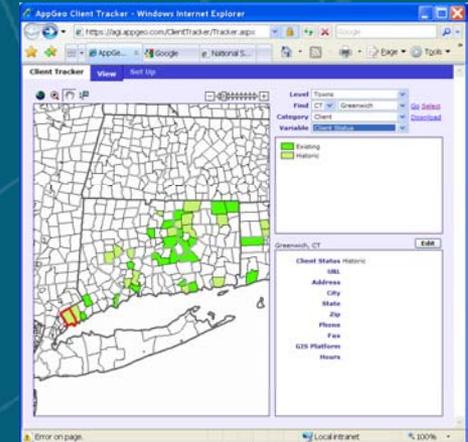
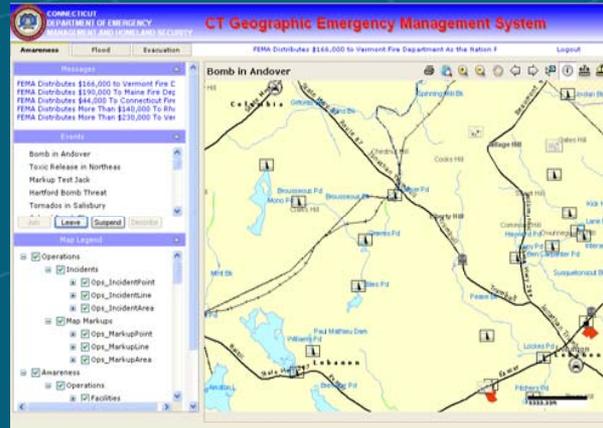


State of Connecticut DEMHS Geographic Emergency Management System (GEMS)



Source: Re



Steven Anderson, GISP
GIS Day - November 18, 2009

Overview – Questions to be answered

- What is GEMS?
- What's the history of it being created?
- How was it decided to build which pieces?
- Who was involved in the process?
- What does it do?
- What are the benefits of the system?

- Questions

What is GEMS?

- GEMS: **G**eographic **E**mergency **M**anagement **S**ystem
 - **Web-based** application that provides access to a set of **critical information** that helps a user **make decisions** that have a **spatial** nature
 - Consists of 5 primary components:
 - **Event awareness portal** – common operating picture
 - **Flood planning and response**
 - **Evacuation planning and execution**
 - **Map request tool**
 - **Critical Infrastructure Management tool**
 - Other highlights
 - **Central repository** of the best available data
 - **Web services** that can be exposed and used to build upon
 - **Administrative management tool**: who can do what with each layer

Project History

- First envisioned in the early Spring of 2005
- **TOPOFF3 Event** – April 2005
 - Stands for Top Officials 3
 - Most comprehensive **terrorism response exercise** conducted in the United States
 - International, Federal, State, Regional, Local Government, Tribal , and Private Sector
 - Simultaneous simulated cyber attack on Connecticut's IT infrastructure
 - Designed to test response to a terrorism attack at all levels
 - First time fully operational **GeoLab** was stood up as part of CT's EOC
- **Lessons learned** from TOPOFF3 event used to inform the creation of GEMS
- Funding applied for and acquired by the CT DEMHS from DHS to create system
- Project was planned as multi-phased, **systematic** approach
 - Requirements and System Design
 - Pilot Project
 - Build of Priority Applications
 - Future phases as required
- Engage **all levels** of Gov't **Stakeholders**
 - Local, regional, state and federal



Lessons Learned from TOPOFF3 Event

- It gets **hectic** in the EOC during a large-scale event
- A **Common Operating Picture** (COP) is crucial
- People require **exposure** to applications **before** an event
- Having **mapping** is **critical** component for making **decisions**
- **Data** must be **readily available** and **current** to be useful



How did we decide to build which pieces?

- Detailed **Requirements Analysis** was performed
 - Four days of **workshops at LOB** (Commissioners, Department Heads, Municipal officials, Geospatial professionals) (over 110 people participated)
 - Detailed follow-on **Interviews**
 - 11 State agencies
 - Utility companies
 - Focus groups of large and small municipalities
 - **On-line survey** to involve broader user community
- **Capitalize** on opportunity to **kill 2 birds with one stone**
 - Single system design should support **both**:
 - Homeland security/**emergency management** applications
 - Other **more routine state and local** Gov't requirements



Summary of findings and scenarios of concern

- **Flooding** has caused **more damage** and loss of life than any other natural disaster in Connecticut
- **High winds** next most damaging natural hazard in Connecticut. High winds typically result from hurricanes, tornadoes, and severe thunderstorms.
- Most recent "**Major Disasters**" in Connecticut
 - **Nor-easter**, April 15-17, 2007
 - **Tropical Storm** Floyd, September 16, 1999
 - **Blizzard** of 1996, January 7-8, 1996
 - **Nor-easter**, (winter storm Beth) December 11-13, 1992
 - **Hurricane** Bob, August 9, 1991
 - Western CT **Tornado**, July 10, 1989
 - **Hurricane** Gloria, September 1985
- Occurrence Frequency
 - Hurricanes CAT II - once every 10 years
 - Nor-easters – seven in last 25 years ('79, '83, '88, '92, '96, '03, '07)
 - Significant Winter Storms w/ major flooding - 1 every five years
 - Forest Fires – 600 acres per year
 - Tornadoes – 3 every two years
- System should **support** these more **frequent needs first**
- If it **supports** the **more frequent** events, it will **support** the **extreme case too**



Who was involved as part of the project?

- Inventoried all known data from many agencies
 - **CT DEMHS**: including Regional Offices Evacuation and Shelter Plans
 - **CT DEP**: including all Geospatial Base Map Data, permitted facilities
 - **CT DOT**: including bridges, facilities, airports, railroad, commuter parking
 - **CT MMR**: sensitive population data that is available to be released
 - **CT DPH**: Shelter locations, permitted facilities, sensitive populations, hospitals
 - **CT OPM**: State owned facilities
 - **CT DPS**: 911 PSAP regions, police stations, fire stations, sensitive population
 - **CT Consumer Prot**: Major suppliers, water, food, pharmacies, industrial
 - **Red Cross**: Federal Shelter Management System
 - **United Way**: Elder care facilities
 - **Federal**: Census, FEMA, USGS, NOAA
- **5 Workshops** held around the state for **municipal** & **regional** entities
 - More than **130 people** attended the workshops

Data Needs - identified for priority applications

- **Administrative & Political Boundaries**

- State, county, municipal, independent city, borough, village
- Connecticut regional planning organizations
- American Indian reservations and trust lands
- Fire districts
- Police districts

- **Critical Infrastructure**

- Airports
- Bridges and tunnels
- Cultural Treasures
- Dams and reservoirs
- Emergency equipment and supply warehouses
- Emergency Shelters
- Harbors and ports
- Hazardous Materials storage facilities
- Hospitals, EMS, relief organizations
- Military and National Guard Bases
- Municipal Offices
- Petrochemical industry plants and storage
- Police and Fire stations
- Power plants and electrical distribution systems
- Schools and Universities
- Stadiums and conference centers
- State and federal facilities
- Telecommunication facilities
- Transportation facilities (roads, rail, ferry)
- Water/wastewater facilities

- **Ortho imagery**

- 2004 Digital Orthoimagery
- Coastal (leaf on) Imagery
- Satellite Imagery

- **Hydrography**

- Surface water features such as lakes and ponds, streams and rivers, canals, bays, harbors, oceans, and shorelines.
- Dams, waterfalls, canals
- USGS stream monitoring stations
- Stream linear network (flowlines) - flow direction, stream order, gradient
- Shoreline linear network (coastlines)
- Historic, mean high, mean low water shorelines
- Drainage basin, watershed boundaries

- **Transportation**

- All public, local and private roadways in Connecticut.
- Bridges and Tunnels
- Street address ranges
- Railroads
- Airports & Heliports
- Harbors and ports
- Ferries
- Bus and para-transit service

- **Addressing**

- Street centerline network
- Street names and address ranges



What does GEMS do and what does it look like?



Awareness

Flood

Evacuation

FEMA Flood Insurance Forum Scheduled for Provincetown and Surrou

Logout

Messages

FEMA Flood Insurance Forum Schedule:
FEMA Flood Maps Communicate the Floo
\$2.5 Million in Disaster Aid Helping Mair
FEMA Community Education Specialists
FEMA Flood Aid to Maine Tops \$1 Million

Events

Map Legend

- Operations
- Incidents
- Map Markups
- Critical Infrastructure
 - Facilities
 - Bus Stations
 - Dams and Reservoirs
 - Hospitals
 - Cultural Treasures
 - TV Broadcast Facilities
 - Schools Colleges and Universiti
 - Airports

Find Address or Place

Location

Find

Location can be:

- street address, city OR zip code

Hurricane Zulu



Layer
Control



Awareness Flood Evacuation

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RSS Feeds



Awareness | Flood | Evacuation

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Location can be:

- street address, city OR zip code

Hurricane Zulu



Tabbed Tools



Awareness

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Evacuation

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 - Airports

Find Address or Place

Location

Find

Location can be:

- street address, city OR zip code

Hurricane Zulu



Map Navigation



Awareness | Flood | Evacuation

FEMA Flood Insurance Forum Scheduled for Provincetown and Surrou

Logout

FEMA Flood Maps Commemorate the First \$2.5 Million in Disaster Aid Helping Main FEMA Community Education Specialists Flood Aid to Maine Tops \$1 Million

Events

Map Legend

Find Address or Place

Incidents

Incident Tools



Limit display to incidents added:

(quick date)

Before

On or After

Update

Markup / Redline

Markup Tools

Shared



Limit shared markup display to:

(quick date)

Before

On or After

User

(all users)

Update

Reports

Hurricane Zulu



Incident Management



Awareness

Flood

Evacuation

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Limit shared markup display to:

(quick date)

Before

On or After

User

(all users)

Update

Hurricane Zulu



Mark-up Tools

Now that we collected all of this data, how is it kept current?

Many, many data sources



Pending Submissions For sanderson

Layer	Action Id	Subtype Name
Police S...	Add	Sigourney Weaver PD State SW1 Cancel

Update Critical Infrastructure

Search Existing Features

Municipality:

Feature Layer:

Feature:

Review Proposed Changes

Search Proposed Changes

Municipality:

Date From-To: -

Submitter:

Feature Layer:

Submission Status: Submitted In Review

Layer	Action Id	Subtype Name
-------	-----------	--------------

Upload Tool



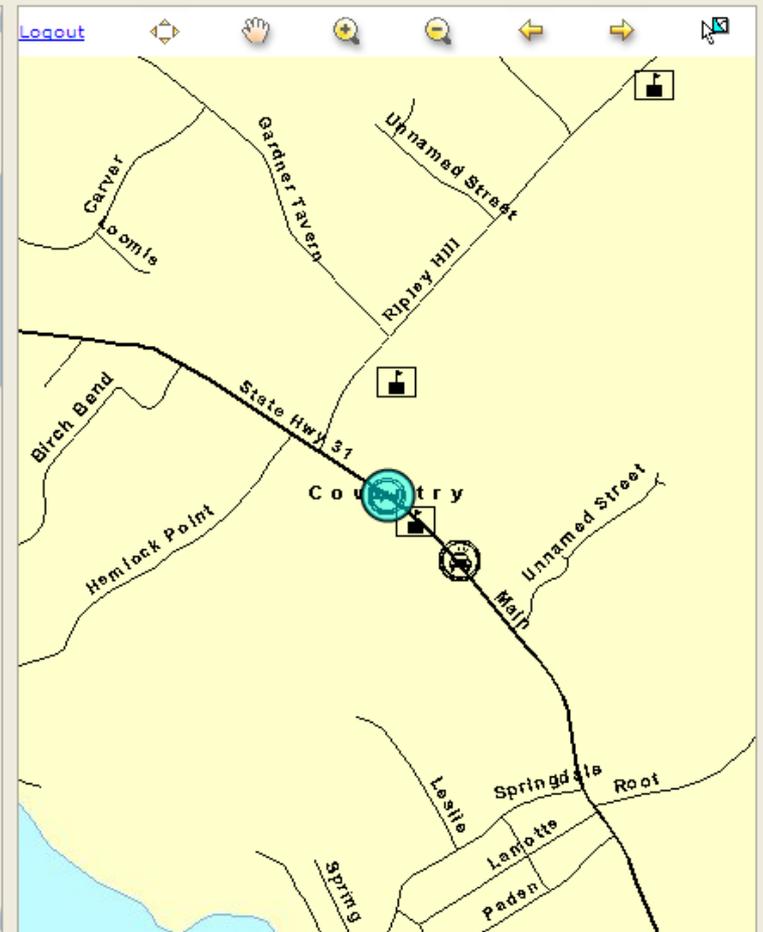
Search for
feature



Address must be: street address, zip code
(do not include city or town)

Required fields

Current Data	Proposed Data
Id 77	77 *
Subtype	<input type="button" value="v"/>
PlaceDescription	
Name Coventry Fire Dept Station 8	Coventry Fire Dept Station
Name2	
Address 1755 Main St P.O. Box 1	1755 Main St P.O. Box 1 *
Address2	
City Coventry	Coventry *
State	
Zip	
Zip4	
Telephone	
EmergencyTitle	
EmergencyName	
EmergencyTelephone	
EmergencyExtension	
TotalPersonnel	
Directions	
Len	



Propose changes



Review Data

Address (lat/long, national grid, etc.)

Locate

Address must be: street address, zip code
(do not include city or town)

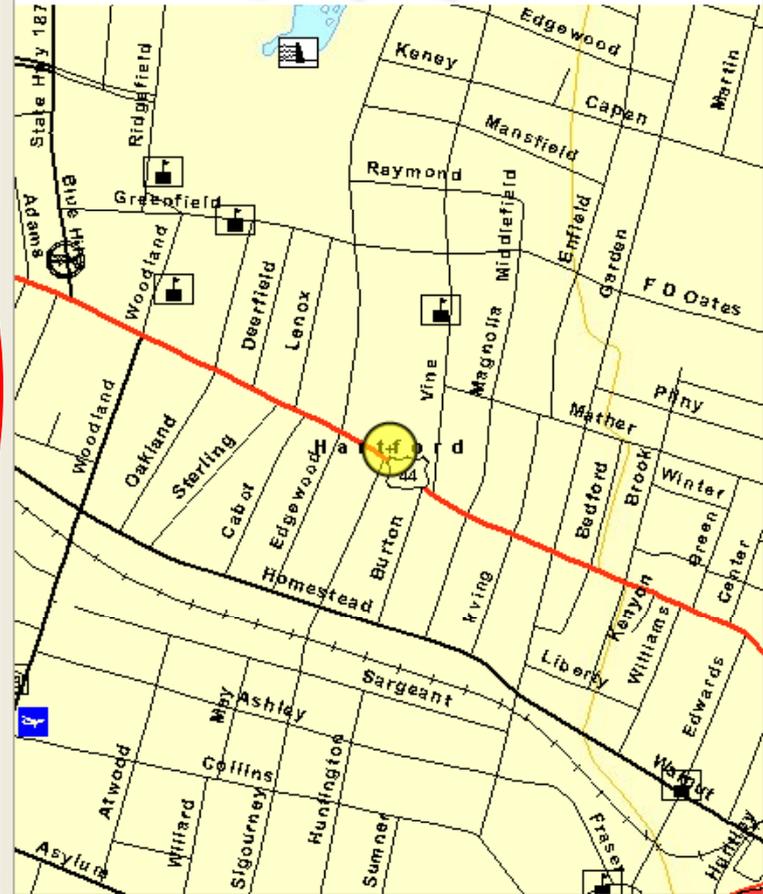
Add/Move Point

* = Required fields

Current Data Proposed Data

Id	Sigourney Weaver PD *
Subtype	State *
Name	SW1 *
Name2	Sigourney PD *
Address	6000 Farmington Rd *
Address2	
City	Hartford *
State	CT *
Zip	06103 *
Zip4	
Telephone	860-999-9999
EmergencyTitle	Chief of Police
EmergencyName	Bob
EmergencyTelephone	860-999-9990
EmergencyExtension	1
TotalPersonnel	2

Logout



Review and approve
changes

What are the benefits of the system?

- Provides a **Common Operating Picture (COP)**
 - Two instances are in production (one at DOIT and one at the EOC)
 - Over 50 municipalities were trained this past Spring, people are providing updates
- Applications are available **24 hours/day 7 days** a week to users
- Provides a **core set of definitive data** to users
- **Critical infrastructure data** is kept current by edits made by municipalities
 - Rolls up local data (best source) to a regional and state level
- **Semi-automated** processes were built for **loading of updated State data** sets into the system
- Will provide **access** to base layers in the form of **web services**

Thank-you and any questions?

Steve Anderson, GISP
Applied Geographics Inc