

# *Integrating web based resources for national infrastructure analysis*

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# Background

- Department of Homeland Security (DHS)
  - National Infrastructure Simulation & Analysis Center (NISAC)
  - Homeland Infrastructure Threat & Risk Analysis Center (HITRAC)
- NISAC analysts assess critical infrastructure risk, vulnerability, interdependencies, and event consequences
- HITRAC manages requests for information or analyses related to national infrastructure protection
- Partnered with Sandia National Laboratories
- Provide analytical products and support to DHS decision-makers about critical national infrastructure



# Critical infrastructure

“Critical infrastructure is the backbone of our nation's economy, security and health. We know it as the power we use in our homes, the water we drink, the transportation that moves us, and the communication systems we rely on to stay in touch with friends and family.” (DHS)



# Hazards

## Natural

- hurricane • drought • earthquake • flood
- heat wave • ice storm • pandemic • tsunami • wildfire

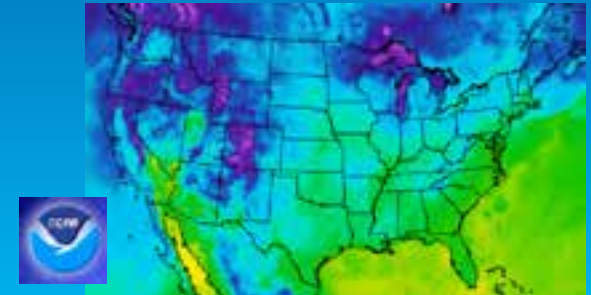
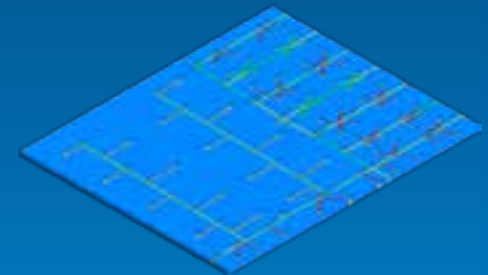
## Human-caused

- cyber • chemical • biological • explosive
- radiological • nuclear



# Web based resources

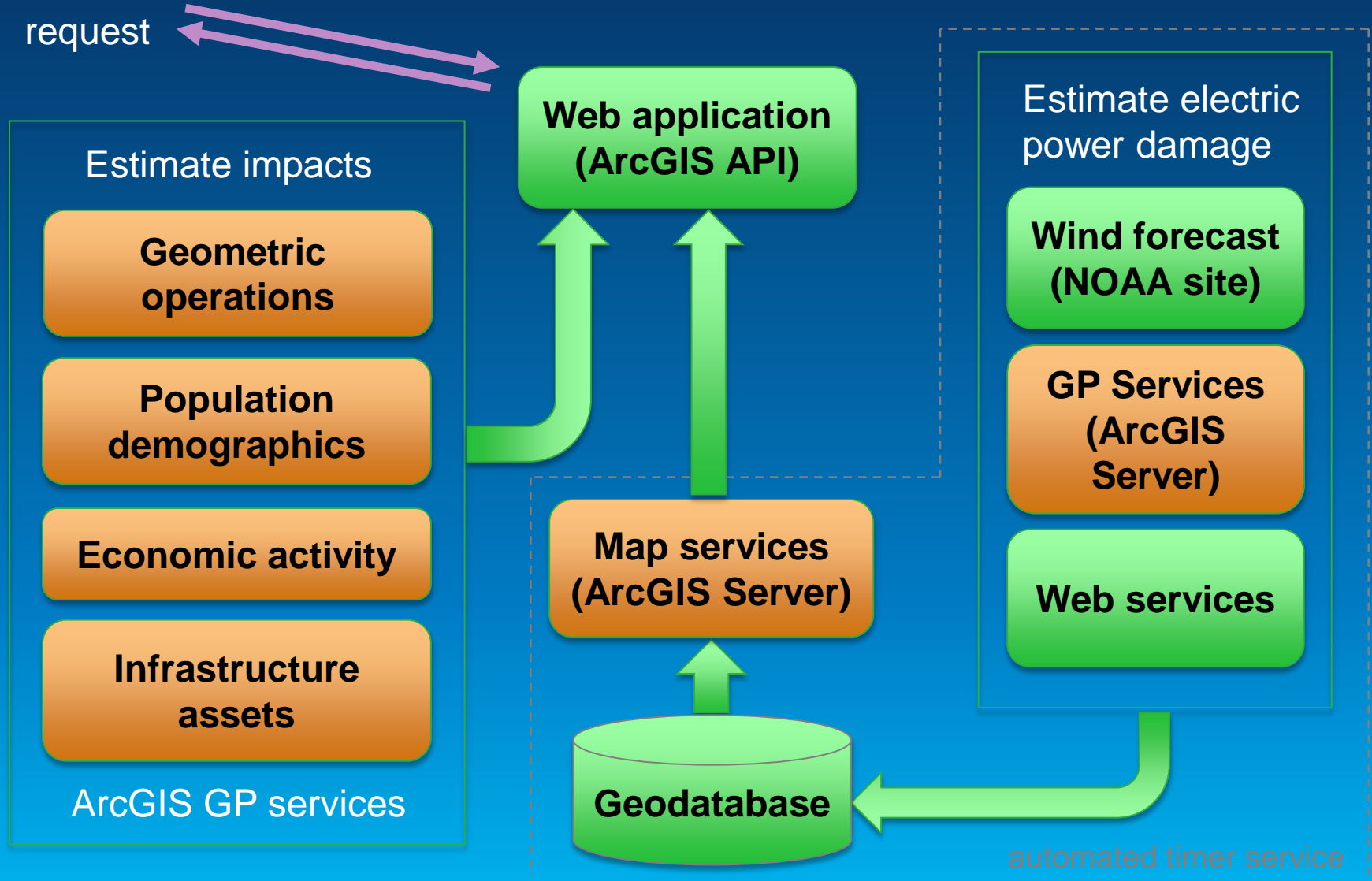
- ArcGIS Services
  - Map layers
  - Geoprocessing
    - Fundamental operations
    - Population/demographics, economic activity
    - Post-processed NOAA forecasts
- Modeling & simulation services
  - Solvers: water distribution, electric power transmission, natural gas, epidemiology, economic...
- Geospatial Data
  - Weather forecasts and observations
    - Wind, precipitation, snow/ice, radar
  - Environmental observations and models
    - Tidal gauge sensors, stream gauges



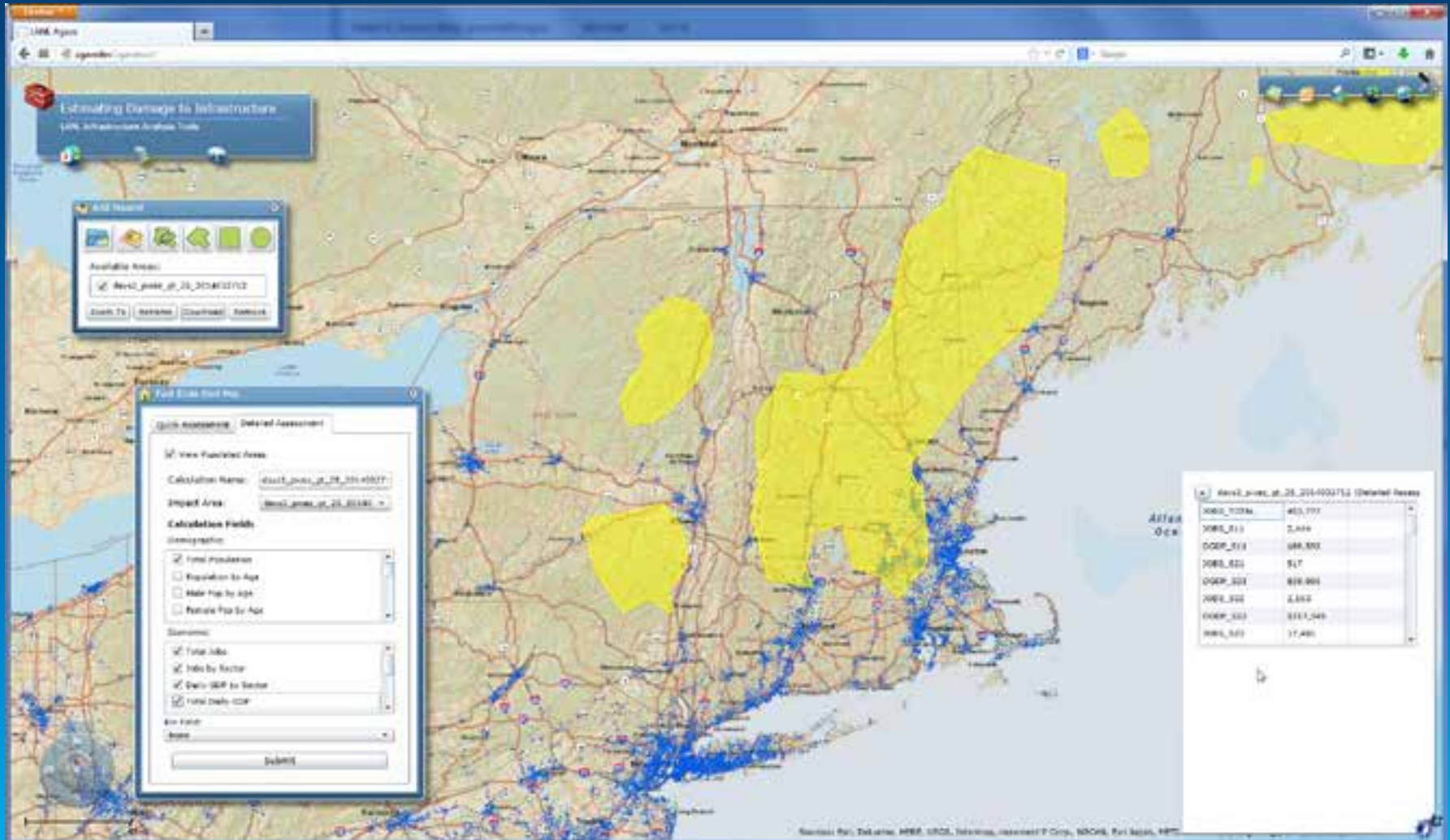


# Use case: hurricane wind impacts

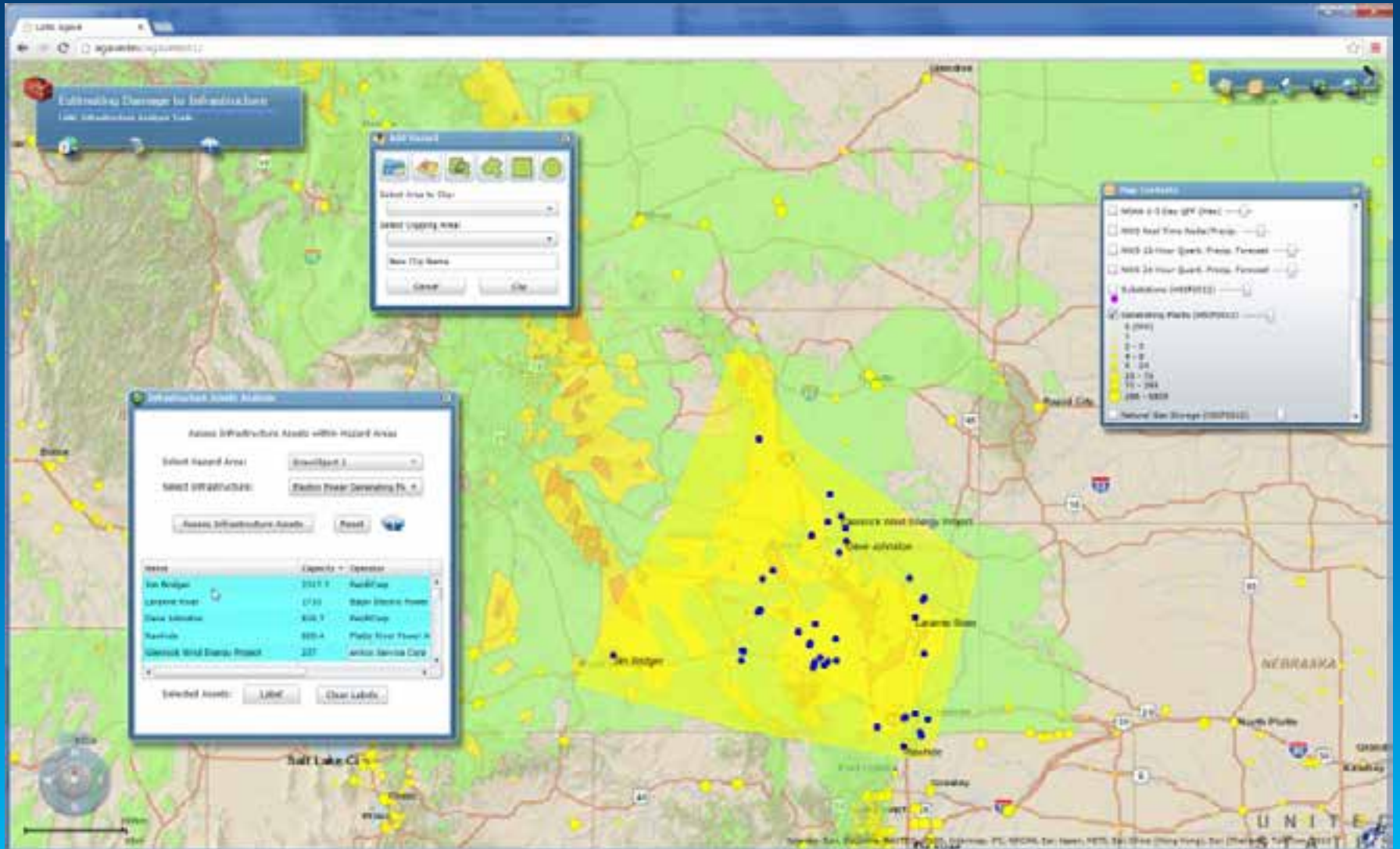
Customer request



# Applied Geospatial Analysis & Visualization Environment (AGAVE) web client

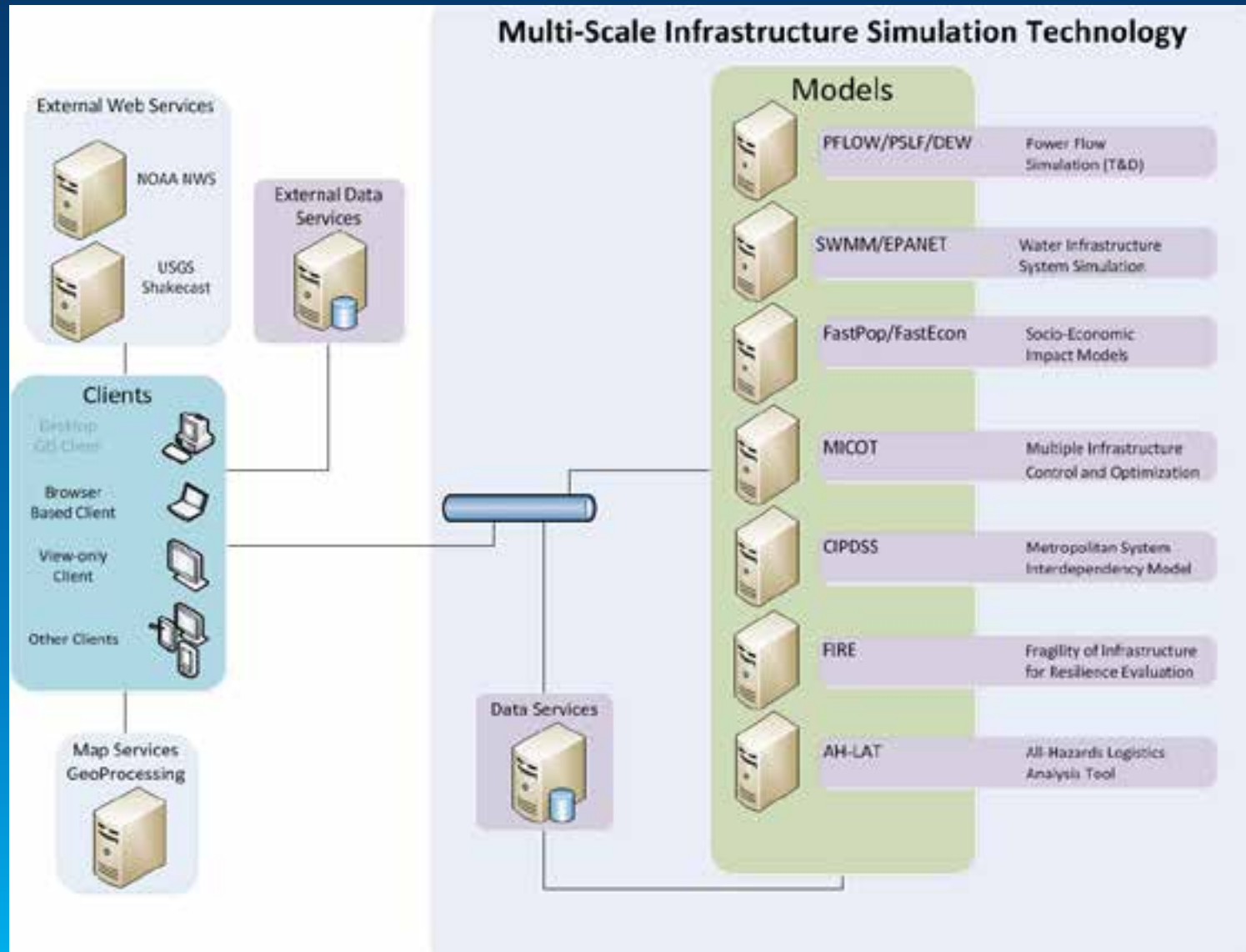


# AGAVE web client





# MIST web resource



# Technologies

- ArcGIS Server
  - Map layers
  - Geoprocessing
  - Silverlight API, JavaScript API
- Web services
  - WSDL, REST
  - Java, .Net, Apache Tomcat, IIS
- Databases
  - Oracle, MySQL, MongoDB

# Questions

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