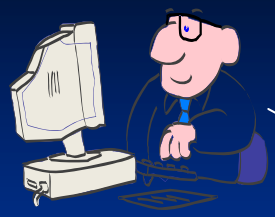
New Jersey Ambient Water Quality Data Exchange

Paul Morton, NJDEP/WM&S
NJ Water Monitoring Coordinating Council
September 30, 2009

NJDEP Ambient WQ Data Exchange



NJ DHSS Lab

Text

Text
Web forms

NJDEP

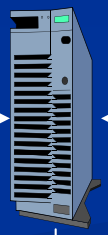
Counties
Commissions

Text
Web forms

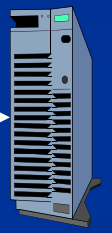
Text
Web forms

spreadsheets
Web forms
XML

E2
Web Server



COMPASS dB
(Water Quality)

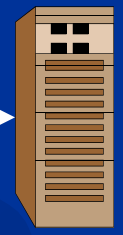


NJEMS dB
(Facility data)

TMDL
Contractors
319(h) Grantees

Volunteer
Organizations

Inventory
(Who, What, Where, When, Why)



USEPA
Central Data Exchange
(CDX)

NJ Water Monitoring Coordinating Council

Co-chairs:
Leslie McGeorge, NJDEP Water Monitoring & Standards
Rick Kropp, USGS NJ Water Science Center

- NJDEP (WM&S, NJGS, OS)
- USGS-NJ Water Science Center
- Delaware River Basin Commission
- Interstate Environmental Commission
- NJ Water Supply Authority
- Meadowland Environmental Research Institute
- Passaic River Institute
- NJ Harbor Discharge Group

Goals

- Develop an up to date, searchable **inventory** of ambient water quality monitoring activities in New Jersey
- **Integrate** federal (USEPA STORET and USGS NWIS), state, county and local ambient water quality monitoring data into NJDEP's enterprise environmental data management system (COMPASS) to enable more integrated environmental decisions (305(b), 303(d), TMDLs)
- Make NJDEP's ambient water quality monitoring data readily **available** to DEP staff and the public
- **Exchange** ambient water quality monitoring data with USEPA and USGS (not just send NJDEP data to EPA)

Core Components

WQX Module on **E2**

- Web based solution for importing data
- Both Web forms and batch file loading

Data **Validation**

- historical range checks,
- characteristic unit pairing, and
- logical checks

NJ Water Monitoring **Inventory** and **Data Portal**

- Web based mapping of monitoring locations & results

Outbound Data **Transmission to EPA/CDX**

Use of the WQDE System Include:

- Development of NJ's Integrated Water Quality Monitoring and Assesment (305(b) & 303(d)) Report – the federally mandated biannual assessment of state water quality
- Disseminate NJ ambient water quality data generated by multiple sources to:
  - Water managers
  - The public
  - US Environmental Protection Agency
- Provide water quality info to evaluate the effectiveness of management and restoration activities

Features

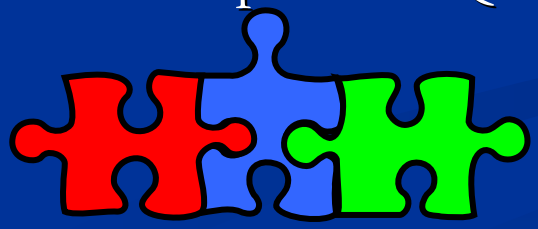
- Reuse of an existing NJDEP database (COMPASS used by Private Well Testing, Volunteer Monitoring, NJQL) to enhance compatibility and keep costs to a minimum.
- Security: Multiple levels, so outside parties can submit data to the system without accessing/changing DEP and other's data
- Inventory: Can tell us the who, what, where, when and why of a project without having to submit results. Make DEP staff more aware of available data sources in an area
- Deletes: can't delete monitoring locations with data or projects with data.
- Audit Trail: record of all submissions and transactions so you can know when data was added changed or deleted
- Handles Data Logger result in their native form

Data Discovery Solutions from WQDE

- **Inventory**: Discover projects with data not currently on a DEP or Federal data system. Also, provide access to data only on the DEP system that has not been sent to EPA

- **USGS/NWIS web services:** NJDEP will build an application to get data from the USGS web services and make that data available to the user's desktop in a WQDE compliant format.

- **EPA's WQX web services**: NJDEP will build an application to get data from EPA's WQX web service and make that data available to the user's desktop in a WQDE compliant format



Types of Data

- Project Descriptions (with QA Project Plans)
- Monitoring Location Information
- Results
  - Field Measurements/Observations
    - Temperature, weather, waterbody appearence
  - Chemical Results
    - water column, sediment, tissue
  - Biological Results
    - taxa counts, metrics and indicies
  - Habitat Assessments
  - Continuous Data (Data Loggers/Data Sondes)

Data Entry Methods

- **Web Forms**
- Organizations
- Projects
- Monitoring Locations
- Attachments

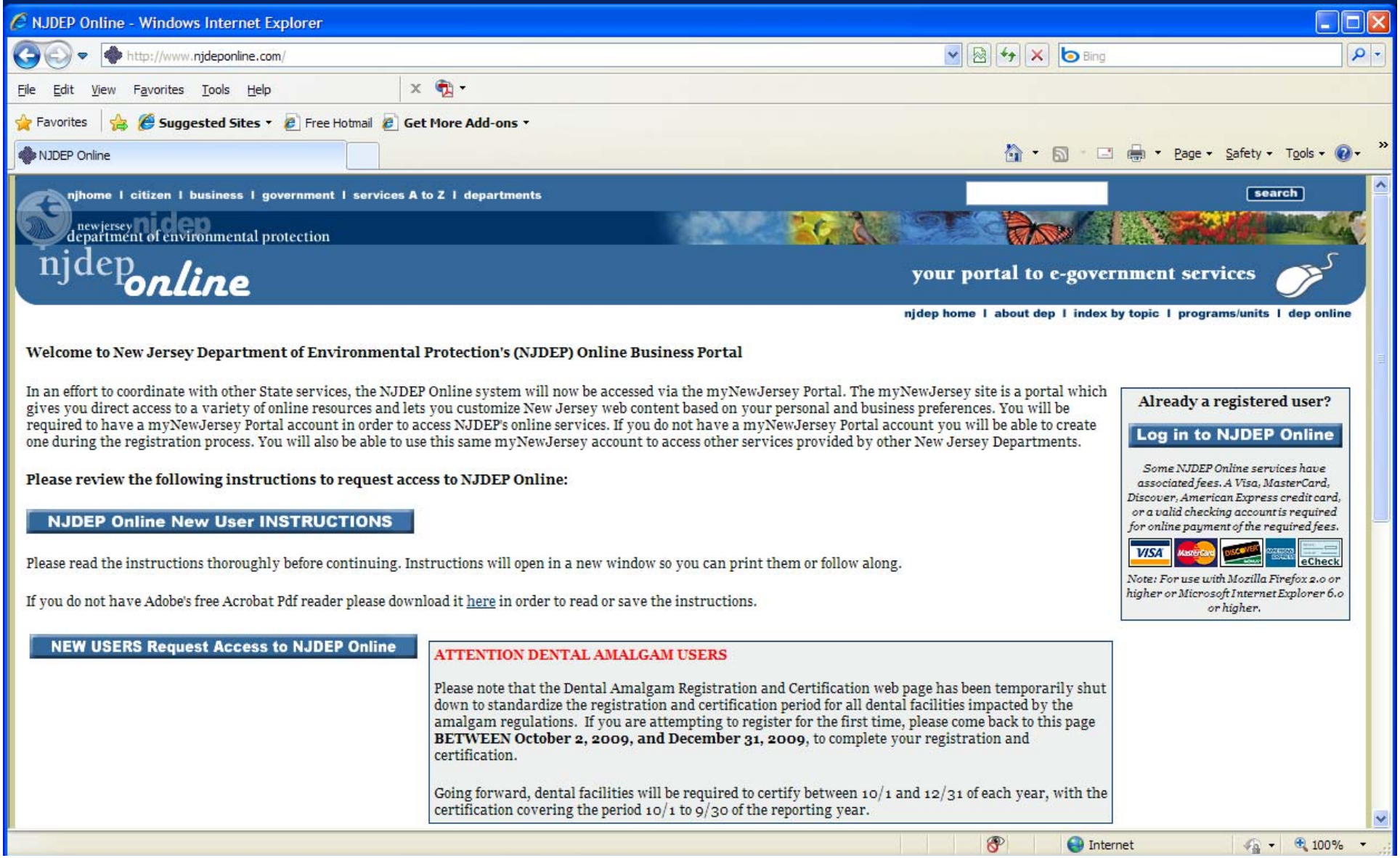
- **Batch Files**
- Projects
- Monitoring Locations
- Results
- Attachments

Potential Uses

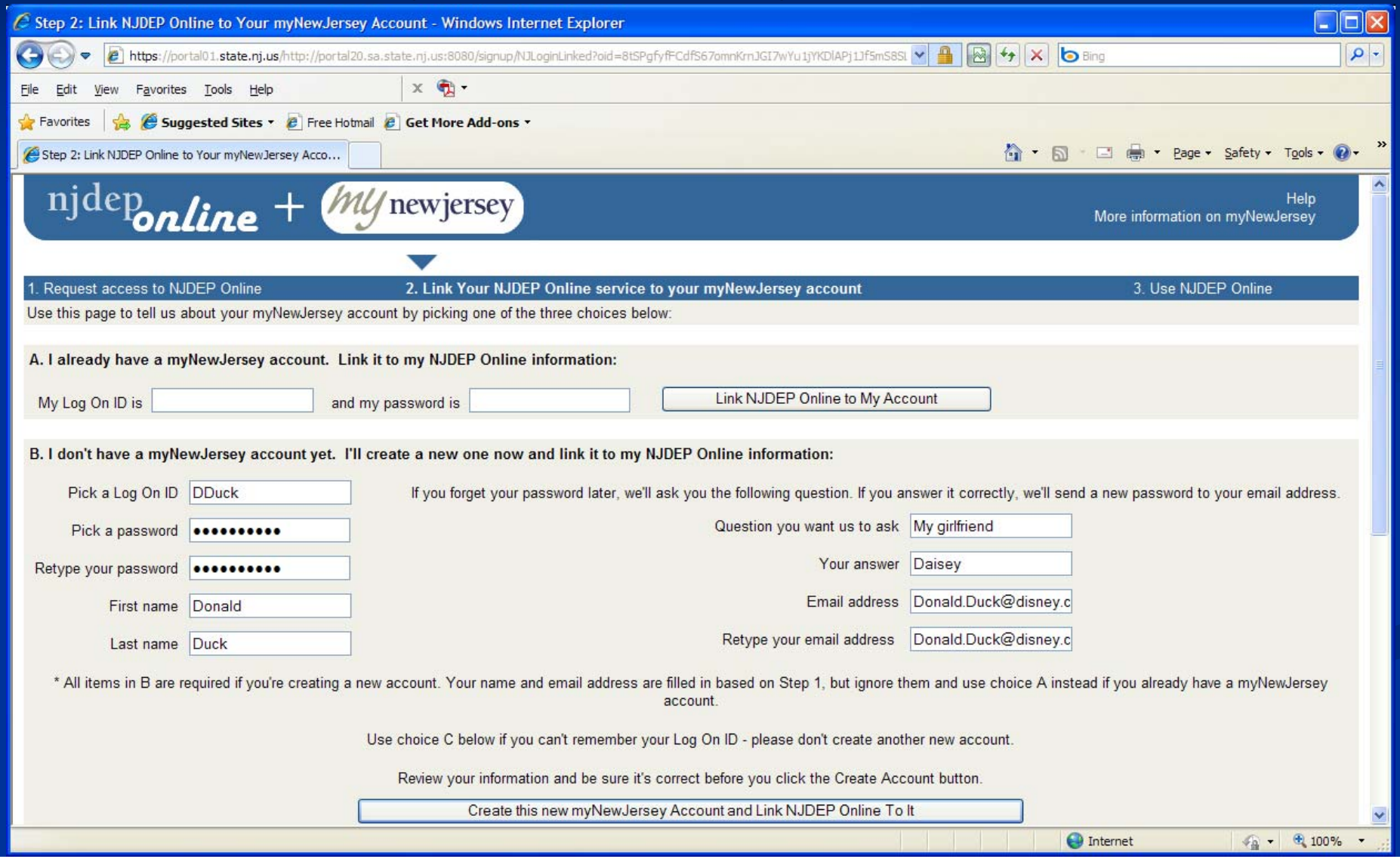
- Basically any ambient water quality data collected in NJ or in common waters with NJ can be entered into this system
- The mandatory data quality documentation fields (metadata) make it possible for data of known high quality to be used for regulatory decisions

How Do I Get Started?

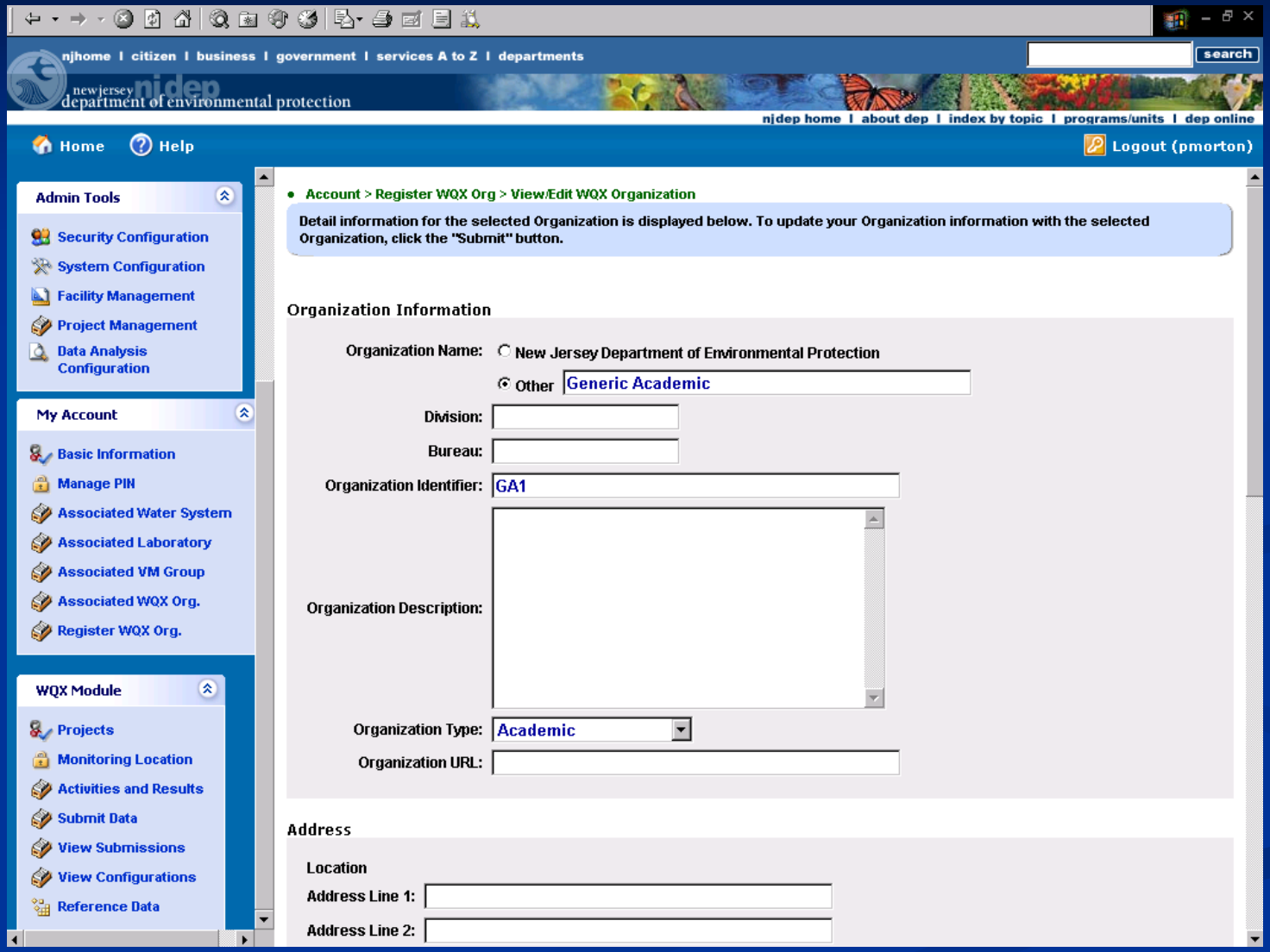
Register at NJDEP Online



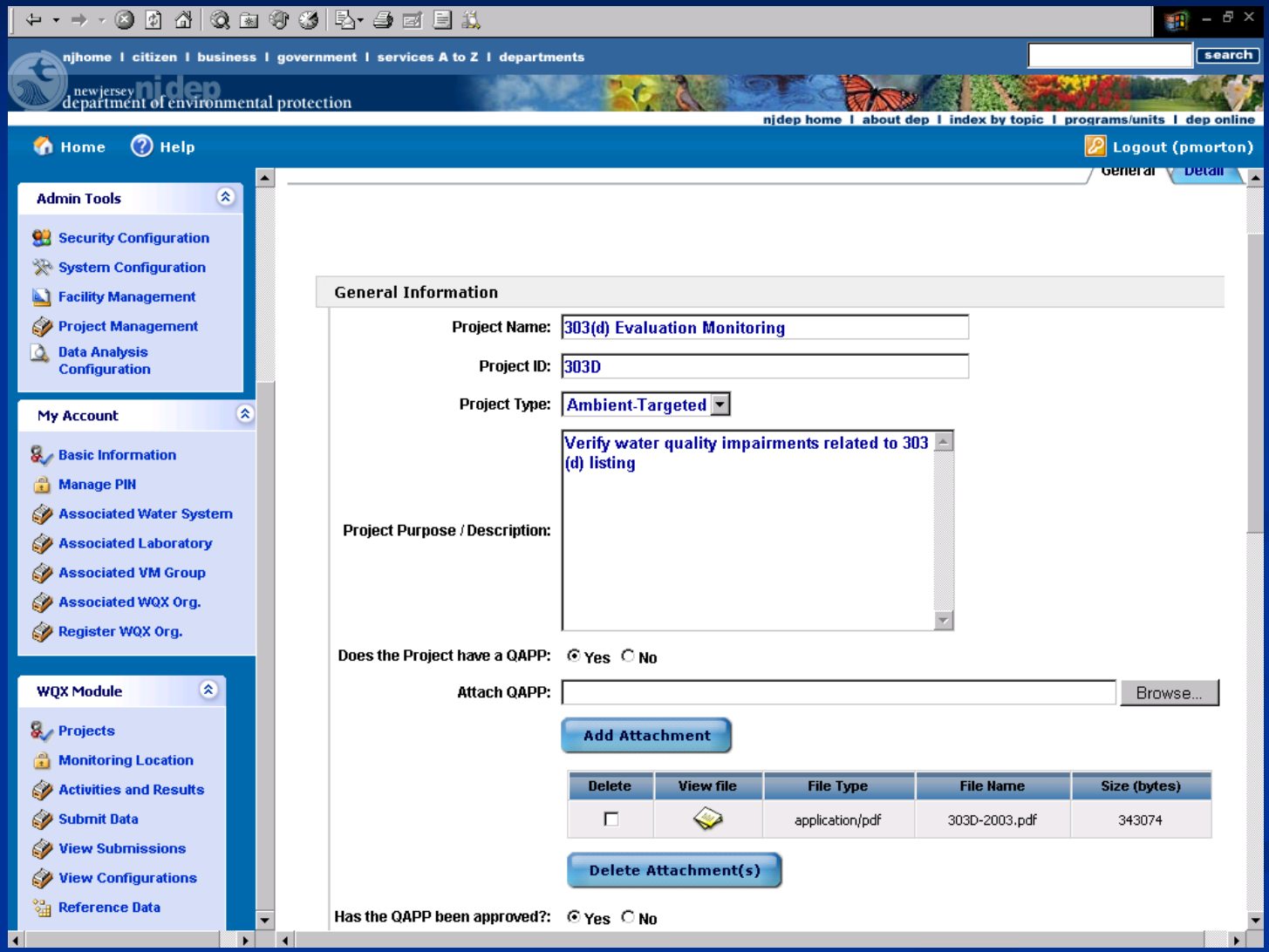
Link NJDEP Online service to myNewJersey account



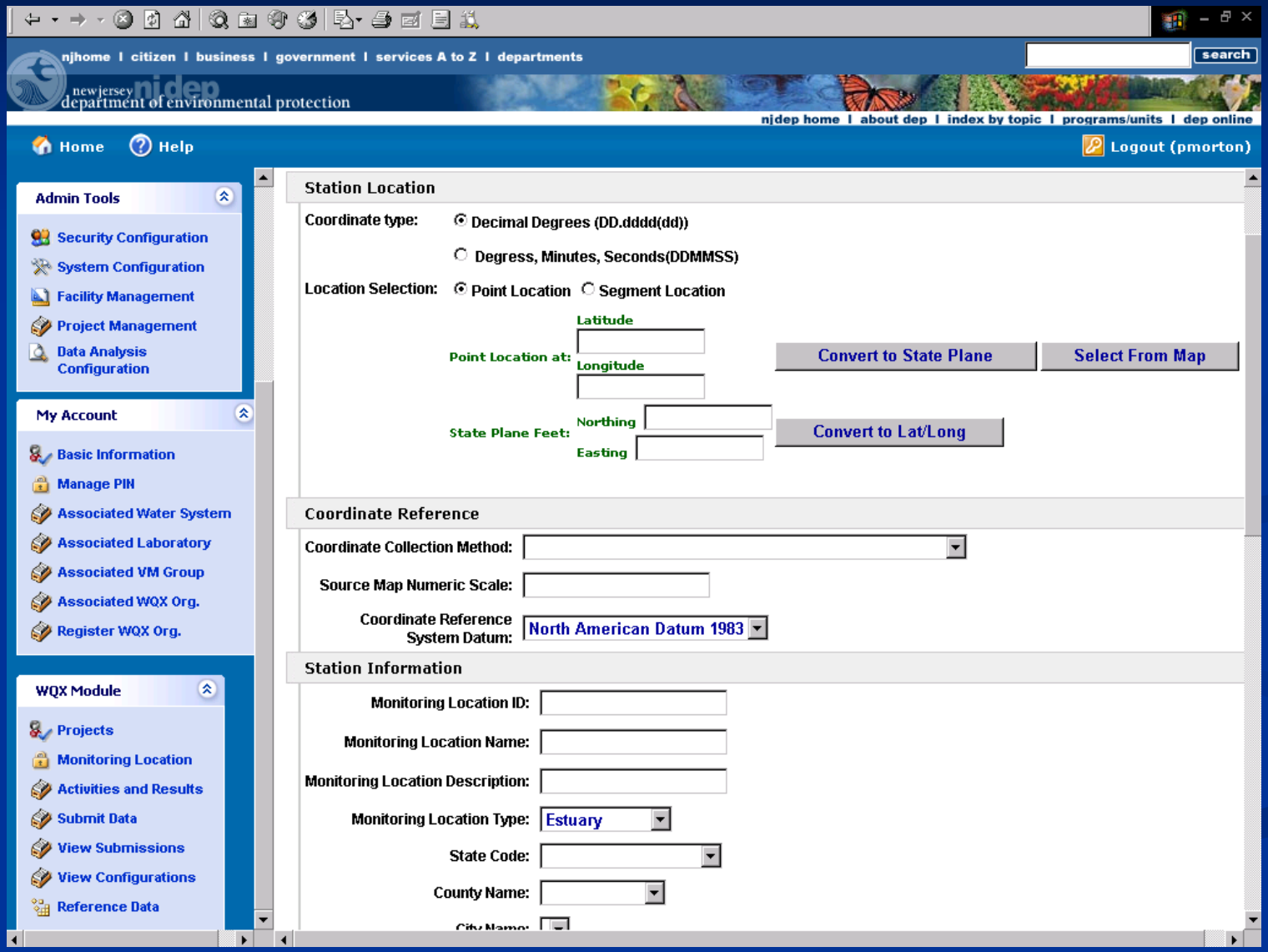
Step 1: Register Organization



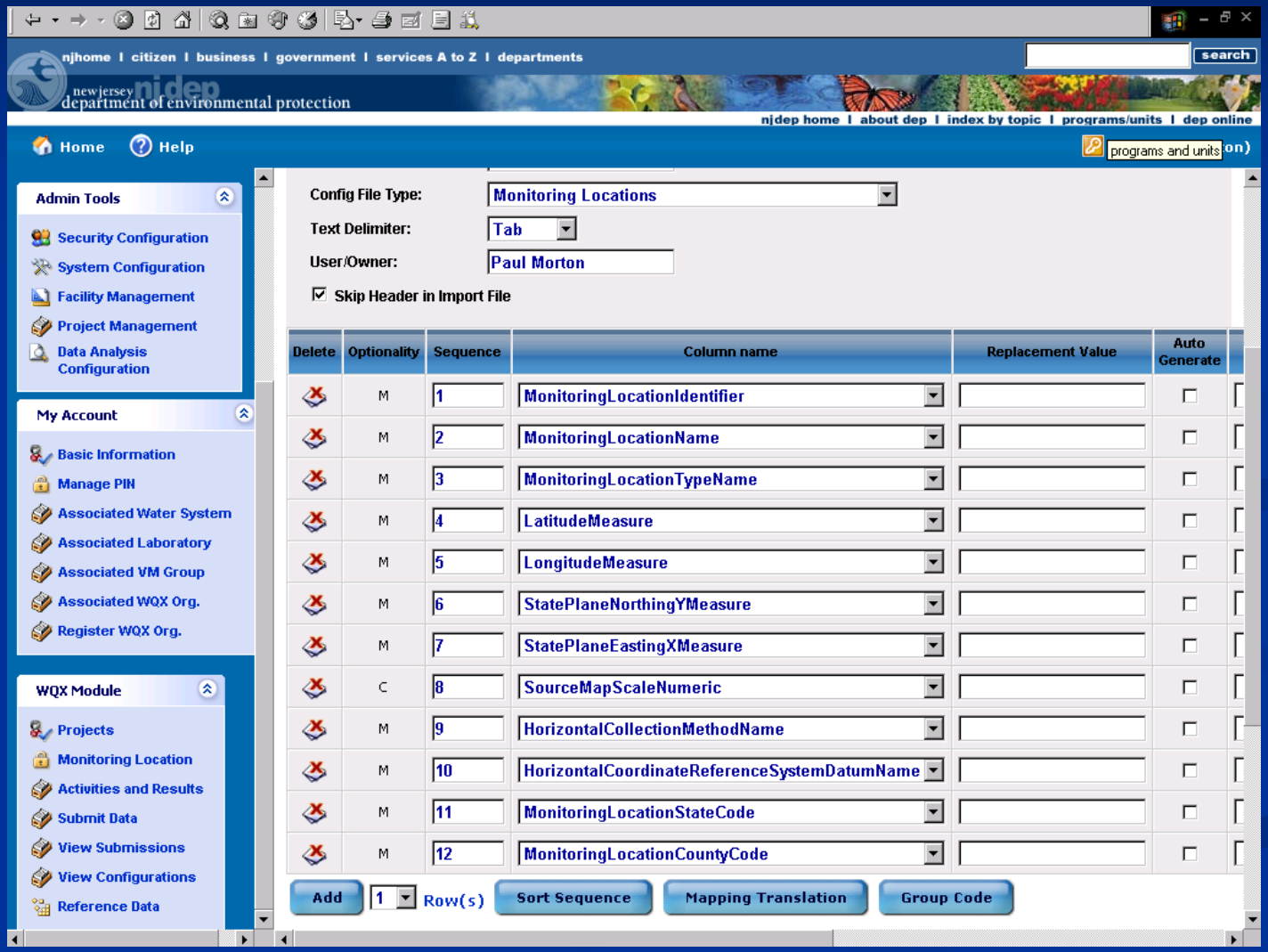
Step 2: Add Project Information



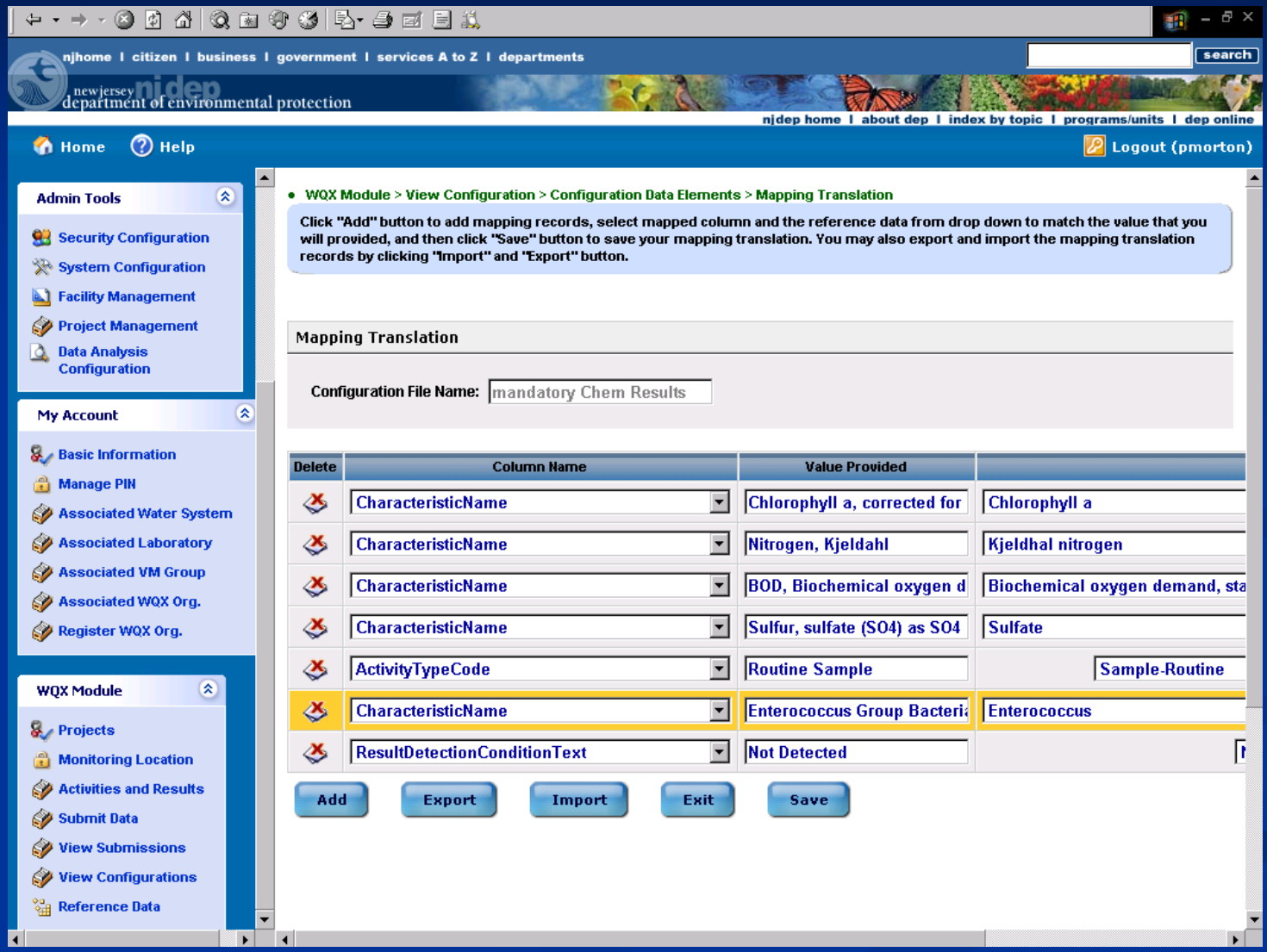
Step 3: Add Monitoring Locations



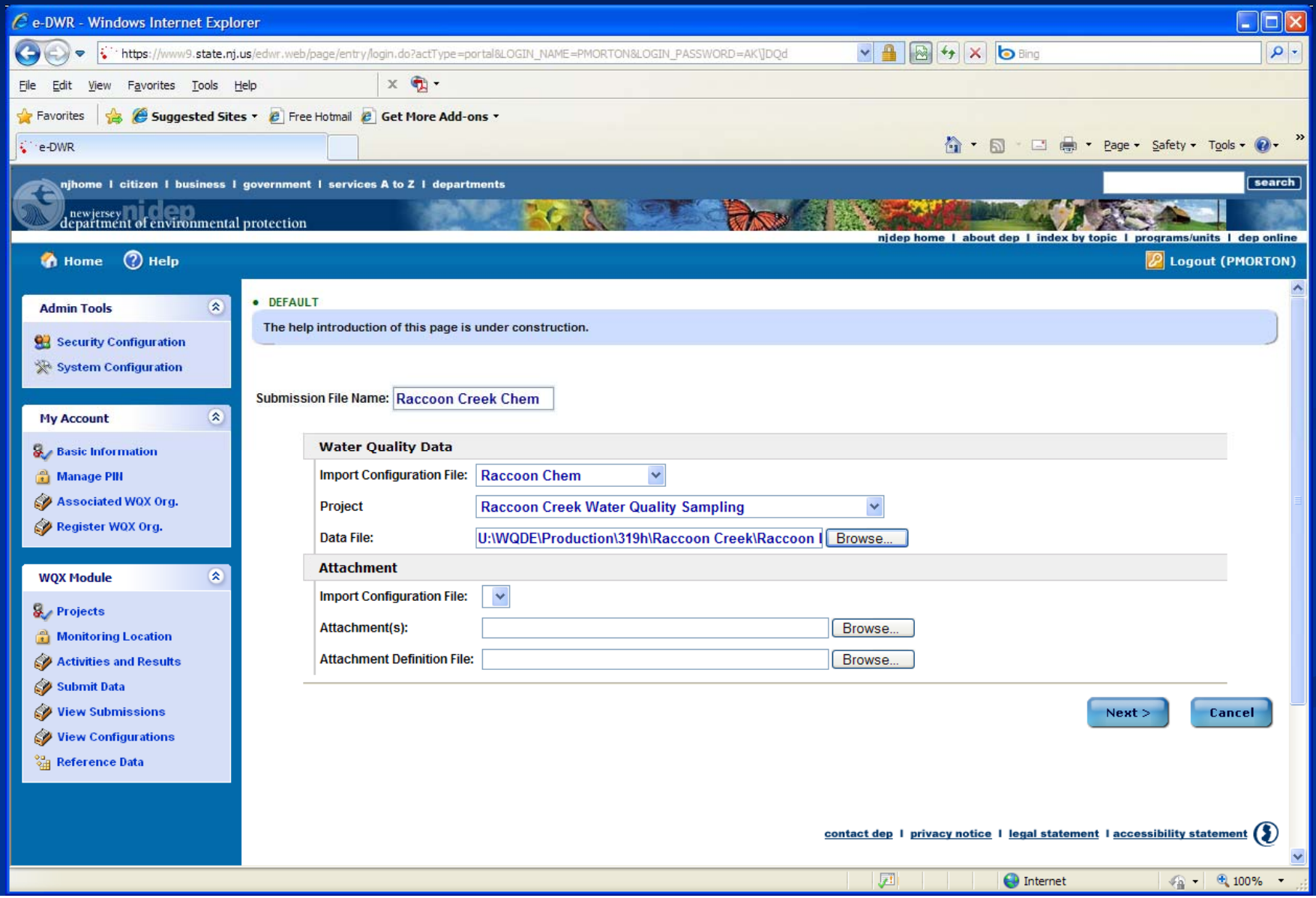
Select Columns and Order to Match Your Batch Files



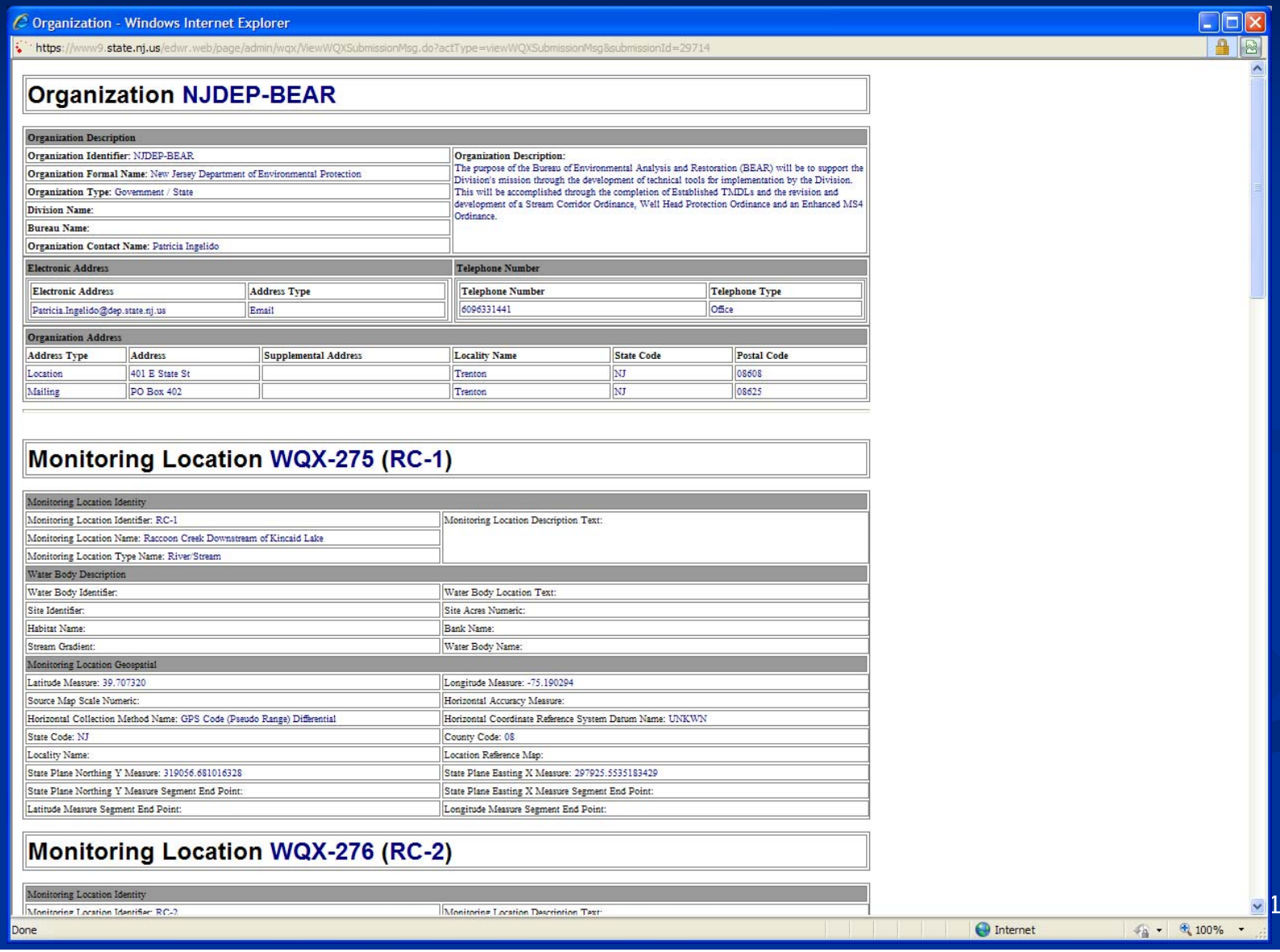
Match Your Codes to Our Codes



Submit Your Data



View Data You Submitted



Organization NJDEP-BEAR

Organization Description	
Organization Identifier: NJDEP-BEAR	**Organization Description:** The purpose of the Bureau of Environmental Analysis and Restoration (BEAR) will be to support the Division's mission through the development of technical tools for implementation by the Division. This will be accomplished through the completion of Established TMDLs and the revision and development of a Stream Corridor Ordinance, Well Head Protection Ordinance and an Enhanced MS4 Ordinance.
Organization Formal Name: New Jersey Department of Environmental Protection	
Organization Type: Government / State	
Division Name:	
Bureau Name:	
Organization Contact Name: Patricia Ingelido	

Electronic Address		Telephone Number	
Electronic Address	**Address Type**	**Telephone Number**	**Telephone Type**
Patricia.Ingelido@dep.state.nj.us	Email	6096331441	Office

Organization Address

Address Type	Address	Supplemental Address	Locality Name	State Code	Postal Code
Location	401 E State St		Trenton	NJ	08608
Mailing	PO Box 402		Trenton	NJ	08625

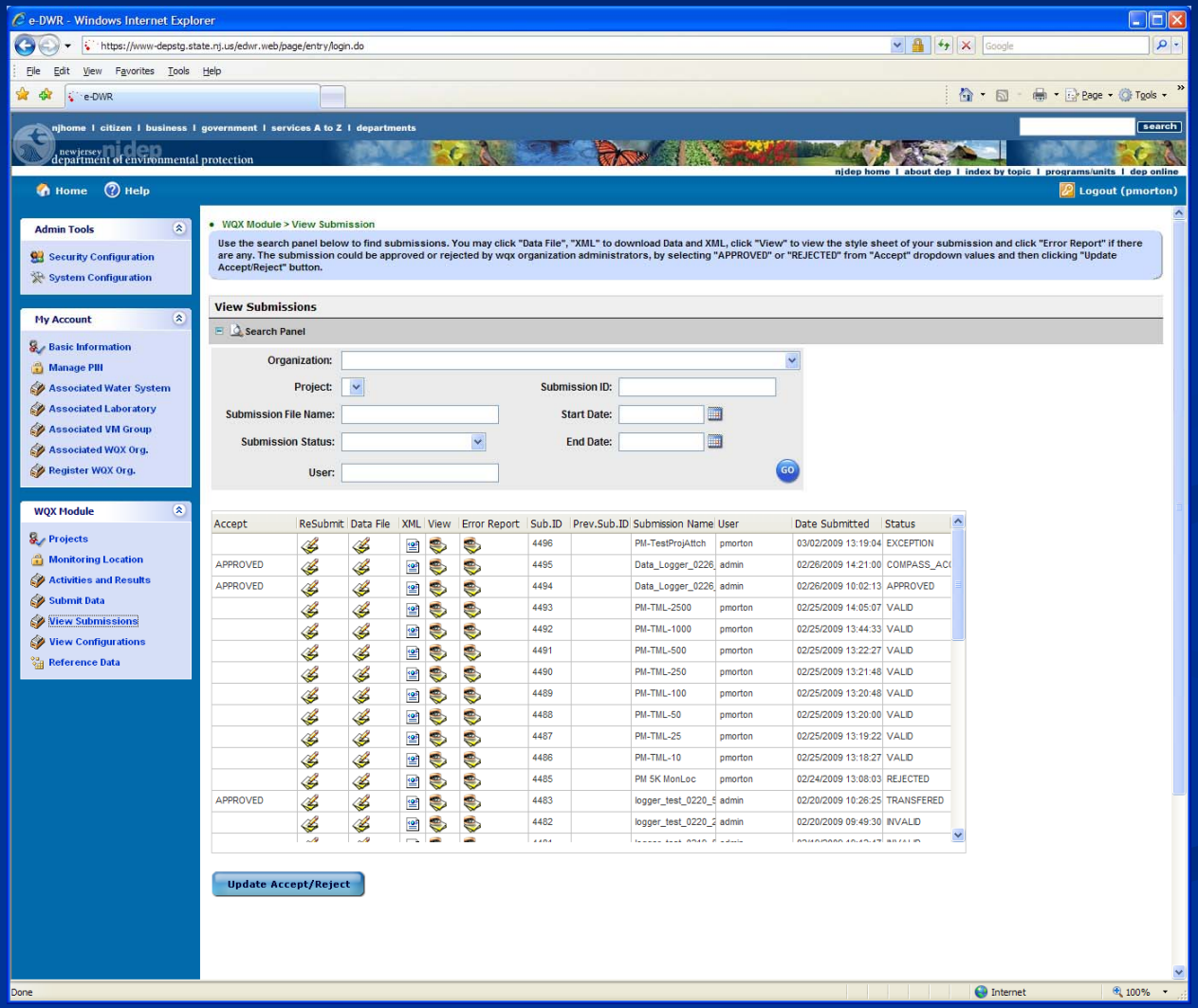
Monitoring Location WQX-275 (RC-1)

Monitoring Location Identity	
Monitoring Location Identifier: RC-1	Monitoring Location Description Text:
Monitoring Location Name: Raccoon Creek Downstream of Kincaid Lake	
Monitoring Location Type Name: River/Stream	
Water Body Description	
Water Body Identifier:	Water Body Location Text:
Site Identifier:	Site Acres Numeric:
Habitat Name:	Bank Name:
Stream Gradient:	Water Body Name:
Monitoring Location Geospatial	
Latitude Measure: 39.707320	Longitude Measure: -75.190294
Source Map Scale Numeric:	Horizontal Accuracy Measure:
Horizontal Collection Method Name: GPS Code (Pseudo Range) Differential	Horizontal Coordinate Reference System Datum Name: UNKWN
State Code: NJ	County Code: 08
Locality Name:	Location Reference Map:
State Plane Northing Y Measure: 319056.681016328	State Plane Easting X Measure: 297925.5535183429
State Plane Northing Y Measure Segment End Point:	State Plane Easting X Measure Segment End Point:
Latitude Measure Segment End Point:	Longitude Measure Segment End Point:

Monitoring Location WQX-276 (RC-2)

Monitoring Location Identity	
Monitoring Location Identifier: RC-2	Monitoring Location Description Text:

Submissions must be Approved (and Can be Rejected) by Bureau Administrator



Coming Attractions

Available via the Internet

January 31, 2010

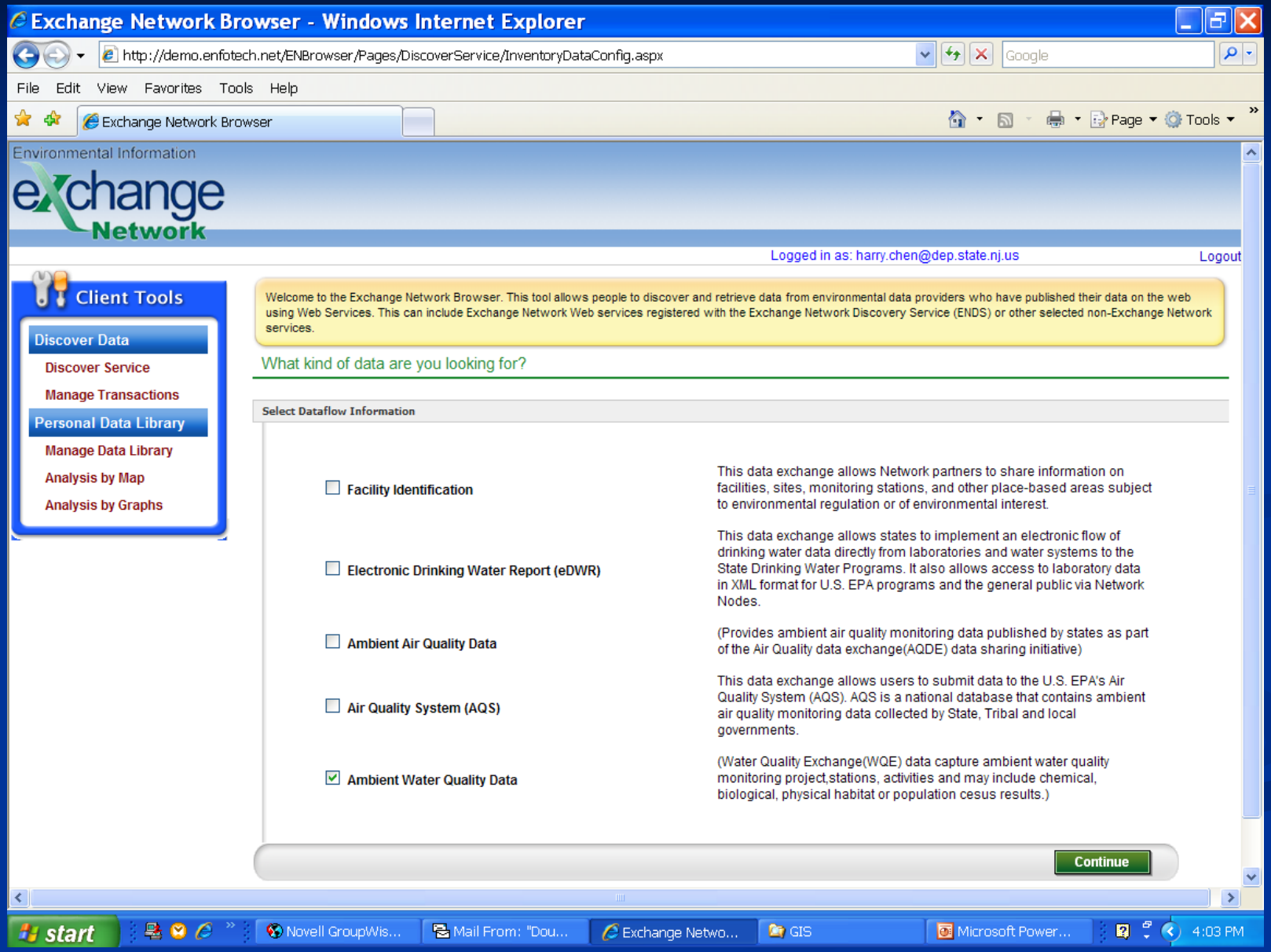
Water Quality Monitoring Inventory & Data Portal

- Water monitoring data for New Jersey waters was integrated and normalized under a common schema – WQDE.
  - WQDE schema is an extension of WQX schema. Captures additional information e.g. allows more detailed project descriptions.
- Data is made available to decision makers, planners, researchers and the public.

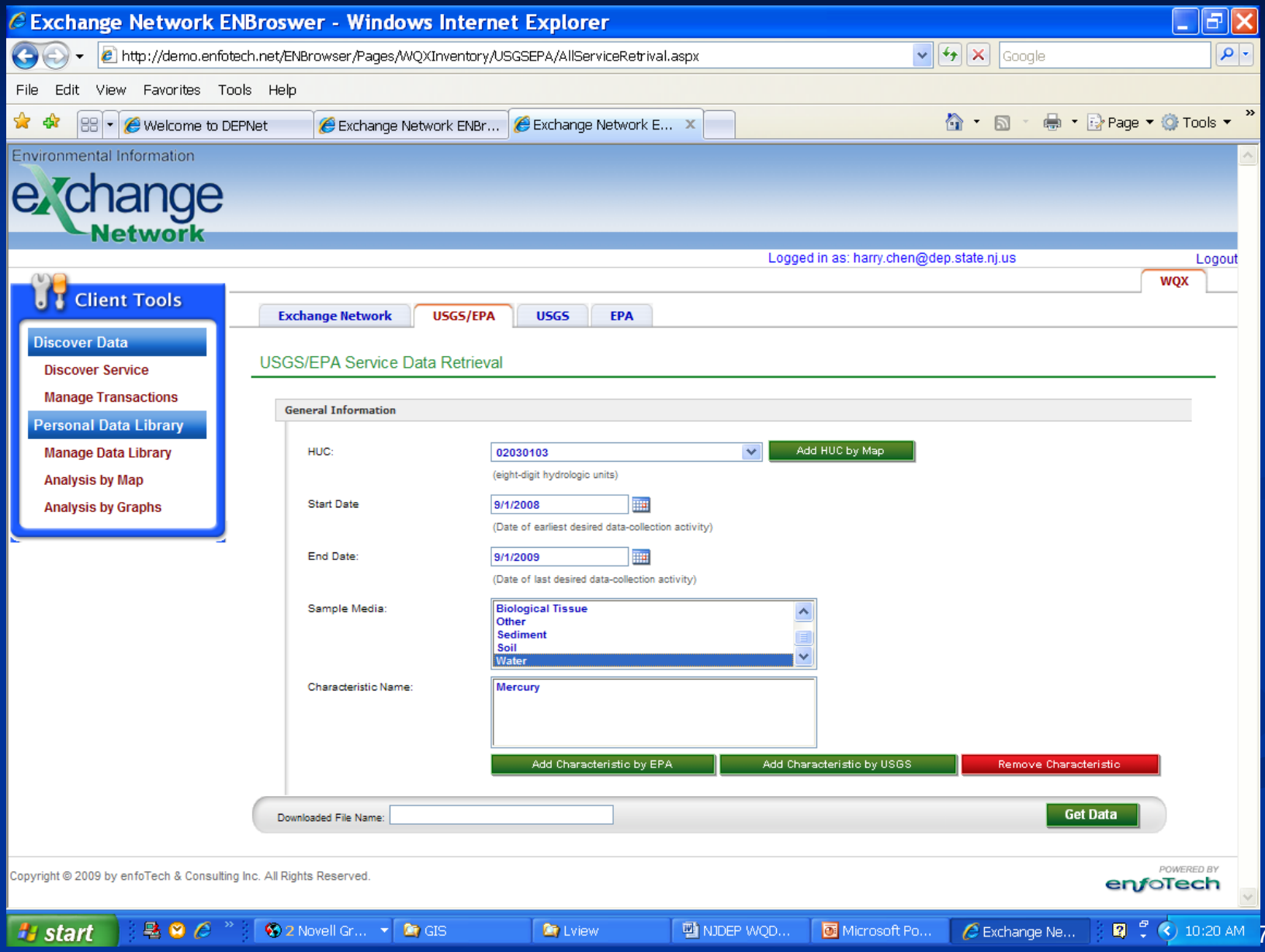
Built on the Exchange Network Browser

- Provides a single web interface for multi-media searches.
- Added a search for Water quality monitoring data
  - Includes a simultaneous search and retrieve for data from USGS, EPA and states publishing their data on the EN in the WQDE schema.
- Any state can join the Inventory.

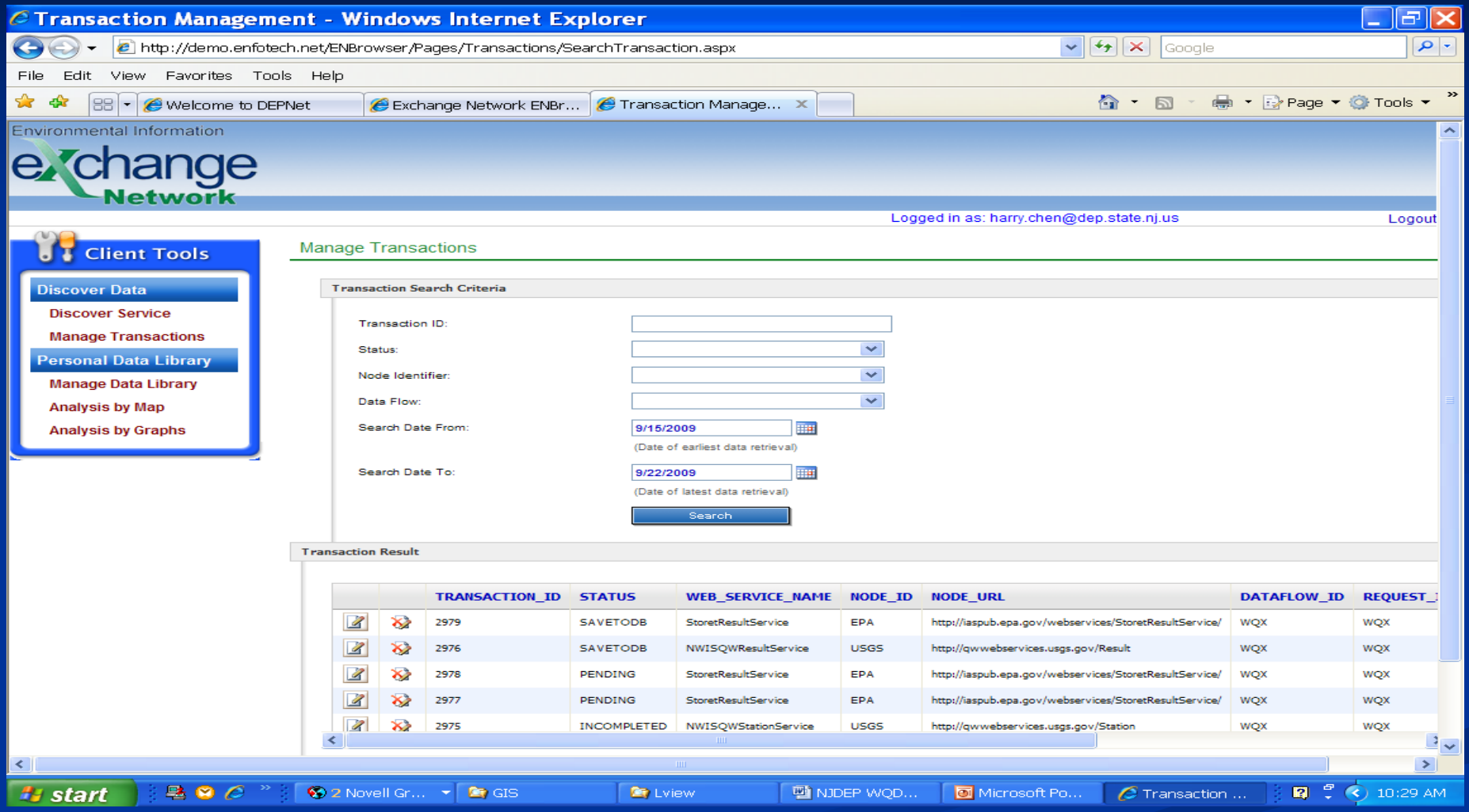
Discover Service



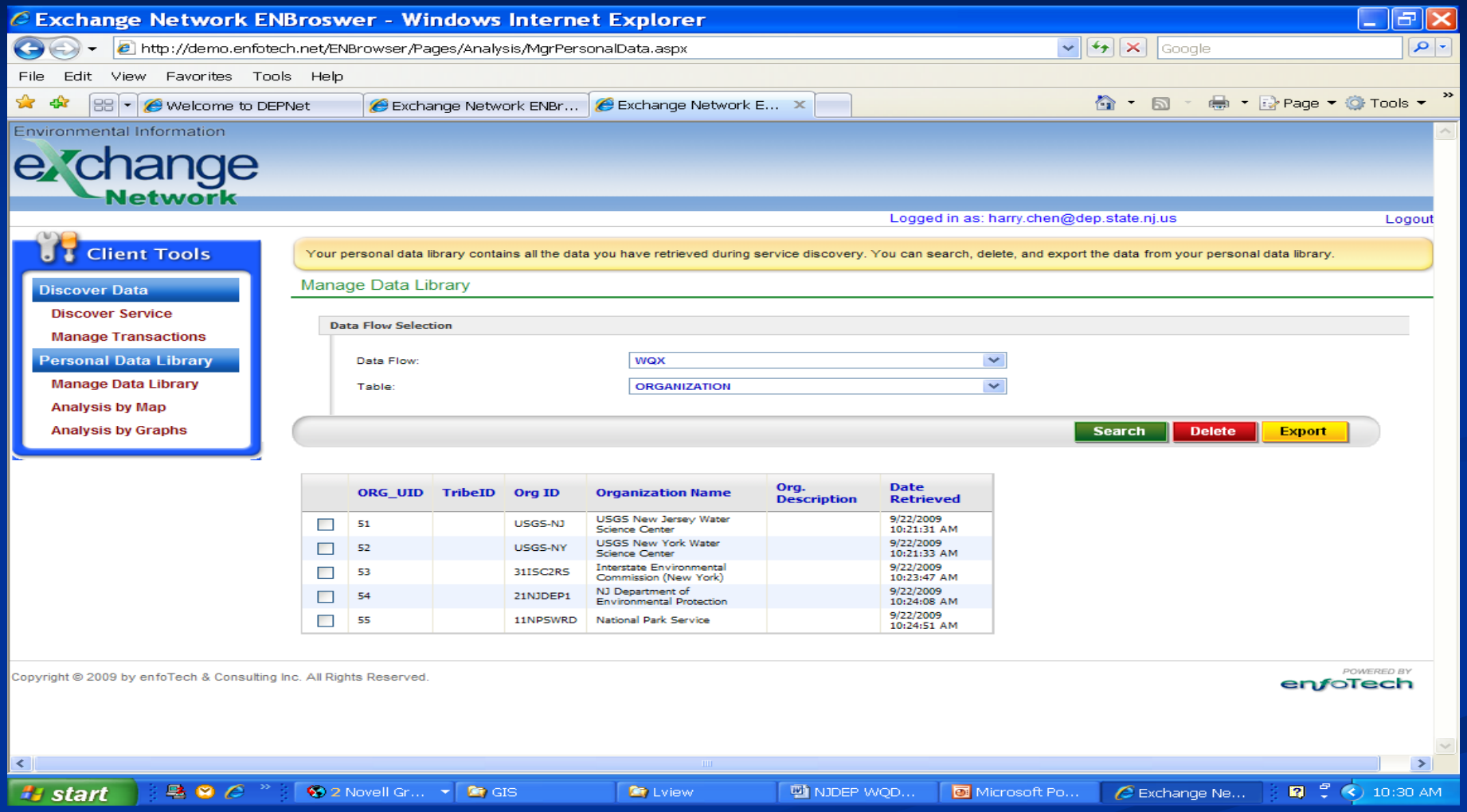
USGS/EPA Data Retrieval



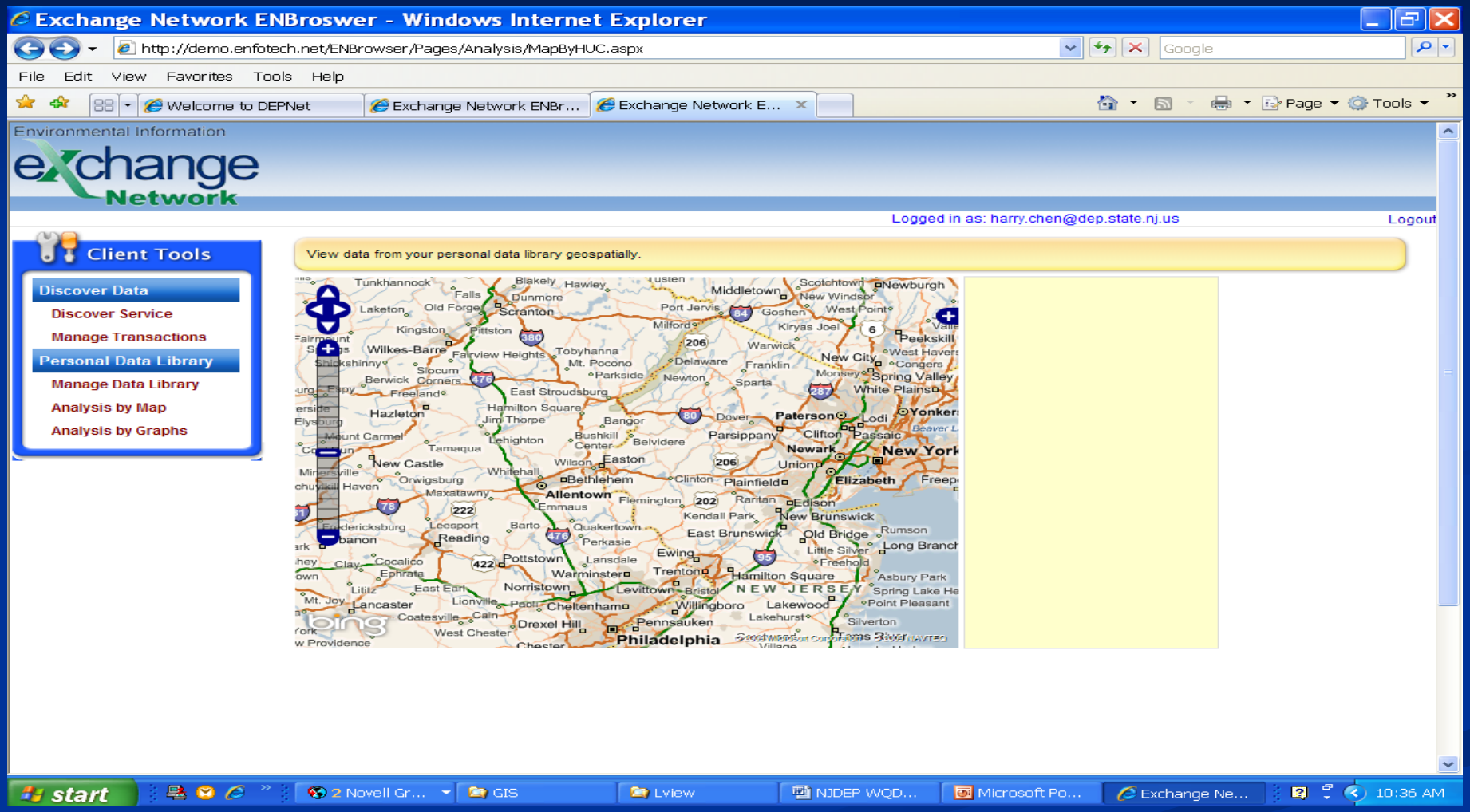
Manage Transactions



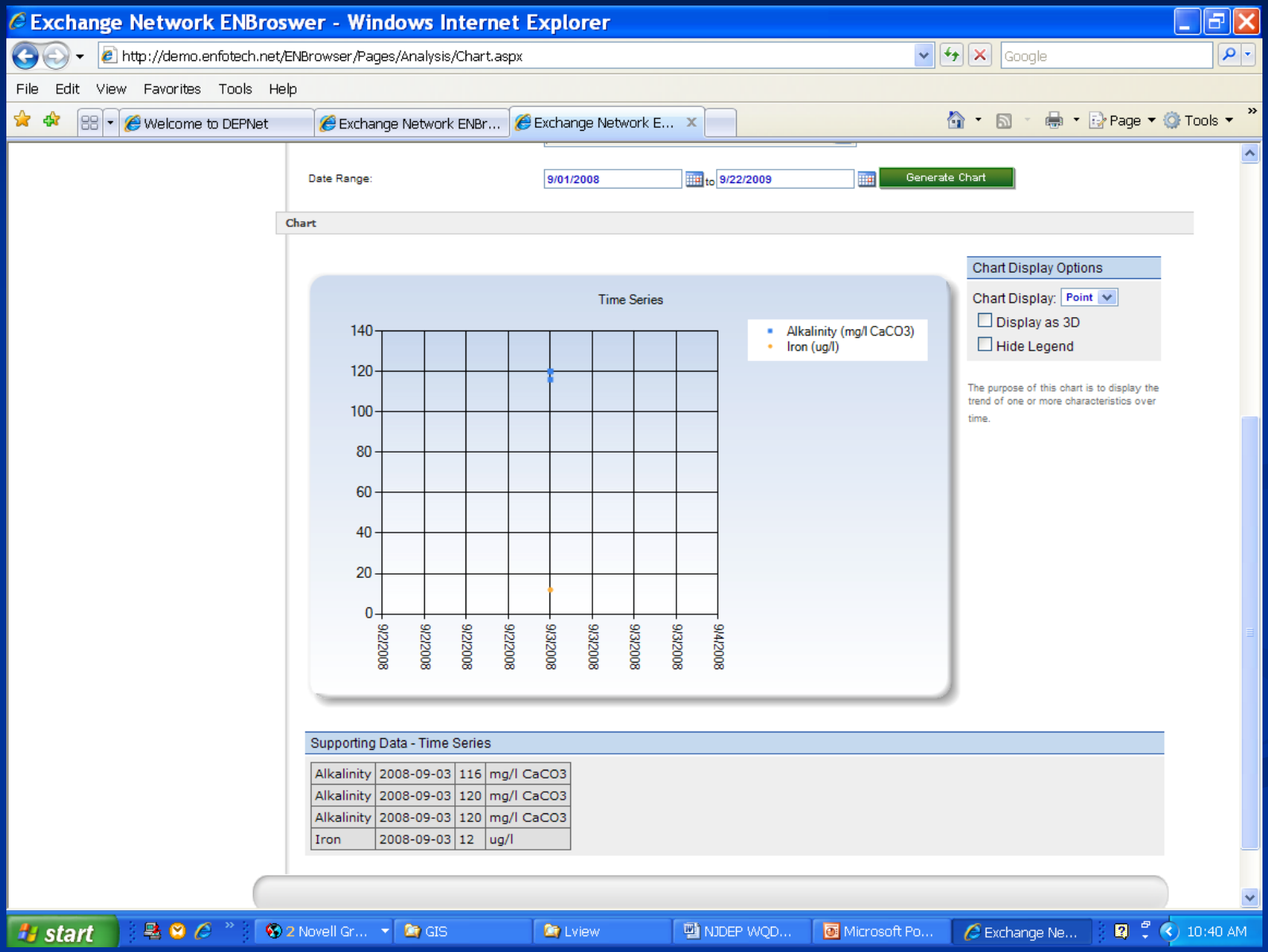
Manage Data Sources



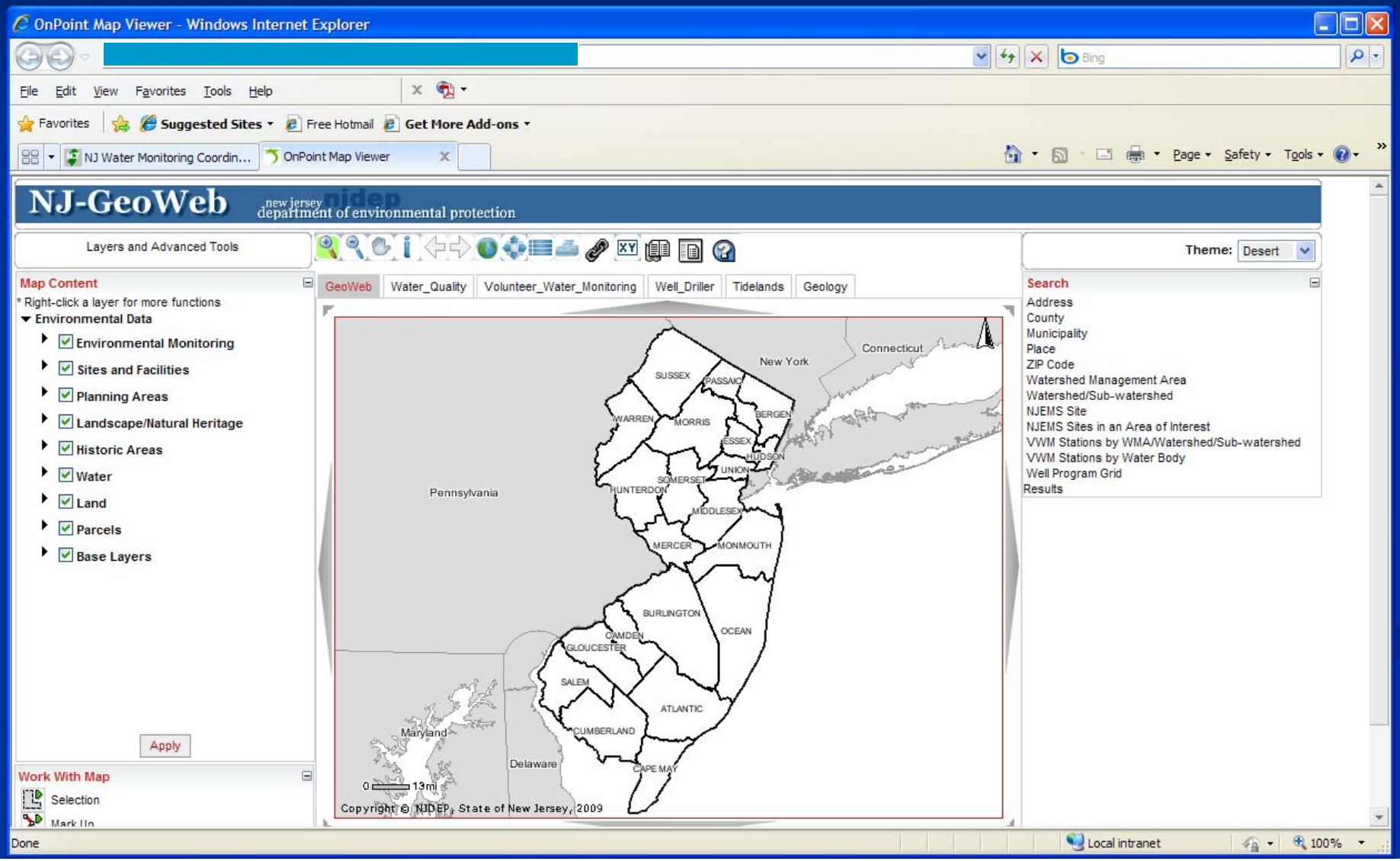
Analysis by Map



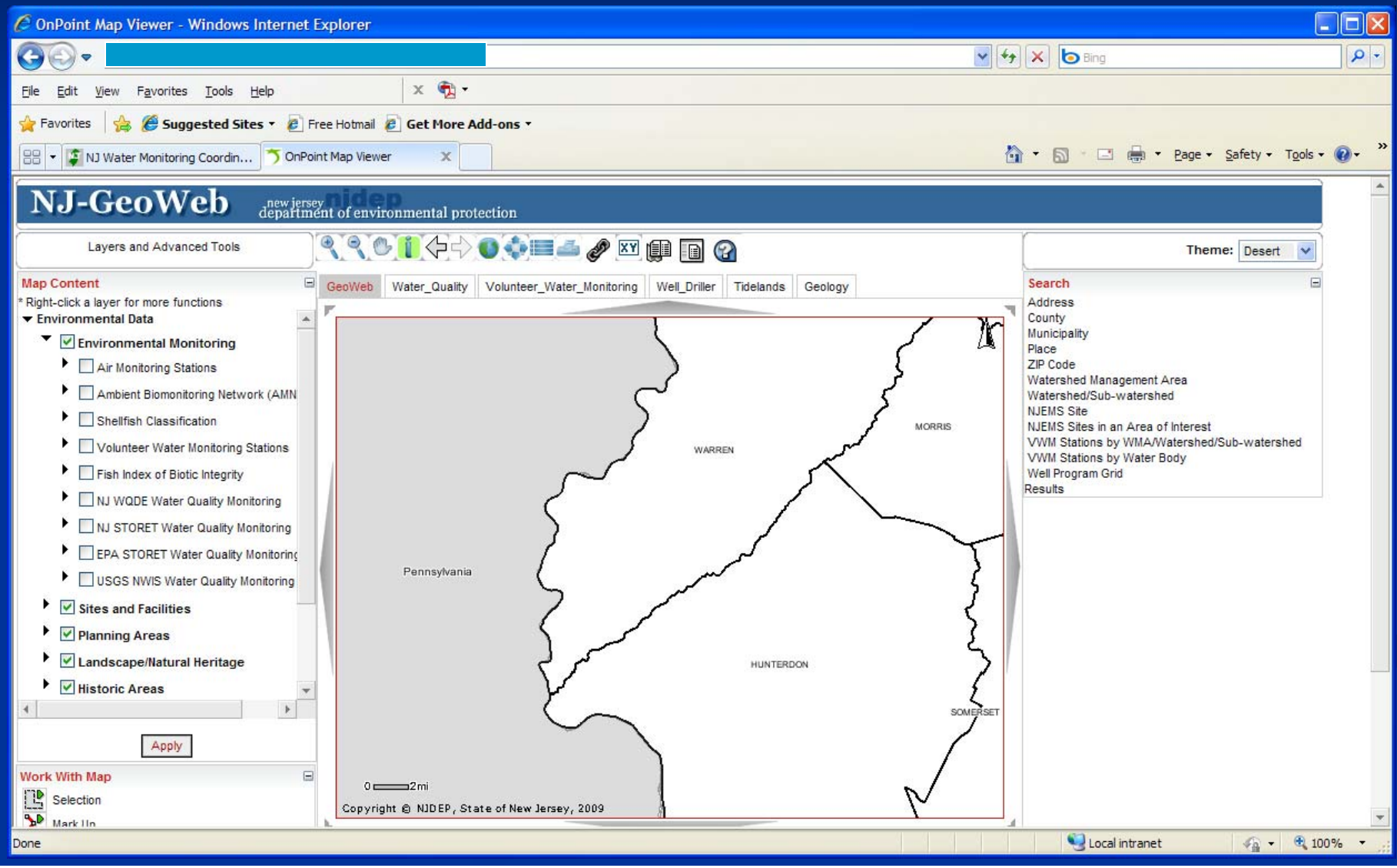
Analysis by Chart



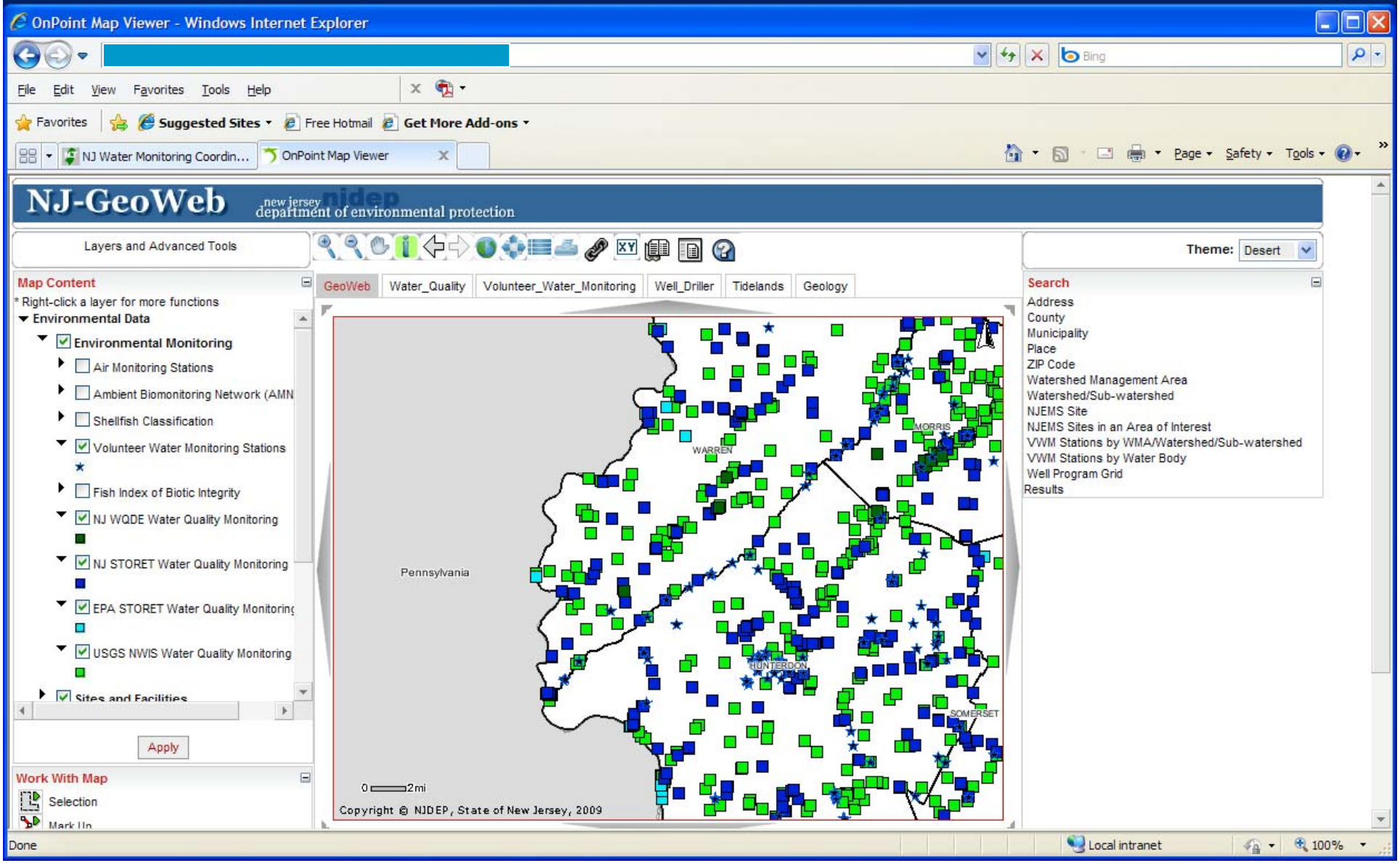
Search for Data Spatially with NJ-GeoWeb



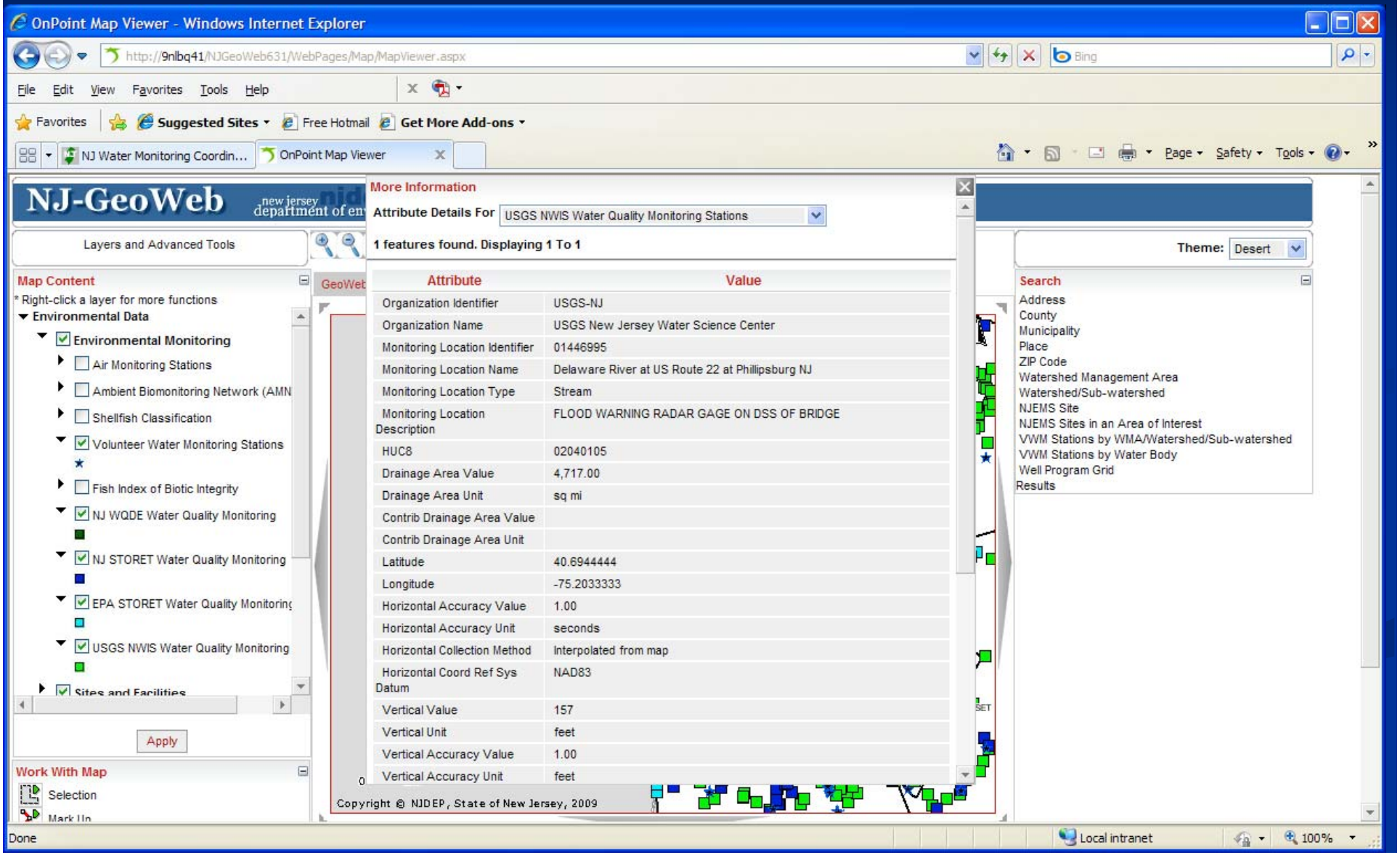
Zoom Into An Area



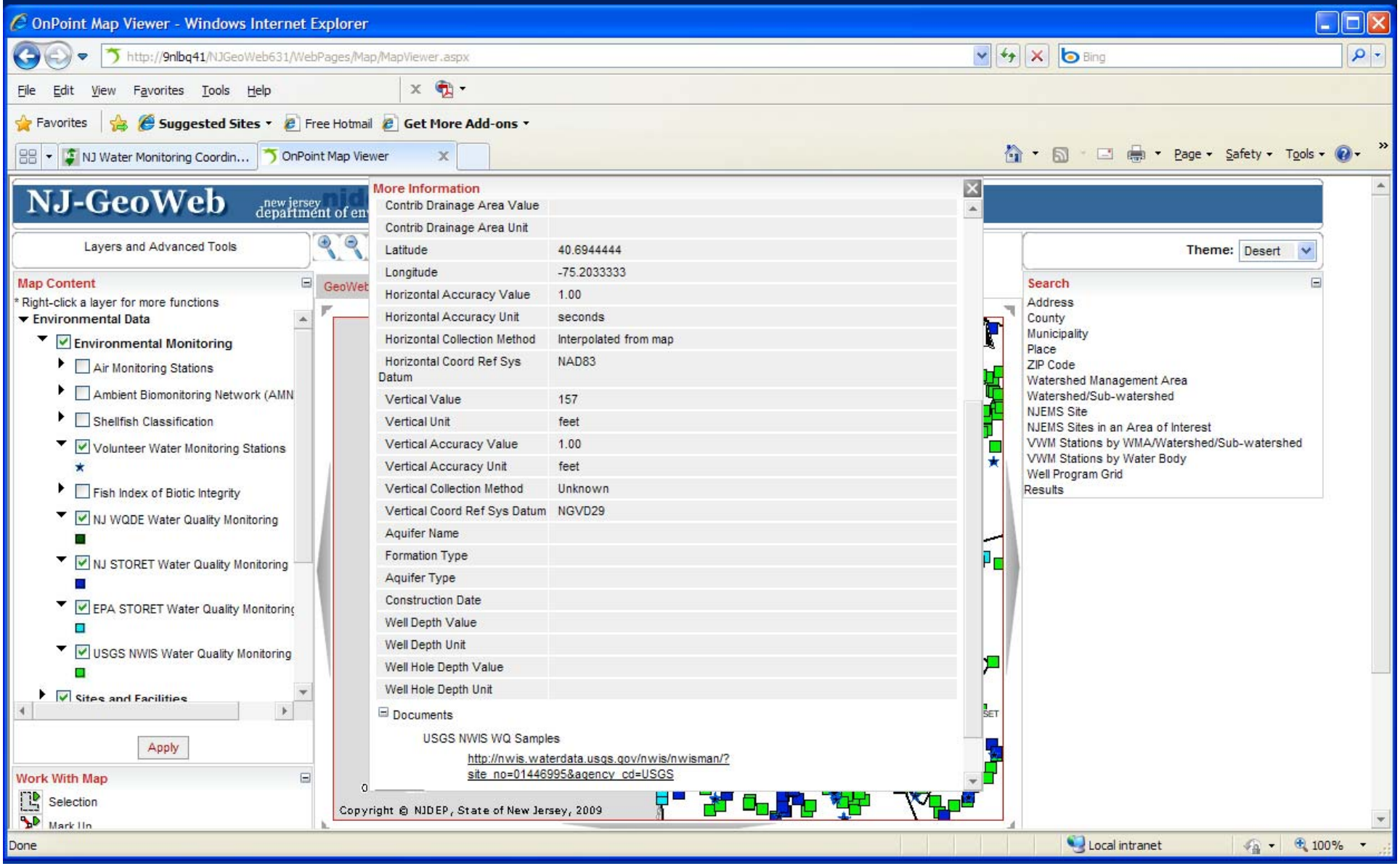
Display Monitoring Locations



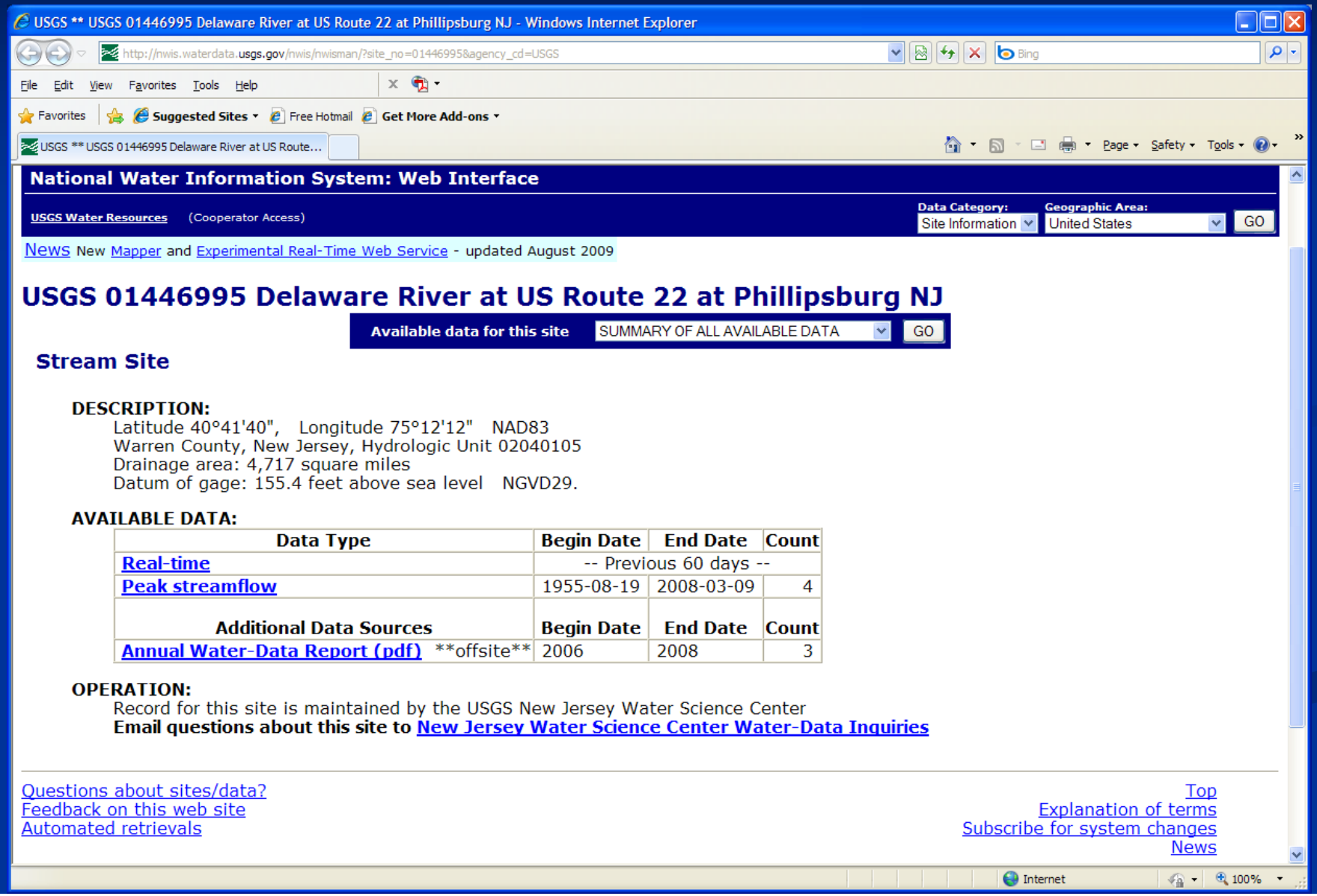
Get Info About a Location



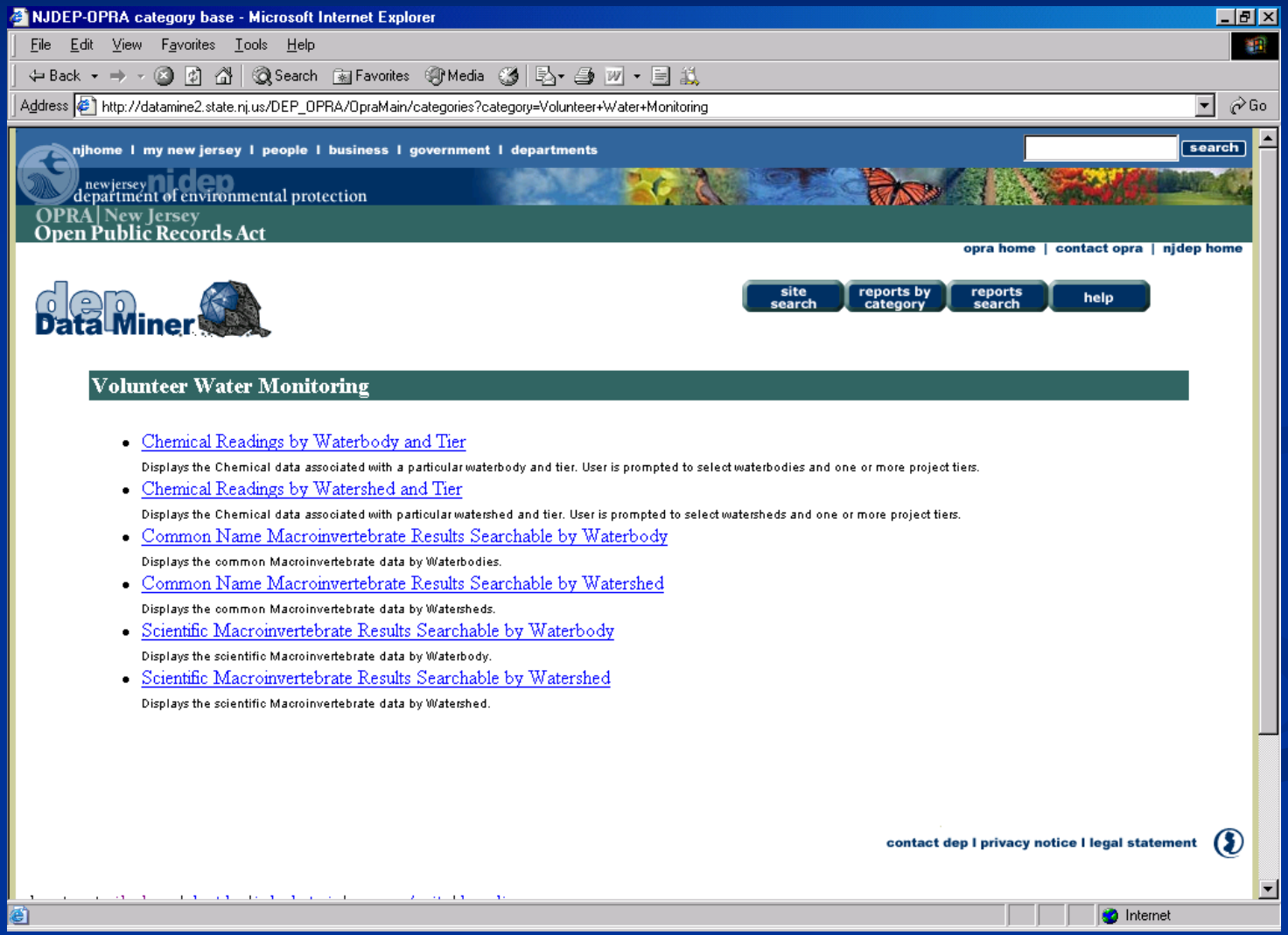
Click on Link for Data



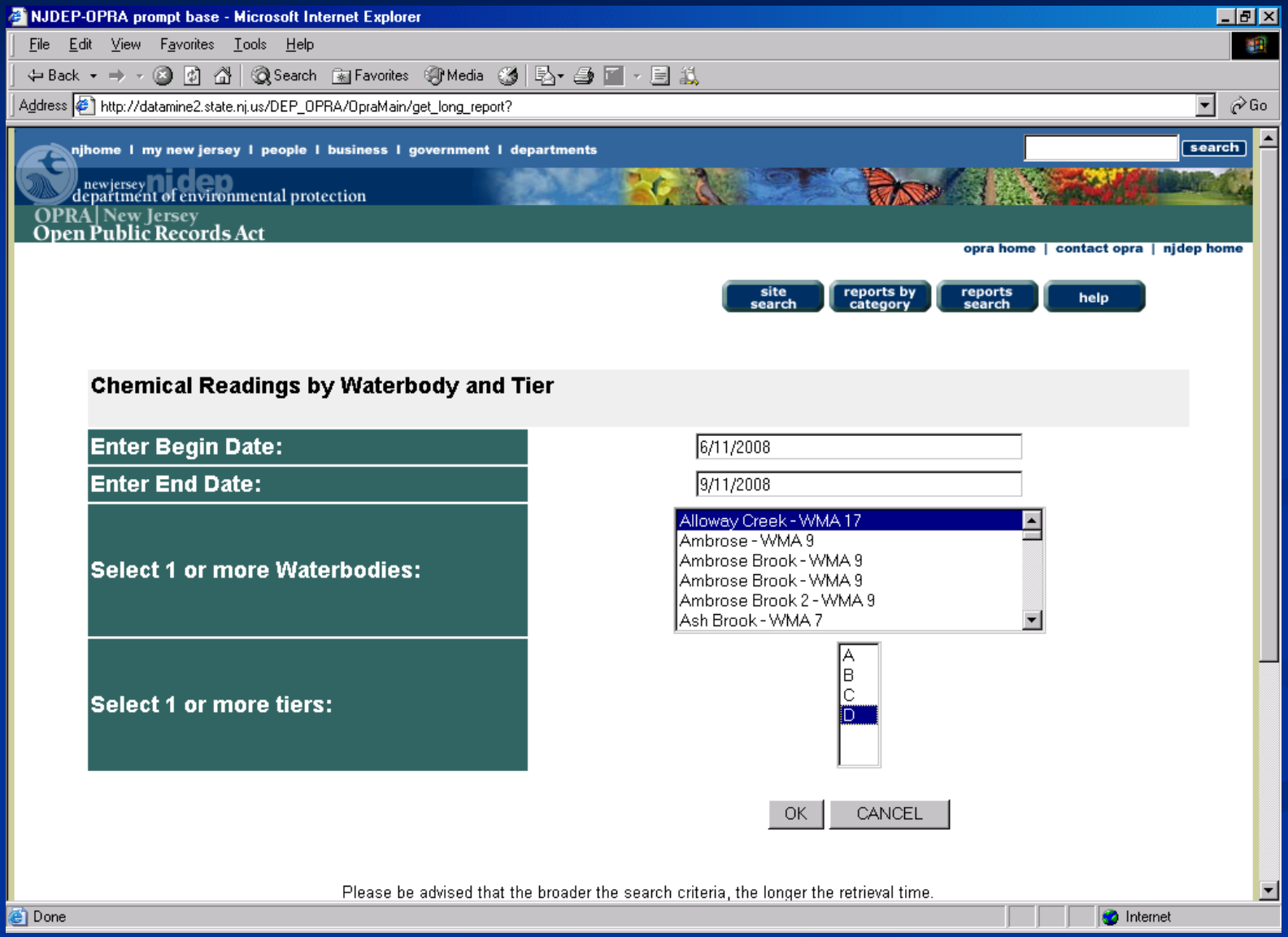
View the Data



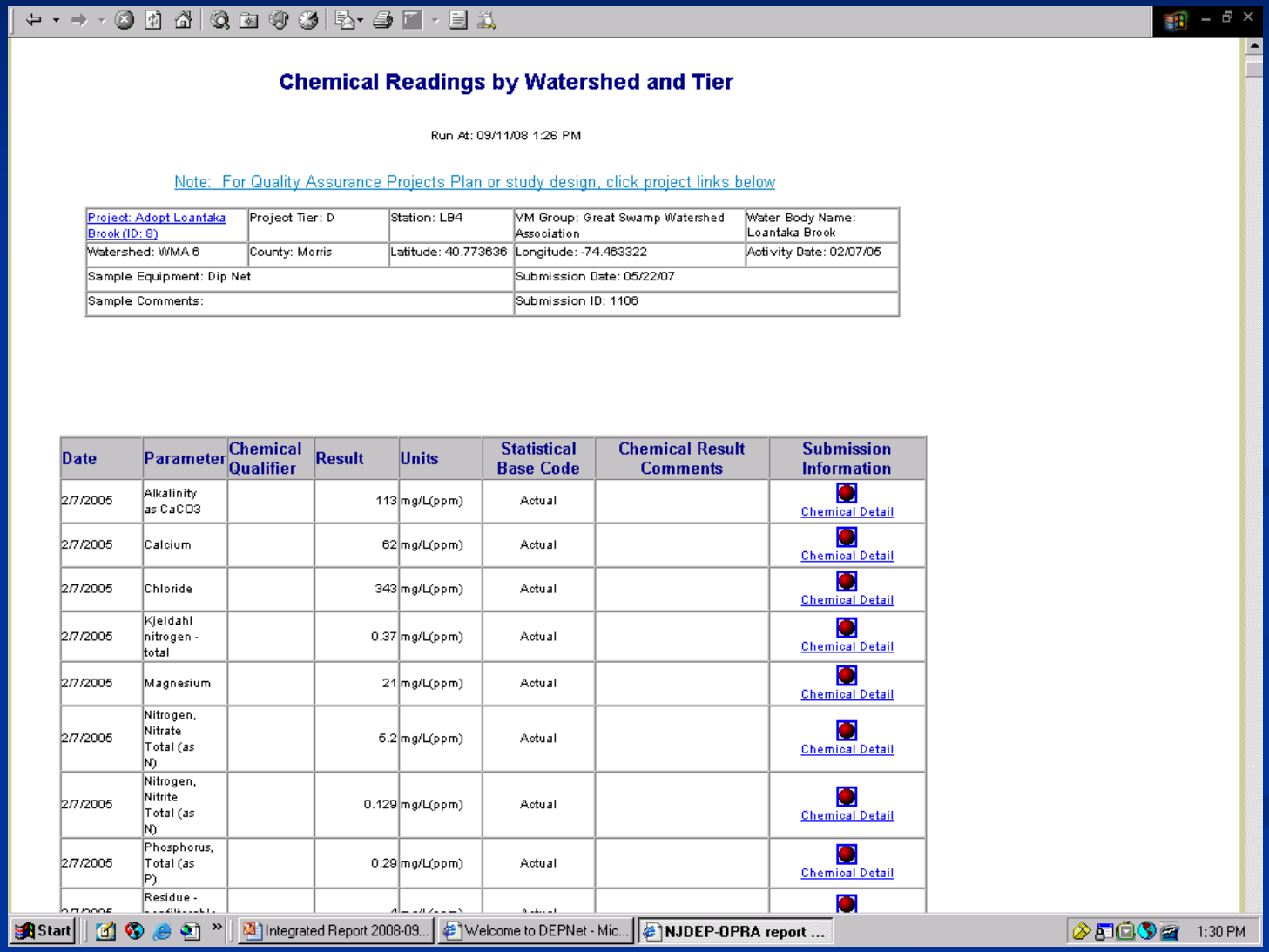
Search Text-Based via DEP Data Miner



Selecting Results



View Results on Screen



Chemical Readings by Watershed and Tier

Run At: 09/11/08 1:26 PM

Note: For Quality Assurance Projects Plan or study design, click project links below

Project: Adopt Loantaka Brook (ID: 8)	Project Tier: D	Station: LB4	VM Group: Great Swamp Watershed Association	Water Body Name: Loantaka Brook
Watershed: WMA 6	County: Morris	Latitude: 40.773636	Longitude: -74.463322	Activity Date: 02/07/05
Sample Equipment: Dip Net			Submission Date: 05/22/07	
Sample Comments:			Submission ID: 1106	

Date	Parameter	Chemical Qualifier	Result	Units	Statistical Base Code	Chemical Result Comments	Submission Information
2/7/2005	Alkalinity as CaCO3		113	mg/L(ppm)	Actual		Chemical Detail
2/7/2005	Calcium		62	mg/L(ppm)	Actual		Chemical Detail
2/7/2005	Chloride		343	mg/L(ppm)	Actual		Chemical Detail
2/7/2005	Kjeldahl nitrogen - total		0.37	mg/L(ppm)	Actual		Chemical Detail
2/7/2005	Magnesium		21	mg/L(ppm)	Actual		Chemical Detail
2/7/2005	Nitrogen, Nitrate Total (as N)		5.2	mg/L(ppm)	Actual		Chemical Detail
2/7/2005	Nitrogen, Nitrite Total (as N)		0.129	mg/L(ppm)	Actual		Chemical Detail
2/7/2005	Phosphorus, Total (as P)		0.29	mg/L(ppm)	Actual		Chemical Detail
2/7/2005	Residue -						

Links

- NJDEP Online
  - http://njdeponline.com
- myNewJersey
  - http://www.state.nj.us/ and click on Login
- NJ Water Monitoring Coordination Council
  - http://www.nj.gov/dep/wms/wmcchome.html

What can we do at the end of this project?

- Complete picture of all the data out there
- Data in a common format so you don't have to copy & paste and translate data from multiple sources
- One Stop Shop for a given area regardless of who generated the information
- Map based and text/table based searches of data for a given area
- Metadata, especially QA Project Plans, stays with the monitoring results

For Further Information

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  NJDEP Water Monitoring and Standards

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- Angela Witcher

  NJDEP Office of Information Resource Management

  609-633-2169

  Angela.Witcher@dep.state.nj.us