



LEHMAN COLLEGE  
OF  
THE CITY UNIVERSITY OF NEW YORK

PROPOSAL TO ESTABLISH A PROGRAM IN  
GEOGRAPHIC INFORMATION SCIENCE  
LEADING TO THE  
M.Sc. DEGREE

EFFECTIVE FALL 2012

SPONSORED BY THE DEPARTMENT OF ENVIRONMENTAL, GEOGRAPHIC, AND  
GEOLOGICAL SCIENCES (EGGS)

APPROVED BY

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## **ABSTRACT**

Lehman College's Department of Environmental, Geographic, and Geological Sciences (EGGS) proposes a Master of Science degree program in Geographic Information Science (the M.Sc. in GISc). The intent of the proposed M.Sc. in GISc program is to prepare students to meet the demands and challenges of theoretical and applied research careers in the field of geospatial sciences, which in recent years has seen an exponential increase in the demand for highly qualified personnel in the fields of healthcare, environmental, and geospatial sciences. Recent reports have emphasized the growing need for people knowledgeable in GISc and spatial analysis in a wide range of fields. According to Dr. Christopher Sutton, in his presentation of the 9<sup>th</sup> Annual John Hallwas Liberal Arts Lecture, "It is estimated that the geospatial job market right now is growing by 35 percent annually. We have crossed a threshold where geospatial technologies are no longer just interesting, but essential, we need them to survive as a business, as a government and in many respects, across the spectrum."

GISc has become one of the major disciplines involved in analysis of environmental, health, and other societal concerns, and thus is poised to become an increasingly integral part of all scientific endeavors having a spatial component. GISc is a field of study encompassing spatial analysis, computer-assisted cartography, geostatistics, and exploration and interpretation of geographic data. We expect that the M.Sc. in GISc, with emphasis on public health and environmental spatial sciences, will be highly attractive to professionals working in these fields who strive to optimize their qualifications, as well as to traditional graduate students who may wish to pursue further studies in Geographic Information Sciences and Applied Geography and start their careers in GISc.

The curriculum of the proposed M.Sc. in GISc is comprised of three key elements (core courses, electives, and a capstone research experience) that include 16 existing courses and one proposed new course for a specialization track in Health and Environmental Spatial Sciences. This new comprehensive program will enable students to develop the necessary theoretical, programmatic, and applied skills in the general area of spatial analysis that are necessary to succeed in the present day field of geomatics, geospatial analysis, and related disciplines. It will take full-time students four terms to complete the 40-credit program. In the first years we expect an average of 10 students to join the program per year; we anticipate a gradual increase in this number thereafter. Sufficient faculty and GISc laboratory resources already exist to implement this program immediately.

## **PURPOSE AND GOALS**

The purpose of the M.Sc. Program in GISc is to prepare students to meet the demands and challenges of theoretical and applied research, planning, and management careers in the field of geospatial sciences. In recent years there has been an exponential increase in the demand for highly qualified GISc personnel in public health, environmental analysis, conservation and natural resource management, epidemiology, ecology, urban planning, hazard and risk assessment, emergency response, demographics, criminal justice, homeland security, public policy and administration, transportation planning, engineering, international relief organizations, and geospatial sciences.

GISc has become one of the major disciplines involved in analysis of environmental, health, and other societal concerns, and thus is poised to become an increasingly integral part of all scientific endeavors having a spatial component. Geographic Information Science is a field of study encompassing spatial analysis, computer-assisted cartography, geostatistics, and exploration and interpretation of geographic data. We expect that the proposed M.Sc. in GISc, with emphasis on public health and environmental spatial sciences, will be highly attractive to professionals working in

these fields who strive to optimize their qualifications, as well as to traditional graduate students who may wish eventually to pursue doctoral studies in Geographic Information Sciences and Applied Geography, or enter the GISc job market. Recent reports have emphasized the growing need for people knowledgeable in GISc and spatial analysis. According to Dr. Christopher Sutton, in his presentation of the 9<sup>th</sup> Annual John Hallwas Liberal Arts Lecture, “It is estimated that the geospatial job market right now is growing by 35 percent annually. We have crossed a threshold where geospatial technologies are no longer just interesting, but essential, we need them to survive as a business, as a government and in many respects, across the spectrum.”

The intent of the proposed M.Sc. program in GISc is to prepare students for careers in the multidisciplinary field of Geographic Information Science, while also serving as a potential for continuation of the educational pipeline from undergraduate to Master’s and to advanced degrees beyond the Master’s, including those available through the CUNY Graduate Center’s Earth and Environmental Sciences Doctoral Program and other similar programs. The M.Sc. program in GISc will offer opportunities for students to engage in real-world GISc project work and faculty-student research collaboration. Partnerships established through Lehman’s existing GISc Certificate program with organizations and agencies will be continued and amplified, permitting students to experience working with professionals in the field, and contributing in a meaningful way to solving complex urban, environmental, and health problems. These partnership organizations and institutions include the New York City Department of Environmental Protection; Montefiore Medical Center; the New York City Department of Health; New York Botanical Gardens; the Wildlife Conservation Society (the Bronx Zoo); the New York City Parks Department; several environmental consulting firms; non-profit environmental and community planning groups; and many other federal, state, and local governmental agencies. See Appendix N for Letters of Support from a range of organizations and agencies.

Lehman College is ideally suited to host this program because

- Lehman’s EGGs Dept. is adequately staffed with full-time faculty to teach all of the required core courses and the majority of the electives, and have already been doing so for several years;
- Most of the required core courses are already part of the existing curriculum in the GISc program;
- All necessary facilities and equipment are already in place;
- Student demand for the program has been demonstrated; and
- The implementation of this program is perfectly in line with the strategic plan and mission of the department and the college (promotion of STEM fields).

#### **A. Program Structure**

The curriculum of the proposed M.Sc. program in GISc is comprised of three key elements (core courses, electives, and a capstone research experience) that include 16 existing courses and one proposed new course for a specialization track in Health and Environmental Spatial Sciences. This new comprehensive program will enable students to develop the necessary theoretical, programmatic, and applied skills in the general area of spatial analysis that are necessary to succeed in the present day fields of public health, environmental science, and related disciplines.

The breadth required to achieve the necessary strength involves the construction of academic links across the span of the health sciences, environmental sciences, and geography at Lehman. In this way, the M.Sc. program in GISc will have the inherent flexibility to adjust to the growing demands of Geographic Information Sciences leading to anticipated future tracks within the Master’s Program (e.g., expanded areas of remote sensing, environment and sustainability, urban planning, and applied geo-spatial analysis).

Lehman’s existing graduate-level GISc courses in the EGGs Department will form the central components of the proposed Master’s program in GISc at Lehman. Faculty, research

expertise, and laboratory space and equipment are already in place for the proposed M.Sc. program in GISc at Lehman through the existing GISc Certificate program. An important basis of support within Lehman College for the proposed program is the Master's of Public Health (MPH) Program. The EGGs Dept. has established close relationships with the Lehman MPH program as well as with all the public health programs in the CUNY School of Public Health. We already share faculty between the departments/programs, cross-list a number of GISc courses, work collaboratively on research projects, place students in appropriate internships, and partner with the other programs in a number of other ways. We expect that this will only be enhanced with the advent of the M.Sc. program in GISc.

Another basis of support for this proposed program is provided by the vibrant and nationally-regarded National Oceanic and Atmospheric Administration Cooperative Remote Sensing Science and Technology (NOAA-CREST) Center at CCNY and Lehman. This unique 20 million dollar center has already created a series of courses and a network of faculty all focused on environmental issues thus forming a strong platform for the proposed new Master's Program. NOAA-CREST is one of only five Educational Partnership Programs supported by NOAA in the United States and is therefore one of the premier Centers for remote sensing and climate in a major urban setting. Lehman College's EGGs Department is a full partner in NOAA-CREST. In addition to tuition support and stipends to under-represented minority students, NOAA-CREST offers students opportunities to collaborate within all NOAA-CREST partner institutions on research, presenting papers at national and international conferences, internships at NOAA headquarters and other NOAA cooperative centers, and working closely with mentors that are drawn from Lehman College, City College, University of Maryland, Hampton University, Columbia University, the University of Puerto Rico, and the NASA-Goddard Institute for Space Studies, among other NOAA-CREST partners. In addition, City College and Lehman have been working together for several years to encourage students to take courses across the spectrum of NOAA-CREST partnership colleges, and there have been several instances of successful course sharing, which directly benefits graduate students from our respective campuses by offering a wider range of courses that might not be fully enrolled by each campus separately. The resources of NOAA-CREST are considerable, and many of our prospective Master's program GISc students would have access to them. Additionally, NOAA-CREST serves as an educational "pipeline" for minority students who are under-served in the sciences, propelling them from undergraduate to graduate to doctoral level work, and thus the M.Sc. program in GISc has the potential to be a valuable source of funded students for the Graduate Center's Earth and Environmental Sciences (EES) doctoral program. (See attached Letters of Support in Appendix N, from both Reza Khanbilvardi, Director of NOAA-CREST, and Yehuda Klein, EO of the EES program at the GC.)

## **B. Program Purpose**

In recent decades, increasing attention has been given to global change as it influences local areas, and to the integration of local area information into the global system framework. This confluence has been driven in part by the growing necessity for the intelligent management of natural resources, and for developing optimal approaches to spatial management issues, such as coastal processes, surface and groundwater hydrology, urban public policy, sustainable development, growth management of megacities, health and the built environment, and in all phases of environmental remediation and modeling. The key to the effective management of resources revolves around an ability to utilize modern imaging, mapping and data assessment techniques. The proposed M.Sc. program in GISc is envisioned as an umbrella discipline that encompasses established fields such as environmental health, earth science, environmental and urban geography, geographic information science, and remote sensing. There is a critical need to elevate the Masters-level curriculum within the City University of New York to meet growing sustainability issues. The proposed structure

draws together existing talent and resources to create the necessary links between the environmental sciences-public health-geography fields and established research areas, such as those developed under NOAA-CREST and the Urban GISc Laboratory at Lehman. Although students graduating with undergraduate degrees in earth and environmental science, geology, biology, chemistry, and other natural and social sciences, are well-grounded in the behavior of complex and dynamic systems, such as climate change, global warming, and resource management, there is a clear need for graduate work in the areas proposed for the M.Sc. program in GISc, areas that deal specifically with spatial analysis, modeling and mapping, geo-statistical evaluation of current and future conditions, and most importantly, the application of these skills in real-world industries like the field of Public Health.

It is increasingly evident that solutions to environmental, industrial, and governmental needs require a cross-disciplinary array of scientific and analytical skills. As a consequence, a growing number of institutions have put in place multi-disciplinary Geospatial Sciences Programs, such as *M.S. in Applied Geospatial Sciences* at Northern Arizona University; the *Master's of Geospatial Information Sciences (MSc)* at the University of Texas; the *Master's of Geographic Information Science (MGIS)* program at the University of Minnesota; and the *Master's of Science in Geographic Information Science* at Indiana University-Purdue University Indianapolis (IUPUI). Such programs are flexible, providing a robust level of general training, while allowing a wide array of specializations. The number of credits, required core courses, electives, and capstone experience options in the proposed M.Sc. program in GISc are comparable to what is required in other GISc Master's of Science degrees, such as those programs listed above. Although each program differs slightly in focus and emphasis, the analytical and methodological skills the students are tasked to acquire are similar and meet the same standard criteria of the profession. The learning objectives of the proposed M.Sc. in GISc program are firmly in-line with those of the MS-GIS programs at leading universities.

The intent of the M.Sc. is to combine rigorous science education with professional development and experience, using a multidisciplinary approach. The proposed M.Sc. program in GISc will prepare students to take their place in the myriad firms and organizations that work with locational data while providing them with a solid technical expertise in a related and cross-disciplinary field, such as public health or urban sustainability planning.

More detailed information on the growing workforce needs in the geospatial technology industries and relevant employment potential can be taken from the US Dept. of Labor Report under <http://www.doleta.gov/brg/Indprof/Geospatial.cfm>

The fact that Geospatial Technology fits into the High Growth Industry Profile is also confirmed by <http://www.nationalgeographic.com/foundation/pdf/GeospatialHighGrowthProfile.pdf> See Appendix L for a selection of recent GISc position announcements.

## **C. Faculty Qualifications and Commitment**

### ***Existing Faculty***

As of Fall, 2011, the EGGs Department has six tenured or tenure-track professors qualified to teach in the GISc program: Prof. Juliana Maantay, the Director of Lehman's GISc Program; Prof. Stefan Becker, EGGs Dept. Chair; Prof. Yuri Gorokhovich; Prof. Elia Machado, Prof. Andrew Maroko, and Prof. Glen Johnson. All of these faculty members have expertise in geospatial analysis, GISc, remote sensing, and/or modeling, and each has research foci and professional experience in environmental and health spatial sciences. All are enthusiastically anticipating the start of the Master's of Science program in GISc, and are eager to participate in the teaching, advising, and administrative efforts required to successfully run the program. The EGGs Departmental Chair and the Dean of Natural and Social Sciences have strongly supported the creation and implementation of



the program, and have encouraged the faculty and staff to devote their energies and talents to ensuring the proposed program's success. The EGGS Dept. also has a full-time Lab Technician who maintains the GISc Lab and works closely with the faculty in developing and updating lab exercises and assisting students. The full-time faculty members and staff will be able to teach all the required courses and a wide range of electives. See Appendix K for detailed biosketches of full-time GISc faculty. Given that all courses do already exist, (with the exception of the Thesis Research course) faculty will not be impacted or pulled away from established programs to teach new courses.

***Proposed Administrative Structure:***

The GISc Program will be administered by a coordinating committee, consisting of participating faculty and the GISc program director. The committee will oversee advisement, program development and recruitment. The GISc Program Director will be responsible for the day to day administration of the program.

***External Advisory Committee***

It is important to insure that the educational goals and the curriculum of the M.Sc. program in GISc keep pace with the demands of industry and government. To this end an Advisory Committee will be created with representatives from industry, ESRI (the preeminent GIS company and industry standard), and local government agencies, not-for-profits, and other relevant institutions, in conjunction with the GISc Coordinating Committee. This group will also help to direct outreach to local industry and government to promote the objectives of the GISc program and help place students in appropriate venues for their professional experience. The external advisory committee, made up initially of industry experts and individuals in the fields of GISc, environmental science, and public health, will be augmented with appropriate members when new specialization tracks are added.

**D. Relationship of the Proposed Program to the College and CUNY**

The proposed M.Sc. program in GISc has strong ties to several other departments within Lehman, and the potential to develop additional connections within the college. We are actively collaborating with faculty and students in the Health Sciences Dept, and in particular, the MPH program, as well as the departments of Biology, Mathematics and Computer Science, Chemistry, and Education. It is expected that the presence of a new, vital graduate program on campus will bolster many aspects of academic life, including aiding in recruitment and retention of undergraduates, fostering collaboration amongst faculty and students in cognate fields, and strengthening departmental programs and initiatives. The proposed new graduate program will complement existing programs within and outside of the department, and add depth and breadth to course offerings for students across the campus.

Additionally, the proposed program fits in very well with the College's stated aims and mission statement. According to the Lehman Vision Statement, "The College's geographic information systems and numerous partnerships with schools, hospitals, social service and governmental agencies, small businesses, major corporations, and cultural and scientific institutions will contribute to the economic development of the region. Service learning and internship opportunities will be further developed to foster the engaged citizenship and commitment to public service embodied in its namesake, Herbert H. Lehman." The implementation of this program is perfectly in line with the strategic plan and mission of the department and the college, especially as regards the promotion of STEM fields.

Although at this time there is no exactly comparable program within CUNY, we plan to work closely with Geography and GISc faculty and existing programs at other campuses - for instance, at Hunter, Baruch, the Graduate Center, John Jay, and City College. These collaborative activities

might include the development of GISc-related symposia, conferences, or speaker series; team-teaching specialty seminars; creating cross-campus and interdisciplinary research opportunities for students; instituting an “internship bank” or clearinghouse for GISc professional experiences, internships, and fellowships for students; coordinating course offerings amongst those campuses offering GISc courses, to increase the number and range of courses available to students, and to enhance program flexibility; ideally resulting in the creation of a community of CUNY students and faculty interested in spatial sciences, to maximize the graduate school experience for the students and provide broader networking capabilities.

## **NEED AND JUSTIFICATION**

### **A. Needs of Students**

It has become crucial to train scientists who can perform research, analyses, and predictive modeling on the spatial aspects of environmental and health issues, while also being aware on a very practical level how this fits in with organizational and corporate mandates and standards, including an awareness of policy and ethics. This proposed degree program will prepare students to do so and to enable them to take their place in industry, non-profit organizations, health care institutions, and governmental agencies, as well as in academia. Geographic Information Sciences is a growing and cutting edge field with numerous career possibilities and opportunities.

The attached CUNY Student Survey Summary shows that approximately 10% of the 1,123 surveyed students would like to pursue a Masters Degree in GIS. See Appendix M for the Student Survey Summary.

Since we started the GISc Certificate Program at Lehman, it has attracted students from varied disciplines and backgrounds, including health sciences, biology, ecology, anthropology, sociology, urban planning, architecture, political science, and computer science, in addition to the traditional geography and environmental science majors. We anticipate that a wide variety of students will continue to be attracted to the M.Sc. program in GISc, and we will continue to be able to draw on these diverse areas to increase the ranks of the students in the proposed program. Based on the students enrolled in the existing GISc Certificate courses, we also expect that a significant portion of the student body for the proposed Master’s program may be comprised of professionals in existing management, planning, and analysis positions who wish to augment their skills with GISc and spatial analysis, as is increasingly necessary in many governmental, non-profit, and private sector organizations.

### **B. Needs of the College**

The Lehman College mission specifically promotes the preparation of students to enable them to live and work in the global community through new interdisciplinary programs, a good example of which is the proposed M.Sc. program in GISc. According to the Lehman Vision Statement, “The College’s geographic information systems and numerous partnerships with schools, hospitals, social service and governmental agencies, small businesses, major corporations, and cultural and scientific institutions will contribute to the economic development of the region. Service learning and internship opportunities will be further developed to foster the engaged citizenship and commitment to public service embodied in its namesake, Herbert H. Lehman.”

We anticipate that much of the work that our prospective graduate students and GISc faculty will engage in will be very supportive of the Lehman mission and vision statements, especially regarding the commitment to public service, active citizenship, and the betterment of the community and quality of life for all New Yorkers.

### **C. Needs of CUNY**

Lehman College's EGGS Dept. has graduated over 20 students (undergraduate) from our 17-credit GISc Certificate Program since 2003 (approximately 40 additional students, primarily graduate students, received the GISc certificate while enrolled as non-degree students at Lehman). Many of these students wanted to continue on in a Master's degree program, but there is no such degree program at Lehman. In fact, there is no specialized Master's degree program in GISc offered on any CUNY campus, or anywhere in the NYC metropolitan region, although several colleges and universities offer general Geography Master's degrees, such as Hunter College and Rutgers University. The proposed M.Sc. program in GISc would address the important need of enabling students to achieve a Master's degree in GIScience without having to leave the NYC region, thus allowing NYC organizations, agencies, and companies to benefit from the talent pool created by this program.

### **D. Needs of the Industry**

Another focus of the M.Sc. program in GISc is to attract local professionals experiencing a need to modernize their skills in the area of spatial analysis and presenting mapped information in an appropriate format. A significant number of students in our existing GISc Certificate Program have been drawn from governmental agencies, medical institutions, and private environmental engineering firms who need to update and expand their knowledge base into the new area of spatial analysis. Many of these students, in particular the governmental agency employees, would strongly benefit from the opportunity to earn a Master's degree in this subject. An informal survey reveals that the majority of environmental consultants, engineering firms, health institutions, and government agencies have only limited internal resources in Geographic Information System Programming, overlaying GIS maps with satellite information, performing important statistical evaluations of mapped data or presenting information in an appropriate GIS format. Many smaller companies depend on commercially available routines, for example existing Autocad or related programs that are edited to display relevant information. Most engineering professionals and company administrators see the need to both upgrade the capability of existing staff, and to work with a college to create specialized programs for their applications. See Appendix L for a collection of recent GISc job announcements pertaining to the job market for GISc professionals and graduates with GISc credentials.

### **E. Needs of the Community**

Knowledge of GISc has become very important to community-based organizations, non-profit planning groups, and environmental and health advocacy groups, and has proven to be effective in presenting the community perspective on many local and wider-scope issues. Many community-based organizations have expressed an interest in gaining expertise in GISc in order to produce spatial analyses and presentation maps in-house, and also to acquire the skills necessary to accurately interpret and critique spatial data produced by others (e.g., consultants, governmental agencies). The analyses necessary for community-based research pertain to community health studies, urban planning and development problems, open space and preservation planning, environmental assessments, environmental justice evaluations, land use conflicts, zoning proposals, accessibility measurements, among many other community concerns that are eminently addressable through GISc. With GISc, the community has a more powerful voice and an increased ability to utilize quantitative and qualitative resources in order to participate more actively in the decision-making process. GISc can be an enormous benefit to the community: the proposed specialization track in environmental and health spatial sciences would help to address these important societal issues in a comprehensive and understandable way, while maximizing community involvement and participation.

Additionally, GISc has proven to be a powerful means of fostering community-university partnerships in order to deal with these significant issues in a collaborative manner. The proposed Master's degree program in GISc meets these needs at several levels. There is a baseline set of core courses that are currently available at Lehman to allow individuals access at the entry level through advanced. There is also a significant tier of elective courses that will address the common needs of local agencies designed to upgrade skills and knowledge over that of the core GISc courses. Therefore, the GISc program is geared to address a wide variety of needs across the spectrum of GISc education. Due to the relationship between the EGGs Department's Urban GISc Lab and NOAA-CREST, Lehman can provide an added resource: the downloading of real-time data from the new NOAA-CREST satellite receiving station. This unique capability is not duplicated in the greater New York area, and is an ideal add-on to the GIS capability of the GISc Master's degree program. The M.Sc. program in GISc is also an excellent source for professional development and the continuing education mandates of the Center for Worker Education and Masters Programs in Education. Lehman's GISc Lab has already worked closely with community groups (such as For a Better Bronx and the South Bronx Environmental Justice Partnership); locally-based non-profit organizations (such as the Wave Hill Forestry Project, and the Wildlife Conservation Society); as well as local governmental institutions (Bronx Borough President's Office, Bronx Parks Dept., Bronx Overall Economic Development Corporation, NYC Dept. of Health), and major health institutions (Montefiore Medical Center, Albert Einstein College of Medicine, and New York Medical College) and we expect that these relationships will continue to expand with the implementation of the M.Sc. program in GISc.

#### **F. Issues of Overlap and Duplication with Existing CUNY Programs**

As mentioned in section D above (Relationship of the Proposed Program to the College and CUNY), there is no directly comparable program existing in CUNY. Although geography faculty are scattered throughout many different departments of several of the CUNY campuses, only Hunter and Lehman Colleges contain actual Geography Departments. Currently Hunter College has a Masters of Arts degree in Geography, and they offer GISc courses as part of that program. However, the two graduate programs will be distinctly different and not duplicative of each other's programs. Moreover, there is sufficient need and more than enough students to warrant having two different but complementary programs in a field which is cutting edge and growing rapidly.

### **STUDENTS**

#### **A. Interest/Demand**

Evidence for student interest in this area is clear. Lehman's existing GISc program, implemented in 2003, has awarded more than 20 certificates to undergraduate students, after students completed the 17-credit program (approximately 40 additional students received the undergraduate or graduate level certificate as non-degree students at Lehman). Another pipeline for students to enter the M.Sc.-GISc program is the new interdisciplinary Environmental Science major at in the EGGs Department in collaboration with the Departments of Biology, Chemistry, and Physics and Astronomy. These programs are inherently multi-disciplinary in their organizational structure and curriculum and provide a foundation for the proposed new Master's program, as well as potential students.

The EGGS Department at Lehman College has introduced GIS and remote sensing courses in the last several years that have attracted many students to GISc technology. The proposed M.Sc.-GISc program is a logical extension both from this standpoint and as an important advanced-degree area for NOAA-CREST students. And, as mentioned in the “Needs” section above, many of the students completing the GISc Certificate Program at Lehman would like to continue on in a Master’s program in GISc, but are unable to do so due to lack of availability of such a program locally. There are also a number of environmental science-related programs at CUNY Community and Senior Colleges that make a possible pool of students for recruitment into the proposed program, as well as students from undergraduate degree programs in health sciences, biology, ecology, anthropology, sociology, political science, computer science, and other natural and social sciences, who currently form the preponderance of the student body in the GISc Certificate program.

Students are likely to be drawn from all CUNY campuses, other local area colleges in Rockland, Westchester, and nearby New York and New Jersey counties. In addition, we expect that a significant portion of the students in the GISc Master’s Program will be returning mid-career professionals, whose jobs include working with spatial information and who need to update and expand their knowledge base to enable them to do so effectively, or to manage those who do. There is very little likelihood that the student body anticipated to enroll in Lehman’s M.Sc.-GISc program will overlap or conflict with any other existing CUNY graduate level program.

It is envisioned that the entering class may attract approximately 6 students initially, but with appropriate outreach support by the College, enrollment is projected to grow swiftly in the near future.

**B. Enrollment Projections**

Projected Enrollment in MS-GISc at Lehman (full time students)

Projected Enrollment	Year 1	Year 2	Year 3	Year 4	Year 5
Number of Incoming Students	6	10	12	12	12
Attrition (Number of students dropping the program)	0	1	1	1	1
Projected Total Enrollment	6	15	21	23	23
Number of Graduating Students at the end of the respective year	0	5	9	11	11

These numbers are based on informal surveys of current and past GISc Certificate students at Lehman, and data from comparable Master’s programs.

The percentage of attrition is estimated based on an informal survey of other four-year institutions, both public and private, currently offering a similar technical and professional master’s degree programs in the New York City area. The attrition rates from these institutions ranged from seven to 12 percent. Based on the attrition rates of other institutions, an average attrition rate of approximately 10 percent was used in the above estimations.

The “Projected Total Enrollment” is total student enrollment for that academic year, prior to graduation.

### **C. Admission Requirements**

In order to be accepted to the M.Sc.-GISc program in the EGGS Department at Lehman College, students must:

- Possess a bachelor's degree (or its equivalent) from an accredited college or university;
- Have demonstrated the potential to successfully pursue graduate study – that is, have attained a minimum undergraduate grade average of B in geography or a closely allied field, and a minimum grade average of B in the undergraduate record as a whole;
- Submit two letters of recommendation;
- Submit an essay detailing their career objectives;
- If conditionally admitted, satisfy the degree requirements within three years

### **D. Student Support Services**

Lehman College provides a wide range of support services for graduate students, for academic advisement as well as personal counseling, and the College is committed to providing the highest quality education in a caring and supportive environment. The Office of Graduate studies is dedicated to assisting students in their academic, personal, and professional development. With an active cultural life, Lehman College is home to over 2,200 graduate students. Additionally, the EGGS Dept. will be actively engaged in intensive advisement and close mentoring of each of the graduate students in the new program, with GISc faculty and other support staff working to enable students to achieve and succeed. Class schedules are arranged to accommodate working professionals, reasonably priced tuition enables scholars to work toward the future affordably, and extensive resources are available to enhance learning. Opportunities exist for collaborative research work with faculty at Lehman, CUNY Institutes and Centers, and other affiliated institutions, as well as professional practicum/internship experiences, as organized by the GISc faculty and program director.

## **CURRICULUM**

### **A. Overview and Objectives of Curriculum**

Graduate courses in Geographic Information Science are offered through Lehman's EGGS Department. A "Health and Environmental Spatial Sciences" specialization track will be offered within the Master's degree program. In the future, other specialization tracks may be developed, including ones focusing on environmental sustainability, urban planning, demography and population science, environmental technology, and applied geospatial analysis, possibly in collaboration with other CUNY programs and campuses.

The Health and Environmental Spatial Sciences specialization track proposed to be offered through Lehman's EGGS Department is outlined below. This track would entail a total of 40 credits: 14 credits of required core courses; an 8 credit capstone experience (either a Thesis Option, with an 8-credit thesis research project, OR the Professional Experience and Applied Research [PEAR] Option, consisting of a 4-credit capstone course - designing and implementing an applied project; plus a 4-credit intensive professional internship course); and 18 credits of GISc electives within the specialization track, with the option of up to 9 credits of the 18 elective credits in coursework in a cognate discipline, to be determined in consultation with an advisor, based on the student's stated interests and goals.

The objective of the 4 required core courses is to provide students with a solid grounding in the fundamentals of the geospatial sciences. Each core course explores one of the four main pillars of Geographic Information Science: geographic information systems, cartography, and spatial data interpretation; remote sensing; geostatistics and spatial analysis; and modeling. All GI Science

students need to know at least the rudiments of each of those sub-fields, regardless of their eventual area of specialization. These four core courses serve to integrate the different strands of GI Science into a cohesive body of knowledge, and situate the particular sub-fields within an over-arching framework of the broader geospatial sciences.

The range of elective GISc courses ensures that students have the chance to hone their abilities and deepen their understanding within the topic areas that will serve them best for their particular objectives when they complete the program. There is a considerable amount of latitude in meeting the requirements for the electives, which gives the program flexibility as well as the ability to custom-tailor the program to individual students' needs.

The 8-credit capstone experience gives students the opportunity to conduct a substantive research project of their own choosing; and in the PEAR Option, to also contribute their knowledge of GISc and their technical skills to a real-world project that might result in jump-starting their careers. The capstone experience helps students connect all the dots of their prior coursework, create the necessary linkages, and tie everything together, while also preparing them for their next steps, segueing to careers or to further academic pursuits.

### **B. Health and Environmental Spatial Sciences Specialization Track Description:**

The proposed Health and Environmental Spatial Sciences Specialization Track at Lehman College includes core courses in Geographic Information Science (GISc), spatial analysis, remote sensing, and environmental modeling, and provides a concentration in geo-spatial sciences focusing on environmental and health issues. This focus enables the integration of geo-spatial sciences and real-world applications in environmental analysis, risk and hazard assessment, public health, epidemiology, urban planning, urban geography, demographics, sociology, political science, ecology, biogeography, anthropology and archaeology, and other social and natural sciences. The program will examine the public policy connections and implications of GISc modeling and spatial analysis, and provide a broad-based framework in GISc theory and applied science.

The required courses, as listed below, are Principles of GISc; Introduction to Remote Sensing; Geostatistics and Spatial Analytical Concepts; Special Topics in GISc: Environmental Modeling; and an 8-credit capstone experience, which consists of either a Thesis Option, or a Professional Experience and Applied Research ("PEAR") Option.

Electives include Environmental Health and GISc; Natural Hazards and Risk Assessment with GISc; Demography and Population Geography with GISc; Biogeography and GISc; Urban Geography and GISc, Data Acquisition Methods for GISc; Geovisualization and Analytical Cartography; and Advanced Image Processing. See Appendix A for more detailed course descriptions of core courses and electives.

### **C. Proposed Required and Elective Courses for M.Sc. Program in GISc, Health and Environmental Spatial Sciences Specialization Track**

#### ***Required Core Courses (14 credits): Credits/Hours***

GEP 505 Principles of GISc (\*) 3/4

GEP 621 Remote Sensing (\*) 4/6

GEP 630 Geostatistics and Spatial Analytical Concepts (\*) 3/4

GEP 605 Special Topics in GISc (Environmental Modeling) (\*) 4/6

**Total Required Core Courses = 14 credits**

***Capstone Experience Coursework (8 credits):***

An 8-credit capstone experience, either the Thesis Option or the Professional Experience and Applied Research (PEAR) Option:

GEP 695 Thesis Research in GISc (~) 8 credits

**OR:**

GEP 690 Workshop in GISc Research (\*) 4/4 **AND:**

GEP 670 Internship in GISc/Professional Experience (\*) 4/4

**Total Required Capstone Experience Credits Needed = 8**

***Health and Environmental Spatial Sciences Specialization Track Electives (18 credits):***

***Credits/Hours***

GEP 602 Biogeography and GISc (\*) 4/5

GEP 620 Demography and Population Geography with GIS (\*) 3/4

GEP 632 Environmental Health and GISc (\*) 3/4

GEP 635 Natural Hazards and Risk Analysis (\*) 4/5

GEP 640 Urban Geography and GISc (\*) 3/4

GEP 641 Advanced Image Processing (\*) 4/6

GEP 660 Analytical Cartography and Scientific Visualization (\*) 4/6

GEP 675 Field Surveying, GPS, and Data Acquisition Methods (\*) 3/4

GEP 689 Methods Seminar in GISc (\*) 3/4

**Total Elective Course Credits Needed = 18 (up to 9 credits of courses may be taken in a cognate discipline, with permission of program advisor)**

**TOTAL FOR M.Sc. in GISc 40**

(\*) = Existing Graduate Course in EGGS Dept.

(~) = Proposed New Graduate Course.

The required core courses are existing at Lehman, and are currently offered at least once per academic year. The one course that will have to be added is GEP 695 Thesis Research, for those students choosing the Thesis Research Option. All suggested elective courses in the EGGS Department also currently exist. See Appendix A for detailed descriptions of existing Graduate Level GISc courses, and Appendix B for the proposed Curricula for GEP 695 Thesis Research in GISc. See Appendix D for a listing of existing faculty, their education, qualifications, and the GISc courses they are scheduled to teach (and in most cases, have already been teaching). All core courses, capstone experience courses, and most electives are covered by existing full-time faculty.

**D. Proposed Student Schedule:**

It is expected that a full-time student will be able to complete all the requirements for the degree within four terms. Part-time students would likely need 5 or 6 terms to complete the requirements, taking between 6 and 7 credits each term. In the final term of the program, the students complete their capstone experience, by either taking the Thesis Option or the Professional Experience and Applied Research (PEAR) Option. The Thesis Option requires a traditional Master's level research project and written thesis document, and is especially suitable for those students contemplating continuing on to doctoral studies or who want to pursue a career in research. The PEAR Option requires the Workshop in GISc Research course, which entails the design and implementation of a substantive and comprehensive GISc research project. In addition, students taking the PEAR option also take GEP 670, Internship in GISc/Professional Experience, which is an intensive real-world work experience in the field. See Appendix C for a sample of a typical student schedule.



**E. Residency Requirements and Transfer Credits**

Graduate students in the GISc program at Lehman must complete as matriculated students at Lehman at least half of the total graduate credits required to complete their program, OR 18 credits, whichever is greater. Six (6) credits of the residency requirement may be taken as permit classes at other CUNY colleges offering appropriate master’s-level courses.

Courses taken at other institutions can be applied to fulfill the GISc Master’s degree requirements in the first term or two of attendance at Lehman as a matriculated student. Grades of B or better are required in order for courses to be eligible for transfer, and are subject to the approval of the student’s graduate advisor at Lehman, and must also be approved by the Office of Graduate Studies. With appropriate permission, matriculated graduate students may apply as transfer credit towards their master’s program a total of 12 credits of graduate courses completed prior to matriculation in the GISc program. Within the total of 12 credits may be included: courses applied toward a previously awarded graduate degree at Lehman or elsewhere (maximum of six credits); courses taken at Lehman College in a non-matriculated status; and courses taken at other colleges where no degree has been awarded. See the Lehman College Graduate Bulletin for additional limitations regarding transfer credits.

**COST ASSESMENT**

The proposed curriculum for the MS-GISc is based almost entirely on existing courses currently being offered. These courses currently are run with excess capacity, and it is anticipated that the additional students enrolled in the MS-GISc program will not necessitate the addition of extra sections of these classes and will not impact the ability of full-time faculty to teach in the already established programs.

The proposed MS-GISc program also does not require new laboratories or facilities. The existing GISc Lab in the EGGS Department is a state-of-the-art facility, and will not require any significant upgrading for the foreseeable future. There are currently 24 workstations in the GISc Lab, and generally at this time our lab sections contain about 14 – 17 students. EGGS Department currently has a full-time laboratory technician, and this will be adequate to accommodate the additional enrollment due to the MS-GISc program.

The administrative costs for the proposed program will be minimal since the program will make use of existing Lehman College administrative structure, including the existing support and secretarial staff, as well as the existing GISc Program Director. There will be a negligible impact on library resources due to the GISc program. The only quantifiable expenditures associated with the implementation of the program will be costs for advertising (websites such as /www.sciencemasters.com, brochures, posters etc).

**Projected Expenditures for the MS-GISc**

First Year: Advertising	\$2,000
Second Year: Advertising	\$2,000
Third Year: Advertising	\$2,000
Fourth Year: Advertising	\$2,000
Fifth Year: Advertising	\$2,000
Total Expenditures 5 years	\$10,000

NOTE: Revenue tables can be found in Appendices G and I.

**APPENDIX A      COURSE DESCRIPTIONS FOR REQUIRED COURSES**

## **Existing Graduate GISc Courses at Lehman College EGGS Dept.**

### **Required Core Courses for M.Sc. Program in GISc:**

#### **GEP 505: Principles of Geographic Information Science**

(3 credits, 4 hours)

##### ***Course Description:***

The use of Geographic Information Systems (GIS) in the teaching of Social, Earth and Life Sciences. Demographic Studies and Graphic Presentation of Demographic Analyses. The use of modern mapping techniques in studies of Earth Environment.

#### **GEP 605 (650): Special Projects in GISc: Environmental Analysis and Modeling with GISc**

(4 credits, 6 hours)

##### ***Course Description:***

Use of Geographic Information Systems for conducting research and spatial analyses in the natural and social sciences. The advanced use of computer mapping and spatial analysis technologies for studying the physical and human components of the Earth environment.

#### **GEP 621: Principles and Applications in Remote Sensing**

(4 credits, 6 hours)

##### ***Course Description:***

In this course, students are taught the fundamental concepts and principles of electromagnetic theory in remote sensing, becoming familiar with the characteristics, capabilities, and limitations of past, current, and planned future remote sensing systems, and develop practical skills in interpreting aerial photographs, satellite optical remote sensing data, and thermal and radar imagery. Students will also be exposed to a wide variety of applications in environmental mapping and monitoring, natural resources management, urban and regional planning, and global change research. Weekly assignments will be provided to develop skills in interpreting different types of images. A term project will be required to make use of remotely sensed data and digital image processing capabilities in one particular area of application.

#### **GEP 630: Geostatistics and Spatial Analytical Concepts**

(3 credits, 4 hours)

##### ***Course Description:***

Explores the emerging fields of geostatistics and spatial analysis. Various quantitative techniques will be studied and applied to real-world geographic problems. Exploratory spatial data analysis (ESDA) will be done within multiple GIS packages such as ArcGIS and GeoDa. Traditional statistics (e.g. incidence ratio, correlation, regression) as well as geo-statistics such as spatially-lagged regression, spatial error model, and geographically weighted regression (GWR) will be performed within various packages including SPSS, GWRIII, GeoDa, ArcGIS, [R], and Excel.

### **Capstone Experience Courses (PEAR Option):**

#### **GEP 690: Workshop in Geographic Information Science Research**

(4 credits, 4 hours – may be taken for a total of 8 credits)

##### ***Course Description:***

An advanced examination of mapping and of new computer-aided technologies in the natural and social sciences, including research design and methodology and designing and conducting an

independent GIS research project, conforming to generally acceptable professional geographical practices and techniques, under the supervision of faculty.

**GEP 670: Seminar and Internship Program in Geography**

(10 field, 3 hours, 4 credits)

***Course Description:***

Current issues in Geographic Information Science(GISc), with weekly work as an intern in one of various governmental, non-profit, academic, or consulting organizations. Minimum 150 hours of GISc-related project work.

***Elective Courses for M.Sc. Program in GISc:***

**GEP 602: Biogeography and GISc**

(4 credits, 5 hours)

***Course Description:***

The methods and techniques used to examine the past and current distribution of organisms, in the context of geophysical, evolutionary, and ecological processes. Study of the geographic ranges of living organisms and discussion of numerous relevant topics. Lab work will provide students with hands-on experience using GISc to explore such concepts as species distribution, island biogeography, and community fragmentation.

**GEP 620: Demography and Population Geography w/GISc**

(3 credits, 4 hours)

***Course Description:***

The world's population in the context of geography and demography. The theoretical framework, defined by the fields of population geography and demography, will be studied and explored qualitatively and quantitatively. Data sources and acquisition, population metrics (growth, change distribution, and composition), population and food supply, mortality, fertility, and migration. Lab work will provide students with hands-on experience using GISc to explore demographic concepts.

**GEP 632: Environmental Health and GISc**

(3 credits, 4 hours)

***Course Description:***

This course explores the field of environmental health, especially focusing on spatial factors, medical geography, and the use of Geographic Information Science (GISc) to analyze relevant relationships between environmental impacts, diseases, demographics, socio-economic conditions, and the implications on public health and policy. Topics include environmental epidemiology, environmental toxicology, environmental justice, environmental policy, hazardous substances, air and water quality, food safety, global warming, population pressures, solid waste, occupational health, and risk assessment, as related to environmental health. Lab work uses GISc to examine and analyze environmental health, population, and built environment data for planning and research.

**GEP 635: Natural Hazards and Risk Analysis**

(4 credits, 5 hours)

***Course Description:***

Fundamentals of the natural hazards and disasters origin; physical and social implications; methods of quantitative and qualitative analysis; elements of geographic, geological, social and political analysis applied to risk estimation and mitigation and management measures. Use of Geographic Information Systems (GIS)tools and analytical techniques in lab exercises and assignments.

**GEP 640: Urban Geography and GISc**

(3 credits, 4 hours)

***Course Description:***

This course covers the contribution of geographical concepts and methods to an understanding of contemporary and future urban problems. It applies the use of GISc to the study of the internal structure of cities and urban systems, including city dynamics, classic and postmodern models, central place theory, urban migration and mobility, race, ethnicity, and gender, urban migration, poverty, industrial and post-industrial urban societies, residential segregation, land use change, gentrification, urban and suburban sprawl, housing, urban environmental issues, and regional planning. Lab work involves using GISc to explore the form and function of urban areas, and to solve critical urban problems using spatial analysis.

**GEP 641: Advanced Image Processing**

(4 credits, 5 hours)

***Course Description:***

Introduction to digital image analysis, application of digital analysis techniques to remote sensing data including mapping of land cover, land use, vegetation, geology, soil, built-up area, agricultural land, forest. Digital image analysis techniques will include image processing, transformation, registration and classification using industry standard digital image analysis software. Advantages and limitations of digital image analysis techniques will be discussed.

**GEP 675: Field Surveying, GPS, and Data Acquisition Methods**

(3 credits, 4 hours)

***Course Description:***

The techniques and science behind field methods commonly used for the acquisition and creation of geo-spatial data. Various techniques for data capture as well as processing and analyzing the data within a geographic information system (GIS). Labs will focus on the hardware and software needed for data creation, the integration of this information into a coherent GIS, and basic concepts of analysis including point-pattern analysis. Students will use GPS devices, mobile GIS, workstation GIS, as well as data from other sources including satellite and airborne remotely sensed data.

**GEP 660: Geovisualization and Analytical Cartography**

(4 credits, 6 hours)

***Course Description:***

Creating maps using advanced Geographic Information Science (GISc) techniques with a focus on understanding cartographic conventions and principles of good cartographic design, and analysis of complex spatial data through geovisualization methods. Maps will be studied critically in terms of their creation, interpretation, and relationship to space and place.

**GEP 689: Methods Seminar in Geographic Information Science (GISc).**

(3 credits, 4 hours)

***Course Description:***

Current methods in the field of Geographic Information Science. The nature of scientific research, defining geographic problems, issues of scale and resolution, research design, scientific literature review, acquisition of relevant data, capturing information and mapping in GIS, analysis and interpretation of data, presenting scientific findings in written and oral formats.

**APPENDIX B      SYLLABUS FOR NEW COURSE**

**LEHMAN COLLEGE  
CITY UNIVERSITY OF NEW YORK  
DEPARTMENT OF ENVIRONMENTAL, GEOGRAPHIC, AND GEOLOGICAL  
SCIENCES  
CURRICULAR CHANGE**

Hegis Code: 2206.01

**1. Type of Change:**

New Course

**2. Course Title and Description:**

GEP 695 Thesis Research in GISc, 4 or 8 credits

Preparation for Master's degree research and thesis writing in the GISc graduate program. A substantive and meaningful GISc research project is undertaken and a written thesis is prepared, using appropriate research methods in the field of GISc, demonstrating sufficient understanding of the nature of scientific research, the process of defining geographic problems, issues of scale and resolution, formation of research design, scientific literature review, acquisition of relevant data, capturing information and mapping in GIS, analysis and interpretation of data, presenting scientific findings in written and oral formats. Open only to students matriculated for the M.Sc. degree in GISc. Prerequisite: GEP 605

**3. Rationale:**

This course is intended to meet the needs of students in the graduate GISc program, within the context of promoting enhanced understanding research methods and scientific presentation of research. This course is one of the required courses in the proposed new Master's degree program in Geographic Information Science, as part of the capstone experience component of the degree program, Thesis Research Option. This course is especially appropriate for those graduate students who are intending to continue with doctoral studies or an academic research career.

**4. Learning Objectives -upon the successful completion of this course, students will be able to:**

- Conduct independent data assessment, data acquisition, data integration, data exploration, and geovisualization;
- Formulate workable hypotheses/problem statements;
- Perform a comprehensive literature search and review of relevant publications;
- Develop a research design using best statistical, geospatial, and cartographic methods;
- Translate GISc functions of spatial analysis and computer mapping to a substantive research project;
- Apply advanced GISc analytical techniques and methods to Geographic Information Science problem-solving;
- Interpret analyses correctly;
- Report findings and results in a cogent and logical fashion.

**6. Rationale for Prerequisite:**

The course is one of the Capstone Experience Options of the M.Sc. degree in GISc, to be undertaken at the end of the degree program. To satisfactorily complete the thesis research coursework, students must possess an advanced understanding of Geographic Information Science concepts, and a working knowledge of GISc use, project design, and implementation. Therefore, an advanced GISc course is required as preparation for the Thesis Research in GISc course.

**7. Effect on Curriculum Offerings Outside the Department:**

None

**8. Faculty:**

The course will be taught as a tutorial by members of the faculty of the Department of Environmental, Geographic, and Geological Sciences.

**9. Estimated Enrollment and Frequency:**

Anticipated enrollment is 6 students per year. The course will be offered every term, on a tutorial basis. Current mean enrollment in courses offered by the department: 20

**10. Date of Departmental Approval:** October 13, 2011



**APPENDIX C      PROGRAM SCHEDULING (SED Form)**

**Table 1b: Graduate Program Schedule**

▪ Indicate **academic calendar** type:   x Semester   Quarter   Trimester   Other (describe)

<b>Term: FALL 1</b>				<b>Term: SPRING 1</b>			
<b>Course Number &amp; Title</b>	<b>Credits</b>	<b>New</b>	<b>Prerequisite(s)</b>	<b>Course Number &amp; Title</b>	<b>Credits</b>	<b>New</b>	<b>Prerequisite(s)</b>
GEP 505 Principles of GISc (R)	3			GEP 630 Geostatistics and Spatial Analytical Concepts (R)	3		GEP 504 or departmental permission (DP)
GEP 621 Remote Sensing (R)	4			GEP 660 Geovisualization and Analytical Cartography (E)	4		GEP 504 or 505 or DP
GEP 632 Environmental Health and GISc (E)	3			GEP 635 Natural Hazards and Risk Analysis with GISc (E)	4		GEP 504 or 505 or DP
Term credit total:	10			Term credit total:	11		
<b>Term: FALL 2</b>				<b>Term: SPRING 2</b>			
<b>Course Number &amp; Title</b>	<b>Credits</b>	<b>New</b>	<b>Prerequisite(s)</b>	<b>Course Number &amp; Title</b>	<b>Credits</b>	<b>New</b>	<b>Prerequisite(s)</b>
GEP 605 Special Projects in GISc (R)	4		GEP 505 or DP	GEP 690 Workshop in GISc Research (C)	4		GEP 605
GEP 602 Biogeography and GISc (E)	4			GEP 670 Seminar in GISc Internship (C)	4		GEP 505 or DP
GEP 675 Field Surveying and Data Acquisition Methods (E)	3			<b>OR</b>			
				GEP 695 Thesis Research in GISc (C)	8	X	GEP 605
Term credit total:	11			Term credit total:	8		
<b>Program Totals:</b>	<b>Credits:</b> <b>40</b>	Identify any comprehensive, culminating element(s) (e.g., thesis or examination), including course number if applicable: <u>Thesis Option</u> : GEP 695 Thesis Research in GISc; <b>OR</b> <u>Professional Experience and Applied Research [PEAR] Option</u> : GEP 670 Seminar in GISc Internship AND GEP 690 Workshop in GISc Research					

**New:** indicate if new course      **Prerequisite(s):** list prerequisite(s) for the noted courses

**(R)= Required course; (E) = Elective; (C) = Capstone Course**

**APPENDIX D FACULTY TEACHING ASSIGNMENTS (SED Form)**

**Table 2: Full-Time Faculty**

<b>Faculty Member Name and Title</b> (include Program Dir.)	<b>Program Courses to be Taught</b>	<b>Percent Time to Program</b>	<b>Highest and Other Applicable Earned Degrees &amp; Disciplines</b> (include College/University)	<b>Additional Qualifications:</b> list related certifications/ licenses; occupational experience; scholarly contributions, etc.
Juliana Maantay, Professor (Program Director)	GEP 605 Special Projects in GISc	50	Ph.D., Environmental Geography, Rutgers University; M.U.P. Urban Planning, New York University; M.A. Geography/GISc, Hunter College, CUNY; B.Sc. Environmental Analysis, Cornell University	15 yrs teaching GISc; 15+ yrs professional practice; Author of GISc textbooks: "GIS for the Urban Environment," and "Geospatial Analysis of Environmental Health," and numerous peer-reviewed papers; Developed GISc curricula, internship program & GISc Certificate Program; Fulbright Distinguished Chair Award; technical consultant to US EPA, NAS, NIEHS, etc.; NOAA-CREST Research Scientist
	GEP 690 Workshop in GISc Research			
	GEP 689 Method Seminar in GISc			
Elia Machado, Assistant Professor	GEP 505 Principles of GISc	40	Ph.D., Geography Clark University; M.Sc. Geography Clark University; D.E.A. (M.Sc.) Environmental Sciences University of Granada (Spain); B.Sc. Environmental Sciences, University of Granada (Spain)	More than 10 years of research experience in GISc and Remote Sensing, and several years of teaching experience in GIS at different levels; Author of several peer reviewed publications on GISc and GIS applications.
	GEP 621 Remote Sensing			
	GEP 641 Advanced Image Processing			
Yuri Gorokhovich, Assistant Professor	GEP 635 Natural Hazards and Risk Analysis with GISc	40	Ph.D., Earth and Environmental Sciences, Graduate Center, City University of New York, MS, BS, Engineering /Marine Geology, Odessa University, Ukraine	GIS practitioner since 1991; designer of the first GIS for the Division of Water Quality and Control, New York City Department of Environmental Protection; designed GIS program for the District Attorney of New York City for the project "Safe Neighborhoods" that targeted mapping illegal guns possession within New York City; Author and contributor of 25 peer-reviewed publications, four video documentaries; Recipient of the Excellence in Research, Scholarship and Creative Works Award at Lehman College (2010).
	GEP 675 Data Acquisition Methods			
Andrew Maroko, Assistant Professor	GEP 632 Environmental Health and GISc	40	Ph.D., Earth and Environmental Sciences (Geography Specialization), CUNY Graduate Center; M.Phil, Earth and Environmental Sciences, CUNY Graduate Center; B.A., Biology, Rutgers University	6 yrs. teaching GISc, co-founder of Public Health Geographic Information Science specialization track in the CUNY School of Public Health MPH program; numerous peer-review papers.
	GEP 660 Geovisualization and Analytical Cartography			
	GEP 640 Urban Geography and GISc			

<b>Faculty Member Name and Title</b> (include Program Dir.)	<b>Program Courses to be Taught</b>	<b>Percent Time to Program</b>	<b>Highest and Other Applicable Earned Degrees &amp; Disciplines</b> (include College/University)	<b>Additional Qualifications:</b> list related certifications/ licenses; occupational experience; scholarly contributions, etc.
Glen Johnson, Associate Professor	GEP 630 Geostatistics and Spatial Analytical Concepts GEP 620 Demography and Population Geography with GISc,	30	Ph.D. in Quantitative Ecology, Penn State University (PSU); M.A. in Statistics (environmental option), PSU; M.S. In Ecology, PSU; B.S. in Biology, S.U.N.Y. College of Environmental Sci. and Forestry	Co-developed and taught “GIS and Public Health” for 11 years at the University at Albany-S.U.N.Y. School of Public Health; 16 years of applying GIS to environmental and public issues in academia, state government and private industry. Author of “Landscape Pattern Analysis for Assessing Ecosystem Condition” and many peer-reviewed journal papers applying GIS and spatial statistics.
Stefan Becker, Professor (Dept. Chair)	GEP 670 Seminar in GISc Internship GEP 695 Thesis Research in GISc	30	Dr. of Natural Sciences and Habilitation in Geography, Justus-Liebig-University, Giessen, Germany	More than 10 years of research experience in GISc; Author of numerous peer reviewed publications on topics that include applications of on GISc.

Faculty teaching at the graduate level must have an earned doctorate/terminal degree or demonstrate special competence in the field. Provide information on faculty members who are **full-time at the institution** and who will be teaching each course in the major field or graduate program. The application addendum for professional licensure, teacher certification, or educational leadership certification programs may provide additional directions for those types of proposals.

**Table 3: Part-Time Faculty**

<b>Faculty Member Name and Title</b>	<b>Program Courses to be Taught</b>	<b>Highest and Other Applicable Earned Degrees &amp; Disciplines</b> (include College/University)	<b>Additional Qualifications:</b> list related certifications/licenses; occupational experience; scholarly contributions, etc.
Holly Porter-Morgan, Adjunct Assistant Professor	GEP 602 Biogeography and GISc	Ph.D. Biology, Specialization in Biogeography, The Graduate Center, CUNY, Postdoctoral associate in GISc and Conservation Biogeography	Over a decade of work experience and 7 years teaching GIS and geospatial analysis at the undergraduate and graduate levels, Specialist in the use of GISc as related to the Natural Sciences and Conservation Biogeography, Specialist in predictive modeling

Faculty teaching at the graduate level must have an earned doctorate/terminal degree or demonstrate special competence in the field. Provide information on part-time faculty members who will be teaching each course in the major field or graduate program. The application addendum for professional licensure, teacher certification, or educational leadership certification programs may provide additional directions for those types of proposals.

**APPENDIX E FACULTY TO BE HIRED (SED Form)**

**Table 4: Faculty to be Hired**

If faculty must be hired, specify the number and title of new positions to be established and minimum qualifications.

<b>Title/Rank of Position</b>	<b>No. of New Positions</b>	<b>Minimum Qualifications</b> (including degree and discipline area)	<b>F/T or P/T</b>	<b>Percent Time to Program</b>	<b>Expected Course Assignments</b>	<b>Expected Hiring Date</b>

**NOTE: No new faculty need be hired to support the proposed M.Sc degree program in Geographic Information Science.**

**APPENDIX F      NEW RESOURCES TABLE (CUNY)**

N/A



**APPENDIX G      PROJECTED REVENUE TABLE (CUNY)**

The projected revenues are based on the rate of \$345 per graduate credit, assuming a full time course load of 20 credits per year per student.

*Projected Revenues for the MS-GISc*

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Year	Number of Students	Revenue
1	6	\$41,400
2	15	\$103,500
3	21	\$144,900
4	23	\$158,700
5	23	\$158,700
Total Revenue 5 years		\$607,200

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**APPENDIX H**  
**SUPPORTING MATERIALS FOR PROJECTED REVENUE TABLE (CUNY)**

See notes in Appendix G

**APPENDIX I FIVE YEAR FINANCIAL PROJECTION (CUNY TABLE)**

Based on projected costs and revenues, we expect that the MS-GISc will be self-sustaining within its first year.

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Year	Projected Cost	Projected Revenue	Projected Balance
1	\$2,000	\$41,400	\$39,400
2	\$2,000	\$103,500	\$101,500
3	\$2,000	\$144,900	\$142,900
4	\$2,000	\$158,700	\$156,700
5	\$2,000	\$158,700	\$156,700
5 year total	\$10,000	\$607,200	\$597,200

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**APPENDIX J**  
**EVALUATION REPORT FORM (NON TEACHER EDUCATION GRADUATE**  
**PROGRAM) (CUNY FORM)**

**APPENDIX K      FACULTY BIOSKETCHES**

## **Bio Sketches of Full-Time GISc Faculty at Lehman College's EGGGS Dept.**

### ***Juliana Maantay***

Dr. Juliana Maantay is a professor of urban and environmental geography at Lehman College, City University of New York, and director of Lehman's Geographical Information Science (GISc) Program, which she designed and established in 2002. She is the Director of the Urban GISc Lab, and is also a faculty member in the Earth and Environmental Sciences Ph.D. program at the CUNY Graduate Center; the doctoral program (DrPH) in Public Health at the CUNY School of Public Health/CUNY Graduate Center; the Master of Public Health Program at Lehman; and a research scientist with NOAA-CREST, the National Oceanic and Atmospheric Administration Center of Remote Sensing Science and Technology, at City College.

Dr. Maantay has over 20 years experience as an urban and environmental planner and policy analyst with governmental agencies, nonprofit organizations, and private sector environmental and planning firms, and has been active in environmental justice research and advocacy for more than 15 years. She was the Director of the Center for a Sustainable Urban Environment at Hostos Community College, CUNY, where she developed and conducted a comprehensive GIS analysis of environment and health in the Bronx, a community-university partnership program of the United States Environmental Protection Agency. Her research on environmental health justice and related topics has been published in leading journals, including the *American Journal of Public Health*, *Environmental Health Perspectives*, *Health and Place*, *Urban Geography*, *Applied Geography*, *Cartography and GIScience*, and the *Journal of Law, Medicine, and Ethics*. Her award-winning book, *GIS for the Urban Environment*, was published in 2006 by ESRI Press (Environmental Systems Research Institute), and has remained on the Top 10 list of GISc books on Amazon.com since it was published. The book is currently specified for urban planning, public health, and geography courses in universities throughout the world. The book *Geospatial Analysis of Environmental Health*, which she co-authored with Dr. Sara McLafferty, was published in 2011 by Springer-Verlag.

Maantay's major research interests include the spatial analysis of health disparities and environmental health justice, and the use of participatory GISc for community-based organizations. She is a co-PI of the South Bronx Environmental Justice Partnership, with major funding from the NIEHS. Her research work has also been supported by the USDA, NOAA, NASA, NYC Parks Dept., the National Center for Minority Health and Health Disparities, the Peter Wall Institute for Advanced Research, and others. Dr. Maantay serves on the Environmental Protection Agency's National Environmental Justice Advisory Council's Work Group in developing a nationally consistent screening method for environmental health justice communities, in the capacity of Geographic Information Science specialist. She has been invited to present her research at the National Research Council/National Academy of Sciences, the New York Academy of Sciences, the New York Academy of Medicine, National Institute of Environmental Health Sciences, the United Nations, NOAA, NASA, EPA, and numerous universities and public agencies, nationally and internationally.

Maantay has designed curricula for and taught courses in GISc; mapping science; cartography; environmental health and GIS; spatial analysis; urban planning with GIS; environmental geography; environmental modeling with GISc; GISc research methods; urban geography and GISc; and GISc for earth and environmental sciences. She has taught undergraduates, graduates, and doctoral students at Lehman, the Graduate Center, Hunter College, Hostos Community College, and Pratt Institute, and supervises the GISc Internship Program at Lehman. She holds an M. Phil. and a Ph.D. in urban environmental geography from Rutgers University, a Master of Urban Planning from New York University, an M.A. in environmental geography/geographic information systems from

Hunter College/CUNY, and a B.Sc. in Environmental Analysis and Design from Cornell University. Dr. Maantay is the recipient of a Fulbright Distinguished Chair Award, and was elected a Fellow of the Royal Geographic Society in Great Britain.

### ***Stefan Becker***

Dr. Stefan Becker is a professor and chair in Lehman College's EGGG Dept. He received his doctorate (Dr. rer. nat.) from the Justus-Liebig-University Giessen (Germany). In addition to his work experience in the United States, Dr. Becker has pursued his career by working at universities in various countries: The main work for his dissertation was done at the Tel Aviv University (Israel); he did his postdoctoral studies at the University of the Witwatersrand, Johannesburg, South Africa and received his habilitation from the Justus-Liebig-University Giessen (Germany). Before joining Lehman College in August 2010, Dr. Becker was employed as full-time instructor and researcher at the University of Wisconsin Oshkosh. He also is a faculty member in the Earth and Environmental Sciences Ph.D. program at the CUNY Graduate Center.

Dr. Becker has been particularly interested in atmospheric processes and regional impacts of climatic and environmental change. He has studied temporal and spatial variability of rainfall patterns in Tibet and in the Yangtze River basin in China and their impact on flood events based on atmospheric modeling, nonlinear statistical analysis, and GIS applications. Recent works have led him to focus on developing future scenarios and improving the forecast of severe flood events in the region. Furthermore, Dr. Becker has studied the distribution of air pollution from coal-fired power stations and their impact on humans in South Africa based on statistical models and GIS applications. Other research projects include heat-stress in Israel and South Africa, regional impacts of climate change in Wisconsin, and wind energy potential in Germany. In recent years, his research has also focused on understanding and modeling of hurricane track and intensity changes in the Atlantic. Dr. Becker has published more than 30 peer-reviewed articles in international journals such as *Theoretical and Applied Climatology*, *International Journal of Climatology*, *Stochastic Environmental Research and Risk Assessment (SERRA)*, *Climate Research* and others.

Dr. Becker has developed curricula and taught courses in physical geography, statistics, weather and climate, climatology, environmental conservation, environmental policy, as well as many other courses on regional geography.

### ***Yuri Gorokhovich***

Dr. Yuri Gorokhovich is an assistant professor in Lehman College's EGGG Dept. He received an M.S. in Engineering/Marine Geology from Odessa State University (Ukraine), and a Ph.D. in Earth and Environmental Sciences from the Graduate Center of the City University of New York. He was a research scientist and manager of the GIS unit at the New York City Department of Environmental Protection, and an associate research scientist at CIESIN, Columbia University, and has taught at Lehman, Columbia, City College, and Purchase College, SUNY.

His research interests include natural hazards and disasters, climatic studies, and Geographic Information Systems (GIS) modeling in applied geology and geography. Dr. Gorokhovich has taught *Introduction to Geographic Information Systems*; *GIS Research, Environment, Infrastructure, Management*; and *Environmental Data Analysis*. Graduate courses he teaches regularly in the GISc Program at Lehman are *Natural Hazards and Risk Analysis with GISc*; and *Data Acquisition and Field Surveying Techniques*.

### ***Glen Johnson***

Dr. Johnson is an Associate Professor in the Department of Health Sciences and the Department of Environmental, Geographic, and Geological Sciences at Lehman College, City University of New York. He has a Ph.D. in Quantitative Ecology, a M.A. in statistics and a M.S. in Ecology, all from Penn State University. His undergraduate studies in environmental biology and chemistry were completed at the S.U.N.Y. College of Environmental Science and Forestry in association with Syracuse University. His Ph.D. dissertation was titled “Landscape Pattern Analysis for Assessing Ecosystem Condition”.

Glen’s cross-disciplinary career has included work as a biologist and statistician with the Pennsylvania Department of Environmental Resources, addressing water and soil contamination issues; a consultant in Geographic Information Systems (GIS) and statistics; a graduate research assistant in environmental and ecological statistics; and as a biostatistician for the New York State Department of Health. Glen was also elected to the faculty of the University at Albany School of Public Health, Department of Environmental Health Sciences where he co-developed and taught “GIS in Public Health”, mentored many graduate students and was actively involved in the MPH program. Glen’s research has resulted in about 30 peer-reviewed journal papers and book chapters, and one book.

Glen Johnson’s current research interests are in geo-spatial aspects of health, with particular application to environmental and community-level social determinants of health outcomes. More specifically, he is interested in health effects of the built environment; and also the development of community needs indices to assist public health agencies with resource allocation decision-making using evidence-based community risk assessment.

### ***Elia Machado***

Dr. Machado is an Assistant Professor in the Department of Environmental, Geographic, and Geological Sciences. Her research intersects the fields of Medical and Health geography, GIScience, and Vulnerability to global environmental change.

She received her B.S and M.Sc. in Environmental Sciences from the University of Granada, Spain, and earned her Ph.D and M.A. in Geography from Clark University with a dissertation on vulnerability to dengue fever in Mexico.

She has been a graduate fellow at UC Berkeley as well as the Institut Supérieur d’Action Internationale et de Production in Angers (France), and has worked as a researcher at the Biogeography lab of UC Santa Barbara, and Clark Labs (Clark University), best known for its GIS and Image Processing software IDRISI.

Professor Machado has taught GIS and Remote Sensing at undergraduate and graduate levels, and instructed international seminars for GIS professionals. Her publications on GIS include work on spatial and time series analysis, decision making, vulnerability analysis of vector-borne diseases, and conservation planning.

### ***Andrew Maroko***

Dr. Maroko is an Assistant Professor in the Department of Health Sciences and the Department of Environmental, Geographic, and Geological Sciences. He received his Ph.D. and Master’s degrees in Earth and Environmental Sciences (geography specialization) from the Graduate Center of the City University of New York (NY, NY), and his undergraduate studies in Biology were completed at Rutgers University. His doctoral dissertation was entitled *Chronic Exposure to Fine Particulate Matter and Heart Failure in New York City: A Methodological Exploration of*



*Environmental Justice and Health.* Professor Maroko earned his bachelor's from Rutgers University (New Brunswick, NJ) while majoring in Biology. He now is an assistant professor in the health sciences department of Lehman College (CUNY) / CUNY School of Public Health. Dr. Maroko is also on the faculty of the CUNY Graduate Center's Ph.D. programs in Public Health (DPH) and Earth and Environmental Sciences. Professor Maroko has taught numerous courses at the graduate and undergraduate levels in geographic information science, spatial analysis, geography, and environmental health.

Andrew Maroko's research interest in health geographics centers on the spatial analysis of environmental health and equity issues. He is the associate director of the Urban GISc Lab at Lehman College and is actively involved in the research core of the CUNY Institute for Health Equity. His research has been published in leading journals, and includes work on environmental justice, exposure assessment, pollution modeling, geo-statistical analyses, computational geography, urban health geographics, accessibility, and geovisualization.

**APPENDIX L      RECENT GISc JOB ANNOUNCEMENTS**

## **23 Recent GISc Position Announcements – (August-September 2011)**

1.)

Please note that these positions are \*in addition to\* the Applications Developer position still listed on the OEM website.

NYC OFFICE OF EMERGENCY MANAGEMENT  
GRANT FUNDED POSITION UNTIL JULY 31, 2013 WITH THE POSSIBILITY OF AN EXTENSION  
CITYWIDE JOB VACANCY NOTICE

Civil Service Title: EMERGENCY PREPAREDNESS SPECIALIST  
Title Code No.: 06766  
Salary Range: \$60,000 - \$80,000  
Office Title: GIS SPECIALIST  
Division/Work Unit: GEOGRAPHIC INFORMATION SYSTEMS (GIS) DIVISION  
Work Location: 165 CADMAN PLAZA EAST BROOKLYN, NY 11201  
Number of Positions: 1

### **JOB DESCRIPTION**

OEM has an opportunity for a motivated GIS professional to become part of a team of GIS Specialists comprising the Public Safety GIS Data Development Center. The ideal candidate has extensive GIS experience at an enterprise level in addition to programming and database development/management skills. The position is under the supervision of the Assistant Commissioner for Strategic Data and the Public Safety GIS Data Development Center Project Manager.

The applicant will bring considerable technical expertise to issues pertaining to the acquisition, refinement, maintenance, and operability of geospatial data in support of the agency's mission and goals. The applicant will stay abreast of current developments and trends in geospatial technology and provide recommendations on how proceed in a manner that provides the maximum benefit to the agency.

Sample tasks the applicant will undertake include:

- Procuring datasets from various data sources
- Review data for quality assurance
- Improve data to meet production quality standards as needed.
- Write metadata for data sets
- Produce new datasets from complex data integration processes that are automated by scripting
- Enhance the data center's data management capabilities via the automation of tasks and implementation of custom tools
- Customize the ArcGIS for Desktop application based upon specific needs and assessment of data center workflows.
- Develop, maintain, and enhance ArcGIS Image Server services
- Maintain and update collection of high resolution imagery
- Set-up, configure, and optimize ArcSDE for Microsoft SQL Server
- Work with libraries from multiple programs
- Manage code production in an enterprise environment
- Provide guidance on the adoption of emergent technologies
- Prepare and deliver presentations to the division regarding data of interest and/or workflows
- Assist with Ready New York presentations to external groups.

The selected candidate will be expected to work during non-business hours during emergencies and will be assigned to a periodic Emergency Operations Center Team.

### **QUALIFICATION REQUIREMENTS**

1. A master's degree from an accredited college in emergency management, public administration, urban planning, engineering, economics, political science, the physical sciences or related field and one year of satisfactory full-time professional experience in one or a combination of the following: emergency management, fire, police service, military service, public safety, public health, public administration, urban

- planning, engineering, or another specialized area to which the appointment is to be made; or
- 2. A baccalaureate degree from an accredited college and two years of satisfactory fulltime professional experience in the areas listed in "1" above; or
- 3. A four year high school diploma or its educational equivalent approved by a state's department of education or a recognized accrediting organization and six years of satisfactory full-time professional experience in the areas listed in "1" above, at least two years of which must have been in one of those areas, or another specialized area to which the appointment is to be made.

PLEASE NOTE: NYC Residency is required within 90 days of appointment. However, City employees in certain titles who have worked for the City for 2 continuous years may also be eligible to reside in Nassau, Suffolk, Putnam, Westchester, Rockland, or Orange County.

**PREFERRED SKILLS**

- Related fields cited in qualification requirements above may include geography, GIS, or computer science.
- Strong, demonstrated experience with ESRI ArcGIS 10.x and/or 9.x desktop applications, geoprocessing tools, and the Spatial Analyst, Network Analyst, and 3D Analyst extensions.
- Strong, demonstrated knowledge of ArcObjects.
- Strong, demonstrated experience with Python and the arcpy and/or arcgisscripting module and other modules relevant to data management such as pyodbc and GDAL.
- Demonstrated experience constructing, using, and publishing models in ModelBuilder.
- Extensive familiarity with geospatial data types.
- Extensive familiarity with metadata and FGDC standards.
- Strong, demonstrated experience with Microsoft Visual Studio 2010 and/or 2008, preferably using C#, for both 32-bit and 64-bit development environments.
- Strong, demonstrated knowledge of ArcGIS Server components Image Server and ArcSDE.
- Strong, demonstrated knowledge of Microsoft Access.
- Knowledge of Microsoft SQL Server 2008 or 2005 capabilities and SQL.
- Demonstrated experience working with technical and non-technical staff.
- Strong initiative and ability to perform with little supervision.
- Ability to identify needs of end users and communicate possible solutions to them.
- Strong organizational skills.
- Ability to handle multiple projects simultaneously under tight deadlines.
- Ability to work in a team environment.

NOTE: The following types of experience are not acceptable: superficial use of preprogrammed software without complex programming, design, implementation or management of the product; use of word processing packages; use of a hand held calculator; primarily the entering or updating of data in a system; the operation of data processing hardware or consoles.

TO APPLY, PLEASE SUBMIT RESUME AND COVER LETTER WITH THE JVN NUMBER TO:

Mailing Address: 165 CADMAN PLAZA EAST BROOKLYN, NY 11201

E-Mail Address: [jobs@oem.nyc.gov](mailto:jobs@oem.nyc.gov)

NOTE: ONLY THOSE CANDIDATES UNDER CONSIDERATION WILL BE CONTACTED.

POSTING DATE:

August 18, 2011

POST UNTIL:

FILLED

JVN:

176/12/017

- AN EQUAL OPPORTUNITY EMPLOYER-

Special accommodations will be provided for disabled applicants.

2.)\*\*\*\*\*

NYC OFFICE OF EMERGENCY MANAGEMENT  
GRANT FUNDED UNTIL 8/31/2013 WITH THE POSSIBILITY OF AN EXTENSION

CITYWIDE JOB VACANCY NOTICE

Civil Service Title: EMERGENCY PREPAREDNESS SPECIALIST  
Level: 01  
Title Code No.: 06766  
Salary Range: \$52,000 - \$72,000  
Office Title: GIS SPECIALIST  
Division/Work Unit: GEOGRAPHIC INFORMATION SYSTEMS  
Work Location: 165 CADMAN PLAZA EAST, BROOKLYN, NY 11201  
Hours/Shift: M – F / 9 - 5  
Number of Positions: 1

JOB DESCRIPTION

The candidate will be part of a team of GIS specialists whose focus is to determine the availability of a wide variety of existing GIS data sets; update and reformat such data sets; and produce or arrange for the production of new data sets specifically for the use of City agencies involved in public safety / emergency management.

Additionally, the GIS Specialist will help produce and manage data sets of specific critical infrastructure systems and building floor plans that may be useful for emergency response. Existing CAD drawings will be reviewed and modified for this purpose. The GIS Specialist will also reformat the CAD data sets for use with other GIS data sets.

The GIS Specialist, under supervision, shall:

- inventory, catalog, and categorize existing GIS data sets;
- produce metadata for the data sets;
- update, reformat, and distribute data sets, including CAD drawing data sets;
- research / investigate the availability of other data sets;
- make informed recommendations about the maintenance and procurement of identified data;
- produce map products using this data for ad hoc projects; and
- assist with Ready NY Presentations to external groups.

The selected candidate will be expected to work non-business hours during emergencies and will be assigned to a periodic Emergency Operations Center Team.

QUALIFICATION REQUIREMENTS

1. A master's degree from an accredited college in emergency management, public administration, urban planning, engineering, economics, political science, the physical sciences or related field and one year of satisfactory full-time professional experience in one or a combination of the following: emergency management, fire, police services, or military service, public safety, public health, public administration, urban planning, engineering, or another specialized area to which the appointment is to be made; or
2. A baccalaureate degree from an accredited college and two years of satisfactory full-time professional experience in the areas described in "1" above; or
3. A four-year high school diploma or its educational equivalent approved by the state's department of education or a recognized organization and six years of satisfactory full-time professional experience in the areas listed in "1" above, at least two years of which must have been in one of those areas, or another specialized area to which the appointment is to be made.

PLEASE NOTE: NYC Residency is required within 90 days of appointment. However, City employees in certain titles who have worked for the City for 2 continuous years may also be eligible to reside in Nassau, Suffolk, Putnam, Westchester, Rockland, or Orange County.

**PREFERRED SKILLS**

- Master's degree in geography, geographic information systems, architecture, or engineering.
- Strong data management skills.
- Strong background using and producing GIS data sets.
- Strong experience with ArcMap 9 & 10 and ArcSDE.
- Strong experience with Autodesk AutoCAD or Autodesk Map 3D.
- Strong experience with reviewing and modifying architectural floor plans and infrastructure systems.
- Strong ability to work effectively in a team structure and to complete tasks in a timely fashion.

TO APPLY, PLEASE SUBMIT RESUME AND COVER LETTER TO:

Mailing Address: 165 CADMAN PLAZA EAST, BROOKLYN, NY 11201  
E-Mail Address: [JOBS@OEM.NYC.GOV](mailto:JOBS@OEM.NYC.GOV)

NOTE: ONLY THOSE CANDIDATES UNDER CONSIDERATION WILL BE CONTACTED.

POSTING DATE:  
August 18, 2011

POST UNTIL:  
FILLED  
JVN: 017/12/177  
- AN EQUAL OPPORTUNITY EMPLOYER -  
Special accommodations will be provided for disabled applicants.

3.)\*\*\*\*\*  
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**Organization:** Esri (Environmental Systems Research Institute)

**Title:** Support Analyst - Database

**Location:** Redlands, CA

**Application Deadline:**

**Posted:** 2011-09-26

**Position Description:**

General

Do you have a unique combination of strong technical and customer service skills? Learn about the latest Esri technology in this consultative support role while providing timely, expert assistance to our customers by phone and e-mail. Join the team whose mission is to put into practice Esri's long standing commitment of serving and responding to our user community.

Department  
Educational Services - Support Services

Responsibilities:

Provide high-quality support to end users of Esri software to solve technical problems quickly and effectively.

Document technical issues through incident tracking, Knowledge Base articles, and submission

of software defect/enhancement requests.

Test software and hardware to troubleshoot issues and evaluate solutions.

Determine or recommend software changes to programmers/software engineers.

Utilize and develop problem-solving skills, communication skills, creativity, and knowledge of Esri products.

More experienced candidates may also teach and author GIS software, developer, and database training courses, conduct technical workshops, and perform short-term on-site consulting assignments related to database administration.

#### Requirements

Bachelors or masters or equivalent work experience in GIS, geography, computer science, information systems, engineering, environmental science, urban planning, or a related field, depending on position level.

Excellent customer service, analytical/problem-solving, and written and verbal communication skills.

Possess a clear understanding of GIS theory and applications.

Familiarity with and ability to communicate GIS and technical terms and/or technical information.

Working knowledge and experience in the use of Windows operating systems.

Working knowledge and experience using ArcGIS Desktop, ArcGIS Server, ArcIMS, ArcInfo Workstation, ArcView, or other Esri software products.

Familiarity with ArcGIS Desktop extensions (preferably ArcGIS Spatial Analyst and ArcGIS 3D Analyst).

Working knowledge and experience with Esri geodatabase schema and behavior.

#### Recommended Qualifications

Working knowledge/experience in customer service/software support.

Familiarity with ArcObjects/VBA/Python scripting and programming.

Working knowledge and experience with hardware-related issues.

#### The Company:

Esri software gives organizations the power to think and plan geographically. We support the implementation of geographic information system (GIS) technology on the desktop, servers, online services, and mobile devices. Used today in more than 350,000 organizations worldwide, Esri technology helps governments, universities, and businesses save money, lives, and our environment.

With annual revenues of \$794 million, Esri is the market leader in GIS technology. Our diverse staff consists of 2,800 people in the U.S., 1,950 of whom are based at our headquarters in Redlands, a community ideally located in Southern California. We offer exceptional benefits, competitive salaries, 401(k) and profit sharing programs, tuition assistance, opportunities for personal and professional growth, a cafe complete with Starbucks coffee bar, an on-site fitness center, and more.

Learn more about a career in Technical Support at Esri and apply online at [www.esri.com/tscareers](http://www.esri.com/tscareers).

Esri is an equal opportunity employer (EOE) supporting diversity in the workforce.

4.)\*\*\*\*\*

**Organization:** Harte Research Institute for Gulf of Mexico Studies

**Title:** Programmer III (Web Applications Developer)

**Location:** Corpus Christi, TX USA

**Application Deadline:**

**Posted:** 2011-09-26

**Position Description:**

The web applications developer is primarily responsible for designing, testing, and implementing public-facing web services and applications for the Gulf Research Initiative Information and Data Cooperative (GRIIDC). GRIIDC is a data stewardship program which seeks to address the needs of Gulf Research Initiative (GRI) researchers, and to ensure a data and information legacy that promotes continual scientific discovery of the Gulf of Mexico ecosystem. GRIIDC will work with many disparate scientific and environmental data formats and standards. GRIIDC is housed in the Harte Research Institute for Gulf of Mexico Studies, which is affiliated with and located at Texas A&M University - Corpus Christi.

**Primary Assigned Duties:**

Design, implement, test, and maintain web sites, web services, and applications. Work with Grant Sponsor and other developers to make data accessible via intranet and internet applications. Ensure cross-browser, cross-platform integrity of web site designs and applications. Design and develop GIS web applications, maintain knowledge of current trends in web application development. Work closely with the team members to achieve project goals. Work with web administration team members with content updates, design changes, and general website maintenance. Maintain code and project documentation and provide reports. Perform related duties as assigned.

**Minimum Qualifications:**

Bachelors degree in Computer Science or related field. Three (3) years of related experience. Any equivalent combination of education and experience will be considered. Strong knowledge and demonstrated experience in web and software application development, and website design, development, and maintenance. Strong skills in database-driven web application development. Experience with Content Management Systems (CMS) such as Joomla!, WordPress, and Drupal. Excellent interpersonal and verbal and written communication skills. Demonstrated experience or familiarity in the following technologies: Object-oriented design and development ( Java, .Net), Windows and Linux system administration and scripting, web development (HTML, CSS, XML, PHP, ASP.NET, JavaScript), and web-based database application development.

**Preferred Qualifications:**

MS in Computer Science, GIS, or similar field, or five (5) or more years of related experience. Demonstrated experience designing web mapping applications and applying GIS concepts. Demonstrated graphic design skills for web sites. Experience with JavaScript frameworks such as JQuery, ExtJS, and Dojo, and/or RIA platforms such as Adobe Flex or Microsoft Silverlight. Experience with Esri GIS product line, including ArcGIS Server, ArcGIS Web APIs, ArcGIS for



Desktop, ArcPy, and ArcSDE. Experience with Open Source GIS platforms, including PostGIS, GDAL/OGR, Geoserver, Mapserver, OpenLayers. Experience with Open Geospatial Consortium (OGC) standards, including SOS, WMS, WFS, WCS, CSW. Familiarity with environmental and scientific data formats including but not limited to oceanographic, underwater video, water quality, remote sensing, and geospatial data types. Familiarity with NSF research grants, including data management requirements, metadata standards, and statistics.

**Special Notices:**

This position is grant funded. Continued employment is contingent upon availability of funds.

This is a security-sensitive position. Employment is contingent upon an acceptable background investigation.

To apply for this position, visit

<http://islanderjobs.tamucc.edu/applicants/Central?quickFind=69593>

5.)\*\*\*\*\*

**Organization:** Woolpert, Inc.

**Title:** Application Developer - Chesapeake, VA

**Location:** Chesapeake, VA

**Application Deadline:**

**Posted:** 2011-09-23

**Position Description:**

Leading Innovation and Integrity... As members of a leading design, geospatial and infrastructure management firm, Woolpert employees inspire each other to be the best through their ingenuity, diversity and vision. With projects that contribute to the sustainability, security and efficiency of federal, local and private-sector clients across the U.S. and abroad, our employees appreciate rewarding careers that contribute to advances in the Architectural/Engineering industry while also knowing they're serving the needs of some of the best communities and organizations around the world.

Woolpert, Inc. seeks an Application Developer (GIS) in our Chesapeake, VA office. The successful candidate will be responsible for designing, developing, implementing, consulting & addressing the software or system demands of GIS-based applications for municipal clients. The position requires:

1. Participation in project planning, development, and providing input for application development scope and time estimates.
2. Planning and designing processes & tools for GIS-based applications.
3. Designing, developing & maintaining systems integration solutions for the client's IT enterprise (service-oriented architecture solutions).
4. Draft system requirements & system design specifications for management review.
5. Apply problem solving techniques to identify & resolve project issues.
6. Document code or designs according to company & client standards. Store files, versions & libraries according to company & client standards.
7. Visit clients & work onsite as required.
8. Expert with C#.

Qualified candidates will possess have a BA/BS and four (4) years related experience, MA/MS and two (2) years related experience or eight (8) years related experience in Computer Science, Engineering, Computer Engineering or related field. Expertise in the implementation of service-oriented architecture in a GIS (ESRI) environment & application of GIS to manage networks & processes are strongly preferred.

Presenting Opportunities and Challenges at Every Turn... As a firm that recognizes the importance of developing top talent from within, our employees have access to a wide range of training and coaching programs and are rewarded for their achievements through our excellent benefits package and competitive salaries. For consideration, please apply on line at <http://www.woolpert.com> using requisition number JJ11349-4. Please no agency or recruiter calls. We are proud to be an EEO/AA employer (M/F/D/V) who maintains a drug-free workplace.

6.)\*\*\*\*\*

**Organization:** Ecology and Environment, Inc.

**Title:** Senior GIS Analyst

**Location:** Morocco

**Application Deadline:** 2011-10-21

**Posted:** 2011-09-21

**Position Description:**

Ecology and Environment, Inc. is a fully-integrated environmental consulting firm committed to supporting sustainable development through responsible environmental stewardship. We are seeking a highly motivated GIS Analyst, with 6+ years' of client management and business development experience, to support our Moroccan operations. The successful candidate will be part of our growing team of international scientists and engineers who are delivering innovative solutions on major development projects in Morocco and West Africa. The Senior GIS Analyst will aid in designing enterprise-levels applications for our client as wells as adeptly handling all aspects of desktop GIS analysis and mapping. Position will be located at our offices in Casablanca.

Technical Responsibilities Include:

- Identify and Communicate System Design Considerations: Identifying client business goals, outputs, and processes where ArcGIS can assist existing business workflows.
- Capacity planning and performance: Identifying functional and non-functional user requirements, and design corresponding conceptual architecture. Assisting in implementation of system phase/migration plans in testing, staging and production environments.
- Geographic Data Types: Working with GIS and CADD data file formats to determine effective methods of creating, managing, and editing raster and vector GIS data for use in desktop and enterprise-level applications.
- Cartographic Expertise: Using cartographic knowledge-base to produce GIS maps for static and/or interactive mapping sites.
- Geospatial Analysis and Geo-processing: Identifying appropriate spatial operation for each particular need and automating, documenting, and sharing multiple-step workflows, using ArcGIS desktop ModelBuilder and Python programming language, where appropriate.
- Spatial Data Acquisition and Management: Collecting and organizing spatial data from local or

regional data holders. Creating GIS datasets using ArcGIS Desktop (ArcCatalog and ArcMap) and ArcPad in conjunction with handheld GPS devices, for integration into an ArcSDE Enterprise Geodatabase.

- Web Mapping Enterprise Applications: Basic maintenance of enterprise interactive web-mapping sites including the ability to modify map services behind mapping applications (adding and removing data layers, symbology changes), site debugging, and coordination with GIS development team in bug resolution.

Requirements:

- Bachelor's Degree in GIS, Geography, Computer Science or related discipline; Master's degree preferred
- Fluency in technical French and English required; conversational Arabic a plus
- 6+ years of experience with ArcGIS 9.x/10.x, MS Office and MS Access
- Basic knowledge of ESRI ArcGIS Server 10.x (Silverlight/WPF API preferred)
- Demonstrated ability to build basic custom tools for ArcGIS Desktop as well as program debugging skills
- Demonstrated ability with client relationship management and consultation
- Excellent interpersonal communication skills, and cultural sensitivity with the ability to effectively and tactfully interact with individuals
- Willingness to work internationally in Morocco for a minimum of one year

E & E offers opportunities for growth in a team-oriented environment and a competitive benefits package. Please view our website at [www.ene.com](http://www.ene.com) to apply on-line; resumes must be submitted in English. Join our team and make a difference! Ecology and Environment, Inc is an EEO/AA employer. M/F/V/D

7.)\*\*\*\*\*

**Organization:** Applied Geographics, Inc. (AppGeo)

**Title:** GIS Project Manager

**Location:** Boston, Massachusetts

**Application Deadline:**

**Posted:** 2011-09-20

**Position Description:**

Applied Geographics, Inc. (AppGeo) has an opening and seeks a talented, motivated and experienced person to join our GIS consulting team as a GIS Project Manager. The successful applicant will join a professional staff focused on planning and applying GIS and related technologies to satisfy specific customer needs which include: spatial data development, web applications development and/or hosting as well as enterprise system design, architecture and implementation.

This position entails both hands-on GIS software skills and the ability to manage multiple projects simultaneously. Strong communication skills are required for both direct customer and colleague interaction and acting as a liaison between the client and AppGeo specialists (i.e. data development and programming staff). Applicants should also have a minimum of 5 years of experience with the Esri suite of software products, and SQL Server and/or Oracle RDBMS. Experience with the OpenGeo Suite of products is a plus, as well as project management and collaboration tools such as Microsoft Project and Sharepoint.

Requirements: Applicants should have working knowledge of implementing GIS for both public and private sectors in some, or all of the following areas:

- System planning and user requirements gathering
- Data collection methods
- Database management and SQL
- Application specification and development (both web and desktop)
- Tax parcel and utility mapping
- Familiarity with local government commercial tools (e.g. CAMA, public safety/E911, permitting, etc.)

Candidates should have, at a minimum:

- Bachelor's degree in a field related to GIS; graduate degree is a plus
- 5 years of professional GIS experience; local government GIS is a plus
- 2 years of GIS project management experience (e.g. budgeting, scheduling, customer relationship management and business development); certification from the Project Management Institute (PMI) as Project Management Professional (PMP) is a major plus

Job experience in GIS professional consulting is considered a strong plus. Some out-of-state travel required. Salary will be commensurate with skills and experience.

About AppGeo: AppGeo [www.appgeo.com](http://www.appgeo.com) was founded in 1991 to provide GIS professional services to a wide-range of governmental and private sector customers. We offer competitive salary and benefits. AppGeo is an Equal Opportunity Employer.

8.)\*\*\*\*\*

**Organization:** Michael Baker Jr., Inc.

**Title:** GIS Specialist II

**Location:** Anchorage, AK USA

**Application Deadline:**

**Posted:** 2011-09-20

**Position Description:**

GIS Specialist II

Anchorage, Alaska

Michael Baker Jr. Inc., a division of Michael Baker Corporation seeks a GIS Specialist II for our Anchorage, AK office.

The Anchorage office currently specializes in pipelines and associated facilities, civil infrastructure, water resources, and geotechnical.

**Responsibilities/Description/Role:**

Under limited supervision, the GIS Specialist II will be responsible for a range of GIS tasks, including program development, evaluation, and maintenance, complex data analysis and client consultation. Project leadership/management in some cases.

Requirements:

- Four year degree preferred, but work experience may substitute. Bachelor degree in geography or related field preferred

- Minimum of five years work experience (A Master's degree can be substituted for 2 years of experience)
- Computer Skills: Strong exposure through work and/or academic experience to geographic analysis and geoprocessing; cartography/map making (e.g.. map books, alignment sheets), and database integration with GIS

Preferences:

- Masters degree considered a plus
- Experience in raster-based GIS (e.g. Spatial Analyst) would be helpful
- Web services, relational database, programming helpful

Baker (NYSE Amex: BKR), founded in 1940, provides professional engineering and consulting services for its public and private sector clients' most complex challenges worldwide. The Company's markets of focus include Aviation, Defense, Environmental, Facilities, Geospatial Information Technologies, Homeland Security, Municipal & Civil, Pipelines & Utilities, Rail & Transit, Transportation, and Water. Services span the complete life cycle of infrastructure and managed asset projects, including planning, design, construction services, asset management, and asset renewal. With more than 2,900 employees in over 90 offices across the United States and internationally, Baker is consistently ranked by Engineering News-Record among the top 10% of the 500 largest U.S. design firms.

We strive to instill a set of Core Values that include Integrity, Quality, People and Teamwork, Safety, Communication and Commitment.

Baker offers an excellent benefits package that includes: Medical, Dental, Vision, Disability Insurance, Life Insurance, Flexible Spending Accounts, Additional Paid Time Off, Flex-Time, 401-K Retirement Plan, Tuition Reimbursement, Employee Credit Union, and Savings Bond Purchase Program.

To apply for this position, please log on to [www.mbakercorp.com/careers](http://www.mbakercorp.com/careers) and reference IRC43939.

Baker is an EEO/AAP (M/F/V/H) e-Verify Employer

(Note: if you are unable to apply on line, please contact the Systems Administrator at [BAKERHRMS@mbakercorp.com](mailto:BAKERHRMS@mbakercorp.com) )

9.)\*\*\*\*\*

**Organization:** Esri

**Title:** Consultant/Project Manager - Natural Resources/Environmental

**Location:** Redlands, CA

**Application Deadline:**

**Posted:** 2011-09-19

**Position Description:**

## General

Use your consulting and project management experience in the natural resources and environmental markets to support our users with the implementation of solutions throughout the entire life cycle--from requirements to rollout. Our projects range from small focused technology transfer to large enterprise implementations of mission-critical systems.

## Department Consulting Services

### The Team:

A career on the Esri Professional Services team provides you the opportunity to collaborate with our customers to support innovative database and applications development, SOA, and enterprise software solutions. The variety of project work enables you to use your software development, database engineering, GIS expertise, and project management skills in a number of growing markets such as natural resources, commercial, government, utilities, and defense. Most positions are based at our headquarters in Redlands, California and our regional office in Washington, D.C.; however, opportunities are also available in other locations.

### Responsibilities

- Help clients translate and implement real-world needs into practical, state-of-the-art, GIS technology-driven solutions using Esri enterprise GIS technology.
- Work with clients to prepare multi-year GIS implementation and migration strategies.
- Lead project teams during requirements, analysis, design, build, and rollout.
- Create and manage the scope, cost, schedule, and contractual deliverables through the application of planning, tracking, quality assurance, change control, and risk management.
- Manage subcontractors.
- Manage client relationship and expectations.
- Work with Esri's marketing and sales teams to develop new business.

### Requirements

- Bachelors, masters, or Ph.D. in relevant field, depending on position level.
- Two to three years of experience for entry-level positions, eight to 12+ years of significant proven experience for senior positions.
- Ability to lead and manage consulting and software development teams.
- Knowledge of software development methodologies.
- Ability to develop project designs, work plans, budgets, and schedules.
- Knowledge of and ability to apply GIS technologies.
- Experience with desktop, client/server, and Internet applications and architectures.
- Strong team skills and the ability to work independently.
- Excellent interpersonal, writing, presentation, and leadership skills.
- Knowledge of and experience with federal and state agencies implementing GIS (e.g., DOI, Dept. of Agriculture, EPA, NOAA, NASA, DNR, DEQ).
- Knowledge of imagery, remote sensing, and image processing techniques and systems.

### Recommended Qualifications

- Experience with Esri products to solve complex business problems.

Familiarity with RDBMS and geodatabase design using UML.  
Direct experience in the integration of ArcGIS with permitting/regulatory, process modeling, decision support, upstream and downstream resource management systems, environmental monitoring, business intelligence, data and metadata warehousing, and document management systems.  
Additional experience with development of Internet and intranet applications for public access and desktop applications for site assessment and environmental analysis (including NEPA) and other spatial modeling exercises.  
Familiarity with mobile applications for data collection.

**The Company:**

Esri software gives organizations the power to think and plan geographically. We support the implementation of geographic information system (GIS) technology on the desktop, servers, online services, and mobile devices. Used today in more than 350,000 organizations worldwide, Esri technology helps governments, universities, and businesses save money, lives, and our environment.

With annual revenues of \$794 million, Esri is the market leader in GIS technology. Our diverse staff consists of 2,800 people in the U.S., 1,950 of whom are based at our headquarters in Redlands, a community ideally located in Southern California. We offer exceptional benefits, competitive salaries, 401(k) and profit sharing programs, tuition assistance, opportunities for personal and professional growth, a cafe complete with Starbucks coffee bar, an on-site fitness center, and more.

Learn more about a career on our consulting team and apply online at [www.esri.com/careers/consulting](http://www.esri.com/careers/consulting).

Esri is an equal opportunity employer (EOE) supporting diversity in the workforce.

10.)\*\*\*\*\*

**Organization:** Chesapeake Bay Helicopters

**Title:** Remote Sensing Manager

**Location:** Chesapeake, VA

**Application Deadline:**

**Posted:** 2011-09-18

**Position Description:**

Chesapeake Bay Helicopters (CBH) is seeking an experienced remote sensing professional. The pre-requisites include:

1. At least five years of GIS/Remote Sensing experience in which proven and successful management experience has been attained.
2. An undergraduate degree with a Master's Degree preferred.
3. Familiarity with Six Sigma management principles.

4. The proven ability to develop and implement quality control processes for data.
5. The proven ability to track employee efficiency and set a standard of performance.

The responsibilities of the Remote Sensing Manager will be to lead a team of 15-30 processing personnel as they process LiDAR and nadir ortho data with Terra series software. Must be able to develop training programs, QA programs and track employee efficiency.

CBH offers medical, dental and life insurance. We also offer an IRA with a limited company match. CBH offers personal time earned (for sick leave and/or vacations) and paid holidays.

This will be a salaried position with a pay range of \$64,000 to \$74,000 annually. Higher pay is possible for an experienced executive. Actual pay will be negotiated and will be based on experience. This position requires proven leadership and the ability to work within tight deadlines while keeping upper management informed. This is a highly demanding position.

Please send a cover letter and a resume to [wilsonwilliam@cbhelos.com](mailto:wilsonwilliam@cbhelos.com). Additional information about our company may be found at [www.cbhelos.com](http://www.cbhelos.com).

Qualified applicants will be contacted for a phone interview, followed by a personal interview.

11.)\*\*\*\*\*

**Organization:** McCormick Taylor, Inc.

**Title:** Transportation GIS Analyst

**Location:** Glen Allen, VA

**Application Deadline:**

**Posted:** 2011-09-14

**Position Description:**

Transportation GIS Analyst - Entry Level - Richmond

McCormick Taylor is seeking an entry level Transportation GIS Analyst with an environmental background for a part time or full time position in our Glen Allen, Virginia office. Candidates should have 0-5 years experience in this field and should be familiar with Virginia mapping and data sources.

Work will include map design and production, data conversion, programming, and database design, and execution of geoprocessing models to support an interdisciplinary team on transportation project development studies. Depending on qualifications, additional responsibilities could include environmental studies documentation and report preparation, field work, and agency and client coordination.

Qualified candidates will possess strong mapping and GIS software and analysis skills. Previous experience with graphics programs, MS Access, Microstation and ESRI GIS software is required. Familiarity with environmental regulations and previous experience with VDOT is a plus. Excellent verbal and written communications skills are a must.



Competitive salary and excellent benefits offered.

Please send resume and salary requirements to:

McCormick Taylor, Inc.  
Attn: BSC  
4951 Lake Brook Drive, Suite 275  
Glen Allen, Virginia 23060  
Email: BSCollier@mtmail.biz

EOE/AA

12.)\*\*\*\*\*

**Organization:** City of Shreveport  
**Title:** GIS Analyst (\$3,140.80 - \$4,954.40 monthly)  
**Location:** Shreveport, LA  
**Application Deadline:**  
**Posted:** 2011-09-13  
**Position Description:**

Closing Date/Time: Fri. 09/16/11 12:00 PM Central Time  
Salary: \$3,140.80 - \$4,954.40 monthly

Job Type: Full Time  
Location: Government Plaza, Louisiana  
Department: Engineering and Environmental Affairs  
Position ID: 0458

Duties:

- 1). Undertake data analyses and data conversion.
- 2). Develop and manage quality control procedures.
- 3). Provide support for cartographic design and high quality map production.
- 4). Diagnose and "troubleshoot" problems experienced with the use of GIS and related software.
- 5). Coordinate the acquisition of new spatial data and supervise the integration of these data into the organization's GIS.
- 6). Perform spatial analyses and creating information products from the GIS and related software and subsystems.
- 7). Coordinate GIS activities with technicians.
- 8). Design and implement training plans.
- 9). Consult with users in identification of new data/software requirements.
- 10). Support users
- 11). Design, develop, test, document and certify applications, programs and system functionality.
- 12). Manage individual data and application development projects.
- 13). Provide support for data conversion, system integration and systems applications

development and implementation.

14). Prepare project plans, and direct vendor (consultants) and internal project teams to accomplish plan task in order to meet user/data/software requirements.

Minimum Qualifications:

1). Ability to perform project tasks and meet deadlines. provide support to different city departments, master the knowledge of application development, interpretation of high complex GIS data, modeling and system architectural design, as well as, other area of GIS operations which equate to at least two (2) to five (5) years experience as an analyst .

2). Bachelor and or Master Degree in related areas of geography, geosciences, geology, surveying, planning, environmental studies, engineering, computer sciences and geographical information systems.

3). This ability and experience may be acquired by any combination of training courses including online training, seminars, workshops or any formal training course that counts towards CEU hours for Professional GIS Certification.

To apply online please visit:

[https://www.governmentjobs.com/js\\_login.cfm](https://www.governmentjobs.com/js_login.cfm)  
&JobRequested=350150&TopHeader=shreveportla&

13.)\*\*\*\*\*

**Organization:** Esri

**Title:** Training Solution Sales Representative, Washington, D.C.

**Location:** Vienna, VA

**Application Deadline:**

**Posted:** 2011-09-12

**Position Description:**

General

Leverage your consultative sales experience to strengthen the success of Esri technology in federal government agencies. An energetic and resourceful individual is needed to drive strategic conversations with all levels of contacts to promote and secure training packages. Your partnership with the account team will result in Esri customers being more efficient and empowered to fully take advantage of ArcGIS.

Department

Educational Services – Training Services

Responsibilities

- Work as an individual contributor utilizing available resources to achieve sales target
- Proactively seek out training opportunities from a current customer base by consulting with government agencies to clearly understand their needs

- Work with customers who have shown interest in training
- Represent and communicate the value of training to both the account team and Esri's customers
- Contribute to a total package solution as you partner with teams across Esri
- Achieve success by using your consultative skills to effectively manage the sales process from discovery to close
- Leverage your networking skills at Esri events and elsewhere to expand customer contacts and support the overall mission of helping Esri customers be successful

Requirements

- Bachelor's or master's in a related field
- A minimum of two years of sales experience selling to the federal government
- Demonstrated ability to be creative in the consultative sales process
- Excellent verbal and written communication skills
- Ability to travel as needed, up to 25%

Recommended Qualifications

- Strong interpersonal and relationship-building skills
- Experience with Esri products
- Excellent organizational skills and ability to manage several opportunities at once
- Familiarity with Microsoft Office including PowerPoint and Outlook

The Company:

Esri software gives organizations the power to think and plan geographically. We support the implementation of geographic information system (GIS) technology on the desktop, servers, online services, and mobile devices. Used today in more than 350,000 organizations worldwide, Esri technology helps governments, universities, and businesses save money, lives, and our environment.

With annual revenues of \$794 million, Esri is the market leader in GIS technology. Our diverse staff consists of 2,800 people in the U.S., 850 of whom are based in our 10 regional offices. We offer exceptional benefits, competitive salaries, 401(k) and profit sharing programs, tuition assistance, opportunities for personal and professional growth, and much more.

Learn more about a career at Esri and apply online at [www.esri.com/careers](http://www.esri.com/careers).

Esri is an equal opportunity employer (EOE) supporting diversity in the workforce.

14.)\*\*\*\*\*

**Organization:** NYCDEP Bureau of Water Supply

**Title:** GIS Program Analyst/Data Manager - Natural Resources Management

**Location:** Kingston, NY USA

**Application Deadline:** 2011-10-14

**Posted:** 2011-09-09

**Position Description:**

The New York City Department of Environmental Protection (“DEP”), Division of Watershed Lands and Community Planning, Natural Resources Management Section (“NRM”) seeks to

contract the services of a Program Analyst/Data Manager through an Intergovernmental Agreement between the New York City Department of Environmental Protection and the Research Foundation of the City University of New York (“RF-CUNY”). The Program Analyst/Data Manager shall be subject to approval by DEP and will report to the NRM Section Chief or his assigns on a daily basis for work assignments in the Kingston, NY facility of DEP. RF-CUNY will administer the salary of \$70,000.00 per year plus benefits to the Program Analyst/Data Manager from DEP funding through this Agreement.

**WORK LOCATION:** The upstate headquarters of the DEP Bureau of Water Supply (“BWS”) in Kingston, New York.

**APPROXIMATE START DATE:** Fall 2011

**DURATION:** 36 months.

**TASKS:**

- Under supervision of the NRM Section Chief or his assigns, the Program Analyst/Data Manager will develop and implement strategies for data acquisition and management to support program priorities.
- Develop and implement Quality Assurance/Quality Control (“QA/QC”) procedures; assist in maintenance of existing divisional database tables; convert and maintain data in a variety of environments, including spreadsheets, database and peripheral hardware such as data loggers.
- Independently provide data analysis and reporting services to users with a high degree of expertise. Develop and maintain queries and reports for users in Crystal Reports, SQL Reports or other similar reporting environments.
- Evaluate NRM and other BWS directorate procedures and needs and recommend ways to automate and streamline processes by incorporating into new and existing information systems, including Watershed Lands Information System (“WaLIS”). Work with division and bureau Information Technology (“IT”), Geographic Information System (“GIS”), and other computer staff and consultants to implement these recommendations.
- Become familiar with and develop expertise in the WaLIS and serve as the liaison between NRM staff and WaLIS programmers and contract managers. Work with NRM staff to develop WaLIS functions to address and satisfy program needs.
- Manage GIS projects and data and perform analysis and maintenance of DEP's GIS data. Produce maps and reports for both internal and external use as needed. Assist in Global Positioning Systems (“GPS”) coordination, including specifying equipment, maintenance, data standards, and project needs; perform GPS project planning, data processing, and integration with other data bases.
- Train and support users in use of hardware and software applications including WaLIS in Kingston, off-site offices, and in the field, as necessary.

REQUIREMENTS: Bachelor's Degree in Computer Science or related field is required (Master's preferred), including three or more years experience and/or education in programming, database management, GIS or GPS. Superior computer and analytical skills are essential, including a demonstrated ability to create complex management reports using Crystal Reports or similar software. Experience working with relational databases is required. Knowledge of a programming language is strongly recommended. A thorough understanding of ESRI GIS products is necessary. This position requires extensive interaction with non-technical staff. Ability to translate and transfer the needs of users and integrate into an existing database is required. Experience in one or more of the following (or related) fields are encouraged: real estate, forestry, governmental operations, and environmental studies.

CONTACT: Qualified applicants only, please email resumes to:

Paul Lenz - Section Chief, Natural Resources Management Section  
Bureau of Water Supply  
New York City Dept. of Environmental Protection  
71 Smith Ave., Kingston, NY 12401  
E-mail: [plenz@dep.nyc.gov](mailto:plenz@dep.nyc.gov)

15.)\*\*\*\*\*

**Organization:** Minnesota Population Center, University of Minnesota

**Title:** Coordinator, U-Spatial Initiative

**Location:** Minneapolis, MN, USA

**Application Deadline:**

**Posted:** 2011-09-09

**Position Description:**

The Minnesota Population Center (MPC) seeks an experienced professional to provide administrative coordination and support the research and programs of the new U-Spatial research infrastructure initiative. U-Spatial is a collaborative initiative established to provide a network of data, equipment, and expertise among researchers working with spatial science and systems at the University of Minnesota, to strengthen the quality of ongoing research, and to provide a foundation for new directions in spatial science (<http://uspatial.umn.edu/>). MPC is a University-wide interdisciplinary center for demographic research and is a key collaborator in the U-Spatial Initiative ([www.pop.umn.edu](http://www.pop.umn.edu)).

## RESPONSIBILITIES

The coordinator will have responsibility for U-Spatial Central Core activities including:

**Help Desk:** The coordinator will supervise help desk staff and provide consultative services as needed in order to develop new clients and maintain liaisons with existing clients across a wide array of University of Minnesota departments. The coordinator will consult with clients to assess their needs, develop appropriately scoped service plans, and then work with staff across the U-Spatial cores to deliver services, such as map creation or spatial data development.

**Training:** The coordinator will assess training needs, develop presentations, coordinate

instructional resources and instructional plans, and schedule training sessions for U-Spatial and the wider University research community. Some delivery of training will be required.

**Data Management:** The coordinator will develop a data management and dissemination plan in collaboration with the U-Spatial data associate and other U-Spatial staff. The coordinator will take a key role in the development of systems to support data discovery and access through existing and newly developed software systems. This function also requires consideration of data policy issues.

**Grants Development and Management:** The coordinator will provide unit administration of current grants, collaborate with the director and other cores to identify opportunities for funding extensions or new resources, and assist in proposal development.

**Communication, Outreach and Events:** The coordinator will be responsible for administration and management of the U-Spatial website, the main avenue of communication for the project. In addition, the position will organize and schedule U-Spatial sponsored events, such as guest speakers and brown bag lunch sessions.

The position will collaborate with and support the U-Spatial director as well as staff and faculty associated with the Imaging, Data, and Analysis Cores in the creation of online resources to be hosted on the U-Spatial website, in the facilitation of discussions and meetings, and in gathering data and preparing program activity reports.

## QUALIFICATIONS

**Required:** Master's degree in geography, GIS, or a related field. Demonstrated knowledge and use of ArcGIS or other GIS software packages. Excellent computer skills, including demonstrated experience with spreadsheets and knowledge of data management tools (for example: ArcSDE, PostGIS, SQL, JSON). Excellent written and verbal communication skills. Demonstrated skills in problem-solving and the ability to organize tasks, manage multiple priorities, and meet deadlines. Demonstrated skill in communicating technical material to technical and non-technical audiences.

**Preferred:** A broad background in GIS, remote sensing, cartography/visualization, and/or data management. Experience in a university, nonprofit, or similar setting involving teaching, research, outreach or engagement. This may include experience applying for scientific grants, administering programs, delivering training, or promoting mission-driven activities.

## APPLICATION PROCEDURES

Please apply using the University of Minnesota's online employment system at <http://employment.umn.edu/applicants/Central?quickFind=97437>. Include a resume/curriculum vitae, cover letter, and contact information for three professional references. Review of applications will begin immediately.

The University of Minnesota is an equal opportunity educator and employer.

16.)\*\*\*\*\*

**Organization:** CH2M Hill Academy Services LLC

**Title:** GIS / Programmer

**Location:** USAFA, Colorado

**Application Deadline:**

**Posted:** 2011-09-07

**Position Description:**

**JOB SUMMARY:** Report to MIS/IT Manager to perform job responsibilities at the U.S. Air Force Academy (USAFA) and auxiliary sites as described by the primary, secondary and additional duties listed below. Must possess strong time management, organizational and communication skills. Be able to work independently and in support of others while meeting project deadlines.

**PRIMARY DUTY:**GIS Developers And Programmers:. Shall include web and desktop application design and development, including a minimum of 2 year building, designing, and working with ArcGIS, ArcIMS, and ArcSDE based applications. Must have experience with Microsoft Visual Basic 6.0, VB.NET, ASP.NET, Java, JSP, HTML, JavaScript, SQL, XML and COM. Must have experience programming ESRI Arc Objects, Map Objects and ArcIMS AXL. Must have applied experience with formal GIS design and implementation methodologies and related tools (e.g., Visio, Rational, etc.). Must have experience programming with Oracle including stored procedures written in PL-SQL. A SECRET security clearance is required for GIS developers and programmers or can attain a Secret clearance to meet PWS requirements.

**ADDITIONAL DUTIES:** As required in direct support of departmental mission requirements.

**EXPERIENCE:** Minimum of five years experience in GIS Programming capacity. Must understand, read, write and speak fluent English. Capable in use of computer for research, tracking, and communicating.

**EDUCATION:** GIS developers and programmers Shall at minimum, have a Bachelors Degree in Geography, Cartography, Computer Science, GIS, or related field.

**REQUIRED CERTIFICATIONS:** Must possess and maintain a valid Colorado Driver's License. Able to receive and maintain a favorable Local Background Check and National Agency Check as applicable to the position requirements.

Resumes can be faxed to 719-472-8549 or sent thru the website below

<http://www.ch2mhillacademyservices.com>

17.)\*\*\*\*\*

**Organization:** Geo-Marine

**Title:** GIS Specialist

**Location:** El Paso, TX

**Application Deadline:**

**Posted:** 2011-09-07

**Position Description:**

GIS SPECIALIST POSITION, EL PASO, TEXAS

Position Summary

Upper-level GIS Analyst with 3-5 years professional experience needed to support fast-paced cultural resource projects. We are in need of a highly motivated individual dedicated to GIS

production for complex archaeological investigations. The candidate will need to adapt to existing methods as well as contribute to the ongoing development of the GIS program. Candidate will maintain GIS cultural resource database, process data collected in the field, produce cartographic maps, format databases for project deliverables, and conduct spatial analysis of GIS data.

**Requirements**

Preferred qualifications include a M.A. degree or equivalent in Geographic Information Systems, archaeology, or a closely related field, strong working knowledge of ArcGIS 9.x and Geodatabases, demonstrable experience with ESRI extensions (Spatial Analyst/Geostatistical Analyst), and proficiency with GPS tools (Trimble, Pathfinder, TeraSync) and data dictionaries, and programming related to ArcPad. Candidate must have excellent communication skills, be well organized, and capable of handling multiple project assignments.

**Term and Compensation:**

This is a full-time position with benefits. Compensation is dependent on experience.

To apply, send resume to Steve Silva, company Recruiter at [steve.g.silva@att.net](mailto:steve.g.silva@att.net)

We are an Equal Opportunity Employer.

18.)\*\*\*\*\*

**Organization:** Clermont County Auditor's Office

**Title:** Cadastral Specialist

**Location:** Batavia, Clermont County, OH USA

**Application Deadline:** 2011-10-06

**Posted:** 2011-09-06

**Position Description:**

Work involves design, development, and management of GIS data resources within the context of the Auditor's Office and the Clermont County Enterprise GIS programs and policy directives. Work includes coordination of GIS Cadastral database activities and database development and modernization. Perform quality control assurance of data enhancement initiatives and assistance in managing GIS data conversion projects. Manage the refinement and enforcement of database standards; develop mapping and participate in the planning and development of system and application development activities, and other GIS database-related activities. Specifically:

Assist in management of database resources of the Cadastral GIS; confer and coordinate with the Auditor and user organizations, e.g., Surveyors, Title Companies, Local Governments and County personnel.

Communicate with system users to translate application concepts into system applications.

Responsible for refinement and enforcement of data standards impacting Cadastral applications, database designs, and data update procedures.

Oversees data quality control procedures and loading of Cadastral data into the system;



coordinates activities in data acquisition, transfer and translation.

Assist in the review of preliminary and detailed submittals for new Plats, Surveys or other instruments including compliance with Conveyance Standards.

Performs or assists in investigating and correcting or modifying the Cadastral GIS Database.

Designs applications, programs, menu interfaces or other tools that may be needed for use by Auditor's Office, local governments, businesses and the general public.

Develop specifications and RFPs for consulting services, conversion contracts and other outsourcing projects.

Conduct proposed software usability tests; review and recommend geospatial software for use by County Auditor staff. Assist and train users in the Auditor's Office in the use of GIS software and the use of applications.

Interface with Enterprise GIS Manager at Clermont County GIS and engage the Clermont County GIS User Group(s) to ensure coordination with County standards, objectives, development initiatives and systems and data integration.

Scan and index new Plats, Surveys or other instruments.

Develop maps, map books and other geospatial analysis products.

Perform related work as required.

Clermont County is an Equal Opportunity employer.

#### Minimum Qualifications

- Must have a BS/BA in GIS, Geography, Computer Science or closely related field. Masters degree is ideal.
- Must have a minimum of five years of local government work experience using ESRI suite of products including Arc Server, ArcSDE, ArcMap, ArcCatalog, and ArcToolbox.
- Considerable knowledge of tax map maintenance, property appraisal, land records, Plats and instruments, COGO calculations and methods, concepts of surveying, experience with legal descriptions and local and state statutes as they relate to subdivisions, annexations, lot splits, etc.
- Experience working within, or closely with, Auditor's or Assessor's Offices. Good understanding of appraisal and parcel maintenance concepts.

Special preference

- GISP certification preferred.
- Experience working with Spatial Analyst, Network Analyst, Model Builder, FLEX, Arc Objects or SQL Server.

Other Qualities/Abilities

- Strong verbal communication skills.
- Multi-tasking ability.
- Organized and results oriented.
- Working knowledge of Microsoft Office products.

Email your resume to [rkotapish@roadrunner.com](mailto:rkotapish@roadrunner.com)

19.)\*\*\*\*\*

**Organization:** Chesapeake Bay Helicopters, Inc.

**Title:** LiDAR Processor / Imagery Analyst

**Location:** Chesapeake, VA

**Application Deadline:**

**Posted:** 2011-09-01

**Position Description:**

Aerial Imaging and LiDAR Technician

About the Job:

Chesapeake Bay Helicopters, Inc. is seeking to immediately fill the position of Aerial Imaging and LiDAR Processing Technician. This is a ground based job at our headquarters.

Job Description:

Aerial Imaging and LiDAR Processing Technicians work with software programs in processing LiDAR and nadir imagery into specified products. The technician will assist a team of other processors in the development of three dimensional models and ortho-mosaic images. This data is collected from airborne sensors and then processed to meet customer requirements.

Required Skills and Attributes:

Punctuality.

Team Player.

Use of TerraPhoto or previous imagery experience a plus.

Ability to work under tight deadlines.

Acceptance of working some overtime.

Should be very computer literate.

Bachelor's or Master's Degree preferred.

1-3 years processing experience preferred.

Benefits:

Medical.

Dental.

Life Insurance.

401K.

Personal time off (paid).

Ability to work overtime.

The starting position for this job is between \$42K and \$59K, depending upon experience.

Please email resumes to [wilsongilliam@cbhelos.com](mailto:wilsongilliam@cbhelos.com) and visit our website for information about our company: [www.cbhelos.com](http://www.cbhelos.com)

20.)\*\*\*\*\*

**Organization:** Woolpert, Inc.

**Title:** Phase Manager, GIS/eALP - Denver, CO

**Location:** Denver, CO USA

**Application Deadline:**

**Posted:** 2011-08-31

**Position Description:**

Leading Innovation and Integrity... As members of a leading design, geospatial and infrastructure management firm, Woolpert employees inspire each other to be the best through their ingenuity, diversity and vision. With projects that contribute to the sustainability, security and efficiency of federal, local and private-sector clients across the U.S. and abroad, our employees appreciate rewarding careers that contribute to advances in the Architectural/Engineering industry while also knowing they're serving the needs of some of the best communities and organizations around the world.

Woolpert, Inc., is seeking a Phase Manager, GIS/eALP to manage the conversion of AutoCAD data to a Geodatabase. General responsibilities include trouble-shooting technical problems, participating in defining scopes and fees, designing data conversion processes, doing QA/QC, and coordinating with other phase managers and project management staff. Strong GIS data conversion and database design skills are required, as well as analysis, organizational, communication, time management, and team-building skills. Will require ability to master and communicate about ongoing GIS technology. Knowledge of or experience working in a dynamic data conversion environment is strongly preferred.

Must have experience using AutoCAD, ESRI products (ArcObjects, ArcGIS Suite, ArcSDE, ArcIMS, Extensions, etc.) versions 9.x and 10.x Database Experience: RDBMS (SQL Server and/or Oracle preferred). Industry knowledge desired: eALP experience, Analyzing AC-18B features, Analyzing existing data for potential reuse, Coordinate data development with Photogrammetry, CAD & GIS technicians. The desired candidate will have strong writing and oral communication skills. Responsibilities include: Managing phases, schedules and budgets.

Leading a technical team for phases, supporting system design/configuration projects, assisting in the preparation of bids and technical design reports.

Qualified candidates will have a BA/BS and four (4) years related experience, MA/MS and two (2) years related experience or eight (8) years related experience.

Presenting Opportunities and Challenges at Every Turn... As a firm that recognizes the importance of developing top talent from within, our employees have access to a wide range of training and coaching programs and are rewarded for their achievements through our excellent benefits package and competitive salaries. For consideration, please apply on line at <http://www.woolpert.com> using requisition number MH11346-4.

Please no agency or recruiter calls. We are proud to be an EEO/AA employer (M/F/D/V) who maintains a drug-free workplace.

21.)\*\*\*\*\*

**Organization:** Sanborn Map Company  
**Title:** Senior Remote Sensing/GIS Analyst  
**Location:** McClellan, CA  
**Application Deadline:**  
**Posted:** 2011-08-30  
**Position Description:**

Join our award-winning team! Sanborn is in search of a talented senior remote sensing/GIS Analyst with experience in image processing and GIS support for vegetation mapping. In this role, you will support our federal agency client on a new project. Primarily your work will focus on data acquisition, pre-processing, classification and modeling using satellite and aerial imagery. You will be part of a team of ecologists, foresters and other scientists working on a habitat and disturbance mapping project.

#### Responsibilities

- Atmospheric correction of imagery and normalization of overlapping or adjacent scenes to a common reference image.
- Image-to-image or GPS-based geocorrection of imagery to meet or exceed established mapping standards.
- Perform both unsupervised and supervised classifications to identify landcover classes. Proposed personnel should be familiar with parametric and non-parametric classifiers and when a specific technique is most appropriate for a particular task.
- The classification of vegetation life-form, such as conifer, hardwood, and shrub, as well as knowledge of forest vegetation dynamics is an important element of the SOW.
- Develop modeling input variables that utilize spectral information and bio-geophysical data to estimate forest structural characteristics.
- Create pan-sharpened image outputs using the most appropriate technique based on the end use of the outputs.
- Change detection analyses using an image time series and novel techniques is a requirement for aiding the map update process and for providing information on disturbance/recovery dynamics for regional modeling efforts.

- Hierarchical segmentation is commonly used in the mapping process for identifying specific landcover types. Each project will require the extraction of different landcover types using multiple imagery sources using the most appropriate parameters for the imagery source and project objectives. The resultant vector output is used for all subsequent mapping steps.
- Dependent on each specific project, manual editing of vector line work may be required to improve the spatial accuracy of ancillary layers incorporated into the segmentation process. Manual photointerpretation will also be needed to augment reference site sample sizes of field collected data for modeling and accuracy assessment purposes.
- Occasional fieldwork will be required to check the accuracy of the vegetation maps or collect field measurements to support mapping and modeling projects.

#### Qualifications

- PhD or Master's degree in remote sensing, geography, ecology, or related field.
- 10 years of experience in remote sensing data processing including image pre-processing (geometric, radiometric and atmospheric correction), advanced classification techniques, spectral mixture analysis and algorithm development.
- Publication in peer-reviewed literature.
- Experience with using or scripting in one or more applications/languages from each of the following categories:  
SAS, R, MatLab, IDL→  
ArcGIS, GRASS, GDAL→  
ENVI, ERDAS Imagine, eCognition→  
VB .Net, C/C++, C#, Java, Python→  
FLAASH, QUAC, ATCOR→

#### Required Skills and Experience

- Ability to assist project management staff with technical documentation development.
- Experience leading remote sensing field data collection and processing activities.
- Experience directing and guiding more junior staff members.
- Exceptional communication skills, oral and written.
- Develop appropriate technical methodologies and workflows for the processing and QA/QC of remote sensing based projects.
- Experience utilizing remotely sensed data sources for monitoring vegetation-disturbance dynamics, land cover/vegetation classes and conditions mapping, watershed conditions, large-scale disturbances (especially insect-induced and wildfire), forest fuels and wildlife habitat.
- Development of pattern recognition, anomaly detection and multi-temporal data analysis algorithms for analyzing multispectral, hyperspectral and LiDAR datasets. Demonstrated previous success in developing remote sensing algorithms for multispectral, hyperspectral, or LiDAR datasets.
- Advanced time series and multivariate statistical analysis knowledge.
- Familiarity with statistical modeling of biophysical characteristics of forested ecosystems.

To Apply ... Please send your resume to [employment@sanborn.com](mailto:employment@sanborn.com), indicating "Senior Analyst - CA" in the subject line. No phone calls please.

Sanborn is an equal opportunity employer.

22.)\*\*\*\*\*

### **GIS Analyst**

Sapphos Environmental, Inc.

#### **Job Description**

Sapphos Environmental, Inc., an environmental consulting firm, has an opening for a GIS analyst in our Pasadena, California office. Sapphos Environmental, Inc. is looking for a person to work in a friendly, fast-paced environment on a broad range of ongoing and upcoming assignments in the environmental consulting field. Sapphos Environmental, Inc. use GIS for a variety of work products, including environmental impact assessments and reports, biological resources reports, hazardous materials reports, and historic/archaeological resources reports. The ideal candidate will have excellent communication skills, a positive attitude, a solid work ethic, attention to detail, very strong computer skills, and a demonstrated capacity to learn new technologies and take additional responsibilities over time. Some familiarity with environmental regulation, planning, natural resources, and chemical contaminant issues is desired. This is a full-time salaried position.

#### **Job Requirements**

The candidate must have at least 2 years of experience working with ESRI ArcGIS software and extensions and a BS/BA degree in Geography, Computer Science, Planning, or related field. A MS/MA degree will substitute for one year of experience.

- An understanding of cartographic design principles, spatial data management, geoprocessing, efficient spatial data editing, database design, and quality assurance/quality control is essential.
- Attention to detail and the ability to work independently are critical.
- Strong communication skills are required for working collaboratively with coworkers and clients.
- Demonstrated working knowledge of ESRI ArcGIS software and extensions is required.
- Demonstrated working knowledge of GPS and mobile GIS technologies and associated software, is required. Candidate will be required to provide training and end-user support for GPS-related fieldwork.
- Programming skills are a plus.

Please submit resume, salary history, writing sample, and references to the email address listed above.

Sapphos Environmental Inc. offers excellent benefits, salaries, and opportunities for growth for energetic, dynamic individuals. We promote a challenging team approach toward achieving professional goals balanced with the flexibility to pursue personal interests. Please visit our web site.

[www.sapphosenvironmental.com](http://www.sapphosenvironmental.com)

23.)\*\*\*\*\*

**Senior GIS Analyst**

Applied Sciences and Information Systems, Inc.

**Job Description**

Job Title: Sr. GIS Analyst

Job Type: Exempt

Organization: Applied Sciences and Information Systems, Inc.

Travel: Estimated 5% of annual working time

Starting Date: October 2011

Job Description: ASIS has an identified need for a GIS Senior-level Analyst to provide GIS and Project Coordination to support work performed within the corporate office. Utilize a strong background in GIS applications and databases as well as a proven understanding of hydrology, biology and modeling components to support GIS data collection and create GIS features/attributes.

Must be able to work with and interact with ASIS customers. Must be able to clearly communicate technical concepts to non-technical individuals.

**APPENDIX M      STUDENT SURVEY SUMMARY**



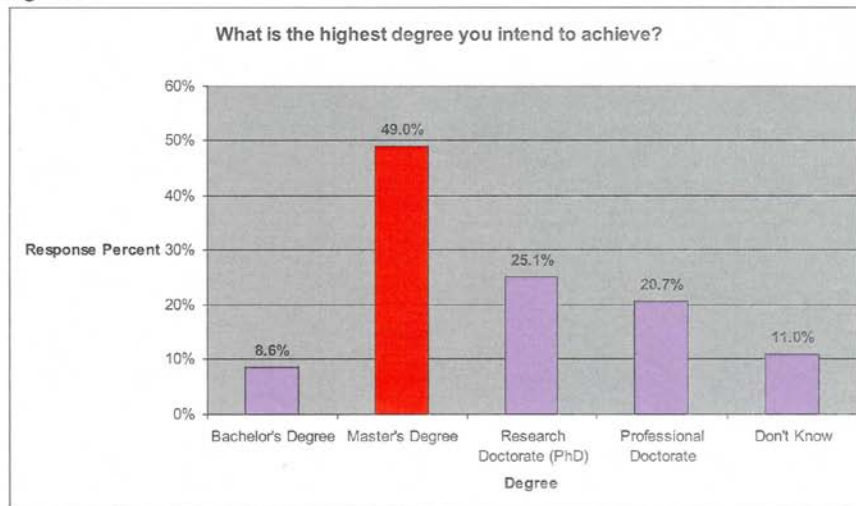
### CUNY PSM Student Survey Summary

CUNY's Office of the Vice Chancellor for Research conducted an online survey of undergraduate students at five CUNY senior colleges (Brooklyn, Hunter, City, Lehman, and Queens). These schools will launch PSM (Professional Science Master's) programs in the fall of 2012.

The students took the survey between April 19<sup>th</sup> and June 13<sup>th</sup> 2011. There were 1,361 respondents and 1,123 completed surveys. The majority of respondents (76.4%) were juniors and seniors, the population most likely to be considering postgraduate education.

The survey showed that over 90% of respondents intend to pursue a higher degree. Almost half are looking to complete Master's degrees, while 45% intend to undertake either research or professional doctorates.

Figure 1.



The survey found that 35% of respondents intend to enter graduate school immediately after obtaining their Bachelor's degree. A further 24% will begin graduate study after one year in the workforce. 12.7% plan to start their careers immediately, and 7% will work for more than a year but intend to return to graduate school at some point in the future.

Over 75% of respondents indicated that tuition costs are an impediment to pursuing an advanced degree. Comments made by numerous students in the final open-ended narrative section reinforce this finding. Several undergraduates talked about the need to take time off after graduation in order to work and save money for graduate school. One student indicated, *tuition is one of the reasons that is making me delay obtaining a Master's degree...I would have to work*

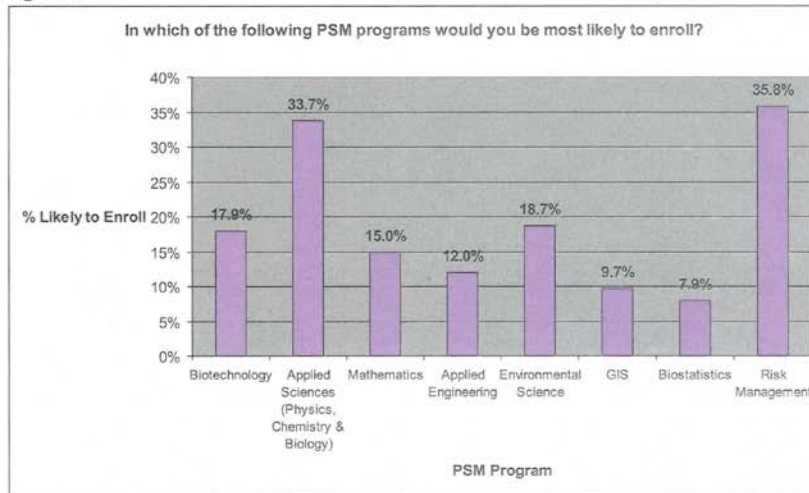
and be a part time student. Another stated, *the cost will determine whether I attend graduate school full time or part time.*

This finding almost certainly reflects the demographics of CUNY. At the schools surveyed, 32% of students originate from households with an income of less than \$20,000.<sup>1</sup> Given this statistic, a student's ability to establish a working relationship with a potential employer, while enrolled in the PSM program, could have a significant impact on her retention and eventual success.

Questions that detailed the proposed PSM programs at CUNY yielded encouraging results. Over 30% of respondents stated that they would consider enrolling in a PSM degree. Given that the PSM presents an entirely new opportunity for many of our students, we view this finding as a very positive starting point from which to introduce our programs. However, we also found that 50% of students would not enroll in a PSM because of the relative newness of the program and uncertainty about how effective it might be in helping them advance their careers. There is a clear need to promote the unique strengths of PSM programs and their capacity for career placement and development.

The table below (Figure 2) shows the likelihood of enrollment in specific programs. Students demonstrated interest in both Risk Management and the Applied Sciences (Physics, Chemistry, Biology), which each account for over a third of the responses.

Figure 2.



<sup>1</sup> CUNY 2010 Student Experience Survey:  
[http://owl.cuny.edu:7778/portal/page/portal/oira/OIRA\\_HOME/SES\\_2010\\_Final\\_Report.pdf](http://owl.cuny.edu:7778/portal/page/portal/oira/OIRA_HOME/SES_2010_Final_Report.pdf)

According to student responses, the three most important aspects of PSMs are: career placement after graduation (60%), internships with industry that might lead to a job offer (55%), and having a professional mentor who can provide career advice and networking opportunities (52%).

### Conclusion

Overall, the responses to the survey are both promising and speak well of CUNY students. The number of students interested in pursuing postgraduate degrees is higher than the national average. Students are receptive to the creation of professionally oriented Master's degrees and there is a demonstrated interest in the programs that are currently under development at CUNY.

In the comments section numerous responses supported the applied training aspect of the PSM programs. Two representative comments reflect this: *most academic work is too abstract and it would be lovely to have a program that grounds what you are learning in real world situations.* Another student asserted, *I would definitely be more inclined to join a Master's program that encourages real world experience as well as incorporates different fields that will diversify one's interests.*

Several students expressed concern about the utility of getting a professional Master's degree because of the newness of the program. Job placement was an important factor in this: *What's the point of getting a Master's if nobody is interested in you. My classmates go for their PhDs because there are no jobs out there. We need more connections for jobs.* A couple of respondents also indicated an interest in having entrepreneurship included in the curriculum. At this early stage of developing a new Master's program which is still in the process of establishing itself nationally, some students questioned how PSMs would differ from more established Master's programs, and whether or not employers would recognize the unique merits of the degree. One such response: *I would be interested in knowing more about how widely accepted this degree would be.*

A number of respondents requested that the program be amenable to students trying to balance their education with their developing careers. One respondent wrote, *I would very much like to see a program designed with the working person in mind.* Several respondents requested that evening classes be made available. This level of response strongly supports our intention to make courses available online and in hybrid form (particularly the plus courses).

Encouragingly, a couple of respondents specifically praised programs that we will be offering in our first round of PSM programs: *GIS training* (being developed by Lehman College) *would be amazing for the Urban Studies program to make it more competitive and established in quantitative skills.* Several students, who have already embarked on Hunter's Biotech program—which is preparing to launch as a PSM in the Fall of 2012—were very enthusiastic about the potential of professionally oriented programs. For example: *I can't stress how much I loved Hunter College's MA program in biology with a specialization in biotechnology. It really focused on workforce preparation—including internships. Programs like this (which resemble PSM programs) and the new PSM programs being proposed will really benefit future generations of students.* Students also reacted positively to the idea that the PSM programs will be University-wide, one wrote, *the PSM programs should utilize the strengths of each of the CUNY schools.*

**APPENDIX N      LETTERS OF SUPPORT**

- Emerging Health Information Technology, Inc.
- Cameron Environmental Engineering, Inc.
- Albert Einstein College of Medicine, Bronx Center to Reduce and Eliminate Ethnic and Racial Health Disparities (Bronx CREED)
- Wildlife Conservation Society (WCS)
- New York City Department of Health and Mental Hygiene, Division of Environmental Health
- New York City Department of Environmental Protection, Blue Belt Program
- City University of New York Graduate Center Earth and Environmental Science Doctoral Program
- City University of New York, Lehman College, Health Sciences Dept., Master of Public Health Program
- NOAA-CREST (National Oceanic and Atmospheric Administration's Cooperative Remote Sensing Science and Technology Center) at City College, CUNY



Juliana Maantay, PhD  
Gillet Hall, Room 325, Urban GISc Lab  
250 Bedford Park Blvd. West  
Bronx, NY 10468

Dear Dr. Maantay:

As Vice President of Clinical IT Research and Development at Emerging Health Information Technology as well as Director of Montefiore Medical Center's Department of Outcomes Analysis and Decision Support, I enthusiastically support your effort to develop at Lehman College a Center of Excellence – a Master's training program in Geographic Information Sciences to produce a new generation of individuals expert in using GIS analyses to enhance Public Health and Health Services Research.

I am the leader of a development group of Clinical Looking Glass. Clinical Looking Glass® is a user-friendly interactive software application developed at Montefiore Medical Center to evaluate health care quality, effectiveness, and efficiency. The system integrates clinical and administrative datasets allowing non-statisticians to produce epidemiologically cogent self-documenting reports globally assessing care quality while identifying the specific patients in need of clinical remediation.

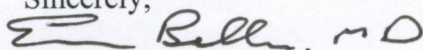
Anticipating the day when expertise in GIS would be available, we have built into our software application the ability to tag patient cohorts with geographic location (longitude, latitude, census block, census tract). We are poised to use our quality improvement tool to take advantage of geographic notions of proximity to health care resources as defined by linear distance as well as network analysis proximity as defined by subway and bus routes.

A Master's level program in the Bronx would empower organizations such as Montefiore to be able to enhance its analytic efforts to achieve its goal of population health accountability. Opportunities for direct health service planning, health care intervention, and advocacy would be empowered by a center of GIS excellence in the Bronx,

I should also mention that the hospitals in the Bronx have come together to form a Regional Health Information Organization for the purpose of supporting patients' desires that their healthcare information be available at the point of care regardless of the originating healthcare facility source. This massive cooperative effort has been funded by New York State, has an active board, and has as its technology integrator Emerging Health Information Technology. I can envision a day, when with the appropriate permissions, the sort of data integration enabled by a RHIO could support health care planning, quality improvement, and directed intervention on a borough level that would be deeply enriched by having a partner with a deep sense of the potential of geographic analyses to inform policy and intervention.

Please let me know if I can be of help in supporting your development of this important program.

Sincerely,



Eran Bellin, M.D.





# CAMERON ENGINEERING & ASSOCIATES, LLP

100 Sunnyside Boulevard, Suite 100 Woodbury, NY 11797 (516) 827-4900  
260 Madison Avenue, 8th Floor New York, NY 10016 (212) 324-4000  
303 Old Tarrytown Road, 1st Floor White Plains, NY 10603 (914) 721-8300

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American Council of Engineering Companies

*Managing Partner*

John D. Cameron, Jr., P.E.

*Senior Partner*

Joseph R. Amato, P.E.

*Partners / Principals*

Mark Wagner, CEP

Janice Jijina, P.E., AICP

Nicholas A. Kumbatovic, P.E.

Kevin M. McAndrew, R.L.A.

Alan J. King, Jr., P.E.

*Senior Associate*

Glenn DeSimone, P.E., CPE

*Associates*

Robert E. Wilkinson, P.E.

Steven R. Giammona, P.E.

September 13, 2011

Dr. Juliana Maantay  
Department of Environmental, Geographic and Geological Sciences  
Lehman College, City University of New York  
250 Bedford Park Blvd West  
Bronx NY 10468

Dear Dr. Maantay:

Cameron Engineering & Associates, LLP (Cameron Engineering) wishes to express our support for the proposed Master of Science degree in Geographic Information Science (GISc) to be offered by Lehman College of the City University of New York. As an established provider of environmental, engineering and planning services to Long Island, Cameron Engineering believes that graduates of the proposed program – particularly its proposed Environmental and Health Spatial Sciences Track – would be uniquely qualified to address a number of critical environmental, health and social issues in Nassau and Suffolk Counties. The program would fulfill a growing need in Long Island for expertise in environmental and spatial analysis.

In support of the need for such a GISc program, Cameron Engineering notes that there are indeed key spatial aspects to Long Island's most pressing environmental, health and social concerns. Protection of our groundwater resources, the remediation and redevelopment of brownfield sites, and satisfying the demand for affordable housing are all issues with important spatial components. There will be a continuing requirement for technical experts who can effectively demonstrate the relationships among the environmental, economic and spatial factors of these complex issues. The interrelationship of these factors demands an interdisciplinary approach, comparable to that proposed of the new Master of Science degree in GISc.

Cameron Engineering currently employs GIS in a variety of planning, environmental and design projects. Our GIS Manager is, in fact, a graduate of your undergraduate GISc certificate program at the Department of Environmental, Geographic and Geological Sciences at Lehman College. It is in the context of environmental analysis where GIS has made the most significant contribution to our projects. It is certain that our applications for spatial analyses will expand in the future for which graduates of the proposed program could potentially fill an important niche.

We are pleased to offer our support for the proposed Master of Science degree in Geographic Information Science and wish you success in this endeavor.

Very truly yours,

John D. Cameron, Jr., P.E.  
Managing Partner

JDC/lb

N:\Office\Corres2011\L-LehmanCollege-091311jdc.doc

*"Celebrating Over 25 Years of Business"*

www.cameronengineering.com



**Bronx Center to Reduce and Eliminate Ethnic and Racial Health  
Disparities (BXCREED)**

*A. Hal Strelnick, MD  
Director*

September 16, 2011

Juliana Maantay, Ph.D.  
Professor  
Department of Environmental, Geological, and Geographic Sciences  
Lehman College-CUNY  
Gillet Building—Room 325  
250 Bedford Park Boulevard West  
Bronx, NY 10468

**Re: Masters of Science degree in Geographic Information Science at Lehman College**

Dear Professor Maantay:

*Juliana,*

I am writing this letter with enthusiastic support for the proposed Masters of Science degree program in Geographic Information Science that would be sponsored by your department at Lehman College. This would be a logical progression from the certificate program in Geographic Information Science (GISc) that you have already developed.

In 1999 when the Dean and I established the Institute for Community and Collaborative Health, I undertook a review of the areas of scientific inquiry that would help establish its unique research agenda and contribution to community health at Einstein and in the Bronx. I determined that the Institute needed expertise in geographic information science. We turned to you to help us recruit a new faculty member to Einstein. After extensive advertising and recruitment efforts we identified several potential candidates who we interviewed and who presented their work on campus, but our offers were just not competitive with the many other opportunities these doctoral-level candidates had.

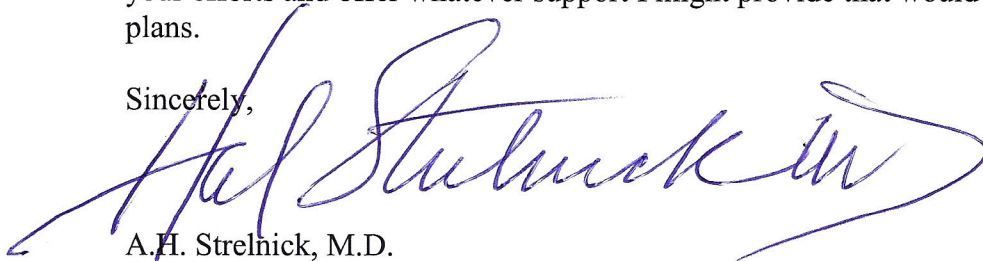
Since then, the applications of GISc for medical, environmental, and public health research have dramatically expanded and their methodologies grown increasingly complex and sophisticated. Scientific journals increasingly publish research in this field. Interest in GISc among journalists and the general public has also grown.

We eventually abandoned our efforts to recruit our own faculty member and have instead worked with you, your colleagues, and your research assistants on an ever-widening agenda of environmental health-related research projects. We successfully secured funding for this research from the National Institutes of Health's National Institute for Environmental Health Sciences (NIEHS) and National Institute for Minority Health and Health Disparities (NIMHD). In 2007 we hosted a forum on asthma and air pollution in New York City at the New York Academy of Sciences and participated in a forum on GISc sponsored by the Association of

Health Care Journalists at the CUNY Graduate Center. Since those initial joint presentations, we have presented at numerous professional meetings, including the Association of American Geographers, International Cartography Association, International Conference on Urban Health, and NOAA-CREST among others and published our work in diverse journals, including *Cartography, Health and Place, International Journal of Environmental Health Research, Social Science and Medicine, and Urban Geography*. A detailed account of our NIEHS collaboration, the South Bronx Environmental Justice Partnership, has been published as a chapter in *Urban Health and Society: Interdisciplinary Approaches to Research and Practice* (San Francisco, CA: Jossey-Bass, 2009). We continue to seek opportunities for collaboration including sending our junior faculty to study in your GISc programs.

In summary, there is a growing need for expertise in applying GISc to community and public health problems that your Masters of Science degree program would help to address. I applaud your efforts and offer whatever support I might provide that would be useful in realizing your plans.

Sincerely,



A.H. Strelnick, M.D.

Professor, Department of Family & Social Medicine

Assistant Dean for Community Engagement

Principal Investigator, Bronx Center to Reduce & Eliminate Ethnic & Racial Health Disparities





GLOBAL CONSERVATION PROGRAMS

2300 Southern Boulevard . Bronx, NY 10460 -1099 . USA . T-718 220-5100 . F-718 364-4275

14 September 2011

Juliana Maantay, Ph.D., M.U.P., F.R.G.S.  
Professor of Urban Environmental Geography  
Director of the Geographic Information Science (GISc) Program, and Urban GISc Lab  
Department of Environmental, Geographic, and Geological Sciences  
Lehman College, City University of New York  
250 Bedford Park Blvd. West  
Bronx, NY 10468

Dear Dr. Maantay:

I am very pleased to learn about the new Master's of Science degree in Geographic Information Science at the City University of New York. I believe the new program will be very helpful in New York City's efforts to lead in all areas of technological innovation, particularly geographic science technology. Spatial data development, as you know, is essential to modern practice in economics, emergency services, public health and environmental conservation. At the Wildlife Conservation Society, headquartered at the Bronx Zoo, we use geographic information everyday in our global conservation programs spanning 500 field projects in over 60 countries in the world. We have also used these kinds of technologies to help New Yorkers understand their place in nature through the Mannahatta Project, and its new expansion, the Welikia Project ([welikia.org](http://welikia.org)). Students from Lehman College and other CUNY campuses have worked with me on these enterprises over the years. Having a stream of well-educated and skilled professionals working on high-level geographic analyses is important for our on-going work and the economic health and vitality of New York City.

I wish you luck in establishing your program and look forward to its fruition under your leadership.

Sincerely,

A handwritten signature in black ink that reads "Eric W. Sanderson".

Eric W. Sanderson, Ph.D.  
Senior Conservation Ecologist  
Wildlife Conservation Society  
Phone: 718-220-6825  
Email: [esanderson@wcs.org](mailto:esanderson@wcs.org)



NEW YORK CITY DEPARTMENT OF  
HEALTH AND MENTAL HYGIENE  
Thomas Farley, MD, MPH  
*Commissioner*

Daniel Kass  
Deputy Commissioner  
Environmental Health  
125 Worth Street  
New York, NY 10013  
212 788-4646 tel  
212 788-2159 fax

September 4, 2011

Juliana Maantay, Ph.D.  
Department of Environmental, Geographic and Geological Sciences  
Lehman College, City University of New York  
309 Gillett Hall, 250 Bedford Park Blvd.  
Bronx, NY 10468

Dear Dr. Maantay:

I am the Deputy Commissioner for Environmental Health at the NYC Department of Health and Mental Hygiene. Our work frequently involves the use of geographic information systems to support visualization and spatial analysis of the geographic distribution of hazards, exposures and health outcomes, and land use, built environment and other factors that may explain or be associated with them.

Were Lehman College to develop a masters degree track in geographic information sciences that included training in epidemiology, general environmental science or data presentation, our Department would be delighted to consider students for internships, group or individual student projects. Each year, our bureaus in food safety, environmental surveillance, lead poisoning prevention and other environmental areas fund a variety of graduate student internships. As you no doubt know, we host national and international students in GIS related internships. Furthermore, most of our entry-level research scientists are hired following internships, and we look forward to both an academic and budgetary time when we can consider employing your graduates.

In just a few years, our Environmental Division expanded its staff of geographers from just one to seven. It has been difficult to find ideal candidates for these positions, because it is rare that a single individual possesses background and experience in epidemiology, statistics, environmental science and GIS, and even rarer still someone who understands urban environmental concerns and New York City. I am heartened that your proposed masters program recognizes the importance of these inter-related sciences and skills.

Best wishes in gaining approval for the masters program.

Sincerely,  
A handwritten signature in blue ink that reads 'Daniel E. Kass'.

Daniel Kass  
Deputy Commissioner



*Carter H. Strickland, Jr.*  
*Commissioner*

**James J. Roberts, P.E.**  
Deputy Commissioner  
Bureau of Water &  
Sewer Operations  
jroberts@dep.nyc.gov

59-17 Junction Boulevard  
Flushing, NY 11373

September 8, 2011

Ms. Juliana Maantay, Director of the GISc Program  
Department of Environmental, Geographic, & Geological Sciences  
Lehman College, City University of New York  
250 Bedford Park Boulevard West  
Bronx, NY 10468

**Re:** Proposed Master's Degree Program in GISc

Dear Ms. Maantay:

I am delighted to provide this letter of support for your new proposed Master's degree program in GISc, with a specialization in Environmental and Health Spatial Sciences. I can assure you that this program would be filling a need for New York City, especially its government.

As director of the Staten Island Bluebelt program for the New York City Department of Environmental Protection, I have a constant need for all kinds of maps. The Bluebelt is an award winning undertaking that acquires, restores and preserves wetlands on Staten Island for flood control purposes. Geographic information and the manipulation and analysis of that information are critical to the success of the program.

The Bluebelt system consists of approximately 400 acres of wetlands which DEP is responsible for managing as part of the City's storm water management network. For the past 19 years, we have been building special drainage facilities called Best Management Practices which cleanse the urban storm water runoff before it flows into the Bluebelt wetlands. All of this has been accomplished with extensive mapping which plots the storm sewer system in relation to the wetlands and Best Management Practices.

Over the years, you have referred to me a number of your former students as candidates for positions in my office. I have hired two of them and have found their training in Geographic Information Systems to be invaluable in their performance of their duties on the job. I welcome the expansion of that training into a new Master's program because it will certainly fill a need in my office.

As a practitioner in the field of municipal infrastructure development, I am happy to learn of your new Master's degree program in GIS for Lehman College. I can attest that the proposed program would be of value to the region because its graduates would contribute in a very significant way to important municipal undertakings like the Bluebelt program.

September 8, 2011

Ms. Juliana Maantay

**Re:** Proposed Master's Degree Program in GISc

I wish you every success in the new program, and thank you for your work preparing students for a career in GIS.

Sincerely,

A handwritten signature in blue ink that reads "Dana F. Gumb, Jr." with a stylized flourish at the end.

Dana F. Gumb, Jr., AICP  
Chief, Staten Island Bluebelt

DG:js



September 26, 2011

Dr. Juliana Maantay  
Department of Environmental, Geographic and geological Sciences  
Lehman College – The City University of New York  
250 Bedford Park Blvd. West  
Bronx, NY 10468

Subject: Proposed Masters of Science in Geographic Information Science (M.Sc. in GISc)

Dear Dr. Maantay:

On behalf of the doctoral program in Earth and Environmental Sciences at the CUNY Graduate Center, I am pleased to endorse the proposed Masters of Science in Geographic Information Science at Lehman College. This program, beyond its intrinsic merits, can make several important contributions to the EES doctoral program:

1. With its focus on spatial analysis that spans the disciplines of geography, environmental science, and public health, we would anticipate that the M.Sc. in GISc will train the next cohorts of technically-skilled doctoral students who will be able to contribute to EES specializations in both geography and environmental science.
2. As a pipeline, the M.Sc. in GISc will strengthen our efforts to recruit qualified students from under-served populations.
3. We have recently introduced new fields in Geography, among them Productions of Nature and Health Geographies. The M.Sc. in GISc, with its emphases on environmental science and health geographies, will enable us to provide a broader range of graduate course offerings and attract a larger pool of qualified doctoral students in both areas.

I commend you on your efforts in initiating this important program, and look forward to our continued close collaboration.

Best wishes,

Yehuda L. Klein  
Executive Officer



October 7, 2011

Professor Juliana Maantay  
Department of Environmental, Geographic  
and Geological Sciences  
Lehman College, CUNY  
250 Bedford Park Boulevard West  
Bronx, NY 10468

Dear Professor Maantay:

I am writing to support your proposed new inter-disciplinary Master's degree program in Geographic Information Science, (M.Sc. in GISc). Expertise in spatial analysis, computer-assisted cartography, geostatistics, and the exploration and interpretation of geographic data for the field of environmental health has become an integral part of public health practice and research. The knowledge and skills included in this field are highly valued by Departments of Health as well as by community-based organizations focused on developing programs to improve the health of the populations in their communities. Mapping of fast-food restaurants, hazardous emission sites and clusters of diseases are only some of the uses of GIS that are now standard requirements for any community assessment or impact statement.

Our students in the Lehman College Master of Public Health (MPH) Program are eager to learn and employ this discipline. The Program currently includes a very basic introduction to GISc in our Environmental Health course and students have expressed an interest in gaining further expertise which they could obtain from completing the full M.Sc. in GISc Program.

I fully support the establishment of the Master of Science in Geographic Information Science in the Lehman College Department of Environmental, Geographic and Geological Sciences. In reviewing the curriculum, the program offers theoretical, analytical and applied laboratory courses that will prepare students to work in this growing field. I look forward to our MPH students having the opportunity to enhance their abilities as public health professionals with the knowledge of geographic information science.

Sincerely,

A handwritten signature in black ink that reads "Jane Levitt".

Jane Levitt, Ph.D.  
Associate Professor  
Director, MPH Program



October 4, 2011

Dr. Juliana Maantay  
Department of Environmental, Geographic and Geological Sciences  
Lehman College-The City University of New York  
250 Bedford Blvd, West  
Bronx, NY 10468

**Sub: Proposed Masters in Geographic Information Science, Engineering and technology (GISET)**

Dear Dr. Maantay:

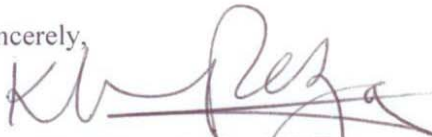
I wish to express my support for your proposed Master's Degree program in GISc, with specialization in Environmental and health Spatial Sciences.

It is our pleasure at NOAA-CREST center, which is a consortium of Universities led by the City College of the City University of New York, to enthusiastically support, the Lehman College in this effort, which is also one of CREST partners. With the growing need for expertise in GISc application to the human society and public health problems, this degree program will not only benefit the academic and student community but will also serve the community at large.

As one of the CREST partners, Lehman College has extensively worked on CREST research projects like Air pollution and its Impacts on Human Health with emphasis on Asthma in Bronx. This project has high significance and is of great interest to NOAA. CREST has been institutionalized as CUNY Remote Sensing of Earth Institute (CUNY/CREST) in November 2010 and Lehman is one of our partners in that effort. CREST being a Remote Sensing Science and Technology Center, a number of students who are currently being trained in NOAA-related sciences at CREST, could additionally benefit from this multi-disciplinary curriculum, thus increasing the number of graduate students.

I am very pleased to endorse this effort, which will benefit scientific, academic and students' community. My best wishes to this endeavor and we look forward to continued close collaboration.

Sincerely,



Reza Khanbilvardi, Ph. D., P.E.  
NOAA Chair Professor of Engineering/CE  
Director, NOAA CREST Center  
The College of the City University of New York

#### Cooperative Institutions



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