



GeoShield Web: Journey of a Silverlight Mashup

Craig E. Oaks

ESRI Federal User Conference

February 2010

INNOVATION THROUGH EXPERIENCE



GeoShield Web

- Web-enabled geospatial mashup application focused on CBRN and Force Protection workflows.
- Rich Internet Application (RIA)
- CBRN Analysis (Chemical, Biological, Radiological & Nuclear)
 - Analyzing,
 - Defending
 - Responding
- Performance Requirements
 - Easy to Use
 - Quick to Train
 - Ready to Deploy

INNOVATION THROUGH EXPERIENCE



Project Sponsors

- Maneuver Support Center, Ft. Leonard Wood, MO
- ARDEC, Picatinny Arsenal, NJ
- iLab, Ft. Huachuca, AZ



INNOVATION THROUGH EXPERIENCE



Joint CBRN Working Group

- Subject Matter Experts (SMEs), Users & Customers
 - National Guard CIP-MAA Teams
 - Critical Infrastructure Protection – Mission Assurance Assessment
 - National Guard Civil Support Teams (CSTs)
 - USAF Force Security Unit (Lackland AFB)
 - STRATCOM
 - US Army ECBC (Edgewood Chemical Biological Command)
 - NGB (National Guard Bureau)
 - US Army ARDEC (Armament Research, Development & Engineering Center)
 - US Army MSCoE (Maneuver Support Center of Excellence)
 - US Army iLab (Intelligence Lab)
 - US Army ERDC (Engineer Research & Development Center)

INNOVATION THROUGH EXPERIENCE



Key Technologies

- Microsoft Silverlight 3.0
 - Web browser plug-in (similar to Flash)
 - Cross-platform
 - Windows, Linux, Mac
 - Cross-browser
 - Internet Explorer, Firefox, Chrome, Safari
 - Authority To Operate (ATO) on multiple DOD networks



- ESRI ArcGIS API for Silverlight
 - Features
 - Mapping
 - Geocoding
 - Geoprocessing
 - Well documented & easy to use
 - Zero deployment footprint



INNOVATION THROUGH EXPERIENCE



Mashup Components



**ArcGIS Online
Maps & Streets**



Bing Maps



IWMDT



Weather



**GeoRSS
Feeds**



**USGS Seamless
Imagery**



**ArcGIS Server
Services & Tasks**



360° Video



**Amazon
Web Services**

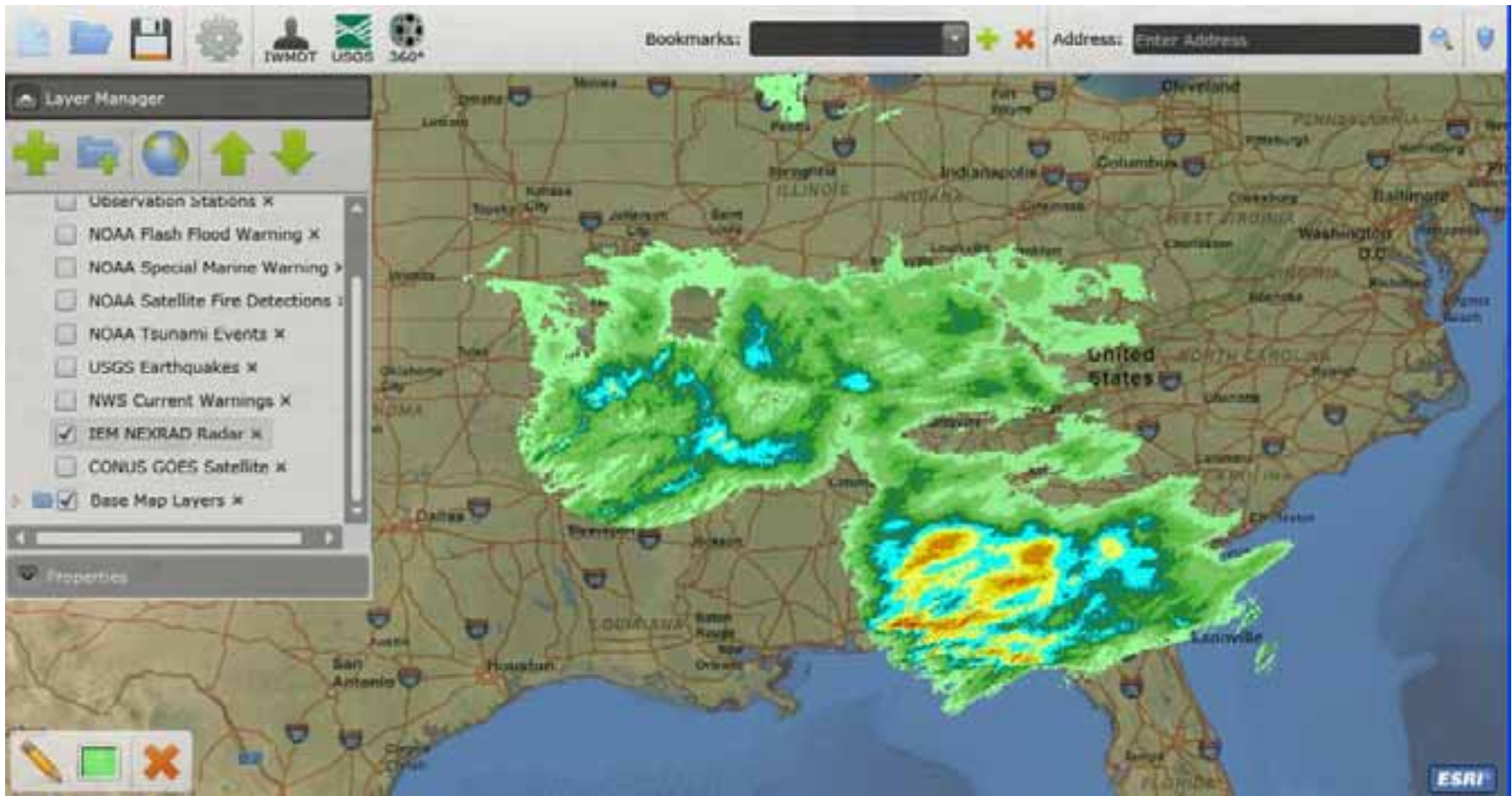


WMS

INNOVATION THROUGH EXPERIENCE



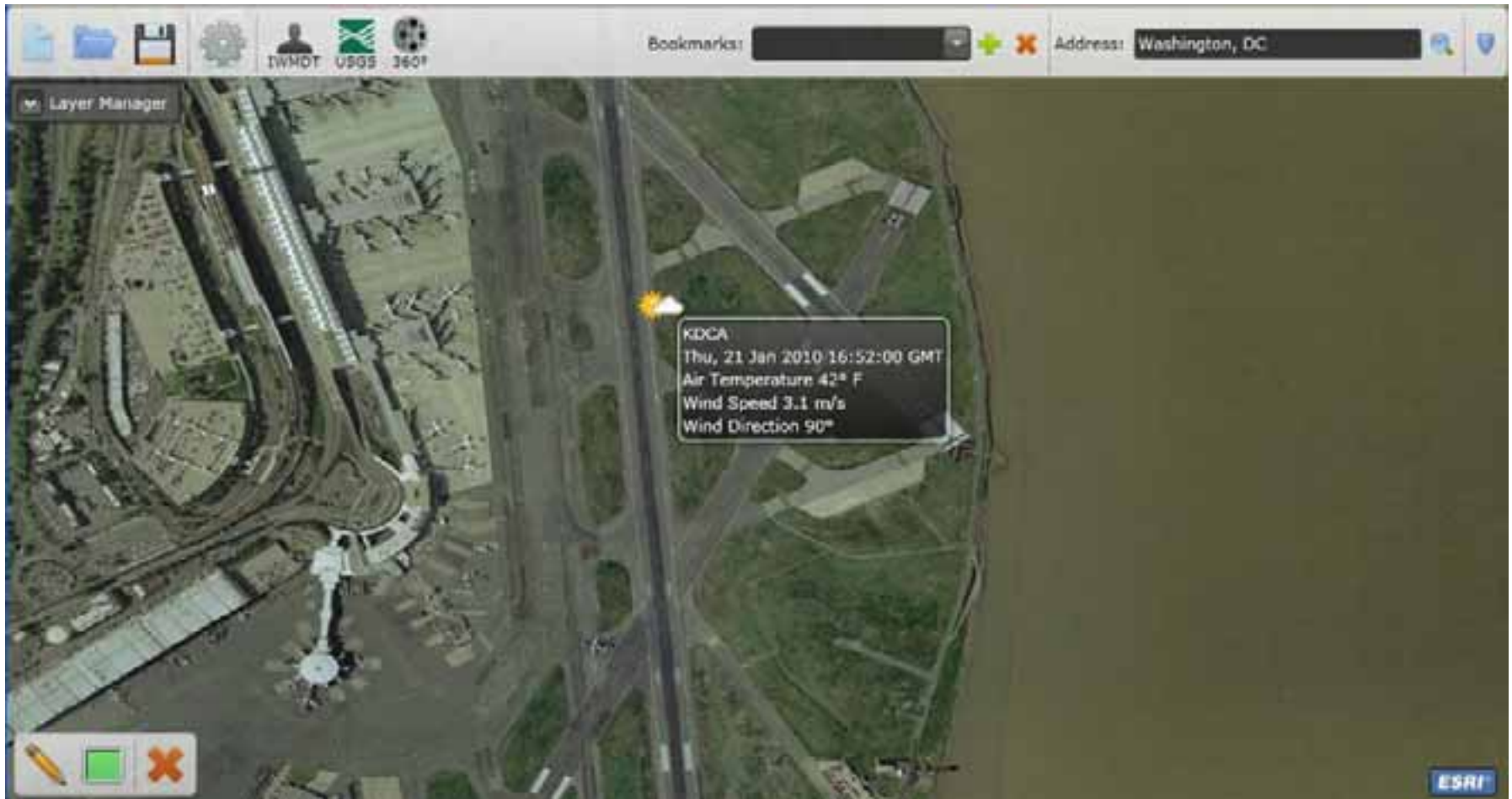
WMS Layers



INNOVATION THROUGH EXPERIENCE



JET Weather Observations



INNOVATION THROUGH EXPERIENCE



GeoRSS Feeds



INNOVATION THROUGH EXPERIENCE



IWMDT Incidents

Bookmarks: [] Address: Newark, NJ

Layer Manager Hazard Manager

Incident Name: VX Rocket Date: 1/21/2010

Latitude / Longitude: 40.696 -74.178 Select On Map Time (GMT): 16 15

Height (feet): 0 Incident Type: Chemical / Biological V

Chemical / Biological Weapon Incident Reset Defaults Create Incident

Chemical/Biological System Munition Area Factors Area Delivery System Area

Dissemination Efficiency: 89.5%

Agent Purity: 74.2%

Vapor Fraction: 0 %

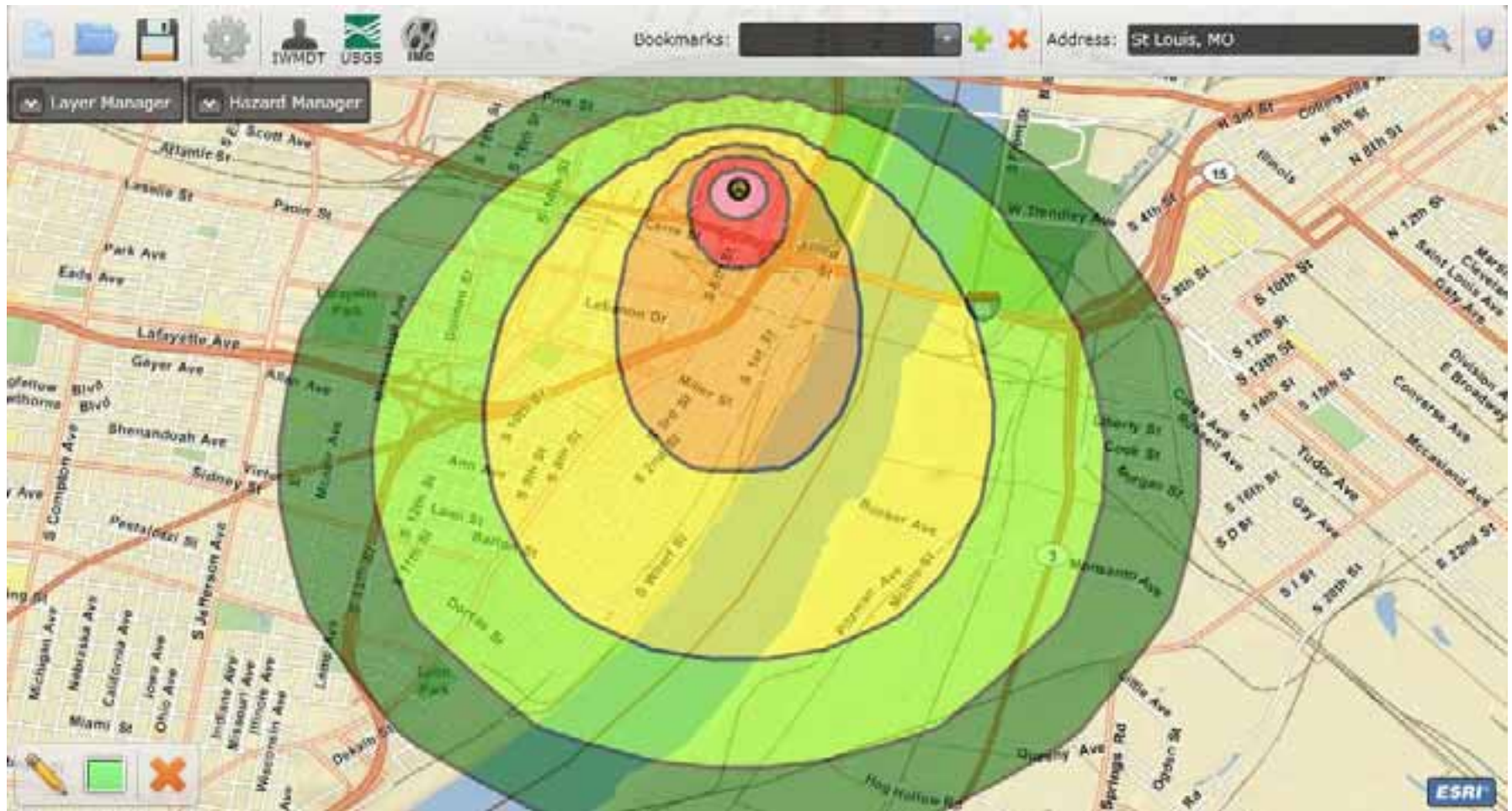
Liquid Fraction: 90 %

Release Mass: 1.43999 kg

INNOVATION THROUGH EXPERIENCE



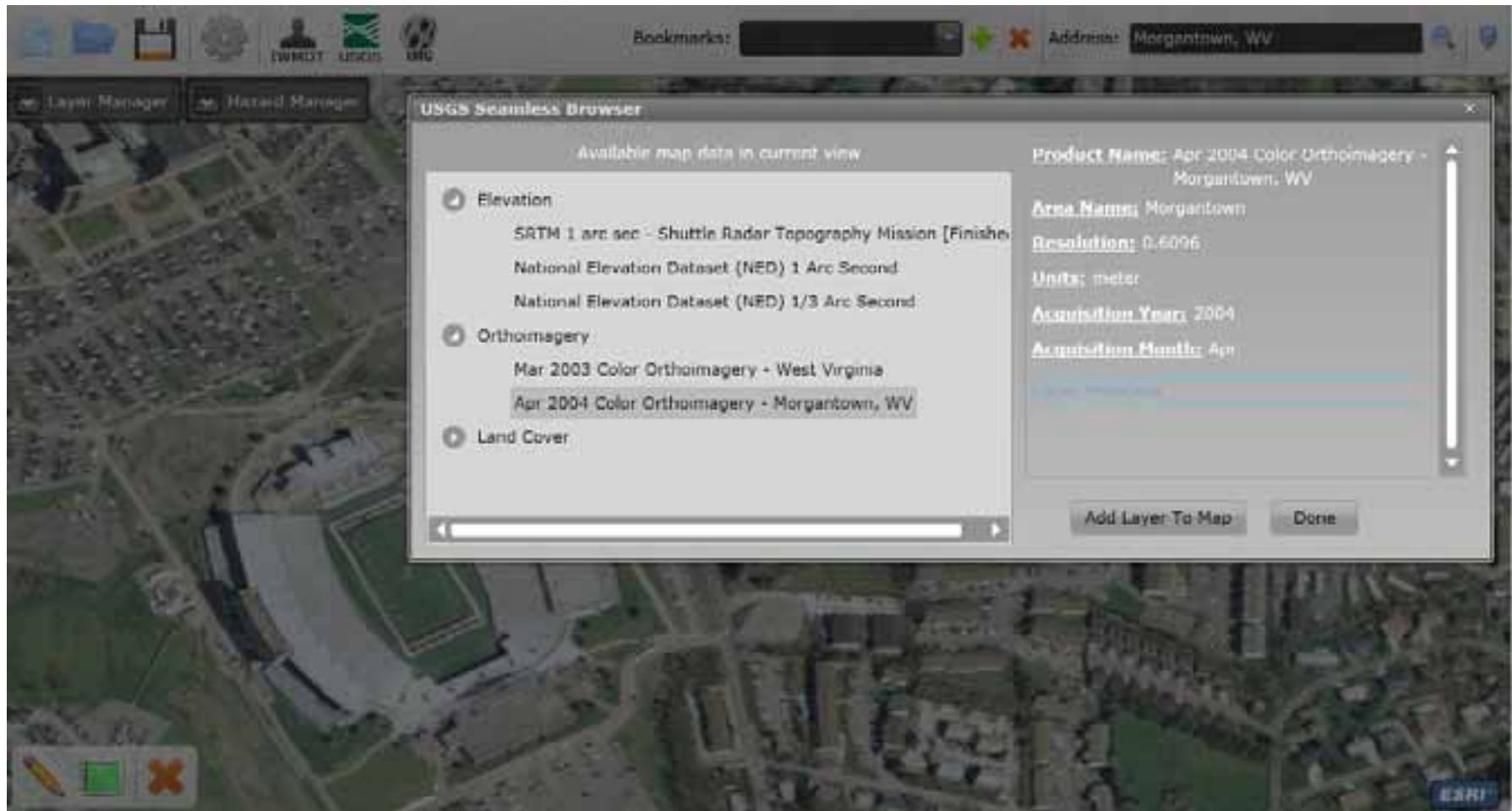
IWMDT Plumes



INNOVATION THROUGH EXPERIENCE



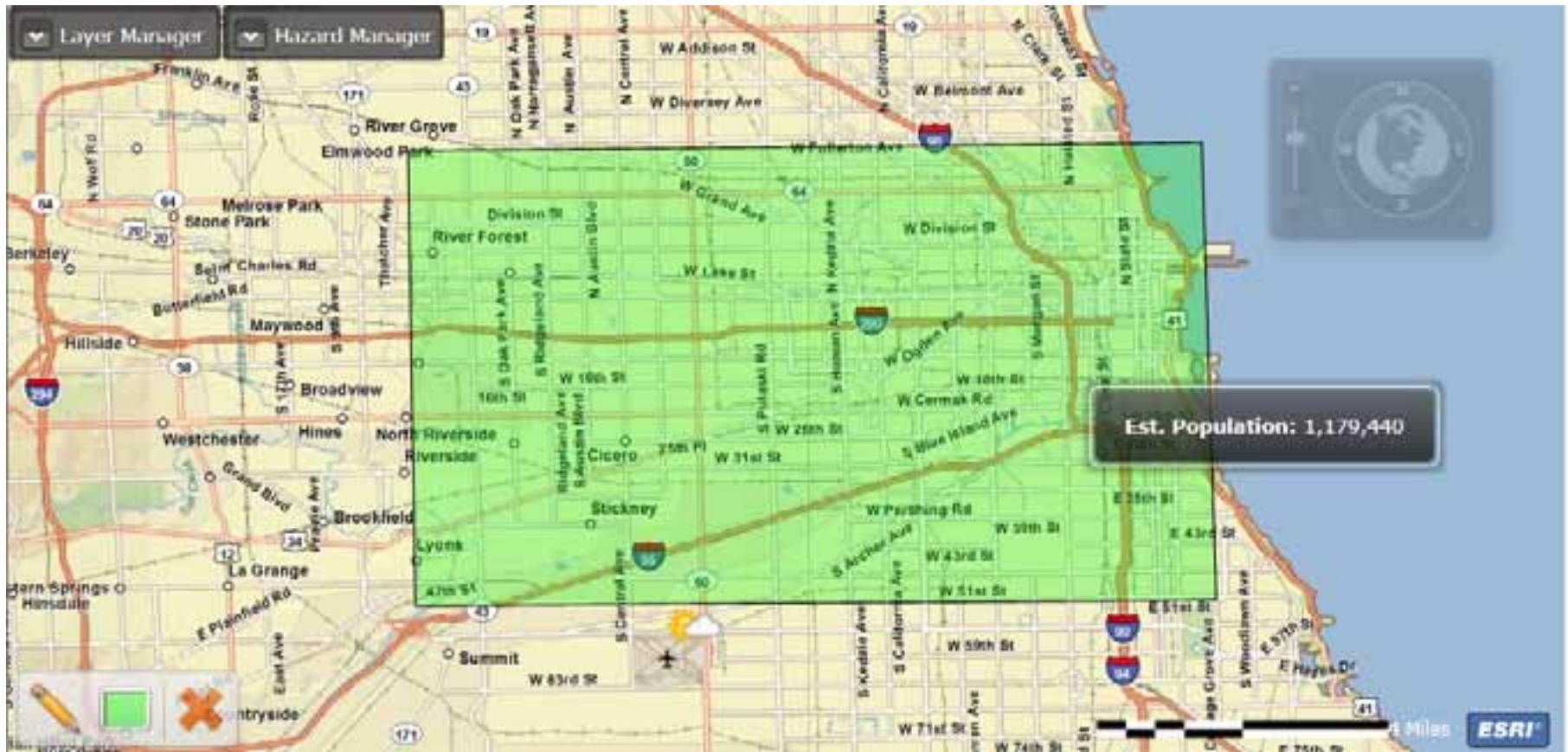
USGS Seamless Imagery



INNOVATION THROUGH EXPERIENCE



Population Geoprocessing Task



INNOVATION THROUGH EXPERIENCE



GeoImmersive Video & Services

- Street-level spherical video
- Extremely precise GPS tracking & location analysis
 - Applanix Inertial Measurement Unit (IMU)
 - Multiple GPS
- Web services to support measurement, coordinate projection and tracking of correspondence sets



INNOVATION THROUGH EXPERIENCE



GeoImmersive Viewer

- Native Flash application to view 360° GeoImmersive video
- GeoShield Web Integration
 - Wrapped Flash with a thin Silverlight user control + SDK
- **GeoShield Web result: Synchronized visualization of spherical street view video and corresponding ground tracks in GeoShield Web**
- Road network coverage published as WMS layers
- MediaStore server streams 360-degree immersive videos
- Amazon Simple Storage Service (S3) during development
 - Hous



Immersive Media Player



INNOVATION THROUGH EXPERIENCE



ArcGIS Resource Center

- Used heavily through development of GeoShield Web
 - <http://resources.esri.com/arcgisserver/apis/silverlight/>
- Interactive Silverlight SDK Samples
- API Library Reference
- Blog, Forums & Knowledge Base
- Community Code Gallery
 - Leveraged Community Samples
 - ArcGIS Server Explorer
 - GeoRSS Layers
 - Geocoding
 - Contributing Community Samples
 - Layer Manager
 - Shapefile Loader
 - Toast Notifications

INNOVATION THROUGH EXPERIENCE



SIPRNET Deployment at STRATCOM

- GeoShield Web engine modified as “GAPS Plume Tool”
- Deployed on SIPRNET at STRATCOM
 - Development servers today
- IWMDT is a key capability to STRATCOM



Next Steps

- Data Sharing & Collaboration
- Cyberspace Workflows
- Integrate Alternate CBRN Models
 - Government & Industry models
- Leverage Advanced Weather Models
- Advanced Photogrammetry
- Augmented Reality
 - 3D objects & text within GeoImmersive Video

Contact Info

Craig E. Oaks

Program Manager, BRAMA II

craig.oaks@ultra-prologic.com

724.626.0425 x241

INNOVATION THROUGH EXPERIENCE

