



GIS

The Geographic Approach for the Nation



ESRI Federal User Conference

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Implementing The National Information Exchange Model in The ArcGIS Platform

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Enforcement**

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What is NIEM

- **Federal State, Local and Tribal interagency initiative to provide a foundation for information exchange**
 - **Identify common information sharing requirements**
 - Emergency
 - Steady state
 - **Develop:**
 - Standards
 - Common lexicon
 - Repository of Information Exchange Package Documents (IEPDs)
 - **Provide technical tools to support development, discovery, dissemination and reuse of IEPDS**
 - **Provide training, technical assistance and implementation support**
- **Launched by DHS and DOJ in 2005**

Two NIEM Components

**“Common Language” for
Information Exchange**



**Built and governed by the
business users at Federal, State,
Local, Tribal and Private Sectors**

**Repeatable, reusable process for
business users to document information
exchange requirements**



What are some example NIEM Domains?

- Chemical, Biological, Radiological, Nuclear (CBRN)
- Emergency Management
- Immigration
- Infrastructure Protection
- Intelligence
- International Trade
- Justice
- Maritime
- Screening
- (Youth and) Family Services
- Geospatial (using GML)

NIEM Momentum

- **DHS adoption at 35% of Major IT programs, 60% for end of FY09**
 - FY08 focus on discrete IEPDs has increased adoption significantly
 - Measured compliance in investment review process
 - Built into Enterprise SOA Guidance and System Engineering Lifecycle
- **DOJ adoption**
 - CJIS System of Systems
 - Terrorism Screening Center (TSC)
 - FBI's Guardian
 - NDEX / One DOJ
 - Future Development of NGI
- **DOD/DNI adoption through Maritime Domain Awareness; UCore 2.0 compatibility**
- **PM ISE adoption of the TSC Terrorist Watch Listing and Suspicious Activity**
- **39 of 50 States using NIEM**
 - 39 states represent approx 75% of U.S. population
 - Mostly in Justice-oriented applications, some state wide
 - Bolstered by DOJ/DHS Grant language requiring compliance

For More information on NIEM

www.niem.gov

information@niem.gov

1-877-333-5111

1-703-726-1919

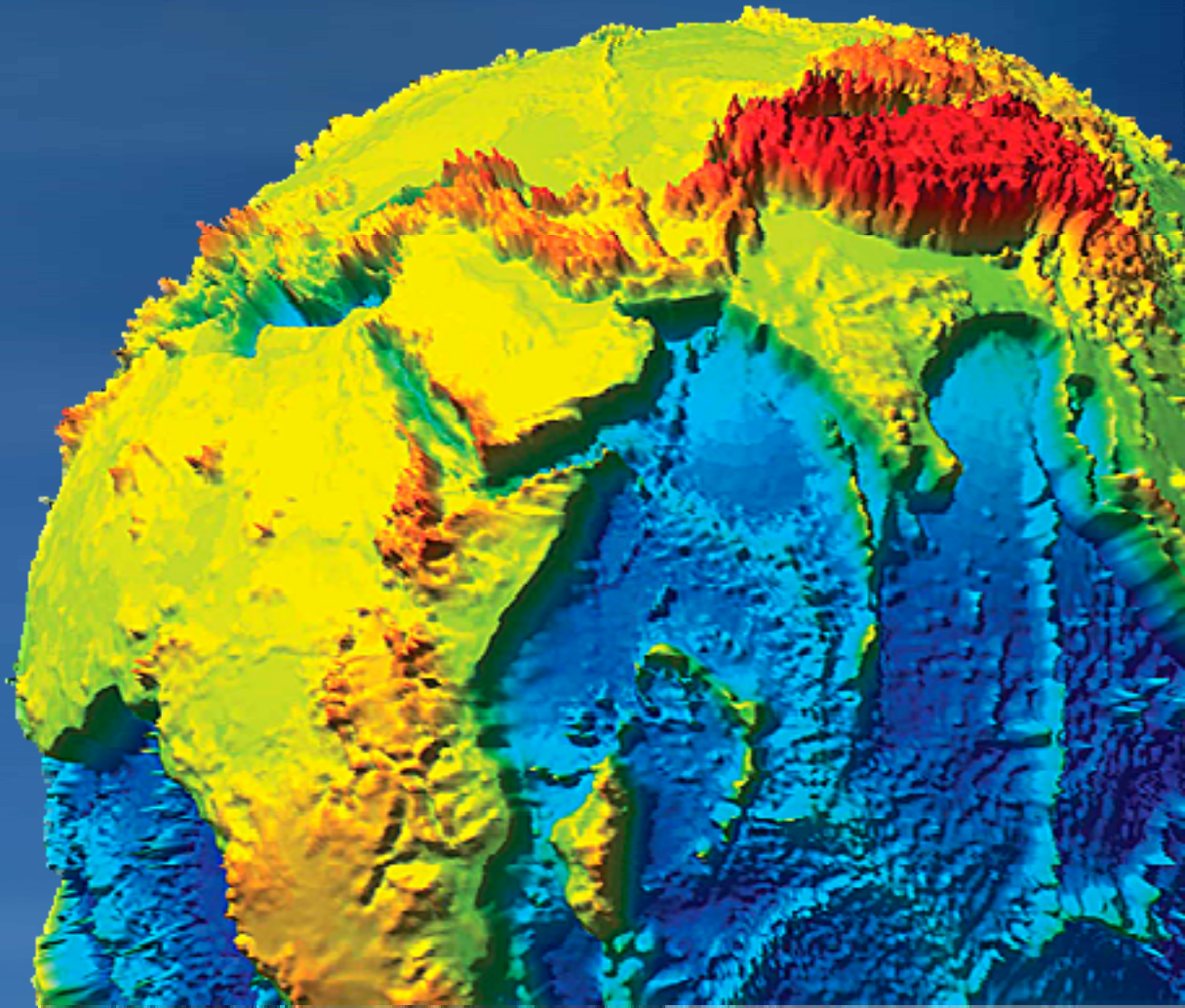


Attend NIEM Training Sessions!

Geography is the Science of Our World



- Understanding Place
 - Patterns
 - Relationships
 - Processes
- Mapping and visualizing
- Modeling



A Geographic Information System (GIS)

A GIS is a system for the **Management, Analysis, Visualization** and **Dissemination** of Geographic Information...



... for effective, timely, and efficient **collaboration, problem solving, and decision-making.**

GIS Integrates Diverse Information



... and Helps to Identify Relationships

Geoenabling SARs – beyond geocoding



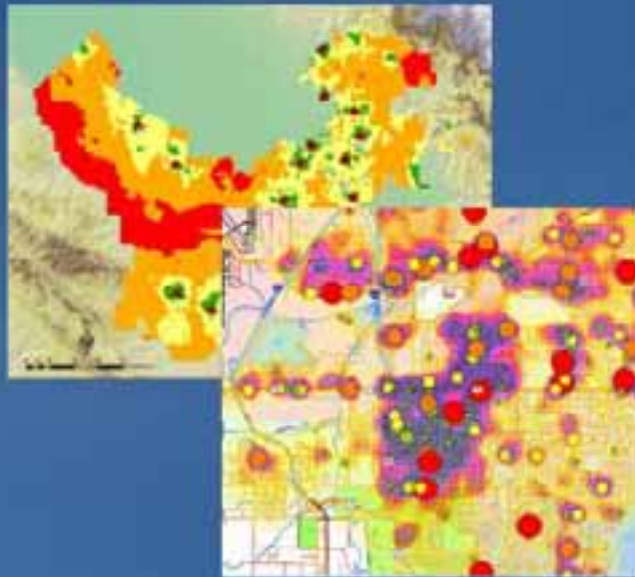
- **Data organized and managed for mission-specific applications**
 - **Analysis for decision making**
 - **Providing a common understanding of events and trends**
 - **Enabling Field Mobility, enhancing Situational Awareness**

Suspicious Activity Report IEPD

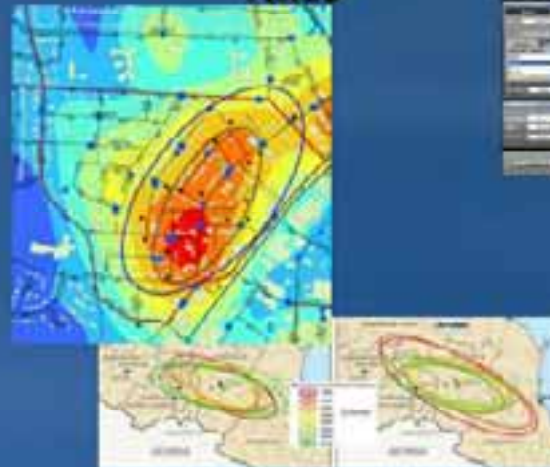
- **Suspicious Activity Report (SAR): Official documentation of observed behavior reasonably indicative of pre-operational planning related to terrorism or other criminal activity.**
- **Distinct from a tip and lead**
- **Robust IEPD**
- **At the core of some of our national security challenges**
- **User demand**

GIS Analysis for Law Enforcement and Intelligence

Fire Response
California



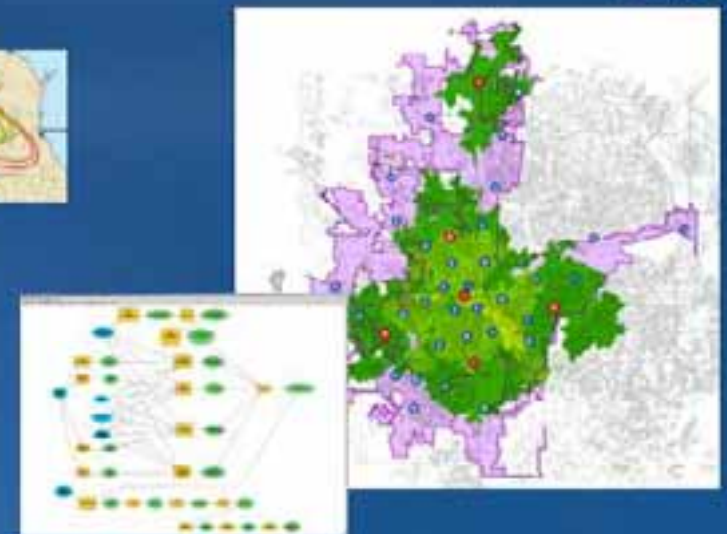
Crime Analysis
Texas



E911 / CAD
Bahrain



NEPA Response Time Model
Texas



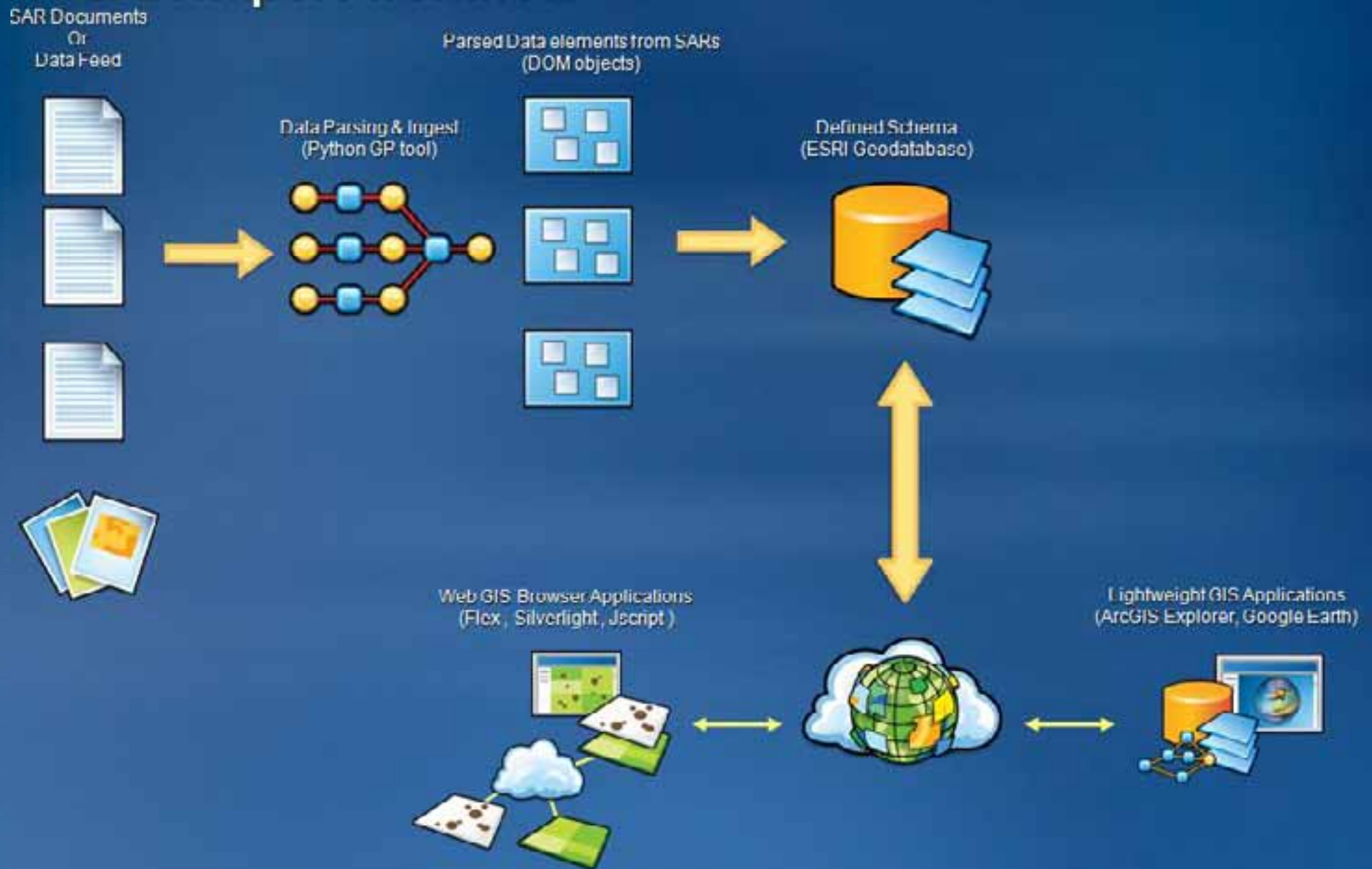


Rich Crissup

SAR IEPD Parser



SAR import workflow



Created on May 6, 2009
Richard Crissup ESRI DTC
Version 1

This tool was created to work with the example NIEM compliant SAR xml documents located in the tooldata folder that came with this tool. The goal of this script is to import most (location and people information) from a SAR and put that information into a ESRI geodatabase. This script was written to work with the schema of the scratch.gdb that came with this script. This script would need to be altered to work with another geodatabase. In the doc folder that came with this script there is more details about how this script works and the modules it uses.

Note:Code disclaimer is located in the mygpclass module

```
'''  
__author__ = 'Richard Crissup'  
__Version__ = '2.1'  
import sys  
import os  
from xml.dom import minidom  
import arcgisscripting  
#import custom gp utils...see associated mygpclass module  
from mygpclass import gp_x,geocode,GetPutLayer2Dic
```

```
<lexsdigest:EntityLocation s:id="LEXSTGTLOC1">
  <nc:Location>
    <nc:LocationTwoDimensionalGeographicCoordinate>
      <nc:GeographicCoordinateLatitude>
        <nc:LatitudeDegreeValue>47</nc:LatitudeDegreeValue>
        <nc:LatitudeMinuteValue>45</nc:LatitudeMinuteValue>
        <nc:LatitudeSecondValue>53.31</nc:LatitudeSecondValue>
      </nc:GeographicCoordinateLatitude>
      <nc:GeographicCoordinateLongitude>
        <nc:LongitudeDegreeValue>122</nc:LongitudeDegreeValue>
        <nc:LongitudeMinuteValue>19</nc:LongitudeMinuteValue>
        <nc:LongitudeSecondValue>24.04</nc:LongitudeSecondValue>
      </nc:GeographicCoordinateLongitude>
    </nc:LocationTwoDimensionalGeographicCoordinate>
  </nc:Location>
</lexsdigest:EntityLocation>
```

```
<lexsdigest:EntityLocation s:id="LEXSTGTLOC1">
  <nc:Location>
    <nc:LocationAddress>
      <nc:StructuredAddress>
        <nc:LocationStreet>
          <nc:StreetNumberText>2411</nc:StreetNumberText>
          <nc:StreetName>Alaskan Way</nc:StreetName>
        </nc:LocationStreet>
        <nc:LocationCityName>Seattle</nc:LocationCityName>
        <nc:LocationStateName>WA</nc:LocationStateName>
        <nc:LocationPostalCode>98121</nc:LocationPostalCode>
      </nc:StructuredAddress>
    </nc:LocationAddress>
  </nc:Location>
</lexsdigest:EntityLocation>
```

```

def handleLoc(location_element):
    '''handleLoc(Dom Location element) -> (x,y) coordinates WGS84
    If the location is an address then it is geocoded from ArcGIS online
    This is done via the geocode module in mygpclass.
    '''
    children = location_element.childNodes
    for child in children:
        if child.nodeName == "nc:LocationTwoDimensionalGeographicCoordinate":
            loc = (handleLocGeoCoord(child))
            xcoords = (loc[0],loc[1],loc[2])
            x = my_gp.xConvertDMStoDD(xcoords)
            ycoords = (loc[3],loc[4],loc[5])
            y = my_gp.xConvertDMStoDD(ycoords)
            loc = -x,y #-x assume USA western hemisphere
        elif child.nodeName == "nc:LocationAddress":
            loc = (handleLocAddress(child))
            #make dic for geocoding
            dic = {}
            dic['Address']=loc[0]
            dic['City']= loc[1]
            dic['State']= loc[2]
            dic['Zip']= loc[3]
            dic['Country']='USA'
            my_gp.xPrint("                Geocoding Address from ArcGIS Online...")
            result = g_code.getLocation(dic)
            my_gp.xPrint("                Geocoding Complete...")
            #get the highest score x,y
            print 'result is ' + str(result)
            if result == None:
                my_gp.xError("Error - Could not Geocode the Address...")
            else:
                x = result[1][2]
                y = result[1][3]
                loc = float(x),float(y)
        else:
            pass
    return loc

```



Demonstration

A GIS enables your information

- A system for the **Management, Analysis, Visualization**
- and **Dissemination** of Geographic Information...
- **Management**
 - SAR import
- **Analysis**
 - Clusters, temporal, query, bomb standoff tools
- **Visualization and Dissemination**
 - Web Viewer (COP), ArcGIS Explorer

Next Steps

- Data model for law enforcement intelligence
 - Working with customers
 - Working with other analytical engines
- Sample parser on ESRI Resources Pages
 - <http://resources.esri.com/gateway/index.cfm>
 - Starting point for your own IEPD parser
- Pilot projects in fusion centers
 - 3 states ... implemented in 2010.

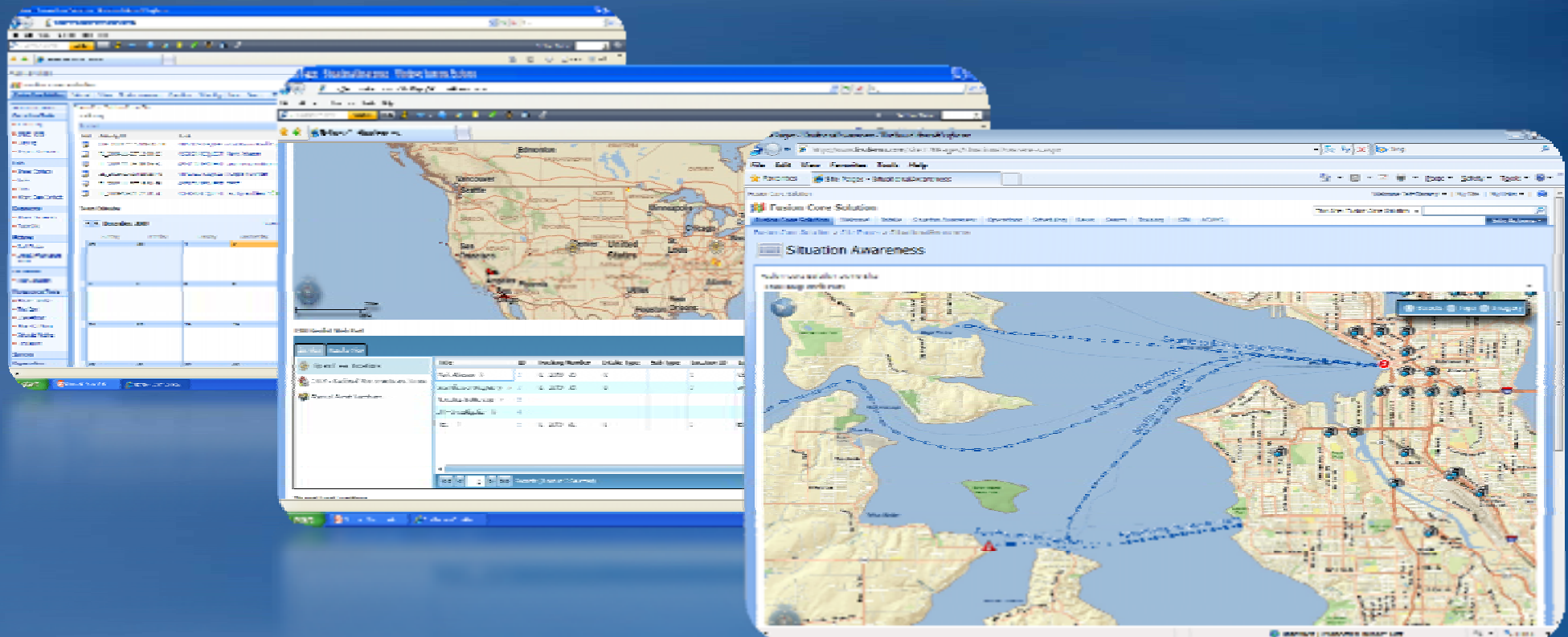
GIS for Intelligence Centers



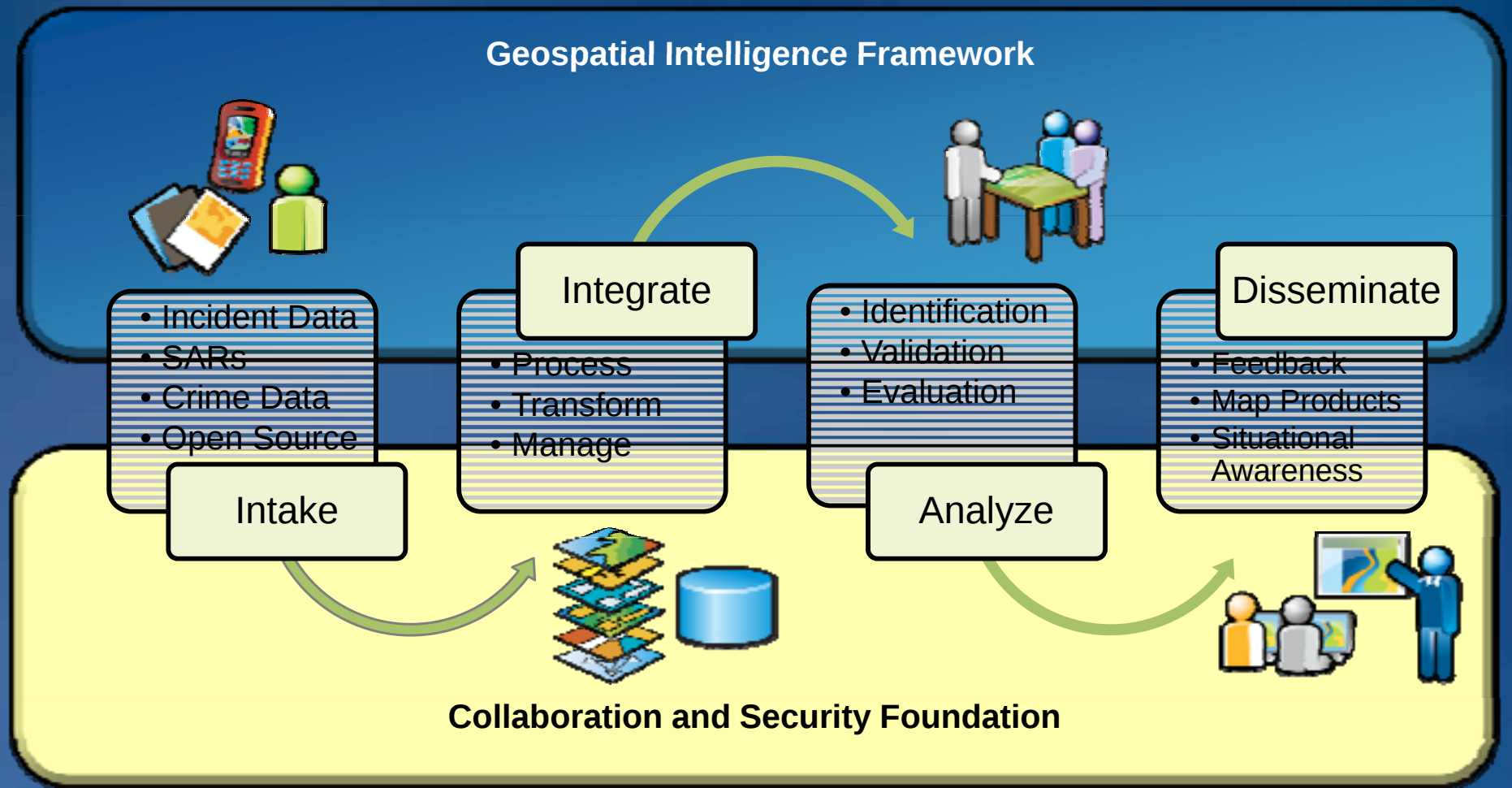
Fusion Core Solution

ESRI and Microsoft Working Together

- Create collaboration
- Leverage existing databases
- Use NIEM (National Information Exchange Model)
- Develop Security



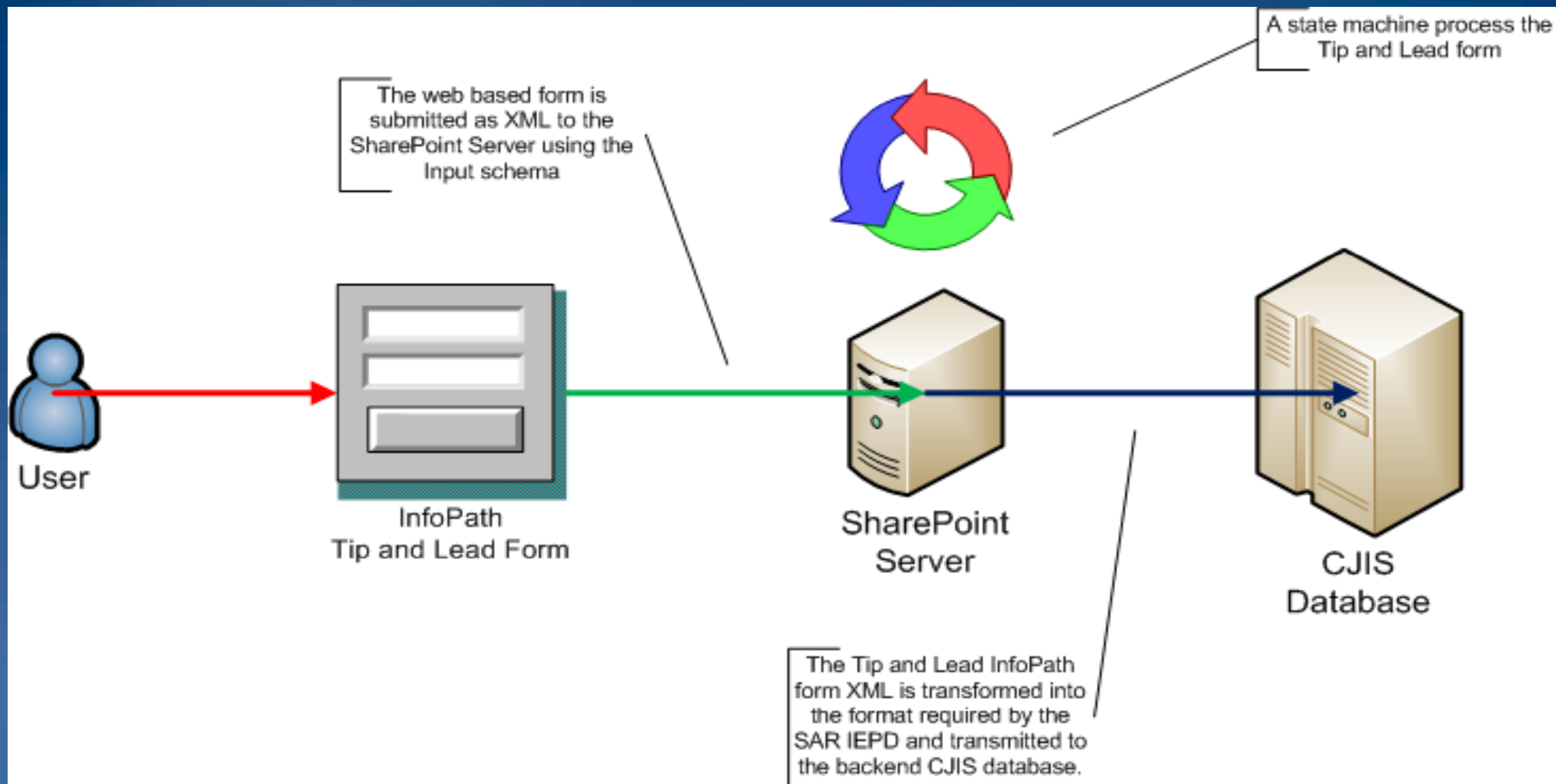
Fusion Center Workflow



Approach Used

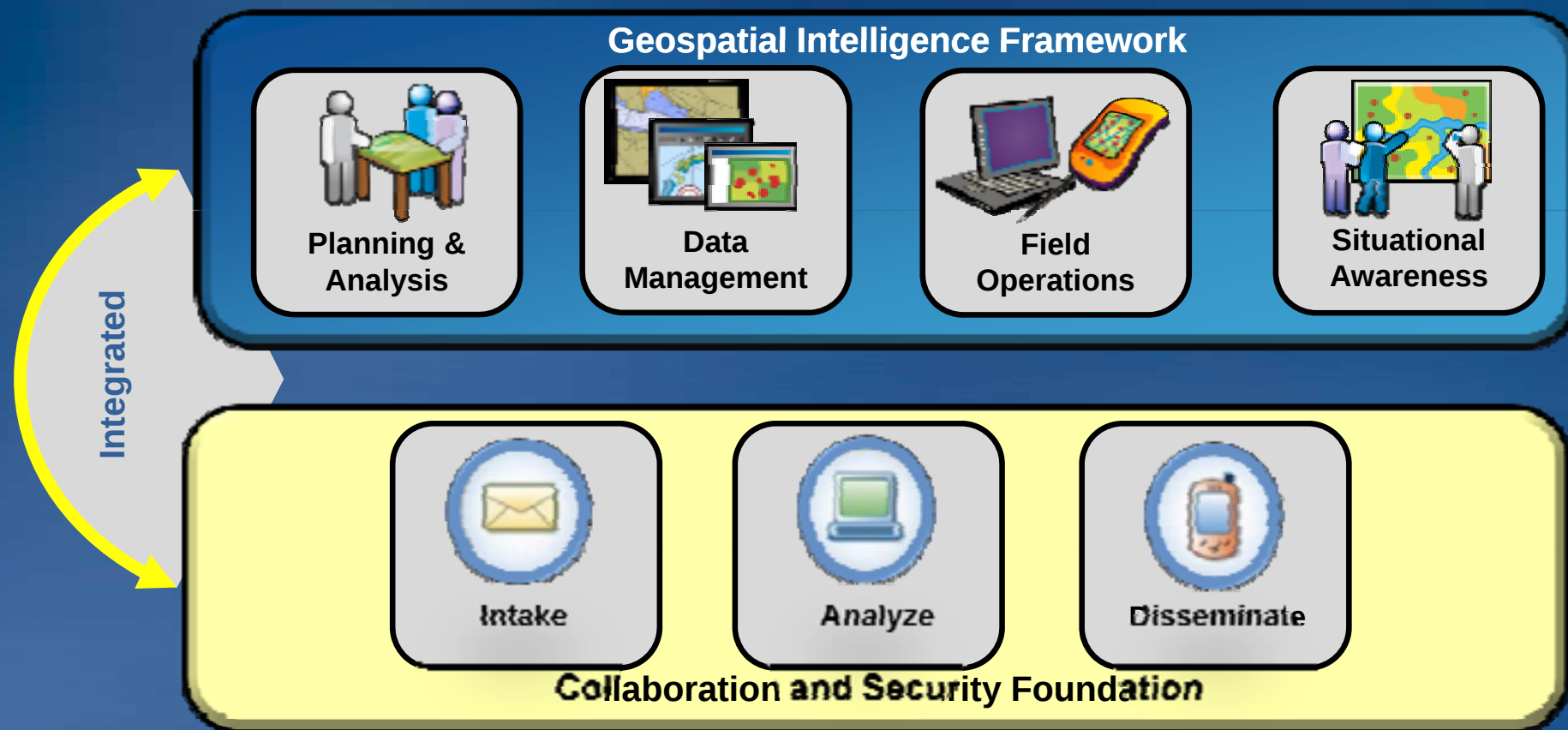
- **Steps**
 - Start with SAR IEPD for State and Local Entities 1.1
 - Use the SAR component mapping table (CMT)
 - Build input schema using the CMT source element
 - Source elements defined using NIEM types
- **Reasoning**
 - The SAR IEPD models almost all of the entities that I needed
 - No need to run through the SSGT tool myself
 - CMT source element names make sense to business users

Information Flow



Fusion Core Solution

Repeatable and Referenceable Solution Architecture



Fusion Core Solution

Preconfigured SharePoint Workflow and Forms

The screenshot shows the Fusion Core Solution interface within a Windows Internet Explorer browser window. The address bar displays the URL: <http://10.10.10.10:10000/FusionCoreSolution/Default.aspx>. The browser's menu bar includes File, Edit, View, Favorites, Tools, and Help. The toolbar contains various icons for navigation and actions. The page title is "Fusion Core Solution".

The interface features a navigation sidebar on the left with the following sections:

- View All Site Content**
- Operations Tools**
 - Activity Log
 - Intake Tasks
 - Duty Log
 - Request Summaries
- Lists**
 - Shared Contacts
 - Tasks
 - Links
 - Military Desc Contacts
- Documents**
 - Shared Documents
 - FusionWiki
- Phone**
 - Staff Phone
 - Call All Information from phone
- Discussion**
 - Team Discussion
- Management Tools**
 - Master Calendar
 - Time Card
 - Whereabouts
 - Phone Call Memo
 - Schedule Meeting
 - Circulations
- Services**
 - Organization

The main content area is titled "Fusion Core Solution Demo Site" and includes a "Task Log" section. The task log table is as follows:

Edit	Activity ID	Task	Assigned To	Task Status
	GIS_2009-11-17T18:12:14	ANALYZE REQUEST: Get Super Bowl Maps	Daniel Atkins - (Analyst)	Open
	TL_2009-11-23T12:00:23	ASSIGN REQUEST: Mark Atkeson	Daniel Atkins - (Watch Officer)	Open
	TL_2009-11-25T08:16:52	ASSIGN REQUEST: suspicious photography	(Watch Officer)	Open
	SE_2009-11-25T18:10:48	ANALYZE REQUEST: Captain Duncan	Daniel Atkins - (Analyst)	Open
	TL_2009-11-30T16:31:56	ASSIGN REQUEST: TEST	(Watch Officer)	Open
	TL_2009-12-01T22:34:58	ASSIGN REQUEST: test tip and lead 1 new	(Watch Officer)	Open

Below the task log is a "Team Calendar" for December 2009. The calendar shows days of the week (Sunday through Saturday) and dates (1 through 26). The 1st of December is highlighted in orange.

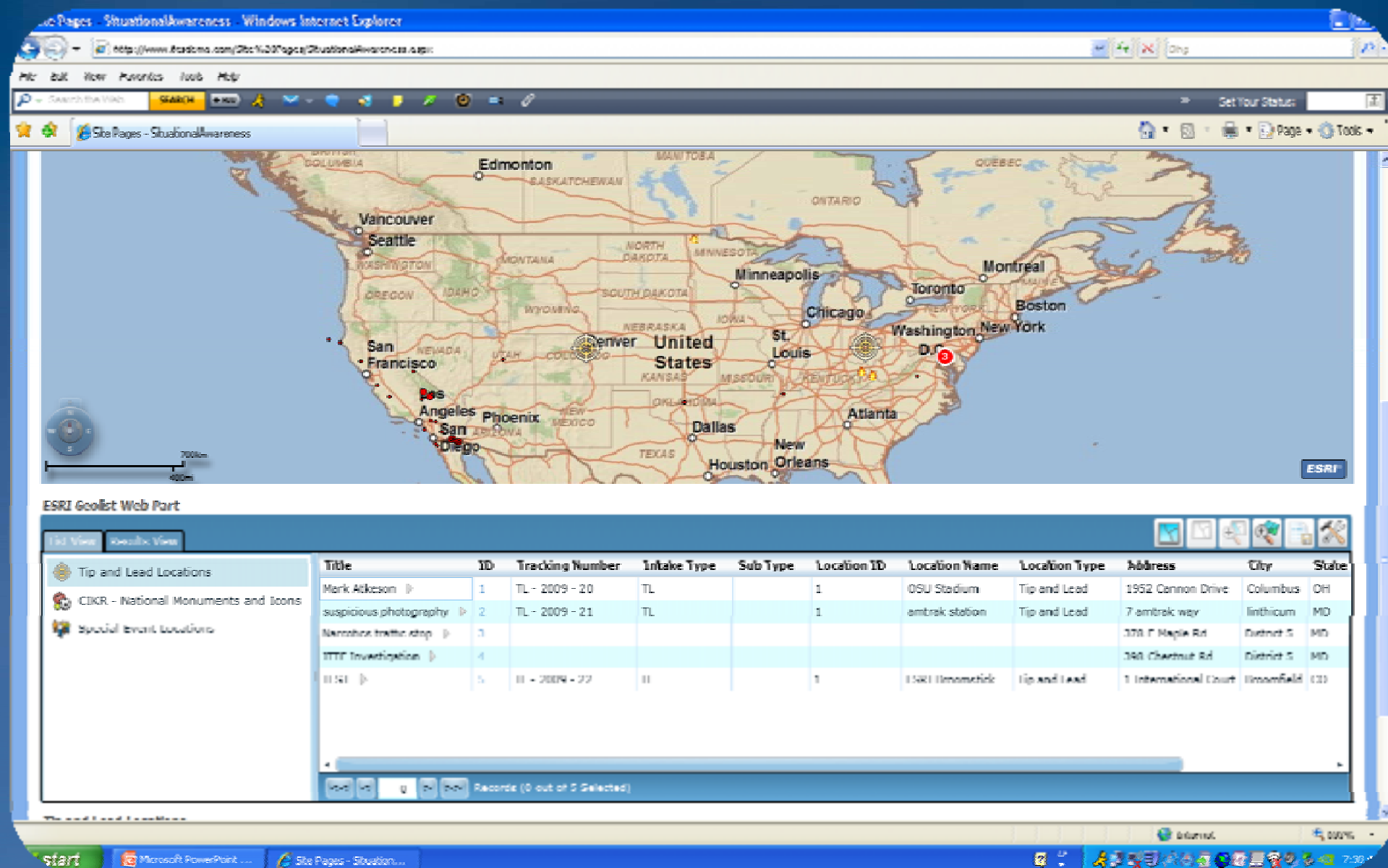
On the right side of the interface, there is a "Welcome to Fusion Core Solution Demo Site" section with a photo of two people in a meeting. Below this is a "New Content" section stating "There are currently no What's New items to display." and an "Announcements" section with three entries:

- Utah State Pilot Deployment** (11/25/2009 9:42 AM by Chuck George): Fusion Core Solution is deployed and operational at the Utah Statewide Information and Analysis Center (SIAC). This marks the first official full Fusion Core Solution deployment in the U.S. All State of Nevada is the delivery partner leading the...
- Fusion Core Solution Briefed to San Bernardino Sheriff** (10/21/2009 1:01 PM by Chuck George): On Tuesday, October 20th, Andy Minors, the Sheriff, from San Bernardino and his deputy sheriff members of the Nevada State Sheriff's Association of Fusion Core Solution.
- WSIC Pilot Install Begins** (10/07/2009 2:47 PM by Chuck George): On September 29th, Matt Deane of Advantage Factory began deployment of Fusion Core Solution to the Washington State Fusion Center (WSFC). This marks the first of many planned installations of SharePoint and ArcGIS capabilities to aid fusion centers...

At the bottom of the page, there is a "Duty Log Punch Card" section with the text "Please punch in:" and a dropdown menu showing "Intake Officer".

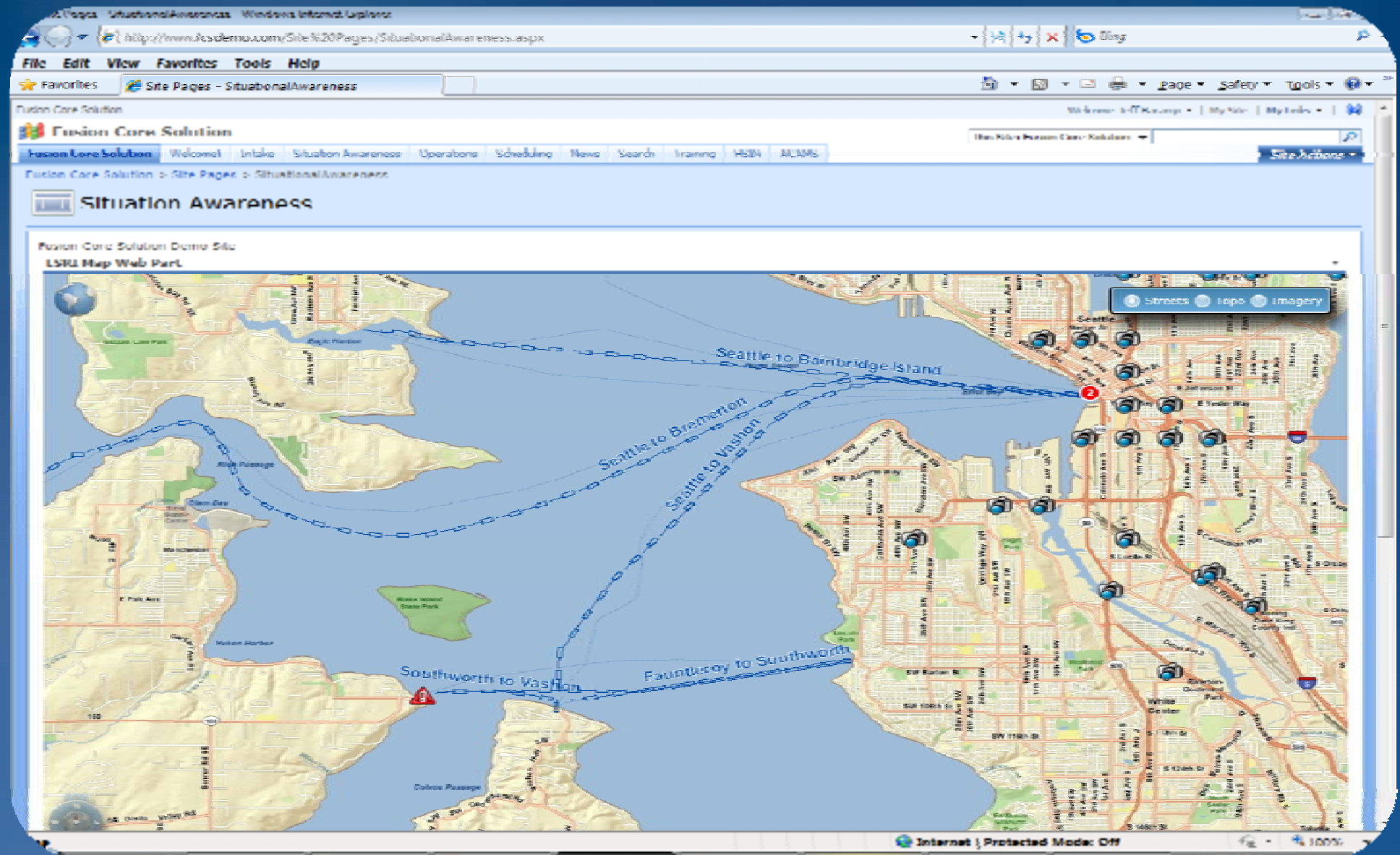
Fusion Core Solution

Integrated Geospatial Analytics and Visualization



Fusion Core Solution

Access and Use Disparate Data Source





Demonstration

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