

Geospatial Preparedness from the Non-Governmental Organization Perspective

Dr. John P. Wilson
President, University
Consortium for Geographic
Information Science

UCGIS – Who Are We?



- Network of 70+ universities, professional organizations, and private firms
- Promotes multi-disciplinary GIScience research and education
 - Today's talk will showcase the work of faculty and students at Hunter College, Louisiana State Univ., Oregon State Univ., Univ. of Oklahoma, Univ. of South Carolina, and the Univ. of Southern California for example

UCGIS – What Do We Do?



- Hosts annual winter and summer meetings to showcase the work of its members and build collaborations with federal, state, and local agencies
- Hosts specialized workshops ...
 - Computation and Visualization for the Understanding of Dynamics in Geographic Domains (Washington, DC, 16-18 October 2006)
- Serves as clearinghouse for agencies that need specialized research services

UCGIS – Research Themes



- Emergency Response
- Private / Public Sector / University collaboration
- Disaster Recovery
- Federal / State Collaboration
- Database QA&QC / Cleanup
- Pre-Disaster Database Development / Data Integration / Modeling
- Data Delivery / Education

On the night of September 11, 2001 the Center For Advanced Research of Spatial Information (CARSI) at Hunter College began making maps of the World Trade Center Site from the NYC digital base-map (**NYCMap**)

Having the only remaining copy of the **NYCMap**, Professor Sean C. Ahearn and his staff at CARSI brought 3 of their computers down to the temporary command center on the morning of September 12, 2001 and set up the kernel that would become a 24X7 mapping and data center established at Pier 97 and serving the EOC with geospatial information and analysis.




FDNY – Ground Zero

- Challenge – Replace cumbersome manual process for collecting and cataloging evidence at WTC "Ground Zero"
- Solution – Ruggedized handheld computers with LinksPoint's GPS and barcoding software
- Benefit – LinksPoint solution cut evidence acquisition time from 5-10 minutes to < 1 minute – reducing firefighter exposure to hazardous conditions and improving data accuracy and usability






LINKSPOINT
Data to the Point




DOB Red Zone Application

- Challenge - Need to inspect all buildings in "Red Zone" for damage
- Solution - Wireless Application tied in to NYCMap GIS database automated existing paper-based process







Benefits: 40%




Post-Disaster Decision-Making

- Collaborative project by Lam (LSU Geography), Pace (LSU Finance) and Campanella (Tulane)
- Telephone surveys of businesses in Orleans Parish in Nov/Dec 05, Apr/May 06, and Aug 06
- Field survey of three major commercial corridors every two weeks
 - St. Claude Avenue (economically deprived artery downtown)
 - Magazine Street (high-end)
 - Carrollton Avenue (mixed)


Key Results – March 2006

- 844 businesses (7.6%) are open
- Levee protection is chief concern, followed by lack of customer base, lack of employees, communication problems
 - While 50% thought levee protection is chief concern, close to 50% thought it is of least concern
- 52% of those surveyed are optimistic (better or about same as before Katrina); the remainder are uncertain about their future prospects



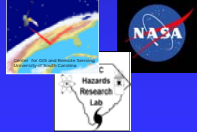
Geospatial Data Approaches During Phases of the Disaster Cycle: State EOC Perspectives

Michael E. Hodgson
University of South Carolina



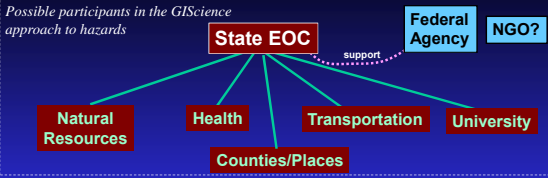
Bruce A. Davis
NASA/DHS

Jitka Kotelenska
University of South Carolina




Why did we survey State EOCs?

Possible participants in the GIScience approach to hazards



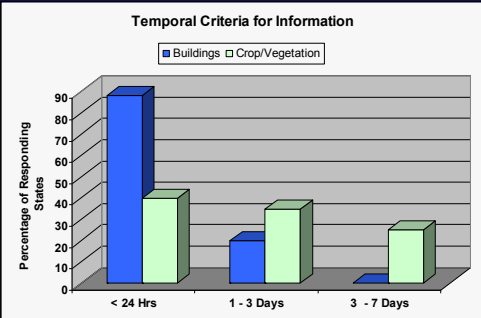
- The State has lead responsibility in emergency response
- Their perception/cognition matters
 - e.g. Agency 'X' claims "our imagery and products were very important in responding to the disaster" (In reality, the state EOC and network of responders never used it)

NOTE: Their perception/cognition may be incorrect – this would suggest education/communication issues




How soon after the event does your agency require geospatial data?

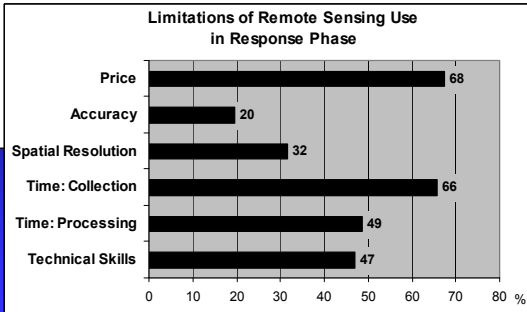
Temporal Criteria for Information



Temporal Criteria	Buildings (%)	Crop/Vegetation (%)
< 24 Hrs	~90	~45
1 - 3 Days	~25	~40
3 - 7 Days	~5	~30



12. In your agency, what are the LIMITATIONS of using aerial photography or REMOTE SENSING data for mapping the following information during the RESPONSE and RECOVERY phases? Please check all that apply.



REMOTE SENSING HAZARD GUIDANCE SYSTEM (RSHGS)

Michael E. Hodgson
Lynn Shirley
Kevin Remington
Jitka Kotelenska
Bandana Kar
Linna Li
Jianwu Chen
University of South Carolina

Bruce A. Davis
Shannon Ramsay
Drew Simpson
NASA/DHS

Yang Cheng
James Miller
Bobby Williams
JPL/Kinetix

Remote Sensing Hazard Guidance System

The Remote Sensing Hazard Guidance System (RSHGS) is under development as part of a NASA REASoL project of the University of South Carolina. NASA and JPL are assisting in the development of the project. The RSHGS is a web-based SCGIS guiding hazards managers in the process of acquiring and analyzing remotely sensed imagery for a hazard event. The intelligence subsystem will use the GIS-based modeling subsystem and satellite query subsystem to automatically determine optimum sensors/satellites for the hazard requirements, geographic study area, and time frame (e.g., 48 hours). The user of this system will also be able to independently query the current and future locations and collection abilities of any unclassified satellite borne sensor. A GIS-based modeling subsystem will predict the area of impact from the hazard event.

The system development cycle is:

- Fall 2005: Alpha version with single user functionality
- Spring 2006: Beta version of the system
- Spring 2007: Version 1.0

Geographic Data	Satellite Name	UTC	Local Time	SatID#	Sub Sat Longitude	Sub Sat Latitude	Satellite Altitude	Satellite Heading
Resources	SPOT4_2	08:07:00Z	11:40:30 AM	TR1	117.301000	23.766010	85.11	102.00

Note: Currently, only 8 satellites are loaded in the modeling subsystem from which to select.

Map SubSat Point

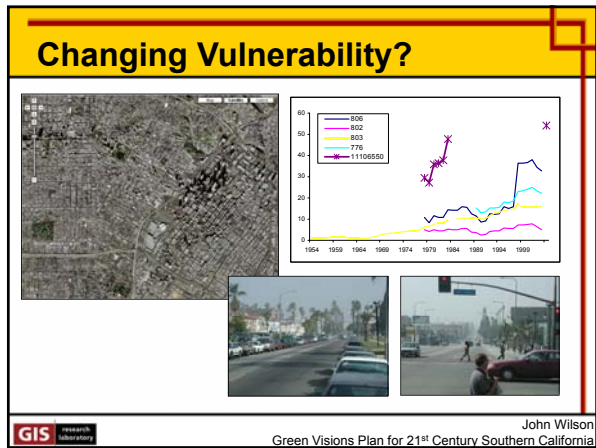
National Hydrography Dataset

John Wilson
Green Visions Plan for 21st Century Southern California

NHD Problems



- Duplicate stream segments
- Flow divergences
- Missing stream segments (reaches)
- Missing or erroneous attributes

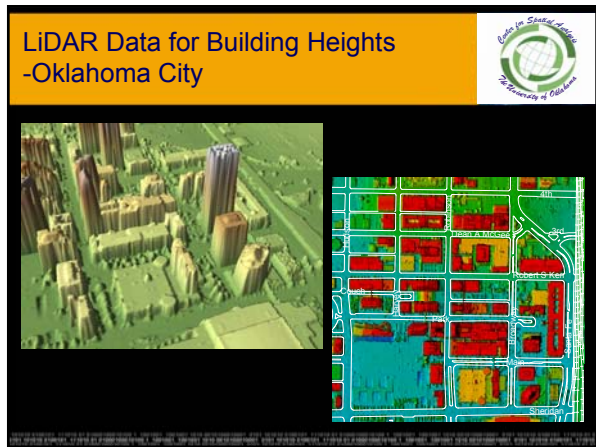
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Green Visions Plan for 21st Century Southern California



LiDAR Data, 3D City, and Urban Dispersion

Modeling the dispersion of pollutants, chemicals, and airborne diseases

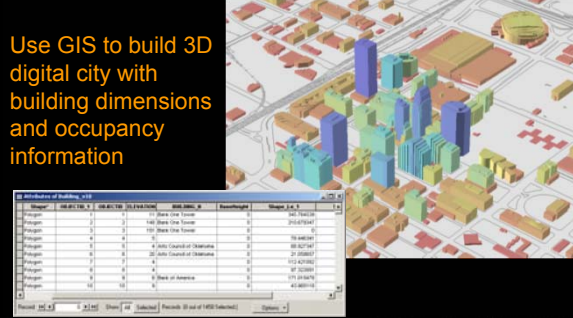
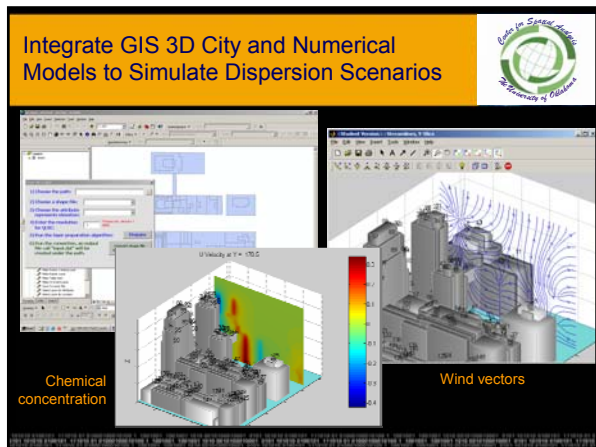





GIS geographically contextualizes LiDAR data

Center for Spatial Analysis
The University of Oklahoma

Use GIS to build 3D digital city with building dimensions and occupancy information

inr.oregonstate.edu

Institute for Natural Resources
Oregon State University



Oregon State University

www.coastalatlus.net

OREGON COASTAL ATLAS

About Tsunami Hazards

Tsunami were one of the most dangerous natural disasters that could affect the Oregon coast. Tsunami are waves that occur when the seafloor is moved by tectonic plate activity, by volcanic activity, or by landslides. The most destructive tsunamis occur in the open ocean. In a tsunami, water level can rise up to 100 feet or greater. In shallow water, tsunamis can be especially dangerous as they can travel up to 500 miles per hour and can arrive with very little warning time.

Tsunami Preparation

Coastal areas are one of the most vulnerable to tsunamis. The Oregon Department of Emergency Services (ODES) and the Oregon Department of Transportation (ODOT) have worked together to create a tsunami preparedness plan. This plan includes a variety of measures to reduce the risk of injury and property damage. The plan also includes a variety of measures to reduce the risk of injury and property damage.

Tsunami Inundation Mapping & Evacuation Planning

Beginning in 1995, tsunami inundation maps were produced for the entire coast to improve Oregon State's ability to respond to tsunamis. These maps are used to identify areas that are at risk of inundation and to develop evacuation routes. The maps are also used to identify areas that are at risk of inundation and to develop evacuation routes.

OSU

Closing Comments

- UCGIS members provide tremendous knowledge base that could be organized and used more effectively during all phases of disaster management cycle
- UCGIS members are technology strong and their work regularly bridges the federal, state, and local domains
- UCGIS members have a unique and expandable workforce that includes faculty, staff, and students