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Louisiana Hazard Information Portal (LaHIP)

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Community Education and Outreach Project: Louisiana's Hazard Risk Portal

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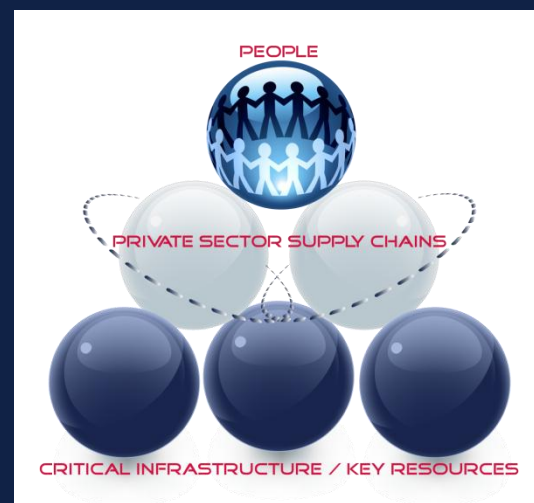
Disaster Resistant University Workshop

University of New Orleans, February 16-18, 2011

4/4/2011

The mission of the Institute is to enhance national resiliency to a full range of potential disasters by conducting research leading to innovative tools and applications that empower the homeland security and emergency management community through education, training, outreach and operational support.

The Institute seeks to improve the nation's **resiliency** by enhancing our understanding of the interconnections between critical infrastructures that support our private sector supply chains, our communities, and our way of life.



What do we do?

- Research
 - *Public Private Partnerships: Best Practices*
 - *Critical Infrastructure and Key Resource (CIKR) Analysis*
 - *Disaster Supply Chain Interdependencies*
- Development
 - *Cyberinfrastructure: Modeling , Simulation and Analysis*
 - *Decision Support Tools and Applications*
- Outreach & Operational Support
 - *Education and Training*
 - *Louisiana Business EOC*



- **CEO Effort at NIMSAT Institute, UL Lafayette**
 - Provide tools for effectively communicating hazards to Louisiana businesses and citizens
 - Provide an improved system of hazards data collection and management
 - Provide training to parish OEP's and regional OEP's
- **3 Elements of the Project:**
 - Provide a Risk assessment methodology
 - Provide a Web based Risk Communication Portal
 - Provide a Data Management Architecture for Hazard Data Collection and Management

Risk Assessment

$$\text{Risk} = \text{Threat} \times \text{Vulnerability} \times \text{Consequence}$$

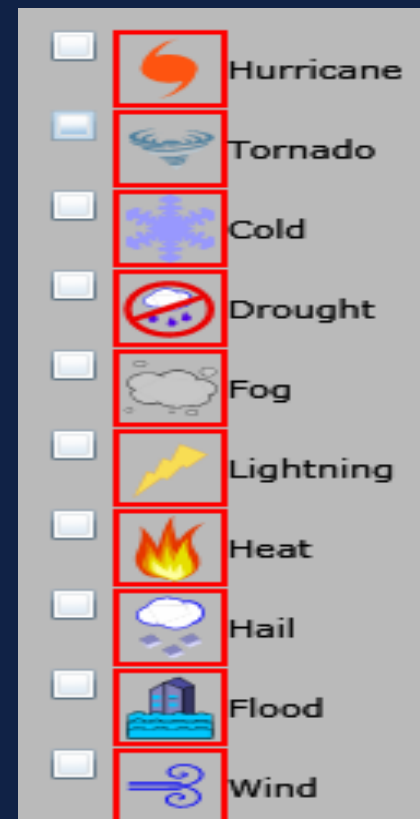
Risk Assessment

- **Hazard (Threat)**
 - Likelihood of an event happening to a particular geographical area
 - Occurrence based on
 - Historical Hazards
 - Physical Environmental conditions
- **Vulnerability**
 - Potential degree of loss
 - Types
 - Biophysical
 - Social
- **Consequence**
 - Magnitude of damage
 - Deaths, Injuries, Property/Crop Damages



Data Used for Risk

- **Attributes for Threat**
 - What occurred (type) (Sheldus)
 - Where it occurred (Parish) (Sheldus)
- **Attributes for Vulnerability**
 - SOVI – 42 Variable calculation
- **Attributes for Consequence**
 - Property Damages (Sheldus)
 - Crop Damages (Sheldus)
 - Fatalities (Sheldus)
 - Injuries (Sheldus)



- Sheldus (1996-2008)
- NCDC (1950-2009)
- SOVI (2000)
- Others
 - USGS (Earthquakes, landslides)
 - Flood Plain Data (16 parishes)
 - Wild Fires

Comprehensive Risk

- Multiple Hazards
- Arrive at a simple number
 - 0 to 1

$$Risk(k) = \left(\sum_{i=1}^k H_i * \left(\frac{\sum_{j=1}^n V_j * C_j}{n} \right) \right)$$

H_i is the probability of a particular hazard occurring to a particular geographical area.

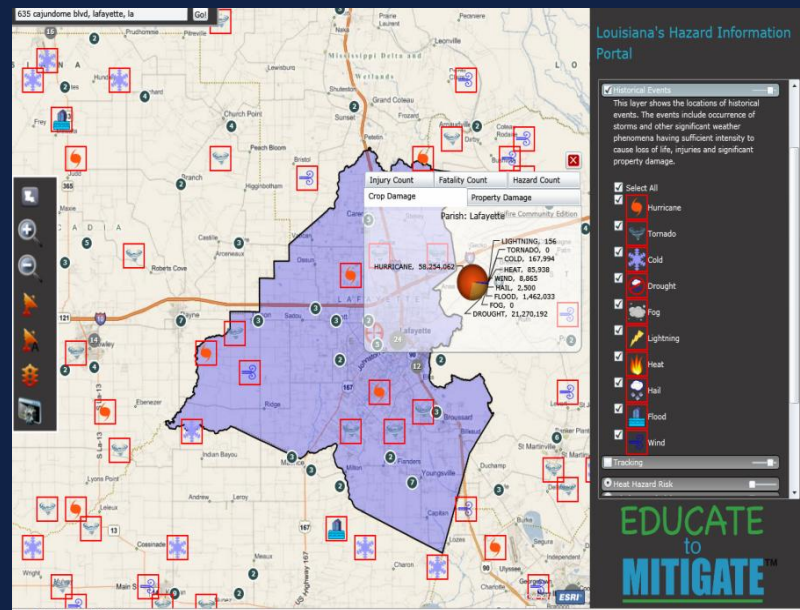
V_j is the degree of vulnerability for a particular factor j for a particular hazard i.

C_j is the consequence factor j for a particular hazard i

Communication of Risk

Risk: Community Education and Outreach (CEO) Portal

- Goal: Provide Risk-based research and tools for Emergency Managers
- Funding from FEMA/GOHSEP
- Provide better access to hazard and risk information
 - Database of historical hazards
 - Risk = (T,V,C)
- Interactive map based portal
 - Easy to use
- Intuitive tools
 - Maps, legends, map navigation tools,
 - Address locator
 - Help page



Requirements


- Secure access to certain information for government stakeholders
 - Viewing / updating data
 - Download data
- Users and roles
 - General public and businesses
 - Secure access to parish OEP
 - and government stakeholders

NCDC Data

Event:

Begin Date:

End Date:



Begin Location End Location

ID	Parish Name	Event Name	City	EDIT
25	Acadia	Flood	Branch	Edit Delete
59	Acadia	Flood	Egan	Update Cancel

Event Information

ID: 59

Event:

Parish:

City:

Begin Date:

End Date:

Begin Location:

End Location:

Begin Latitude:

Begin Longitude:

Event Information

End Latitude:

End Longitude:

Length (in miles):

Width (in yds):

Magnitude of Tornado:

Magnitude of Wind:

Fatalities:

Injuries:

Property Damage:

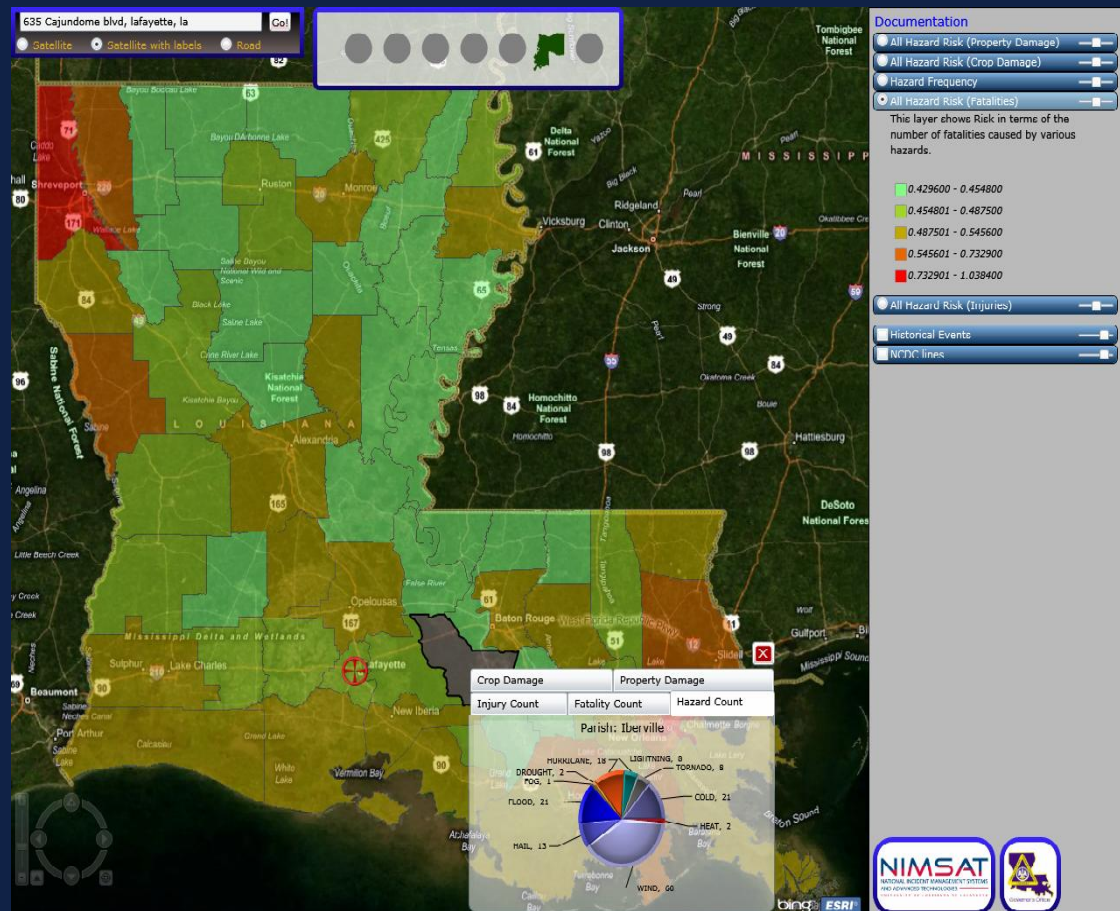
Crop Damage:

Magnitude of Rain (in inches):

72	Acadia	Flood	Crowley	Edit Delete
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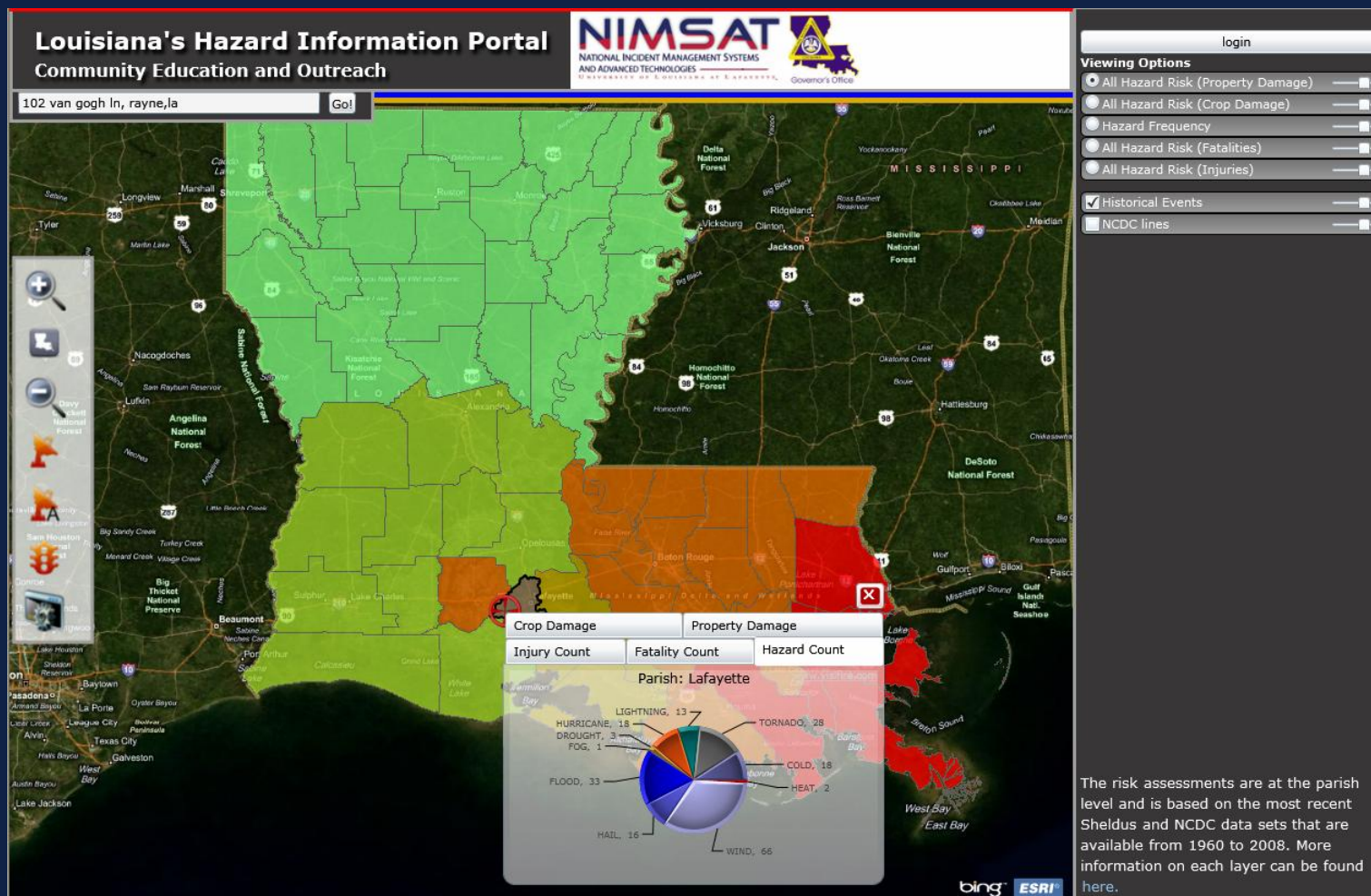
Portal Requirements: Functional

- Map based tools
 - Map selector (select maps and sub maps)
 - View Hazard information
 - Address locator
 - Navigation
 - Map opacity
 - Cluster hazard information summary
- Parish hazard profile summary



Requirements: Non-Functional

- Supported by
 - Windows and Mac
- Browsers
 - Internet explorer 7.0 and above
 - Firefox Mozilla 3.6 and above
 - Require Silverlight installation
- Response time
 - < 5s ?
 - Will depend on data



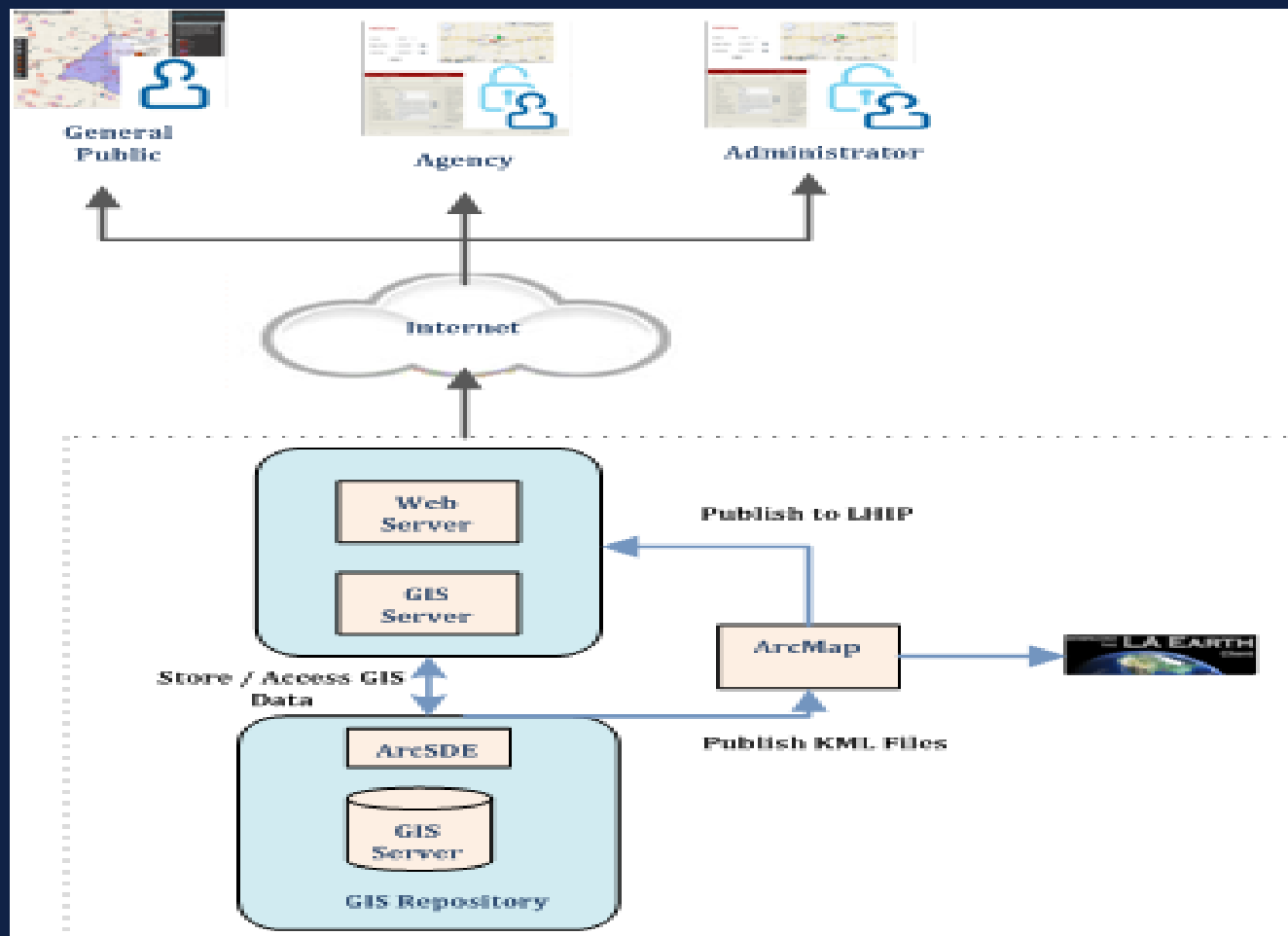
Data Management

- **Data Management Architecture (DMA)**
 - Provide a central online repository for accessing GIS data
 - Complements the CEO Portal in maintaining an updated data on the portal
 - Helps the state's HMP in collecting a major portion of the data
 - Provide hazard and risk related information to general public, business and parish OEP's
 - Intuitive map based tools to understand risk from various hazards
 - Constantly update and provide the most recently available hazard information on the portal

Requirements/Purpose of the DMA

- Provide an online repository for hazard data
 - Several data sets
 - Different data sources
 - Updated at different times
- Provide an easy to use, secure web-based tool to
 - Upload new data, upload existing data
 - Enter information associated with the data
 - Download maps/data
- Minimize overhead for GIS Administrator
 - Add/Delete/Edit users
 - View the online repository of GIS data
 - Download data entered by multiple users

High Level Architecture



Options for Agency User

- Secure Access
 - User Name, Password
- Edit profile
 - Name, contact #, parish, agency, etc
- Upload maps
 - Options to select the map that is being uploaded
 - Upload map data in excel sheet (predefined template)
 - Provide basic info about the data in a form
 - Save for further processing by administrator
 - Do we need non-GIS data ?
- Download Data
- Add hazard information
 - Google map based entry for new hazards
 - Save for further processing by administrator

4/4/2011

Options for Administrator

- Secure Access
 - User Name, Password
- User administration
 - Add/Edit/Delete users
- View Repository
 - View all data uploaded by various users
- Download data from repository
 - Select data category and type
 - Download as an excel file
- Validate Data provided by Agencies
 - Validate user added hazard events and maps
 - Available to other users after validation

Thank you