An Overview: GITA's Geospatially Enabling Community Collaboration (GECCo)

Background

Maryland Digital Cultural Heritage Project
http://www.mdch.org/fire/#

In those days, the thread on fire hydrants and fire hoses was not standardized; each county and city had its own kind of thread. When the first out-of-town firefighters rushed from Washington to help, they could do little. Because they could not use their fire hoses, the firefighters could only marginally increase the amount of water thrown on the fire. As a result, the fire took longer to put out than it would have otherwise.

When Baltimore burned in 1904, fire departments figured they had to standardize

331 Years of Experience in the US

- Emergency services are standards based organizations
  - Standard of care
  - Interoperability/interchangeability
  - Organizational consistency (NIMS/ICS)
  - Scalability
  - Continuity of operations/common operating picture
- When the incident occurs IS NOT the time for innovation

George Washington was a volunteer firefighter with Friendship Veterans Fire Co.

Take-away: When the crisis occurs is not the time to invent, improvise, or discover a lack of interoperability

- Understand basic needs and potential implementations before inserting solutions
- Solutions must be vetted, tested, and trained upon
- Train together!

Would you want my fire department's first use of a new set of Jaws-of-Life rescue tools to occur when you are trapped in your vehicle after a wreck? The analogy applies to any geospatial product you might insert during a crisis.

GECCo Overview

- In 2002 GITA created the GECCo Program to respond to Presidential Directive 7, "*…reduce and/or eliminate the vulnerability of the infrastructures of society's complex technology systems that increase the difficulty for attacks on US systems*

GECCo Overview

- Japan's ROADIC Program
- 85% of critical infrastructure privately owned and operated
- User driven, bottom-up versus top down
- Supports/enables ongoing F-S-L emergency management and infrastructure protection
- Ongoing coordination with the Department of Homeland Security and the Federal Geographic Data Committee

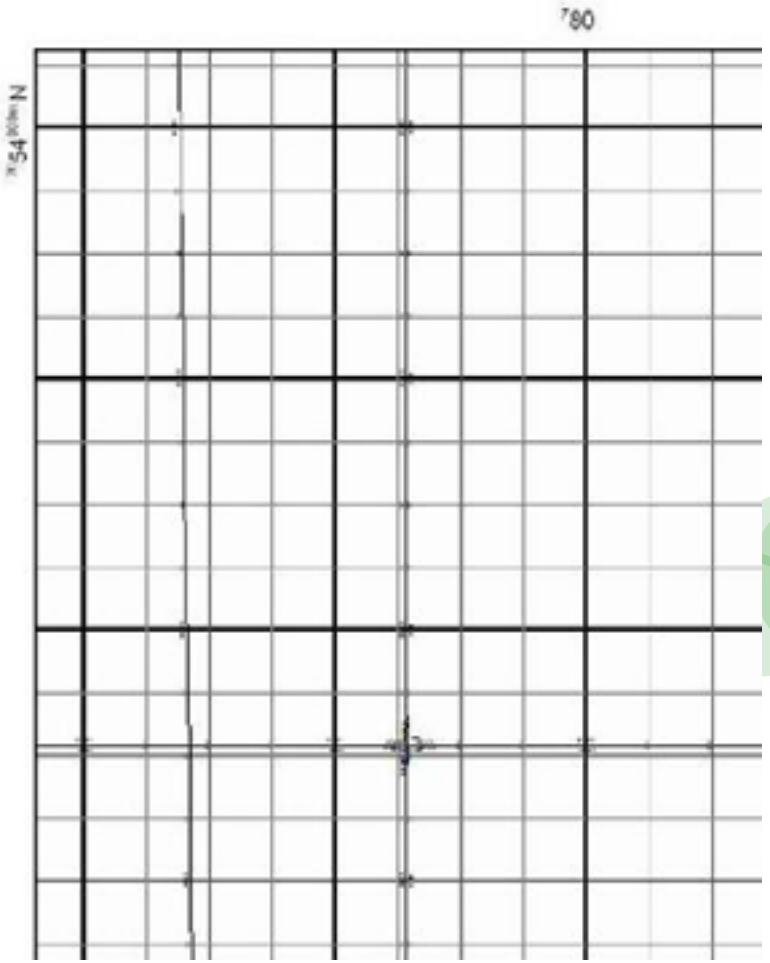
GECCo Objectives

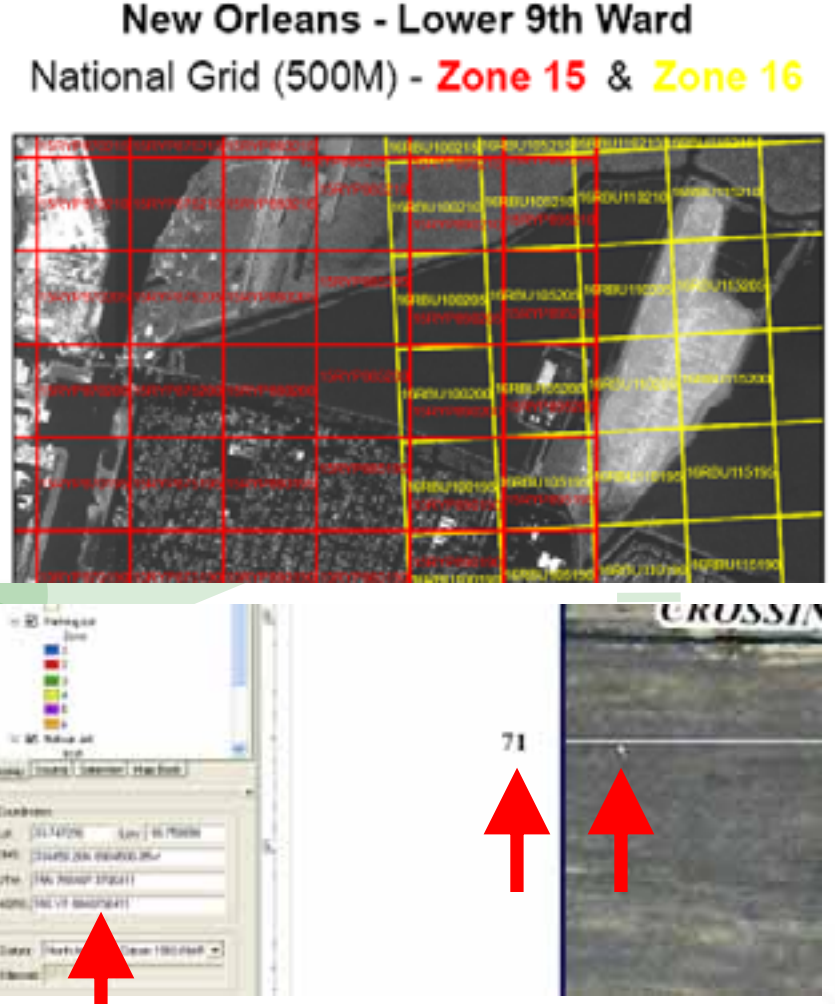
- To provide a framework by which public and private organizations can better collaborate and share information to protect critical infrastructure and relate interdependencies
- To assist infrastructure owners with:
  - Identifying and accessing the interdependencies of critical infrastructure
  - Building an actionable plan for mitigating and protecting those critical infrastructures
  - Establishing procedures and standards

GECCo Process

- Find organizations willing to take on leadership role to bring stakeholders together to support critical infrastructure protection
- Hold a “kick-off” interactive regional workshop to raise awareness and facilitate networking
- Design and conduct an infrastructure protection and interdependencies tabletop exercise
- Identify gaps and recommend solutions
- Develop a prioritized action plan of activities for inclusion into a critical infrastructure strategy
- Define project requirements, assist with securing funding and technical assistance for implementation

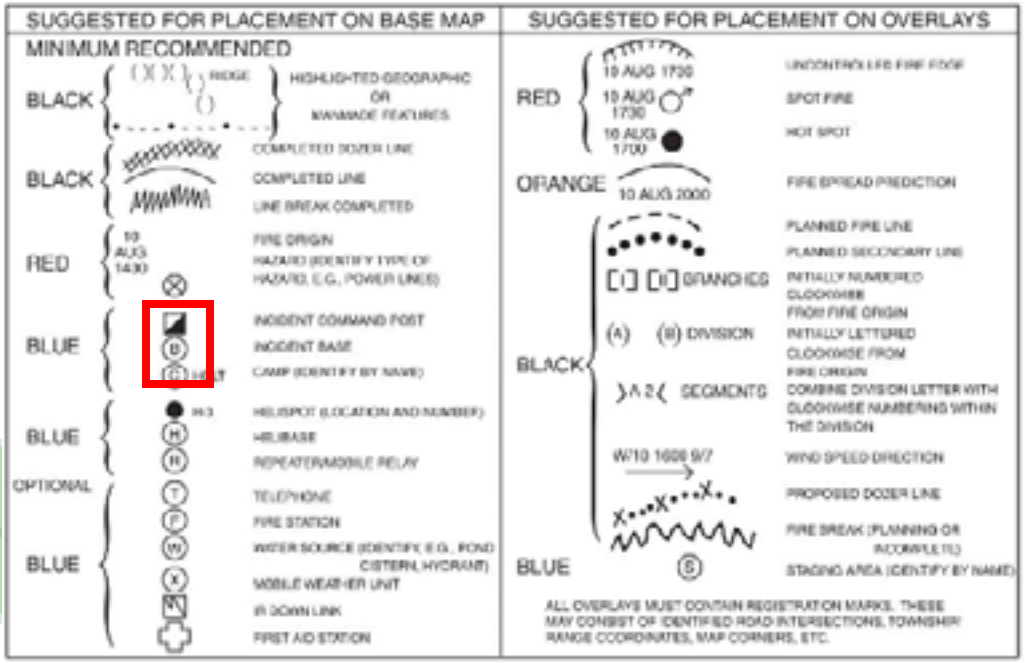
Interoperability Between The Emergency Response and Geospatial Communities?





Operational Friction?

Color	Symbol	Description	Notes
Black		Sector/planning boundaries	
Black	_/_/_/_/	Travel barriers	Cliffs, etc.
Black	======= • , etc.	Modifications/updates to map	
Black	[I] [II] (A) (B)	Branches Divisions	Consider naming divisions North, South, East, etc
Red	PLS 9 Jan 1820 !	Point Last Seen or Last known position	Consider adding direction of travel
Red	X	Hazard	Write description
Blue		Incident Command Post	
Blue	B	Incident Base	Often same as CP
Blue	S	Staging area	Often same as CP
Blue	• H-1	Helispot (location and #)	(LZ)



Without Further Horse Whipping…

- Geospatial technologies may play a crucial supporting role in crisis/emergency management – your map can save lives or contribute to their loss
- Standardization of spatial technologies as applicable to emergency response is required:
  - Planning
  - Mitigation/Prevention
  - Response
  - Recovery

Delta K-9 Search and Rescue trains with a new dog

A mobile home after a Rita-spawned F1

USGS science for a changing world

DELTA STATE UNIVERSITY

Emergency Management

- Structured and compartmentalized
  - Incident command system is nationally consistent and authorizes a single command authority backed by an organized chain of command
  - Broken into an operational structure with functional areas
  - It is flexible and scalable

USGS science for a changing world

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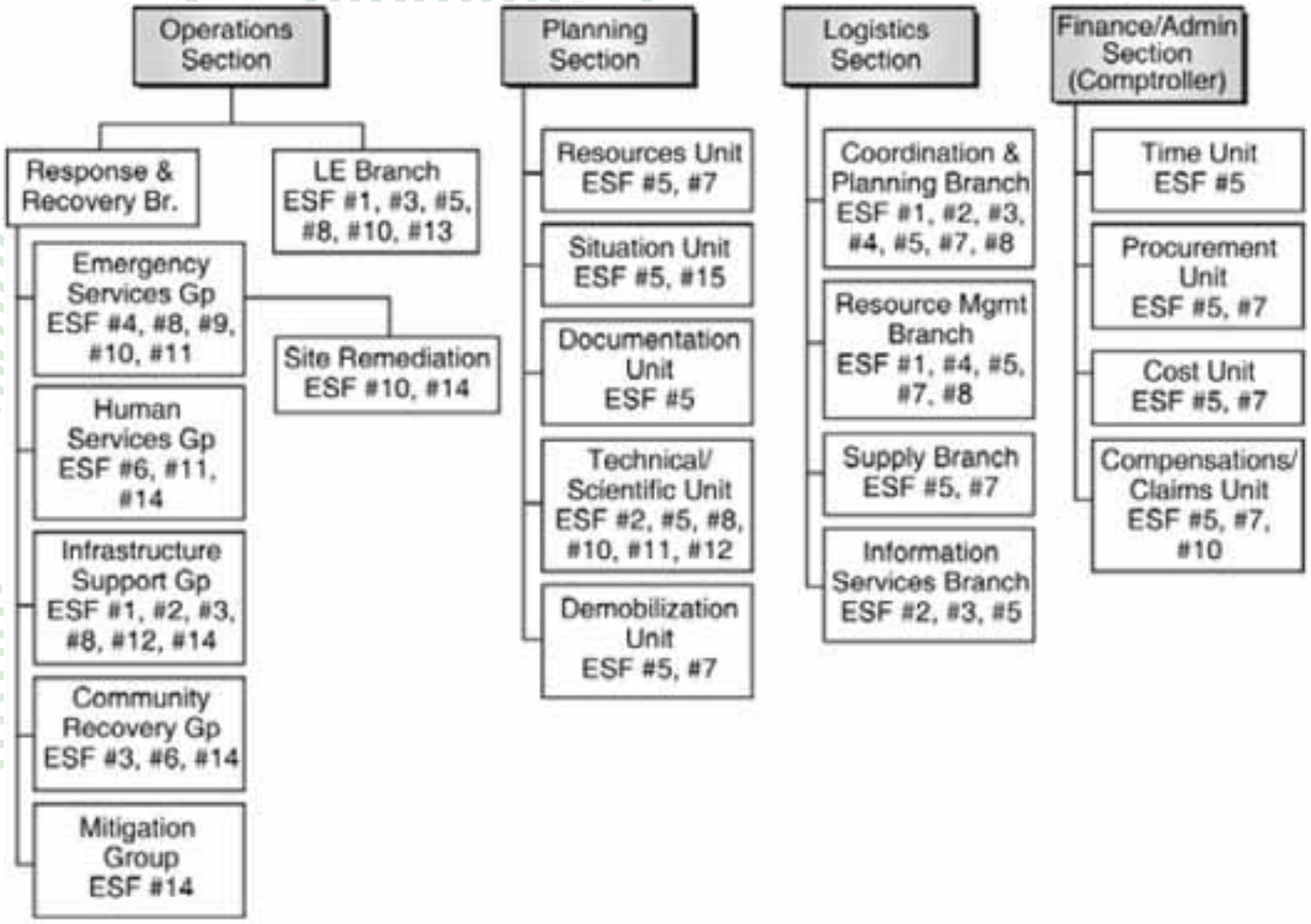


Take-away: Standards

- Standards exist within the emergency response community. Learn them:
  - FEMA Distance Learning Program for Incident Management
    - http://training.fema.gov/IS/
  - National Search and Rescue Committee
    - http://www.uscg.mil/hq/cg5/cg534/nsarc/Georeferencing_info.asp
  - Wildland Fire
    - http://gis.nwcg.gov/
- Standards exist within the geospatial community. Learn them:
  - Federal Geographic Data Committee
    - http://www.fgdc.gov/standards/projects



U.S. Critical Infrastructure and Key Assets

- Agriculture and Food: 1,912,000 farms, 87,000 processing plants
- Water: 1,800 federal reservoirs, 1,600 municipal waste water facilities
- Public Health: 5,800 registered hospitals
- Emergency Services: 87,000 localities
- Defense Industrial Base: 250,000 firms in 215 industries
- Telecommunications: 2,000,000,000 miles of cable
- Chemical Industry: 66,000 chemical plants
- Postal and Shipping: 137 million delivery sites
- Banking and Finance: 26,600 FDIC insured institutions

National Strategy for the Physical Protection of Critical Infrastructures and Key Assets, The White House, Washington D.C., February 2003

U.S. Critical Infrastructure and Key Assets

- Key Assets
  - National monuments and icons: 5,800 historic buildings
  - Nuclear power plants: 104 commercial nuclear power plants
  - Dams: 80,000 dams
  - Government facilities: 3,000 government owned facilities
- Commercial Assets
  - 460 skyscrapers
- Energy
  - 2800 electric power plants
  - Oil and Natural Gas: 300,000 producing sites

U.S. Critical Infrastructure and Key Assets

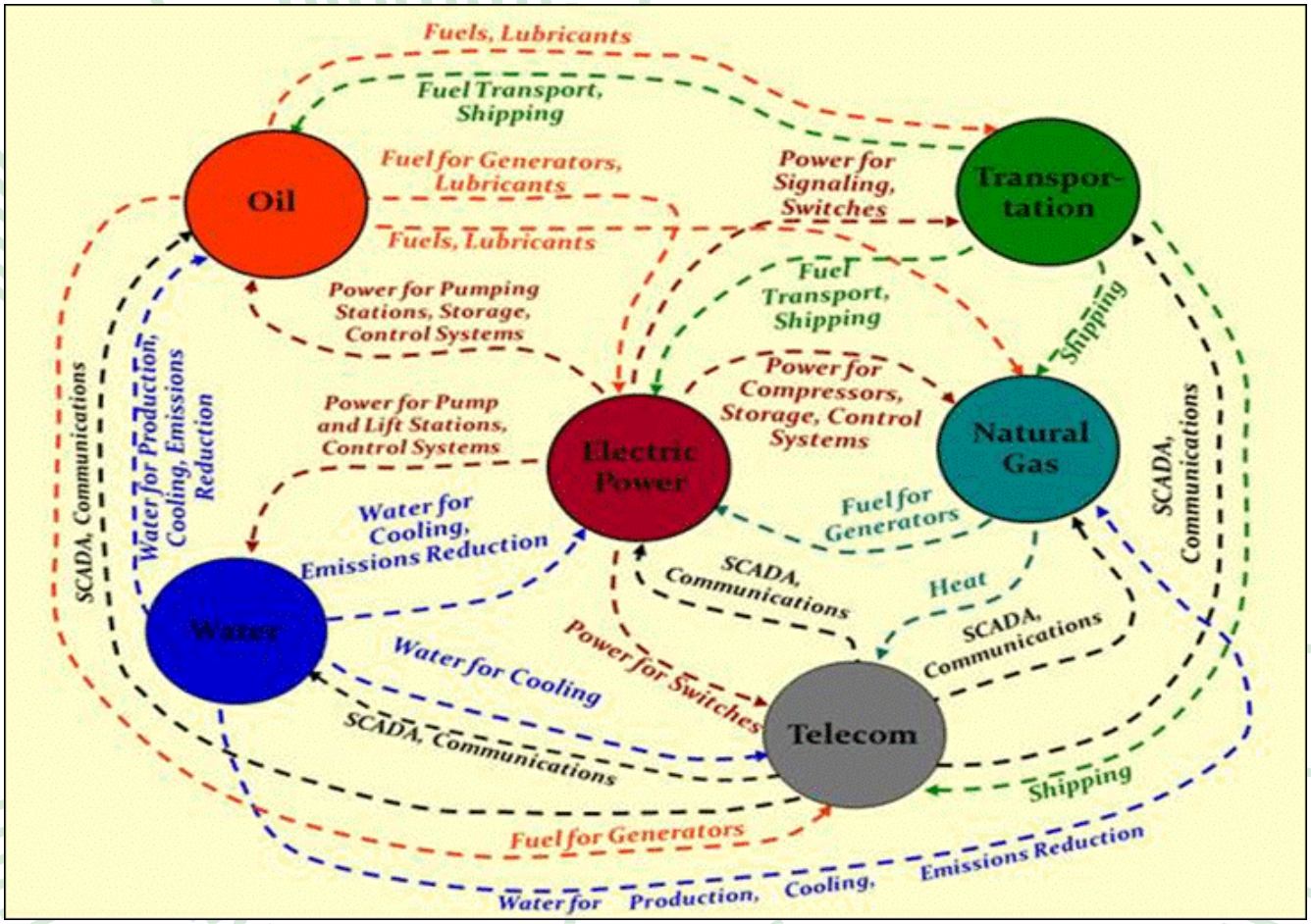
- Transportation:
  - Aviation: 5,000 public airports
  - Bridges: 590,000 highway bridges
  - Railroads: 120,000 miles of major railroads
  - Pipelines: 2,000,000 miles of pipelines
  - Maritime: 300 inland/coastal ports
  - Mass Transit: 500 major urban public transit operators

Highly Connected and Essential Infrastructure and Asset Types

Highly Connected & Interdependent Infrastructures	Essential & Dependent Infrastructure	Public & Private Sectors	Asset Examples
▪ Communications ▪ Energy ▪ Transportation ▪ Banking and Finance	▪ Water ▪ Sewer ▪ Health Care ▪ Government ▪ Agriculture/ Food	▪ Residential ▪ Commercial ▪ Industrial ▪ Medical ▪ Military	▪ Water storage ▪ Power plants and lines ▪ Gas lines ▪ Buildings ▪ Bridges ▪ Etc.
National, regional, and local economic security depends on these infrastructures	Human health and safety (fire, police, EMS) depend on these infrastructures	Source of economic demand for infrastructures	Natural and unintentional disaster locations and terrorist targets

Based on the National Infrastructure Simulation & Analysis Center - Capability Development Strategy. Content modified to support GITA's GECCo Program.

Critical Infrastructure Interdependencies



Heller, M (2001). Interdependencies of Civil Infrastructure Systems. The Bridge, a publication of the Nation Academy of Engineering. V., #31, 2001

Baltimore's Howard Street Tunnel Train Derailment, July 19, 2001

Critical Infrastructure Cascading Consequences Example

Source: GITA 2008-09 Research Committee

Disaster Causes

Oil/Gas Supply Disruption

First Order Effects	Second Order Effects	Third Order Effects
Communications	**Network Ops Centers**	**Emergency Response**
Disruption to Communication Facilities	Limited Communication	Response Disruption for Emergency Services
Water Supply	**Health & Safety**	**Emergency Response**
Disruption of Water Treatment	Lose of Water Supply	Limited Fire Protection
Electric Supply	**Generation Facilities**	**Electric Distribution**
Disruptions of Power Generation	Reduced Supply	Lose of Electricity
Transportation	**Shipping Facilities**	**Goods Delivery**
Fuel Disruption	Limited Shipping of Goods/Materials	Financial Losses

GECCo BoK – Past Findings

Barriers to Collaboration

- Liabilities issues associated with providing data to external organizations (What are they going to do with the data?)
- Security issues - data getting into the wrong hands
- Competitive information gets in the way of sharing data when planning for and responding to an event
- Vulnerable infrastructure assets are not easily identifiable or available for emergency events
- Same data, different formats and accuracies, including the data format issues between software vendors
- Determining what data needs to be shared, can't share everything

Moving Forward

- Existing GECCos
  1. City and County of Honolulu, Hawaii
  2. City of Denver and the Front Range, Colorado
  3. Western New York State, Southern Tier West Regional Planning Agency, New York
  4. City of Seattle and King County, Washington
  5. Greater Tampa Bay Area, Florida
  6. Greater Phoenix Area, Arizona
  7. Dallas/Fort Worth Metroplex, Texas
- 12 Additional Locations Identified - Support from DHS
  - Minneapolis/St. Paul Metro Area, Minnesota
  - San Francisco/Oakland Bay Area, California