GGSI 160

Introduction to GIS/GSI (3) GGS140

Geography of the World (4) GGS130

The Learned Mind (6) GS150

Philosophy

Literature

Fall 2006 Spring 2007

Sophomore

Geomatica (3) GGS1 210

ArcView Suites & Applications

(4) GGS1 220

Elective (3)

The Civic Mind (6) GS200

US Government

Communications

Geography, Culture and

Conservation (3) GGS1 230

Geographic Information Systems

Mgmt (4) GGS1 240

The Political Mind (6) GS250

History of Political Systems

Economics

Fall 2007 Spring 2008

Junior

Computer Networks & Security (4)

GGSI 300

Jr. Year Project (6) GGSI398

The Cultured Mind (6) GS300

Cultures of the World

Advanced Spatial Analysis (4)

GGSI 340

Directed Study in GGSI (3) GGSI 390

Advanced Composition/ Technical

Writing (3) GS350

Elective (4)

Fall 2008 Spring 2009

Senior

Satellite Remote Sensing (4) GGSI 460

Senior Project (6) GGSI498

The Entrepreneurial Mind (3) GS400

Philosophy

GSI/GIS Policy (3) GGSI 440

Senior Capstone (3) GGSI499

The Healthy Mind (3) GS450 Health

**KUTZTOWN UNIVERSITY (PA)
B.A in Geography 60 CREDITS**

<http://www.kutztown.edu/acad/geography/>

Geography Major Applied Track (60 credits)

The Applied Track is more technical in orientation and is designed to prepare majors for employment in industry and in government. An internship is a required element of the Applied Track.

CORE REQUIREMENTS: 18 CR

GEG 010 ELEMENTS OF PHYSICAL GEOGRAPHY

3 CR

GEG 020 CULTURAL GEOGRAPHY

3 CR

GEG 274 INTRODUCTION TO GIS

3 CR

GEG 330 CARTOGRAPHY

3 CR

GEG 375 RESEARCH METHODS

3 CR

GEG 380 SENIOR SEMINAR

3 CR

CATEGORY REQUIREMENTS: 9 CR

CULTURAL or REGIONAL GEOGRAPHY

3 CR

ECONOMIC GEOGRAPHY

3 CR

PHYSICAL GEOGRAPHY

3 CR

APPLIED TRACK: 18 CR

GEG 170 FIELD METHODS

3 CR

GEG 230 MAP READING AND INTERPRETATION

3 CR

GEG 332 COMPUTER CARTOGRAPHY

3 CR

GEG 333 ADVANCED GIS

3 CR

GEG 341 ENVIRONMENTAL PLANNING

3 CR

GEG 343 LAND USE PLANNING

3 CR

GEG 347 REMOTE SENSING OF THE ENVIRONMENT

3 CR

GEG 394 INTERNSHIP IN GEOGRAPHY

(Must be part of the 18 CR of this section)

3 CR

LIBERAL ARTS AND SCIENCES ELECTIVES: 15 CR

MAT 140 OR POL/PSY/SOC 200 (statistics)

3 CR

Any KU course 100 level or above. Any courses taken for a minor may be counted here.
12 CR

WEST CHESTER UNIVERSITY OF PENNSYLVANIA (PA)

- **Minor in Geography 18 CREDITS**
- **B.A in Geography 120 CREDITS**
- **M.A in Geography 33 CREDITS**

West Chester, PA 19383
610-436-1000

<http://quantifactus.wcupa.edu/>

http://www.wcupa.edu/_ACADEMICS/sch_sba/u-ge-a.html

http://www.wcupa.edu/_ACADEMICS/sch_sba/g-ge.html

http://www.wcupa.edu/_information/official.documents/Undergrad.Catalog/geogpln.htm

Graduate and Undergraduate GIS Courses

Undergraduate

Introduction and Advanced courses in Geographic Information Systems cover data sources and analysis techniques used in the planning process, with an emphasis placed on appropriate applications. Students receive considerable experience in using geographic information systems technology to solve real-world problems.

Graduate

The graduate level Introduction and Advanced courses are conducted in a traditional graduate level seminar format. Students are required to complete several projects and labs throughout the course of the term. Students will also be required to make presentations pertaining to specific topics and actively participate in critiquing other students' projects and presentations.

SHIPPENSBURG UNIVERSITY (PA)

- **GIS Certificate 12 credits**
- **B.S. Geoenvironmental Studies 60 credits**
- **B.S. Geography with concentration in GIS 61 credits.**
- **Master in geoenvironmental sciences**
- **Minor in Geography-Earth Science 21 credits**

<http://www.ship.edu/>

<http://webpace.ship.edu/geog/Program/Courses.htm>

The GIS Certificate program is offered to any student, in any major. The certificate is earned by successfully completing both core courses (6 credits) and any two of the approved electives (6 credits). Students who complete the program will have it so indicated on their official transcript.

CORE COURSES

GEO202: GIS I

GEO363: GIS II

ELECTIVE COURSES

GEO420: GIS III

GEO251: Cartography

GEO339: Remote sensing

GEO425: Image processing

GEO440: Field techniques

GEO441: Quantitative methods

SHIPPENSBURG ALSO OFFERS A Geoenvironmental Studies Program

Must complete a minimum of 36 hours of graduate work.

The master's program in geoenvironmental sciences is designed to produce broadly trained scientists with a broad understanding of the environment, with an emphasis on Geotechnology (GIS and GPS) and practical experience (field research, internships).

<http://www.ship.edu/academic/deptgeo.html#Degree>

PENN STATE UNIVERSITY (PA)

- **GIS CERTIFICATE PROGRAM 11 Credits**
- **GIS MINOR 18 Credits**
- **B.S. in GEOGRAPHY(GIS option)120 credits**
- **Masters in GIS 35 credits**

<http://www.gis.psu.edu/index.html>

<http://www.gis.psu.edu/education/index.html>

http://www.geog.psu.edu/pdf/FA06-GEOBS-GIS_ckst8-7-06.pdf

The Geographic Information Science (GIS) minor, as distinct from the Geography minor, is focused upon meeting the needs of students who wish to acquire grounding in **geographical representation and analysis techniques**. The minor is designed to prepare students for entry-level positions in industry and in government where the application of these techniques combined with knowledge of their own major field is required. It will develop professional competence for positions in public and private agencies where competence in GIS, mapping or remote sensing techniques is required. Areas of study include **cartography, remote sensing, and geographical information systems**. This minor provides a unique opportunity to combine and understand the interrelationships among the various aspects of Geographic Information Science through an integrated program.

GIS Minor Requirements - 18 credits

No credit toward the minor will be given for courses with a grade lower than C

Choose 6 courses (18 credits) selected from the following categories:

3 credits

- **GEOG 121** Mapping Our Changing World (grade of 'C' required to progress in the minor)

6 credits (select two courses from the following three)

- **GEOG 321** Cartography-Maps and Map Construction
- **GEOG 352** Image Analysis
- **GEOG 357** Geographic Information Systems

9 credits (6 credits must be at the 400 level)

- **GEOG 330** Computer-Assisted Regional Analysis
- **GEOG 356** Computing for the Earth Sciences
- **GEOG 421W** Dynamic Cartographic Representation

- **GEOG 422** Applied Cartographic Design
- **GEOG 437** Satellite Climatology
- **GEOG 458** Practical Application in Geographic Information Systems
- **GEOG 459** Digital Terrain Models
- **GEOG 480** Spatial Data Structures and Algorithms
- **GEOG 481** GIS Design and Evaluation
- **FOR 455** Remote Sensing and Spatial Data Handling
- **SOILS 415** Soil Morphology, Mapping and Land Use
- **SOILS 450** Environmental GIS

TOTAL = 18 CREDITS

Cartography courses: GEOG 121, 321, 421W, 422

GIS courses: GEOG 121, 330, 357, 421W, 458, 459, 480, 481

Remote Sensing courses: GEOG 121, 352, 421W, 437

PRINCETON UNIVERSITY (NJ)

<http://www.princeton.edu/main/>

<http://facilities.princeton.edu/Administrative/gis/default.htm>

<http://www.princeton.edu/~geolib/gis/>

<http://geoweb.princeton.edu/index.html>

They offer ESRI GIS internal online courses and training to the students, faculty and staff. Also they maintain and support the university's maps, and data with the help of GIS software.

UNIVERSITY OF DELAWARE

B.A in Geography 124 credits

M.S. / M.A. in Geography 30 credits

CURRICULUM, CREDITS FOR B.A. IN GEOGRAPHY

Two courses selected from the following physical geography courses: (7)

GEOG 101/111 Physical Geography: Climatic Processes with lab

or

GEOG 152 Climate and Life

GEOG 106 Physical Geography: Land Surface Processes

Two courses selected from the following human geography courses: (6)

GEOG 102 Human Geography

GEOG 120 World Regional Geography

GEOG 203 Cultural Geography

GEOG 210 Economic Geography

Two courses selected from the following methods courses: (7)

GEOG 250 Computer Methods for Geographic and Environmental Sciences

or

GEOG 271 Introduction to Geographic Data Analysis

GEOG 372 Geographic Information Systems

Six credits selected from geography courses at the 300- or 400-level. (6)

Six credits selected from geography courses at the 200-, 300-, or 400-level. (6)

GEOG 445 Method and Theory in Geography (3)

ELECTIVES

After required courses are completed sufficient elective credits must be taken to meet the minimum credit requirement for the degree.

CREDITS TO TOTAL A MINIMUM OF: 124

MONMOUTH UNIVERSITY (NJ) Minor in Geography 15 credits

http://www.monmouth.edu/academics/dha/geography_minor.asp

Minor in GEOGRAPHY

COURSE	TITLE	CREDITS
GO100	People, Places & Environments	3.0
GO125	Maps & Mapping	3.0
ELECTIVES	6 credits from among:	6.0
	Any other geography course	
	3 credits from among:	
	BY120, BY220, HS203, HS318, PO105,	
	PO330, PR424, SO231, any Geography course	3.0
TOTAL CREDITS REQUIRED FOR THE MINOR:		15.0

ESSEX COUNTY COLLEGE (NJ)

GIS Certificate 30 credits

<http://www.essex.edu/academic/programs/pdfs/geois.certificate.pdf>

<http://faculty.essex.edu/~sandi/gis/>

General Education Requirements: (6 credits)

Communications (3 credits)

ENG 101 College Composition I 3

Mathematics (3 credits)

MTH 101 Statistics and Probability 3

**Major course Requirements:
(21 credits)**

GIS 101

Cartography/Computer Map Reading 3
GIS 111 Fundamentals of GIS 4
GIS 201 Intro. to Spatial Analysis 4
GIS 211 Advanced Applications in GIS 4
GIS 298 GIS Technology Projects 3
GIS 299 GIS Internship 3

**Additional Major Course Requirements: “3”
Select one from the following (3 credits)**

GIS 220 GIS in Homeland Security
GIS 221 GIS in Law Enforcement
GIS 222 GIS in Economic Development

Total Credits Required for Certificate 30

Recommendations

The following is a list of recommendations:

- Create a “Partnership Help Wanted” ad section on NJGIN.
- Include a “Who’s Doing What” discussion at the regional GIS user group meetings.
- Creation of GIS Tourism guide in NJ to include:
 - NJ GIS Day
 - Conferences, meetings, groups, activities, etc
- Revise the NJ GIS Resource Guide through the establishment of a task force.
- Creation of a Funding task force.

APPENDIX A - INTERLOCAL SERVICE AGREEMENT BETWEEN THE COUNTY OF SUSSEX AND THE BOROUGH OF HOPATCONG FOR GIS DATA BASE DEVELOPMENT

This Agreement made this _____ day of October, 2004 by and between the COUNTY OF SUSSEX (hereinafter called the "County") and the BOROUGH OF HOPATCONG (hereinafter called the "Borough"), 111 River Styx Road, Hopatcong, New Jersey, 07843.

1.0 Introduction/Intent

The County of Sussex desires to establish a voluntary, cooperative effort among the County and its governmental and eligible non-profit entities. The goal of the County is to share benefits accruing from GIS technology. Benefit sharing arises from mutually agreed upon data sharing and joint application and utilization, and

A key goal of this cooperative effort is to help share critical data of common interest, and

The data created through this agreement and similar agreements will be data for public consumption and the metadata will be posted on the New Jersey Geographic Information Network (NJGIN) site by Sussex County, unless, due to the sensitive nature of the data, same will be solely utilized by the Borough and the County and data may include but not limited to such items as ownership, address, permit and zoning data/information.

2.0 Effective Date of Agreement

This Agreement is for a period of one year. The year is based on the 12-month period following the execution date of this Agreement.

3.0 Services/Products To Be Provided

The Borough shall receive a complete set of GIS data. Key coverage's are currently under daily maintenance, and new updates will be provided to the Borough on an agreed upon schedule. This schedule will normally be quarterly. As new GIS data becomes available to County, it is the intent to share it with the Borough.

County GIS staff will assist the Borough in loading and viewing the extracted GIS data. Initially this might also include the development of simple viewing applications, query and print/plot of GIS data. County Staff may also assist with data extracts and

exports for work with consultants or engineering firms, as directed by the Borough. The Borough may also request assistance with special projects, as needed throughout the year.

Borough will receive the minimum number of hours of County GIS staff time as set forth in the Work Program attached hereto as Appendix A. Additional hours can be purchased in 8 hour blocks and at the fee set forth in Appendix B. Staff time will be allotted throughout the year, based on an agreed upon work plan, developed by the Borough and Sussex County GIS, see Appendix A. The work plan will describe, in general terms, some of the specific tasks projected. Each task will have a time estimate to complete the task. It is also recommended that a “to be determined” task be identified for special projects and other unforeseen requirements. Staff time expenditures and reporting will be tracked and made available to the Borough on a regular basis, so the work program attainment can be measured. Program hours cannot be banked and or carried over beyond the length of the signed agreement.

4.0 Fee Schedule

See Appendix B.

5.0 Working Relationships

A single point of contact, or Designee, will be responsible for requesting assistance and in the development of the mutually agreed upon work plan. The work plan will focus on agreed upon objectives and will balance requirements with County Staff availability and the Borough needs.

6.0 Problem Resolution

The Borough, or its Designee, will designate a single point of contact to coordinate with the County requests for assistance, approval and development of the work plan and any other issues relating to this Agreement. Any subsequent changes in the work plan will need to be reviewed and approved by the Designee and the Sussex County GIS Manager. Problem resolution will involve the County GIS staff assigned to the project, the County’s GIS Manager and the Borough’s Designee. The County’s GIS staff will make every effort to assist the Boroughs concerning GIS efforts. Due to differences in software/hardware or local implementations, County GIS staff may be unable to assist the Borough in all areas of GIS implementation. All GIS or related software licenses are the responsibility of the Borough.

7.0 Liability - No Warranty

All GIS data and application systems are maintained by County, or consultant staff working under County staff direction. Maintenance by County is planned in a timely and consistent manner; however, there may be delays due to staffing vacancies, or other unforeseen events. GIS data and applications are made available on an “as is” basis and no expressed or implied warranties are made by County in any way. GIS data may

be inappropriate for detailed engineering purposes. GIS data provided by County should in no way replace or be used in lieu of detailed survey or engineering field data collection.

The Borough understands and agrees that the County assumes no liability whatsoever for any damages or losses of any kind incurred by the Borough or any third party as a result of the use by the Borough of any data, information or services provided by the County under this Agreement. The County makes absolutely no warranty to the Borough whatsoever related to the data, information or services provided by the County under this Agreement including but not limited to warranty of merchantability or fitness for a particular purpose. The Borough shall indemnify and hold the County harmless from any losses, damages or expenses incurred by the Borough which may arise out of the Borough's receipt or use of any data, information or services provided by the County under this Agreement.

8.0 Termination of Agreement

This Agreement will automatically terminate at the end of the 12-month term. Upon termination, the County will have no further obligations to deliver any services previously identified in the work plan as described in Appendix B or any further quarterly data. The only exception(s) are those projects and/or services identified in the work plan the County has previously informed the Borough will be delivered based on their progress and degree of completion after the Agreement expiration date.

Notice of Termination of this Agreement by the Borough prior to the end of the term must be specified in writing to County. In the case of early termination on the part of the Borough, no portion of the fee will be refunded.

The County reserves the right to continue, modify or dissolve its GIS effort, as needed in the County's sole discretion. Dissolution of the County effort will be made with written notice to The Borough at least 60 days prior to the date of dissolution. The County, in its sole discretion, may also terminate this Agreement with the Borough with 45 days written notice.

9.0 Entire Agreement

This Agreement represents the entire Agreement between the Borough and the County regarding the GIS Systems. No oral descriptions or conversations are incorporated in this written agreement in any manner. This Agreement may only be modified by an amendment in writing approved by the parties or unilaterally by the County as provided herein.

10.0 Laws of New Jersey

The laws of State of New Jersey shall govern this Agreement.

Witness for Borough:

BOROUGH

Signature

Signature of Authorized Official

Typed Name & Title
Official

Typed Name & Title of Authorized

COUNTY OF SUSSEX

Elaine A. Morgan,
Clerk of the Board of
Chosen Freeholders

Joann D'Angeli, Freeholder Director

APPENDIX B - RESOLUTION RE: COORDINATION OF GIS AND GPS WORK

WHEREAS, the various department and divisions of Sussex County government undertake projects that require or involve Geographic Information System (GIS) mapping and locations of features using Geographic Positioning System equipment; and

WHEREAS, it is necessary to coordinate the efforts of all County agencies in order that all work will be done with maximum efficiency, that duplication of effort be eliminated, and that all work will be compatible with the County's GIS; and

WHEREAS, the Department of Engineering and Planning, Division of Engineering, Office of GIS Management has the expertise and responsibility for implementing and maintaining this County-wide GIS.

NOW, THEREFORE, BE IT RESOLVED that the Board of Chosen Freeholders of the County of Sussex does hereby require that all GIS and GPS technology and execution, including the purchase of GIS and/or GPS related hardware and software, be coordinated through the Department of Engineering and Planning, Division of Engineering, Office of GIS Management.

BE IT FURTHER RESOLVED, that a certified copy of this Resolution be forwarded to the County Administrator; the Deputy County Administrator; all County Department Administrators; all Constitutional Officers; and the GIS Manager

Certified as a true copy of a
Resolution adopted by the
Board of Chosen Freeholders
on the 10th day of December, 2003.

Elaine A. Morgan, Clerk
Board of Chosen Freeholders
County of Sussex

APPENDIX C - THE COUNTY OF SUSSEX GIS COOPERATIVE AGREEMENT

This Agreement made this ____ day of _____, 2006 by and between the County of Sussex (hereinafter called the "County") and the Walkkill River Watershed Management Group (hereinafter called the "Participant"), 34 South Route 94, Lafayette, New Jersey, 07848.

1.0 Introduction/Intent

WHEREAS, the County of Sussex desires to establish a voluntary, cooperative effort among the County and its governmental and eligible non-profit entities. The goal of the County is to share benefits accruing from GIS technology. Benefit sharing arises from mutually agreed upon data sharing and joint application and utilization, and

WHEREAS, a key goal of this cooperative effort is to help share critical data of common interest, and

WHEREAS, the data created through this agreement and similar agreements will be data for public consumption and the metadata will be posted on the New Jersey Geographic Information Network (NJGIN) site by Sussex County, unless, due to the sensitive nature of the data, same will be solely utilized by the Participant and the County and data may include but not limited to such items as ownership, address, permit and zoning data/information.

2.0 Effective Date of Agreement

This Agreement is based on the 12-month period commencing as of the execution date of this Agreement.

3.0 Services/Products To Be Provided

The participant shall receive a complete set of GIS data. Key coverage's are currently under daily maintenance, and new updates will be provided to each Participant on an agreed upon schedule. This schedule will normally be quarterly. As new GIS data becomes available to County, it is the intent to share it with all Participants.

County GIS staff will assist the Participants in loading and viewing the extracted GIS data. Initially this might also include the development of simple viewing applications, query and print/plot of GIS data. County Staff may also assist with data extracts and exports for work with consultants or engineering firms, as directed by the Participant. Participants may also request assistance with special projects, as needed

throughout the year. Participant will receive the minimum number of hours of County GIS staff as set forth in the work program attached hereto as Appendix B. Additional hours can be purchased in 8 hour blocks and at the fee set forth in Appendix A. Staff time will be allotted throughout the year, based on an agreed upon work plan, developed by the Participant and Sussex County GIS, see Appendix B. The work plan will describe, in general terms, some of the specific tasks projected. Each task will have a time estimate to complete the task. It is also recommended that a “to be determined” task be identified for special projects and other unforeseen requirements. Staff time expenditures and reporting will be tracked and made available to the Participant on a regular basis, so the work program attainment can be measured. Program hours cannot be banked and or carried over beyond the length of the signed agreement.

4.0 Fee Schedule

See Appendix A.

5.0 Working Relationships

A single point of contact, or Designee, will be responsible for requesting assistance and in the development of the mutually agreed upon work plan. The work plan will focus on agreed upon objectives and will balance requirements with County Staff availability and Participant needs.

6.0 Problem Resolution

The Participant, or its Designee, will designate a single point of contact to coordinate with the County requests for assistance, approval and development of the work plan and any other issues relating to this Agreement. Any subsequent changes in the work plan will need to be reviewed and approved by the Designee and the Sussex County GIS Manager. Problem resolution will involve the County GIS staff assigned to the project, the County’s GIS Manager and the Participant’s Designee. The County’s GIS staff will make every effort to assist the Participants concerning GIS efforts. Due to differences in software/hardware or local implementations, County GIS staff may be unable to assist the Participant in all areas of GIS implementation. All GIS or related software licenses are the responsibility of the Participant.

7.0 Liability - No Warranty

All GIS data and application systems are maintained by County, or consultant staff working under County staff direction. Maintenance by County is planned in a timely and consistent manner; however, there may be delays due to staffing vacancies, or other unforeseen events. GIS data and applications are made available on an “as is” basis and no expressed or implied warranties are made by County in any way. GIS data may be inappropriate for detailed engineering purposes. GIS data provided by County should in no way replace or be used in lieu of detailed survey or engineering field data collection.

Participant understands and agrees that County assumes no liability whatsoever for any damages or losses of any kind incurred by Participant or any third party as a result of the use by Participant of any data, information or services provided by County under this Agreement. County makes absolutely no warranty to Participant whatsoever related to the data, information or services provided by County under this Agreement including but not limited to warranty of merchantability or fitness for a particular purpose. Participant shall indemnify and hold County harmless from any losses, damages or expenses incurred by Participant which may arise out of Participant's receipt or use of any data, information or services provided by County under this Agreement.

8.0 Termination of Agreement

This Agreement will automatically terminate at the end of the 12-month term. Upon termination, the County will have no further obligations to deliver any services previously identified in the work plan as described in Appendix B or any further quarterly data. The only exception(s) are those projects and/or services identified in the work plan the County has previously informed the Participant will be delivered based on their progress and degree of completion after the Agreement expiration date.

Notice of Termination of this Agreement by a Participant prior to the end of the term must be specified in writing to County. In the case of early termination on the part of the Participant, no portion of the fee will be refunded.

The County reserves the right to continue, modify or dissolve its GIS effort, as needed in the County's sole discretion. Dissolution of the County effort will be made with written notice to Participant at least 60 days prior to the date of dissolution. The County, in its sole discretion, may also terminate this Agreement with Participant with 45 days written notice, as needed.

9.0 Entire Agreement

This Agreement represents the entire Agreement between the Participant and the County regarding the GIS Systems. No oral descriptions or conversations are incorporated in this written agreement in any manner. This Agreement may only be modified by an amendment in writing approved by the parties or unilaterally by County as provided herein.

10.0 Laws of New Jersey

The laws of State of New Jersey shall govern this Agreement.

11.0 Non-Discrimination

Participant shall not discriminate against any person because of race, color, religious creed, ancestry, national origin, age, sex, or handicap.

Witness for Participant:

PARTICIPANT

Signature
Official

Signature of Authorized

Typed Name & Title
Authorized

Typed Name & Title of
Official

COUNTY OF SUSSEX

Elaine A. Morgan,
Clerk of the Board of
Chosen Freeholders

Gary R. Chiusano,
Freeholder Director