

TECHNICAL IMPLEMENTATION

Westchester County Department of Information Technology

Spatial Analysis for Public Health

Over the past decade, Westchester County has been recognized as a leader in developing innovative Geographic Information Systems (GIS) solutions to improve both internal operations and external service delivery to residents and local municipalities. The latest example of GIS innovation is the *Spatial Analysis for Public Health* tool that the Westchester County Department of Information Technology is nominating for a NYS Forum 2009-2010 Best Practices Award in the Technical Implementation Category. This initiative embodies the creative out-of-the-box thinking that the NYS Forum recognizes each year through its awards competition.

In close collaboration with the Westchester County Department of Health, GIS staff designed and developed *Spatial Analysis for Public Health*, a first-of-its-kind intranet application that provides Westchester County employees with immediate access to numerous datasets that may be needed during an emergency. The new *service*, available to staff in various remote offices, requires no client software, and combines dozens of environmental and social datasets with rich geospatial analysis tools. Flexibility was a primary goal, giving users the ability to display multiple event locations, and view them in context of relevant features.

Locations can be mapped on-the-fly from a text file of street addresses or coordinates, and buffered by a user-specified distance. Users can also quickly find facilities of interest within a buffer of any location on the map, or within any selected boundary or service district. 'Find' results, displayed at the bottom of the screen, can be exported as an 'action list' for field staff. Critical facilities available in the map include: schools, hospitals, shelters, senior centers, municipal offices; and regulated industries such as restaurants and dry cleaners. The application also includes datasets such as wetlands, steep slopes, soils, flood zones, EPA-regulated discharge permits, parks, watersheds, boundaries, roads, structures, street addresses, parcel boundaries, service districts, land use, census tracts, aerial photos, and many other layers. In addition, the user interface provides customizable markup tools, measure, and print functions. By including such a vast amount of data layers in the application, users are prepared to respond to any imaginable public health event, and use the application in the way that makes the most sense to them.

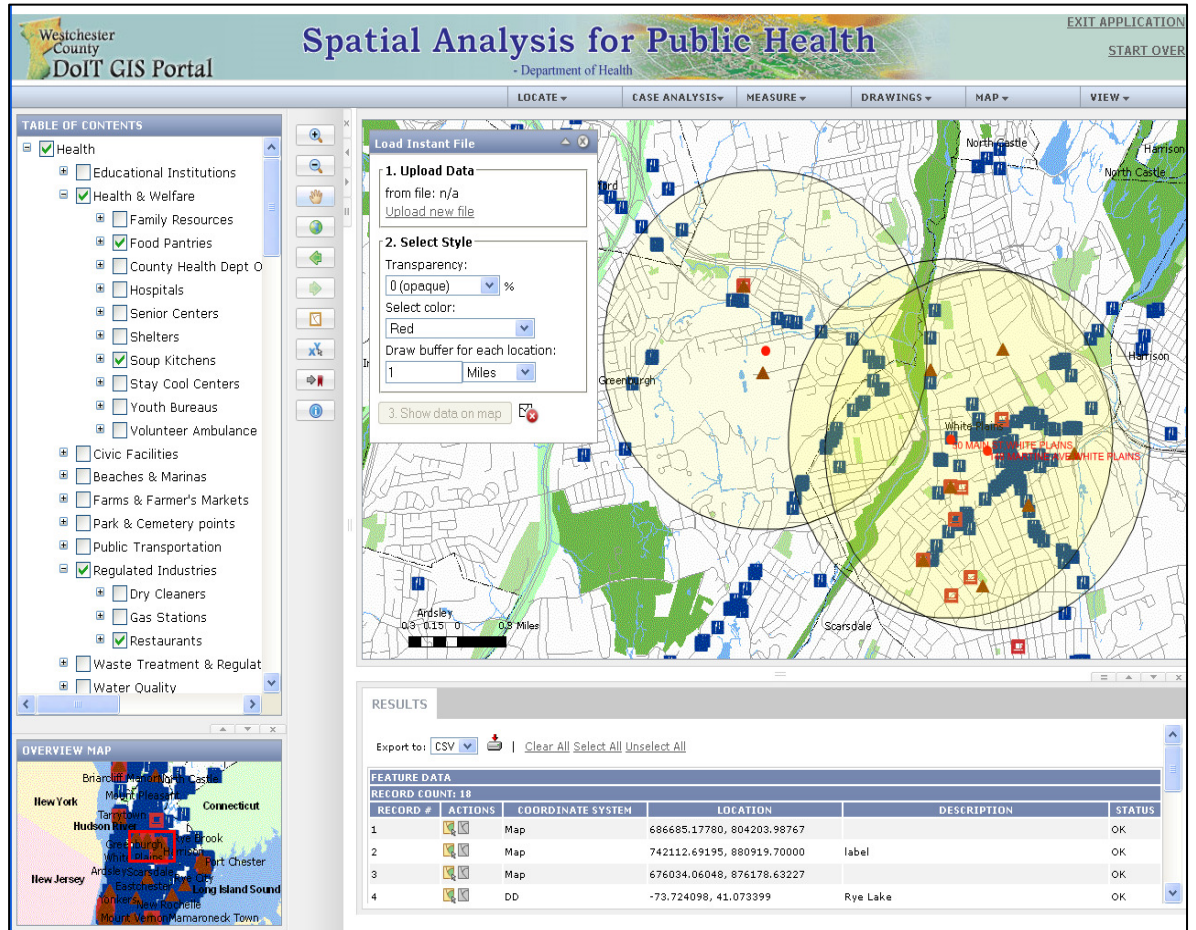
In addition, because *Spatial Analysis for Public Health* is an ArcGIS Server application, the tool contains a rich set of spatial analysis tools designed to support incident (outbreak) analysis, show spatial correlation of data, buffer analysis, identify/list facility information, and other geoprocessing capabilities. Further, the application allows DOH staff to access and reference important environmental and planimetric datasets (contours, soils, wetlands, buildings, tax maps, etc.).

This application is quickly becoming a critical component of the toolkit available to Westchester County officials that are responsible for monitoring and responding to

potential public health emergencies. Further, the ability to identify the sources of outbreaks and community clustering were two key requirements fulfilled by this application. Because of this application, Westchester County is well prepared to respond to New York State's request for a one-mile radius of all outbreaks plus all addresses within that area.

Legionnaire's disease provides one specific example of how this application could be used in the event of a real public health emergency. Because the disease is airborne and spread through a variety of sources – including standing water, cooling towers, produce in supermarkets – a wide range of datasets and geographic locations are required when responding and attempting to contain the outbreak. Because of the flexibility and vast amount of data stored in the *Spatial Analysis for Public Health* application, Westchester County officials are now well prepared to respond to such emergencies and accurately target their response efforts. Inspections teams would quickly be able to identify potential areas of groundwater and soil contamination and conduct the appropriate testing.

In summary, the Spatial Analysis for Public Health application leverages GIS technology in a truly innovative way and provides a cost-effective public health service that will be used for years to come. The popularity of this application will only continue to grow as additional users are introduced to its benefits. The County plans to provide this tool as an additional “shared service” to local municipalities in the near future, generating further cost savings to local governments that will not have to use limited resources to build their own solutions.



Screenshot of the *Spatial Analysis for Public Health* application showing analysis result: input incident addresses were geocoded, mapped and buffered to a user-specified distance, and those feature types the user has requested to 'find' within the buffers, are listed in the output table (as a downloadable 'action list') at the bottom of the screen.

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