Plenary Session

May 2, 2007

GIS:
More Than a Map - *Better Decisions in the Front Office*

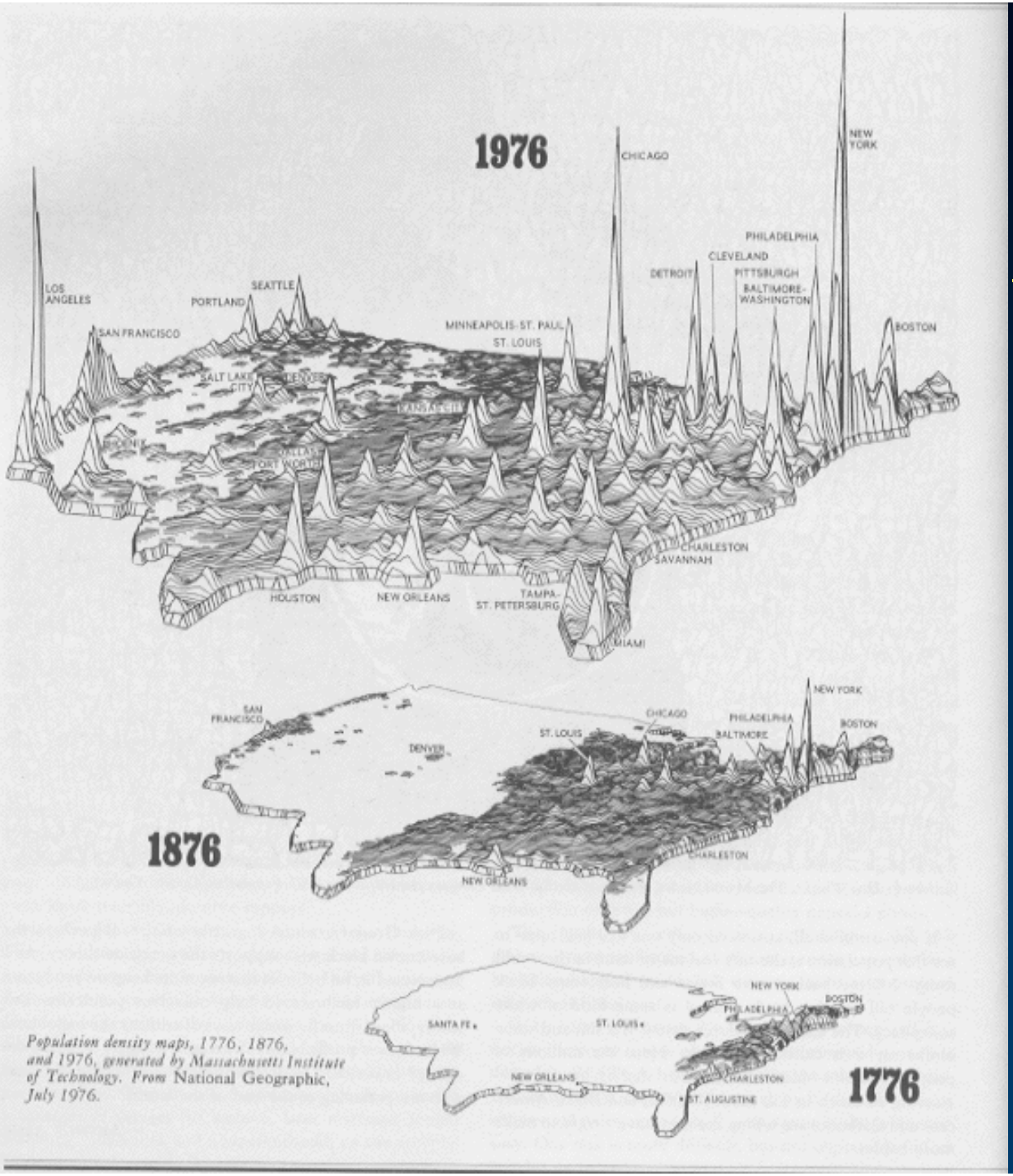
Jim Geringer

ESRI

Wyoming Governor 1995-2003

Wyoming

ESRI



Population density maps, 1776, 1876, and 1976, generated by Massachusetts Institute of Technology. From National Geographic, *July 1976.*

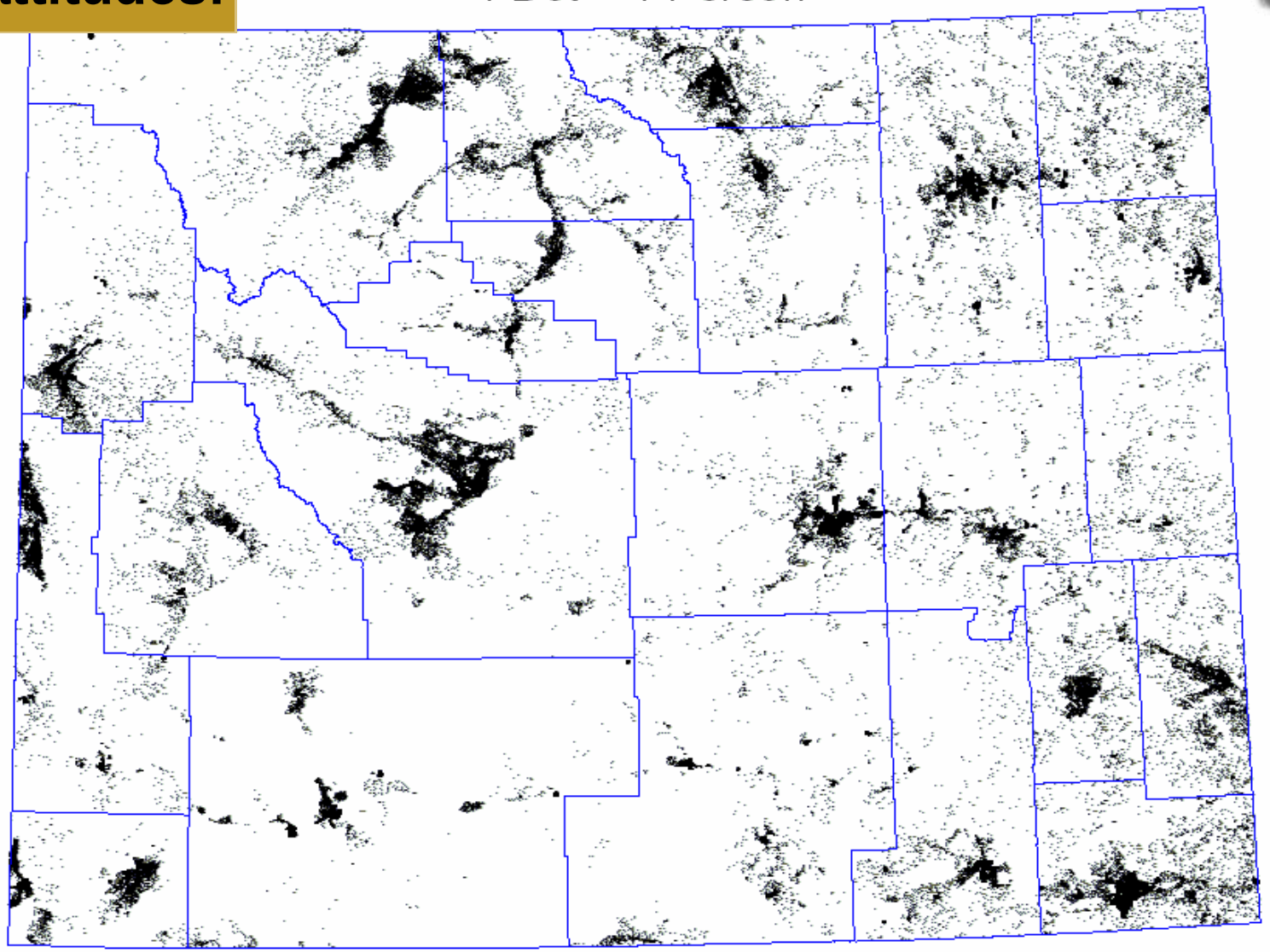
U.S. population density in 1776, 1876, and 1976


Society for Keeping Everybody East of the Mississippi (SKEEM)
Community: A Sense of Place
The Power of a Picture
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

High Altitudes, low multitudes, great attitudes!

Wyoming 1990 Population

1 Dot = 1 Person



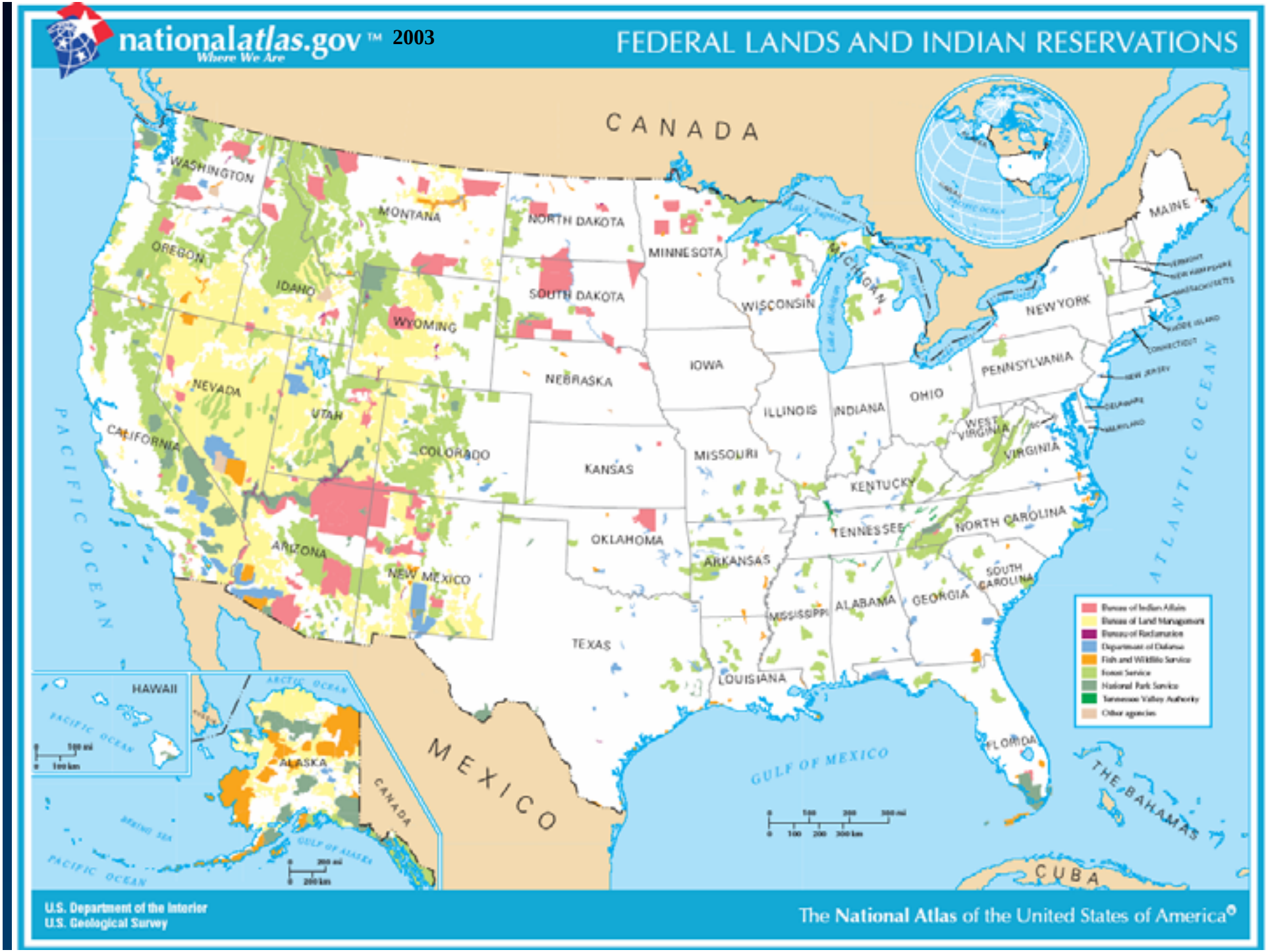
Katherine Abbey Hanna Park
Photo by **aquak9**

Fly Fishing in Wyoming

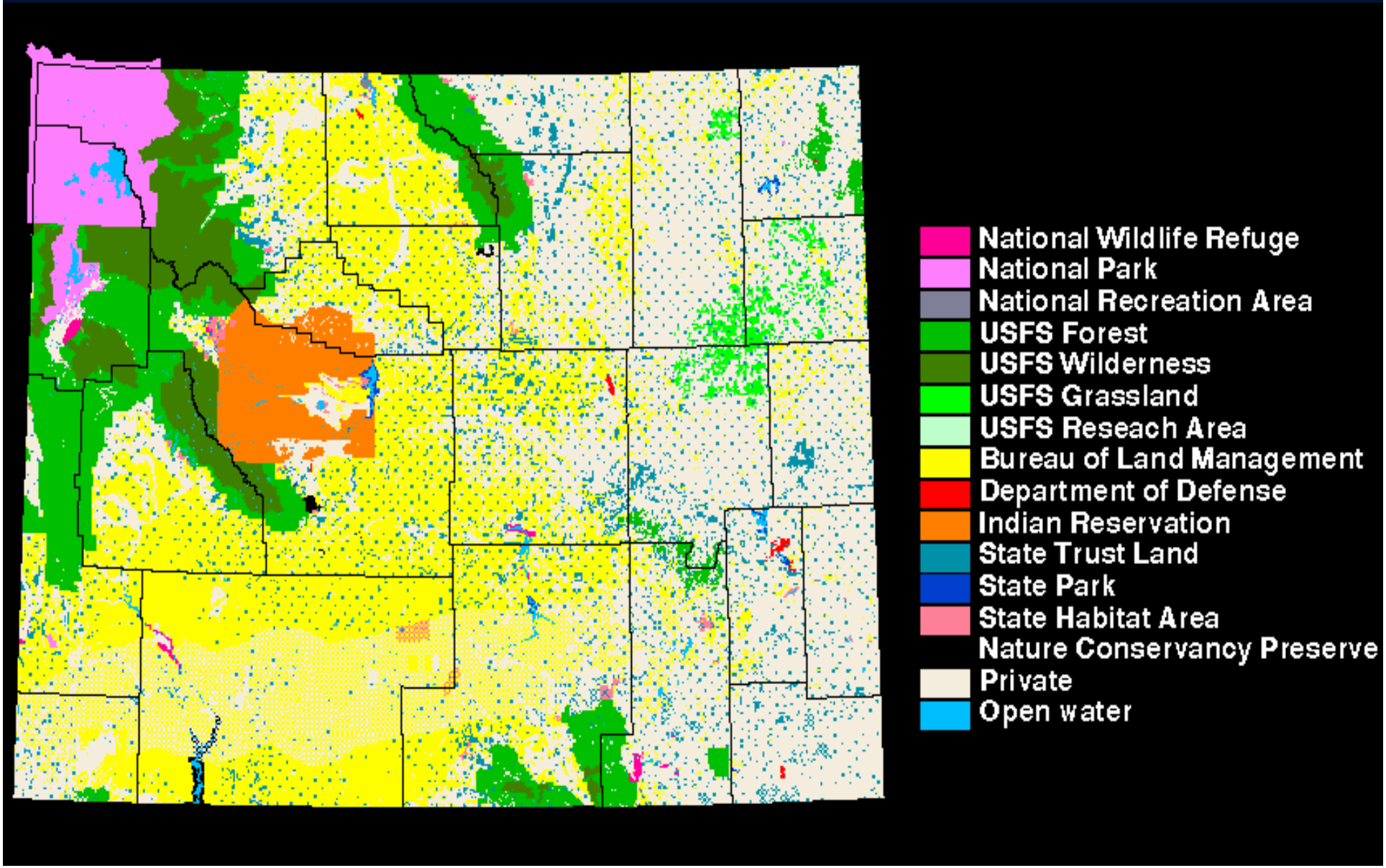
Monte Draper / The Pioneer

Why Would a Governor Become Involved with Information Technology, especially GIS?

- The Technology is not the attraction
- Decisions made and problems solved *through* technology are the attraction
- Democratization of Information


nationalatlas.gov™ 2003
Where We Are
FEDERAL LANDS AND INDIAN RESERVATIONS
CANADA
WASHINGTON
OREGON
CALIFORNIA
IDAHO
NEVADA
MONTANA
WYOMING
UTAH
COLORADO
ARIZONA
NEW MEXICO
NORTH DAKOTA
SOUTH DAKOTA
NEBRASKA
KANSAS
OKLAHOMA
TEXAS
MINNESOTA
IOWA
MISSOURI
ARKANSAS
LOUISIANA
WISCONSIN
ILLINOIS
MICHIGAN
INDIANA
OHIO
KENTUCKY
TENNESSEE
MISSISSIPPI
ALABAMA
GEORGIA
FLORIDA
SOUTH CAROLINA
NORTH CAROLINA
VIRGINIA
WEST VIRGINIA
PENNSYLVANIA
NEW YORK
MAINE
VERMONT
NEW HAMPSHIRE
MASSACHUSETTS
RHODE ISLAND
CONNECTICUT
NEW JERSEY
DELAWARE
MARYLAND
PACIFIC OCEAN
ATLANTIC OCEAN
GULF OF MEXICO
MEXICO
CUBA
THE BAHAMAS
HAWAII
ALASKA
ARCTIC OCEAN
BERING SEA
GULF OF ALASKA
Bureau of Indian Affairs
Bureau of Land Management
Bureau of Reclamation
Department of Defense
Fish and Wildlife Service
Forest Service
National Park Service
Tennessee Valley Authority
Other agencies
U.S. Department of the Interior
U.S. Geological Survey
The National Atlas of the United States of America®

We needed a common framework
Wyoming has 15 Types of Owners



The Gathering Spot

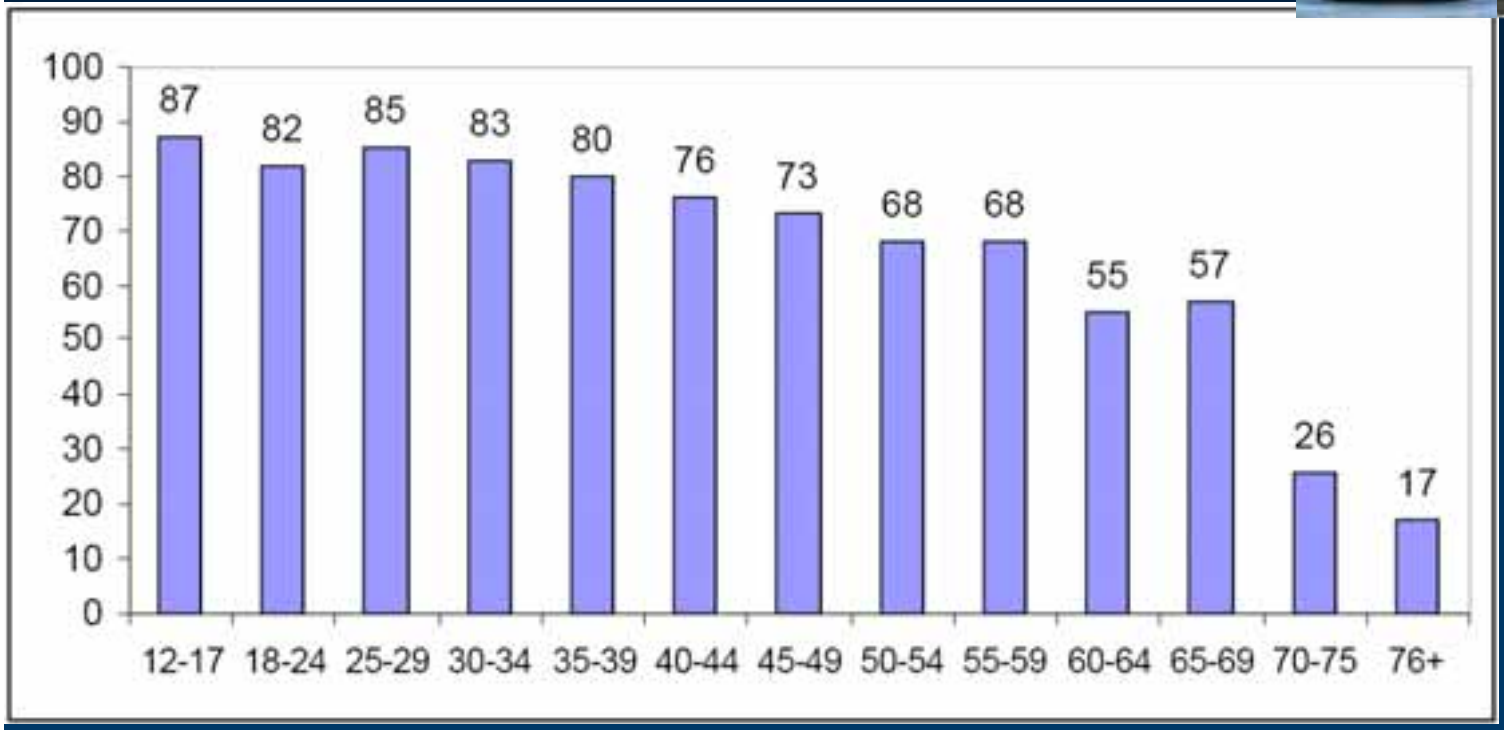
- Local, State and Federal agencies in Wyoming engaged in very few interactive meetings
- SOLUTION: Invite folks to the *Governor's Kitchen Table* - every spring
- Began data sharing agreements that were precursor of collaborative solutions to contentious issues

Today's Thoughts…

- My perspective, first as Governor, now as part of the geospatial community.
- We are a location aware society
- Geographic Information Systems for better decisions
  - Evolution from expensive, hard to access systems to today
- GIS examples
  - for Decision Making
  - for everyday activities
- Information Integration
  - Collaboration, planning
- Ten Minutes at the Top
- What's Next?
  - Web services

Expectations…
Increasingly Connected Constituency Through a Digital Location-Aware Lifestyle

PEW / INTERNET
PEW INTERNET & AMERICAN LIFE PROJECT



Share of Americans online by age

(Teens Oct-Nov. 2004, margin of error = ± 3%. Adults Jan-June 2005, margin of error = ± 1%.)

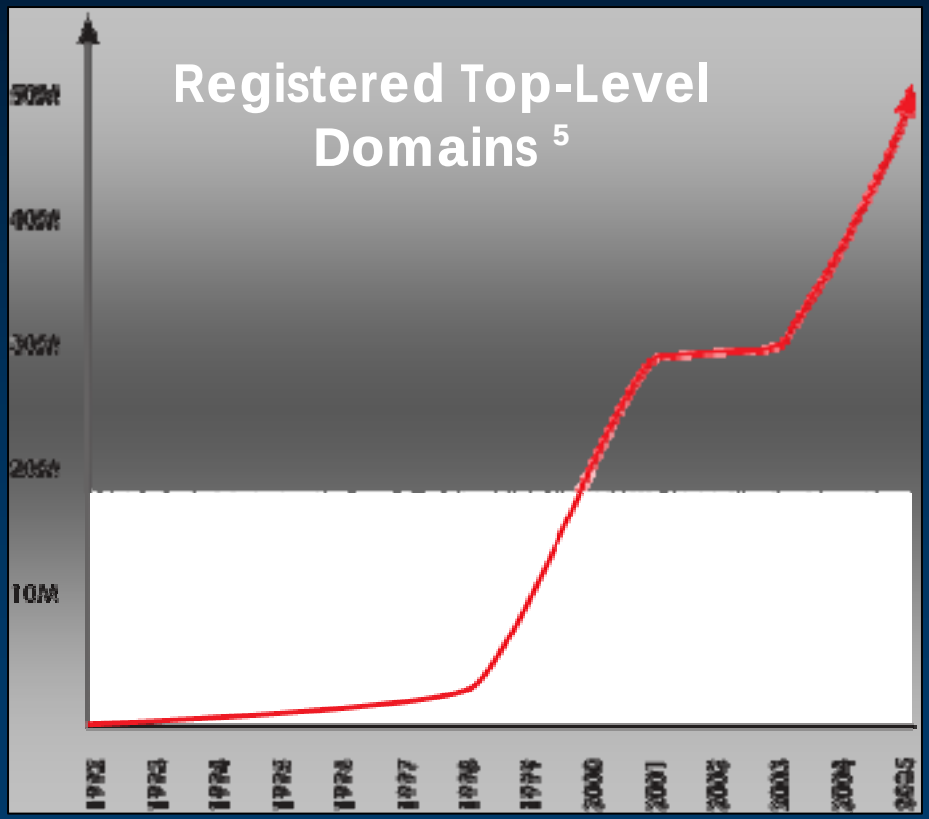
http://www.pewinternet.org/pdfs/PIP_Generations_Memo.pdf

The Internet Today

- 1 Billion Internet users, worldwide[1]
- Total 2004 online retail sales of $200 Billion[2]
- In the US, half of all online households now have broadband connections[3]
- $16.5 Billion spent on online advertising in 2005[4]

•Only 50 web Sites in 1992

•WWW Approved for Open Access in April 1993



sources: [1]ETForecasts, [2-3]eMarketer, [4]Jupiter, [5]Zooknic Inc.

Internet Usage Statistics for the Americas

INTERNET USERS AND POPULATION STATS FOR THE AMERICAS						
AMERICA	Population (2006 Est.)	% Pop. America	Internet Users, Latest Data	% Population (Penetration)	% Usage America	Use Growth (2000-2005)
Central America	144,550,714	16.3 %	21,713,600	15.0 %	6.9 %	574.9 %
South America	370,118,282	41.8 %	57,154,900	15.4 %	18.3 %	299.9 %
The Caribbean	39,239,636	4.4 %	4,499,709	11.5 %	1.4 %	704.4 %
SUB-TOTAL	553,908,632	62.6 %	83,368,209	15.1 %	26.7 %	361.4 %
North America	331,473,276	37.4 %	229,138,706	69.1 %	73.3 %	112.0 %
TOTAL AMERICAS	885,381,908	100.0 %	312,506,915	35.3 %	100.0 %	147.7 %

**NOTES: (1) Internet Usage and Population Statistics for North America were updated for Sept. 18, 2006. (2) Population numbers are based on data contained in world gazetteer. (3) The most recent usage comes mainly from data published by Nielsen//NetRatings , by ITU , and other local sources. (4) Data on this site may be cited, giving due credit and establishing an active link back to Internet World Stats **

NORTH AMERICA INTERNET USERS AND POPULATION STATS						
NORTHERN AMERICA	Population (2006 Est.)	% Pop. of World	Internet Users, Latest Data	% Population (Penetration)	% Usage of World	Use Growth (2000-2006)
North America Only	331,473,276	5.1 %	229,138,706	69.1 %	21.1 %	112.0 %
Rest of the World	6,168,223,784	94.9 %	857,112,197	13.9 %	78.9 %	238.9 %
WORLD TOTAL	6,499,697,060	100.0 %	1,086,250,903	16.7 %	100.0 %	200.9 %

HIGHEST INTERNET PENETRATION RATE

#	Country or Region	Penetration (% Population)	Internet Users Latest Data	Population (2006 Est.)	Source and Date of Latest Data
1	Iceland	86.8 %	258,000	297,072	ITU - Sept/06
2	New Zealand	76.3 %	3,200,000	4,195,729	ITU - Sept/05
3	Sweden	74.9 %	6,800,000	9,076,757	ITU - Sept/06
4	Portugal	74.1 %	7,782,760	10,501,051	IWS - Sept/06
5	Australia	70.7 %	14,663,622	20,750,052	Nielsen//NR - Aug/06
6	Falkland Islands	70.4 %	1,900	2,699	CIA - Dec/02
7	Denmark	69.4 %	3,762,500	5,425,373	ITU - Sept/05
8	United States	69.3 %	207,161,706	299,093,237	Nielsen//NR - Aug/06
9	Hong Kong (China)	69.2 %	4,878,713	7,054,867	Nielsen//NR - Feb/05
10	Luxembourgh	68.6 %	315,000	459,393	ITU - Sept/06
11	Switzerland	68.1 %	5,097,822	7,488,533	Nielsen//NR - Aug/06
12	Canada	67.9 %	21,900,000	32,251,238	eTForecasts Dec/05
13	Norway	67.8 %	3,140,000	4,632,911	C+I+A - Mar/05
14	Singapore	67.2 %	2,421,800	3,601,745	ITU - Sept/05
15	Japan	67.2 %	86,300,000	128,389,000	eTForecast Dec/05
16	Korea, South	67.0 %	33,900,000	50,633,265	eTForecast Dec/05
17	Greenland	66.5 %	38,000	57,185	ITU - Sept/05
18	Faroe Islands	66.5 %	33,000	49,598	ITU - Sept/06
19	Netherlands	65.9 %	10,806,328	16,386,216	Nielsen//NR - Jun/04
20	United Kingdom	62.5 %	37,600,000	60,139,274	ITU - Sept/06
21	Finland	62.5 %	3,286,000	5,260,970	ITU - Sept/05
22	Germany	61.3 %	50,616,207	82,515,988	Nielsen//NR - Aug/06
23	Bermuda	60.7 %	39,000	64,211	ITU - Sept/05
24	Taiwan	60.3 %	13,800,000	22,896,488	C+I+A - Mar/05
25	Barbados	60.0 %	160,000	266,731	ITU - Sept/06

http://www.internetworldstats.com/top25.htm

Youth, Technology and the Social Networking Phenomenon

MySpace

YouTube


com/loopt/sess/index.aspx
loopt
HOME PROFILE FRIENDS JOURNAL PLACES EVENTS MESSAGING SETTINGS HELP
SIGN UP | LOGIN
GPSTRACKSTICK
GPSTrackStick
CLICK FOR DEMO
LOGIN
friends fast!
Buy Now
Home
How It Works
Specifications
FAQ's
Software
Contact Us
Terms Of Use
Affiliates
http://trackstick.com - TrackStick HTML - Microsoft Internet Explorer
Google
Clear All
Print
Help
Set Ext. Maps
GPS Track Stick is
Utilizing Global Po
the track stick will
in pre-set intervals
works anywhere on planet ea
Track Stick is a USB 1.1 conn
downloading data onto your
Track Stick includes integrati
amazing! Data can be expor
EXCEL, Google Earth KML, an
data records the following pa
Stick - Date, Time, Latitude,
Speed, If the unit stopped a
Direction of travel (N, W, E,
Strength, Settings with the
adjustable. When integrated
Track Stick gives the user an
of where the device has been
The GPS Track Stick device w
(within 15 meters) historical
tracking stick has been anyw
a GPS logging device and do
Know Where Anyone O
Runners can accurately keep detailed records of their daily runs
Parents - know where your children have been
R/C Hobbyists - Cars, Boats, Planes, Rockets (Altitude)
Need to track time/distance?
Employers - give to your employees; monitor routes and speeds
Find events and nearby places
friends are nearby
Already a boost loopt member?
Not on Boost Mobile?
Sign Up early on other carriers.
Other carriers coming soon!
Sign up early and give us your information so we can ask your carrier to support loopt.

Ever Increasing Public Expectations – Infinite Demand, Finite Resources

- **I have a computer, PDA, Cell Phone, I-Pod….**
- **I'm on line. What else can I do? Connect with my government - information, networking, blogging**
- **Greater awareness, transparency**
- **Government can no longer hold power through the hierarchical control of information, knowledge**
- **People today expect to have access to information wherever they are**
- **Location–aware equipment**
- **Location savvy citizens**
- **Trend is ever more toward web-based, *easy to use applications***
- ***Enabled with mobile and server based systems***

Connecting Anywhere, Anytime…

What Is a GIS?

- **Can you explain GIS to your mother?**
- **Your teenager?**
- **Your spouse?**
- **Your Governor?**

The Power of a Picture – Geographic Information Systems (GIS) for Policy: More Than a Map

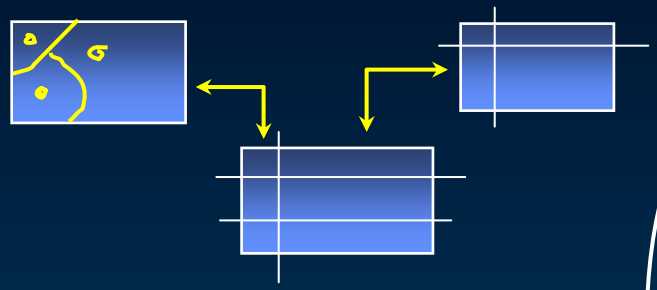
- **GIS provides a *simple* way to grasp very *complex* issues in context**
- **GIS engages through *visualization, which leads to* Analysis and Modeling**
- **To Understand**
  - **Patterns**
  - **Relationships**
  - **Processes**
- **Enabling**
  - **Options and Plans**
  - **Decisions & action at any level, by anyone, in the context of Place**

Geographic Information Systems: More than a Map

- **GIS is pushing beyond mapping and management of geographic space to spatial collaboration, reasoning, dialogue, comprehensive planning and decision support**
- **GIS has transformed the way we capture, analyze, and use data**
- **Just as remote sensing led to a global view, GIS leads to an integrated perspective**

A Language for Decision Support

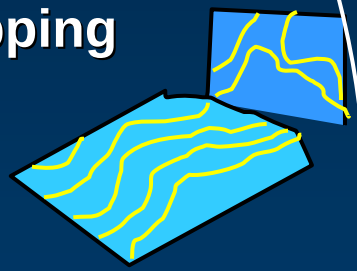
Policy Options Against Which Values Can Be Evaluated



Complex Data Modeling

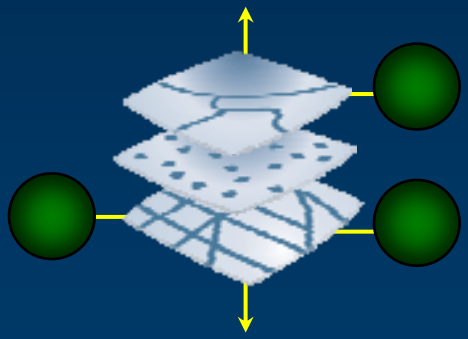
Interactive Mapping

Geoprocessing



Visualization

Analysis & Modeling

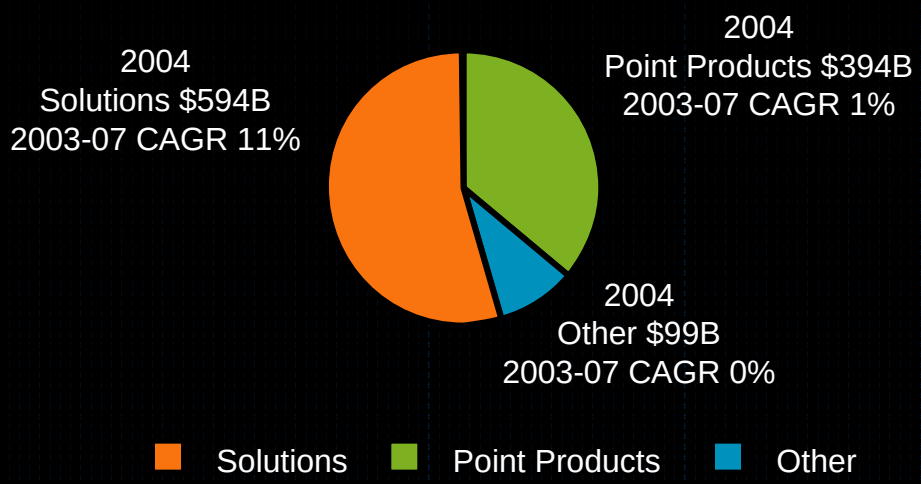


Integrating Data

More Than a Map

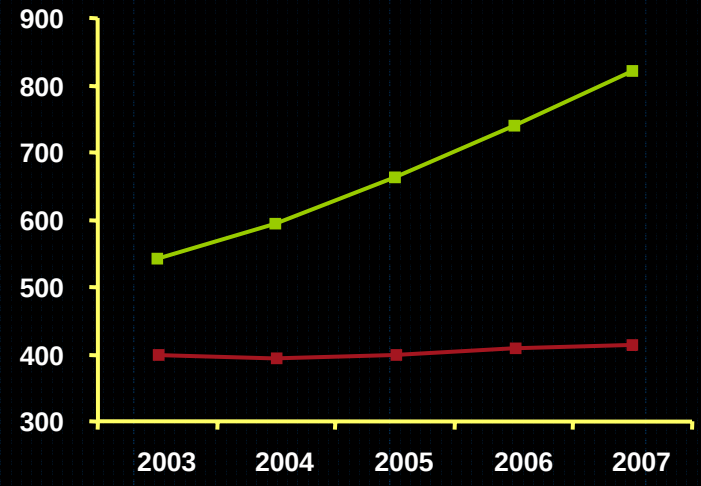
Develop solutions, not just stuff

64% of IT dollars are spent on solutions …



Source: IBM Market Intelligence, Solutions Market View 1H2004

… and solutions are growing faster than the rest of the market



- **Customers are placing value on efficient deployment that solves business issues**
- **Solutions must create value beyond the sum of the parts, involve customization & integration beyond mere bundles, and contain expertise (i.e., knowledge-based service) within the offering**

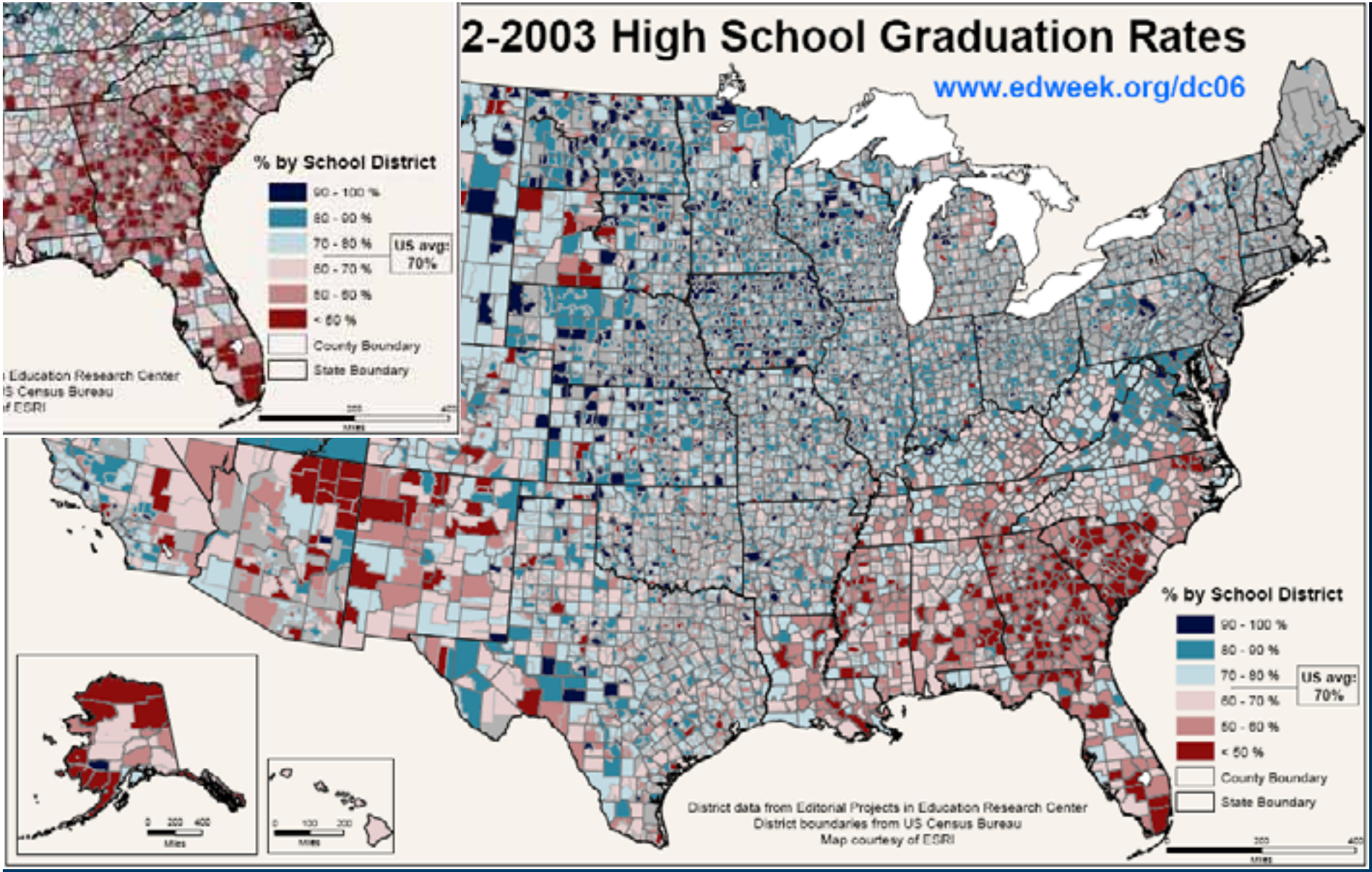
Source: McKinsey, IDC

Remote Sensing, Information Technology, Geography, and GIS

When Integrated - They Become Knowledge, To Enable Decisions

They are Inter-dependent, They Let Us Visualize Inter-relationships

- Technology
- Methods
- Organization (People)
- Data
- Processes
- Plans



http://www.edweek.org/media/ew/dc/2006/usmap_districts.pdf

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edweek.org

Diplomas Count '06

Step 1 -
Find Your Community:

Street Address: (optional)

City, State and/or ZIP:

Jacksonville, FL

Get Map | Clear Address

Step 2 -
Select a District when a list is available below the Map. District lists start at Zoom Level 6.

No District Selected

Zoom to Selected

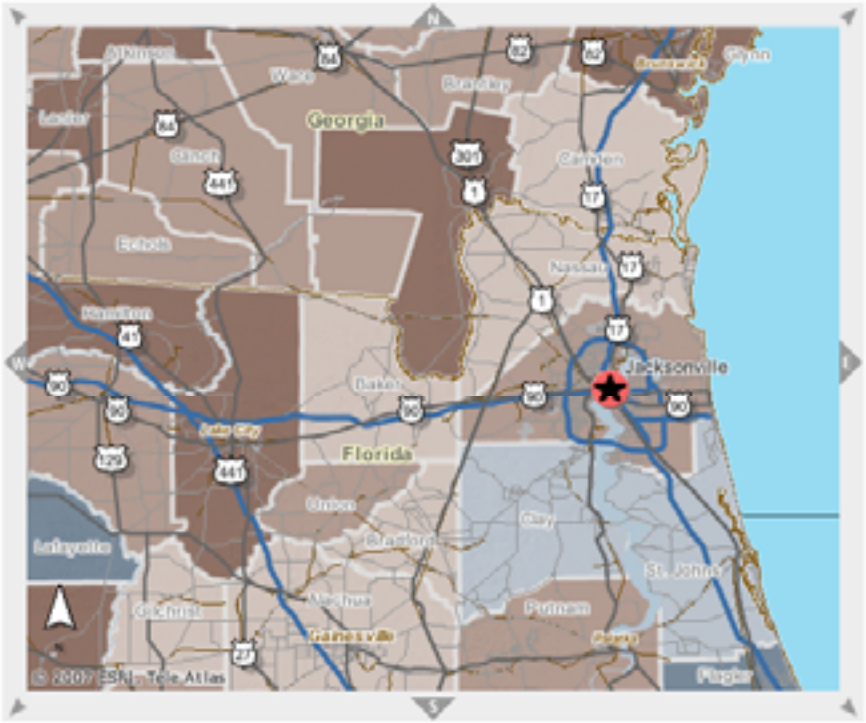
Step 3 -
Click the button below for a PDF District Report:

Get District Report

School district boundary files extracted from US Census Bureau 2004 First Edition TIGER/Line Files

With the current map, you can
Print | Link | Save | Open

Zoom In | Zoom Out | Pan



ZOOM IN
1
5
10
ZOOM OUT

Graduation Rates
90 - 100%
80 - 90%
70 - 80%
60 - 70%
50 - 60%
< 50%
No Data

Step 2 - Select a District from the List Below:

	SCHOOL DISTRICT		
○	CLAY COUNTY SCHOOL DISTRICT	GREEN COVE SPRINGS	FL
○	CLINCH COUNTY SCHOOL DISTRICT	HOMERVILLE	GA
○	COLUMBIA COUNTY SCHOOL DISTRICT	LAKE CITY	FL

Internet

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edweek.org

Diplomas Count '06

DUVAL COUNTY SCHOOL DISTRICT - Graduation Report

Education System Profile

Local Education Agency:	State Education Agenc
DUVAL COUNTY SCHOOL DISTRICT JACKSONVILLE, FL	Florida Department of www.fldoe.org

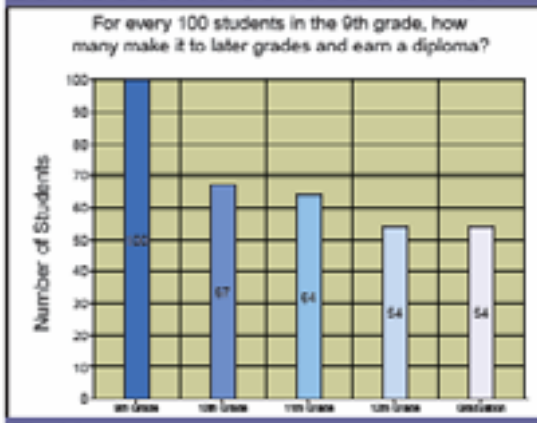
Vital Statistics - K-12 Public Education	District
Schools	181
Students	128,126
Teachers	6,764
Student-Teacher Ratio	18.9
Student Demographics	**District**
Race/Ethnicity	(%)
American Indian/Alaska Native	0.1
Asian/Pacific Islander	2.9
Hispanic	4.3
Black (not Hispanic)	43.7
White (not Hispanic)	48.8
Students Eligible for Free or Reduced Lunch	41.7
English Language Learners	1.9
Special Education	15.7
Segregation Levels	**District**
Levels of segregation are measured using an index that can have values ranging from 0 to 1. A value of 1 indicates the highest possible level of segregation.	
Segregation based on race-ethnicity	0.62
Segregation based on socio-economic status	0.57

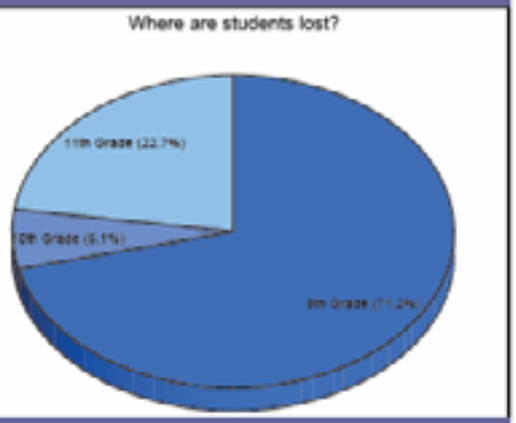
DUVAL COUNTY SCHOOL DISTRICT - Graduation Report

The High School PipeLine

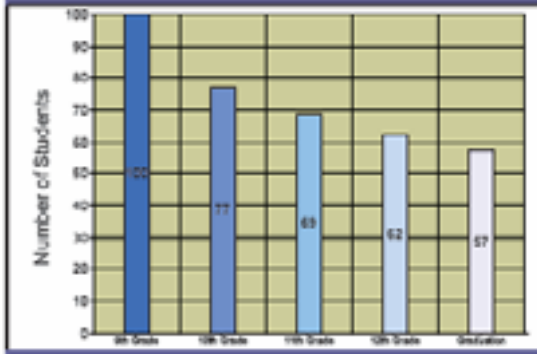
The Cumulative Promotion Index (CPI) method of calculating graduation rates can be used to examine the high school pipeline. That is, we can estimate the numbers of students who fall off track for earning a diploma at various points between the 9th grade and the expected time of graduation.

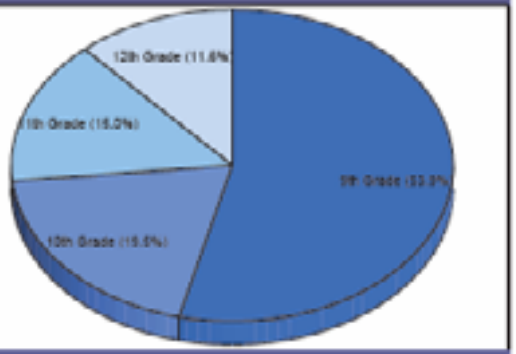
DUVAL COUNTY SCHOOL DISTRICT



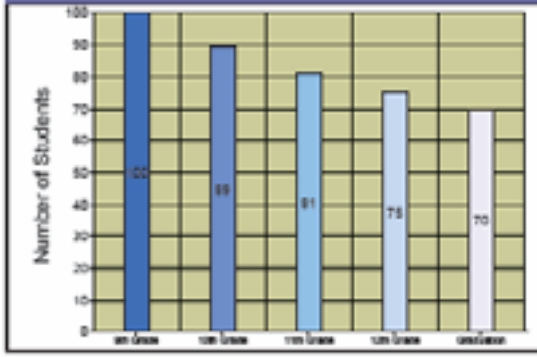


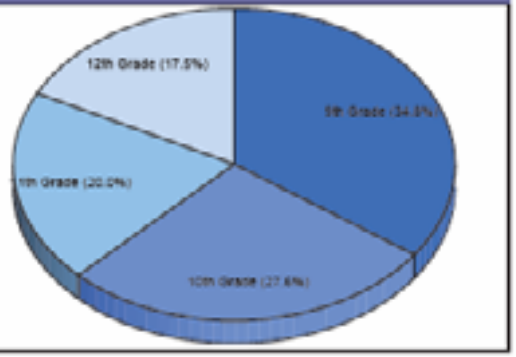
Florida





Nation






AL
GA
NORTH
Tallahassee
Jacksonville
GULF
OF
MEXICO
Crystal River
Orlando
Port
Canaveral
Tampa
St. Petersburg
Port Manatee
St. Lucie
FLORIDA
W. Palm
Beach
Hialeah
Miami
Port
Everglade
Turkey
Point
Electricity Transmission Line (>= 345 kV)
Oil Seaport
Oil Import Site
Petroleum Refinery
Coal Mine, Surface
Coal Mine, Underground
Natural Gas Flow
Hub
(1 mile band width = 100 million cubic feet/day)
Major Electric Power Plants (>=100 MW)
Nuclear
Petroleum
Coal
Biomass
Natural Gas
Solar
Hydroelectric
Wind
Wood
Geothermal
Renewable Energy Potential
Solar - (>= 6.0 kWh/m2/day)
Wind - (>= 4 Power Class)
Geo. - (>= 80 milliwatts/m2)
0
75
150
miles
Energy Information Administration
Zoom In
LAYERS
All Layers
Biomass
Geothermal
10km Solar
40km Solar
200m to 1km Wind
25km Wind
Calculators
Internet

Big Turnaround Complex, Sweat Farm Road
Georgia Wildfires, April 2007
MODIS Imagery

Regional Maps | ArcIMS Maps | Imagery | GIS Data | Fire Detections | Other Products

Large incident map is updated on Fridays or as fire conditions warrant.
Fire locations are based on data provided by the National Interagency Fire Center and are subject to change.
Move your mouse over the fire indicators or click to see additional information (popups required).

Large Incidents - April 30, 2007

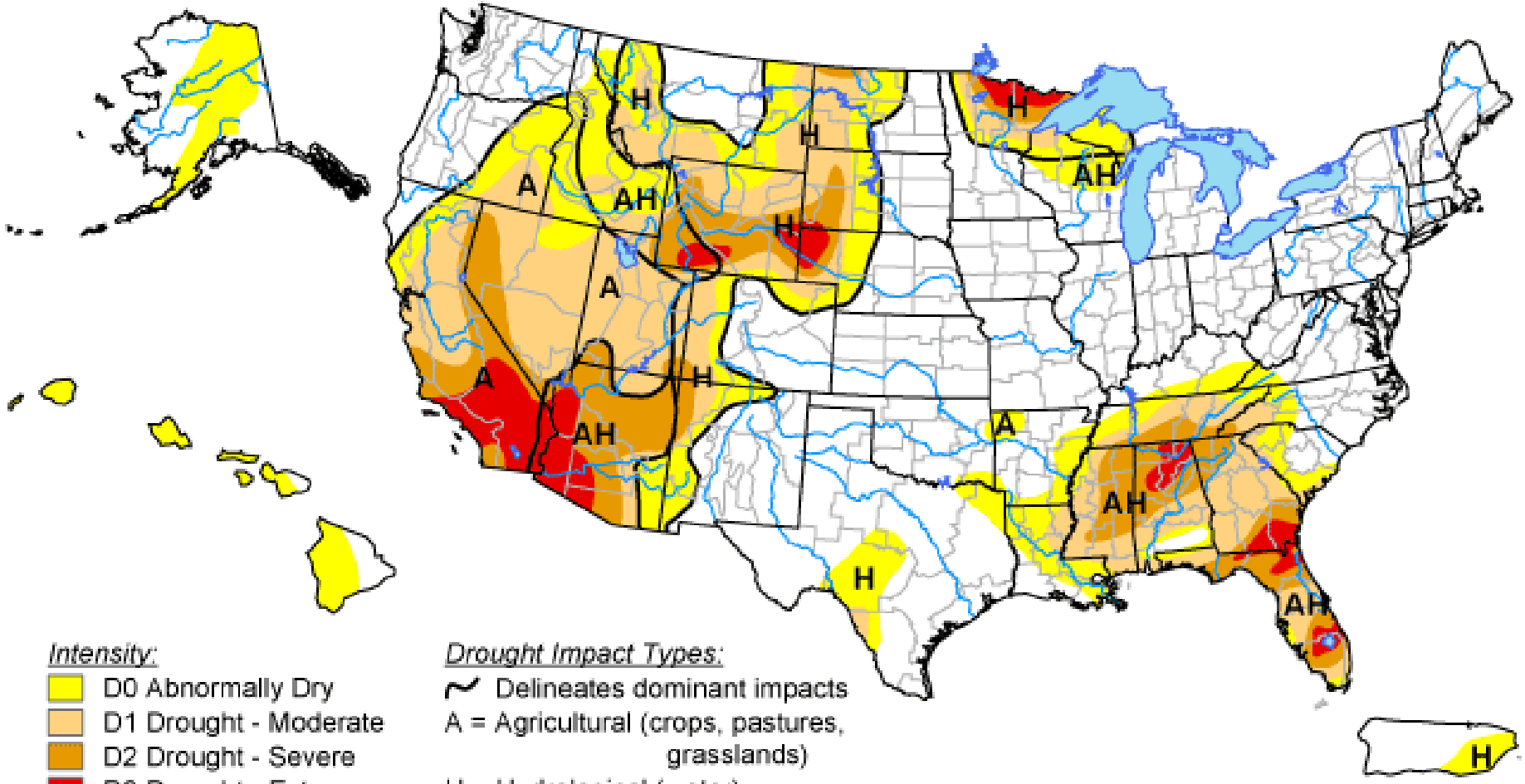
1 JUNEBERRY
2 VALLEY
3 STAR
4 BENVILLE
5 HAMRE
6 THE PITT
7 REINER
8 CANDY KILLER
9 POTATO HILL
10 PIONEER
11 BARAGA BUMP
12 TWO SIDED
13 ROUNDABOUT
14 BIG TURNAROUND COMPLEX
15 SWEAT FARM ROAD
16 KNEE KNOCKER SWAMP
17 PINNACLE
18 BURNS LAKE
19 FRISAR
20 TOPSAIL TOWER

View Printable Map | View High Res Map | Definition of Map Terms | Select a Fire | Go

Internet

U.S. Drought Monitor

April 24, 2007
Valid 8 a.m. EDT



Intensity:
- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

Drought Impact Types:
- ~ Delineates dominant impacts
- A = Agricultural (crops, pastures, grasslands)
- H = Hydrological (water)

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

http://drought.unl.edu/dm

USDA National Drought Mitigation Center

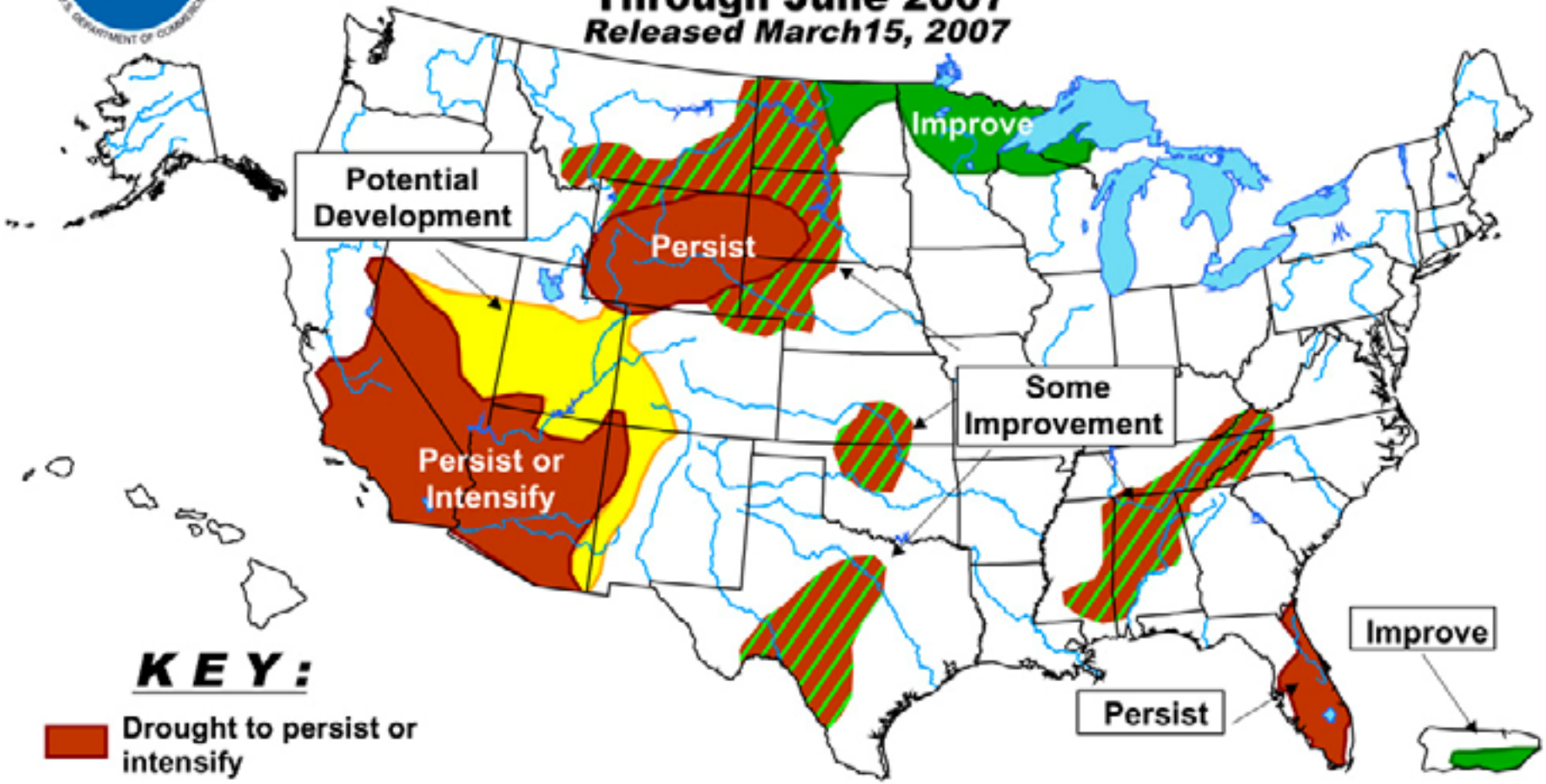
Released Thursday, April 26, 2007

Author: David Miskus, JAWF/CPC/NOAA

U.S. Seasonal Drought Outlook

Through June 2007

Released March15, 2007



KEY:

- Drought to persist or intensify
- Drought ongoing, some improvement
- Drought likely to improve, impacts ease
- Drought development likely

Depicts general, large-scale trends based on subjectively derived probabilities guided by numerous indicators, including short- and long-range statistical and dynamical forecasts. Short-term events -- such as individual storms -- cannot be accurately forecast more that a few days in advance, so use caution if using this outlook for applications -- such as crops -- that can be affected by such events. "Ongoing" drought areas are approximated from the Drought Monitor (D1 to D4). For weekly drought updates, see the latest Drought Monitor map and text. NOTE: the green improvement areas imply at least a 1-category improvement in the Drought Monitor intensity levels, but do not necessarily imply drought elimination.

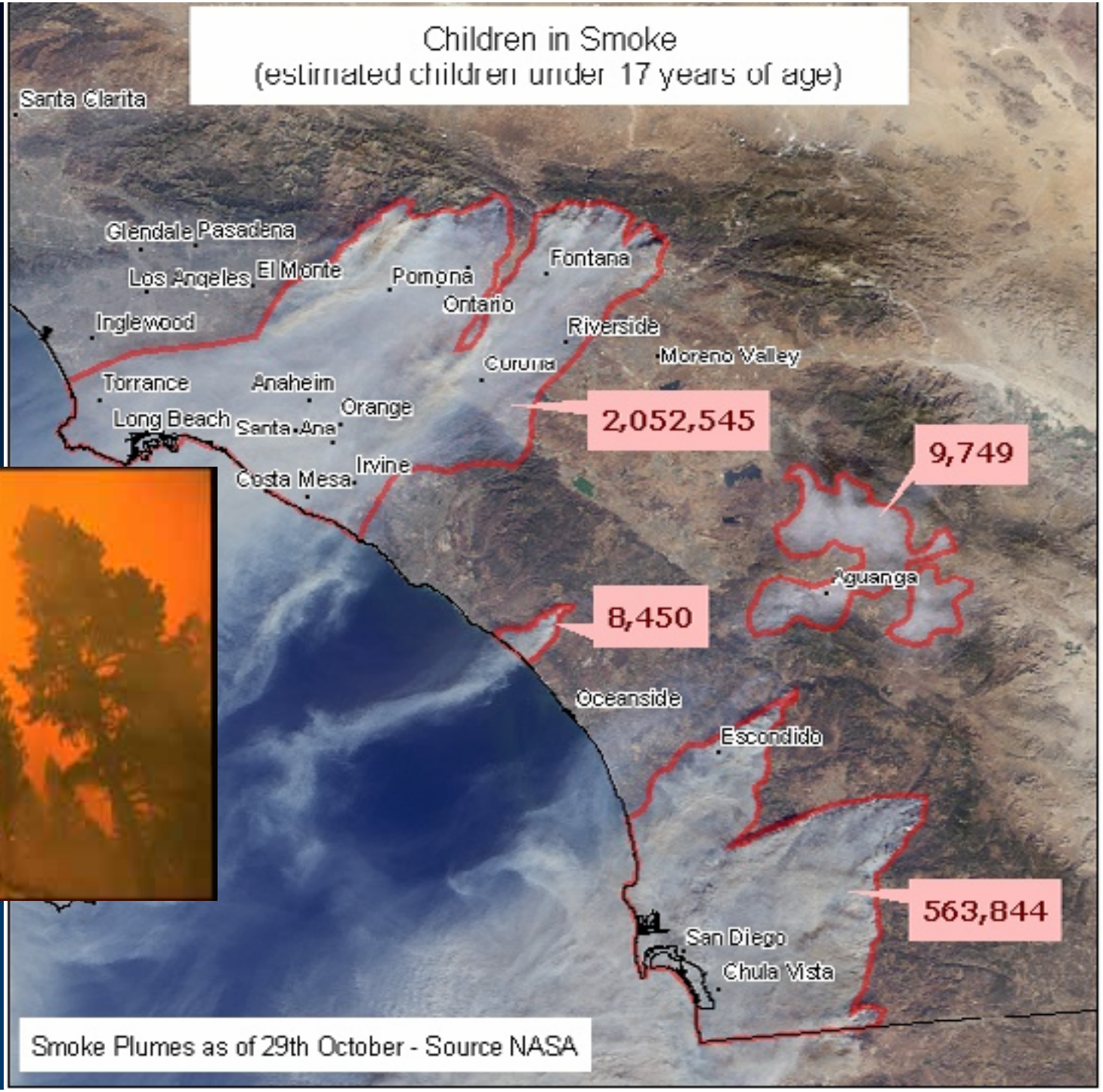
Mountain Area Safety Task Force (MAST)…
Southern California Wildfires 2003

- Clear understanding of Purpose
- Multiple Agencies
- Multiple Levels of Government
- Private Sector Stakeholders, Companies
- Invested in IT, particularly GIS
- Extensive planning, Modeling
- Near and Long-term recovery
- Shared Geography
- Shared Risk

Mountain Agency Safety Taskforce MAST

- **14 Government agencies**
- **5 private companies**
- **Multiple problems drought /bark beetle tree deaths (2+ million dead trees to date)**
- **Advance problem analysis and evacuation, fire and service restoration planning**
- **18 months planning**
- **6 months database building for fire season**
- **1 shared database via a portal**
- **Now leveraged for rehabilitation, recovery, debris flow & flooding**
- **Interactive public GIS Portal**

Children in Smoke

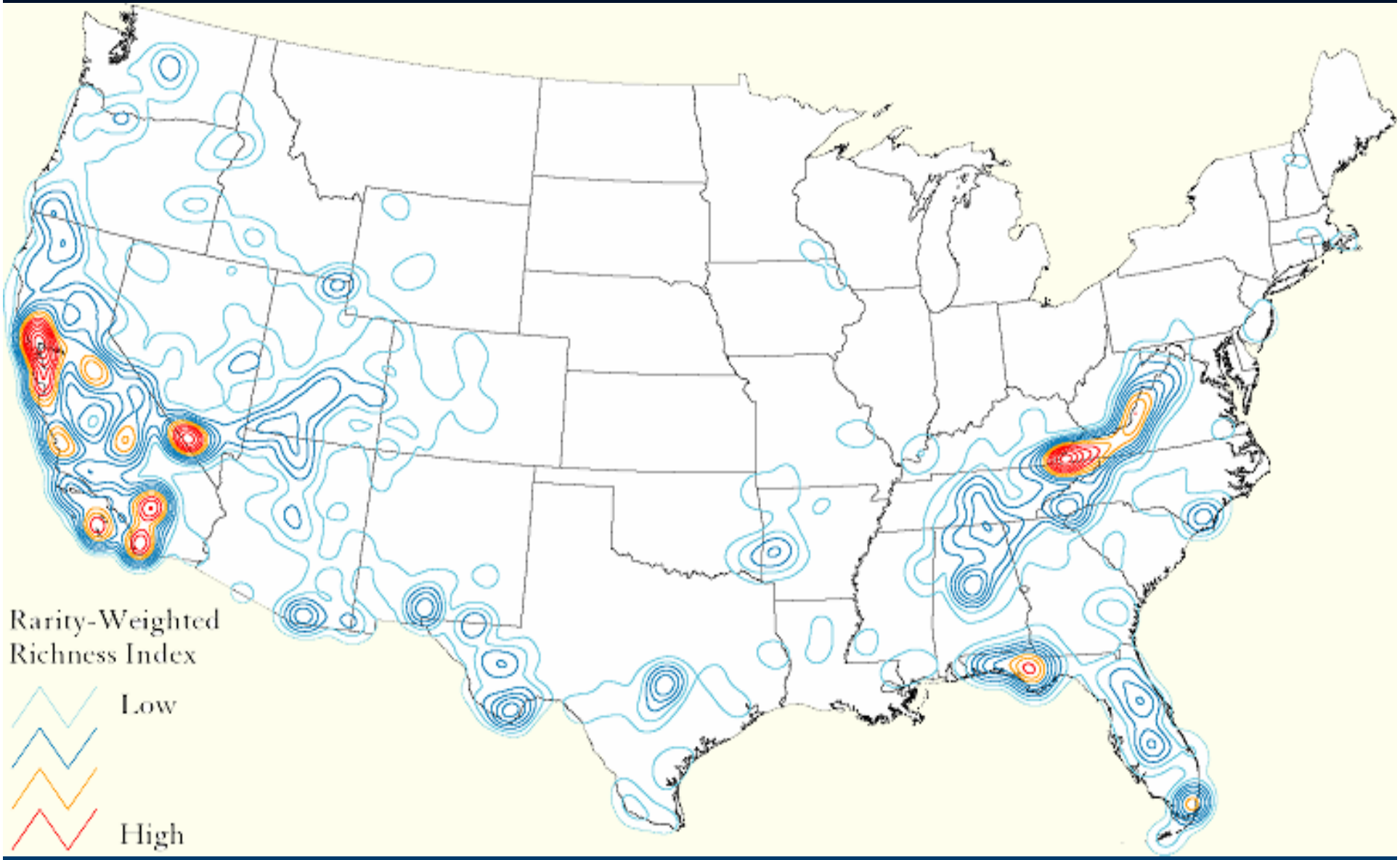


Recent History of Western Forest Actions

WGA Policy 99-011

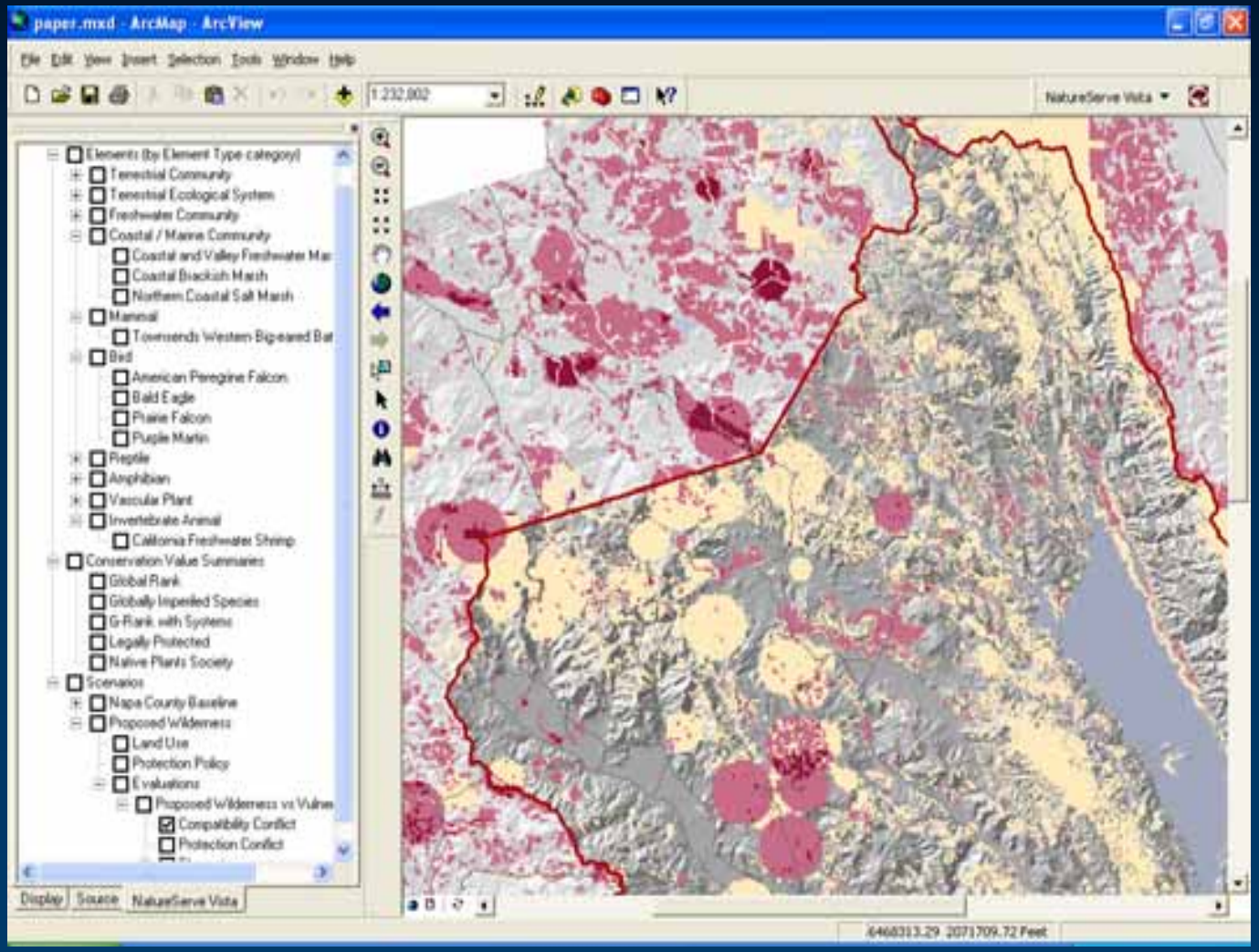
- 75% of the National Forests are in the West
- Historically have provided wood products and grazing
- Other values are being recognized
  - Water quality
  - Terrestrial and aquatic habitat
  - Recreation
  - Historic preservation, conservation
- Millions of acres are in poor ecological health
- Elimination of natural fire from the forest ecosystem
- High risk of uncontrollable wildfire, insect infestation, disease, invasive species
- Ever increasing encroachment by subdivisions

Endangered Species Concentrations



Scenario Evaluation: Conflict Visualization -Napa County, California

- Red shades highlight areas where conservation goals conflict with land use



Conservation Service Framework

Conservation Decisions

Decision Support

Conservation expertise and analysis

Information access and interoperability

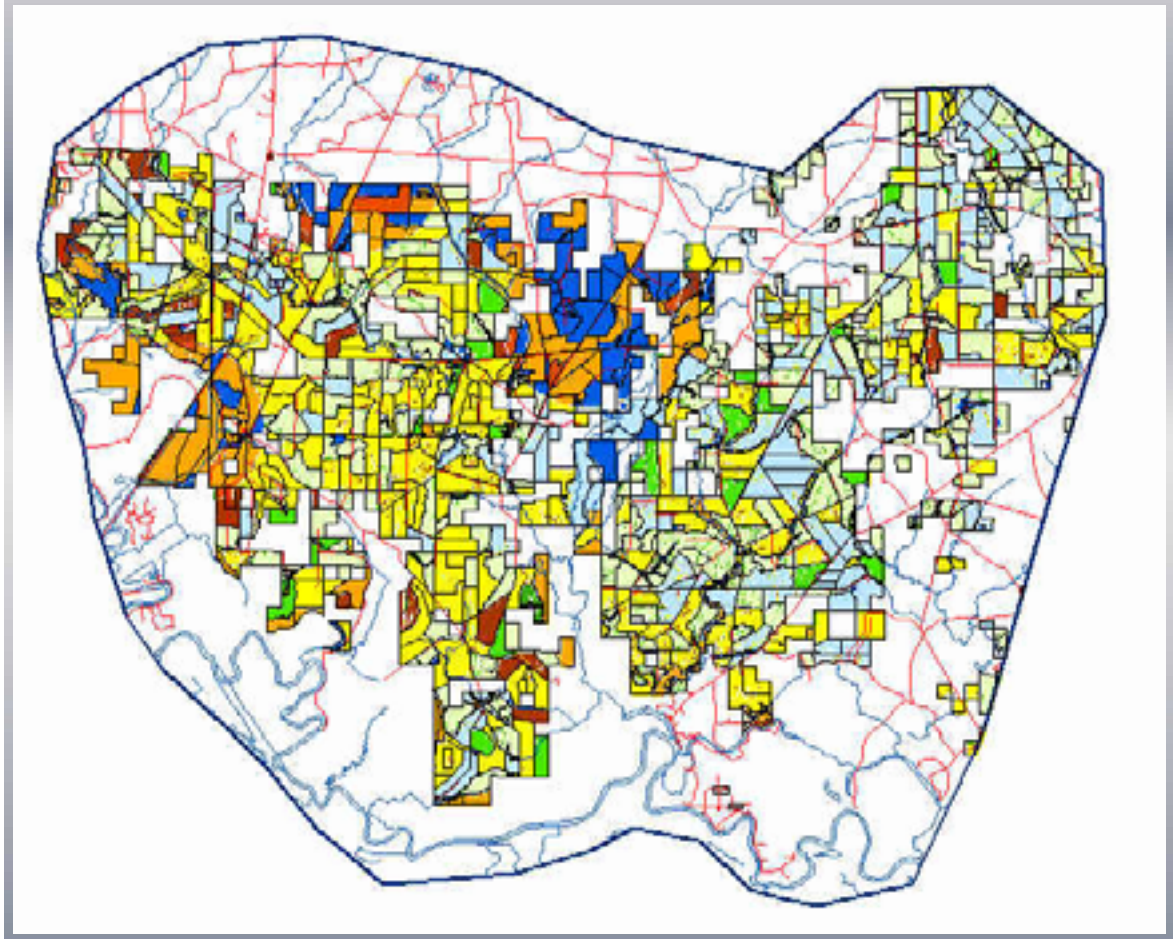
Data management and reporting

Data collection recording

Scientific standards and methods

NatureServe VISTA

Analysis of Conservation and Economic Value of Stands for Potlatch Corporation, Arkansas



Objective: Identify forest stands that have:

- High economic value for forest production without significant conservation impact (green areas).
- High value for conservation and low forest production (blue areas).
- High value for forest production with significant conservation value requiring further analysis (yellow areas).

Potlatch

Study by NatureServe in Cooperation with Potlatch Corporation and the Arkansas Natural Heritage Commission

NatureServe VISTA

GIS Is a Major Influence in How We See and Do Things

The challenges of governing today span political and agency boundaries.

Solutions typically affect more than the geography of a single political or business jurisdiction

Creating a Sense of Engagement

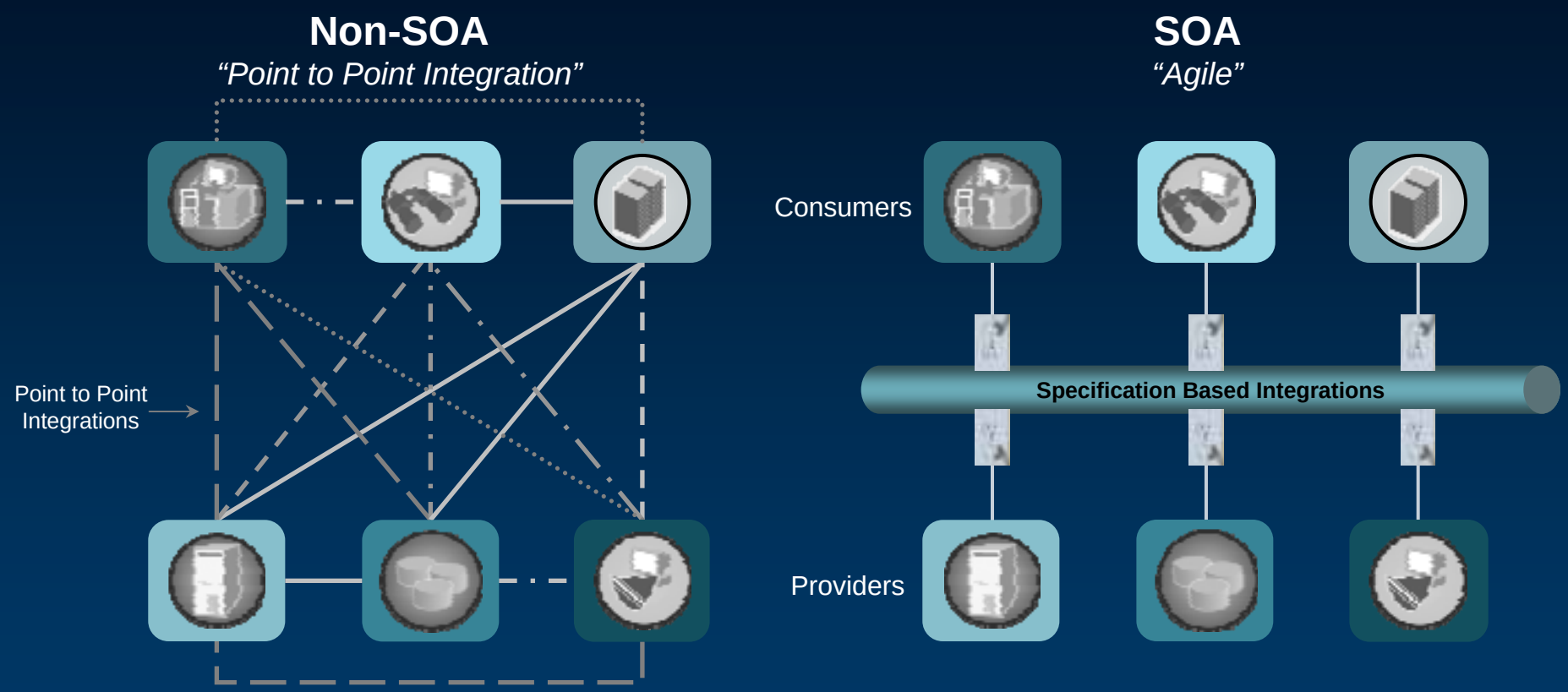
Providing More

- **Science**
- **Accuracy/Detail**
- **Realism**
- **Logic & Analysis**
- ***Immediacy***
- ***Integration***

Imagery and Data

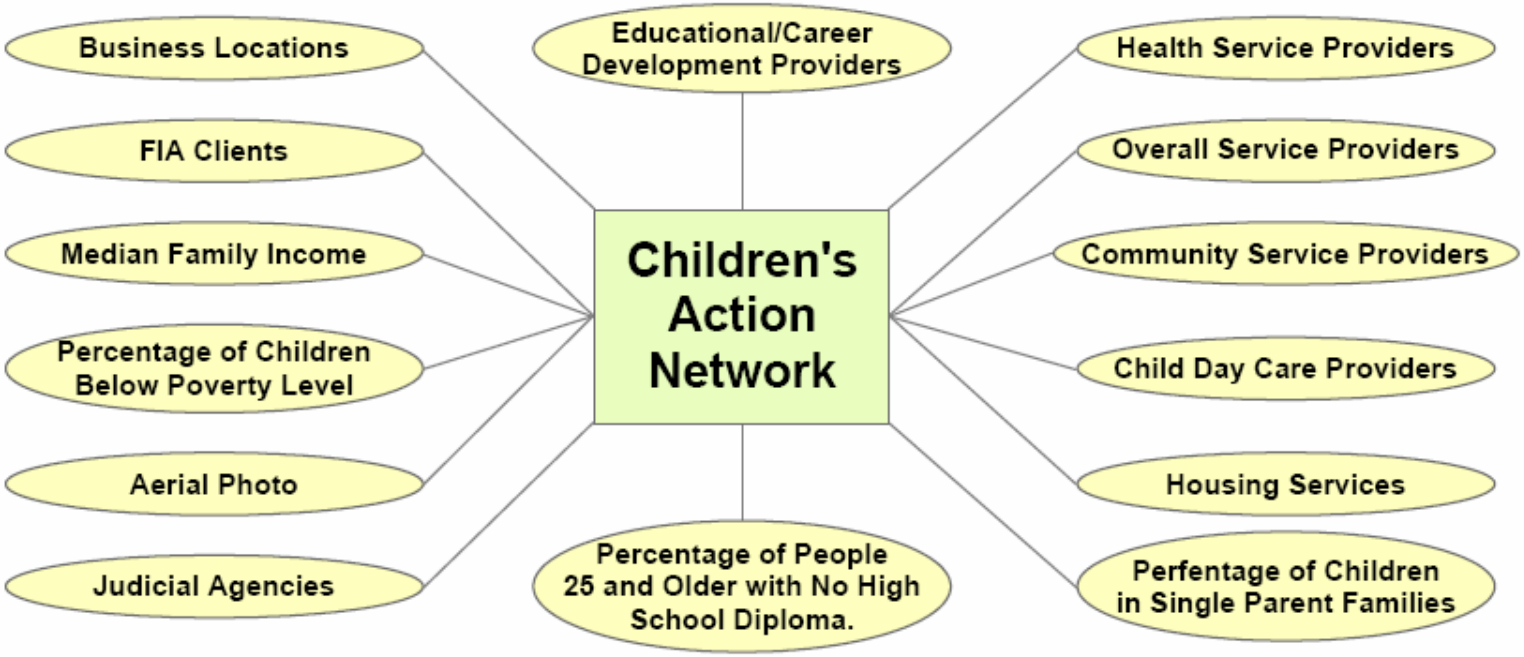
. . . Changing How We Communicate

SOA standardizes integrations and allows them to be applied in different combinations to satisfy changing operational needs

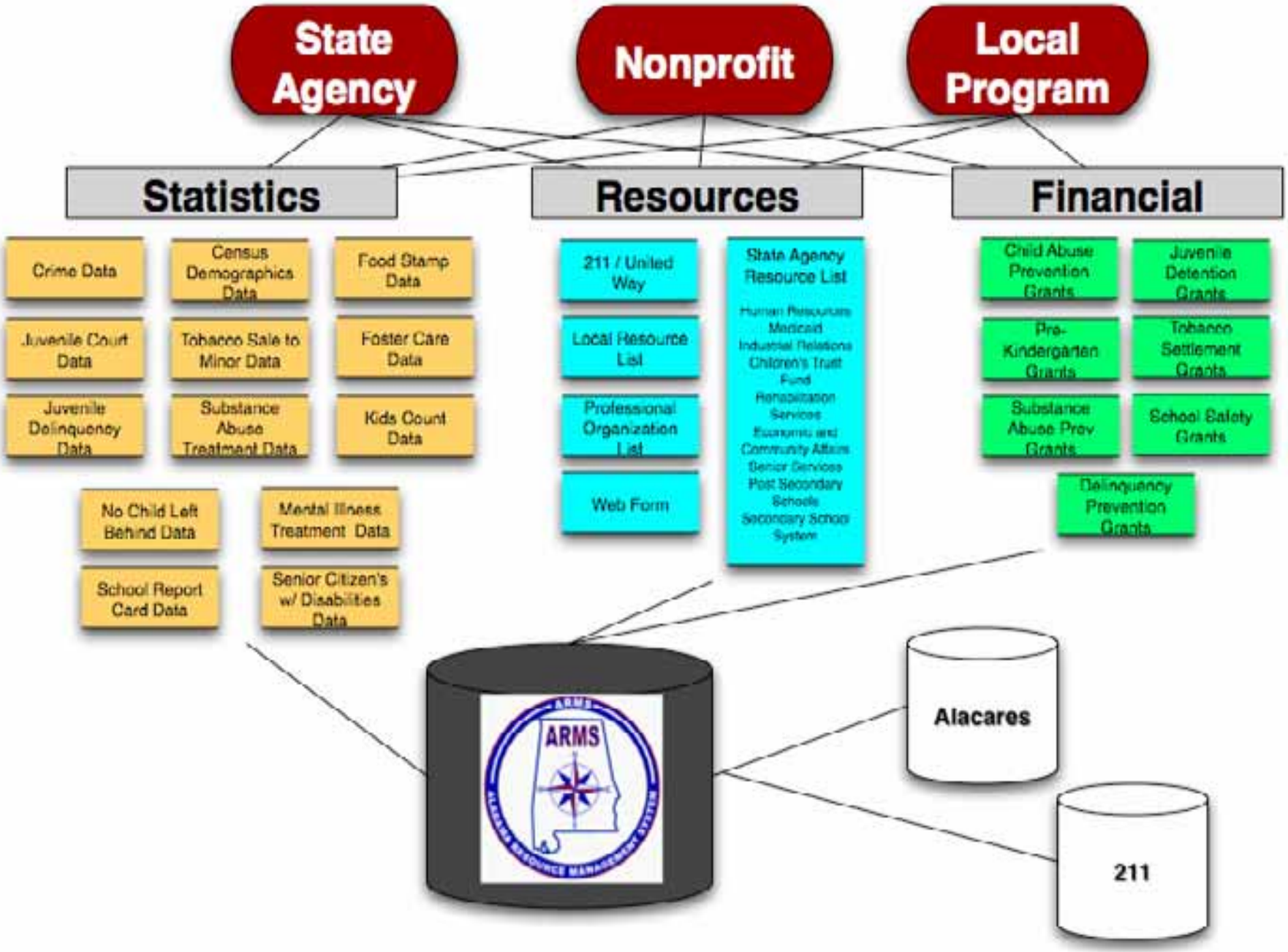


- **Customized integrations occur each time consumers need information, leading to many proprietary information exchanges**
- **Information assets from providers are visible and consumable across the network to create a marketplace of information exchanges**

No Child Left Behind
State of Michigan Governors' Initiative:
Children's Action Network (CAN)



225 schools failing in the "no child left behind" program were examined and GIS was used to help determine appropriate action for overall improvement.


State Agency
Nonprofit
Local Program
Statistics
Resources
Financial
Crime Data
Census Demographics Data
Food Stamp Data
Juvenile Court Data
Tobacco Sale to Minor Data
Foster Care Data
Juvenile Delinquency Data
Substance Abuse Treatment Data
Kids Count Data
No Child Left Behind Data
Mental Illness Treatment Data
School Report Card Data
Senior Citizen's w/ Disabilities Data
211 / United Way
Local Resource List
Professional Organization List
Web Form
State Agency Resource List
Human Resources
Medicaid
Industrial Relations
Children's Trust Fund
Rehabilitation Services
Economic and Community Affairs
Senior Services
Post Secondary Schools
Secondary School System
Child Abuse Prevention Grants
Juvenile Detention Grants
Pre-Kindergarten Grants
Tobacco Settlement Grants
Substance Abuse Prev Grants
School Safety Grants
Delinquency Prevention Grants
ARMS
Alacares
211

Independent, Dependent or INTER-Dependent?

What happens within each State … is part of an integrated system. All processes, whether ecological, biological, climatological, geological, even sociological, are linked…by being location based

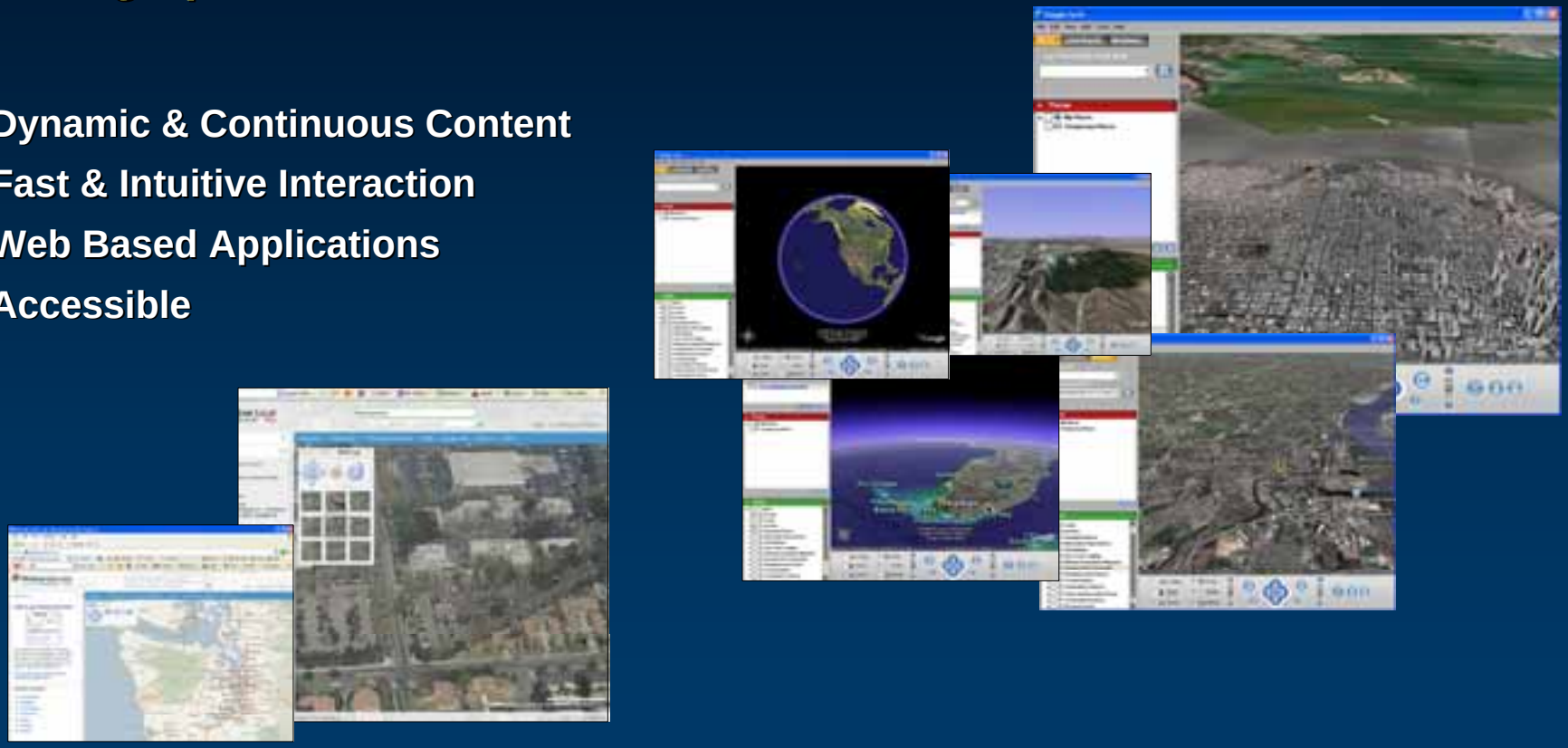
. . . Influenced By Inter-dependent Natural & Human Activities

With intended or unintended consequences

Applications Such As MapQuest, GoogleEarth, Virtual Earth and ArcGIS Explorer are Popularizing Location Based Information and Services

Introducing a Much Broader Audience To a New Way of Interacting with Geographic Information on the Web

- Dynamic & Continuous Content
- Fast & Intuitive Interaction
- Web Based Applications
- Accessible



. . . Opening the World's Eyes, Raising Expectations …

Major Trends in Technology…

that will affect IT and GIS Decisions

- Trend 1: **The Internet and its Web-enabled infrastructure will** continue to grow **and expand; new and better applications will follow; Internet technologies will be used in organizations as the** primary service **mechanism.**

- **Trend 2: Service and information will be the primary focus for users; the perception of an organization will be measured on the** ability to deliver service**.**

- **Trend 3: The need for security, privacy and accessibility will continue be a priority for users.**

- Trend 4: ***Mobile computing*** **will accelerate dramatically through the use of integrated computing devices, Web technology, and increasing availability of wireless**

Sources: Center for Digital Government; *Technology Futures, Inc*

Major Trends in eGov Technology…

that will affect IT and GIS Decisions

- Trend 5: **The costs of computing resources will continue to decline;** human resources will continue to increase in cost.

- Trend 6: **The shift from legacy systems/client servers to network-centric computing environment will allow governments to be** proactive rather than reactive**, service aware instead of environment aware, and, most important,** customer-focused **rather than IT focused**

- Trend 7: **Broadband and high speed wireless will continue to** increase**, enhancing access and timeliness. Better applications and greater expectations will follow.**

Select the **top three areas** for IT/Telecom investment for your organization in 2007.

A. Data Management/Information Sharing
B. e-Government/Improving Citizen Services
C. Information Security
D. Mobile Workforce/Wireless Operations
E. Interoperability and Integration
F. Managing/Replacing Legacy Systems
G. Homeland Security Initiatives
H. IT Consolidation/Shared Services

Survey: NASCIO ANNUAL MEETING Oct 2006

Separate and Separating Roles of CIO or GIO

- The Choices are:
- Vertically challenged manager
  - Know Technology
  - Hardware, software, IT procurement, training
  - Focused on process
- Horizontally enabled strategist
  - Know the issue
  - Peer to peer policy coordination
  - Assures Enterprise approach
  - Focused on purpose that is enabled through technology
- Talk about Technology last, not first

Building Enterprise GIS: Qualifying Readiness

GIS is Enterprise IT if …

- **Policy officials, commanders, operators, users, and IT support all recognize GIS as mission critical**
- **GIS serves a diverse base of mission needs that extends through most of the user community**
- **Geospatial technology, data, and services are discoverable, integrated and shared across the user community**
- **GIS technology, applications, and data are embedded in the core IT infrastructure at all levels, and integrated with other enterprise systems**
- **GIS architecture is centrally managed--like any other enterprise IT system**

NASCIO 2006 Conference Interactive Audience Polling Results

Over the next 5 years, do you see state government IT overall governance moving towards:

A. A *centralized* model (IT activities are performed by one heirarchical organization)
B. A *decentralized* model (IT activities are performed by separate state agencies with no central enterprise organization)
C. A *federated* model (IT activities are performed by a combination of agency-specific IT groups and the central IT group)
D. Total *anarchy*

Connecting Technology, Policy and Sociology

Valuing Purpose…

…Over Process

GIS For Policy Makers

- If you had ten minutes at the top –
- Where would you start?

- *Are IT and GIS expenses part of the solution? Or are they perceived as just an added cost?*
- If GIS and IT aren't tied to an issue, they will always be a discretionary item in the budget

- Tie GIS To Priorities
  Check the Current Budgets, State of the State Addresses, County Initiatives, Legislative postings, business associations to See What Issues Top the List

Typical Top 10 Issues for Governors

- **The Budget – OK this year, crunch is coming**
- **Health Care**
  - **Medicaid**
  - **The aging population**
  - **Health IT**
- **Economy, Jobs, Competitiveness**
- **Education**
- **Energy/Environment – Cost , Alternatives and Climate Change**
- **Disasters, Weather (Fire, Drought, Flood)**
- **Transportation/Infrastructure**
- **Local Government Funding**
- **Homeland Security**
  - **The National Guard**

GIS is the tool to provide integrated information

NCSL Top 10 Issues 2006

- Planning for Emergencies
- Closing the Energy Gap
- Tax and Spending Limits
- Defining “Public Use” (eminent domain)
- Funding Education
- Examining Immigrant Rights
- GPS for Sex Offenders
- Dealing with Real ID
- Contemplating Stem Cell Research
- It’s a Campaign Year

http://www.ncsl.org/programs/press/2005/pr051228.htm

2007 Top 10 National Conference of State Legislatures (NCSL)

http://www.ncsl.org/programs/press/pr070104.htm

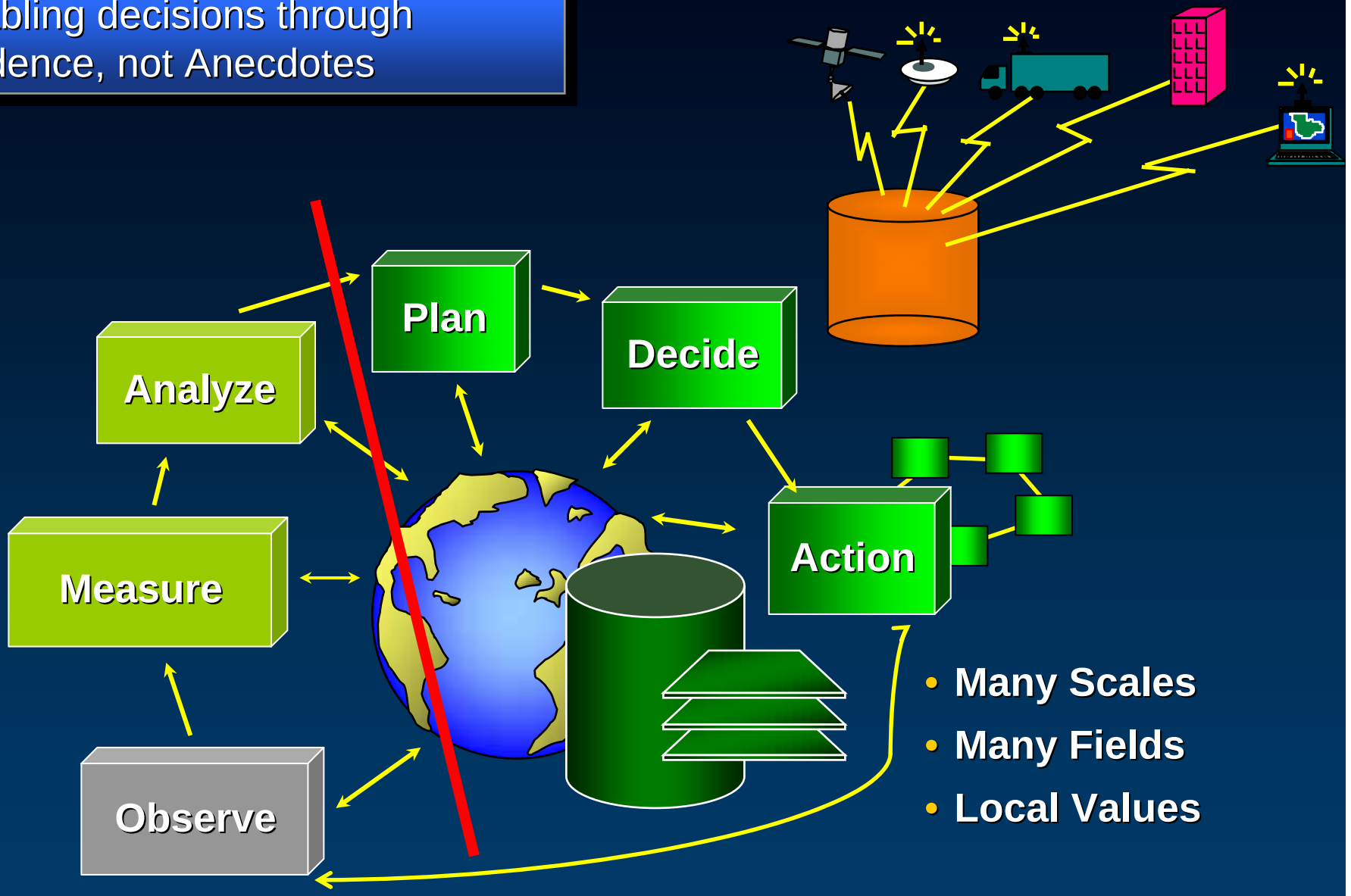
- Immigration
- Homeland security and standardized ID cards (REAL ID)
- Budget pressures
- Health insurance
- Sexual offenders and predators
- Energy and environment
- Minimum wage
- Higher education reform
- Privacy
- Obesity

Business Leaders

Policy Positions & Legislative Agenda

- GENERAL BUSINESS
- ECONOMIC DEVELOPMENT
- EDUCATION
- INSURANCE
- HEALTH CARE
- TAXES
- TOURISM
- WATER
- WORKFORCE
- CONNECTIVITY
- TRANSPORTATION

Enabling decisions through Evidence, not Anecdotes



- Many Scales
- Many Fields
- Local Values

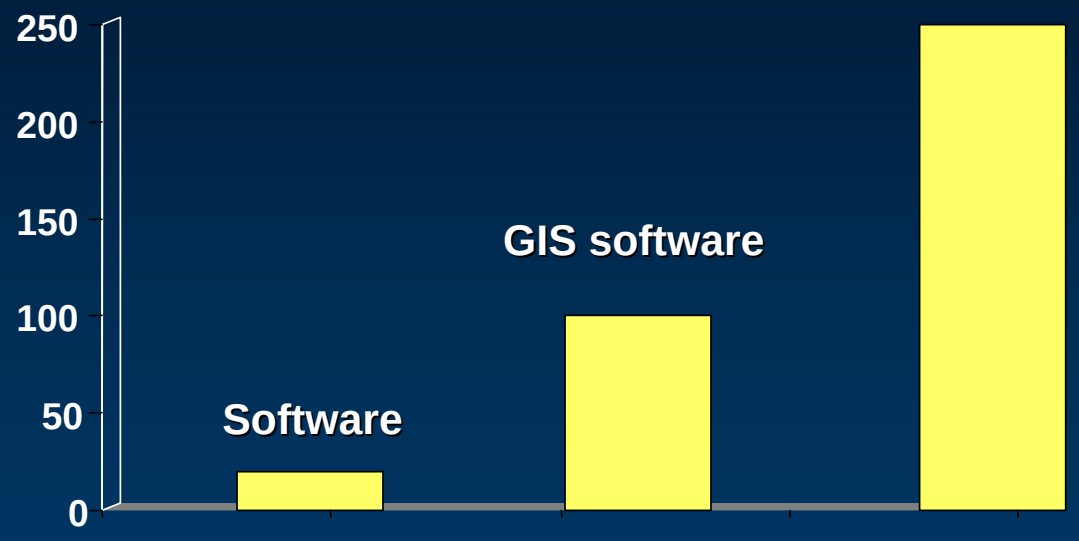
Enabling Decisions, Adapting to Change

To Engage Your Policy Leaders

- Talk about technology last, not first
- They are pre-disposed to think of GIS as only a map, not information in context
- Put a face on it – relate it to PEOPLE (WHO)
- Use a high priority issue to catch their attention (WHAT)
- Let the picture do the talking (VISUALIZATION IS POWERFUL)
- Use terms that communicate (WATCH YOUR LANGUAGE)

GIS Has Become Mainstream Technology—Especially in Government

Trends in Global Revenue Growth, 1999 to 2005



Sources: Information & Software Industry Association; Daraquest

"There is clearly a trend to migrate disparate line-of-business geospatial systems to an enterprise GIS environment. This trend features core GIS infrastructure maintained by a central IS organization, with data management responsibilities held by the lines of business that are the primary users."

Gartner—US Public Sector GIS Survey

Connecting Technology, Policy and Sociology

- Vision and Leadership
- Management Support
- Understanding of Business Processes
- Governance And Finance Model
- Planning
  - Technical Architecture
  - Data Models
  - Organization
  - Implementation Work
- Good People

  . . . And a Spirit Of Collaboration

GIS Servers, Web Services And SOA
Provide New Opportunities For Rapid Implementation

Services Oriented Architecture

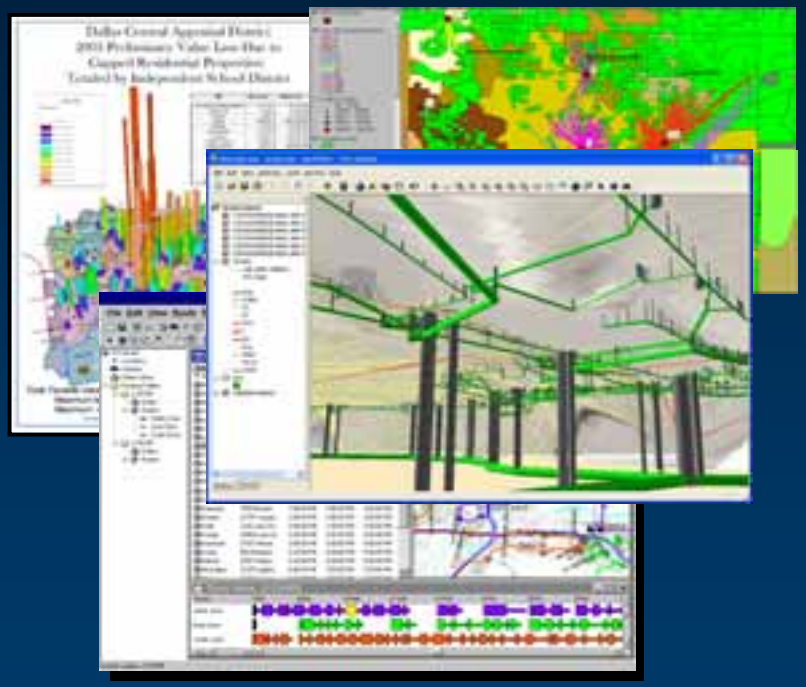
- **Government can no longer justify unnecessary duplication of infrastructure that could otherwise be shared. Nor can it afford to build tomorrow's stovepipe systems today**
- **Service Oriented Architectures work by mapping software services to an organization's actual business processes.**
- ***SOA is not just an architecture of services seen from a technology perspective, but the policies, practices, and frameworks by which we ensure the right services are provided and consumed.***

Enterprise GIS Business Architectures

Some Examples. . . Using the Language of GIS

Geocentric Workflows

Geographic information as the foundation of mission operations



Geospatial Intelligence
Facilities and Asset Management
Land Records Management

Geospatially-Enabled Workflows

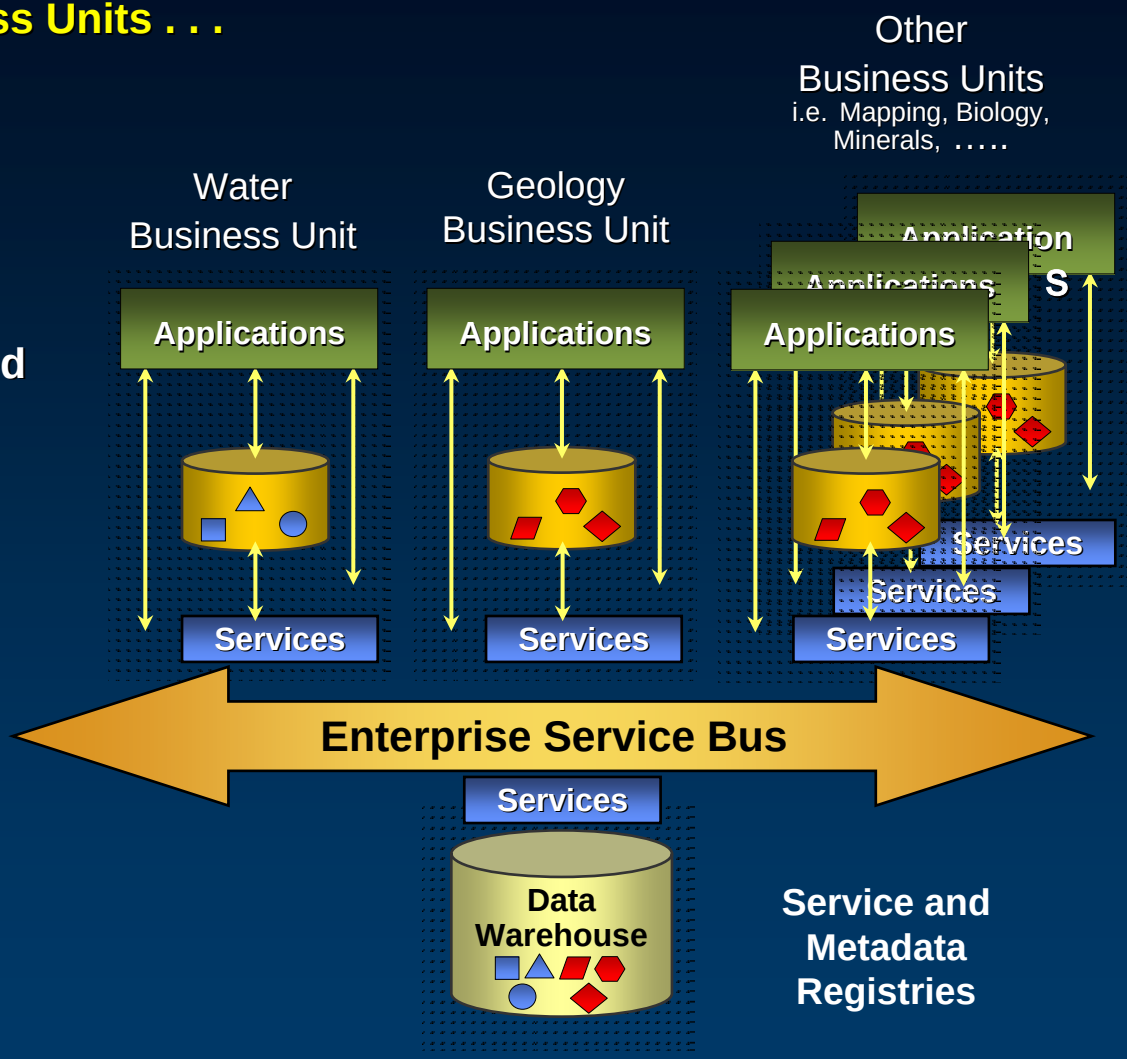
Infusing geospatial intelligence in enterprise IT systems

Command & Control
Business Intelligence
Supply Chain

Enterprise GIS Can Be Implemented Using A SOA

Modernizing and Integrating Business Units . . .

- **Organize Around Business Units**
  - **Applications and Data Tailored to Mission Needs and Productivity Requirements**
  - **Manages Its Own Data in an Operational Database**
  - **Share Data**
    - **Publishing to the Data Warehouse**
    - **Directly as Services**
- **Business Units Are Service Providers and Consumers**



. . . A Framework For Incrementally Growing an Enterprise Services Architecture

GIS Was Used Extensively in Response to Hurricane Katrina/Rita/Wilma Damage Assessment

. . . Lots of Demand for Maps and Geospatial Analysis

Disaster Challenge

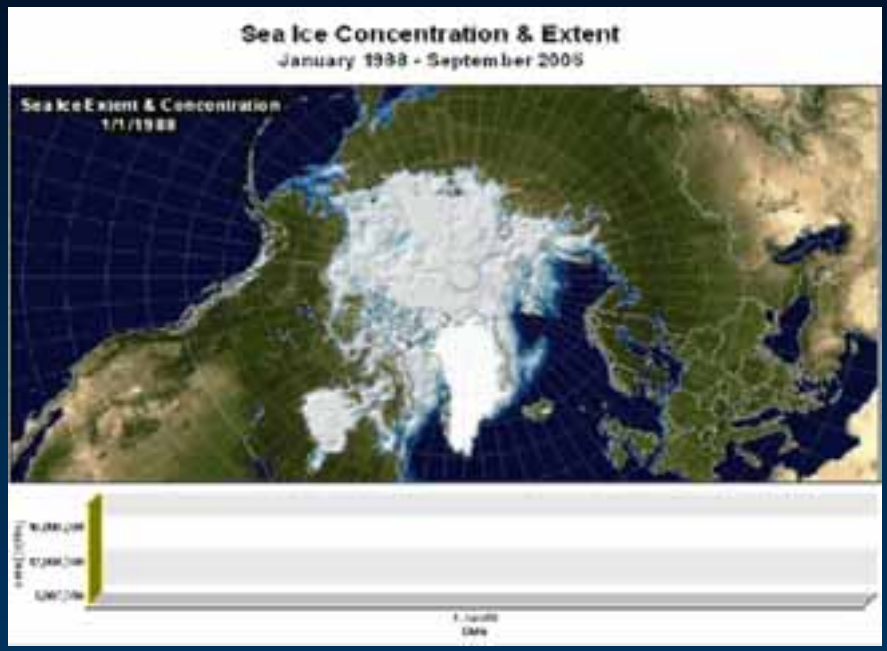
- **The federal government, NGOs, States and the private sector must work together to deliver human services including health, cash assistance, food, clothing, shelter and other immediate needs following a disaster.**
- **Recovery from catastrophic disasters will often require a long term process that requires government and private sector (NGO) resources to restore the victims' lives and well being.**
- *LOCATION AND LOGISTICS* **are key**

GIS For the Nation - Data Model Themes

- Emergency Operations
- Structures/Critical Infrastructure
- Governmental Units
- Utilities
- Addresses
- Transportation
- Cadastral
- Hydrography
- Environmental
- Land Use/Land Cover
- Base Map
- Geodetic Control
- Elevation
- Imagery

Visualizing Geographic Information with Animation

Communicating Geographic Information



Sea Ice

New York

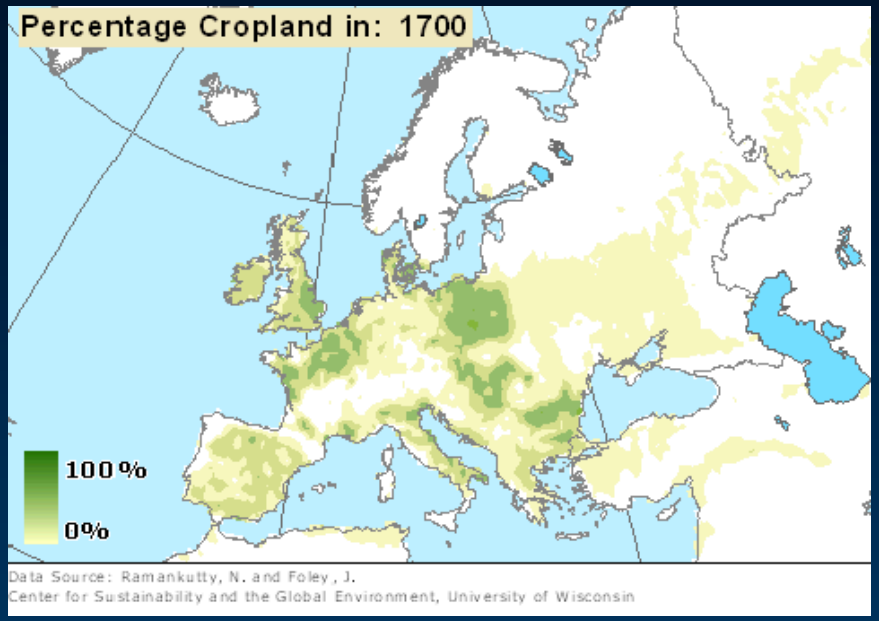
Katrina

. . . Creating Greater Understanding

Visualizing Geographic Information with Animation

Communicating Geographic Information

Medicaid

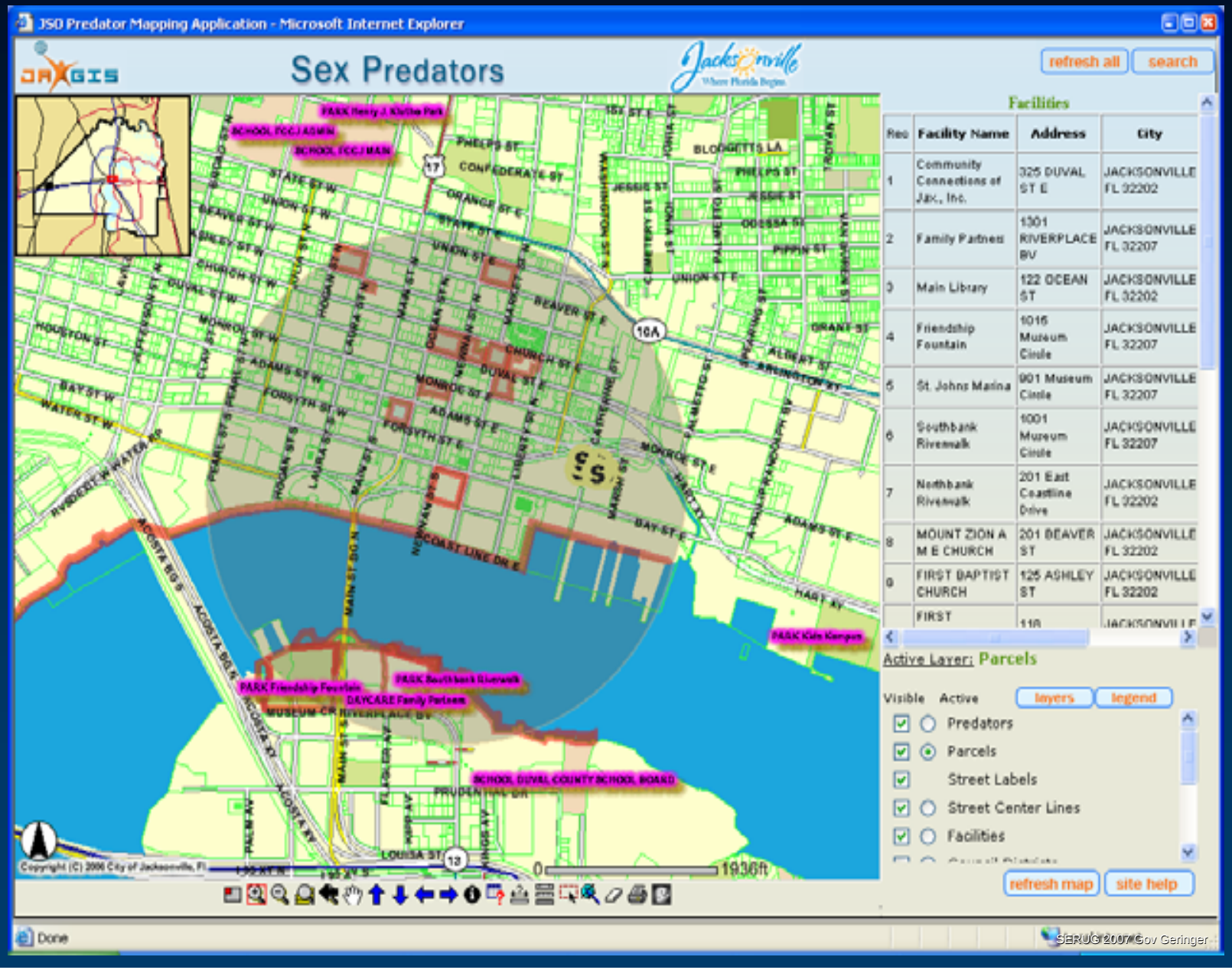


Cropland

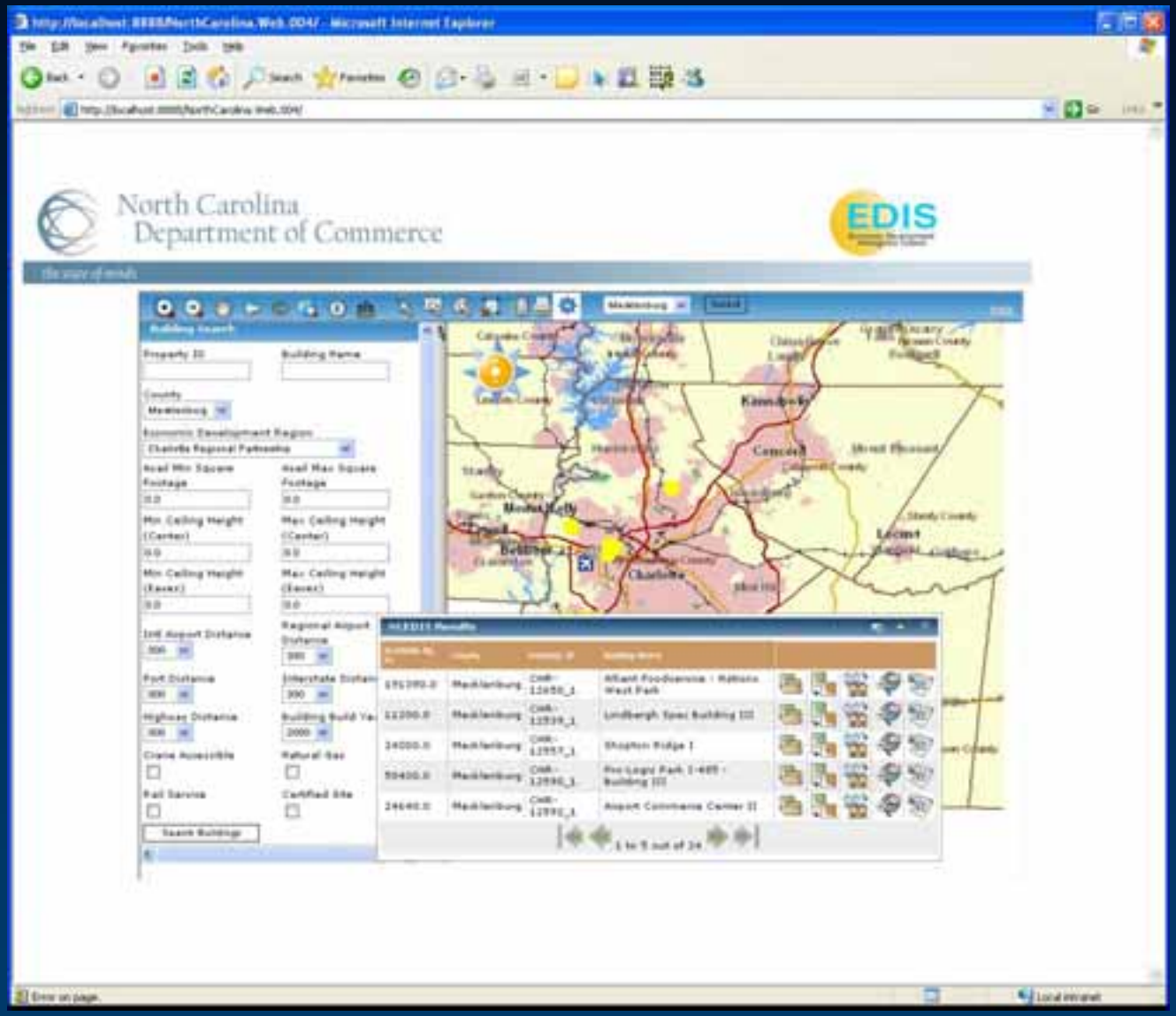
Oil Production

. . . Creating Greater Understanding

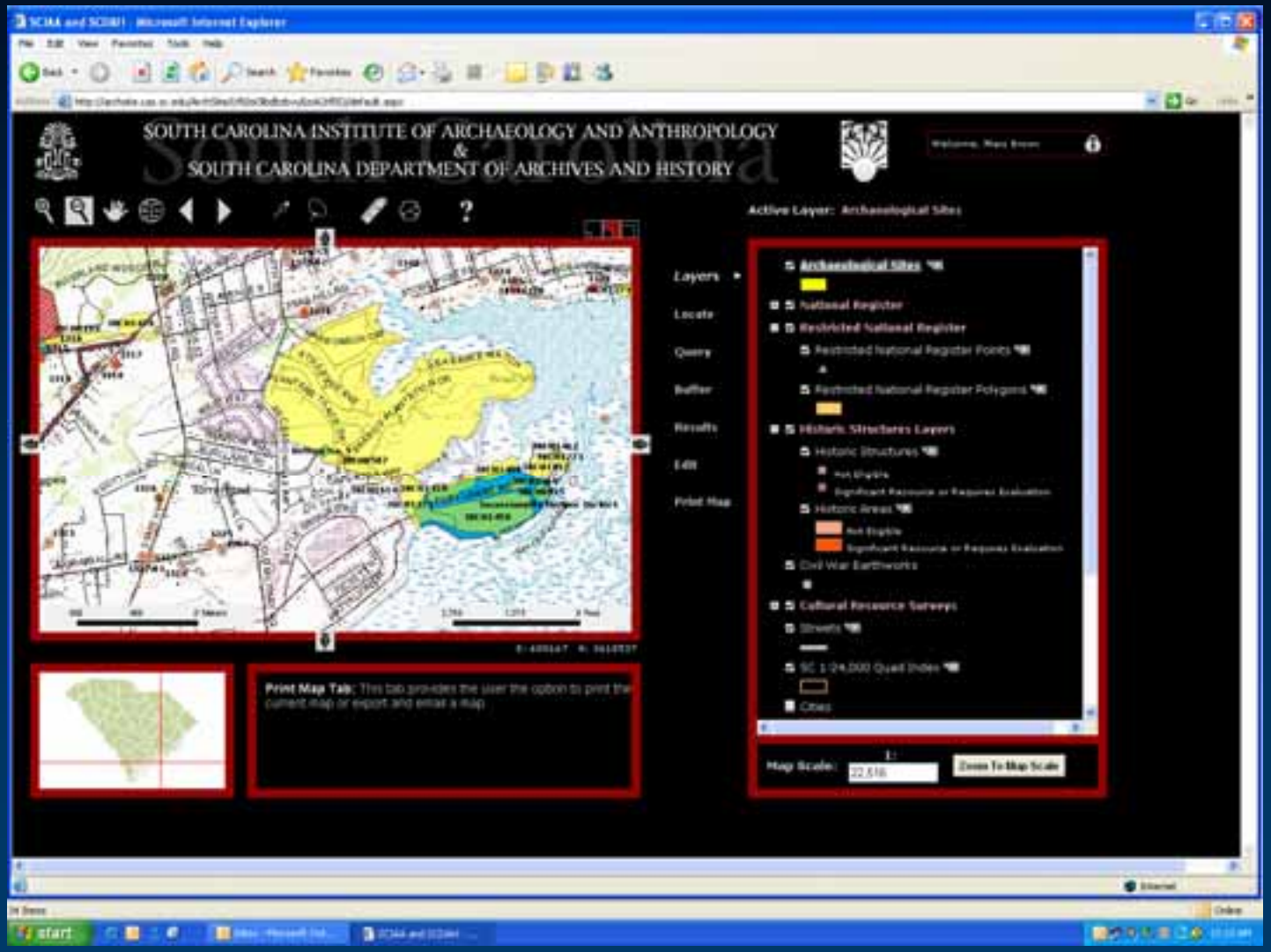
Sexual Predator Monitoring
Jacksonville (FL) Sheriff's Office



ESRI/SAS Integration - Economic Development Intelligence System (EDIS)
North Carolina Department of Commerce

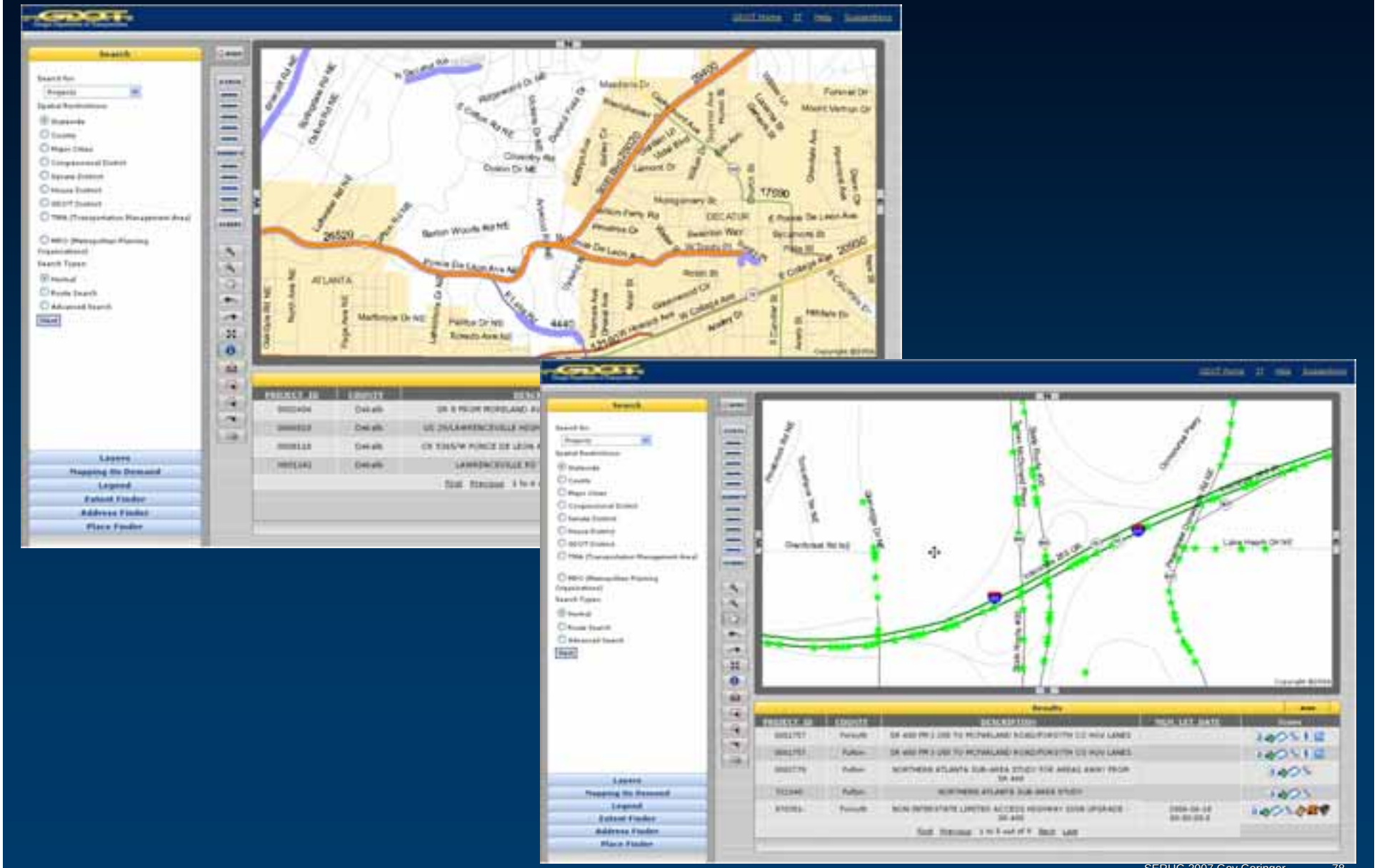


ArchSite
SC Institute of Archaeology and Anthropology

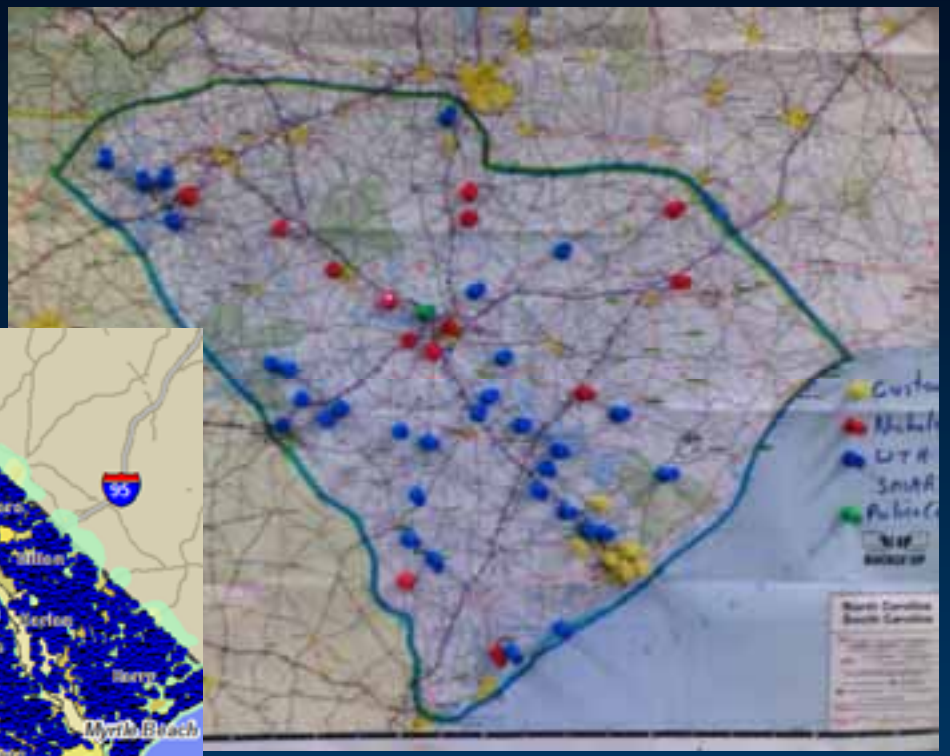


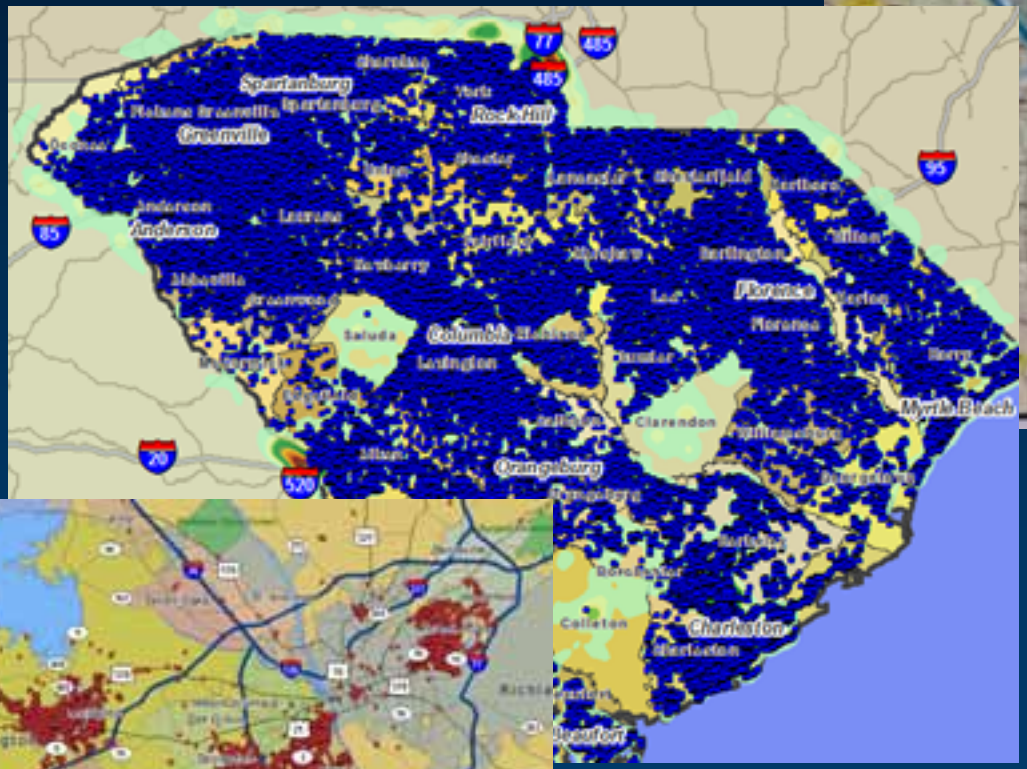
Web-based field editing solution for managing archaeological sites

TREX (Transportation Explorer)
Georgia Department of Transportation



SCIEX – South Carolina Information Exchange
S.C. State Law Enforcement Division (SLED)

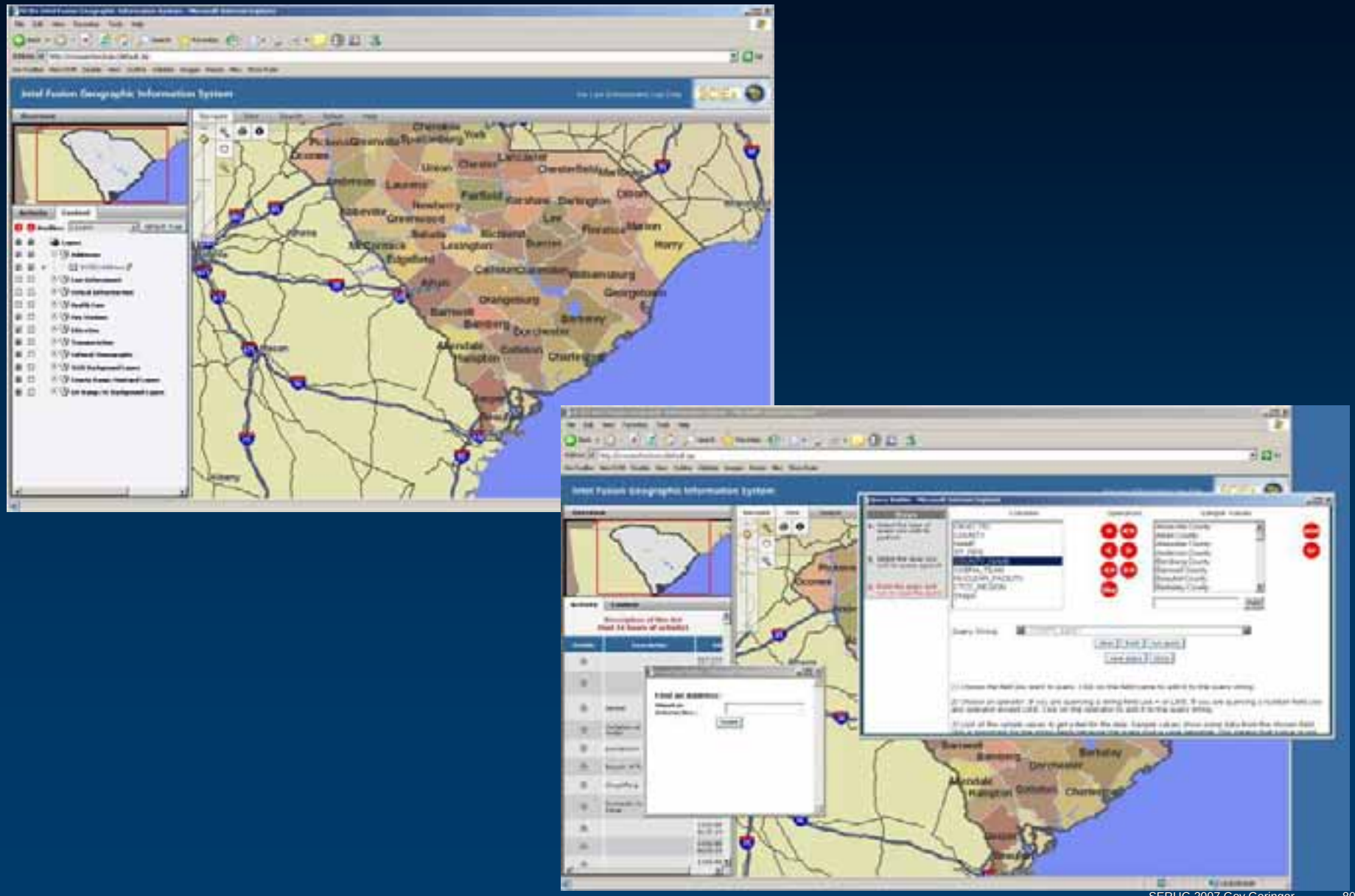




Statewide integration of crime data from 170 local law enforcement agencies.

Information on crimes, suspects, known offenders, etc. is retrieved from 23 proprietary computer-aided dispatch and records management systems and updated state-wide on a nightly basis.

SCIEX – South Carolina Information Exchange
S.C. State Law Enforcement Division (SLED)

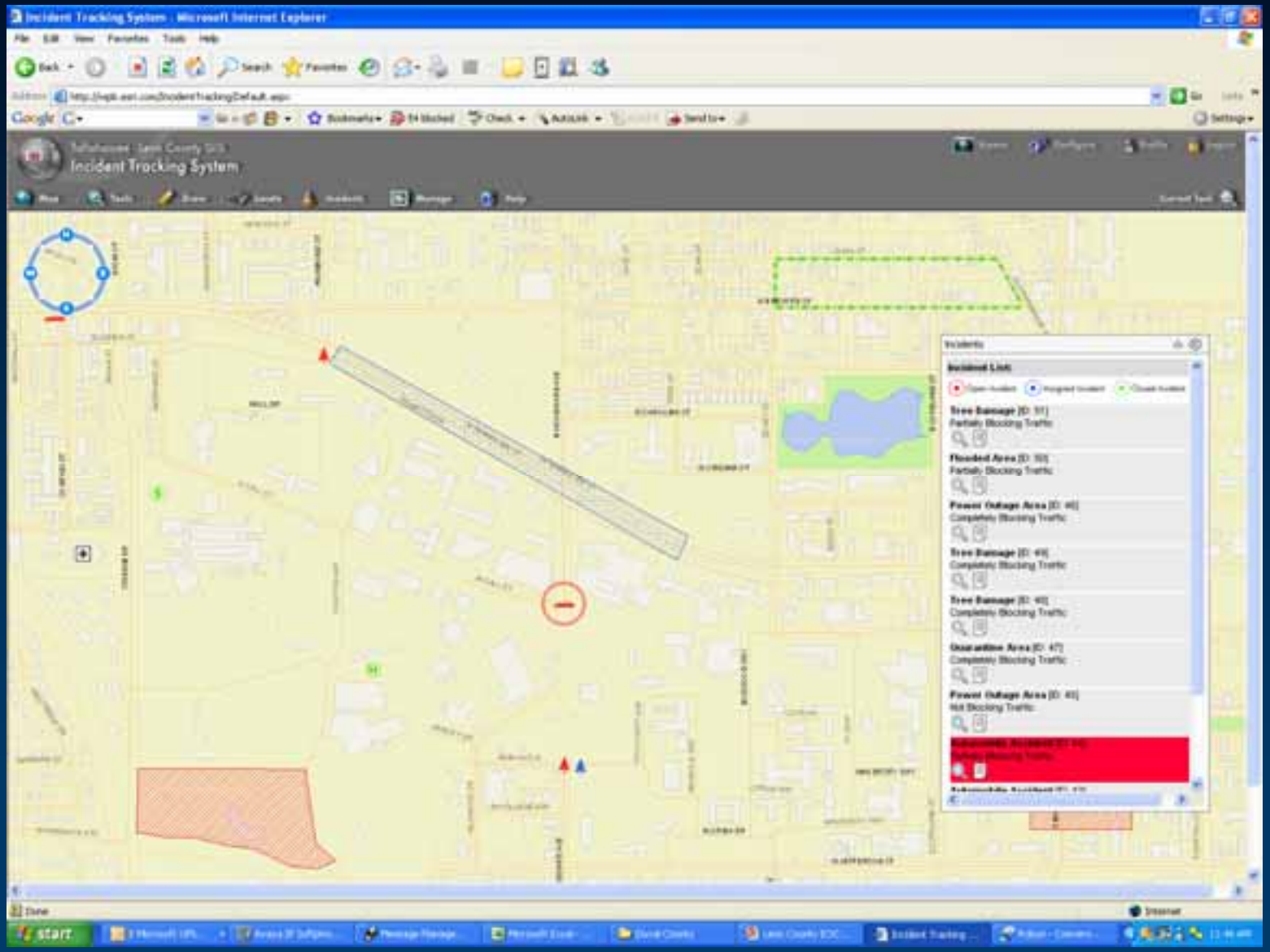


Buffer Zone Protection Plan
S.C. State Law Enforcement Division (SLED)

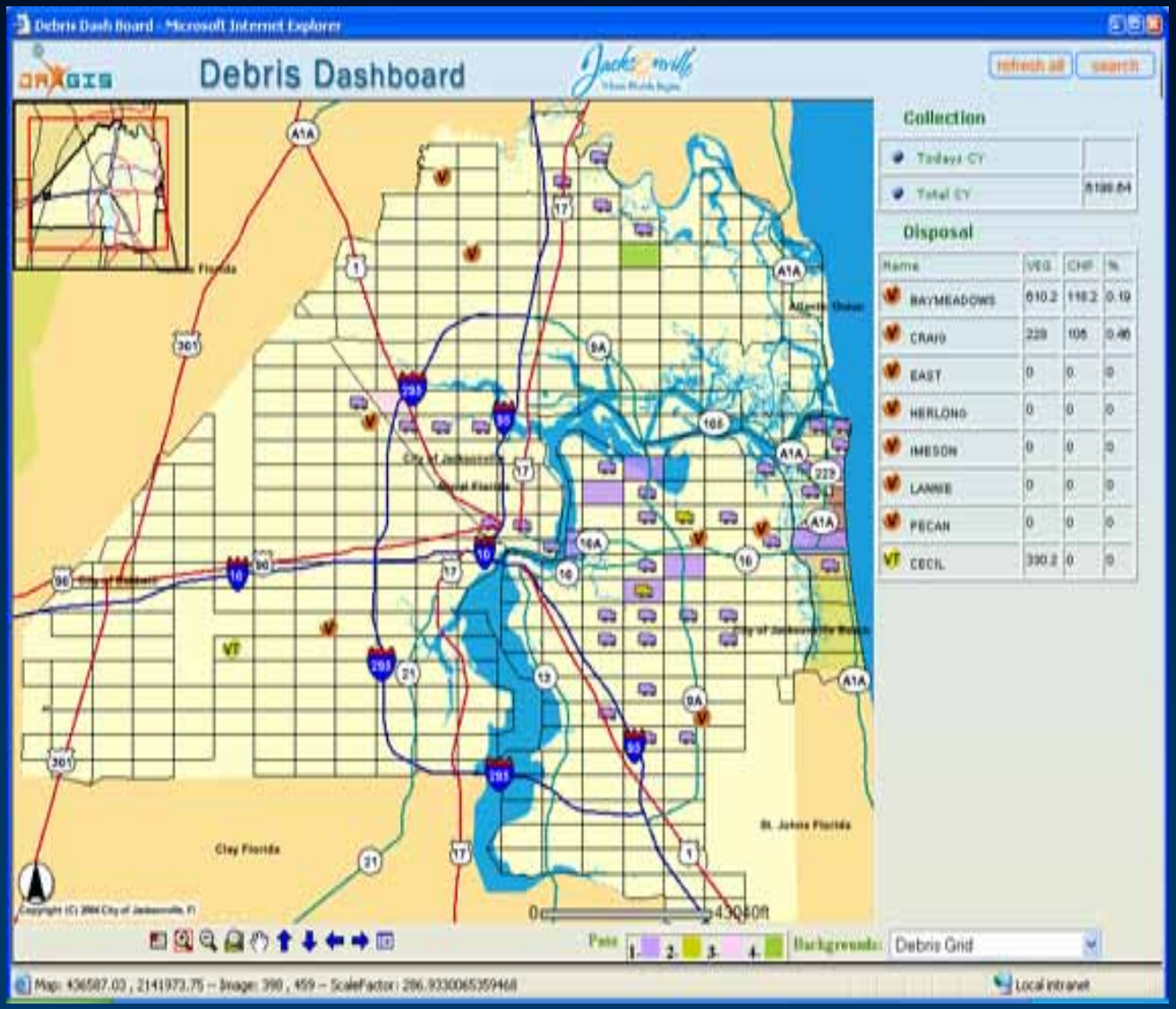
ALL DATA IS LOCAL…

and much of it is locally generated

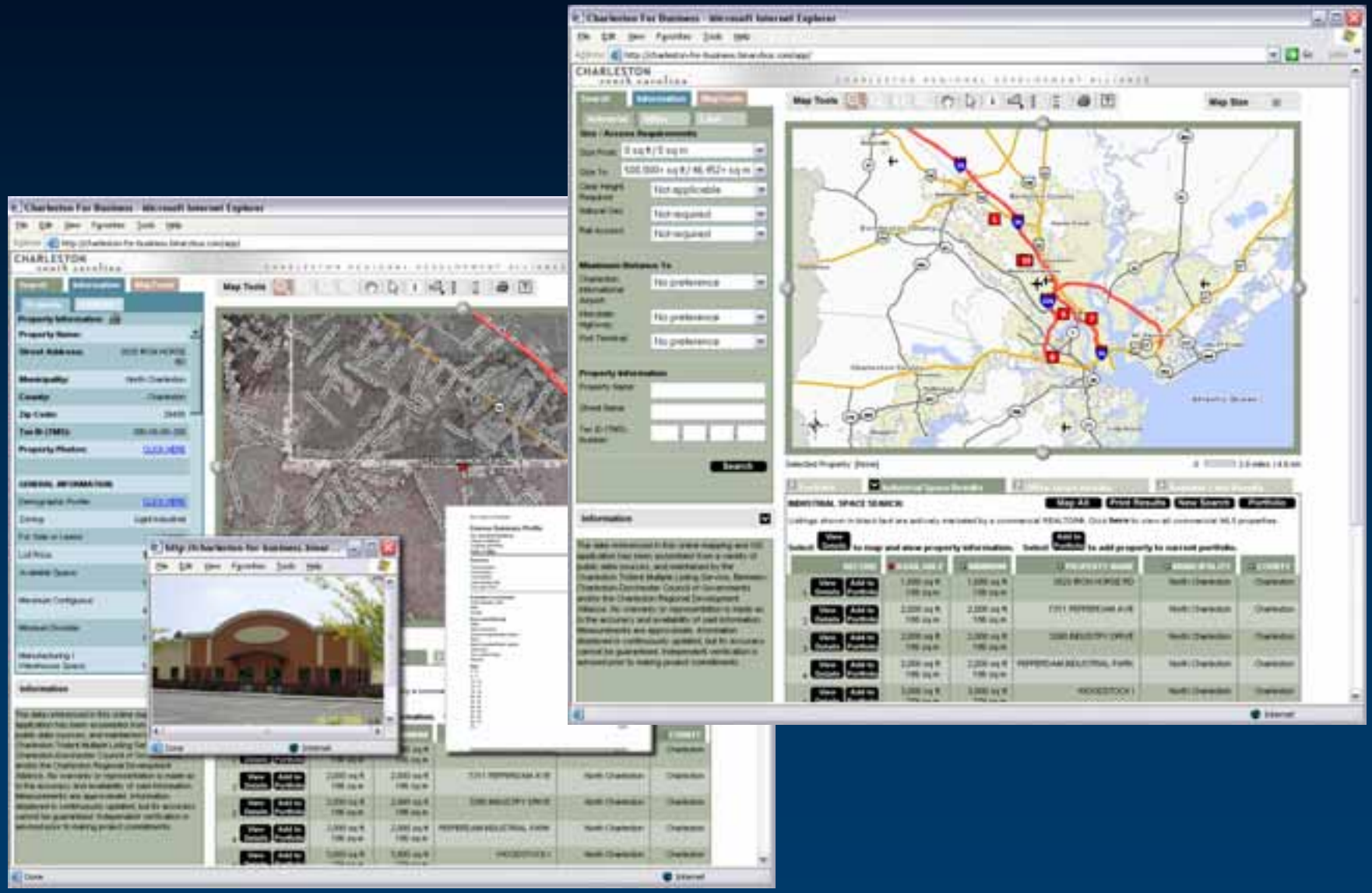
Common Operational Picture
Leon County (FL) Emergency Operations Center



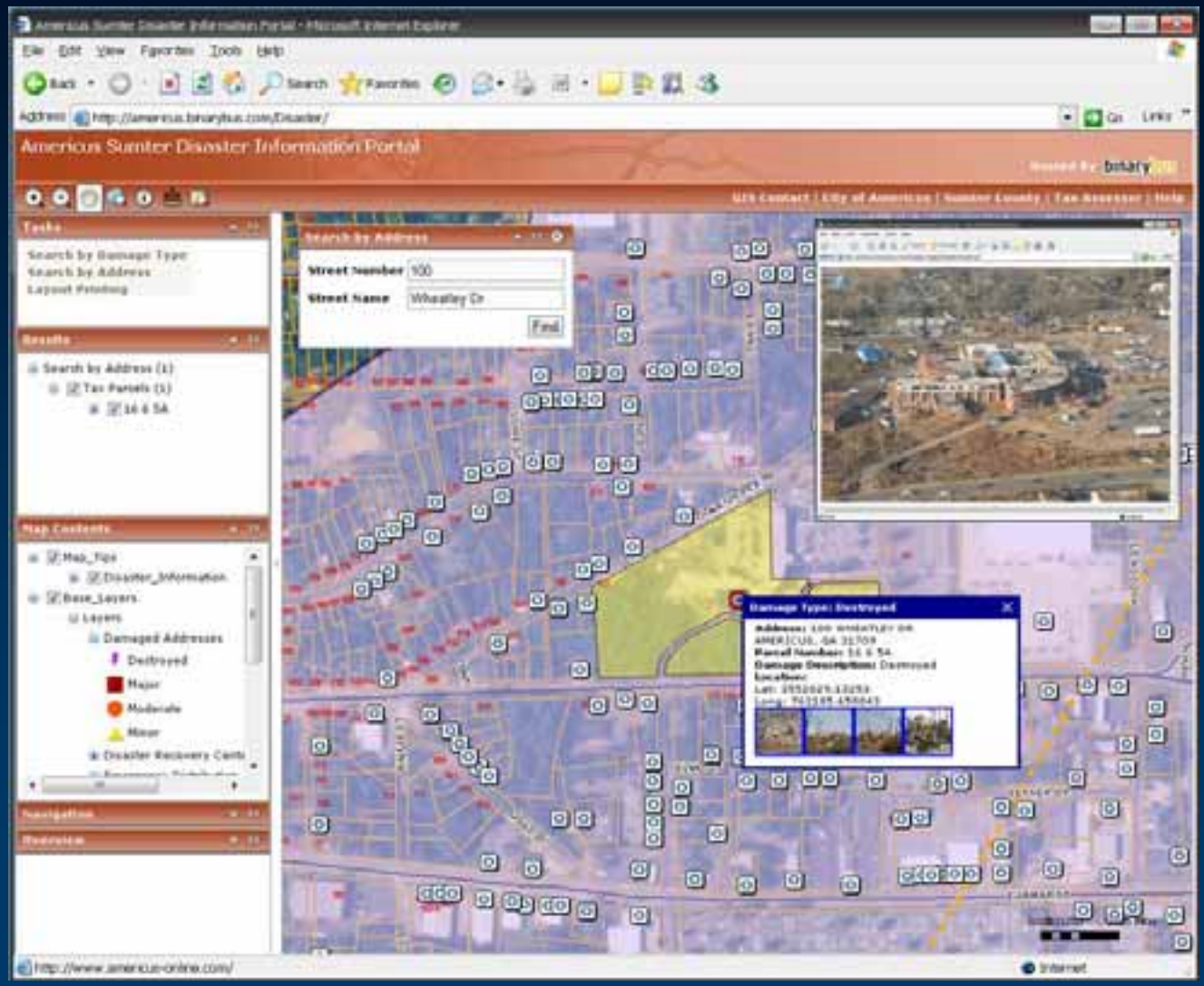
Executive Dashboards
City of Jacksonville (FL) GIS

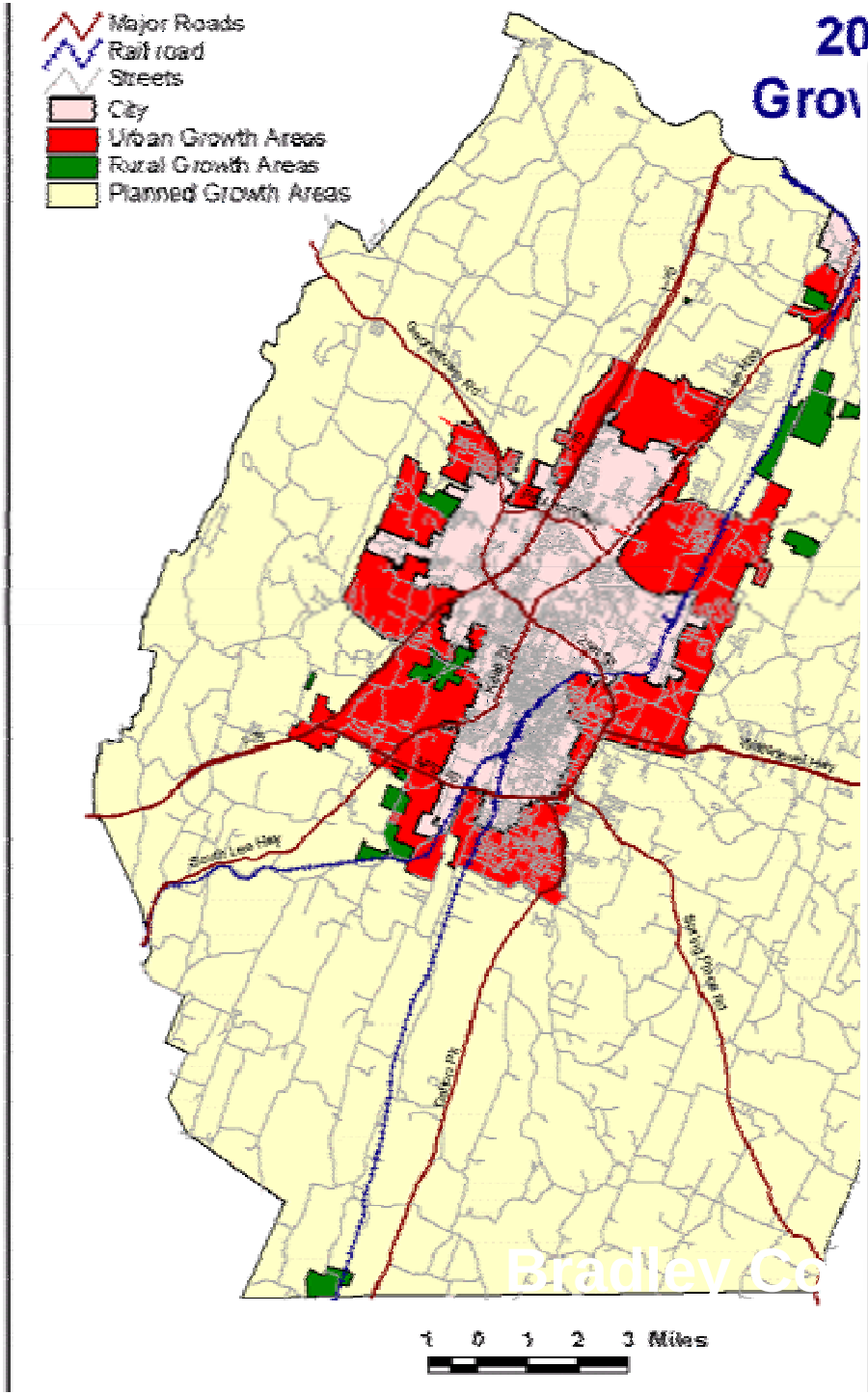


Economic Development – Building and Site Selection
City of Charleston, SC

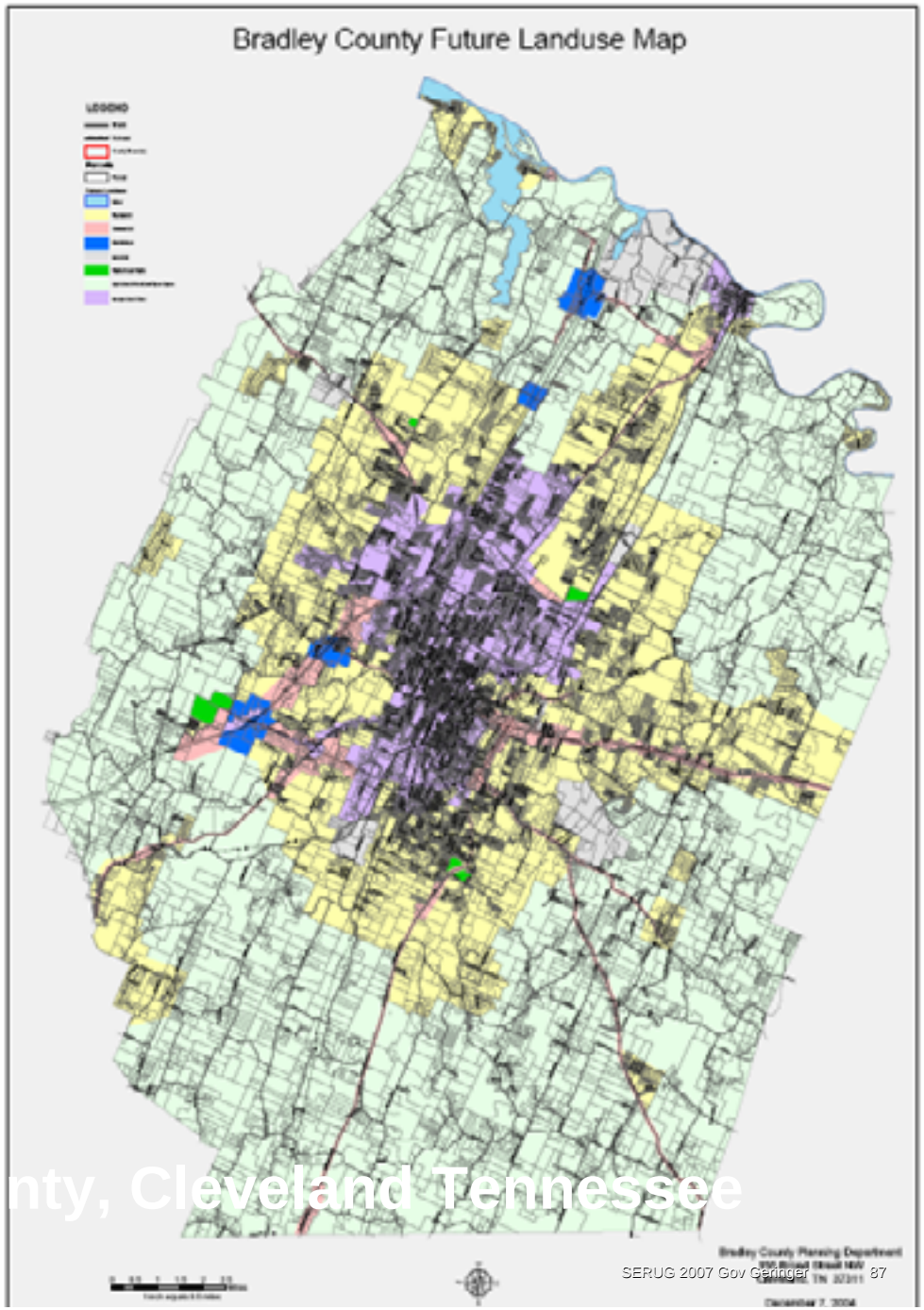


Disaster Management – Tornado 3/1/07
City of Americus, GA





20 Year Grov



Bradley County, Cleveland Tennessee

What's Next?

Most of tomorrow's systems are under development now.

Some of tomorrow's systems already exist, but are not yet available to potential users

Don't Underestimate the Wisdom of Crowds

The Next Great Killer App Might Be Something Completely Unexpected

Looking Forward…

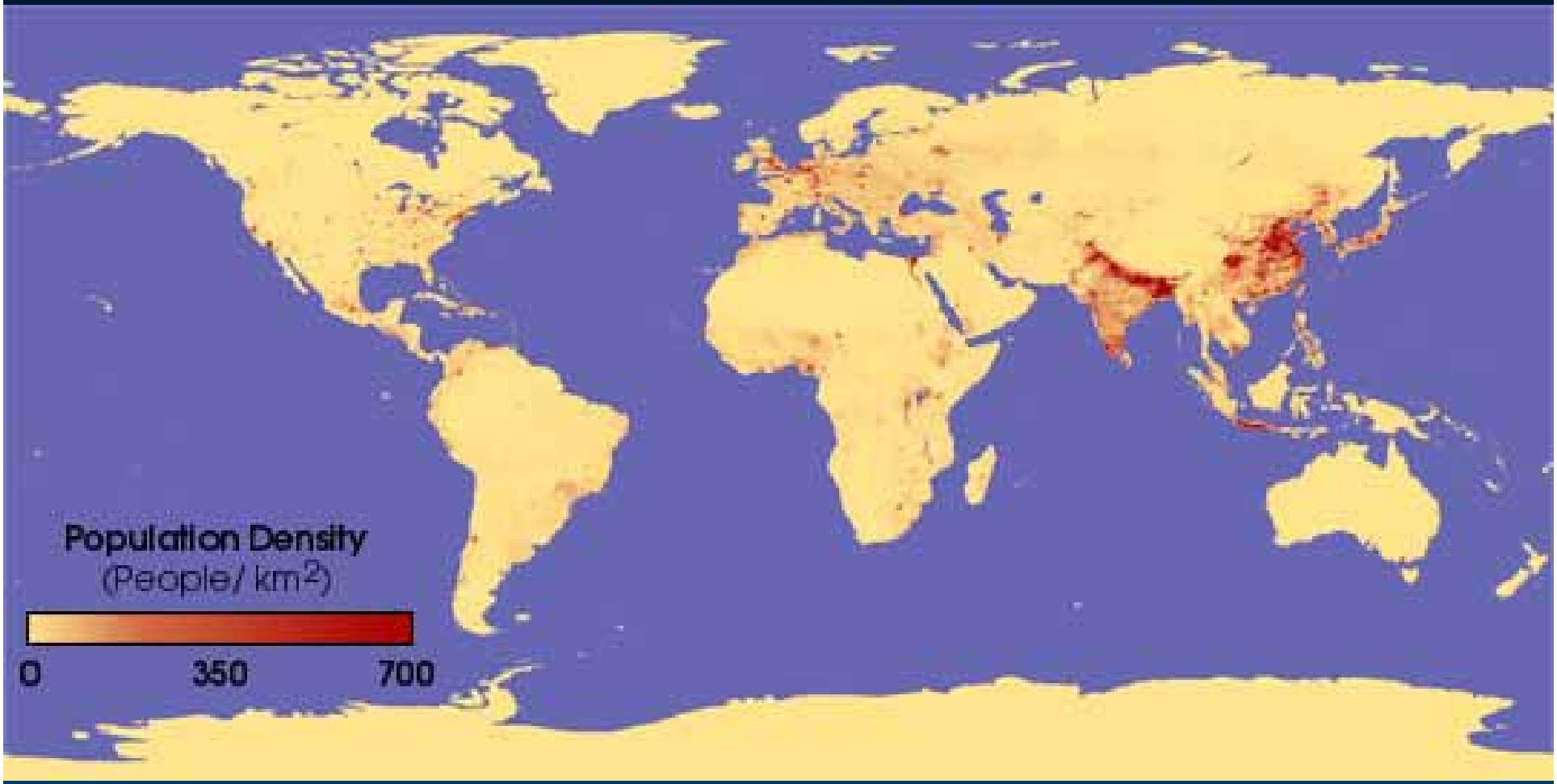
http://www.strategies.org/Alliance/

The Global Earth Observation System of Systems

THE ALLIANCE FOR EARTH OBSERVATIONS

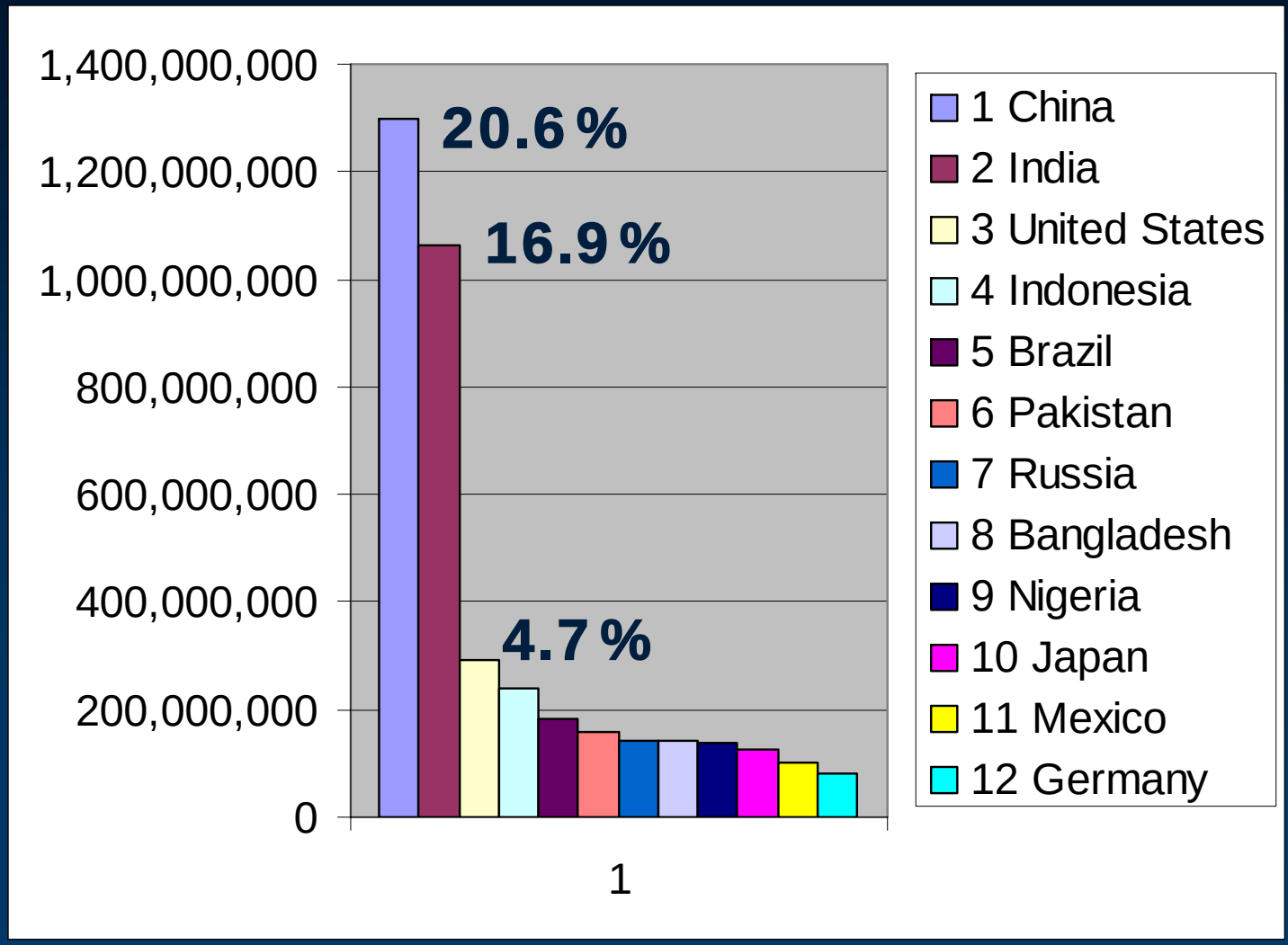
- Dedicated to delivering valuable information
- Global dialogue can make a difference

Beyond the United States: WORLD POPULATION DENSITY

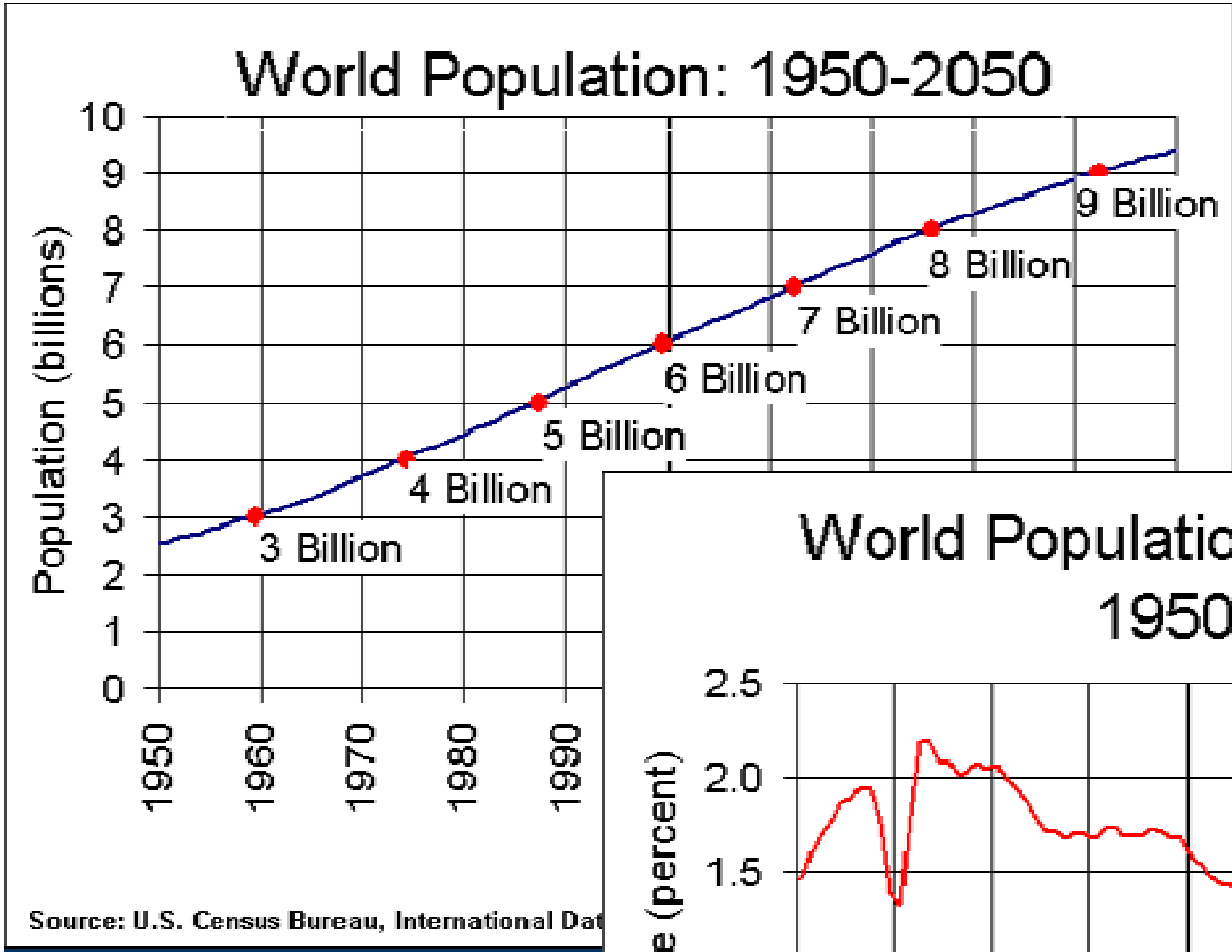


http://www.mapwatch.com/gallery/population-density-map.shtml

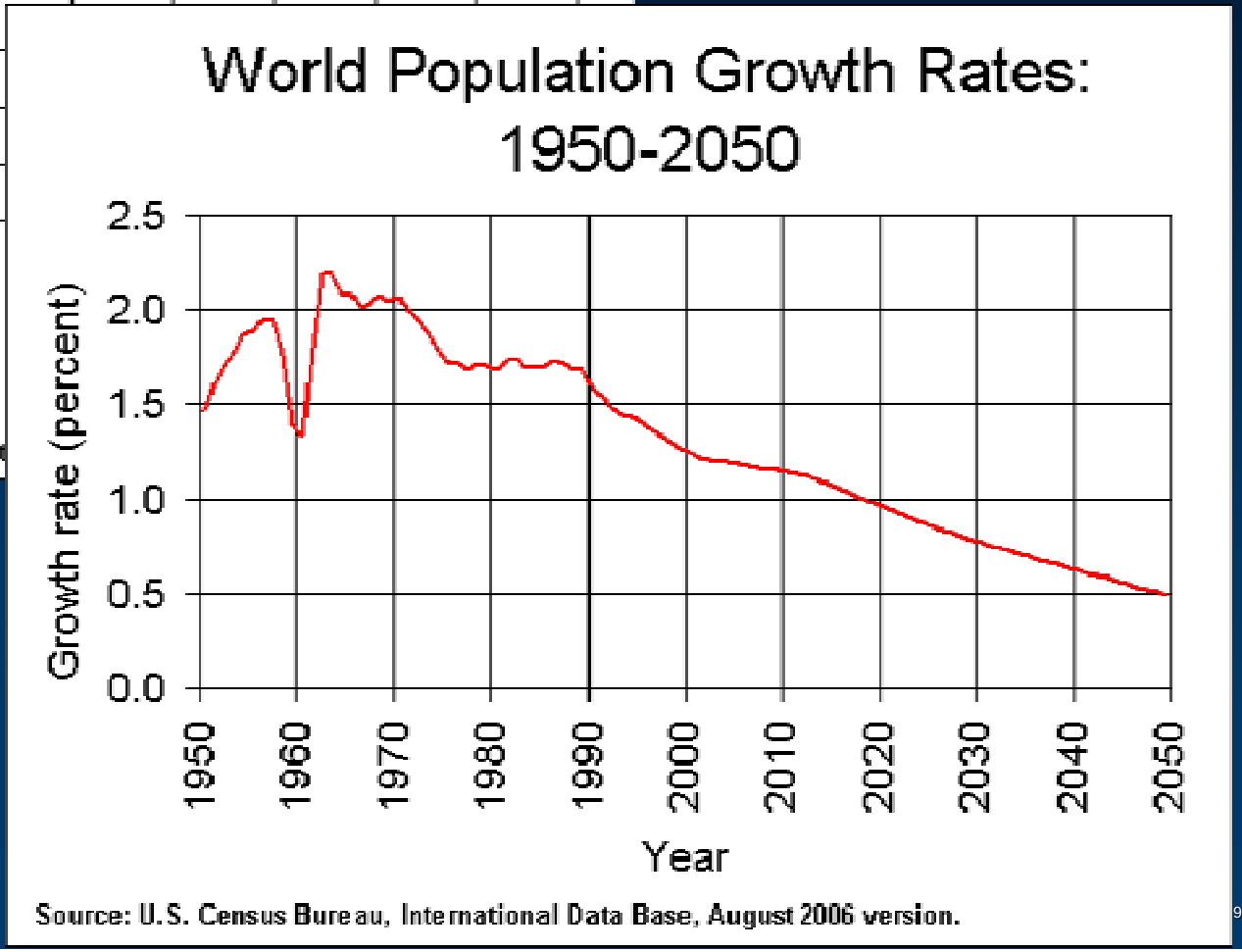
World Population



Sources: U.S. Census Bureau and Times Atlas of the World, tenth edition 2004 Estimate

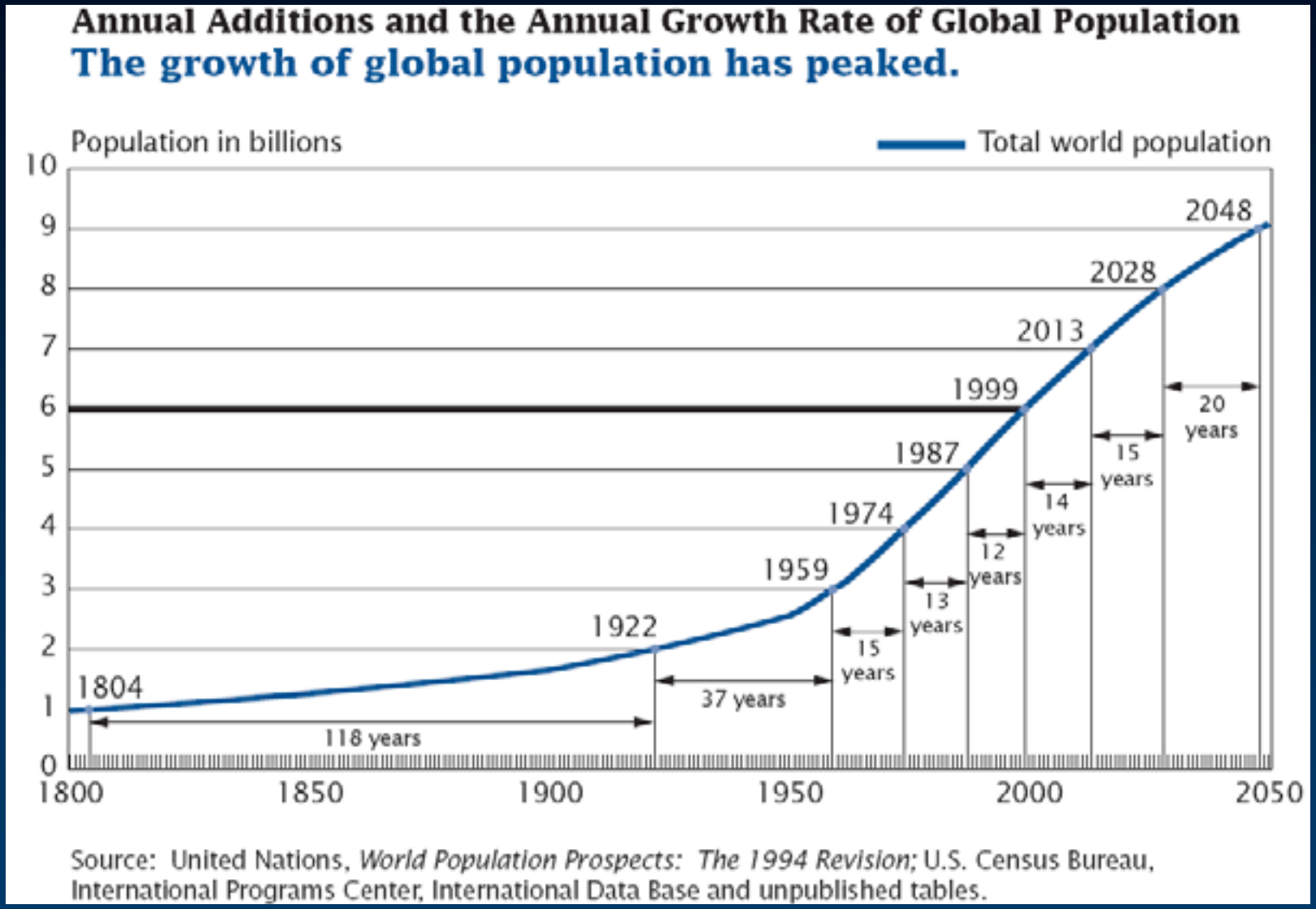


Source: U.S. Census Bureau, International Dat



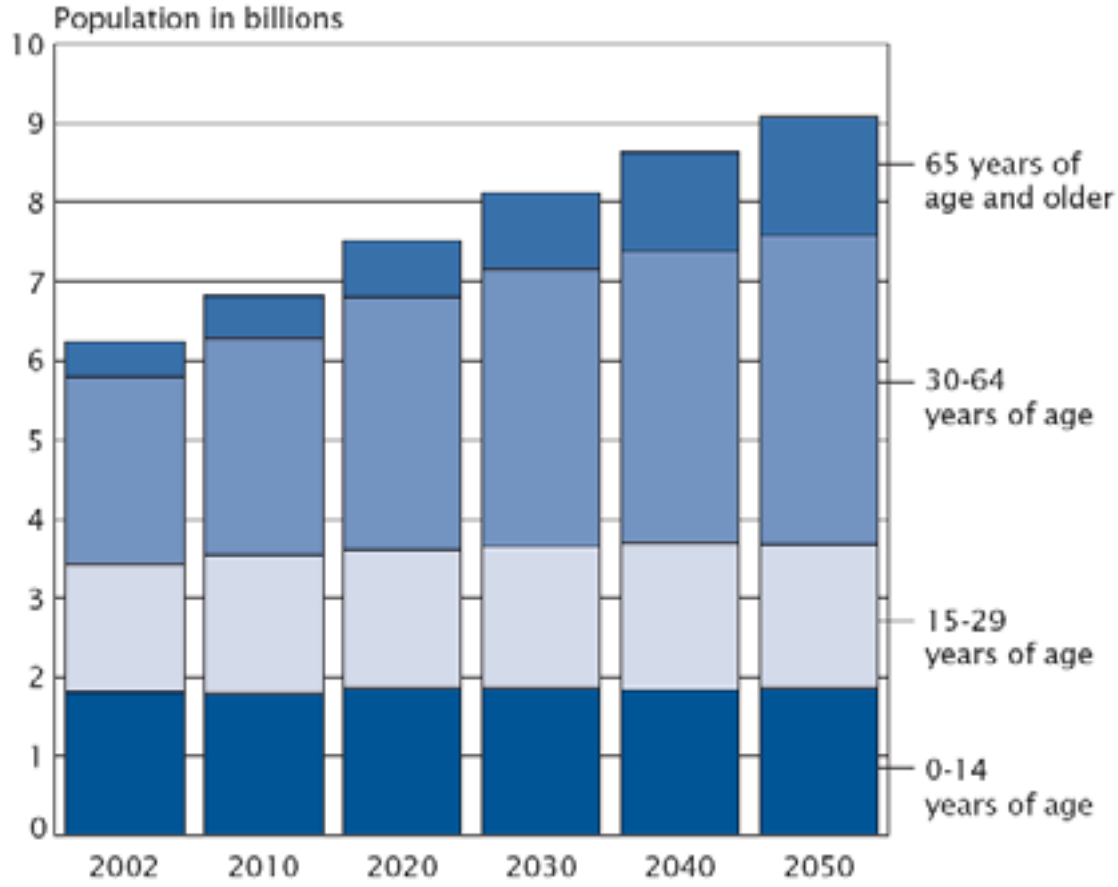
Source: U.S. Census Bureau, International Data Base, August 2006 version.

Reaching the Next Billion…



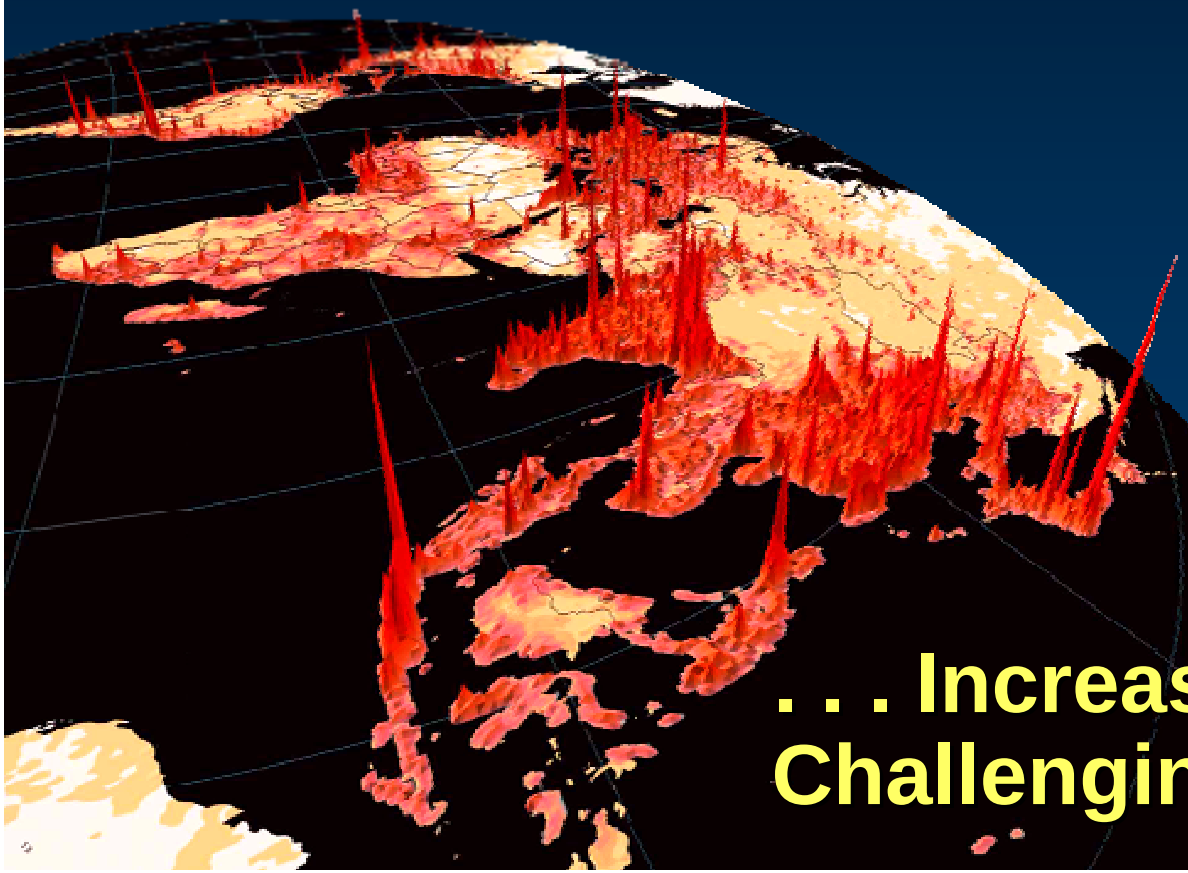
Population Growth of Specific Age Groups: 2002 to 2050

The elderly population is projected to grow most rapidly.



Source: U.S. Census Bureau, International Programs Center, International Data Base.

Sustaining A Changing World



- Population
- Urbanization
- Globalization
- Economic Development
- Environmental Change
- Human Conflicts
- Growing Knowledge
- Advancing Science and Technology

. . . Increasingly Complex, Challenging and Crowded

What Do You Mean, Sustainable?

- A Report from the World Conservation Union defined sustainable as ‘development that meets the needs of the present without compromising the ability of future generations to meet their own needs”
- Two fundamental issues: Environmental degradation typically accompanies economic growth, yet such growth is needed to alleviate poverty
- Can we balance environment, economic growth and community?
- What sustain-ability must our environment and resources have in order to have sustain-able development?
- What is the capacity of the biosphere to absorb pollutants, provide resources and services in space and time

http://www.iucn.org/members/future_sustainability/docs/iucn_future_of_sustanability.pdf

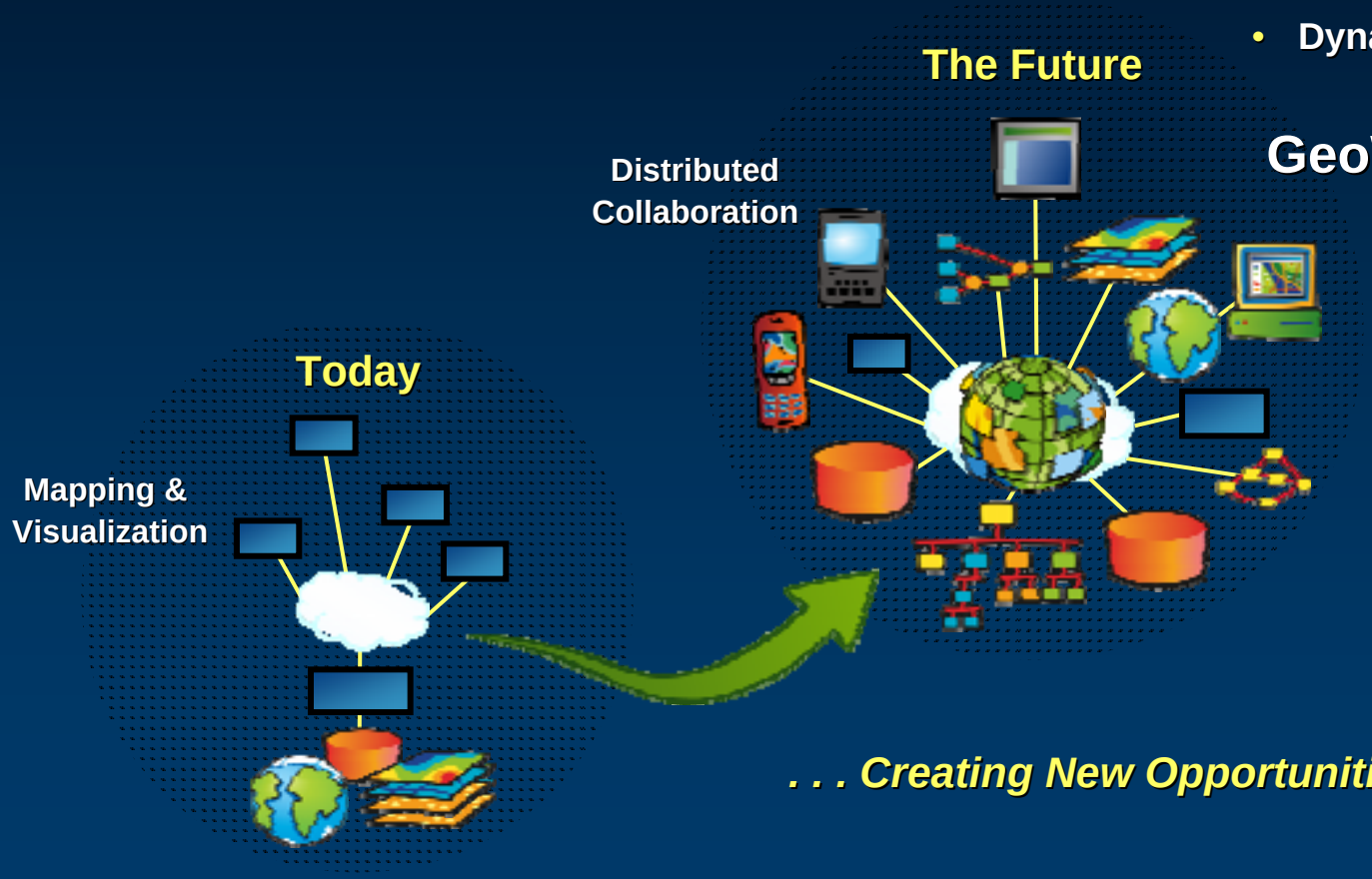
Summarizing

- Geospatial technology is experiencing rapid changes - as are information management systems in general.
- Restructuring of relationships across traditional agency/organizational boundaries.
- GIS has been changing at a fundamental level, from a database and data sharing approach to a knowledge approach.
- Necessary to adapt to new technologies such as web services, distributed data and server-based apps
- Data is often developed for one product or application, rather than across a range of potential uses
- Elimination of duplication of effort through strategic planning and a common mission or sense of purpose

The Web is Becoming Geographically Enabled

Many Services and Lots of Communities

- Many Authors & Publishers
- Interconnected
- Interoperable
- Integrative
- Dynamic



. . . Creating New Opportunities for Collaboration

Adding Value

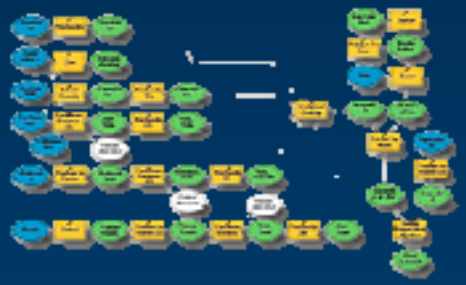
GIS Provides a New Medium To Understand Issues That Are Increasingly Complex

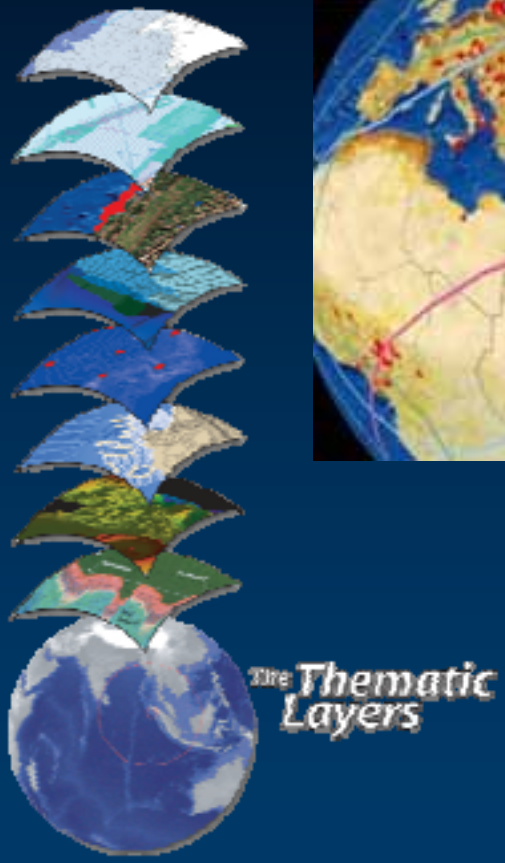
Modeling the Physical and Cultural Knowledge of our World

Breaking Down the Earth into Components to Understand Systems . . .

Providing

- **Systematic Knowledge**
- **An Integrative Framework**
- **Analytic Methods**
- **Intuitive Visualization**





. . . Creating Order and Meaning

. . . Defining Interconnections and Interdependence

. . . Providing a Broad Understanding of Natural and Human Ecology


Thanks!
Wyoming
ESRI