GIS Interoperability in Kentucky CSEPP

Presented by:

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Presentation Topics

• Kentucky Chemical Stockpile Emergency Preparedness Program (CSEPP) GIS Initiative
  – The Past: Phases 1, 2, and 3 (Years 1, 2, and 3)
  – The Present: Phase 4 (Year 4)
• Applicability of Kentucky’s Experience
Kentucky CSEPP Resources

- Small state staff of four to five FTEs – no GIS training, mapping is an adjunct responsibility
- Long-term reliance on enlarged paper maps
- Although some state agencies have GIS capability, there is no emergency management GIS at the Commonwealth’s EOC
- Counties have primary emergency management and CSEPP responsibility, but only three of 10 CSEPP counties have GIS
- No state address database for geocoding
- Very limited FEMA funding
- SQL Server RDBMS
## Kentucky CSEPP GIS
### Initial ArcView Mapping Approach

<table>
<thead>
<tr>
<th><strong>Phase 1 Activities</strong></th>
<th><strong>Phase 2 Activities</strong></th>
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<tr>
<td>• Hire GIS Contractor</td>
<td>• Design Database</td>
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<td>• Purchase Computers, Software, Plotter</td>
<td>• Obtain Local Data and Populate Database (≈50 layers)</td>
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<tr>
<td>• Assemble Basemap Layers (Boundaries, DRGs, Transportation, Aerial Photos and SPOT Imagery, Hydrography)</td>
<td>• Acquire DynaMap 2000 Addressing Software</td>
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<td>• Produce and Distribute County and Composite Maps with IRZ and PAZ</td>
<td>• Geocode Addresses for Display in GIS</td>
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<td>• Conduct Local Data Survey</td>
<td>• Develop General Data Maintenance Strategy</td>
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<td>• Cost: $38,676</td>
<td>• Cost: $65,225</td>
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Phase 3 CSEPP ArcIMS GIS

• Obtain data for 12 additional layers for nine counties
• Create and incorporate Jessamine County basemap
• Assemble and add Jessamine County data
• Program ArcView application functionality
  – Search and find point, line, and polygon features
  – Locate coordinates (DD, DMS, SPC, UTM)
  – Build multiple buffers for feature and coordinate locations
  – Find features within buffers
• Acquire dedicated server and ArcIMS software
• Program secure ArcIMS application and install .mil server
• Produce documentation and train core users/IT support
• Develop specific database maintenance program
• Cost: $67,140
Phase 4 COP Interoperability Portal

• Expand CSEPP’s capability to provide a common operating picture (COP) by introducing an interoperable portal architecture that integrates multiple applications and functions in an single, easy-to-use interface:
  • Location Searching and Geocoding
  • ArcIMS Mapping
  • Crisis Incident Management Software (i.e., Watch Commander)
  • Alert Notification Software (i.e., City Watch)
  • Evacuation Routing
  • 3-D Visualization and Fly-throughs (i.e., TerraExplorer)
  • Traffic Video and Other Sensor Monitoring
  • Real-time Weather Data and Reports
  • eGuides, Documents, and Resources
  • AVL, Chemical Sensor Monitoring, CAD Drawings, CMT, etc.

• Integrate/develop specific modeling applications (e.g., Plume Modeling, Population Density Modeling)

• Cost: $150,000 for prototype ($75K direct, $75K match)
Portal Single-view COP Browser Interface
Geo-location and Searching

Incidents can be created through the Locate function or directly through the Incident application button, which is dynamically linked to the state’s CIMS software.
ArcIMS Map Management

Customized ArcIMS management interface
Stationary and mobile sensor platforms and real-time meteorological conditions are fully integrated.
eGuides, Documents, and Resources

Reference documents, available resources from CIMS and ArcIMS database, drawings, images, and URLs for use by responders.
Notification or call lists can be pre-defined or generated dynamically from search, buffer, and plume model applications for multiple alert notification COTS software packages.
Evacuation routes can be pre-planned or generated by routing software.
D2Puff Plume Model

Plume model feeds population density model and alert notification application.
Collaborative Messaging and Red-lining Tool (CMT)

The tool provides mark-up and instant messaging capability, including sending text, voice, and streaming video.
Applicability of Kentucky’s Experience

- Not every government has access to significant funding, but they all have the same need for a COP; keep costs affordable
- Starting a GIS can be intimidating; build the system to match users’ adoption rate and emphasize ease of use
- Data development and maintenance still represent the largest cost; use unconventional data sources
- Promote multiple use and synergies; weapons will eventually be destroyed, but GIS is a long-term economic resource
- Explore alternative funding sources (Kentucky Science and Engineering Foundation, Kentucky Science and Technology Corporation, private sector)
- Organizational cooperation remains a major challenge
- Design architecture to be independent of hardware and software applications; support multiple COTS products