DISASTER PREPAREDNESS AND EMERGENCY RESPONSE

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GIMS
What is a GIS

• Collection of computer hardware, software, geographic data and personnel...

• ...designed to efficiently capture, store, update, manipulate, analyse and display...

• ...all forms of geographic/spatial data
Building geographic knowledge

- Schools
- Electricity
- Shops
- RDP - Housing
- Disasters
- Water
- Health
GIS for Emergency Management

- The emphasis for emergency management must be prevention and loss reduction

- Thorough analysis and planning is required to effectively deploy scarce resources

- GIS technology is a powerful tool for:
  - assessing potential emergencies
  - where they are likely to occur
  - their potential impacts, damage and losses
  - identifying critical infrastructure and populations at risk that require priority mitigation actions
GIS for Emergency Management

- **GIS is essential for creating situational awareness for daily operations**
  - incident locations
  - tracking
  - sensors
  - video
  - traffic
  - hospital status
  - weather
  - other dynamic data integrated with GIS data (imagery, elevations, streets, critical infrastructure, etc.)

- **Communications is an essential infrastructure required to effectively coordinate and manage the emergency response**
Many Types of Threats

Natural Hazards
- Earthquakes
- Tsunamis
- Hurricanes
- Landslides
- Floods
- Wildfires
- Tornadoes
- Blizzards
Other Threats

Manmade Disasters
- Hazardous material
- Fires
- Nuclear
- Sabotage
- Infrastructure failures
- Civil unrest
GIS Solutions for Telecommunications

Work Flow

GIS for Disaster Management

- Risk Assessment & Planning
- Mitigation
- Preparedness
- Response
- Recovery
- Applications
- Geographic Inventory
- GIS
Risk Assessment and Planning

• What is there to burn?

• Identify **assets** that is most in danger from a disaster
  – physical
  – human
  – other

• Only when you know what you value the **MOST**, you can begin to plan for ways to **protect** it

• Assessment of the **hazard**
  – involves calculations of risks and probability, the question can become more complex i.e. **what kinds of fires are burning?**
Mitigation

• Precision is key to REDUCING or ELIMINATING the hazards identified in previous stage

• Getting people to do things they’ve never done before, or to change the way they are doing things

• Government action is needed to promote mitigation
  – zoning changes
  – code enforcement
  – inspections etc., precision will be required to draft appropriate rules or regulations

• MOST effective when they have support from the greatest number of people
Mitigation

- GIS and spatial analysis helps satisfy both these criteria
  - precision
  - community understanding, by mapping *where* hazards exist; communicating *what* needs to be done to the broadest array of people

- What can we keep from burning?
Preparedness

• Short-term tasks to be done to prepare for an imminent (terrorist attacks and earthquakes) disaster

• ALL pre-disaster stages/activities must be treated as part of a dynamic process
  – develop plans (contingency), must be updated
  – exercises must be conducted to test plans and response capabilities

• One of the MOST important preparedness activities is the mapping and spatial analysis needs of those
  – who are responding to a disaster
  – who are assisting the response
  – who are affected in some way by it, i.e. EVERYONE
Response

• AFTER the first shock of a catastrophic event the focus of everyone will be on one thing…

• …understanding ALL that has happened

• Visualisation and data consolidation capabilities allow GIS to
  – convey large amounts of information
  – to large number of people
  – in a short period of time, exactly WHAT is needed in the immediate aftermath of disaster
Recovery

• The questions asked
  – what has happened?
  – how can I help?
  – where is the help needed?

• GIS can help map patterns of destruction, letting those bringing aid to the task of rebuilding
  – red cross
  – insurance carrier, target their reconstruction efforts with precision
Applications
THIS “STUFF” – SAVES LIVES
QUESTIONS