



GIS and Preparedness

Geographic Information Systems, or GIS, are a set of computer-based programs that are capable of storing, analyzing, and presenting geographically referenced data. They have many potential uses in public health preparedness. GIS software is useful for applications with spatial/geographical components, such as determining hurricane flood zones, or for mapping variation in vaccination rates by neighborhood.



What are some potential uses for GIS in emergency preparedness?

- **Locating vulnerable populations:** You can map census or other data to identify areas with high concentrations of vulnerable populations.
- **Infection Surveillance:** If there is an influenza pandemic, GIS could help you visualize the geographic distribution of the spread of disease.
- **Picking the best places to hold Points of Dispensing (PODs):** You can use GIS to determine whether a location is a suitable place to hold a POD by analyzing population density, proximity to transit routes, availability of parking, whether it is in a flood plain, etc. If you have already chosen a location, you could use GIS analysis to help you find the best location for parking and staging areas.
- **Predicting areas of high risk:** When a potential threat is spread out over a large area, GIS analysis, in combination with information such as census data and weather patterns, can help you predict which areas will be at highest risk for a specific event and can be used to identify people who must be notified or evacuated. For example, when planning for hurricanes, you could map a city's long-term care facilities, flood plains, and areas of potential coastal surge to identify which facilities are most at risk of flooding.

How is GIS used in emergency preparedness and response?

- During the San Diego wildfires in 2007, Google Maps posted real-time updates showing where fires were active. The maps also showed shelter information including locations, which shelters were full, and which were able to accommodate livestock.
- GIS analysis was used after 9/11 to conduct preliminary damage assessments, to notify the public about the availability of telephone, electricity, and subway service, and to keep emergency responders updated on the status and location of basic services such as water, power, and telephones.
- New York City's Office of Emergency Management is using GIS in its Hurricane Evacuation Zone Finder. This is an online tool that residents can use to look up the evacuation zone status of any New York City address. You can view the evacuation zone finder by visiting the website: <http://gis.nyc.gov/oem/he/index.htm>.

How can I start using GIS in public health preparedness?

Check with others in your organization or agency. GIS analysis is now widely used for a variety of purposes, and is very common in environmental health and local land use departments. Someone you have an existing professional relationship with may already be trained in GIS and have access to the software. If this is the case, they may be able to help you determine how you can best use GIS in your preparedness efforts.

If you don't already have access to GIS within your organization, to start using GIS you will need obtain the GIS software and you will need some training. Training courses, ranging from free online tutorials to classroom-based instruction, are available from many sources. See the box below for GIS resources.

GIS resources

- **World Health Organization's HealthMapper website:**

You can download free GIS mapping software from this website:

http://www.who.int/health_mapping/tools/healthmapper/en/index.html

- **The CDC's GIS website:**

This site has links to training resources: <http://www.cdc.gov/gis/training.htm>

- **ESRI, Inc.'s website:**

ESRI, Inc. is the developer of ArcGIS software. Their website offers a variety of trainings that vary in cost and format. It includes a large database of online courses and free tutorials. You can access these at <http://training.esri.com/gateway/index.cfm>

- **FEMA Mapping and Analysis Center website:**

This site has historical disaster data and is updated with new data during disasters:

<http://www.gismaps.fema.gov/index.shtm>

- **University at Albany Center for Public Health Preparedness GIS & Public Health Day Conference:**

This website has conference presentations highlighting how GIS has been used in public health, including in mass dispensing exercises and infection surveillance:

<http://www.ualbanycphp.org/GRS/eventPast.cfm?id=103>



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