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2011 Innovations Awards Application

DEADLINE: MARCH 28, 2011

ID # (assigned by CSG): 2011- _____

Please provide the following information, adding space as necessary:

State:
New Jersey

Assign Program Category (applicant):
Information Systems, Environmental Protection (Use list at end of application)

1. Program Name
   NJGeoWeb
2. Administering Agency
   NJ Department of Environmental Protection
   Office of Information Resources Management
   Bureau of GIS
3. Contact Person (Name and Title)
   Angela Witcher, Acting Manager
   Bureau of GIS
4. Address
   401 East State Street, Trenton NJ 08625
5. Telephone Number
   609-633-2169
6. FAX Number
   609-292-7900
7. E-mail Address
   angela.witcher@dep.state.nj.us
8. Web site Address
   http://www.nj.gov/dep/gis/geowebsplash.htm

9. Please provide a two-sentence description of the program.

   NJ-GeoWeb is the New Jersey Department of Environmental Protection's (NJDEP) latest web-based mapping application for enabling users to view an area of interest, and interact with GIS and related environmental data. Using NJDEP program profiles, custom searches, GIS tools, and leveraging the Department's enterprise environmental databases; users can quickly find the information they are looking for and access up to the minute environmental data related to selected features appearing on the map.

10. How long has this program been operational (month and year)? Note: the program must be between 9 months and 5 years old on March 28, 2011 to be considered.

    February 2009

11. Why was the program created? What problem[s] or issue[s] was it designed to address?

    The Department's first internet based GIS application could only provide content that was associated with GIS data layers. Basic GIS tools were provided, but the path for how best to answer a question was not laid out for the user. It was easy to use, but not easy enough for the most inexperienced user of geographic information, nor was it as powerful as it needed to be. NJ-GeoWeb integrates GIS mapped layers with several NJDEP Data systems, including NJEMS to provide more complete information. NJEMS is the New Jersey Environmental Management System that houses program data for air, water, and land use associated with NJDEP permitting, inspections, clean-up, enforcement interests, and other agency activities. NJ-GeoWeb is also integrated with Data Miner. Data Miner is an internet application that serves specific reports about facilities and environmental monitoring in New Jersey to the public. By integrating these rich data sources, the NJDEP delivers a new level of transparency and public accessibility to users with NJ-GeoWeb.

    The first attempt to build an application that provided links to enterprise databases was made on the Department's intranet in an application called i-MapNJ ArcIntelligence. Connections to enterprise databases were provided to allow the user to access as much information as possible. This was delivered through a series of DEP program profiles (customized GUI's) that targeted specific issues or user interests such as water monitoring, site remediation, geology, water supply and allocation, and historic preservation. Moreover, because the profiles had a targeted audience, a custom set of GIS layers, tools, and searches were provided to address specific questions. This allowed inexperienced end users to get powerful functionality without knowing a wide array of tools. However, the profiles required extensive custom programming and were time consuming to create and update. Consequently, it was very difficult to respond in a timely manner to user needs for new profiles and new functionality. Natural events have a direct impact on the public and the Department's priorities. To be relevant, a GIS application must have the capacity to be updated in a timely manner to address current issues.

    Technical hurdles existed that made migrating the i-MapNJ ArcIntelligence application to the internet difficult. NJDEP users on the intranet had to logon to the application, and it would track some custom user settings and maintain that information in a database. This was going to be a challenge - managing a potentially unlimited number of internet users and their customizations. Since the plan was to build many profiles to address the needs of a wide array of constituents, including the regulated community, it was envisioned that there would also likely be situations where a profile (or some data elements within a profile) might have to be restricted to a set of authorized users. Providing a flexible enough security solution for the application was going to present a difficult challenge.

    With NJ-GeoWeb's development, NJDEP was able to overcome several major problems that plagued previous internet mapping applications. It provides a more efficient way of managing a great number (over 120 and counting) of GIS layers in the same application; and a more efficient and cost effective way of providing this information to staff and the numerous outside constituents (public, regulated community, other state and local government agencies, NGOs, etc.) served over the internet. Instead of a single application that tries to address the needs of many NJDEP programs, NJ-GeoWeb is configured in such a way as to serve DEP program profiles

within the application. This provides a more focused user experience targeted to the users interest. Since NJ-GeoWeb uses Rolta's OnPoint software, the application is much more easily maintained and NJDEP can more easily add new profiles and integrate new technologies (map serving technologies for one example) without having to make major changes in the application's programming code. NJ-GeoWeb also has built-in capabilities for security, enabling restricted access to an entire profile or elements within a profile. Below is the list of profiles.

GeoWeb

This profile has been developed to suit the needs of a general audience who may be interested in viewing what environmental information exists in the vicinity of a location or area of interest. The GeoWeb profile allows users to view and interact with a very diverse set of environmental map layers and related data. Users may run searches to find a location or area of interest, display features from the mapped data layers, and view environmental data associated with those features. Tools are provided to allow users to select and buffer features, measure distances and calculate areas, and determine or locate and display NJ state plane coordinates.

Well Drillers

This profile has been developed for the New Jersey well drilling community. The Well Driller profile provides the mapped layers and tools to allow well drillers to find a location or area of interest, determine if the location is in or near the New Jersey Highlands or Pinelands areas, view possible groundwater contamination concerns in the area, measure distances between locations and determine the New Jersey state plane coordinates for Well Permit Applications.

Ambient Water Monitoring

This profile augments the former Volunteer Water Monitoring profile with additional ambient water monitoring GIS layers including NJ Water Quality Data Exchange (WQDE), NJ STORET, EPA STORET, and USGS National Water Information System (NWIS). Users may view the profile to see where ambient water monitoring is occurring in NJ, and access monitoring results through links to online documents and reports. It is part of a comprehensive plan to allow local monitors with limited resources to store, view, analyze and submit data to NJDEP and EPA.

Geology

This profile provides GIS layers for New Jersey's bedrock and surficial geology, aquifers, groundwater recharge areas, wellhead protection areas, earthquake epicenters, abandoned mines and more. Students and the general public are the primary consumers of this profile. It provides an efficient means of serving the public by providing data and tools to answer questions, while saving staff time in not needing to answer all questions directly on an individual basis.

Tidelands

This profile provides GIS layers for New Jersey's tidelands claim areas, tideland maps, and head of tide. Developers make up the majority of users for this profile. Grid cells aid users in identifying tidelands maps associated with planned project areas. This is very helpful for site suitability analysis and the completion of permit applications.

PCER

This intranet profile is used by NJDEP's Office of Permit Coordination and Environmental Review to aid Developers in working with the Department. It includes tools for selecting parcels that are used to drill through environmentally sensitive layers to determine site suitability. It is a good initial screening tool for finding sites that can be revitalized and redeveloped. It also saves time for the Office of PCER because they don't have to go to individual programs for information; it is all in NJ-Geo-Web. The profile is also valuable for Developers in that problematic sites can be eliminated early before lot of time has gone into the permit application process.

12. Describe the specific activities and operations of the program in chronological order.

2000 iMapNJ NJEMS
2003 iMapNJ DEP
2003 iMapNJ DelBasin
2003 iMap ArcIntelligence Intranet profiles developed
2007 NJ-GeoWeb customized using OnPoint to meet the Department's internet branding requirements and provide additional Help tools.
2008 NJ-GeoWeb customized using OnPoint to duplicate intranet functionality for internet.
2009 NJ-GeoWeb debuts with GeoWeb, Volunteer Water Monitoring (now part of Ambient Water Monitoring) and Well Drillers profiles released on internet
2009 Geology profile released
2009 Tidelands profile released
2009 Special Achievement in GIS Award presented by Esri
2010 Ambient Water Monitoring profile released
2011 Permit Coordination and Environmental Review profile released

13. Why is the program a new and creative approach or method?

NJ-GeoWeb goes beyond the typical approach to providing visualization of spatial data through a web-based mapping application. It is designed for specific users with specific needs. It is neither overly simple with only basic geographic data, nor overly complex with a plethora of layers and tools buried throughout the application. The NJ-GeoWeb profiles strikes the right balance in providing the required amount of information to a defined audience.

14. What were the program's start-up costs? (Provide details about specific purchases for this program, staffing needs and other financial expenditures, as well as existing materials, technology and staff already in place.)

The startup costs include costs for the NJ-GeoWeb application servers that run the OnPoint server software for both internal and external web sites, the OnPoint software licenses running on those servers, training and implementation costs, and staffing (combination of several individuals at NJDEP and NJOIT).

- NJDEP servers (2) and necessary OS and related software: $7,500:
- OIT servers (3) and necessary OS and related software: $12,000
- Rolta OnPoint Software licenses (5): $67,500
- Rolta Training and Implementation: $30,000
- Staffing (1.5 FTE): $100,000

- Staffing includes Project Manager, Developer at NJDEP and a Systems Analyst at NJOIT (Office of Information Technology) to deploy, maintain and troubleshoot the application. These staff were already in place when the project began.

- Existing technologies included Esri's ArcIMS (map serving technology), ArcSDE (gateway to GIS database), and Oracle database servers (GIS and other environmental databases).

The approximate startup cost was $217,000

15. What are the program's annual operational costs?

- The annual cost consists predominately of recurring maintenance costs of the Rolta OnPoint licenses, and staffing to update and maintain NJ-GeoWeb. The staffing time includes a combination of several individuals at NJDEP and NJOIT.

- Annual Maintenance (for all OnPoint licenses, recurring after first year): $35,000
  Staffing (1 FTE): $65,000
  The approximate annual operational cost is $100,000

- Note that we are about to embark on a major enhancement project with Rolta to provide new functionality through the OnPoint software and we will make that new functionality available through NJ-GeoWeb. Most of these enhancements will become "core" enhancements, meaning other users of OnPoint will receive the same new functionality in a future release of OnPoint. The cost of this project is approximately $360,000.

16. How is the program funded?

The program has been funded through several sources including state funding (Permit Efficiency and federal grants (EPA - Smart Growth Grant).

17. Did this program require the passage of legislation, executive order or regulations? If YES, please indicate the citation number.

NJ-GeoWeb was not developed as a direct result of passed legislation, However NJDEP views NJ-GeoWeb as a vital presentation mechanism of environmental data that NJDEP collects that is public information. In this way it is a key element in the department's strategy to provide public access to information. In 2002, NJ state legislation was passed to create New Jersey's Open Public Records Act (OPRA). Of all state agencies in New Jersey state government, NJDEP (by far) receives and responds to the most OPRA requests. NJDEP's strategy has been to provide, through its website, access to as much environmental data as possible in order to alleviate the high volume of OPRA requests it receives. NJDEP feels quite strongly that the presence of NJ-GeoWeb, along with the NJDEP Data Miner application, helps substantially in this capacity, and will have an even greater impact as it continues to grow with new program profiles.

18. What equipment, technology and software are used to operate and administer this program?

Database - Oracle 10g
ArcSDE - gateway to the Oracle database
ArcIMS - Serves maps to the internet
Rolta OnPoint for configuring the mapping application
BusinessObjects/WebIntelligence – Connecting to the enterprise databases for serving reports

Each of the above software is running on its own dedicated server. There are development and production environments for NJDEP's intranet; and shared development, testing, and production servers for the application when it is deployed on the internet.

19. To the best of your knowledge, did this program originate in your state? If YES, please indicate the innovator's name, present address, telephone number and e-mail address.

    NJ-GeoWeb is unique to New Jersey. When NJDEP first researched the use of OnPoint, Rolta (at that time Orion Technologies) had a number of government clients that were mostly associated with Canadian provinces as well as a number of US municipal government agencies. While these agencies were using OnPoint software for developing mapping applications, to the best of our knowledge none had developed an application that was as data rich and that leveraged other applications to provide additional information to the degree that NJDEP was planning for NJ-GeoWeb. To NJDEP's knowledge, no US federal or other state government agencies had adopted the OnPoint product as a key part of their web-based mapping solution. NJDEP was the first to customize its web-based mapping application to provide an extensive user help module (including video tutorials, FAQs, Data Descriptions/Metadata), and to customize some of OnPoint's existing tools to make them easier to use.

20. Are you aware of similar programs in other states? If YES, which ones and how does this program differ?
    Yes. But we do not know of other states that have as much data, or links to other environmental information (e.g. easy ways to get to monitoring data, program specific data).

21. Has the program been fully implemented? If NO, what actions remain to be taken?

    Yes it has been fully implemented, but it is and continues to be a work in progress as we add more profiles with additional data and functionality. There is potential for NJ-GeoWeb integration with additional applications such as NJDEP's e-Permitting applications.

22. Briefly evaluate (pro and con) the program's effectiveness in addressing the defined problem[s] or issue[s]. Provide tangible examples.

<u>Pros</u>

- Staff time is significantly reduced by not having to write and maintain much of the code base. The vast majority of the code base behind the engines driving NJ-GeoWeb is being maintained by the OnPoint software, so other than the code we customize, we don't have to update coding as needs change and technologies progressively change. We maintain the map services and the mapped data that sits behind map services. We use OnPoint to configure aspects for each GIS layer that is made available in the website, to direct which GIS layers appear in each profile, to construct custom searches to easily allow users to select specific features from a GIS layer or zoom to an area of interest, to establish critical linkages to associated environmental data housed in other non-GIS enterprise environmental databases, and to enable integration with custom reports served up by NJDEP's reporting tool (NJDEP Data Miner). All of this configuration work done on GIS layers, searches, and reports is done one time in one place, and when developing new profiles, these modular components (resources) can be integrated and deployed where needed and be used by any profiles running in the application. This makes the creation of new profiles a relatively easy and rapid process. In NJDEP's earlier internet environmental mapping applications the functionality was coded in such a way that there was no means to create custom profiles easily, and no infrastructure to the program that would support the modularity that would allow defining components as resources that could be deployed in different profiles within the same application. Each had its own separate code-base that took a great deal of time and financial resources to develop. Each had to be maintained, and as new and updated GIS layers and tools became available, the code would have to be reworked to accommodate these changes. Now the separate i-MapNJ applications are essentially reproduced as profiles within NJ-

GeoWeb, and all run off of the same code-base and draw from the same resources pool for layers, tools, searches, and reports.

- In 2009 NJDEP received the Environmental Systems Research Institute (ESRI) Special Achievements in GIS (SAG) award. SAG award winners are organizations that use GIS to "improve our world and set new precedents throughout the GIS community". Recipients of the Special Achievement in GIS award are submitted by ESRI staff from thousands of organizations worldwide. NJ-GeoWeb was the flagship project submitted by the Department in consideration for this award.

- Several users have written to us about their experiences.
  - "I love this mapping and search tool. It has made my research for an article on South Orange water supply much easier." George Finlay, Principia Inc., 11/16/2010.
  - "Your maps are great." Hok-Man Chan 11:58 PM
  - "Kudos on the new and improved source for online NJDEP GIS data in New Jersey. I think that it is a huge improvement over iMap." Matt Schlitzer, Dewberry, 1/18/2010

<u>Cons</u>

- Custom coding to increase user friendliness has to be reworked when there are new releases of OnPoint.

- NJ-GeoWeb is excellent for advanced beginners, but users with little computer experience may want to start with more streamlined applications with limited functionality before moving on to NJ-GeoWeb.

23. How has the program grown and/or changed since its inception?

We've added additional profiles along with additional GIS data layers and links to reports that contain data associated with those layers. The application was robust enough that we have been able to expand without major changes.

24. What limitations or obstacles might other states expect to encounter if they attempt to adopt this program?

To achieve what we accomplished an organization needs their business data to reside in well organized, transactional, enterprise relational database management systems. This means current, high quality data adhering to high data standards to maintain that quality. NJDEP has several non-GIS enterprise environmental databases available, enabling access to program data associated with permitting, activities with regulated sites, and monitoring data for air, water, and soils. An existing report application (NJDEP uses BusinessObjects) should be leveraged as a key component for serving program business data in an easily useable (users can filter/sort and export results) format.

If an organization's databases are distributed <u>and not enterprise</u>, it is nearly impossible to easily integrate and link the data sources and be able to provide as much information as we have.

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2011 Innovations Awards Application
Program Categories and Subcategories

Use these as guidelines to determine the appropriate *Program Category* for your state's submission and list that program category on page one of this application. Choose only one.

Infrastructure and Economic Development
- Business/Commerce
- Economic Development
- Transportation

Government Operations and Technology
- Administration
- Elections
- Information Systems
- Public Information
- Revenue
- Telecommunications

Health & Human Services
- Aging
- Children & Families
- Health Services
- Housing
- Human Services

Human Resources/Education
- Education
- Labor
- Management
- Personnel
- Training and Development
- Workforce Development

Natural Resources
- Agriculture
- Energy
- Environment
- Environmental Protection
- Natural Resources
- Parks & Recreation
- Water Resources

Public Safety/Corrections
- Corrections
- Courts
- Criminal Justice
- Drugs
- Emergency Management
- Public Safety

Save in .doc or rtf. Return completed application electronically to innovations@csg.org or mail to:
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The Council of State Governments
2760 Research Park Drive, P.O. Box 11910
Lexington, KY 40578-1910

Contact:
Nancy J. Vickers, National Program Administrator
Phone: 859.244.8105
Fax: 859.244.8001 – Attn: Innovations Awards Program
The Council of State Governments
E-mail: nvickers@csg.org

This application is also available at www.csg.org.