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%**

IBM

LINKSPOINT

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

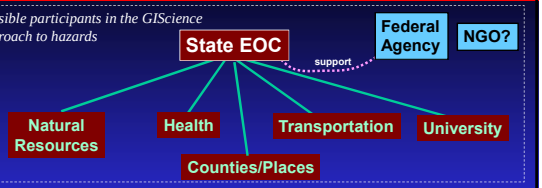
Michael E. Hodgson
University of South Carolina

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

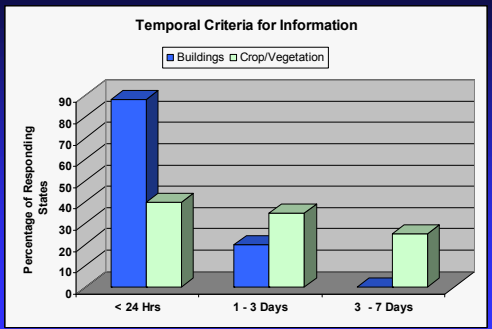


- **The State has lead responsibility in emergency response**
- **Their perception/cognition matters**

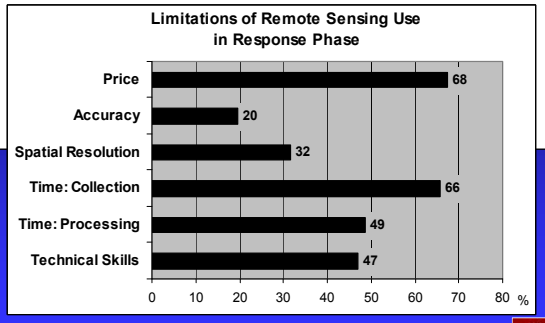
e.g. Agency 'X' claims "our imagery and products were very important in responding to the disaster"
(In reality, the state EOC and network of responders never used it)

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

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



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.*

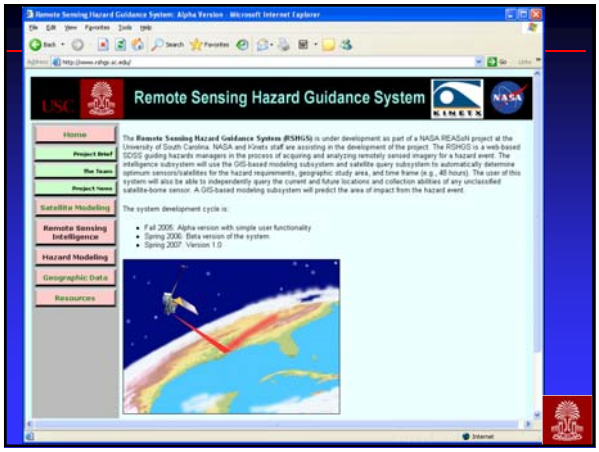


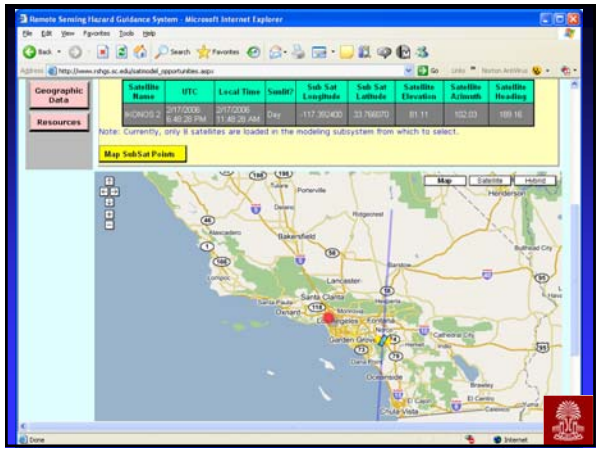
REMOTE SENSING HAZARD GUIDANCE SYSTEM (RSHGS)

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

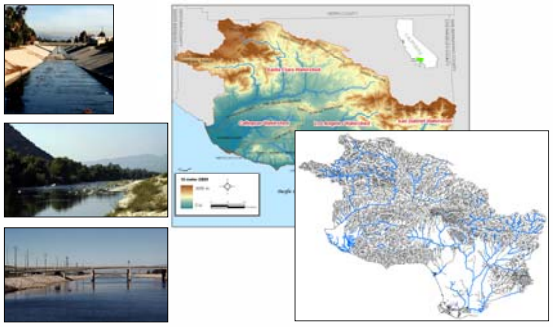
Bruce A. Davis
Shannon Ramsay
Drew Simpson
NASA/DHS

Yang Cheng
James Miller
Bobby Williams
JPL/Kinetx





National Hydrography Dataset



GIS research laboratory

John Wilson
Green Visions Plan for 21st Century Southern California

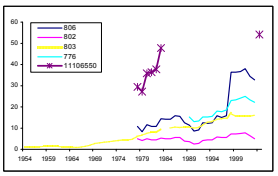
NHD Problems

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

GIS research laboratory

John Wilson
Green Visions Plan for 21st Century Southern California

Changing Vulnerability?



GIS research laboratory

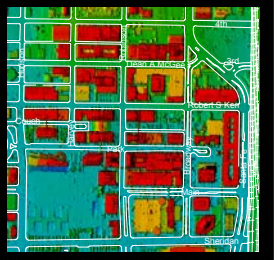
John Wilson
Green Visions Plan for 21st Century Southern California

LiDAR Data, 3D City, and Urban Dispersion

Modeling the dispersion of pollutants, chemicals, and airborne diseases

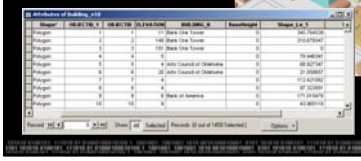
Center for Spatial Analysis
The University of Oklahoma

LiDAR Data for Building Heights -Oklahoma City

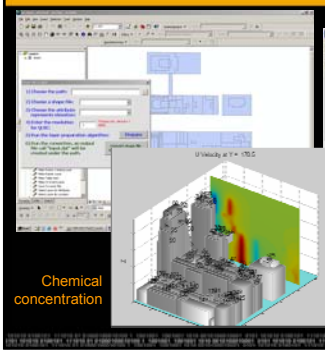


GIS geographically contextualizes LiDAR data

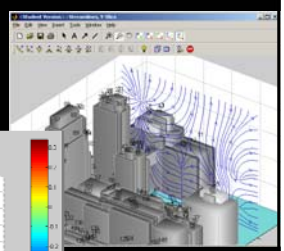
Use GIS to build 3D digital city with building dimensions and occupancy information



Integrate GIS 3D City and Numerical Models to Simulate Dispersion Scenarios



Chemical concentration



Wind vectors

inr.oregonstate.edu

Oregon State OSU

www.coastalatlas.net

Oregon State 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