

GIS in Utilities & Critical Infrastructure Protection

Map Middle East 2007

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- Electricity, water, oil and gas, telecommunications and transportation are vital elements of our lifeline – need to protect critical infrastructure
- Highly distributed infrastructure, hence even more vulnerable; disruption of normal day-to-day life; consequent civil and economic impact
- While perennially at risk from natural and man-made hazards, emphasis has shifted to security related risks in recent years



- **CIP** involves **risk assessment, readiness, response** and **recovery (4 R's)**:

Identify potential hazards; model risk events; assess consequences for the network

Dispatch/track emergency services; reduce secondary damage; safety management

Identify critical asset locations; emergency management plans

Assess extent of disruption; prioritize restoration of affected networks

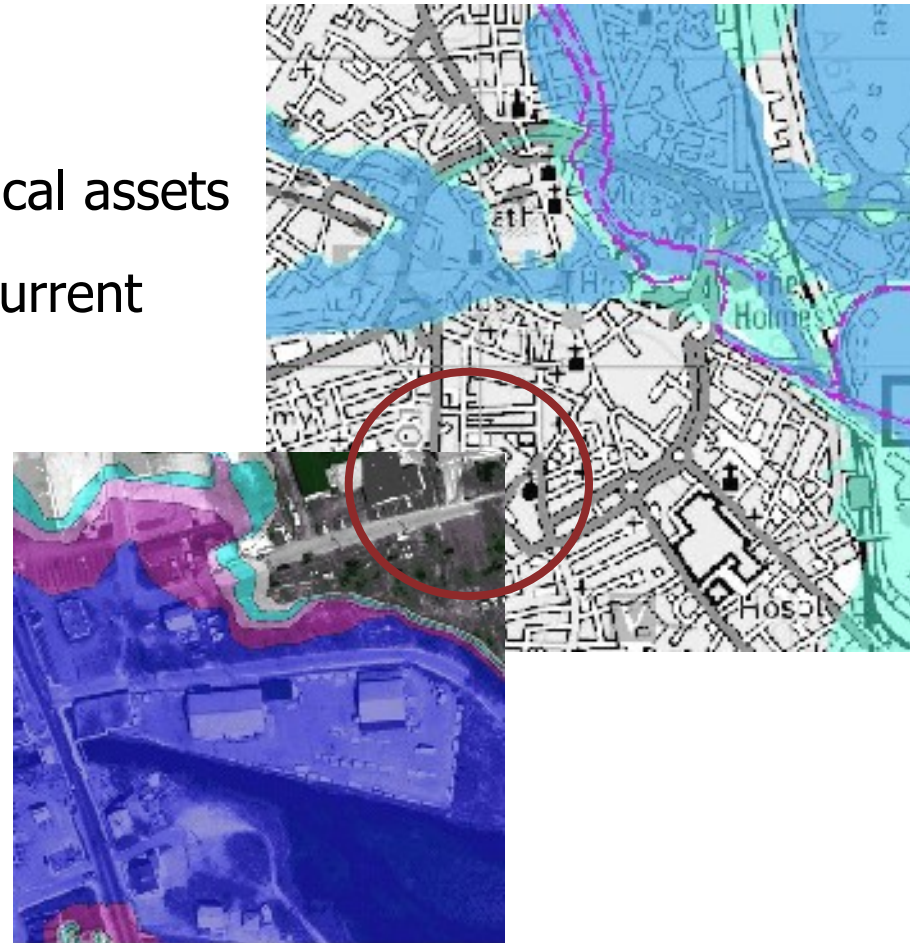
Risk Assessment, example:

- Identify areas at flood, lightning risk
- Model potential damage to the network
- How many customers will be affected, how should recovery be prioritized?



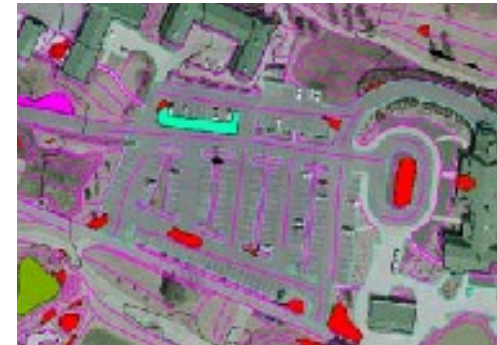
Reduction, example:

- Which areas are at lower risk?
- Identify safer locations for critical assets in future expansion; relocate current assets from high-risk areas



Readiness, example:

- Determine best locations for personnel and equipment to expedite repair
- Contingency planning to reduce secondary damage



Response & Recovery, example:

- Which parts of the network have failed?
- Dispatch field crews, prioritize restoration
- Mobile GIS applications and data
- Common operational picture



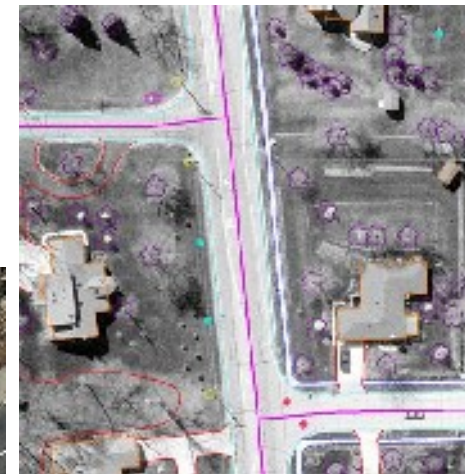
Remote Sensing Data

- Satellite / Aerial imagery – Very Crucial
- Is low cost, covers a large geography
- Identifies critical infrastructure
- Provides base data for risk simulation models
- Supports change detection



Issues that impact CIP

- **Cost** of data collection, maintenance
- Effective **data sharing** between agencies
- **Privacy and security concerns**
- Availability of the right tools, technology
- Staff expertise
- Financial resources



Technology, Data, Services

- Innovate, help reduce cost of data:
acquisition, maintenance, integration
- Provide the right tools, expertise, training
- Enable access, exchange, maintenance of
critical geospatial information
- Work more closely with utilities, government
agencies on CIP initiatives

- Threats to critical infrastructure a question of “when”, not “if”
- Essential to get the right information to the right people: **GIS plays a vital role**
- Need to find balance between data needed for CIP and security/privacy concerns
- Foster more partnerships between utilities, government, geospatial industry, public



THANK YOU