

EFuIS Implementation for the State of Minnesota

Midwest EFuIS User Group Meeting | June 19, 2015
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Outline

- Vision
- Contributors
- Installation Environment
- Content
- Usage
- Team
- Origins
- Challenges and Solutions
- Questions

Vision: Monitoring is Monitoring

- Data and process models prove to be similar among monitoring programs.
- EQuIS offers common ground.
 - **Standardize** reference values, identifiers, and representations.
 - **Consolidate** existing systems and loose datasets.
 - **Manage** sampling workflow from end to end.
 - **Share** data across disparate programs, agencies, and media.
 - **Analyze and visualize** using a common set of built-in tools and extensions.
 - **Build** additional custom tools within EQuIS or against related data systems.

Contributors

- Minnesota Pollution Control Agency (MPCA)
 - Ambient Monitoring
 - Surface Water
 - Groundwater
 - Remediation
 - Closed Landfills
 - Petroleum
 - Superfund
 - Solid Waste
- Minnesota Department of Health (MDH) Beaches

Contributors (continued)

- MPCA Special Studies
 - PFCs
 - PPCPs
 - Wild Rice / Sulfate
- Minnesota Department of Agriculture (MDA)
 - Pesticide Monitoring
 - Incident Response
 - Private Wells
- Minnesota Department of Natural Resources (MNDNR)
 - County Well Atlas
- Future diversification in biology/habitat, sediment, gas, air

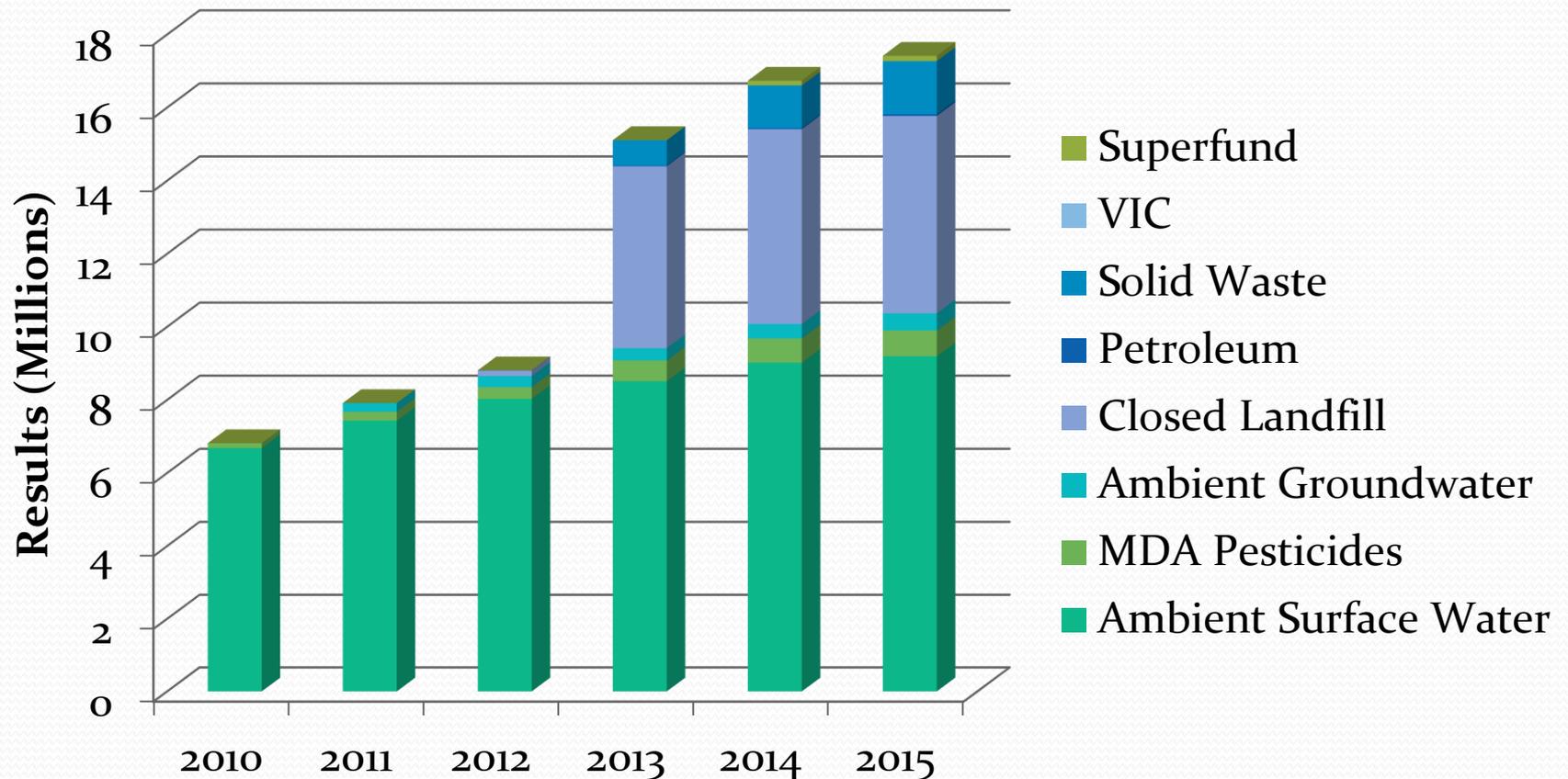
Installation Environment

- Oracle 11 with test and production instances
- EQuIS 6.3
 - Enterprise
 - Professional
 - Sample Planning Module (SPM)
 - EDGE
 - DQM (new)
 - ArcGIS extension
 - WQX schema module
 - Custom import formats
- Windows Authentication
- Application-Level Security (ALS)

Content and Usage | Counts

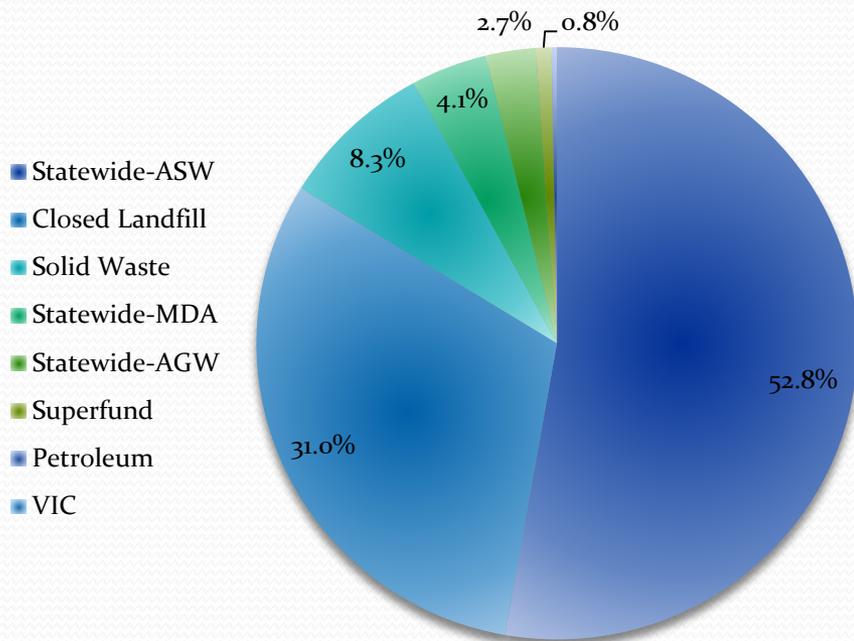
- 194 users activated in Enterprise
- 75 Professional or SPM client application users
- 482 facilities
 - 5 hold statewide ambient monitoring data (not truly facilities) collected by 980 projects
- 37,911 distinct locations
- 17.4 million results

Content | Result Count Growth

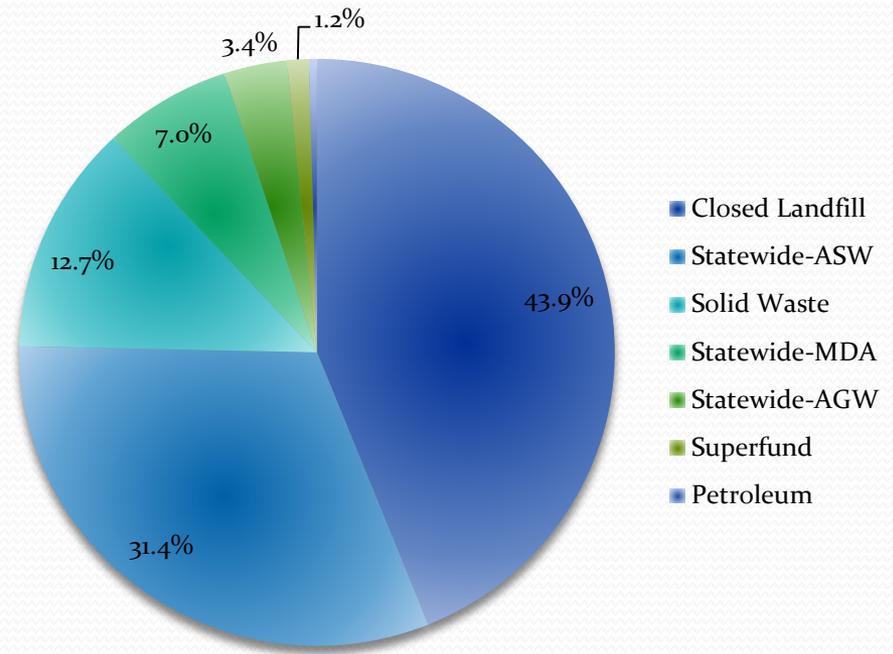


Content | Diversity by Program

All Results

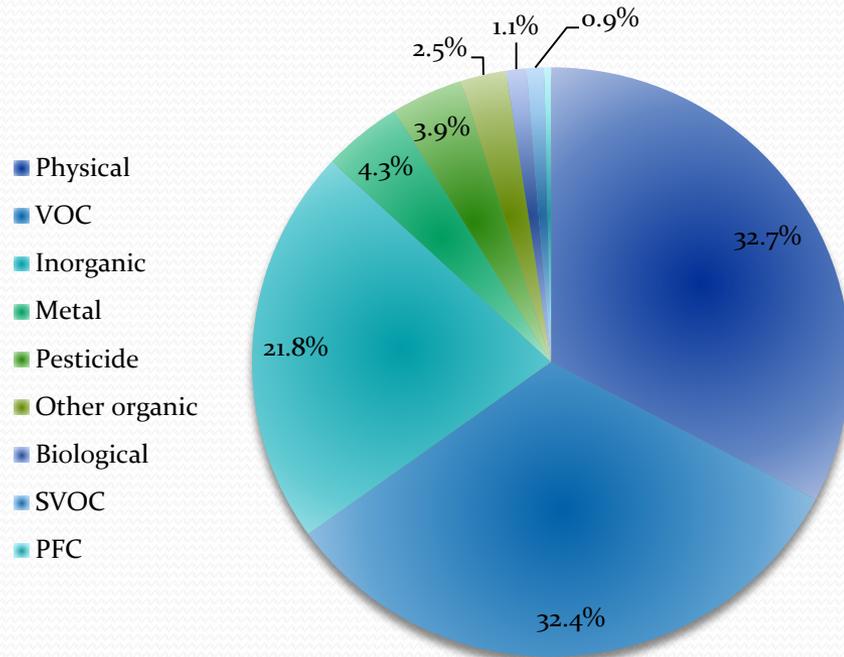


Regular Lab Results

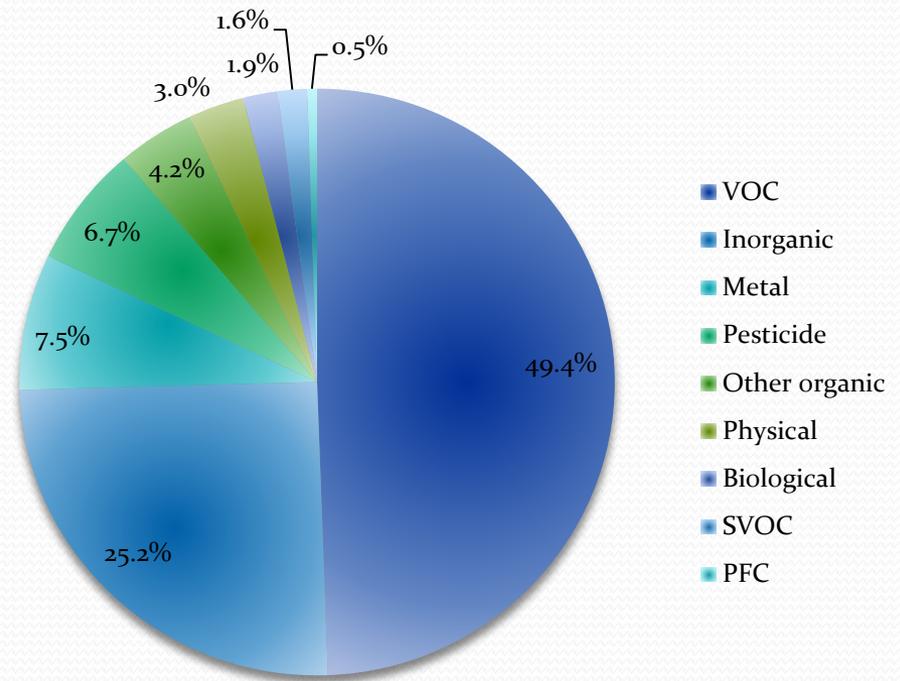


Content | Diversity by Analyte Type

All Results



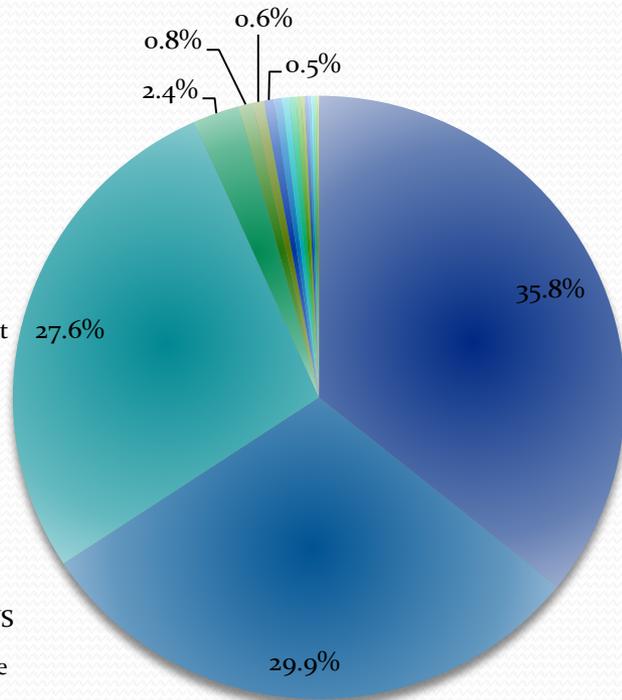
Regular Lab Results



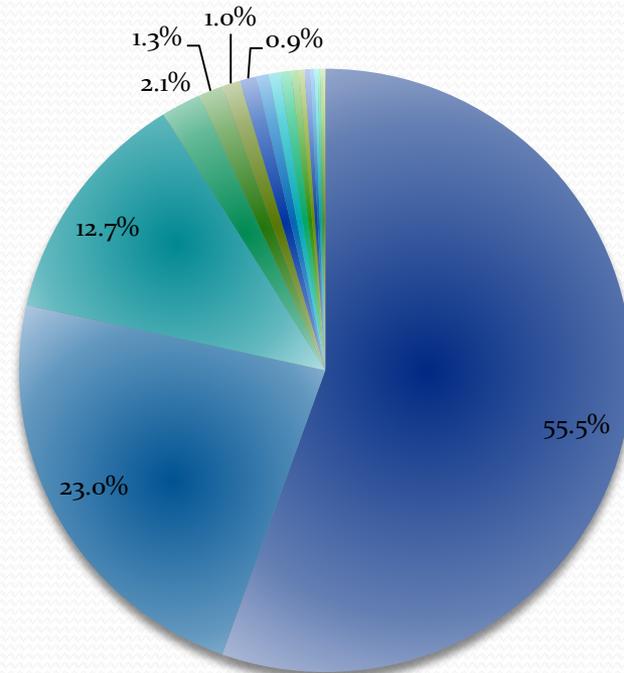
Content | Diversity by Loc Type

- Well
- Lake
- River/Stream
- Landfill
- Other-Ground Water
- Spring
- Leachate-Lysimeter
- Storm Sewer
- Leachate-SamplePoint
- Constructed Wetland
- Wetland
- Land
- Pond-Stormwater
- BEACH-Great Lake
- Fclty PubWtrSup-PWS
- Gas-Monitoring Probe
- Great Lake
- Other-Surface Water

All Results



Regular Lab Results



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Usage | Dependent Systems

- US EPA WQX / STORET Warehouse
 - www.epa.gov/storet
- MPCA ReSTful Web Services
 - services.pca.state.mn.us
- MPCA Environmental Data Access (EDA)
 - www.pca.state.mn.us/ropgda5
- MPCA Impaired Waters Assessments
 - www.pca.state.mn.us/xggx950
- MNDNR Hydrology Data Domain (in development)

Minnesota's Team

Role \ MN Agency	Pollution Control (MPCA)	Agriculture (MDA)	Natural Resources (MNDNR)	IT Services (MN.IT)
Steering team	√	√	√	√
Program data coordinators	√	√	√	
Users	√	√	√	√
Project manager	√			
Data team	√			
System administrators				√

And EarthSoft's technical experts, especially Sharon Keenan and Sue Healey

Origins

- EPA STORET
 - Held ASW, MDA, AGW, and Solid Waste data
 - While building a local database replacement in 2009 with an EPA IPT, recommended buying EQuIS instead
 - Purchased EQuIS in 2010 after 2009 EPA STORET retirement
 - EPA submittal replaced by WQX (NEIEN) flow
 - Influence of WQX
 - Schema and dt_test alternate key
 - Reference values
 - Migrated all but Solid Waste data, which came later

Origins (continued)

- EDMS
 - Closed Landfill Program
 - Very good system but program saw EQuIS benefits
- Data sources for other programs
 - Contractors, sometimes at additional cost
 - Microsoft Access databases
 - Spreadsheets
 - Text files
 - PDF or paper reports

Challenges and Solutions

- Differences in program data cultures
- Wrote many conversion tools
- Oracle
 - Case-sensitivity
 - Sorting
 - Second to SQL Server at EarthSoft. Tested less.
 - Regardless, MPCA DBA says EarthSoft is among the best vendors for Oracle knowledge
- Customizations generally
 - Some customizations prevent usage of continued EarthSoft development (e.g. reports)
 - Benefit to remaining close to standard

Challenges and Solutions (cont.)

- Custom maintenance and error checks
 - EQUIS schema constraints and import formats control data quality.
 - Errors and inconsistencies can still occur via manual editing in Professional or due to inconsistencies between formats.
 - Wrote custom maintenance and error checking scripts
- Data review
 - All results stored as preliminary
 - Up to project managers to review and approve
 - Only final, reportable data used for most outputs

Challenges and Solutions (cont.)

- WQX origin
 - Schema module complicates usage of standard formats due to non-standard dt_test alternate key.
 - Lab_MN and EDGE_MN formats put into production more recently. Based closely on standard formats with primarily WQX-related changes
- Large surface water facility
 - Need for custom reports for facility with ~20,000 locations
 - Solution was progressive filtering. For example, choose a watershed, then related counties, then relevant location types, and finally list only locations meeting those criteria.
 - EQuIS 6.3 has simplified writing and customizing reports without .NET programming.



Questions