Just In Time:

Managing Missing Persons Data during Hurricane Katrina

John Radke

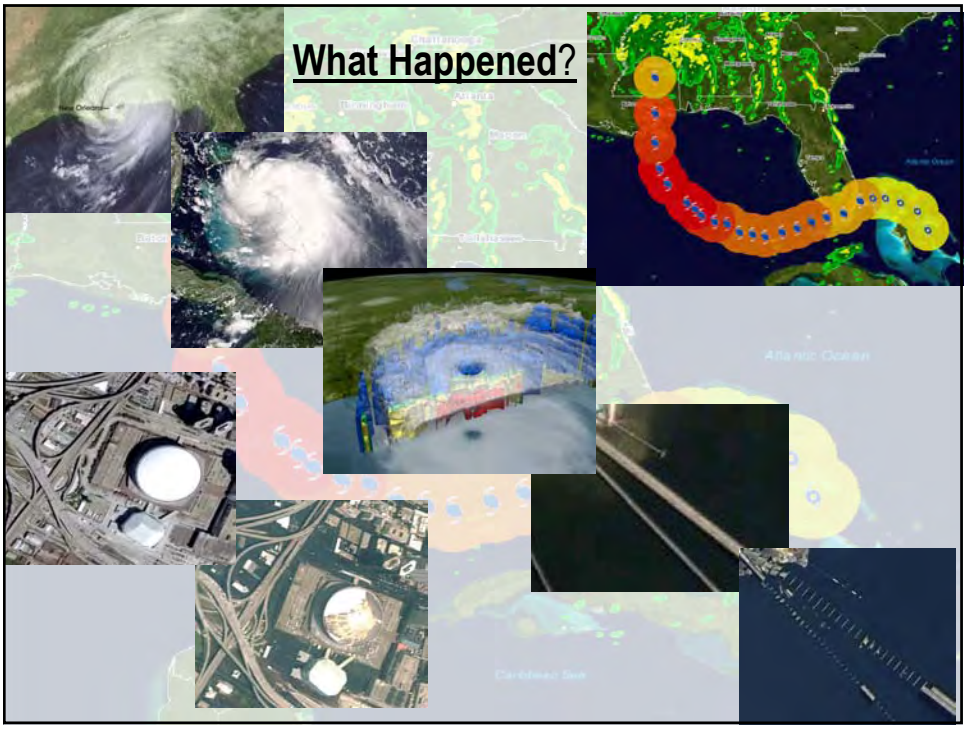
Geographic Information Science Center
University of California, Berkeley
http://www.gisc.berkeley.edu

geographic information GIS Center science

Records Administration Conference
April 18, 2006
Dana Point, CA

Presentation Content

- ❑ What happened?
- ❑ What was missing?
- ❑ A call for help.
- ❑ What we delivered.
- ❑ Why it was possible.
- ❑ Where we are headed.


What Happened?

What Was Missing?
Homes, Infrastructure, People and Information

A Call for Help…

"It was just crazy. Cell phones failed, the 911 system wasn't working, phone lines were going nuts," recalled U.S. Coast Guard Lieutenant Commander Byron Thompson, who had been trying to coordinate search and rescue operations with the Mississippi Emergency Management Agency (MEMA—the state's version of FEMA). "We were getting frantic calls: 'My aunt Matilda's on the roof and the water's rising.' Our aircraft had been flying randomly doing a lot of 'search and jerk,' just seeing someone in trouble and pulling them up."

Mississippi Emergency Management Agency (MEMA)
(the state's version of FEMA)… needed spatially related answers and their GIS staff was missing … victimized by Katrina.

- ❑ **Where are the medical supplies (drugs)?**
- ❑ **Where are the Missing Persons?**

What We Delivered…

An Interactive Web-enabled Spatially Encoded Missing Persons Data Management System

The Team:

- **Susan Radke, Berkeley GeoResearch Group (CA)**
- **Ed Hanebuth, Digital Quest Inc. (Mississippi)**
- **Vladimir Ulyshin, Intelligent Engines Inc. (CA)**
- **John Radke, GISC, University of California, Berkeley**

Digital Quest Inc.

geographic information GISCenter science

❑Where are the medical supplies (drugs)?

hrs

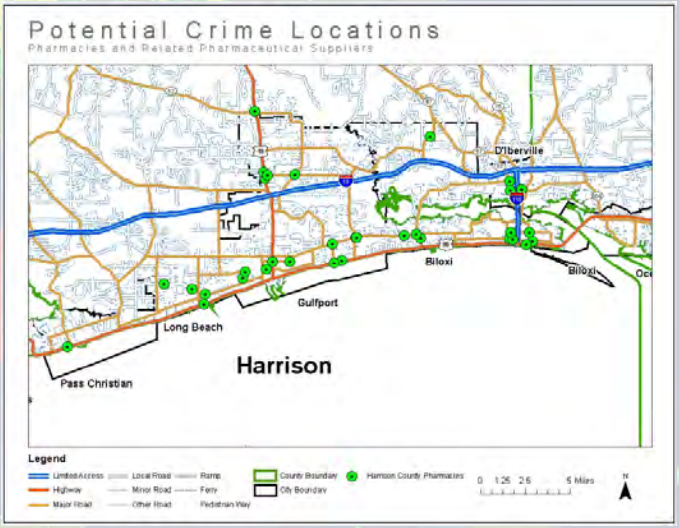
0

3

24

96

Delivered Geo-referenced longitude & latitude



From - SIC coded business data - InfoUSA.com

❑ Where are the Missing Persons?

❑We needed to log missing persons, and

❑ We needed to log persons as they arrived at shelters or other places of registration throughout the state of Mississippi

❑ Where are the Missing Persons?

Address http://www.

hrs

0

6 Proto-type online

24

96

Mississippi Emergency Management Agency

Hurricane Katrina Missing Persons Report Form

Missing Person		
First name	Initial	Last name
Age:		
Telephone Numbers		
Home phone:		
Cell phone:		
Work phone:		
Other phone:		
Address		
Street address 1:		
Street address 2:		
City:		
County:		
State and Zip code:	State:	Zip code:

Address http://www.

hrs

0

6 Proto-type online

24

96

Other Information	
E-mail address:	
Number of people in group:	
Did they plan to evacuate?	Unknown
When were they last time seen? Year: Month: Day: Hour: 12 Noon Minute: 00	
What was the evacuation plan?	
Additional info. Medical and s	

Contact Person		
First name	Initial	Last name
Telephone Numbers		
Home phone:		
Cell phone:		
Work phone:		
Other phone:		
Other Information		
E-mail address:		

Submit

hrs

0

24

36

96

Web-enabled Interactive DBMS operational and online

Address http://www.

Connect to www.gistools.org

Private Pages

User name: memamp

Password: Password Protected

Remember my password

Mississippi Emergency Management Agency

Hurricane Katrina
Missing People Database

Currently contains **10085** records. Refresh

Add new entry	Add a new entry to the database using the *Internal* form.
Add new entry (enhanced)	Add a new entry using the enhanced form, the form that "remembers" data and allows them to be reused in subsequent submissions. This is useful when entering multiple records with the same address or telephone numbers.
ID: Edit	Edit or view a record based on the record ID. Enter the ID and click on "Edit". Useful to go directly to a specified record if the record ID is known.
Last name Lookup	Show a list of entries based on search term. For example enter the last name or any part of the last name and click on "Lookup". Note the lookup is not case sensitive. For example if "son" is entered the list of matched records will contain people with last names like Jackson, Wilson, etc.
City Download	Download set of records that matches certain city. Enter the city name in the box and click on "Download". If the city box is left blank the entire database (over 10085 records) will be downloaded. The entered term is not case sensitive and it can be the full city name or any part of it.

hrs

0

24

36

96

Web-enabled Interactive DBMS Operational and online

Interactive Web Based Data Management and Reporting

Show statistics

Click on a field

Age
City
Zip code
County
State
Status
Location code
Processed
Assigned to

or

Select a field and click on "Show"

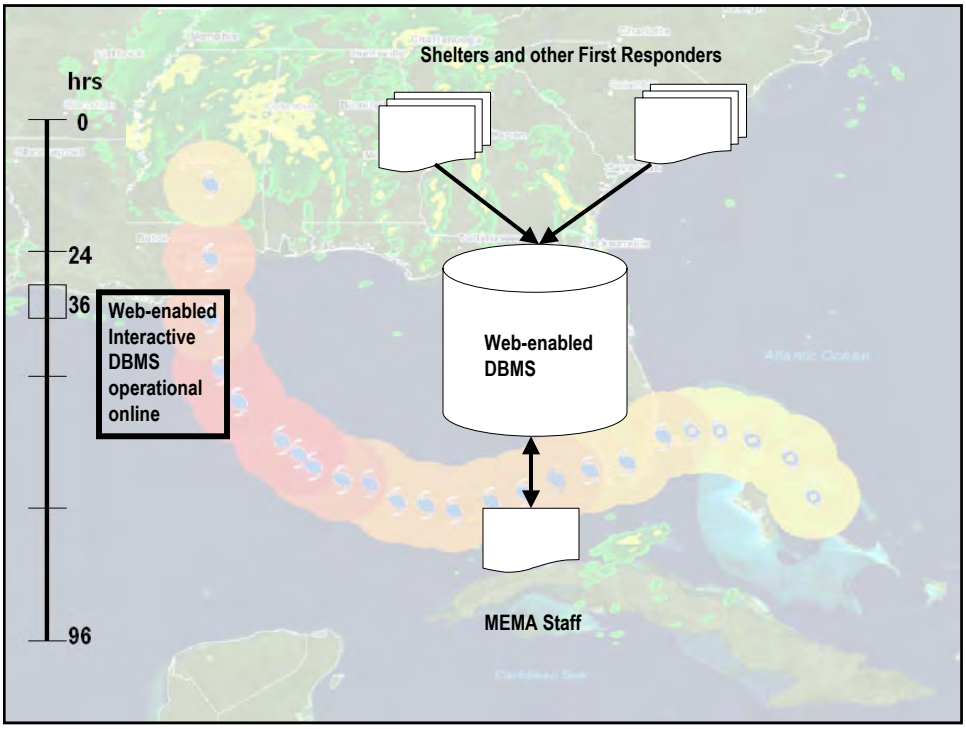
First name

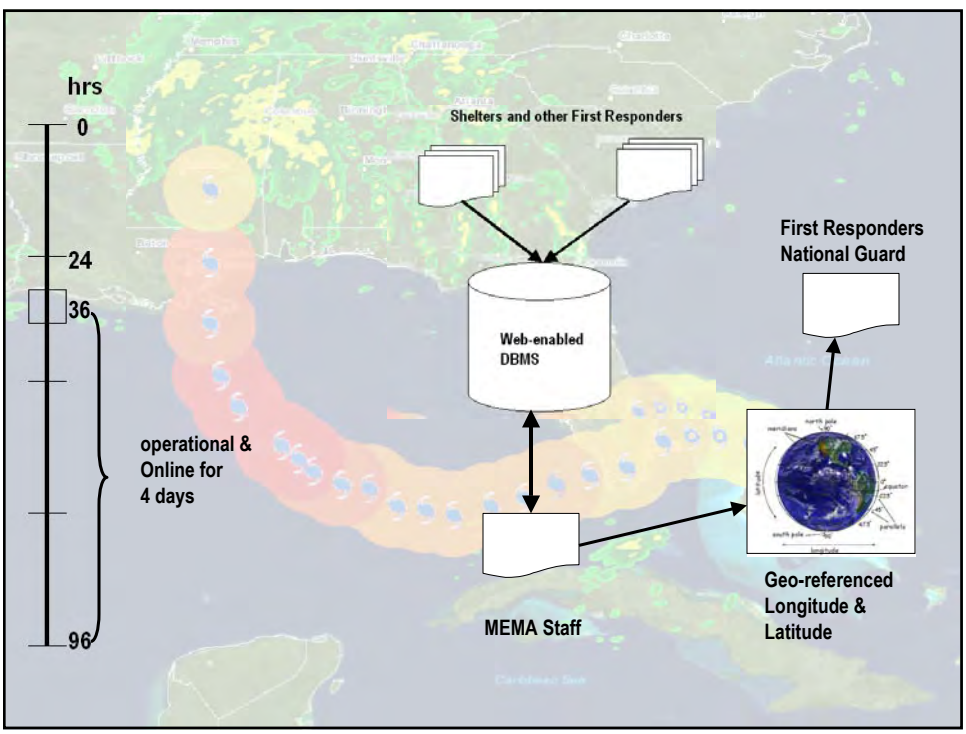
Show

Display a distribution of records based on the values in the selected field. Click on one of the fields on the left or select a field of interest in the box on the left and click on "Show". This will display a table with two columns. Numbers in the first column tell how many records have the value that is shown in the second column. For example:

Number of records	City
123	Golfport
456	Biloxi
789	Value Not Entered

In this example 123 records have Golfport entered in the "City" column, 456 records have "Biloxi" entered in the "City" column, and 789 records have no value entered in the "City" column. Click on the column header to sort by values in that column.


hrs
0
24
36
96
Web-enabled Interactive DBMS operational online
Shelters and other First Responders
Web-enabled DBMS
MEMA Staff


hrs
0
24
36
96
operational & Online for 4 days
Shelters and other First Responders
Web-enabled DBMS
MEMA Staff
First Responders National Guard
Geo-referenced Longitude & Latitude

Web-enabled Online DBMS Functions

MEMA Staff

Query by Age

Show statistics

Click on a field

Age
City
Zip code
County
State
Status
Location code
Processed
Assigned to

Distribution for field "Age".

TIP: Click on header of a column to order by values in that column.

Number of records	Age
5369	0
233	60
199	50
181	70
141	40
125	80
117	45
103	55
98	65
89	30
85	75
82	58

Web-enabled Online DBMS Functions

MEMA Staff

Query by City

Show statistics

Click on a field

Age
City
Zip code
County
State
Status
Location code
Processed
Assigned to

Distribution for field "City".

TIP: Click on header of a column to order by values in that column.

Number of records	City
1510	Gulfport
1056	Biloxi
970	Value Not Entered
596	Bay St. Louis
548	Ocean Springs
377	Picayune
291	Waveland
279	Pascagoula
266	Pass Christian
259	Long Beach
182	Gautier
173	Carriere
168	Laurel
150	Moss Point
145	Poplarville
141	New Orleans
105	Kiln
100	Wiggins
98	Saucier
97	Hattiesburg
85	BILOXI

Web-enabled Online DBMS Functions

MEMA Staff

Select an Individual Record

ID:	33
Creation date:	2005-09-01 22:35:03.352932
First name:	[redacted]
Last name:	[redacted]
Middle name:	
Age:	0
Telephone Home:	2288723045
Telephone Cell:	
Telephone Work:	
Telephone Other:	
Street address 1:	222[redacted] Rd.
Street address 2:	
City:	Biloxi
County:	
State:	MS
Zip code:	395[redacted]
E-mail address:	
People in group:	05
Did plan to evacuate (Y/N/U):	N
Evacuation plan:	
Special needs:	Reported missing while
Contact first name:	[redacted]
Contact last name:	[redacted]
Contact middle name:	

Contact middle name:	
Contact e-mail address:	
Contact telephone Home:	[redacted]
Contact telephone Cell:	[redacted]
Contact telephone Work:	
Contact telephone Other:	
Status:	
Latitude:	
Longitude:	
Contacted or not:	
Location code:	
Processed:	
Assigned to (name):	
Assigned date:	12 AM 00
Last seen date:	12 AM 00

Update | Undo Changes

Web-enabled Online DBMS Functions

MEMA Staff

Check on Status of Persons Missing

Show statistics

Click on a field

- Age
- City
- Zip code
- County
- State
- Status
- Location code
- Processed
- Assigned to

Distribution for field **"Status"**.

TIP: Click on header of a column to order by values in that column.

Number of records	Status
5831	M
391	L
383	Value Not Entered
4	U
3	FOUND (deceased)
0	Value Not Entered
6612	*Total number of records *)*

*) For internal fields the total number does not include records entered with the "public" form.

Web-enabled Online DBMS Functions

MEMA Staff

Select Individual Field in the Data Base

Select a field
and click on "Show"
Did plan to evacuate (Y/N/U)

Show

Telephone Work
Telephone Other
Street address 1
Street address 2
City
County
State
Zip code
E-mail address
People in group
Did plan to evacuate (Y/N/U)
Evacuation plan
Special needs
Contact first name
Contact last name
Contact middle name
Contact e-mail address
Contact telephone Home
Contact telephone Cell
Contact telephone Work
Contact telephone Other
Status
Lattitude
Longitude
Contacted or not
Location code
Processed
Assigned to (name)
Assigned date
Last seen date

Distribution for field "Did plan to evacuate (Y/N/U)".

TIP: Click on header of a column to order by values in that column.

Number of records	Did plan to evacuate (Y/N/U)
5742	U
3375	N
941	Y
7	Value Not Entered
6	y
6	No
6	n
1	unknown
1	yes
10085	*Total number of records *)*

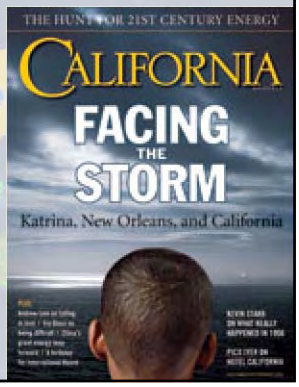
*) For internal fields the total number does not include records entered with the "public" form.

Our Exit Strategy – A Big Data Dump

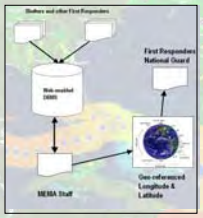
hrs
0
3
24
96

- ❑ Bureaucracy arrives on the 4th day
- ❑ Our Time to Exit

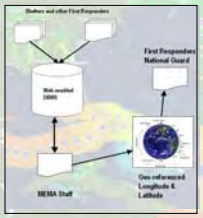
❑… they at least wrote about our effort…



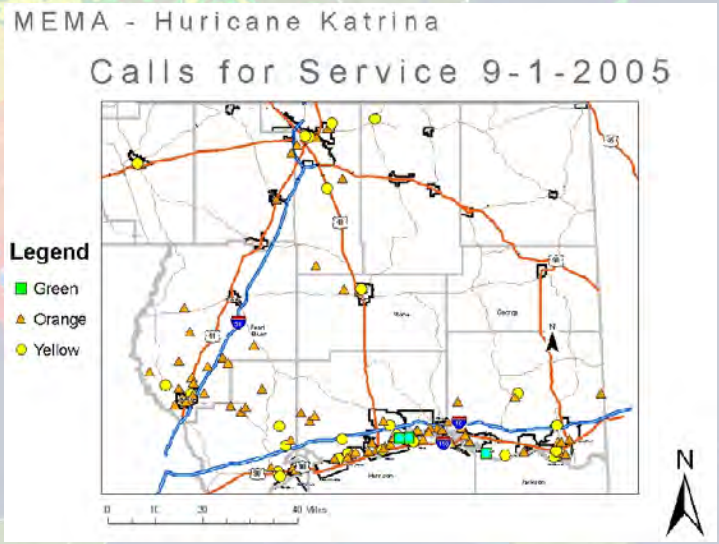
Handing off to the Red Cross

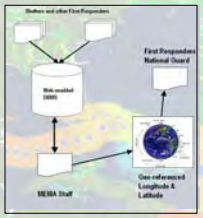


The Results at the End of the Day

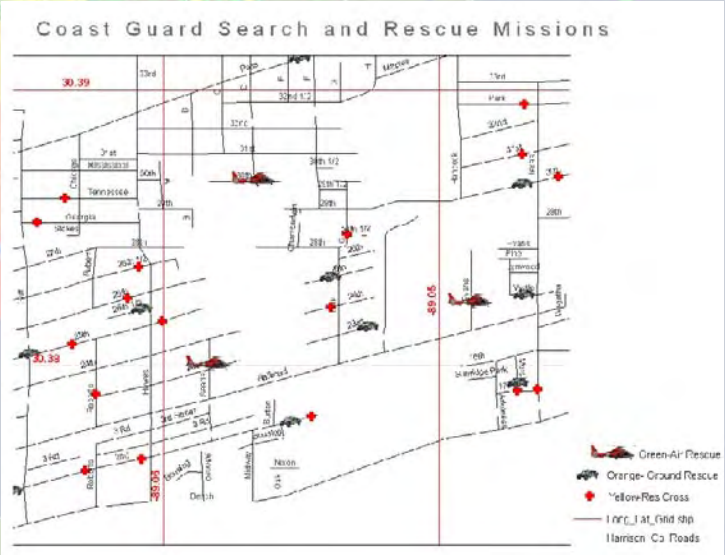


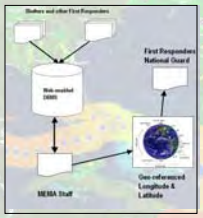
The Results at the End of the Day



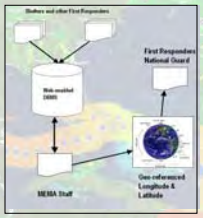


The Results at the End of the Day

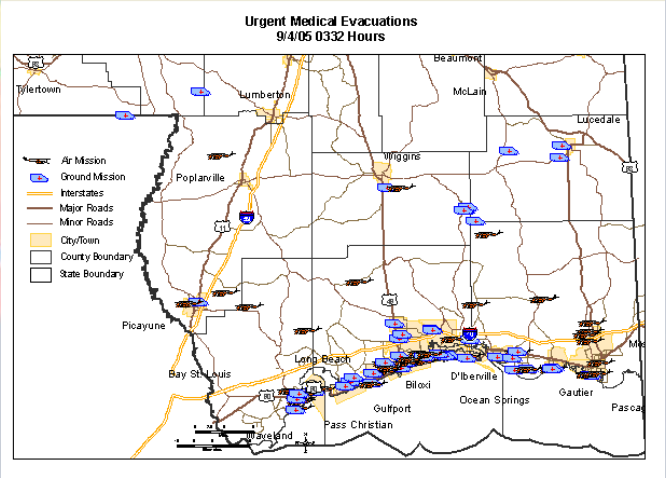




The Results at the End of the Day



The Results at the End of the Day

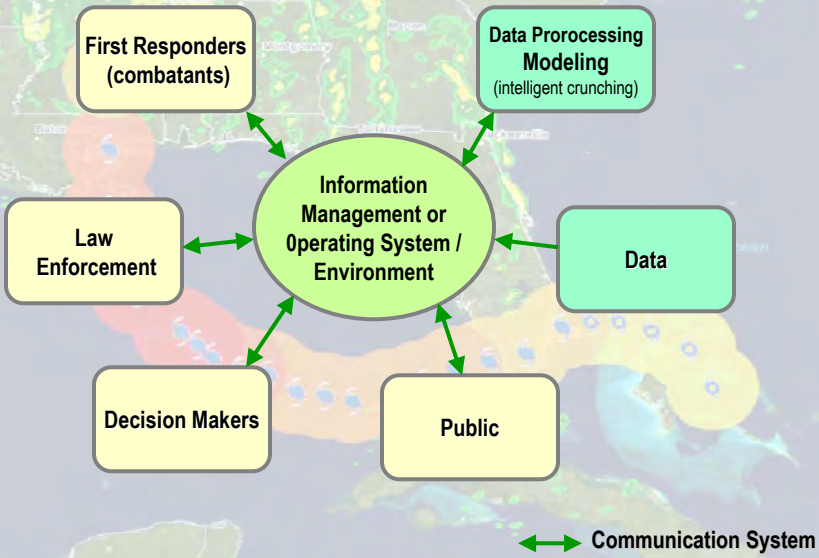


Why It Was Possible … (in 6-36 hours)

No one could do this as fast ….
….we had a Research Tool Bench already in place

- ❑ Berkeley's free version of the UNIX operating system,
- ❑ Berkeley's Postgres database management system,
- ❑ a public domain Apache Web server,
- ❑ a web based data mining operating system environment (an *Information schema*), and
- ❑ common GIS tools by ESRI.

General Information schema



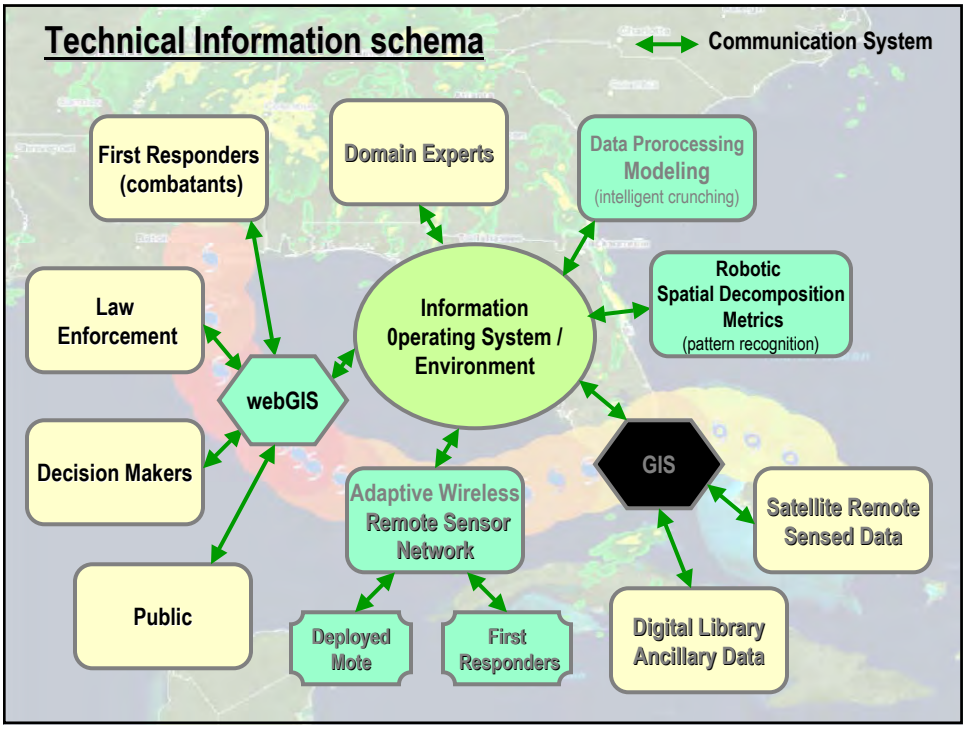
Where We Are Headed…

We Came with…

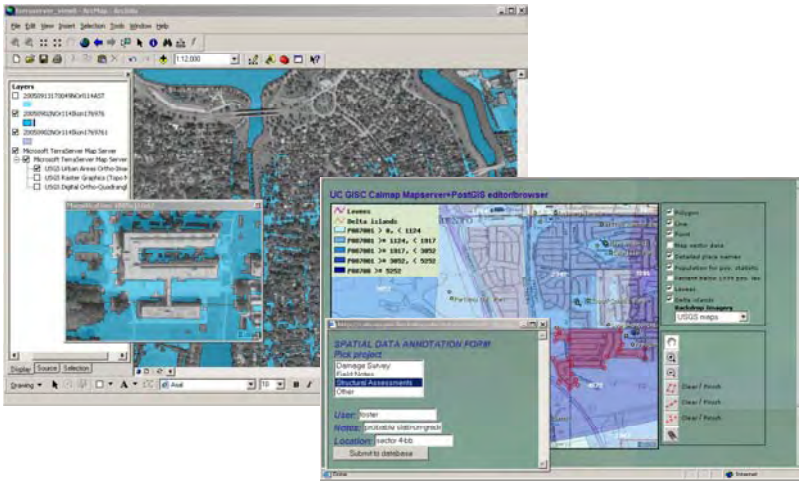
- First web based **GIS: Grasslinks** (by Sue Huse, James Ganong and Kenn Gardels, UC Berkeley, 1995)
- **Postgres:** Sequoia 2000 (by Stonebreaker etal)
- The Digital Library Project (by Wilinski etal)
- Various web related technologies…1995-2005.

Invention…The eLibrary!

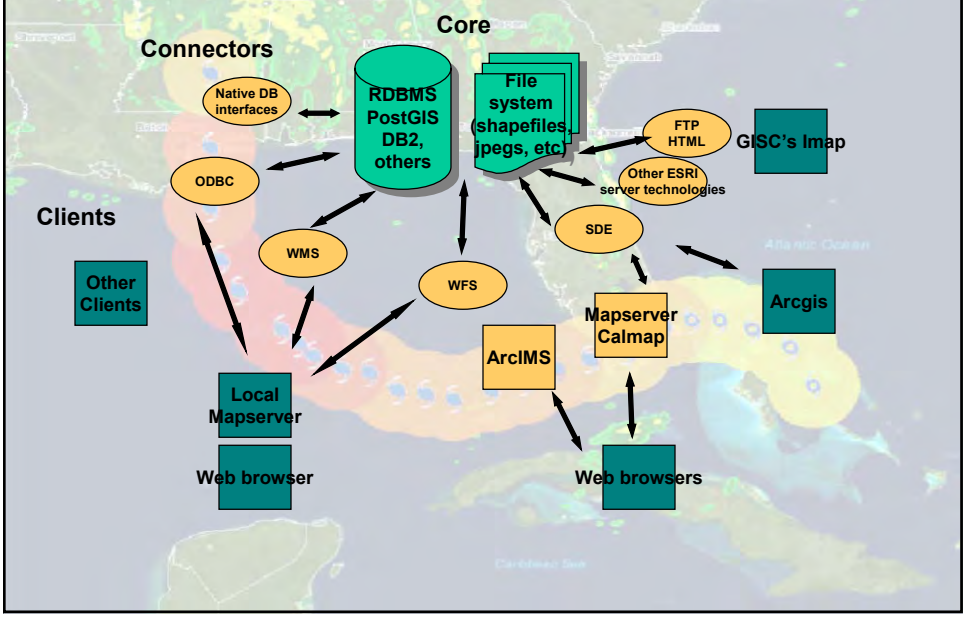
- **Calmap:** Server centric (by Howard Foster, Eric Zhang, John Radke)
- **Imap:** Client centric (by John Radke, Jianchun Xu, Alexandre Repetti)
- Information 0perating System / Environment (IE-malta)
- Spatial Mining Metrics (John Radke, Jianchun Xu, Patricia Frontiera)



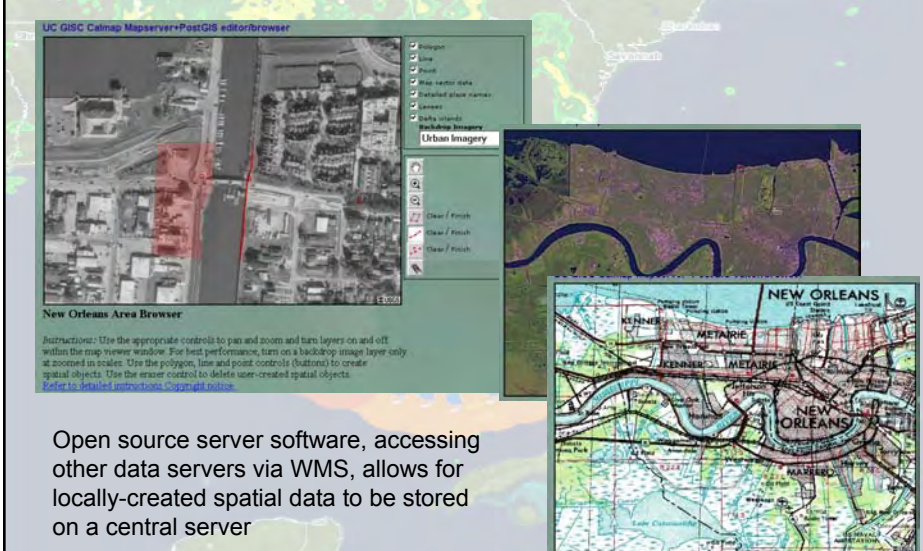
Digital library services: real-time access to library data



eLibrary Architecture



Calmap: Mapserver+ HTML client



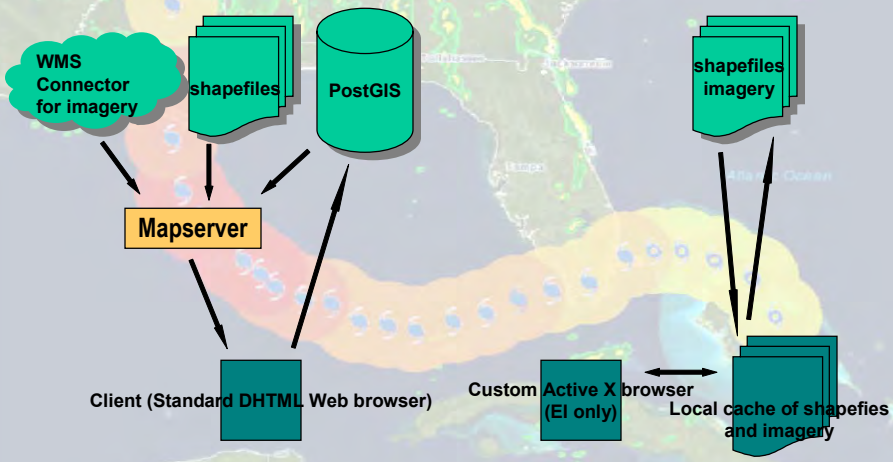
Open source server software, accessing other data servers via WMS, allows for locally-created spatial data to be stored on a central server

Calmap

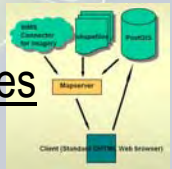
Server centric:
Server renders all images for client display; client captures user-defined spatial objects and uploads to PostGIS

Imap

Client centric:
Data is downloaded to client at startup; data is edited offline, then uploaded



Calmap: advantages and disadvantages



The good:

Trivial to set up and no local data required; all data can be accessed from remotes servers (Microsoft's Terraserver, USGS). Some of these are high-quality (e.g., .5 meter color urban imagery).

Supports many users, annotations instantly available to all users.

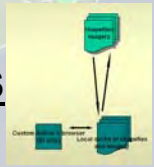
Good DBMS tools to manage users, projects.

The bad:

Possible poor performance as performance depends upon connectivity and remote server availability.

Editing model may be too simple (I.e., create-and-destroy model may be inadequate).

Imap: advantages and disadvantages



The good:

Performs well, as all processing is local and only depends upon Web connectivity at the beginning and end of an editing session.

Supports full line of editing functions (e.g., you can change polygon outlines, move verticies, etc).

The bad:

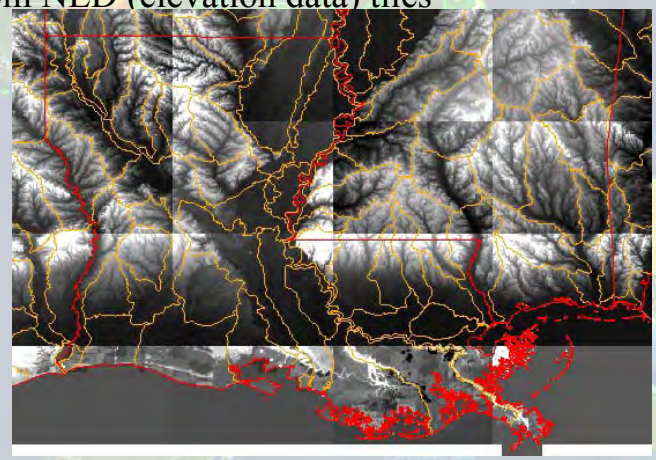
More difficult to administer. Administrator must anticipate data needs and install all needed data at a central site.

User may need a large amount of local storage capacity as the user must download all needed data before going off-line.

Edits by others only available when reconnecting to the Web.

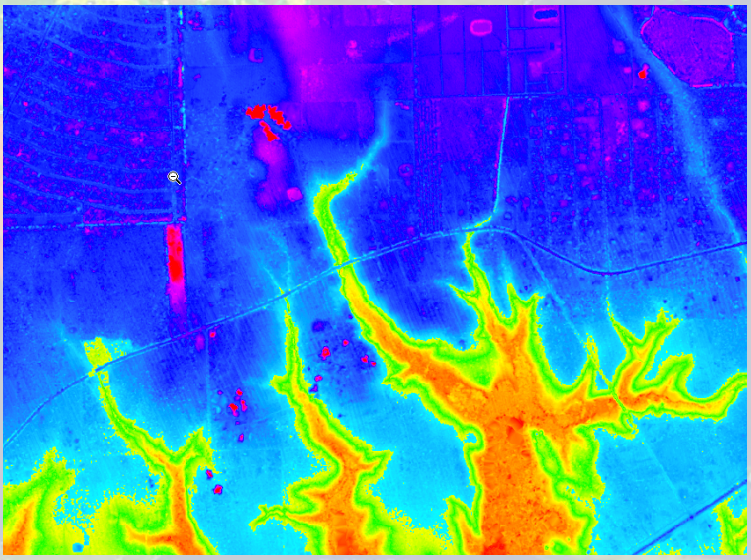
New Orleans data samples from our proto-type eLibrary

30m NED (elevation data) tiles



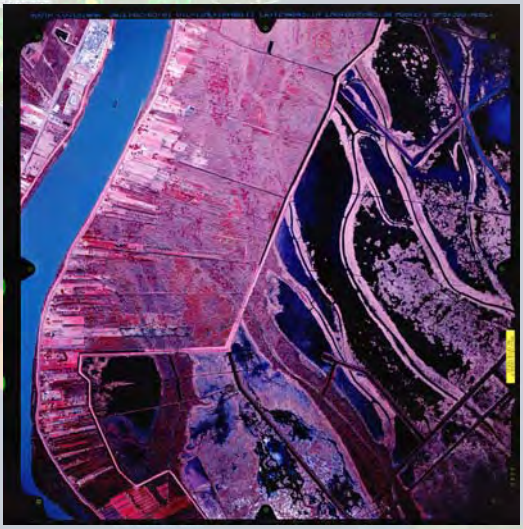
More data…

LIDAR



More data…

LSU accessed
aerial photography



More data…

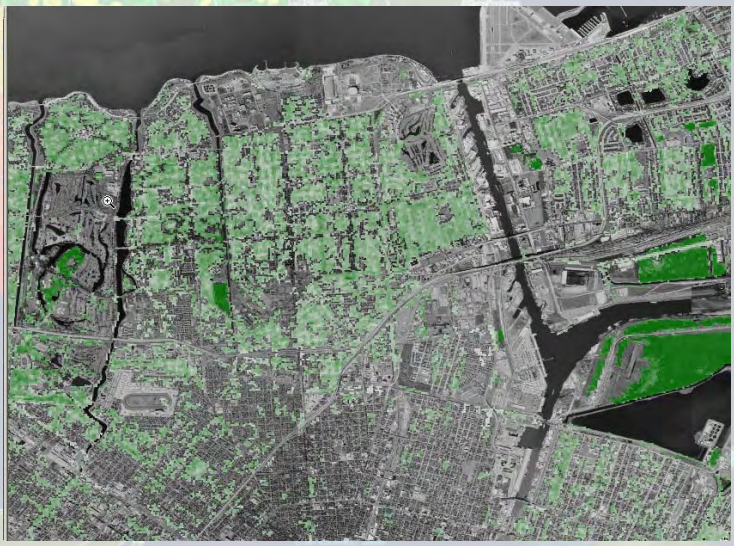
Waterbodies

More data…

Inundation areas

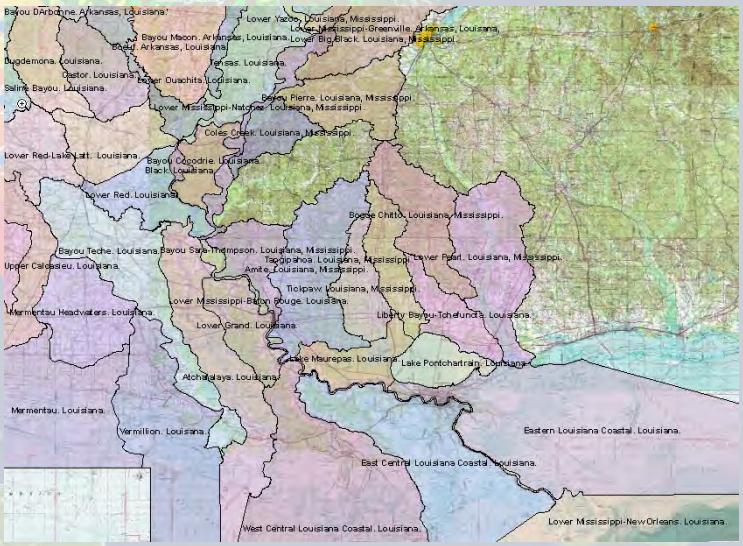
More data…

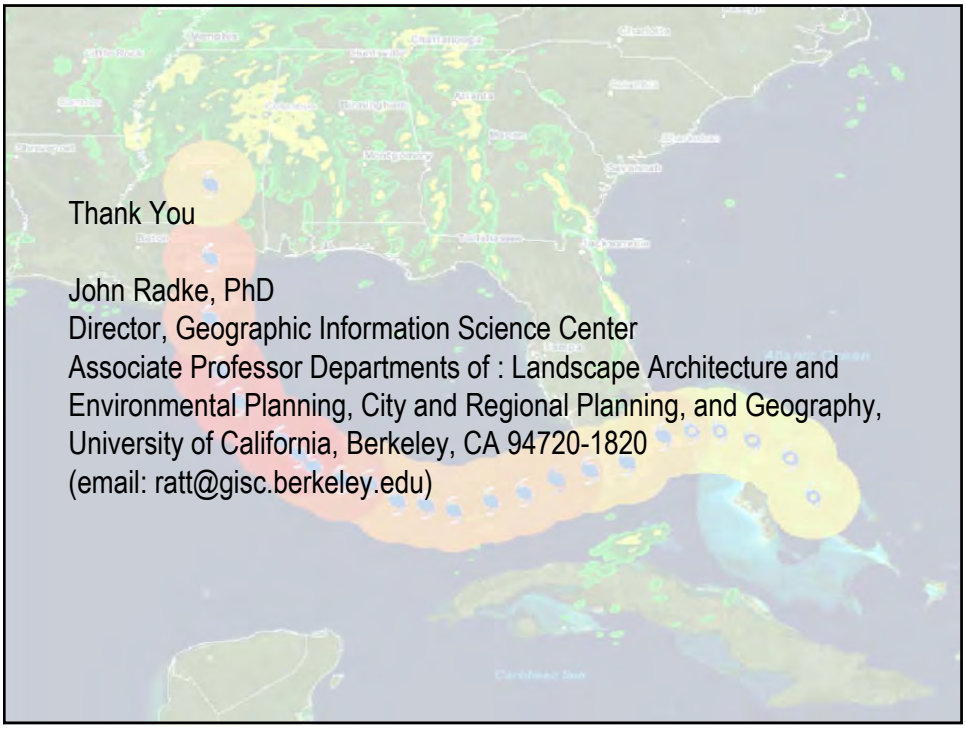
% impervious surface



More data…

Watershed areas





Thank You

John Radke, PhD
Director, Geographic Information Science Center
Associate Professor Departments of : Landscape Architecture and Environmental Planning, City and Regional Planning, and Geography,
University of California, Berkeley, CA 94720-1820
(email: ratt@gisc.berkeley.edu)