Using GPS and GIS for Hawaii Inland Area Planning

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Tetra Tech

Background

- The Clean Water Act, Section 311(j)(4), as amended by the Oil Pollution Act of 1990 (OPA) Section 4202(b), requires that area contingency plans be developed for specified areas designated by the President.
- These Area Contingency Plans are to be developed by an Area Committee that is made up of technically qualified individuals from federal, state, and local governmental agencies. Under Executive Order 12777, the President delegated the authority to designate Areas and Area Committees to the Secretary of Transportation (U.S. Coast Guard) for the coastal zones, and the Administrator of the U.S. Environmental Protection Agency (EPA) for the inland zone.

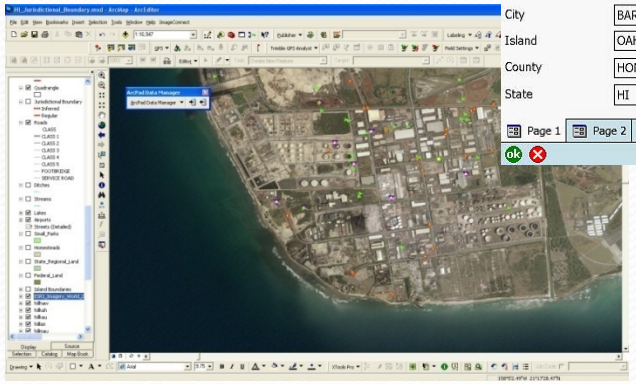
Background

- RRT Inland Area Contingency plans describe information and processes for containing and cleaning up an oil spill or hazmat release that occurs in a defined geographic area. A well-designed contingency plan enables response efforts to proceed smoothly and effectively, minimizes danger to cleanup personnel, reduces the overall costs of cleanup by avoiding unnecessary effort, and ensures that sensitive habitats are protected.
- Understanding the geographic relationships among potential spill and release sources, waterways, access routes, jurisdictional boundaries, population densities and sensitive areas are essential to effective contingency planning at both the area and sub-area levels.

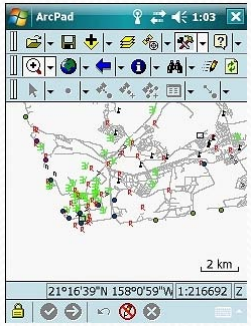
Hawaii Area Contingency Plan

- GPS
  - Collect data
  - Ground-truth data
  - ArcPad
- GIS
  - Geodatabase
  - ArcReader

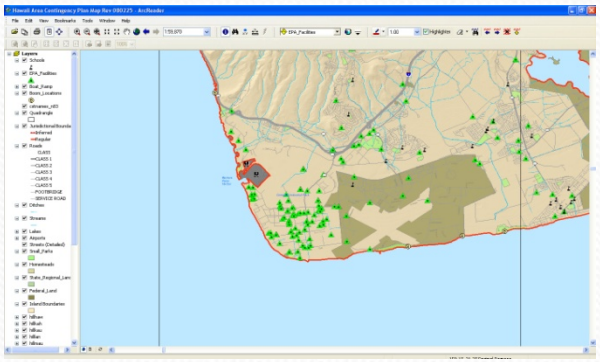
Check edits back into geodatabase



Capture, analyze, and display data on-site



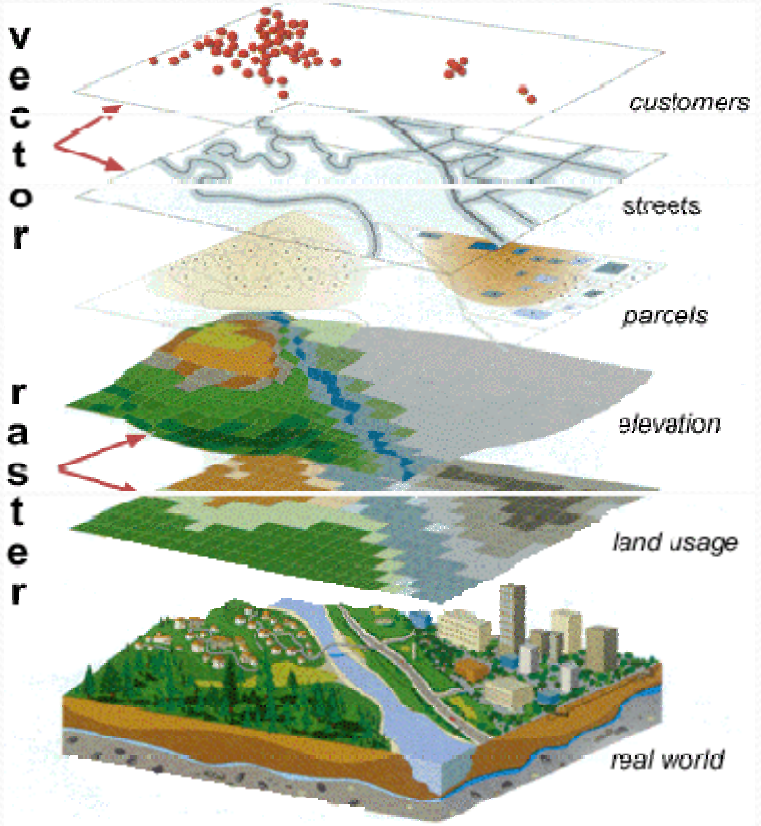
Publish data to ArcReader



Check out data to the field

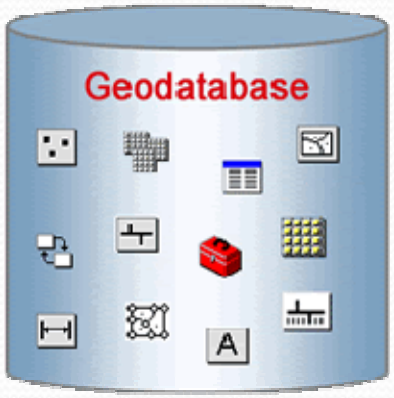
GIS

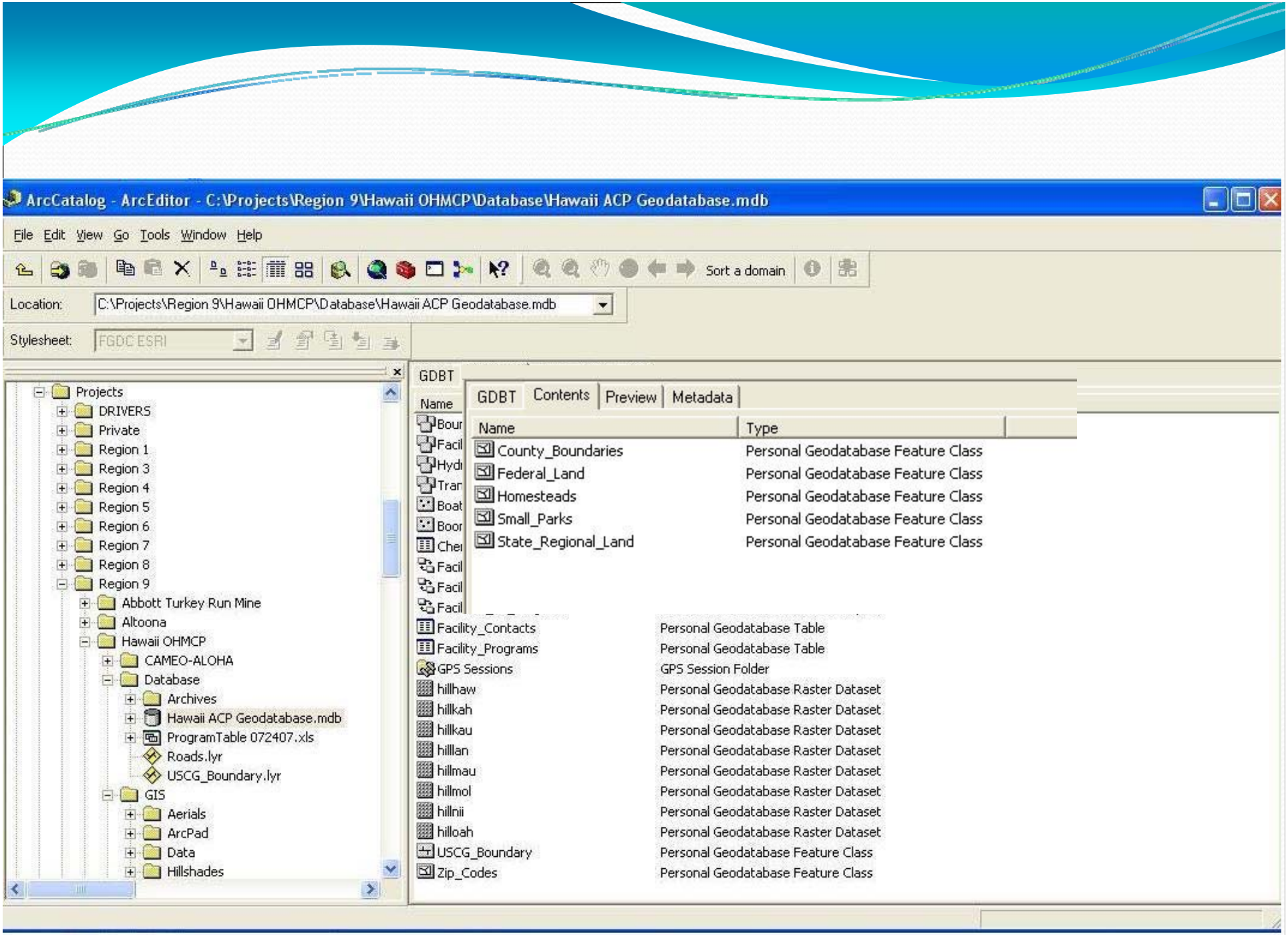
- GIS allows users to view, understand, question, interpret, and visualize data in many ways that reveal relationships, patterns, and trends in the form of maps, globes, reports, and charts.
- A GIS helps answer questions and solve problems by looking at your data in a way that is quickly understood and easily shared.



Geodatabase

- Attribute tables
- Geographic features
- Satellite and aerial imagery
- Surface modeling data
- Survey measurements

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Projects
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Region 3
Region 4
Region 5
Region 6
Region 7
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Region 9
Abbott Turkey Run Mine
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USCG_Boundary.lyr
GIS
Aerials
ArcPad
Data
Hillshades
GDBT
GDBT Contents Preview Metadata
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Federal_Land Personal Geodatabase Feature Class
Homesteads Personal Geodatabase Feature Class
Small_Parks Personal Geodatabase Feature Class
State_Regional_Land Personal Geodatabase Feature Class
Facility_Contacts Personal Geodatabase Table
Facility_Programs Personal Geodatabase Table
GPS Sessions GPS Session Folder
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hillkah Personal Geodatabase Raster Dataset
hillkau Personal Geodatabase Raster Dataset
hilllan Personal Geodatabase Raster Dataset
hillmau Personal Geodatabase Raster Dataset
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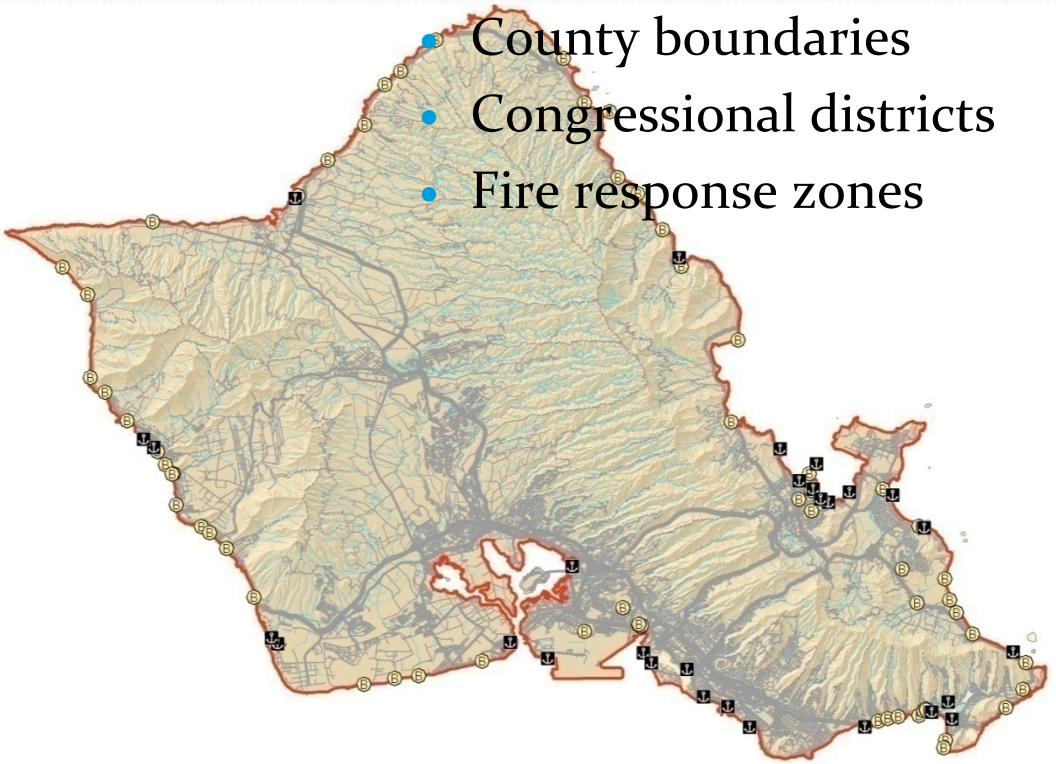
USCG_Boundary Personal Geodatabase Feature Class
Zip_Codes Personal Geodatabase Feature Class

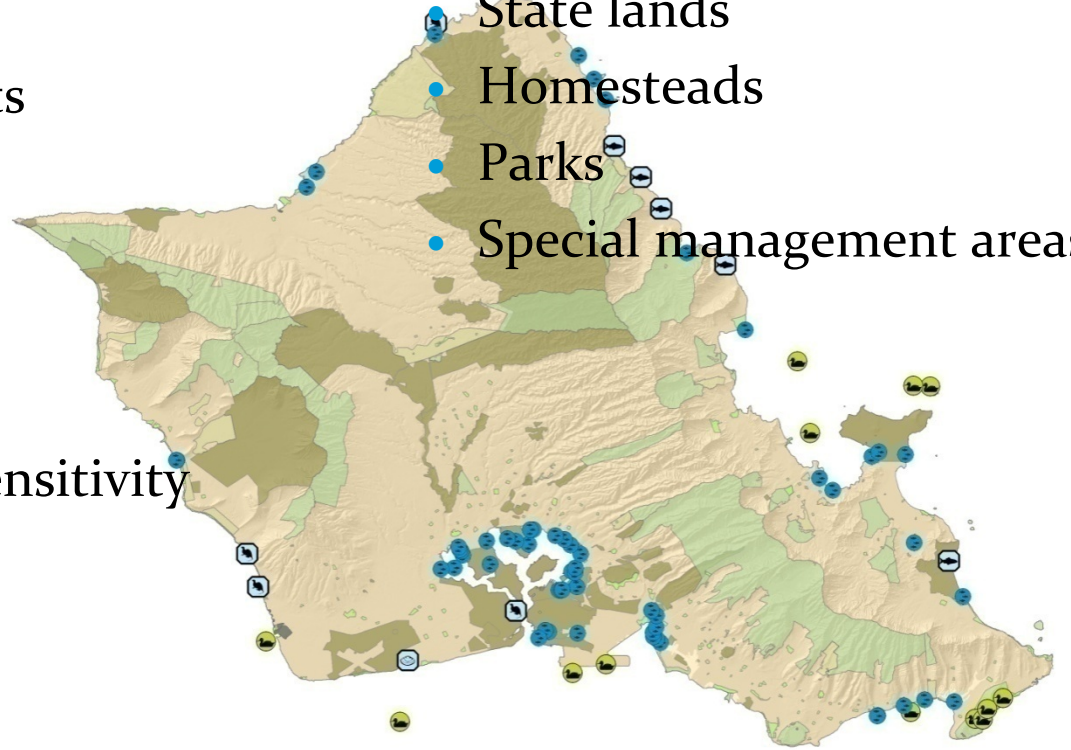
Data Layers

- Base Layers
  - Hydrography
    - Coastline
    - Lakes
    - Streams
    - Ditches
  - Transportation
    - Roads
    - Boat ramps
    - Marinas/harbors
- Boundaries
  - Jurisdictional boundary
  - County boundaries
  - Congressional districts
  - Fire response zones



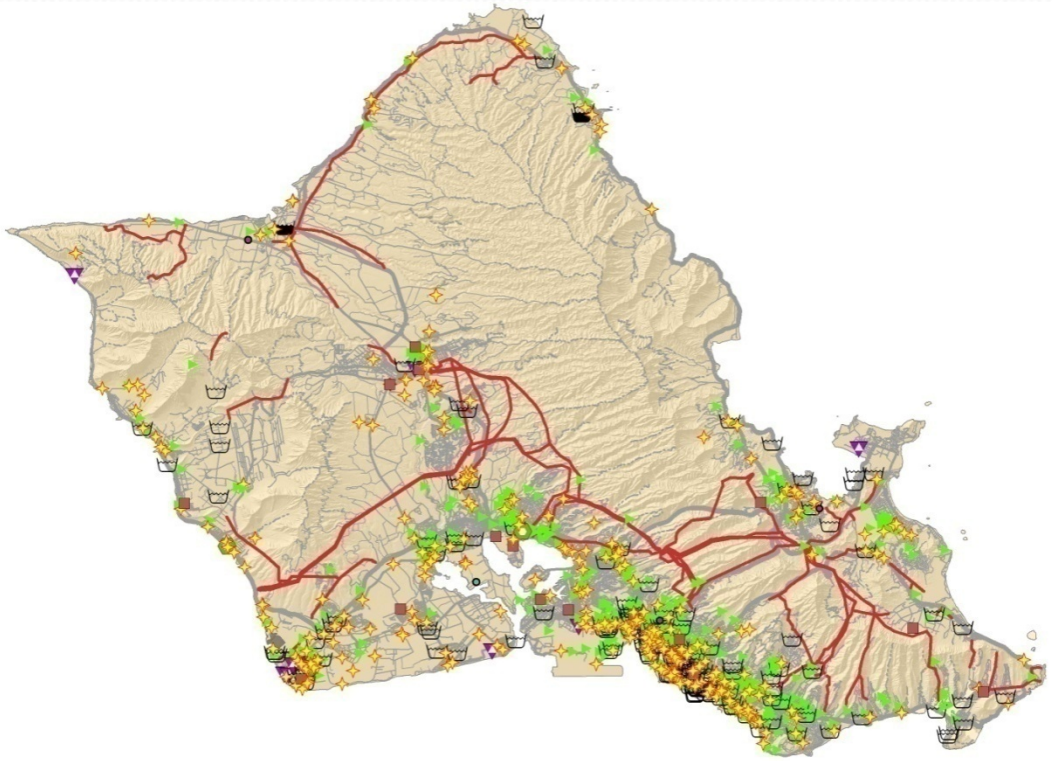
Data Layers

- Sensitive Resources
  - Sensitive Species and Natural Communities
    - Threatened and endangered plants
    - Wetlands
    - Bird habitats
    - Critical habitats
    - Fishponds
    - Environmental sensitivity index
- Managed Areas
  - Federal lands
  - State lands
  - Homesteads
  - Parks
  - Special management areas



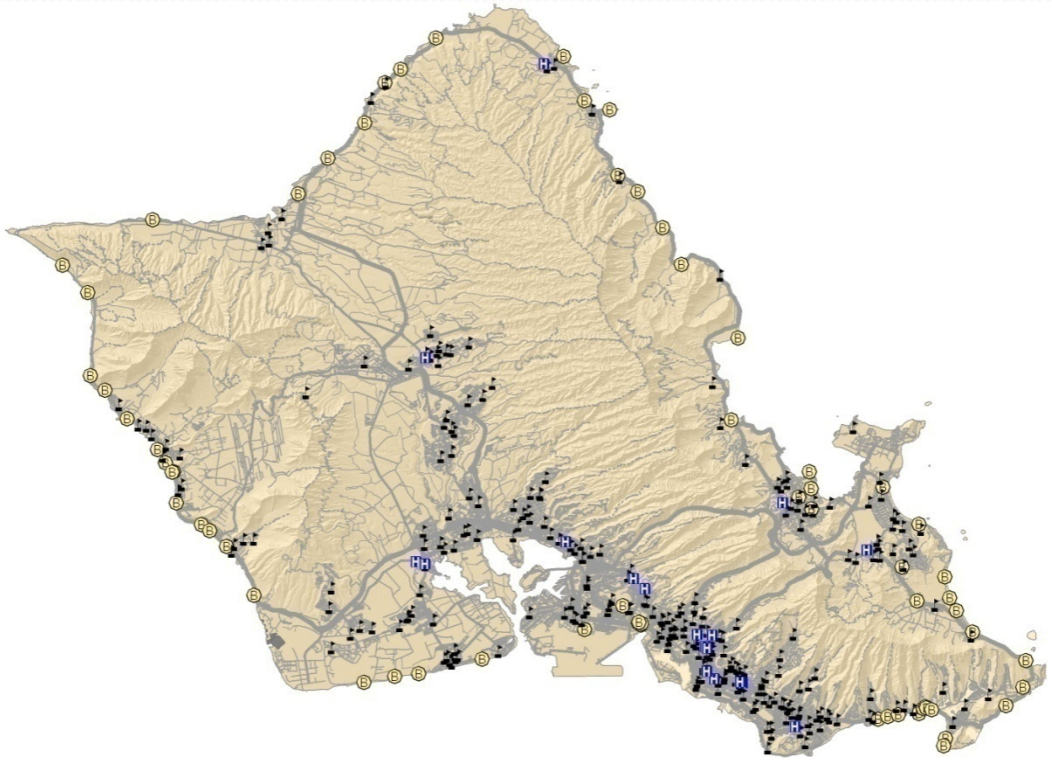
Data Layers

- Potential spill sources
  - Fixed facilities
    - FRP
    - RMP
    - RCRA
    - TRI
    - RCRA
    - WWTP
    - Superfund
    - Tier II
- Pipes and transmission lines

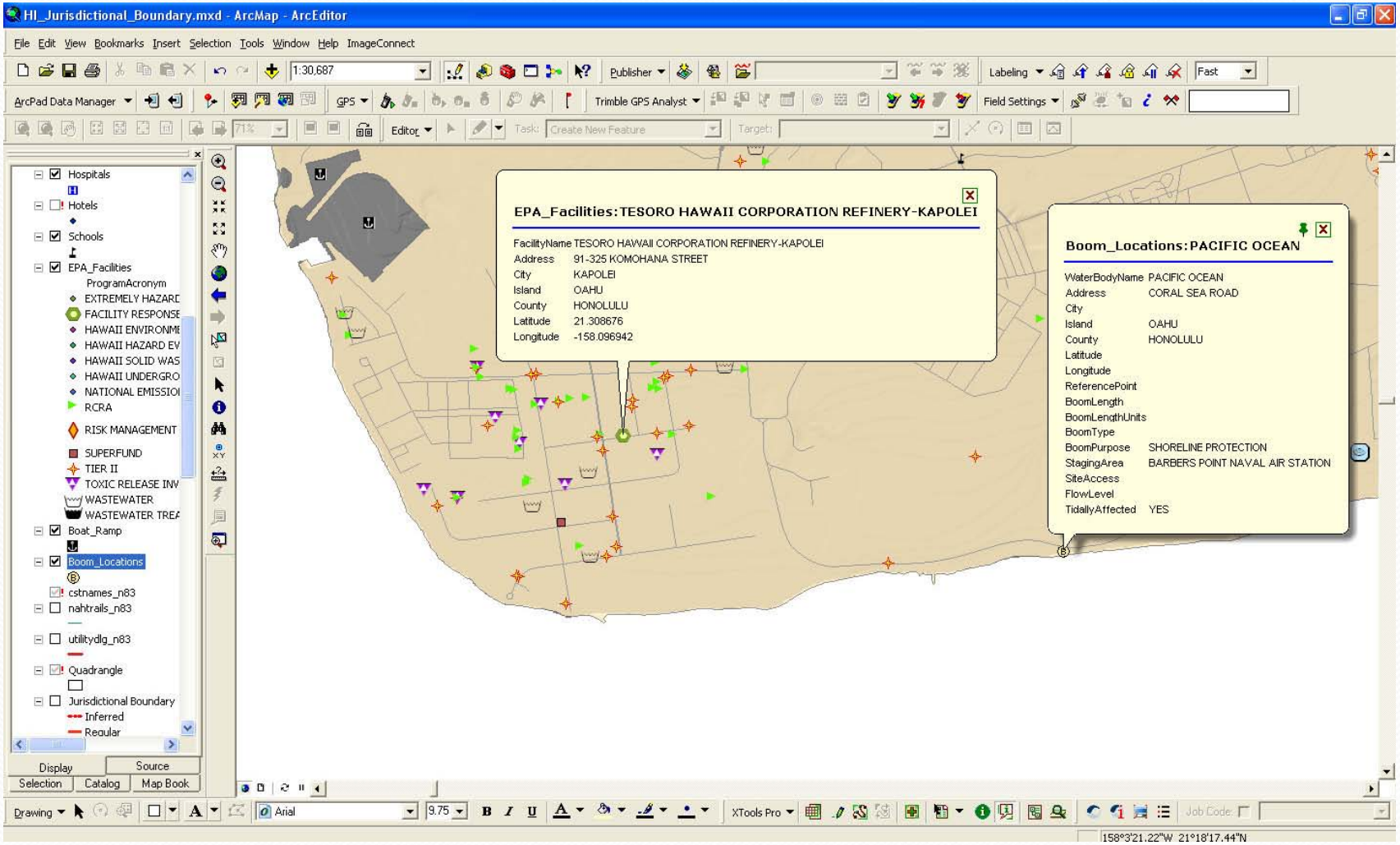


Data Layers

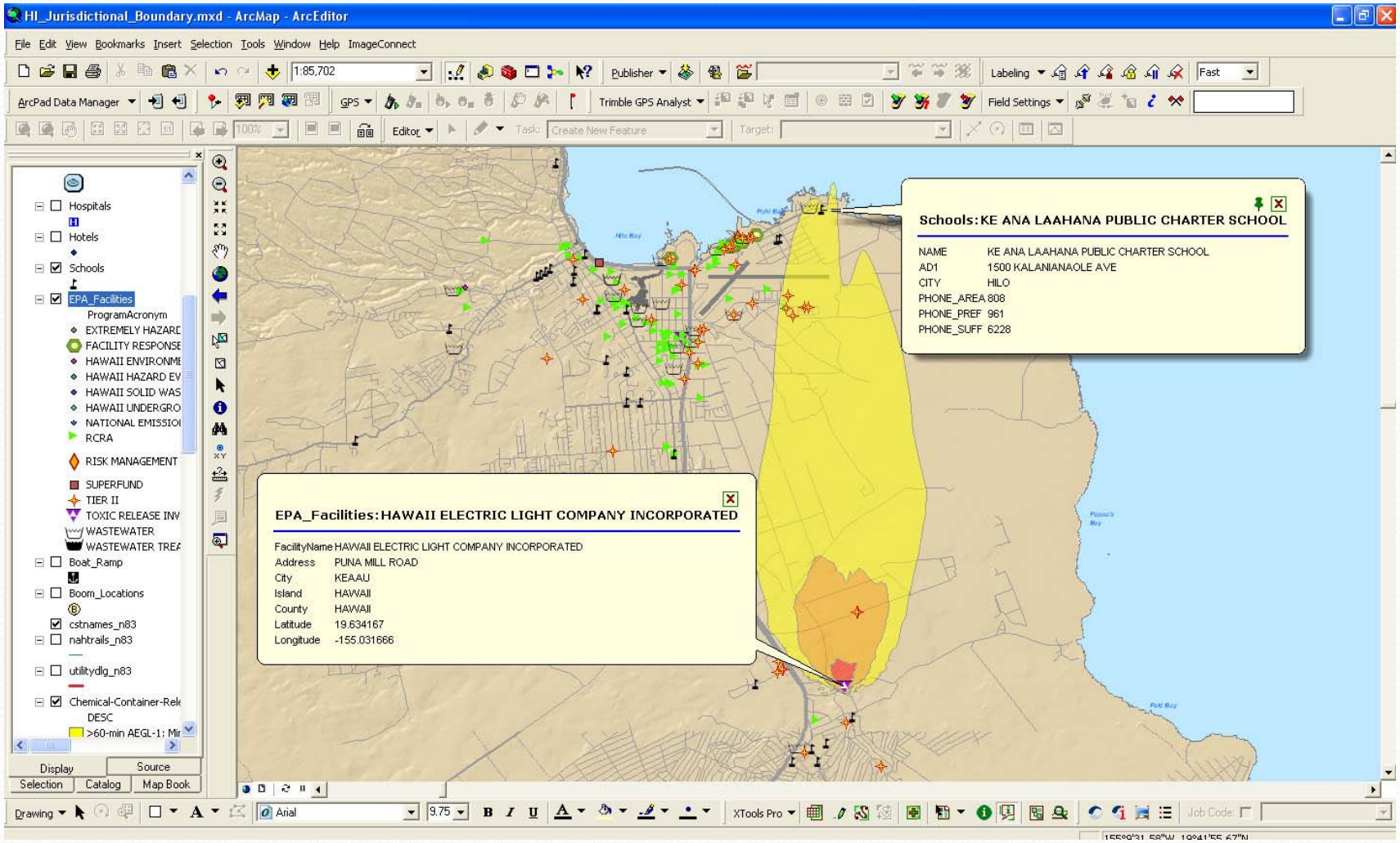
- Miscellaneous data
  - Boom locations
  - Schools
  - Hospitals
  - Land use
  - Parcels
  - Trails



Risk Analysis



Risk Analysis



Data Sources

- EPA Facility Registry System
- U.S. Geological Survey
- NOAA
- U.S. Fish & Wildlife
- HSIP Gold
- State of Hawaii
- City & County of Honolulu
- Honolulu Fire Department

Field Data Collection

- Facilities
- Boom locations
- Boat ramps/marinas
- Jurisdictional boundaries

GPS

- Trimble Nomad
  - High-performance all-in-one integrated
  - 6 GB built-in storage as standard
  - Ultra-rugged form factor
  - Integrated cellular modem option
  - Integrated digital camera and barcode s
  - Comes with a range of GIS field software solutions

ArcPad

- Perform reliable, accurate, and validated field data collection.
- Integrate GPS, rangefinders, and digital cameras into GIS data collection.
- Share enterprise data with field-workers for updating and decision making.
- Improve the productivity of GIS data collection.
- Improve the accuracy of the GIS database and make it more up to date.

ArcPad

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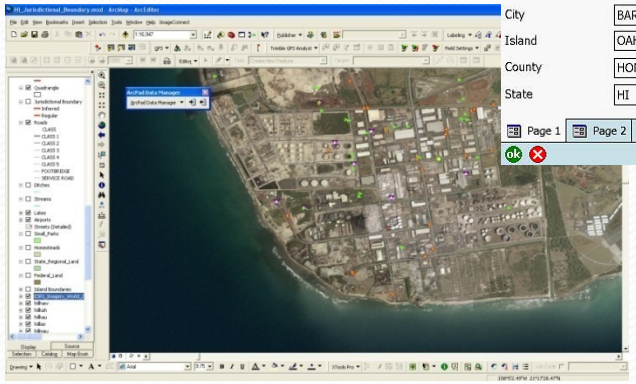

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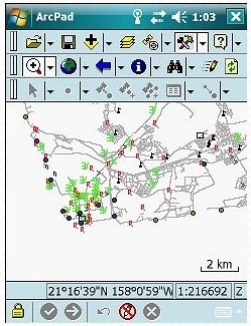

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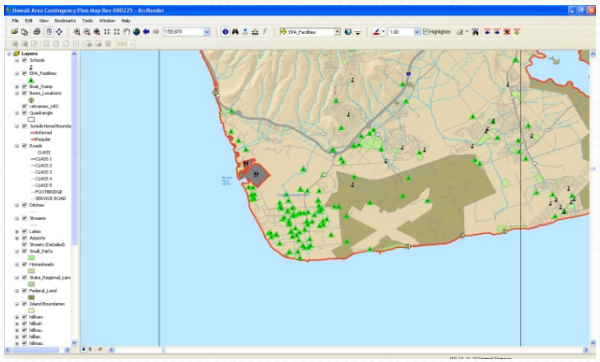


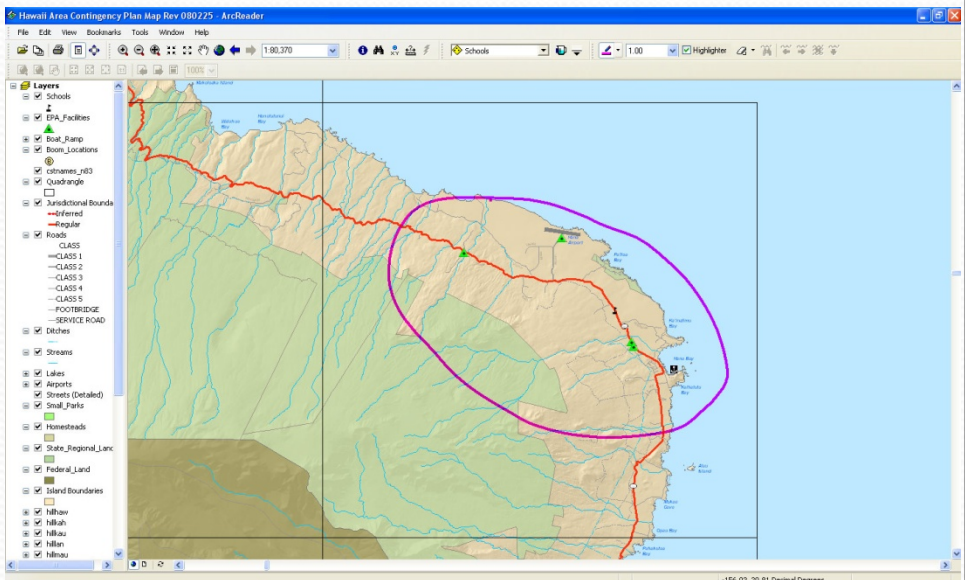
Check out data to the field

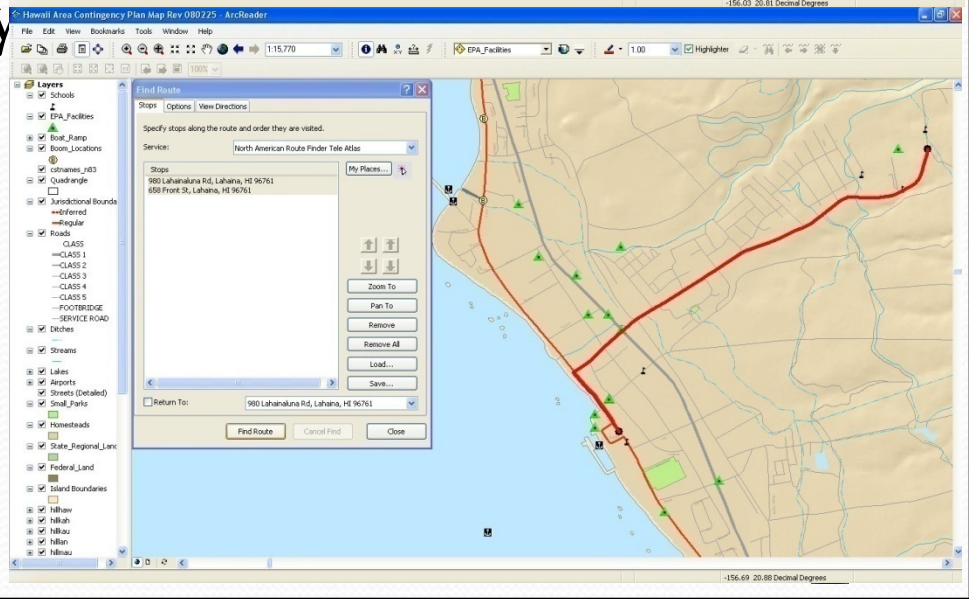
ArcReader

- View, navigate, and print published ArcGIS maps using ArcReader
- Deploy GIS data to novices and professionals alike.
- Zoom, pan, and switch between map and page layout view.
- Communicate more efficiently with the ability to graphically mark up maps.
- Print published map documents including all layer symbology and cartographic map elements on any supported printer.

General Tools

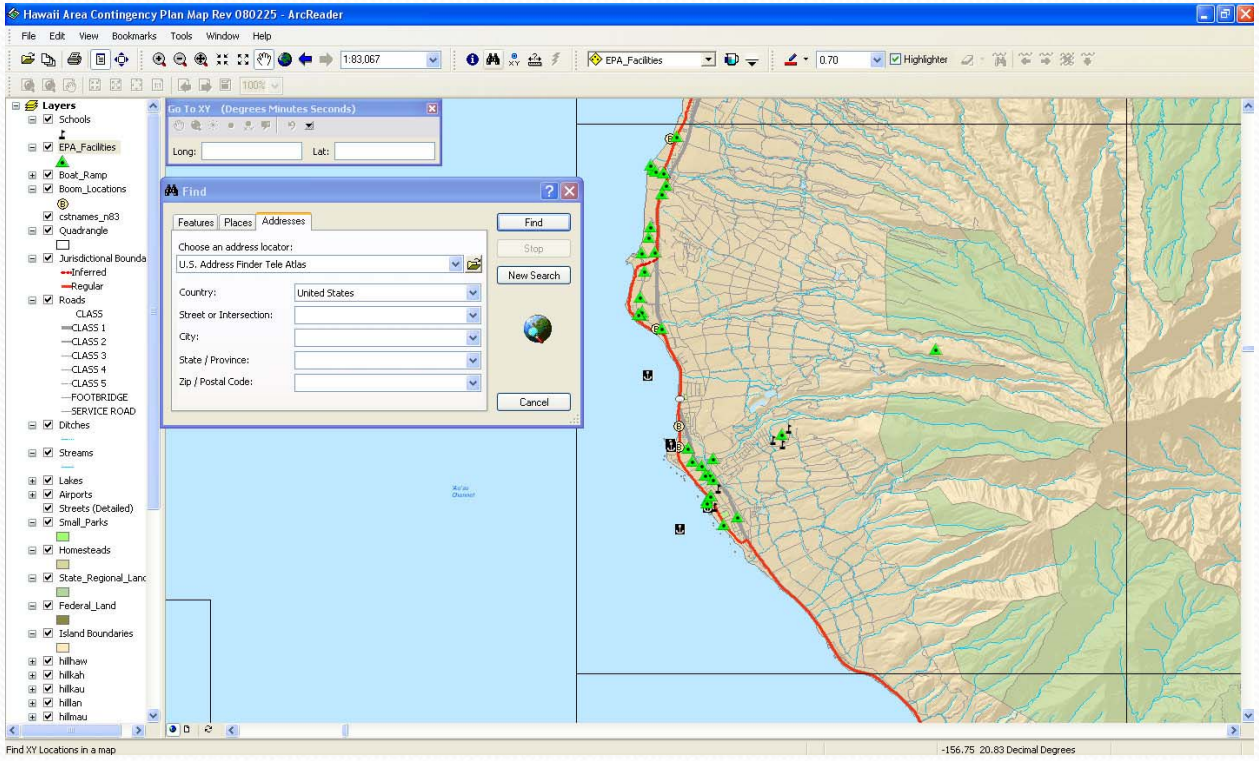
- Zoom In
- Zoom Out
- Measure
- Turn layers on and off
- Change layer transparency
- Highlight and markup
- Online services
  - Find route
  - Find nearby places



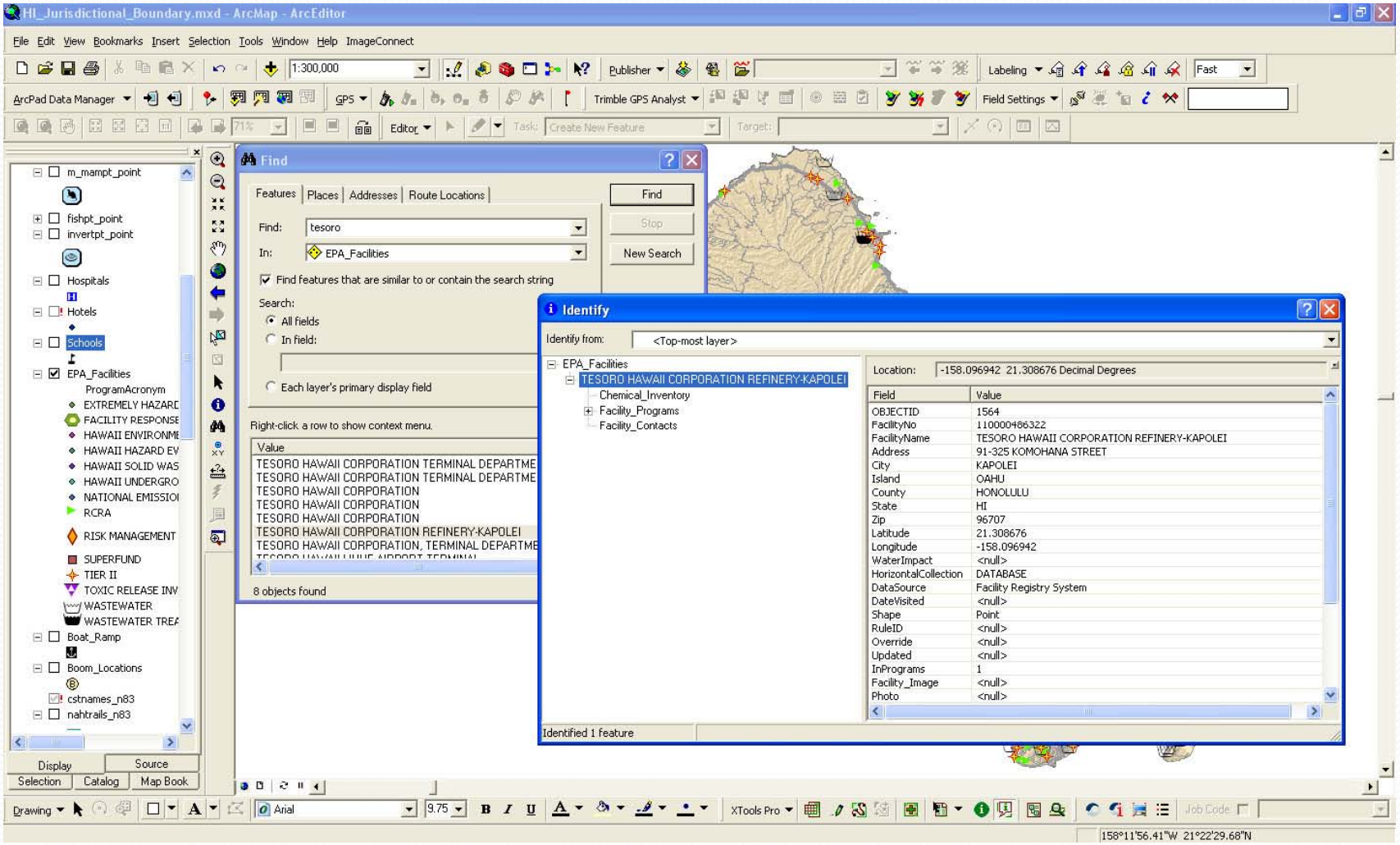


Search

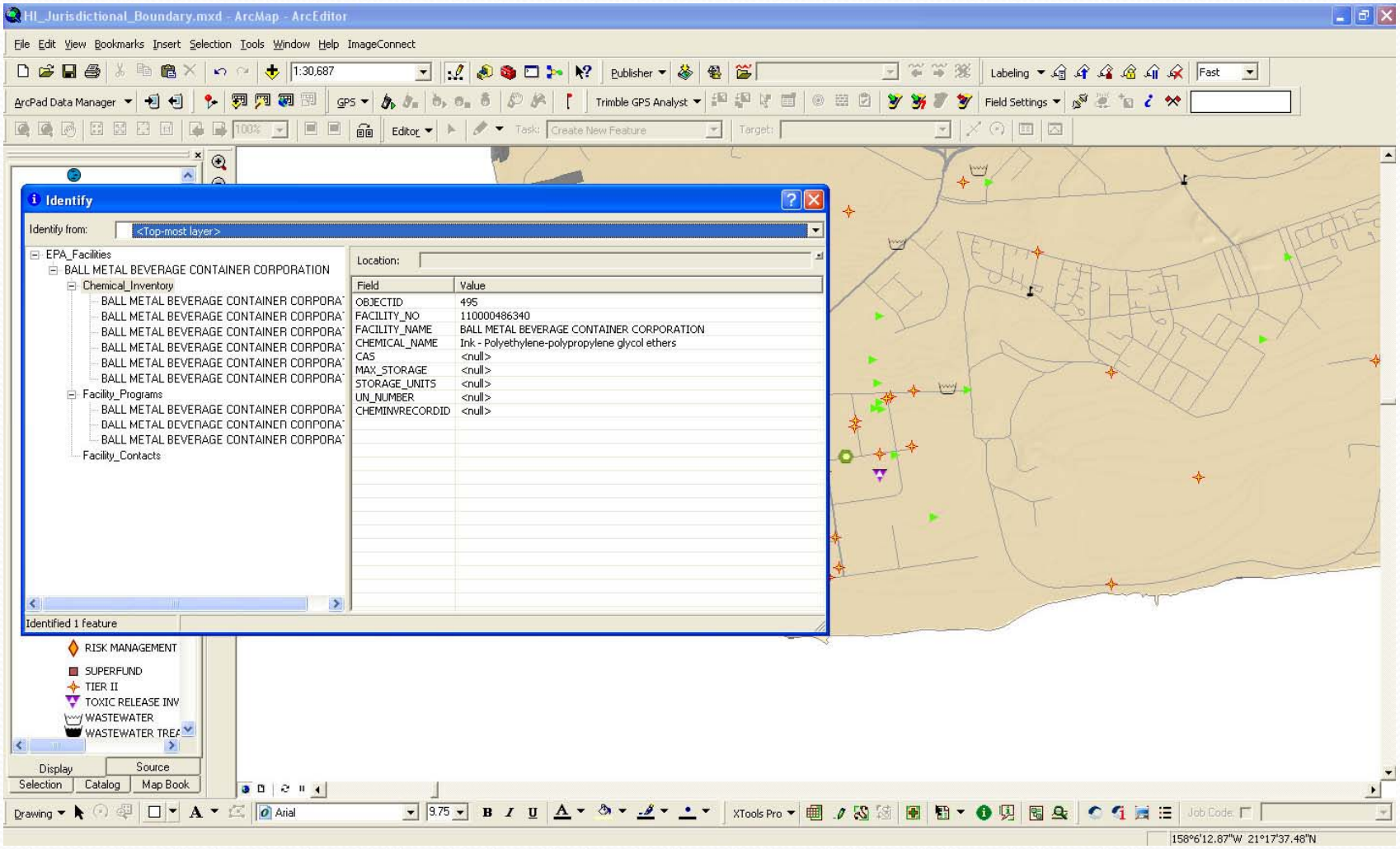
- Name
- Address
- Coordinates



Find & Identify

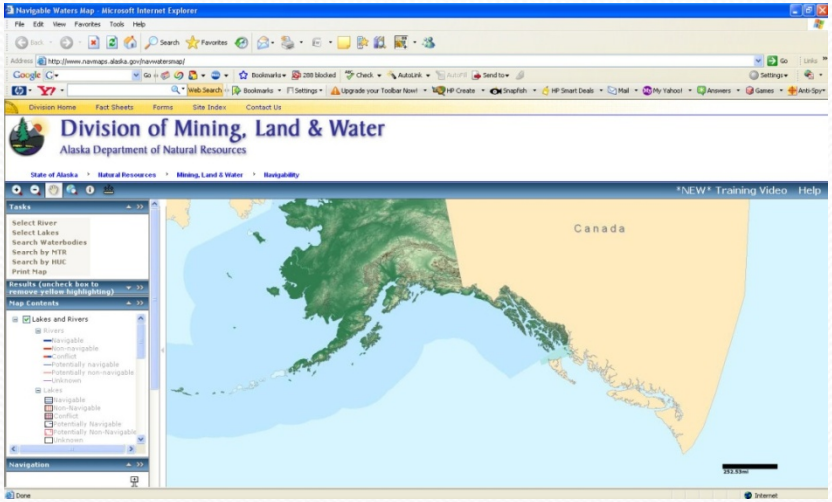


Drill Down



Future Work

- Complete jurisdictional boundary
- Ground-truth data
- ArcGIS Server



Contributors

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