

Protecting our Nation's Waters: Using the Environmental Information Exchange Network

June 15, 2004



Electronic Submission of Wastewater Discharge Monitoring Reports

Presented by:

Michael Beaulac

Michigan Department of Environmental
Quality

Why did MI pursue e-Discharge Monitoring Reporting?

Inefficient mail-based DMR submission process

- Mailed DMRs required manual data coding
- Duplicative manual data coding increased errors
- 3-year backlog of daily wastewater reports
- Engineers didn't have good data access



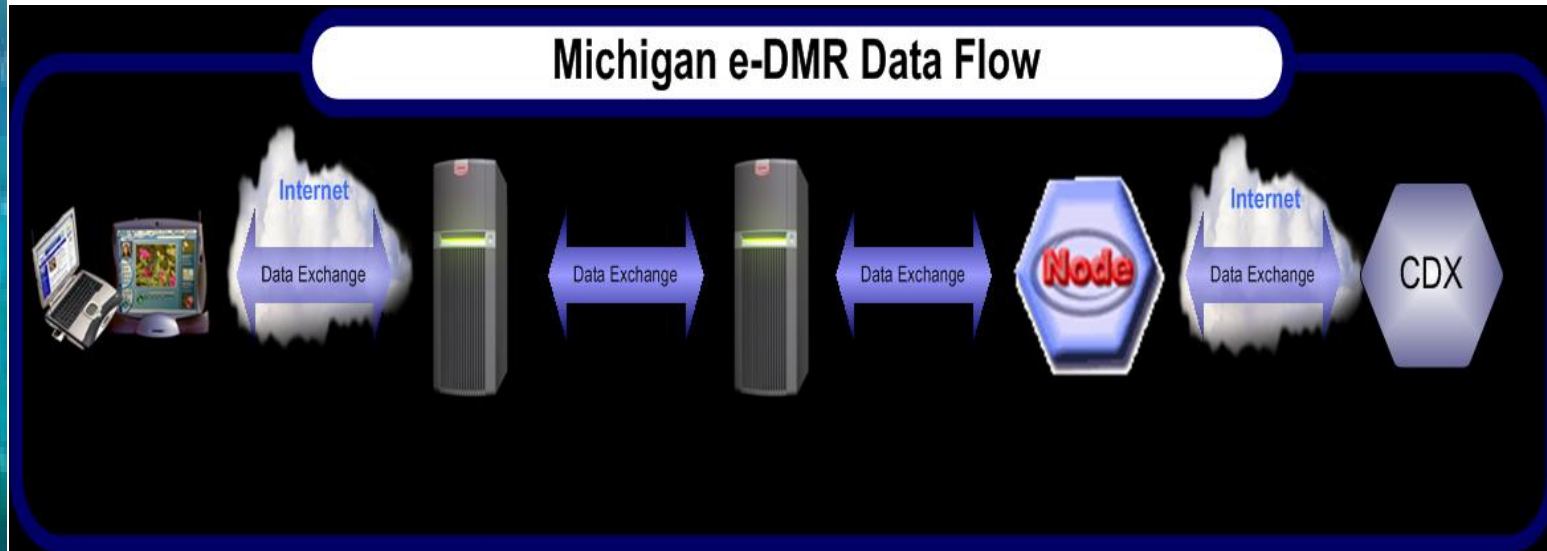
Problem Solution

- Use a new technology, called eXtensible Markup Language (XML), for electronic DMR submissions
- Develop a prototype national standard for this new technology
- Get like-minded states & EPA to work together, with financial resources, to test:
 - prototype e-DMR XML schema
 - State Node
 - EPA's Central Data Exchange (CDX)
 - Security protocols and authentication process
- Get beyond testing to implementation of e-DMRs with facilities

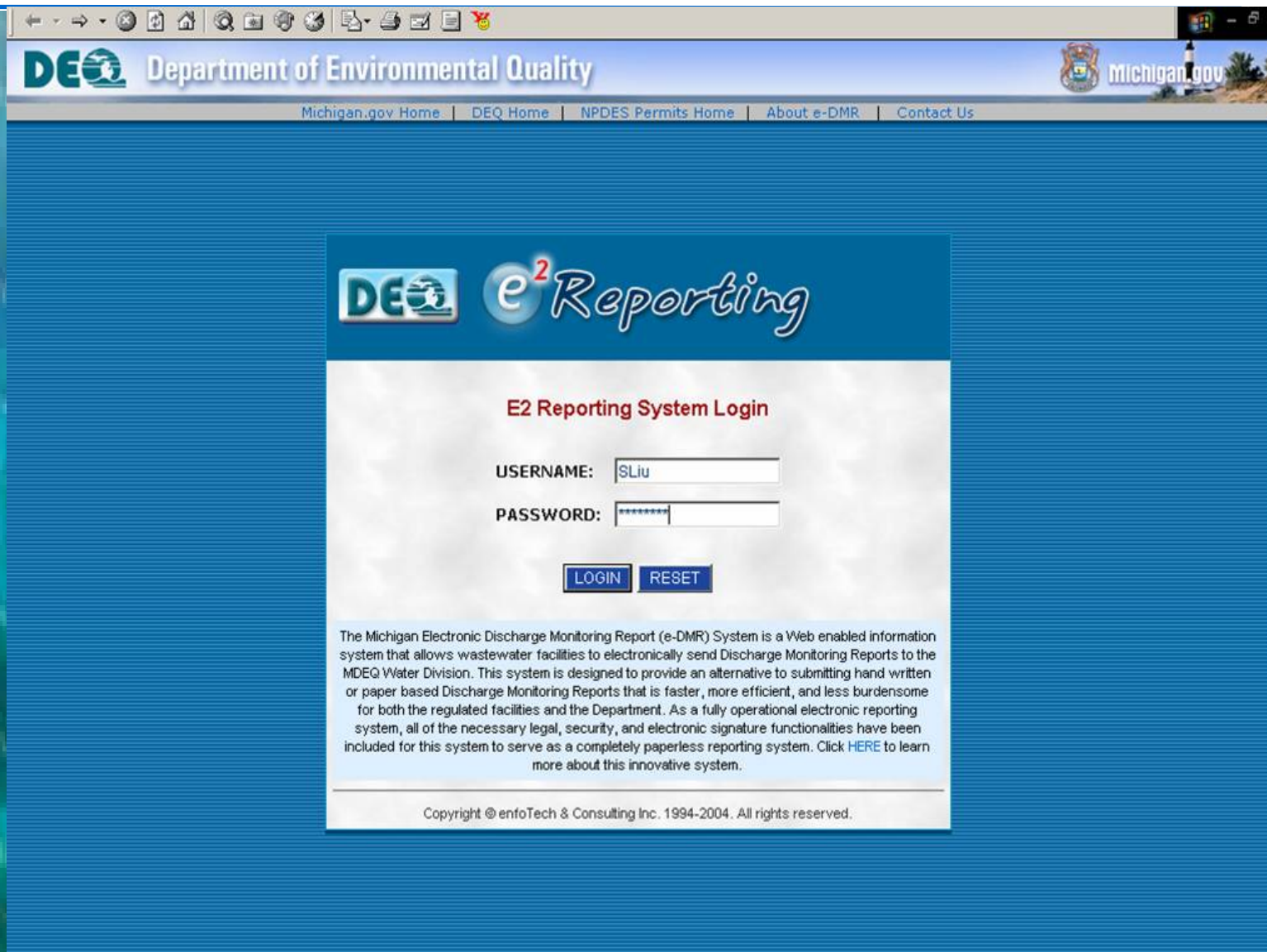
E-DMR Project Partners

- **Pre-project schema development team included:**
 - MI (lead), FL, WI, PA
 - financial backing - 20 states
 - ECOS, Ross & Associates, enfoTech
 - EPA
- **Challenge Grant Project States:**
 - MI (lead), FL, WI, PA, IN, MN, TX, NY & RI
- **EPA Headquarters, Region II, III & V**
- **enfoTech & Consulting, Inc.**

Data Flow Facility to State to EPA



E-DMR Log In Screen

A screenshot of a web browser displaying the E-DMR Log In Screen. The browser's address bar shows the URL "http://www.michigan.gov/deq/e2reporting". The page header includes the Michigan Department of Environmental Quality (DEQ) logo and the text "Department of Environmental Quality". A navigation menu contains links for "Michigan.gov Home", "DEQ Home", "NPDES Permits Home", "About e-DMR", and "Contact Us". The main content area features the "E2 Reporting System Login" form, which includes fields for "USERNAME:" (containing "SLiu") and "PASSWORD:" (masked with asterisks). Below the fields are "LOGIN" and "RESET" buttons. A paragraph of text describes the e-DMR system as a Web-enabled information system for wastewater facilities to submit reports electronically. At the bottom of the page, a copyright notice reads "Copyright © enfoTech & Consulting Inc. 1994-2004. All rights reserved." The browser's taskbar at the bottom shows the Windows XP logo and several open applications.

Completed DMR

DMR: Part A - Microsoft Internet Explorer

MONTHLY DISCHARGE MONITORING REPORT

Select Monitoring Point: **001A**

PERMITTEE NAME: Motor Wheel Disposal Site	PERMIT NUMBER: MI0055077	DISTRICT: Lansing
MAILING ADDRESS: 1250 North High Street Lansing, MI 48912	MONITORING POINT: 001A	COUNTY: Ingham
FACILITY: Motor Wheel Disposal Site		
LOCATION: 1250 North High Street Lansing, MI 48912	MONITORING PERIOD: 2003-12-01 To 2003-12-31	
		NO DISCHARGE FROM SITE: <input type="checkbox"/>

PARAMETER		QUANTITY OR LOADING		UNITS	QUALITY OR CONCENTRATION		UNITS	NO. EX.	FREQUENCY OF ANALYSIS
Flow PARM. Code: 50050 Mon. Site No: 001A Stage: 1	Sample Measurement	.105	.139	MGD	*****	*****	*****	0	Daily
	Permit Requirement	(report) Maximum Monthly Average	(report) Maximum Daily		*****	*****		*****	
Total Suspended Solids PARM. Code: 00530 Mon. Site No: 001A Stage: 1	Sample Measurement	*****	*****	*****	*****	8	mg/l	0	Weekly
	Permit Requirement	*****	*****		*****	(report) Maximum Monthly Average		(report) Maximum Daily	26
Total Dissolved Solids PARM. Code: 70295 Mon. Site No: 001A Stage: 1	Sample Measurement	*****	*****	*****	*****	1040	mg/l	0	Weekly
	Permit Requirement	*****	*****		*****	(report) Maximum Monthly Average		(report) Maximum Daily	1110
Ammonia Nitrogen (as N) PARM. Code: 00610 Mon. Site No: 001A Stage: 1	Sample Measurement	*****	*****	*****	*****	38.89	mg/l	0	Weekly
	Permit Requirement	*****	*****		*****	(report) Maximum Monthly Average		(report) Maximum Daily	48.45
BETX PARM. Code: 30383 Mon. Site No: 001A Stage: 1	Sample Measurement	*****	*****	*****	*****	*****	ug/l	0	Weekly
	Permit Requirement	*****	*****		*****	*****		20.0 Maximum Daily	
cis-1,2-dichloroethene	Sample Measurement	*****	*****	*****	*****	*****	ug/l	0	Weekly
						2.0			Weekly

Completed DMR – Ready to Send

DMR: Part A - Microsoft Internet Explorer

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FACILITY: Motor Wheel Disposal Site		
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PARAMETER	QUANTITY OR LOADING	UNITS	QUALITY OR CONCENTRATION	UNITS	NO. EX.	FREQUENCY OF ANALYSIS
Flow	Sample Measurement: .105		Permit Requirement (report): .139	*****	*****	0 Daily
PARM. Code: 50050 Mon. Site No: 001A Stage: 1			Maximum Monthly Average			Daily
Total Suspended Solids	Sample Measurement: *****		Permit Requirement: *****		26	0 Weekly
PARM. Code: 00530 Mon. Site No: 001A Stage: 1			Maximum Daily			Weekly
Total Dissolved Solids	Sample Measurement: *****		Permit Requirement: *****	*****	1040	0 Weekly
PARM. Code: 70295 Mon. Site No: 001A Stage: 1			Maximum Monthly Average		1110	Weekly
Ammonia Nitrogen (as N)	Sample Measurement: *****		Permit Requirement: *****	*****	38.89	0 Weekly
PARM. Code: 00610 Mon. Site No: 001A Stage: 1			Maximum Monthly Average		48.45	Weekly
BETX	Sample Measurement: *****		Permit Requirement: *****	*****	0	0 Weekly
PARM. Code: 30383 Mon. Site No: 001A Stage: 1			Maximum Daily		20.0	Weekly
cis-1,2-dichloroethene	Sample Measurement: *****		Permit Requirement: *****	*****	2.0	0 Weekly

Microsoft Internet Explorer

Do you want to submit the generated file right now?

Electronic Signature

Server Submit - Microsoft Internet Explorer

Submit Reports

1 Enter PIN	<input type="password" value="*****"/>
2 Certify Your Submission	<p>As the true and sole authorized user of this Personal Identification Number (PIN), I certify under penalty of law that I have personally examined and am familiar with the information submitted herein; and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.</p> <p><input checked="" type="checkbox"/> I CERTIFY</p>
3 Submit File	<input type="button" value="Submit File"/>

Note: The submission process may take a few minutes.

Microsoft Internet Explorer

? This will submit the generated file to the server. Are you sure?

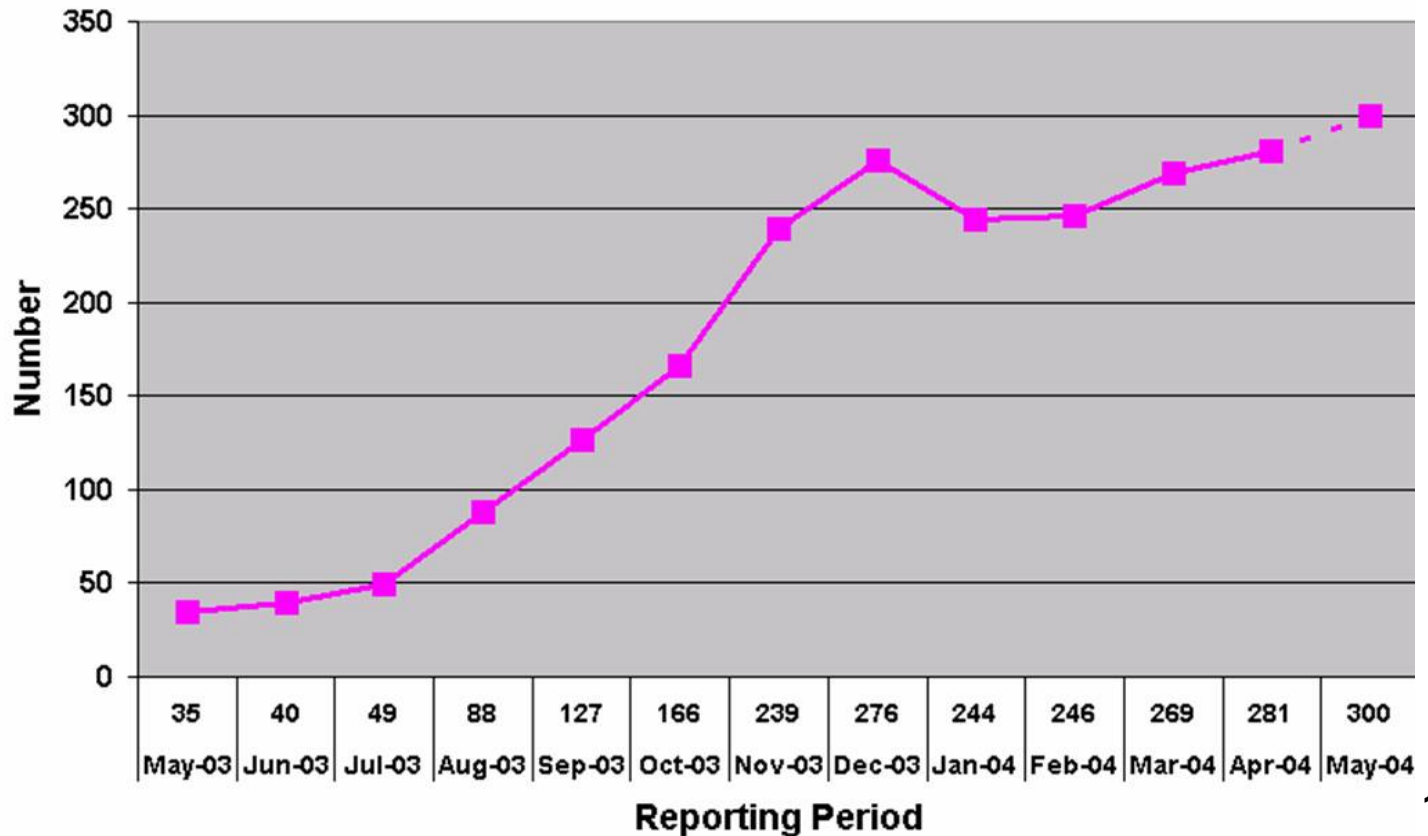
OK Cancel

Michigan Results

By May 2004:

- **300+ facilities per month submitted DMRs online**
- **~ 27 percent of MI's facilities**

Tracking e-DMR Submissions



Other States Successes!

- **Wisconsin:**
 - 2-3 dozen facilities use e-DMRs
 - Expect 80% compliance by 3-4 years
- **Florida:**
 - 46 authorized to submit e-DMRs
 - Over 75 facilities applied to submit e-DMRs
 - Major users: Cape Canaveral Air Station (NASA & USAF), City of Orlando

Benefits

- **State Water Divisions**
 - Eliminate resources - Data entry by state staff
 - Improve data quality: lab => facility => State => EPA (eliminates data coding errors)
 - Improve response to environmental issues
 - Improve Michigan Wastewater program effectiveness (shift focus to Compliance & Enforcement)
- **Public**
 - Increase public access to environmental information
 - Increase Water Division staff resources to respond to public/US EPA's inquiries

Comments from our Permitted Facilities

- “Saves my compliance admin costs ... streamlines the DMR reporting process”
- “... provides immediate feedback of compliance status for proper actions”
- “... will increase the amount of data accessible for trend analysis”
- “... data entry errors are reduced ...”
- “Time saver ... more traceable than paper ... immediate confirmation of receipt”

Michigan Annual Cost Savings

- **State Government Cost Savings**
(at full implementation - 1180 facilities)
\$250,000 - \$500,000

- **Facility Cost Savings**
(at least \$2,000 saved per facility)
\$2,360,000*

*(... and this may be low)


Laboratory Drinking Water Data Exchange

Presented by:

Frank Catanese

New Hampshire Office of Information
Technology

Current Problem.....

- 
- An abstract background image on the left side of the slide, featuring a vertical strip of blue and green colors with a textured, almost crystalline or cellular appearance, possibly representing water or a microscopic view.
- The nation's drinking water quality is assessed by the sampling of its drinking water supplies.
 - Laboratories analyze samples for chemical and microbial contaminants.
 - Laboratories report these analytical results to States to evaluate drinking water quality.
 - Typically, these laboratory results come to States as paper laboratory reports.
 - Mailed and faxed receipt causes delays in reviewing the data.
 - Manual data entry into state and/or EPA drinking water data systems may result in inaccurate data and time delays that could compromise public safety.
 - Reports and data are not standardized.

The Challenge.....

Challenge: *To develop and implement an electronic data flow directly from laboratories to state drinking water programs with the ultimate goal to expand the process to other regulatory programs.*

Challenge Partners

Active Participants

- New Hampshire Department of Environmental Services
- Maine Department of Health Services
- New Jersey Department of Environmental Protection
- Rhode Island Department of Health
- Vermont Department of Environmental Conservation
- EPA Region I and Headquarters

Advisory Committee

- Private Laboratories
- Utility Laboratories
- Public Works Operators
- New England Water Works Association
- SDWIS (EPA Federal Drinking Water System) Data Sharing Committee
- State/EPA Data Standards Council

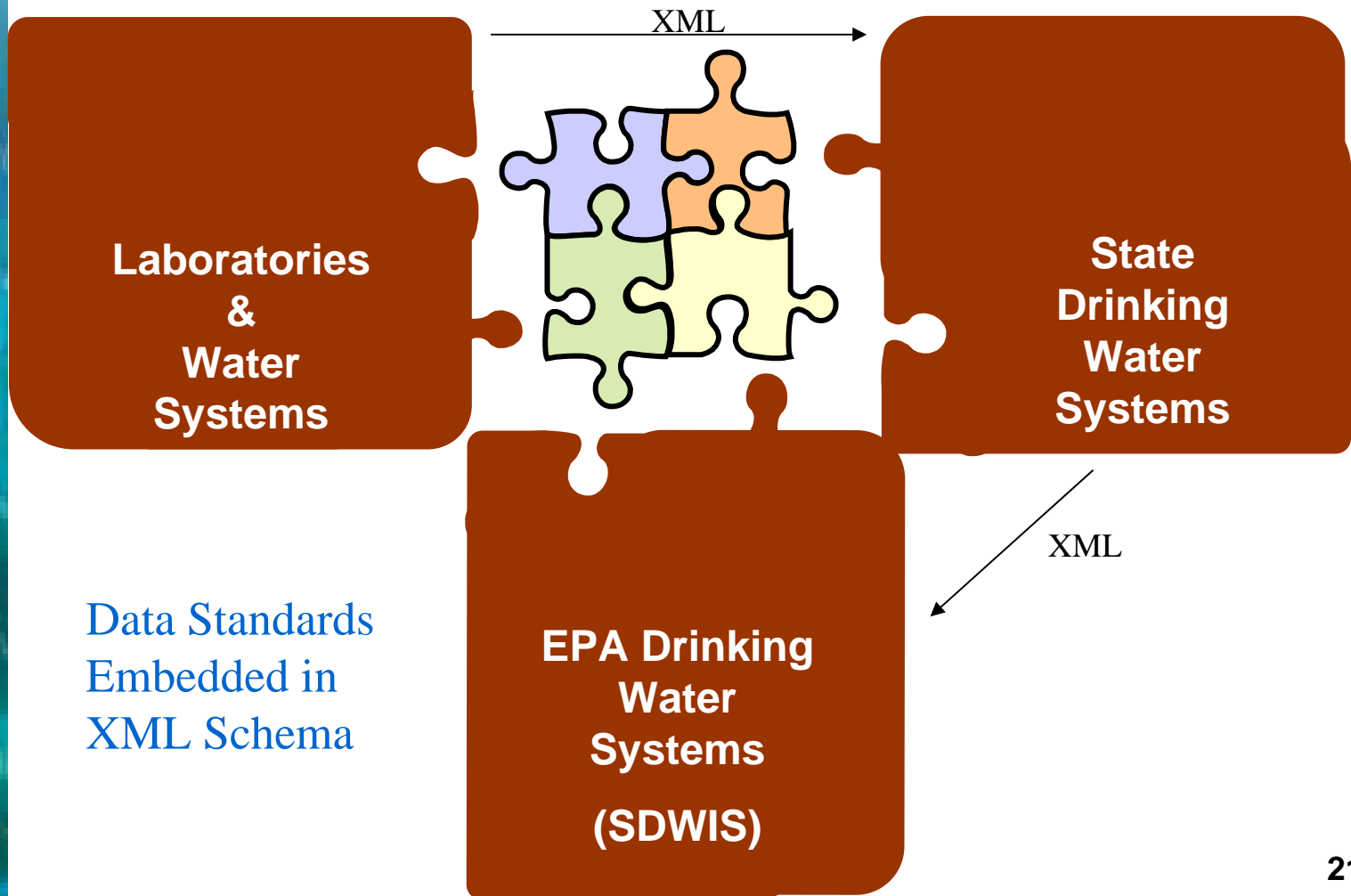
Approach to Challenge

Objectives

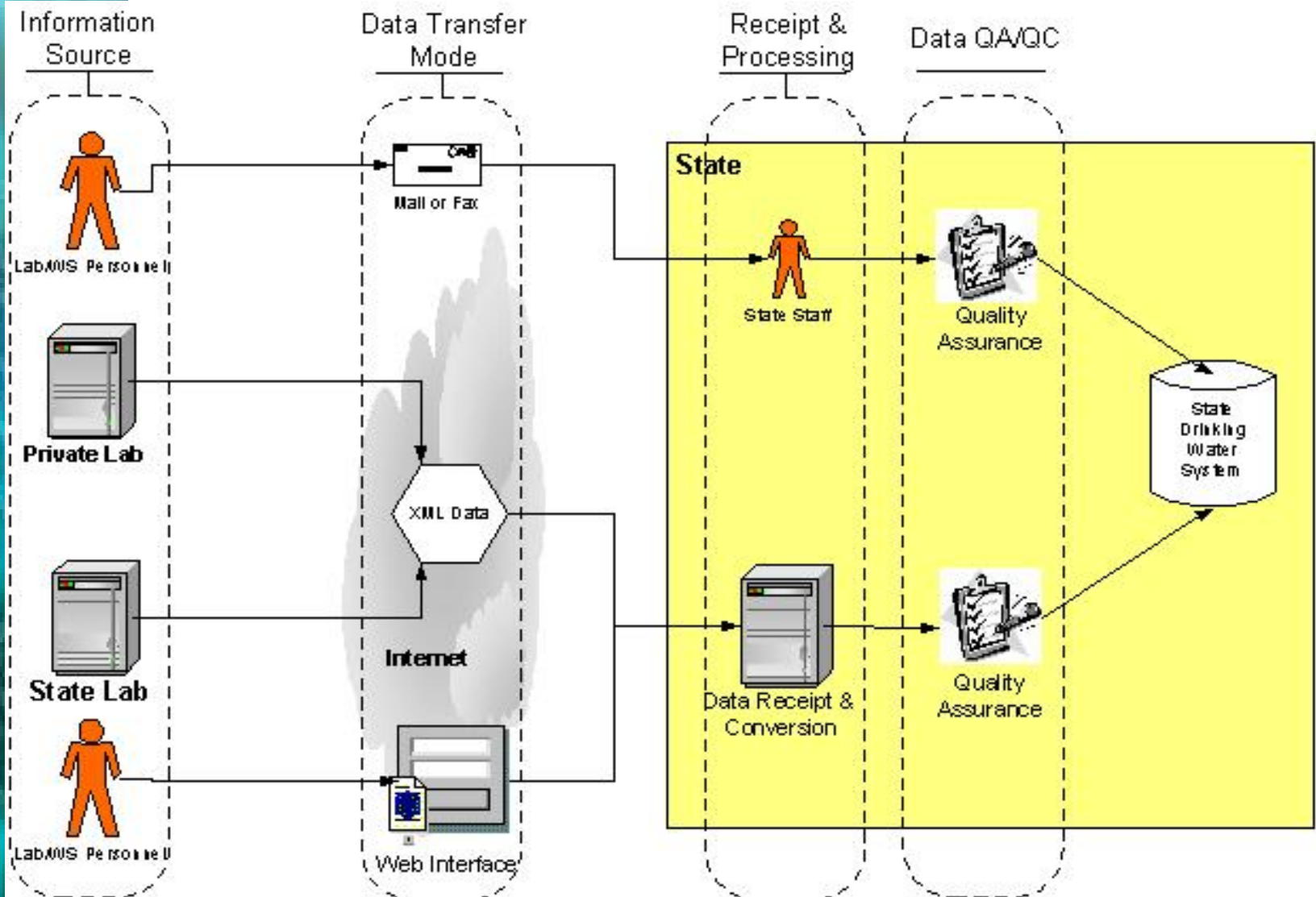
- Implement electronic flow from laboratories to States
 - Generic template
 - Electronic Signature/Registration
 - Submittal Procedures
 - Validation Procedures
 - Feedback Process
- Develop tools and guidance to share with other states

Approach to the Challenge

- Develop XML Schema to flow Drinking Water Data from Labs to States and to EPA



Approach to Challenge



Benefits...

- Schema to be shared by many states.
- Schema may be shared among other environmental programs.
- One reporting format for labs.
- Eliminate duplicate data entry.
- Minimize errors in data entry.
- Rapid availability of data to stakeholders and decision makers.
- Secure and comprehensive process that is not burdensome to laboratories, water systems, or agency staff.

Pacific Northwest Water Quality Data Exchange

Presented by:

Mitch West

Oregon Dept of Environmental Quality

The Problem

- ~30% of water monitoring data ever sees the light of day (electronic/discoverable/searchable).
- Many failed efforts had focused on data consolidation, technology standards, and always, a big database.
- Large investments in competing technologies.
- Cost of participation was too high for small organizations.

Network "Challenge"

EPA Region 10 states received a 2002 EPA Network Challenge Grant to implement

Project Agencies

- Alaska Dept. Environmental Conservation
- Idaho Dept. Environmental Quality
- Oregon Dept. Environmental Quality
- U.S. EPA Region 10
- Washington Dept. Ecology

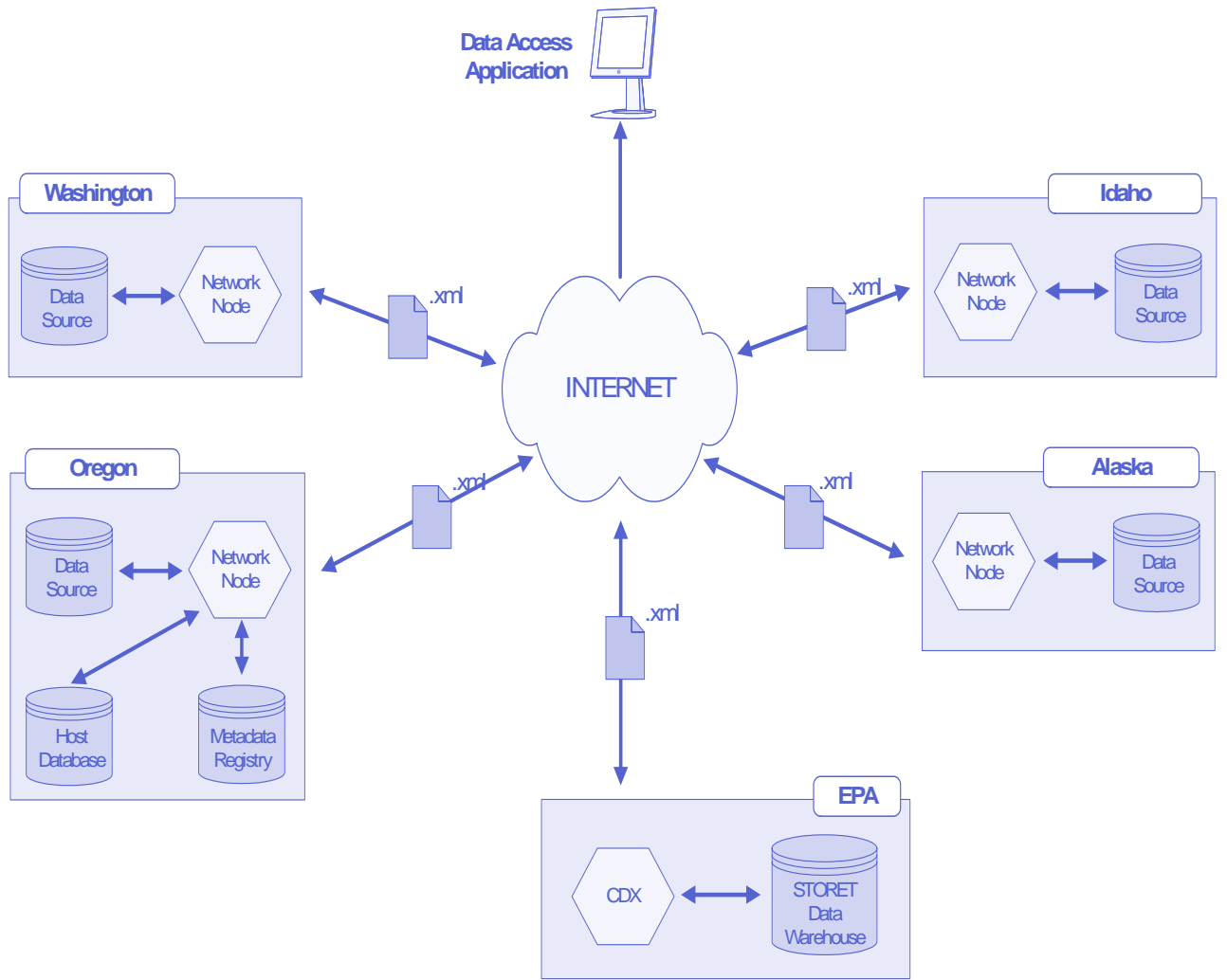
Active Partners

- Idaho Soil Conservation Commission
- Nestucca-Neskowin Watersheds Council
- Northwest Indian Fisheries Commission
- U. of Idaho - Water Resources Research Institute

Challenge Grant Objectives

- Provide one-stop access to PNW water quality monitoring data from many sources
- Enable wide range of participation
- Design data exchange to support
 - Partner needs
 - Eventual upload to EPA STORET
- Follow National Exchange guidelines
 - Develop data exchange formats
 - Implement Internet “nodes”

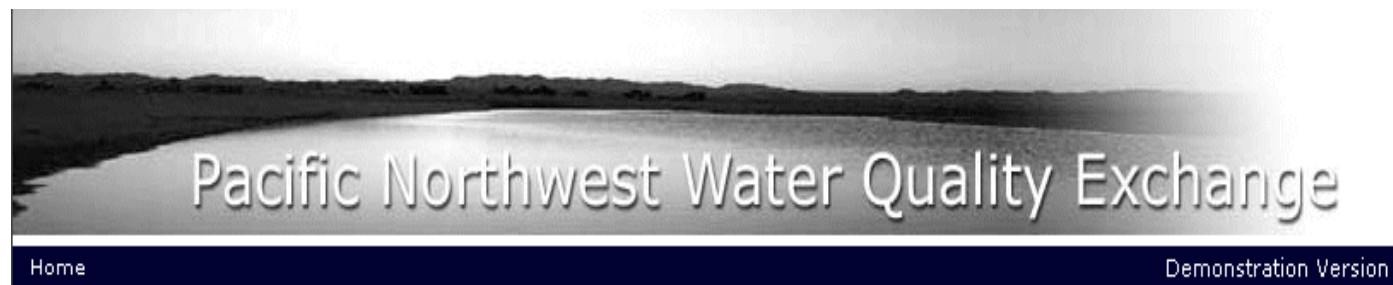
Exchange Data Flow Model



Where Are We Now?

- Data exchange templates, schema, and data flow model finalized
- Oregon, and Washington network nodes and host database operational.
- Idaho data served from the “host database”
- Demonstration data access tool functional
- Ready for business (data and data consumers)

Data Access Tool Demo



<http://www.windsorsolutions.biz/pnwwqxdemo/>

Search Page



Projects

Data Source: Idaho (Ready)
 Oregon (Ready)
 Washington (Ready)

Data Provider: contains

Project Name: contains

Project Organization: contains

Project Date Range: After: Before:

1. Pick data sources

Locations

Responsible Organization: contains

Station Name: contains

Station Type: Estuary
Groundwater
Intertidal
Lake or Pond

Station Location:

Latitude: to

Longitude: to

Location Context:

Location Description:

2. Click 'Select from Map'

Results

Sampling Organization: contains

Sampling Date Range: After: Before:

Taxon Name: Acarina
Ambloplites rupestris
Ameiurus melas
Ameiurus nebulosus

Map Search



ArcWeb Site Starter Viewer - Microsoft Internet Explorer

1. Draw box

2. Click 'Select'

© 2004 ESRI, GDT

X: Y: Legend

Zoom In Re-center

Return to Search Page



Locations

Responsible Organization:

Station Name:

Station Type:
Groundwater
Intertidal
Lake or Pond

Station Location:

Latitude: to

Longitude: to

Location Context:

Location Description:

Results

Sampling Organization:

Sampling Date Range: After: Before:

Taxon Name:
Ambloplites rupestris
Ameiurus melas
Ameiurus nebulosus

Media Name:
Biological (tissue)
Sediment
Soil

Analyte Name:
1,1,1-Trichloroethane
1,1,2,2-Tetrachloroethane
1,1,2-Trichloroethane

1. Map selection populates coordinates

2. Pick other criteria such as sampling date range

3. Click 'Search'

Data Providers Summary List

Pacific Northwest Water Quality Exchange

[Home](#)

Demonstration Version

Data Sources

Organization Identifier	Name	Contact	Telephone Number
Idaho-DEQ	State of Idaho, Department of Environmental Quality 1410 North Hilton, Boise, Idaho 83706	Jake Duplessie	208-373-0161
OregonDEQ	Oregon Department of Environmental Quality 811 SW 6th Ave, Portland, OR 97204	Curtis Cude	503-229-6086
WADOE	Washington State Department of Ecology P.O. Box 47600, Olympia, WA 98504-7600	Chris Neumiller / EIM Data Coordinator	360-407-6258

[Projects \(3\)](#)
[Locations \(27\)](#)
[Results \(900\)](#)
[Refine Search](#) | [New Search](#)

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Provider	Identifier	Project Organization	Project Name	Start Date	End Date
WADOE	380770	Washington State Department of Ecology	Effectiveness Monitoring on Alpowa, Deadman, & Pataha creeks	4/23/2002	12/17/2002
OregonDEQ	441	Oregon Department of Environmental Quality	LQ Landfill - Baker Landfill	10/15/2002	10/15/2002
Idaho-DEQ	SDWIS/Idaho	State of Idaho, Department of Environmental Quality - Drinking Water Program	Safe Drinking Water Information System- For Idaho	1/1/1993	1/1/0001

Projects Summary List



Pacific Northwest Water Quality Exchange

Data Sources

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Idaho-DEQ	State of Idaho, Department of Environmental Quality 1410 North Hilton, Boise, Idaho 83706	Jake Duplessie	208-373-0161
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Projects (3)

Locations (27) Results (900)

Refine Search | New Search

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Results Summary List

Pacific Northwest Water Quality Exchange

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[Demonstration Version](#)

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[Locations \(27\)](#)
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[Refine Search](#) | [New Search](#)

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Provider	Project ID	Station ID	Start Date	Media	Method	QA Code	Analyte	Result Value	Qual
Idaho-DEQ	SDWIS/Idaho	ID10113	5/15/2002	Water		E	NITRATE (AS N)	0 MG/L	*
Idaho-DEQ	SDWIS/Idaho	ID10113	5/15/2002	Water		E	NITRITE (AS N)	0 MG/L	*
WADOE	380770	4154911	5/21/2002	Water	83218	E	Ammonia	0.049 mg/L	
WADOE	380770	4154911	5/21/2002	Water	50757	E	Phosphorus	0.079 mg/L	
WADOE	380770	4154911	5/21/2002	Water	1008	E	Total Persulfate Nitrogen	0.897 mg/L	
WADOE	380770	4154911	5/21/2002	Water	34	E	Total Suspended Solids	24 mg/L	
WADOE	380770	3033911	5/21/2002	Water	83218	E	Ammonia	0.027 mg/L	
WADOE	380770	3033911	5/21/2002	Water	50757	E	Phosphorus	0.156 mg/L	
WADOE	380770	3033911	5/21/2002	Water	1008	E	Total Persulfate Nitrogen	0.588 mg/L	
WADOE	380770	3033911	5/21/2002	Water	34	E	Total Suspended Solids	24 mg/L	
WADOE	380770	8534911	5/21/2002	Water	323	E	Fecal Coliform	180 #col/100ml	
WADOE	380770	8534911	5/21/2002	Water	83218	E	Ammonia	0.021 mg/L	
WADOE	380770	8534911	5/21/2002	Water	50757	E	Phosphorus	0.064 mg/L	
WADOE	380770	8534911	5/21/2002	Water	1008	E	Total Persulfate Nitrogen	0.609 mg/L	
WADOE	380770	8534911	5/21/2002	Water	34	E	Total Suspended Solids	18 mg/L	
WADOE	380770	4154911	5/21/2002	Water	323	E	Fecal Coliform	3900 #col/100ml	
WADOE	380770	6482911	5/21/2002	Water	21453	E	Temperature, water	12 deg C	*

Benefits

- Data that would have taken weeks to collect can be downloaded in minutes.
- Low cost of entry for new participants will bring in data never before available.
- Easy data “discovery” can fuel new lines of inquiry—is there data to test this hypothesis?”
- The data service can supply multiple new analytical tools (example: Region 10 RAINS)
- There is a straight-forward path to move data from the Exchange to STORET
- We believe this to very “repeatable”—we have received numerous inquiries.

Beach Data Flow

Presented by:

Sherry Driber

New Jersey Department of Environmental
Protection

and

Tim Gormley

Earth 911

BEACH Program Data Flow

- Data Share Coastal/Great Lake States with US EPA via Exchange Network
- Water Quality Information for Recreational Beaches
- Weekly Sampling and Public Postings for Advisories/Closures
- 5 State Collaborative Effort (NJ, CA, DE, NC, GA)
- Earth 911 provides national Public Notification Web Portal for water quality and other environmental information

Opportunities:

- Significantly improve data management.
- Increase quality and quantity of information shared - States to EPA sharing was limited to annual end of year survey.
- Eliminate/reduce redundancy of data input at all govt. levels.
- Provide automated public notification – Past notification was disparate phone hotlines, websites, and posting of signs at beaches

Outcomes:

- States implemented XML schema for data sharing with PrAWN.
- Implemented Trading Partner Agreement
- Delaware successfully exchanged between State node and CDX
- NJDEP/Earth 911 developed a completely paperless solution from point of sampling through EPA reporting.
- Earth 911 demonstrates Network Node capability to assist NJ and others
- Results/Solutions available to all States
- BEACH data is now available to EPA as often as weekly.

New Jersey Beach Monitoring Solution (NJBMS)

- System allows local coordinators to upload sampling results into system via the Internet
- Laboratories add sample results to data records
- System recommends action for agency officials (e.g. closures) from results
- Posting determinations are immediately available on NJDEP and Earth 911 websites
- Citizens, lifeguards, media, resorts, other stakeholders receive immediate email alerts of closures/advisories via “opt-in”
- Results are immediately available for BEACH Data Flow



NJ Beach Monitoring Solution

Field Data

Shoreline: Indiana

Municipality:

Beach Monitoring Station:

Edit Previous Entry:

Add New Information: (mm/dd/yyyy) Today's Date: (6/9/2004)

Air Temperature: °C °F

Water Temperature: °C °F

Time Sampled:

Tide Phase

MID-FLOOD TIDE

Wind From:



NJ Beach Monitoring Solution Laboratory Reports

Default Entry

6/11/2004

11:00

Save	Location (Station#)	Date Sampled	Date Analyzed	Time Analyzed
------	---------------------	--------------	---------------	---------------

<input type="checkbox"/>	Gary Lake Street Beach (LakeStr2)	6/9/2004	6/11/2004	11:00
--------------------------	-----------------------------------	----------	-----------	-------

Results

Comments

E coli:

<input checked="" type="checkbox"/>	Gary Lake Street Beach (LakeStr2)	6/10/2004	6/11/2004	11:00
-------------------------------------	-----------------------------------	-----------	-----------	-------

Results

Comments

E coli:

<input type="checkbox"/>	Gary Marquette Park Beach (Marquet1)	6/9/2004	6/11/2004	11:00
--------------------------	--------------------------------------	----------	-----------	-------

Results

Comments



NJ Beach Monitoring Solution Health-Based Risk Determination

Location (Station#)	Date Sampled	Analyzed by	Date / Time Analyzed	Analysis Parameter	Results	Comments	Close	Reason
Gary Lake Street Beach (LakeStr2)	6/10/2004	CP	6/11/2004 11:00:00 AM	E coli	350		<input checked="" type="checkbox"/>	Bacteria levels in monitoring excee
Gary Marquette Park Beach (Marquet1)	6/10/2004	CP	6/11/2004 11:15:00 AM	E coli	<2	None Detected	<input type="checkbox"/>	- Select -

Save Changes

Cancel

[NJ BMS Main Page](#)
[Return To Earth 911 Main Page](#)

Environmental Information Exchange Network



 **Earth 911**
INDIANA 

BEACH WATER QUALITY ●●●

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GLOSSARY

- WATER OPEN
- WATER CLOSED
- NO SAMPLING DATA AVAILABLE

LOCATIONS

Indiana

Gary Beaches

- ▶ Wells Street Beach ■
- ▶ Marquette Beach ■
- ▶ Lake Street Beach ■
- ▶ Lake Street Boat Ramp ■

[Back To Indiana](#)

LET US KNOW ●●●

- what you think
- beach conditions

Gary Beaches



Receive an e-mail alert on
BEACH STATUS!



click here

WATER=LIFE



Program Partners:



Environmental Information Exchange Network



Earth 911
INDIANA

BEACH WATER QUALITY ●●●

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GLOSSARY

- WATER OPEN
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LOCATIONS

Indiana

Gary Beaches

- ▶ Wells Street Beach ■
- ▶ Marquette Beach ■
- ▶ Lake Street Beach ■
- ▶ Lake Street Boat Ramp ■

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LET US KNOW ●●●

- what you think
- beach conditions

Gary Beaches

Gibson Juniper Lake Hancock Henry Howard
 Forrest Forest

Receive an e-mail alert on BEACH STATUS!

click here

WATER=LIFE

Lake Street Beach

■

Beach Water Quality Status is **Closed**

Bacteria levels in monitoring exceed State standards

Last Time Local Agency Updated Information 6/10/2004 9:29:00 AM

A closure is the placement of signs at a public beach that the area is closed to swimming and/or water contact due

NJDEP BEACH Program Solution

- Data collectors this year will use PDA's for wireless input at point of data collection – forms are on PDA.
- A complete paperless system - collection to reporting.
- System will be Oracle to accommodate other database platforms.
- NJBMS is being offered to any state at no cost.
- Illinois, Indiana and other states are looking to apply application to meet their needs.
- Counties love the new system and want the PDA's.

Environmental Information Exchange Network

Summary Benefits:

- Use of state-of-the-art technology to reduce workload and streamline data management at all levels of govt.
- Government-to-Government and Government-to-Public information exchange through one seamless network.
- Ability to instantaneously disseminate public information.
- Leverage of a national public/private partnership (Earth 911) to offset cost of sustaining public notification requirements.
- Ability to disseminate information to a broader audience (e.g. Gannet, Clear Channel, Yahoo, etc.) through their web sites, publications and broadcast content.

Protecting our Nation's Waters: Using the Environmental Information Exchange Network

June 15, 2004

