Empowering Decision Support and Analysis through the Service Oriented Architecture

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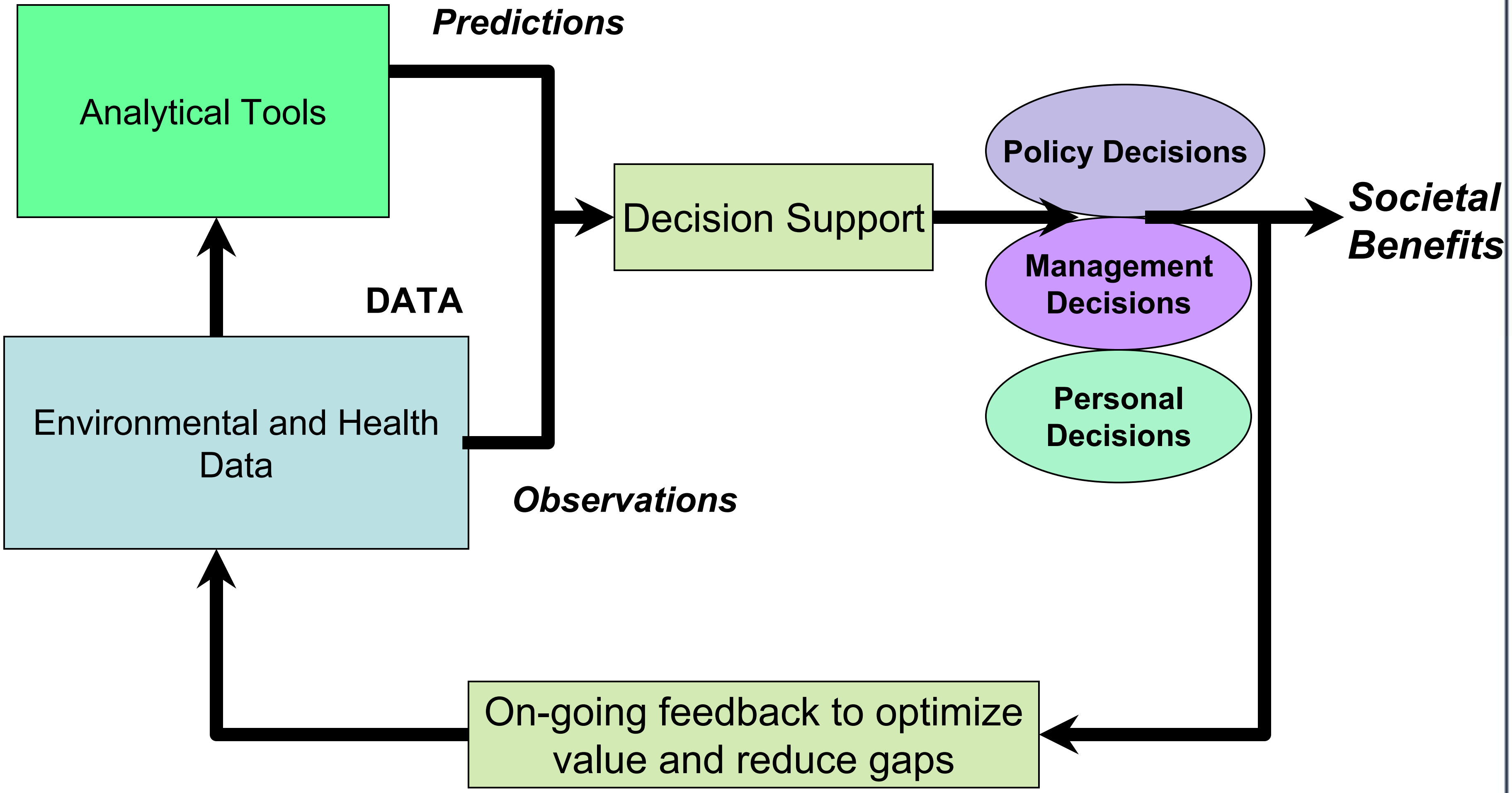
Rick Martin, Deputy Director
Office of Information Analysis and Access

EPA IT Contractors Forum

Decision-Making at EPA

- Management and Strategic Planning Decisions
  - Budget, GPRA tracking
  - Report on the Environment/Indicators
- Regulatory and Policy Decisions
  - Big Decisions e.g., watershed protection, pesticides under ESA
- Public Decisions
  - What are the facilities and chemical releases in my areas? (Toxics Release Inventory)
  - What is the Air Quality Index in my area today? (AIRNow)
  - What is the health of a river in my area? (EnviroMapper for Water)

Decision Support Paradigm



Predictions

Analytical Tools

DATA

Environmental and Health Data

Observations

Decision Support

Policy Decisions

Management Decisions

Personal Decisions

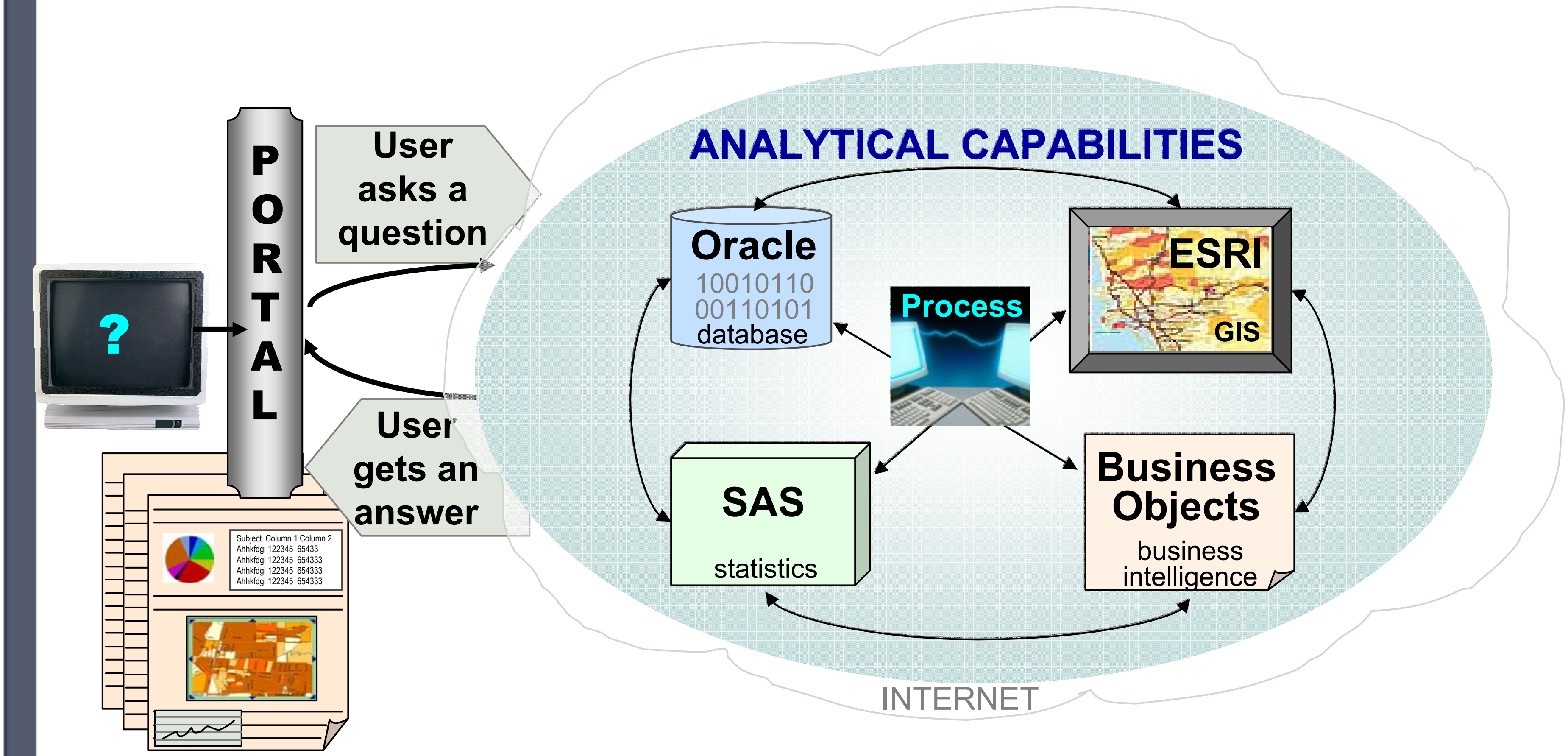
Societal Benefits

On-going feedback to optimize value and reduce gaps

Decision-Makers Needs

- Interactive models
- Visualizations
- Scenario development
- “What-if?” capabilities
- Indicators
- Dashboards and the “bigger picture” view
- Better GIS and remote sensing
- Better interpretive tools
- Intelligence; i.e. “here’s what’s really going on”

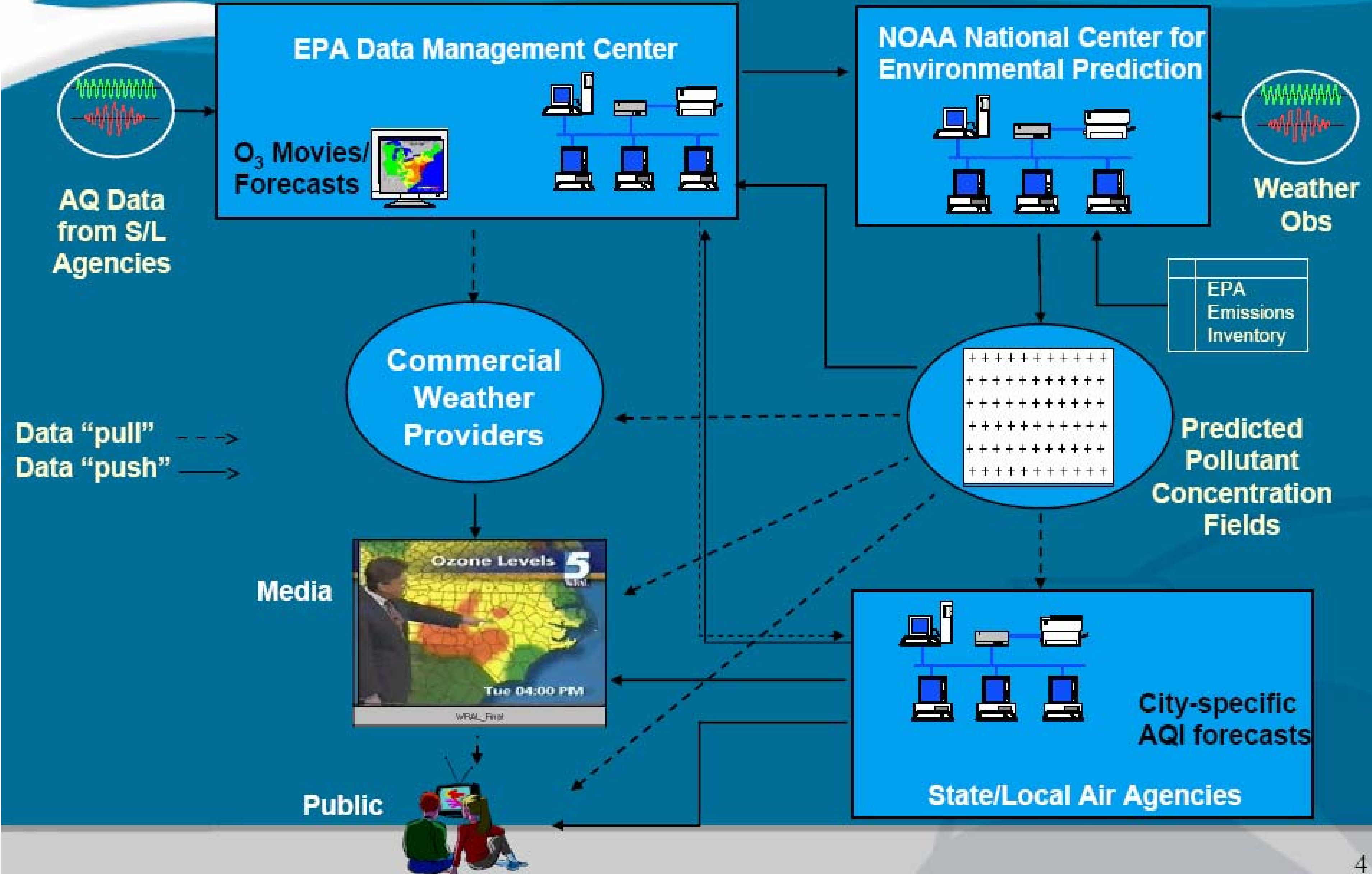
Building Blocks of Analytical Tools Are Enhanced By SOA


?
PORTAL
User asks a question
User gets an answer
Subject Column 1 Column 2
Ahhkfdgi 122345 65433
Ahhkfdgi 122345 654333
Ahhkfdgi 122345 654333
Ahhkfdgi 122345 654333
ANALYTICAL CAPABILITIES
Oracle
10010110
00110101
database
Process
ESRI
GIS
SAS
statistics
Business Objects
business intelligence
INTERNET

Examples of Using the SOA Concept to Enhance Decision Making

- Advanced Monitoring Initiative
- AirNow
- EnviroMapper Applications
- Toxics Release Inventory
- Recalls.gov

Initial Operating Capability:
EPA + NOAA IT Links



EPA Data Management Center

O_3 Movies/ Forecasts

AQ Data from S/L Agencies

NOAA National Center for Environmental Prediction

Weather Obs

EPA Emissions Inventory

Commercial Weather Providers

Predicted Pollutant Concentration Fields

Data "pull" - - ->
Data "push" ——>

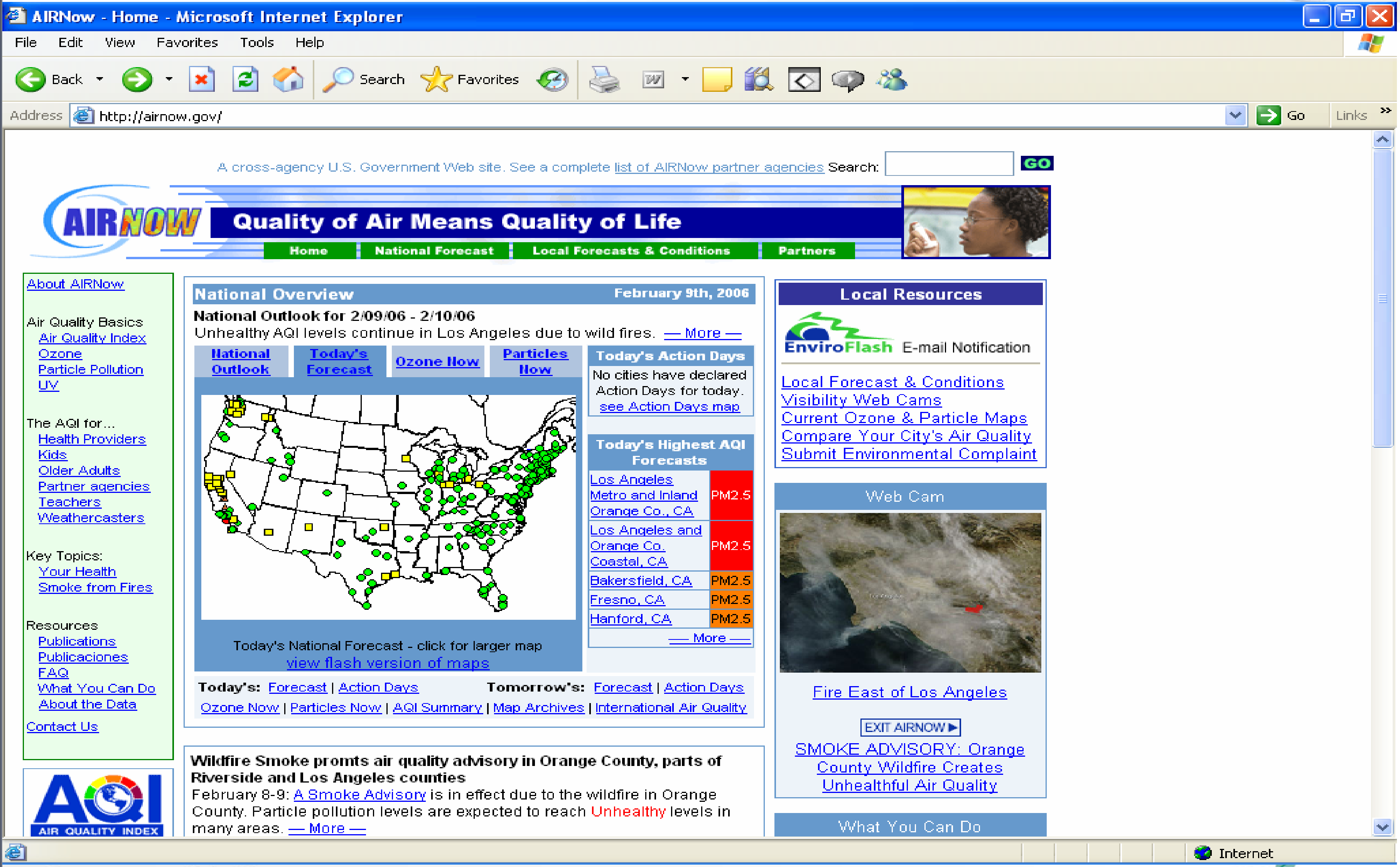
Media

Public

City-specific AQI forecasts

State/Local Air Agencies

AirNow



A cross-agency U.S. Government Web site. See a complete list of AIRNow partner agencies Search: GO

AIRNOW Quality of Air Means Quality of Life

Home | National Forecast | Local Forecasts & Conditions | Partners

About AIRNow

Air Quality Basics
- Air Quality Index
- Ozone
- Particle Pollution
- UV

The AQI for...
- Health Providers
- Kids
- Older Adults
- Partner agencies
- Teachers
- Weathercasters

Key Topics:
- Your Health
- Smoke from Fires

Resources
- Publications
- Publicaciones
- FAQ
- What You Can Do
- About the Data

Contact Us

AQI AIR QUALITY INDEX

National Overview February 9th, 2006

National Outlook for 2/09/06 - 2/10/06

Unhealthy AQI levels continue in Los Angeles due to wild fires. — More —

National Outlook | Today's Forecast | Ozone Now | Particles Now

Today's National Forecast - click for larger map

view flash version of maps

Today's Action Days

No cities have declared Action Days for today. see Action Days map

Today's Highest AQI Forecasts

Los Angeles Metro and Inland Orange Co., CA	PM2.5
Los Angeles and Orange Co. Coastal, CA	PM2.5
Bakersfield, CA	PM2.5
Fresno, CA	PM2.5
Hanford, CA	PM2.5

— More —

Today's: Forecast | Action Days **Tomorrow's:** Forecast | Action Days

Ozone Now | Particles Now | AQI Summary | Map Archives | International Air Quality

Wildfire Smoke promts air quality advisory in Orange County, parts of Riverside and Los Angeles counties

February 8-9: A Smoke Advisory is in effect due to the wildfire in Orange County. Particle pollution levels are expected to reach Unhealthy levels in many areas. — More —

Local Resources

EnviroFlash E-mail Notification

- Local Forecast & Conditions
- Visibility Web Cams
- Current Ozone & Particle Maps
- Compare Your City's Air Quality
- Submit Environmental Complaint

Web Cam

Fire East of Los Angeles

EXIT AIRNOW ▶

SMOKE ADVISORY: Orange County Wildfire Creates Unhealthful Air Quality

What You Can Do

U.S. Environmental Protection Agency

Window to My Environment

Contact Us | Online Help | Background

EPA Home > Where You Live > Window to My Environment

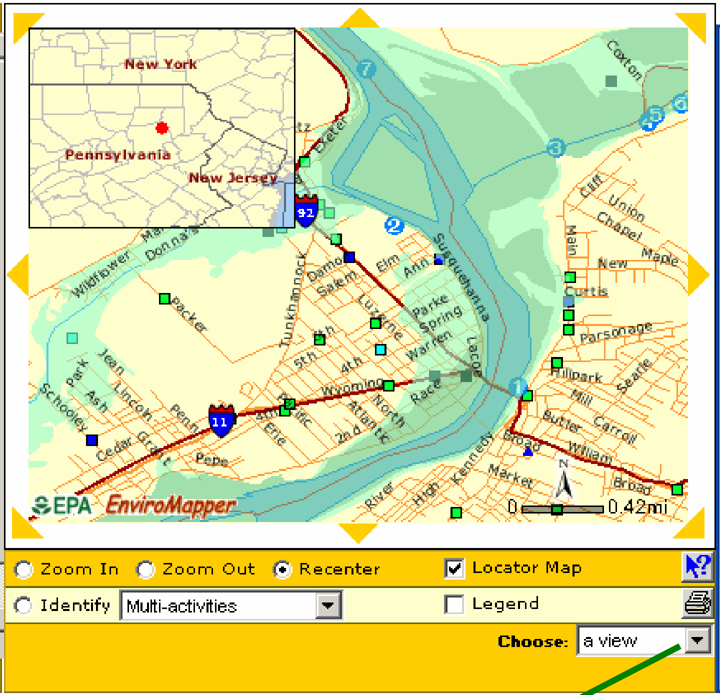
Window to My Environment

Redraw Map

Map Features

- ⊟ **Regulated sites**
  - ☑ ■ Multi-activities
  - ☐ ■ Superfund
  - ☑ ■ Toxic releases
  - ☑ ■ Water discharg
  - ☑ ■ Air emissions
  - ☐ ■ BRS
  - ☑ ■ Hazardous waste
- ⊞ **Places**
  - ☑ Highways
  - ☑ Streets
- ⊟ **Water features**
  - ☑ Impaired water bodies
  - ☑ Impaired streams
  - ☑ Water Bodies
  - ☑ Streams
  - ☐ Demographics
- ⊞ **Political boundaries**
  - ☑ ▲ Air monitors
  - ☑ ● Water monitors EXIT EPA
- ⊟ **Flood zones** EXIT EPA
  - ☑ Special Flood Hazard Area

Redraw Map



Your Window | Your Environment

All features intersecting the map window will appear as part of the information contained in the fact sheet below.

Community (Town,State)	Pittston PA
County(s)	Luzerne PA
Area of Window	6.23 sq mi
Width of Window	2.49 mi
Approx. population (2000)	15895 <=Statistics
Watershed(s)	Upper Susquehanna-Tunkhannock. Pennsylvania., Upper Susquehanna-Lackawanna. Pennsylvania.
Waterbody(s)	Susquehanna River
Congressional District(s)	11(PA)
Urban area	Scranton--Wilkes-Barre PA
No. of facilities reporting to EPA	37 <=Click to view View by industry

Your Window | **Your Environment**

Community is: Pittston, PA

- Home Pages for Federal/State Partners

AIR/CLIMATE

- What is the air quality?
- What facilities emit to the air?
- Where is air monitored?
- What is the Ultra Violet(UV) Index?

LAND

- What facilities handle hazardous waste?
- What facilities have releases to land?
- What are the Superfund Sites?
- Are there Brownfields Areas?

WATER

- What is the drinking water quality?
- What facilities discharge to water?
- What watersheds cross the area?
- Are there polluted waters?
- Where is water monitored?
- Are there any fish consumption advisories?
- Are there any beach advisories/closures?

CROSS MEDIA

- What chemicals are released?
- What industries have releases?

WHAT IS BEING DONE ABOUT MY ENVIRONMENT

- Reporting and Tracking
- Restoring and Protecting
- Working Locally

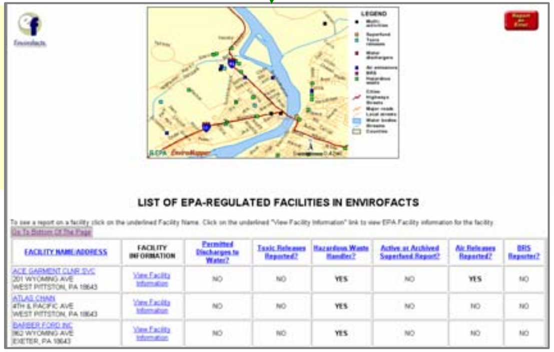
USGS Water Monitoring Sites: EXIT EPA

① PITTSTON WATER TUNNEL
② LU 311
③ Lackawanna River at Pittston, PA

PA

PA

Aerial Photo

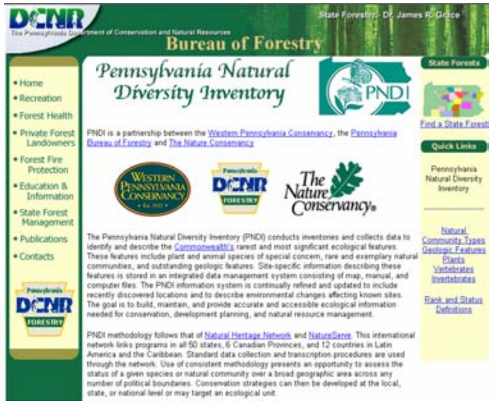


LIST OF EPA-REGULATED FACILITIES IN ENVIROFACTS

To see a report on a facility click on the underlined Facility Name. Click on the underlined "View Facility Information" link to view EPA Facility information for the facility.

Go To Bottom Of The Page

FACILITY NAME/ADDRESS	FACILITY INFORMATION	Permitted Discharges to Water?	Toxic Releases Reported?	Hazardous Waste Handler?	Active or Archived Superfund Report?	Air Releases Reported?	BRS Reporter?
ACE GARMENT CLNR SVC 201 WYOMING AVE WEST PITTSTON, PA 18643	View Facility Information	NO	NO	YES	NO	YES	NO
ATLAS CHAIN 4TH & PACIFIC AVE WEST PITTSTON, PA 18643	View Facility Information	NO	NO	YES	NO	NO	NO
BARBER FORD INC 962 WYOMING AVE EXETER, PA 18643	View Facility Information	NO	NO	YES	NO	NO	NO



DCNR The Pennsylvania Department of Conservation and Natural Resources

State Forester - Dr. James R. Grace

Bureau of Forestry

- Home
- Recreation
- Forest Health
- Private Forest Landowners
- Forest Fire Protection
- Education & Information
- State Forest Management
- Publications
- Contacts

Pennsylvania Natural Diversity Inventory

PNDI is a partnership between the Western Pennsylvania Conservancy, the Pennsylvania Bureau of Forestry and The Nature Conservancy

The Pennsylvania Natural Diversity Inventory (PNDI) conducts inventories and collects data to identify and describe the Commonwealth's rarest and most significant ecological features. These features include plant and animal species of special concern, rare and exemplary natural communities, and outstanding geologic features. Site-specific information describing these features is stored in an integrated data management system consisting of map, manual, and computer files. The PNDI information system is continually refined and updated to include recently discovered locations and to describe environmental changes affecting known sites. The goal is to build, maintain, and provide accurate and accessible ecological information needed for conservation, development planning, and natural resource management.

PNDI methodology follows that of Natural Heritage Network and NatureServe. This international network links programs in all 50 states, 6 Canadian Provinces, and 12 countries in Latin America and the Caribbean. Standard data collection and transcription procedures are used through the network. Use of consistent methodology presents an opportunity to assess the status of a given species or natural community over a broad geographic area across any number of political boundaries. Conservation strategies can then be developed at the local, state, or national level or may target an ecological unit.

State Forests

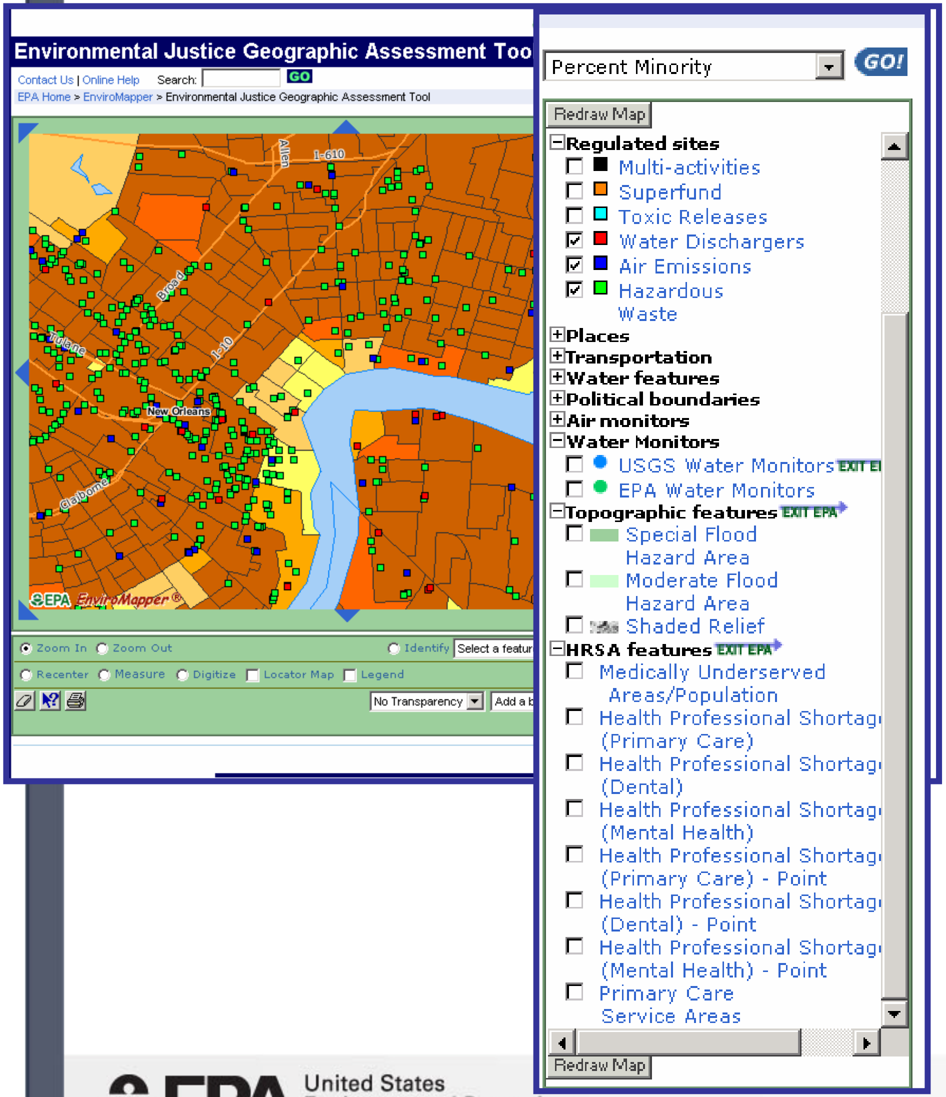
Find a State Forest

Quick Links

Pennsylvania Natural Diversity Inventory

- Natural Community Types
- Geologic Features
- Plants
- Vertebrates
- Invertebrates
- Rank and Status Definitions

Examples of EnviroMapper Data Access



Environmental Justice Geographic Assessment Too

Contact Us | Online Help Search: GO

EPA Home > EnviroMapper > Environmental Justice Geographic Assessment Tool

● Zoom In ○ Zoom Out ○ Identify Select a featur

○ Recenter ○ Measure ○ Digitize ☐ Locator Map ☐ Legend

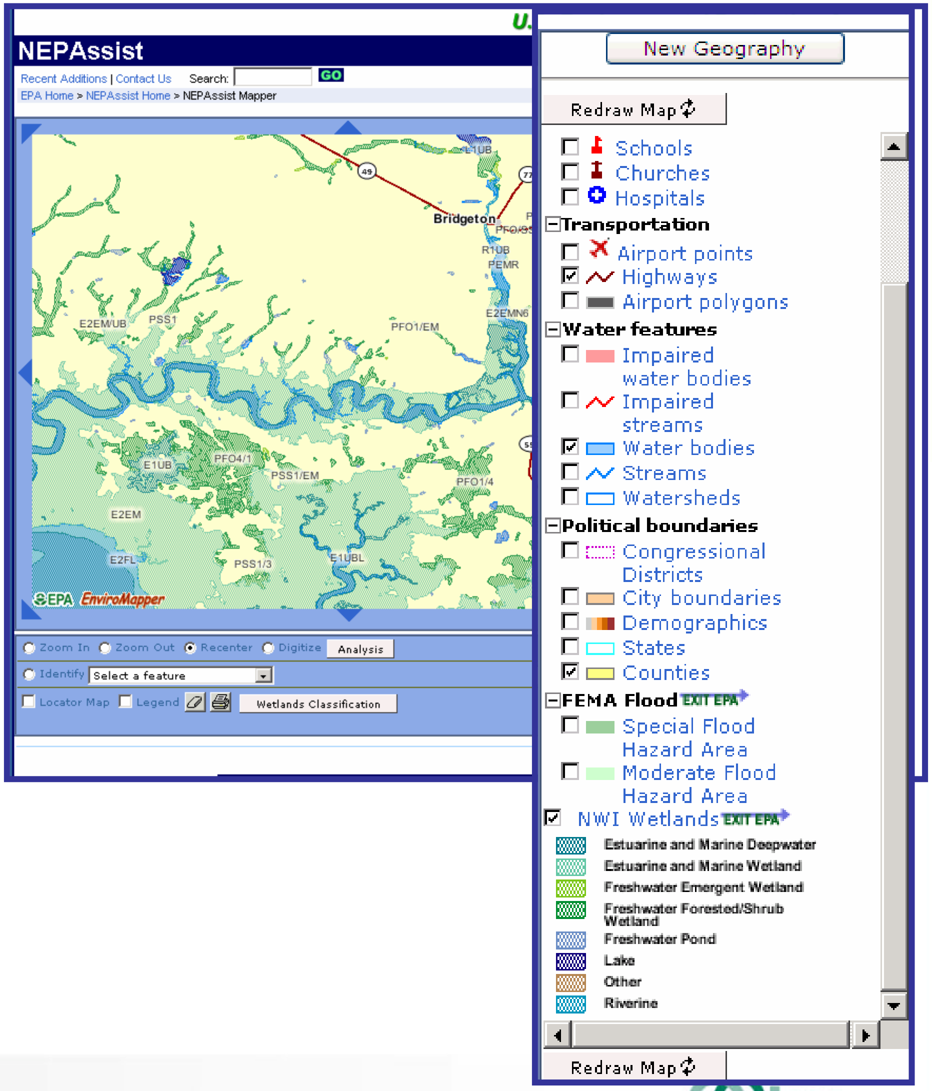
No Transparency Add a

Percent Minority GO!

Redraw Map

- ⊟ **Regulated sites**
  - ☐ ■ Multi-activities
  - ☐ ■ Superfund
  - ☐ ■ Toxic Releases
  - ☑ ■ Water Dischargers
  - ☑ ■ Air Emissions
  - ☑ ■ Hazardous Waste
- ⊞ **Places**
- ⊞ **Transportation**
- ⊞ **Water features**
- ⊞ **Political boundaries**
- ⊞ **Air monitors**
- ⊟ **Water Monitors**
  - ☐ ● USGS Water Monitors EXIT E
  - ☐ ● EPA Water Monitors
- ⊟ **Topographic features** EXIT EPA
  - ☐ 🟩 Special Flood Hazard Area
  - ☐ 🟩 Moderate Flood Hazard Area
  - ☐ Shaded Relief
- ⊟ **HRSA features** EXIT EPA
  - ☐ Medically Underserved Areas/Population
  - ☐ Health Professional Shortag (Primary Care)
  - ☐ Health Professional Shortag (Dental)
  - ☐ Health Professional Shortag (Mental Health)
  - ☐ Health Professional Shortag (Primary Care) - Point
  - ☐ Health Professional Shortag (Dental) - Point
  - ☐ Health Professional Shortag (Mental Health) - Point
  - ☐ Primary Care Service Areas

Redraw Map



NEPAssist

Recent Additions | Contact Us Search: GO

EPA Home > NEPAssist Home > NEPAssist Mapper

○ Zoom In ○ Zoom Out ● Recenter ○ Digitize Analysis

○ Identify Select a feature

☐ Locator Map ☐ Legend Wetlands Classification

New Geography

Redraw Map

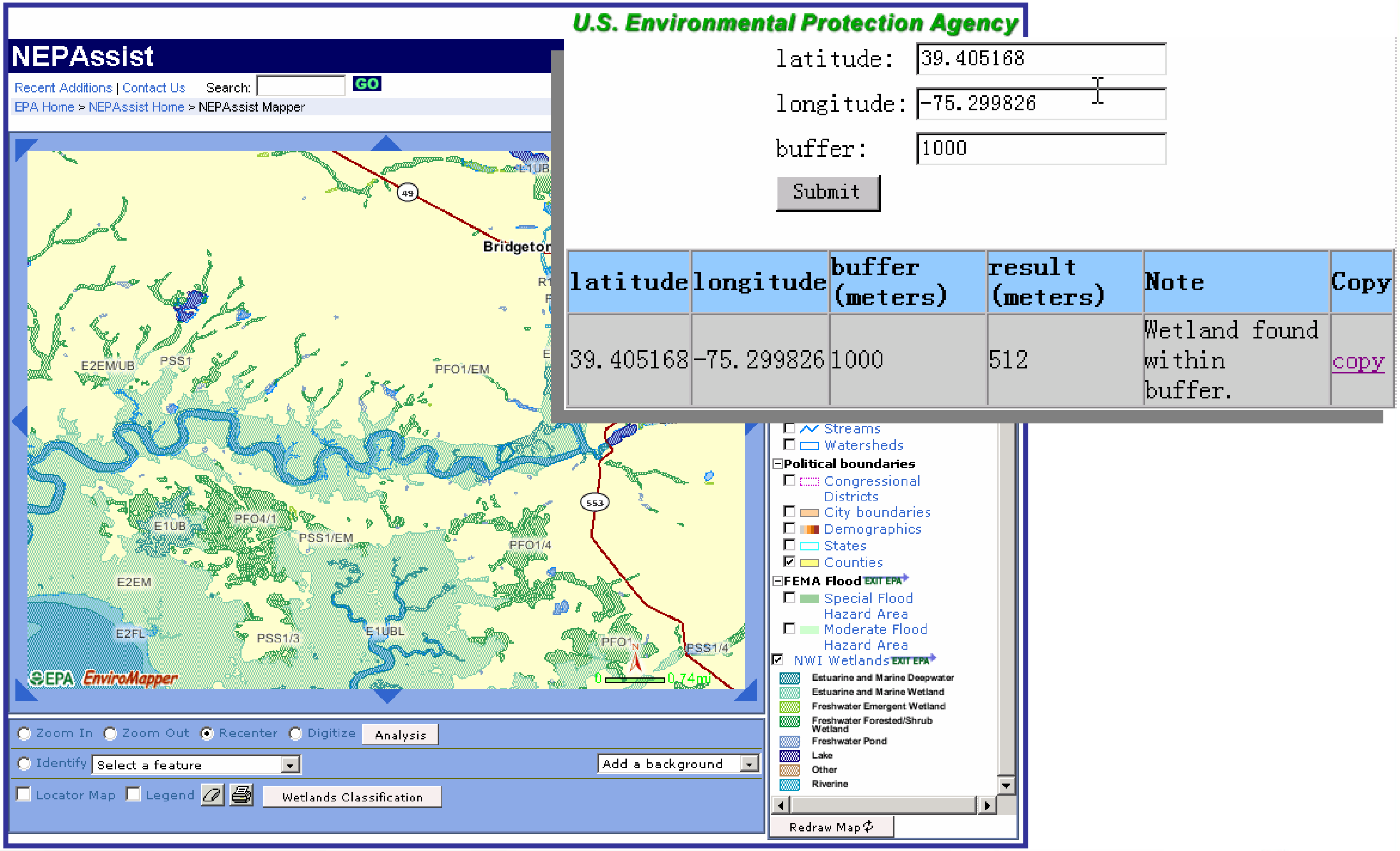
- ☐ Schools
- ☐ Churches
- ☐ Hospitals
- ⊟ **Transportation**
  - ☐ Airport points
  - ☑ Highways
  - ☐ Airport polygons
- ⊟ **Water features**
  - ☐ 🟥 Impaired water bodies
  - ☐ Impaired streams
  - ☑ Water bodies
  - ☐ Streams
  - ☐ Watersheds
- ⊟ **Political boundaries**
  - ☐ Congressional Districts
  - ☐ City boundaries
  - ☐ Demographics
  - ☐ States
  - ☑ Counties
- ⊟ **FEMA Flood** EXIT EPA
  - ☐ 🟩 Special Flood Hazard Area
  - ☐ 🟩 Moderate Flood Hazard Area
- ☑ NWI Wetlands EXIT EPA
  - ▨ Estuarine and Marine Deepwater
  - ▨ Estuarine and Marine Wetland
  - ▨ Freshwater Emergent Wetland
  - ▨ Freshwater Forested/Shrub Wetland
  - ▨ Freshwater Pond
  - ▨ Lake
  - ▨ Other
  - ▨ Riverine

Redraw Map

United States Environmental Protection Agency

OFFICE OF ENVIRONMENTAL INFORMATION

Wetland Proximity Analysis


U.S. Environmental Protection Agency
NEPAssist
Recent Additions | Contact Us
Search:
GO
EPA Home > NEPAssist Home > NEPAssist Mapper
E1UB
49
Bridgeton
E2EM/UB
PSS1
PFO1/EM
553
E1UB
PFO4/1
PSS1/EM
PFO1/4
E2EM
E2FL
PSS1/3
E1UBL
PFO1
PSS1/4
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EPA EnviroMapper
○ Zoom In ○ Zoom Out ● Recenter ○ Digitize
Analysis
○ Identify
Select a feature
Add a background
☐ Locator Map ☐ Legend
Wetlands Classification
☐ Streams
☐ Watersheds
Political boundaries
☐ Congressional Districts
☐ City boundaries
☐ Demographics
☐ States
☑ Counties
FEMA Flood EXIT EPA
☐ Special Flood Hazard Area
☐ Moderate Flood Hazard Area
☑ NWI Wetlands EXIT EPA
Estuarine and Marine Deepwater
Estuarine and Marine Wetland
Freshwater Emergent Wetland
Freshwater Forested/Shrub Wetland
Freshwater Pond
Lake
Other
Riverine
Redraw Map

latitude: 39.405168

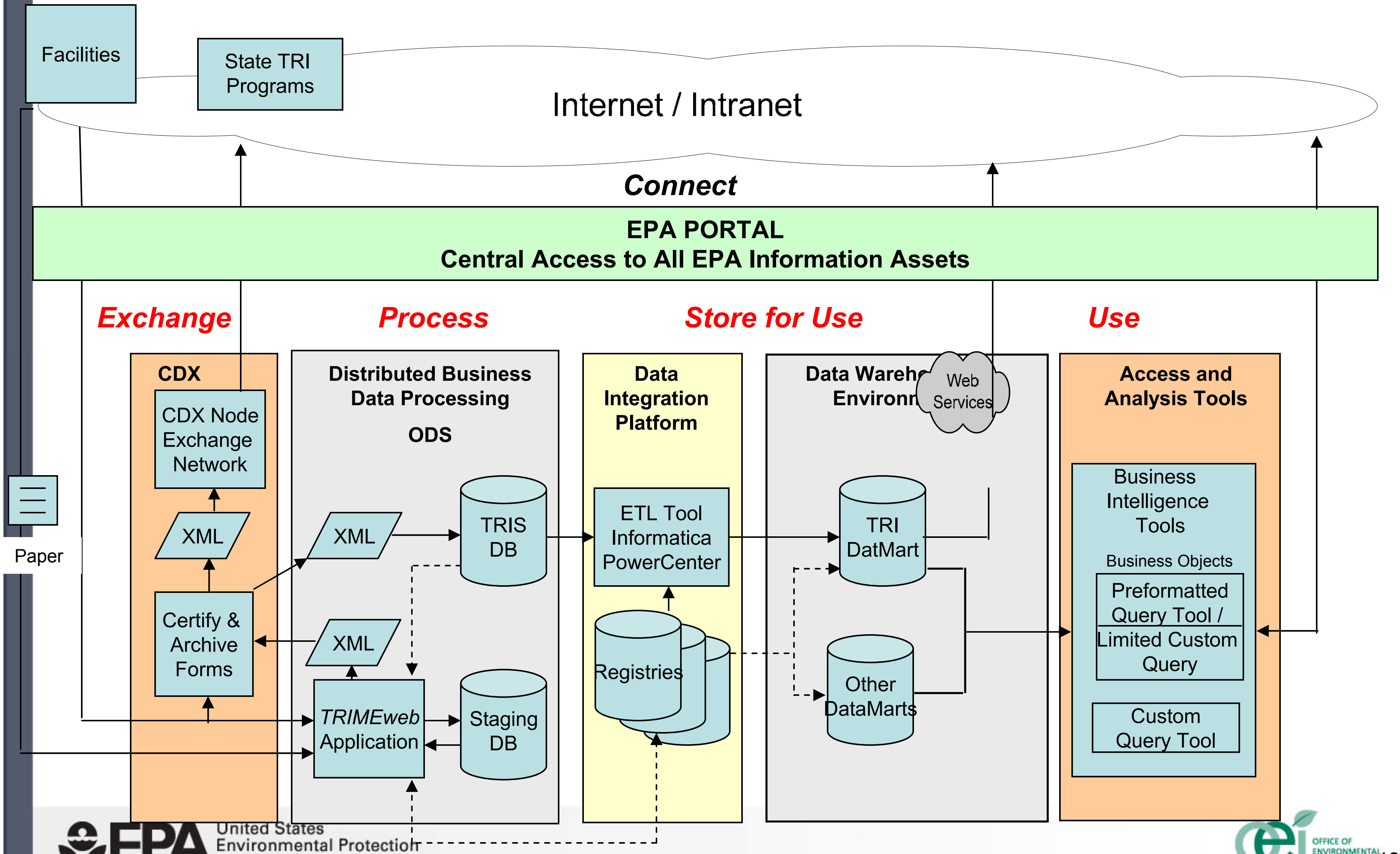
longitude: -75.299826

buffer: 1000

Submit

latitude	longitude	buffer (meters)	result (meters)	Note	Copy
39.405168	-75.299826	1000	512	Wetland found within buffer.	copy

Exchanging TRI Data using SOA



Facilities

State TRI Programs

Internet / Intranet

Connect

EPA PORTAL
Central Access to All EPA Information Assets

Exchange

Process

Store for Use

Use

CDX

CDX Node Exchange Network

XML

Certify & Archive Forms

Paper

Distributed Business Data Processing

ODS

XML

TRIS DB

XML

TRIMEweb Application

Staging DB

Data Integration Platform

ETL Tool Informatica PowerCenter

Registries

Data Wareh
Environm

Web Services

TRI DatMart

Other DataMarts

Access and Analysis Tools

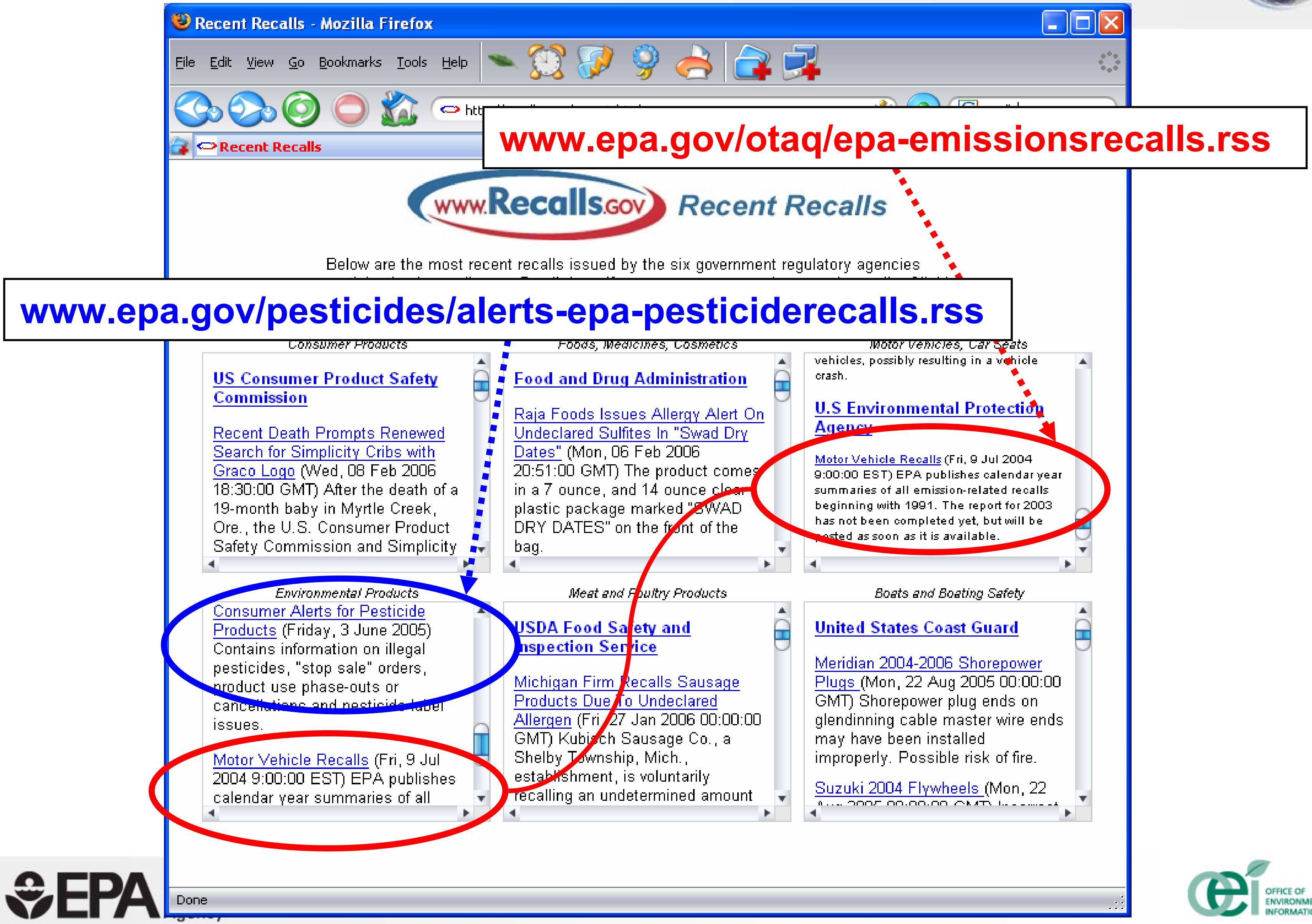
Business Intelligence Tools

Business Objects

Preformatted Query Tool / Limited Custom Query

Custom Query Tool

Recalls.gov: RSS “Feeds” Automate Info-Sharing


Recent Recalls - Mozilla Firefox
File Edit View Go Bookmarks Tools Help
Recent Recalls
Done

www.epa.gov/otaq/epa-emissionsrecalls.rss

www.Recalls.gov Recent Recalls

Below are the most recent recalls issued by the six government regulatory agencies

www.epa.gov/pesticides/alerts-epa-pesticiderecalls.rss

Consumer Products

US Consumer Product Safety Commission

Recent Death Prompts Renewed Search for Simplicity Cribs with Graco Logo (Wed, 08 Feb 2006 18:30:00 GMT) After the death of a 19-month baby in Myrtle Creek, Ore., the U.S. Consumer Product Safety Commission and Simplicity

Foods, Medicines, Cosmetics

Food and Drug Administration

Raja Foods Issues Allergy Alert On Undeclared Sulfites In "Swad Dry Dates" (Mon, 06 Feb 2006 20:51:00 GMT) The product comes in a 7 ounce, and 14 ounce clear plastic package marked "SWAD DRY DATES" on the front of the bag.

Motor Vehicles, Car Seats

vehicles, possibly resulting in a vehicle crash.

U.S Environmental Protection Agency

Motor Vehicle Recalls (Fri, 9 Jul 2004 9:00:00 EST) EPA publishes calendar year summaries of all emission-related recalls beginning with 1991. The report for 2003 has not been completed yet, but will be posted as soon as it is available.

Environmental Products

Consumer Alerts for Pesticide Products (Friday, 3 June 2005) Contains information on illegal pesticides, "stop sale" orders, product use phase-outs or cancellations and pesticide label issues.

Motor Vehicle Recalls (Fri, 9 Jul 2004 9:00:00 EST) EPA publishes calendar year summaries of all

Meat and Poultry Products

USDA Food Safety and Inspection Service

Michigan Firm Recalls Sausage Products Due To Undeclared Allergen (Fri, 27 Jan 2006 00:00:00 GMT) Kubisch Sausage Co., a Shelby Township, Mich., establishment, is voluntarily recalling an undetermined amount

Boats and Boating Safety

United States Coast Guard

Meridian 2004-2006 Shorepower Plugs (Mon, 22 Aug 2005 00:00:00 GMT) Shorepower plug ends on glendinning cable master wire ends may have been installed improperly. Possible risk of fire.

Suzuki 2004 Flywheels (Mon, 22

So If I was a Contractor, I would…

- Strive to understand decision-making at EPA;
- Determine the decision-support needs of your customers;
- Ensure conformance with EA;
- Build on existing capabilities; and,
- Communicate the availability of new and valuable information sources to the rest of the EPA community.