

Spotlight

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REGULATORY UPDATES | BEST PRACTICES | NEW TECHNOLOGIES

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Every map has a story. Discover the amazing stories that GIS can help you tell.

Our work touches everyday life.

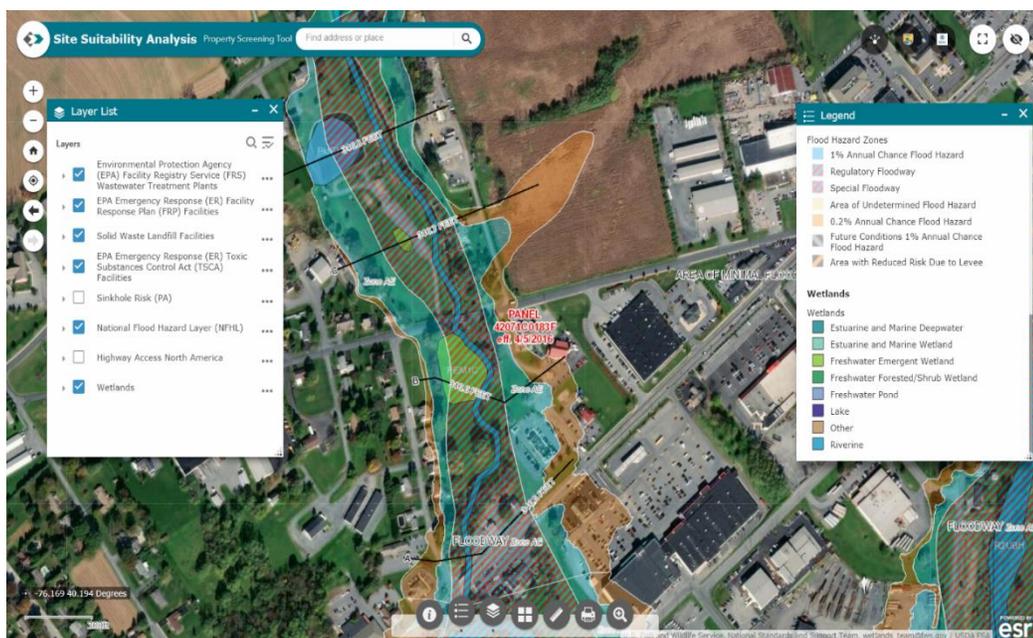
From the water you drink to the air you breathe to the buildings and communities where you live, work and play.

Spotts, Stevens and McCoy is a family-owned regional engineering, environmental, and surveying firm serving local and global clients. We engineer solutions for a better world. Our work touches everyday life; from the water you drink, to the air you breathe, to the buildings and communities where you live, work and play.

EXPERTISE

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- Survey, Data Capture and Modeling
- Water and Wastewater Engineering
- Construction Phase Services

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Where is the High Water Mark?

When evaluating a property for development or improvement, the first questions to arise involve the location of mapped floodplains and wetlands. Increased access to online GIS data has made it quick and easy to answer those questions.

The Federal Emergency Management Agency (FEMA) has made The National Flood Hazard Layer publicly available through online GIS services. Similarly, US Fish and Wildlife Service published the National Wetlands Inventory publicly as online GIS data. To streamline the property evaluation process, SSM has combined these and other GIS data to create a web-based GIS application.

SSM's "Site Suitability Analysis" is a pre-acquisition/pre-development decision maker's tool that identifies physical and environmental limitations or constraints on a property that could impact development scenarios. The analysis uses publicly available geographic information and consolidates it to a single interactive map. In addition to floodplains and wetlands, the application provides sinkhole risk potential (only available in Pennsylvania), highway access distance, and information on nearby environmentally regulated facilities, such as wastewater treatment plants, emergency response facilities, solid waste landfills, and toxic substances facilities.

Check out your property: <https://arcg.is/1fizbG>



Say Goodbye to Clipboards . . . and Hello to GIS Mobile Apps

SSM's GIS department created and is now implementing customized field data collection apps for your mobile device that allow easy and accurate field data collection. We are in the process of replacing unreliable paper-based data collection with a digital solution that fits the needs of field personnel in diverse environments. The customized app guides the user through a series of questions where answers range from yes/no or multiple choice to free-form responses. The data collected, including site photos, are tagged with geographic coordinates to create automatically generated maps, tabulated reports, and real-time analytics. These applications also work well for simply taking field notes (through voice-to-text) and capturing site photos.

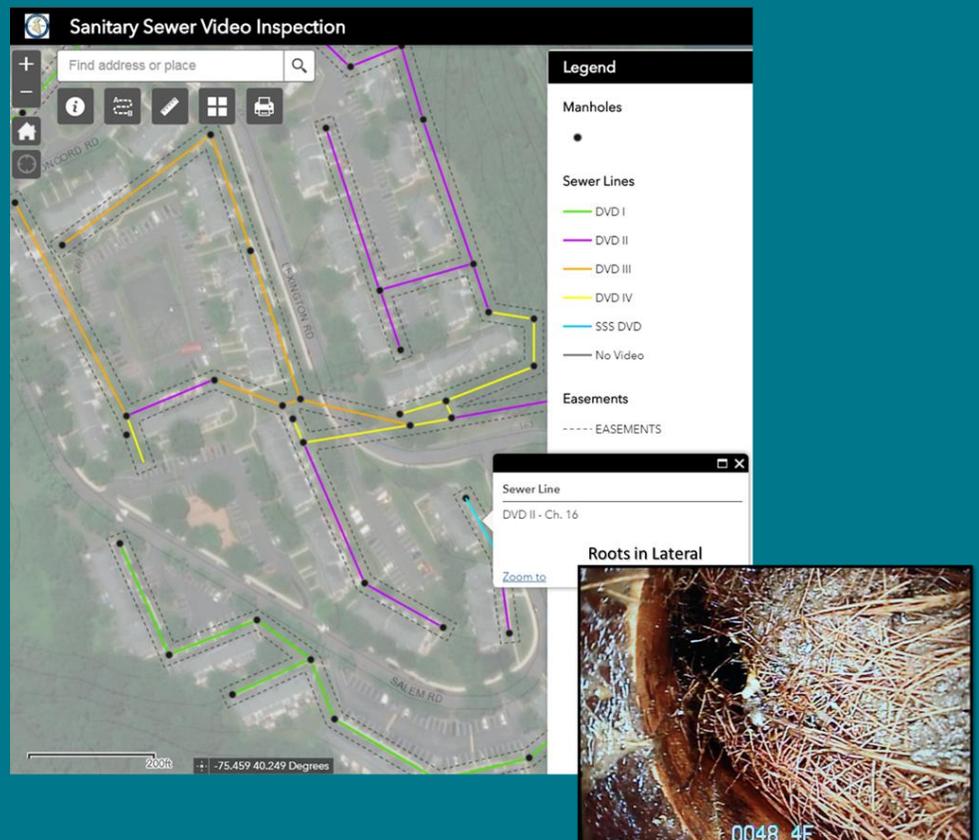
Check out an illustration of how field data collection through mobile apps can increase field work productivity. <http://www.esri.com/esri-news/arcnews/spring17/articles/taking-gis-to-the-field-and-back>

PROFILE

Cataloging Sewer Inspection Videos through GIS

Through routine sanitary sewer inspections, sewer systems will amass a library of inspection videos. Cataloging these records for future reference has always been a challenge.

To help utilities retrieve the valuable information collected through the inspection, SSM creates asset management programs through GIS. The program is built upon a comprehensive GIS geodatabase that locates and inventories every manhole and cleanout in a sanitary sewer system through as-built records and GPS data capture. Video inspection footage is then integrated into the GIS framework of sanitary lines, creating a quick reference to video files for the surveyed lines. Online maps are built through ArcGIS online accounts to provide staff and consultants with the access to data. When a sewer line is selected in the map, a pop-up window displays a reference index to locate the inspection video, such as the date of the inspection, media reference label ("DVD II," or "Tape 03"), and video index ("Chapter 16," or "3:14"). For further quick reference, screen shots of problem areas are embedded directly into the GIS data. The GIS-based asset management program is designed to deliver field-critical information at decision-makers fingertips.



SINKHOLES: Are you at Risk?

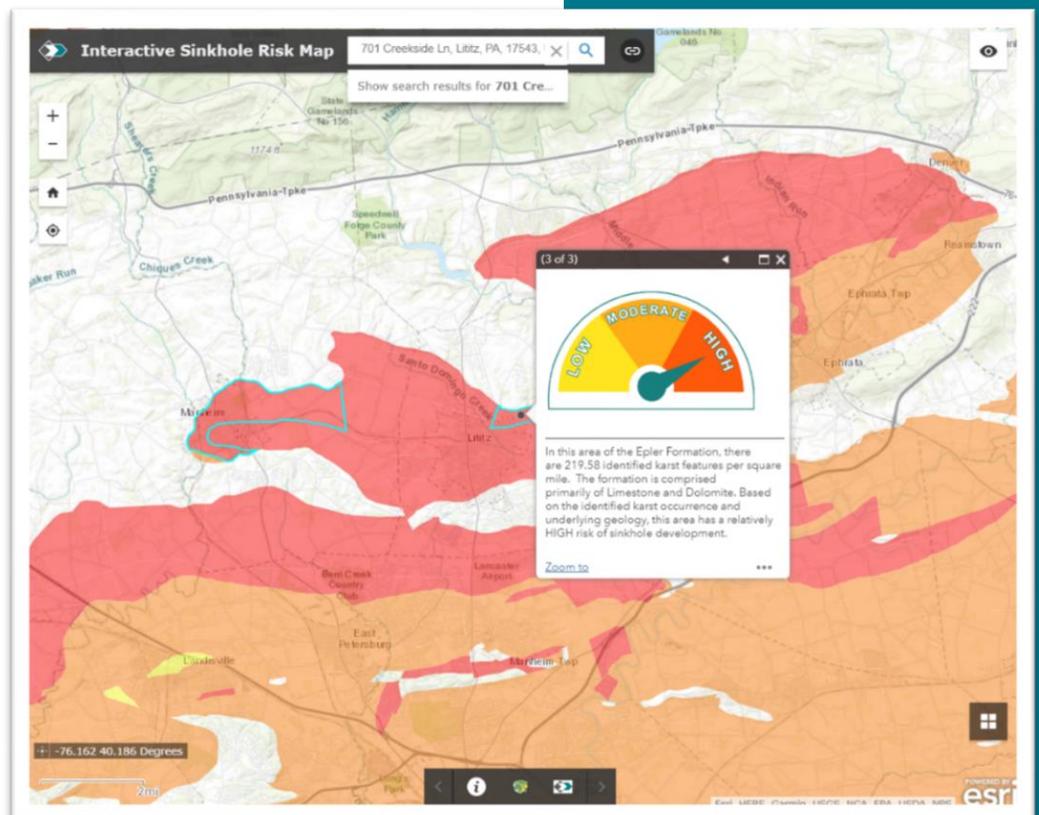
Sinkholes can be dangerous in many ways. They can cause damage to the foundation of a building as well as buried services like water and electrical lines, because they serve as conduits for surficial contaminants to reach groundwater. Knowing the risk of sinkhole formation is key to minimizing possible damages.

Since the amount of karst features in an area can be related to the occurrence of sinkholes, SSM created an interactive sinkhole risk map using the density of karst features within a geologic formation. The Interactive Sinkhole Risk Map provides the public access to searchable and interactive information such as karst density and geologic formations which contain carbonate rocks within Pennsylvania.

The information used to develop the map was derived from Department of Conservation and Natural Resources' (DCNR) data. Both the karst features information and geologic formations used in the making of this map were provided by DCNR. The map displays only geologic formations in which the geologic unit contains carbonate rocks. There is the possibility of sinkholes forming in non-carbonate environments, but those situations were not considered in the making of the map.



To explore the Interactive Sinkhole Risk Map, visit <http://arcg.is/0GmWq0>



Utilizing GIS for MS4 Reporting

A GIS-based infrastructure asset management program can be used to document all MS4 activities, including outfall inspections, basin assessments, public outreach activities, employee training, and BMP installation and maintenance. In addition to functioning as a records management database, the program can be used to generate required compliance reports electronically.

In 2003, the Environmental Protection Agency developed federal regulations that require a stormwater permit program for some communities based on size. This regulation is called the National Pollutant Discharge Elimination System (NPDES) Phase II Storm Water Program. Under the current Phase II Final Rule regulation, all owners of Municipal Separate Storm Sewer Systems (MS4) in Urbanized Areas must obtain a Phase II MS4 Storm Water permit, which affects communities with population of <100,000 people. In order to comply with the regulation, the PA Department of Environmental Protection (DEP) has developed the Phase II MS4 Stormwater Program which meets the Environmental Protection Agency's goal to reduce pollutants associated with stormwater runoff in communities of a certain size. There are currently 953 MS4 communities in Pennsylvania that are subject to this regulation.

MS4 Permit holders are required to prepare and submit Annual MS4 Status Reports to DEP for review by September 30th. As part of the annual report, the permittee is required to document detailed information for each Minimum Control Measure (MCM) listed in the permit. If the permittee is required to implement a Pollutant Reduction Plan (PRP) and/or Total Maximum Daily Load (TMDL) plan, detailed information on all new structural Best Management Practices (BMPs) installed and ongoing nonstructural BMPs implemented during the reporting period must be documented in the annual report. Permittees are required to submit MS4 Outfall Field Screening Report detailing the results of the outfall inspection program as stipulated in the permit conditions.

With all these new compliance reporting requirements, the burden of paperwork has fallen on already over-tasked municipal employees. After the first year of the reporting cycle, municipalities are seeking to implement an easy-to-use records management and reporting system. Instead of purchasing new software to accomplish this task, some municipalities have turned to their existing GIS program for records management. Mapping of the municipal-owned storm sewer infrastructure was a required component of the recent permit renewal process. In most cases, the level of GIS mapping conducted for the permit consisted of infrastructural locations coupled with identification of ownership (public or private). By adding attribute data to the GIS data, the existing framework can form the basis of a robust informational database that can be used to house the documentation required for permit reporting.

A GIS-based infrastructure asset management program is capable of documenting all activities associated with the MS4 permit including public outreach activities, outfall inspections, construction, employee training, basin assessments, and BMP inspection and maintenance. Through the use of mobile applications, inspections are conducted on a hand-held mobile device, eliminating the need for paper field reports. The data collected in the field, including field photos, are transmitted directly to the GIS asset management program, creating a comprehensive document database. The information stored in the database is then used to generate the required annual reporting forms and tables electronically.



Welcome Aboard!

SSM welcomes **Civil/Municipal Project Engineer Nicholas A. Szeredai, PE** to the firm's Municipal Engineering and Planning Department. In this role, Mr. Szeredai serves as the primary contact and advocate for municipalities. He is responsible for the project management of the engineering design and reviews associated with stormwater management, municipal planning, zoning and subdivision and land development, traffic services, and construction management. Mr. Szeredai is also regularly responsible for MS4 Planning and Reporting as well as Project Management of Municipal Annual Roadway Maintenance Programs. He is a graduate of The Pennsylvania State University with a B.S. in Civil Engineering and is a licensed Professional Engineer in Pennsylvania.