



SESSION DESCRIPTION

D4 IN FOCUS: Spatial data for resilience

GIS-based tools and approaches for informed decision-making

Presentations

Date: Friday, May 30, 2014

Time: 11:00-12:30

Rooms: S29-31

Language: English

ICLEI contact: Laura Kavanaugh / Franziska Schreiber

Organized by: ICLEI

OBJECTIVE

Today's cities are faced with a growing number of urban challenges and an accelerating pace of change. In order to understand how global climate change impacts will interact with local urban development, planners and policy makers need sophisticated analysis tools. Spatial data and Geographic Information Systems (GIS) technology offers a host of solutions for analyzing complex urban resilience and risk information. Spatial data tools can process multiple scenarios and datasets, tracking change over time to pinpoint vulnerability hotspots. By visualizing integrated data, GIS technology helps to rationalize urban planning processes, facilitate informed and transparent decision-making, and support holistic, multi-stakeholder approaches.

This session will demonstrate how spatial data tools are used to improve urban resilience with examples from the cities of Wuppertal and Rotterdam. The opening presentation will concentrate on improving the resilience of communities with the help of GIS. This will be followed by a presentation exploring ideas for how traditional enterprise GIS for local governments can be integrated with other information systems in ways that are interconnected, interoperable, and accessible across society. The City of Wuppertal, Germany, will then showcase its spatial data infrastructure 'WuNDa and a scenario-based flood hazard map created in partnership with the Engineering Company Reinhard Beck. The map uses GIS technology to map vulnerability to heavy rainfall and subsequent flooding to guide public and private sector decision-making. Lastly, the City of Rotterdam will present a GIS-based Resilient City Planner, developed in cooperation with Delft University of Technology as part of an integrated planning approach. The tool is capable of visualizing dozens of indicators simultaneously at the neighborhood level. Its various applications by multiple stakeholders will be shared.

OUTCOMES

- The participants will learn about the various uses of spatial data tools for analyzing complex data, visualizing vulnerability, and guiding multi-stakeholder urban planning;
- Through the case studies, participants will gain a deeper understanding of how cities are using GIS technology to identify local impacts and develop integrated resilience strategies; and
- They will be able to take this knowledge with them to apply in their own cities and regions.



METHODOLOGY

- The facilitator will provide an introduction to the session topic and contributors. **(5 minutes)**
- The first two presenters will discuss the use of GIS for resilience from an organizational perspective and a more technical perspective **(2 x 15 minutes)**
- The following two presenters will present examples of how GIS-based tools are being used by local governments to inform urban planning. **(2 x 10 minutes)**
- The facilitator will moderate an audience discussion. **(30 minutes)**
- Closing remarks by the facilitator. **(5 minutes)**

CONTRIBUTORS

Facilitator *Jim Geringer, Director, Policy and Public Sector, Esri; former Governor, State of Wyoming, USA*

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GIS for decision makers: From the citizen on the street to the leadership suite

GIS changes how we think and act and in that sense can be considered transformational. It integrates geographic science into what we measure and predict, how we plan, design, evaluate, and ultimately how we manage a whole workflow of activities. When successfully applied, GIS can enable communities to reopen businesses and restore essential services for a timely economic recovery after a sudden or prolonged disruptive event, or to mitigate the effects before the event. As a tool, GIS is integrative, visual, quantitative, and analytic. It organizes entire enterprises or single projects, enabling city leaders and individuals to create a more sustainable future. Web-based GIS offers particular advantages, leveraging the web and the cloud, and big data, along with advances in remote sensing, GNSS, and 3D.

Presenter *Joseph Abdo, Director of Business Operations, GPC-GIS, Running Springs, USA*

GeoSmart cities for sustainable and resilient development

This presentation will explore ideas for how traditional enterprise GIS for local government can be integrated with other information systems in ways that are interconnected, interoperable, and accessible across society. New ways for municipal governments to understand and react to sustainable and resilient development will be discussed. More importantly, ways to anticipate and respond in a timely, place-based way to these opportunities will be addressed. New tools show promise to support wise management of resources, economies, and to aid in the conservation of cultural and natural heritage. This presentation will provide an overview of how geographic information systems (GIS) and new emerging technologies, tools, and methods are creating opportunities for "GeoSmart" cities to support sustainable and resilient communities and cities.



Presenters *Sebastian Czickus, Project Manager, Engineering Company Reinhard Beck, Wuppertal, Germany*

Stefan Sander, Head of Information Processing and Cartography Department, City of Wuppertal, Germany

Risk-mapping for heavy rainfall impact for the City of Wuppertal

The City of Wuppertal has partnered with the Engineering Company Reinhard Beck to create a GIS-based risk map depicting the impact of heavy rainfall in the city. Probable flow paths and depressions were analyzed for the entire city area. The vulnerability of each building was then classified depending on its use and compared to the risk map to show the distribution of vulnerability across the city. The methodology applied by the City of Wuppertal will be presented as well as the municipal tool for processing geo data called 'WuNDa'. To conclude, the different uses for the data to inform emergency planning for city officials, citizens, and the private sector will be discussed.

Presenter *Nico Tillie, Researcher and Lecturer, Delft University of Technology; Landscape Architect, City of Rotterdam, the Netherlands*

The Resilient City Planner: A next-generation GIS tool for urban planning

Modern urban challenges require a new generation of tools to synthesize and display complex data in a clear and comprehensive manner. The 'Resilient City Planner,' an innovative tool used to inform planning in the City of Rotterdam, will be presented. This tool links traditional data inventories to GIS mapping technology. It creates a baseline study of about one hundred variables and scores an area's performance on an easy-to-read diagram linked to detailed digital maps. In a short time a resilience scan can be produced to guide and rationalize planning for a variety of stakeholders. In this way, GIS technology is enabling cities to build an urban agenda.

Further recommended reading

Local government and Resilience

<http://www.esri.com/Industries/localgov>

Reinhard Beck risk mitigation projects

<http://www.ibbeck.de/DE/2381/aktuelleProjekte.php>
