

EPA OSWER Data Management *Current Efforts and Issues*

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Overview

- Data in OSWER
- TIFSD's Experience
- Data Management in HQ and Regions
- Data Partners and their Efforts
- Issues
- Wrap Up

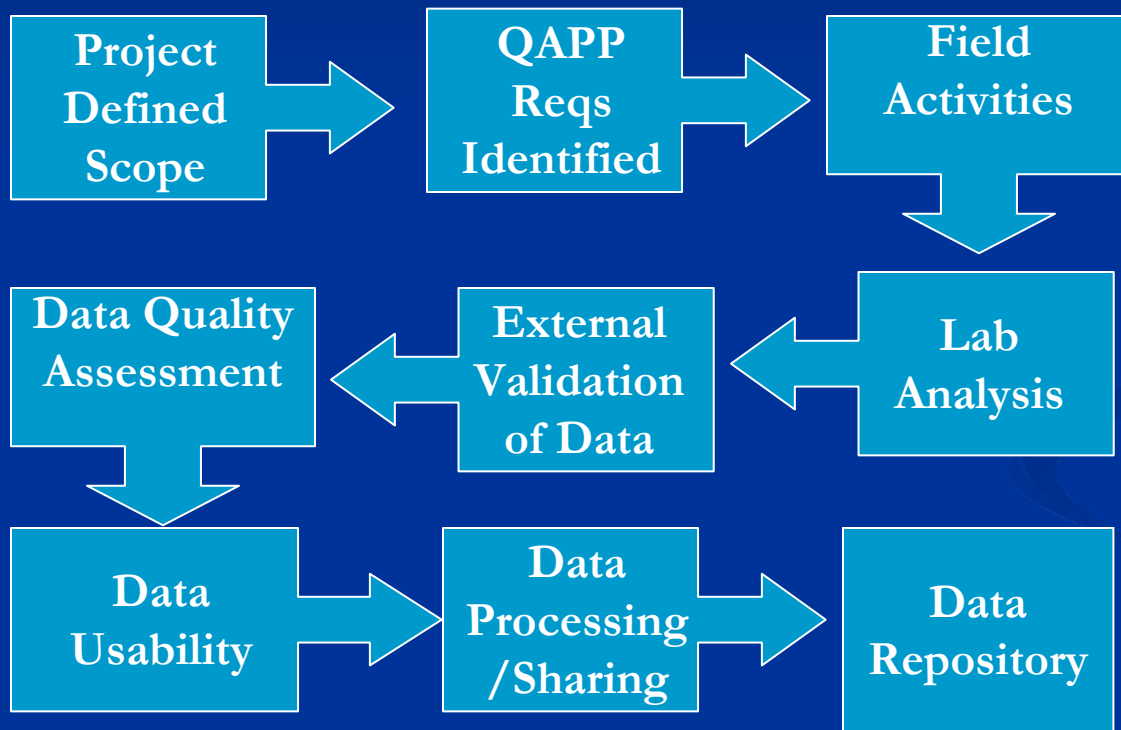
What data?

- Superfund program collects, reviews, and works with large volume of data for decisions at different scales
- Program Data
- Financial Data
- Congressional Metrics Data
- Site-specific data (EPA, RP, state, other data partners)
 - Geologic, Hydrogeologic data
 - GIS data
 - Contaminant data
 - Monitoring and remediation system data
 - Data used to construct a Conceptual Site Model (CSM)

OSWER Data Management

- Decentralized management approach
- Program management, financial, congressional targets collected and tracked nationally (HQ)
- Site-specific data management delegated to regions
 - Specific approach/tools unique to individual RPM
 - Many different approaches for managing data

Typical Data Flow for a Project



All data flow happens in different ways for each region and often each site

When the data flows, often times is not accessible for other purposes

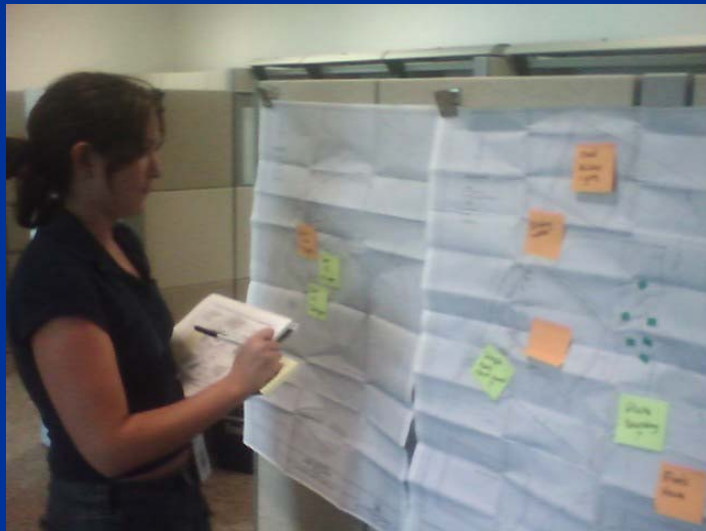
Data flow isn't always linear: constantly collecting and refining CSM

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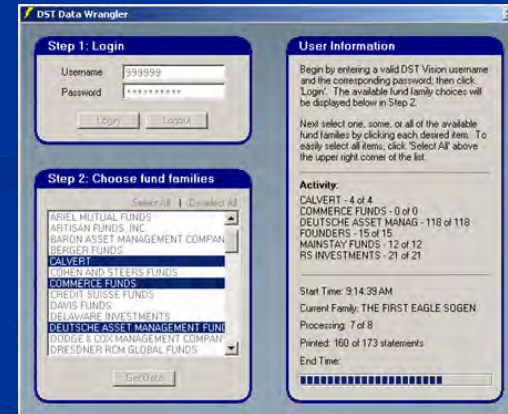
- Offer technical support to SF, BF, and other sites
- Assist with optimization, remedy design reviews
- Run the Contracts Lab Program
- ERT activities and tools (Scribe/Scribe.net)
- Collect and share information on hazardous waste clean up and site characterization

What we've seen...

Data visualization
Conceptual Site Model



Data storage
techniques



Data management

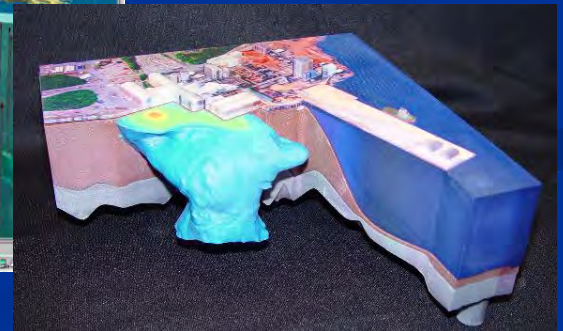
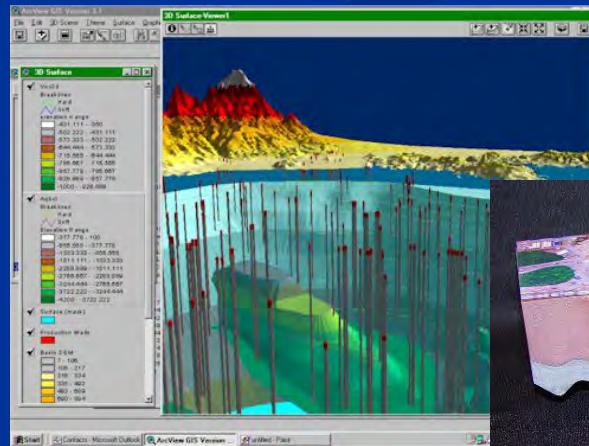
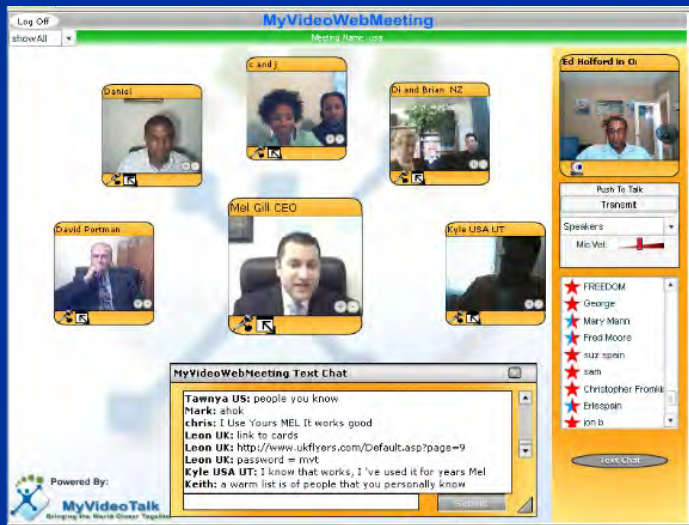


Often a contractor-owned or proprietary system is used to house and analyze data



What we've ALSO seen

- Data management systems deployed in regions
- 3D models and realtime visualization tools
- Applications to ensure sampling design is sufficient
- Use of web-based project management system to provide realtime access to site data





TIFSD Publications & Resources

Several Case Studies and Bulletins available documenting smart data management approaches & tools

- www.cluin.org
- www.triadcentral.org

Management and Interpretation of Data Under a Triad Approach – Technology Bulletin
 May 2007

INTRODUCTION

Since its inception in 1995, the U.S. Environmental Protection Agency's (EPA) Brownfields Initiative and other revitalization efforts have grown into major national programs that have changed the way contaminated property is perceived, addressed, and managed in the United States. In addition, over time, there has been a shift within EPA and state regulatory agencies in the way that hazardous waste site cleanups are managed.

Project managers, regulators, technology providers, and other stakeholders are increasingly recognizing the value of implementing a more dynamic approach to site cleanup that is flexible and focuses on real-time decision-making in the field to reduce costs, improve decision certainty, and expedite site closure. As shown in Figure 1, the Triad approach uses (1) systematic project planning, (2) dynamic work strategies (DWS), and (3) real-time measurement technologies to reduce decision uncertainty and increase project efficiency (Skowis EPA 2006).




Figure 1: The Triad Approach:

The approaches used in Triad projects require specific procedures and tools for data interpretation and management. For example, technologies such as open-path air monitoring systems and subsurface geophysical detection tools can generate thousands of individual data points that must be assimilated and manipulated by computer to provide the full benefit of their real-time imaging capabilities. Fortunately, data management and decision support tools (DST) have become more available in recent years, and

experienced Triad practitioners are already exploring these (TRC 2006).

About the Brownfields and Land Revitalization Technology Support Center (BTSC)

EPA established BTSC (www.brownfieldsupport.org) to ensure that brownfields and other land revitalization decision-makers are aware of the full range of technologies available for conducting site assessments and cleanups and can make informed decisions about their sites. The center can help federal, state, local, and tribal officials evaluate strategies to streamline the site assessment and cleanup process at specific sites; identify, review and communicate information about complex technology options; evaluate contractor capabilities and recommendations; and plan technology demonstrations.

Localities can submit requests for assistance through their EPA Regional Brownfields Coordinators (<http://www.epa.gov/epaosopr/bc/coordinators.html>) or by calling 1-877-333-7333 toll free. For more information about BTSC, contact Debra Pichon at: (703) 606-8904 or debra.pichon@epa.gov.

The Brownfields and Land Revitalization Technology Support Center (BTSC) created this bulletin to focus on implementing a data management program for a Triad project, and includes:

1. A brief introduction to the Triad approach.
2. Answers to frequently asked questions about data management on Triad projects, such as the following:
 - How do Triad practitioners plan for data management and interpretation?
 - Who prepares the dynamic work strategy (DWS) and data management plan, and what are the essential elements of the data management plan?
 - How are data collected and used in a Triad investigation?

Office of Solid Waste and Emergency Response (OSWER)

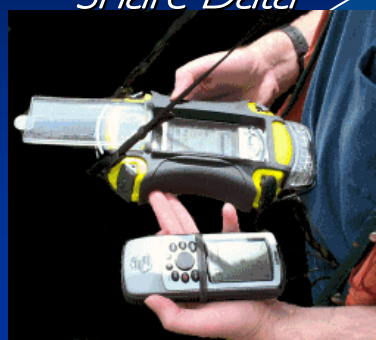
EPA 542-J-07-001
May 2007
www.brownfieldstsc.org

Data Flow & Tools

QAI/QC

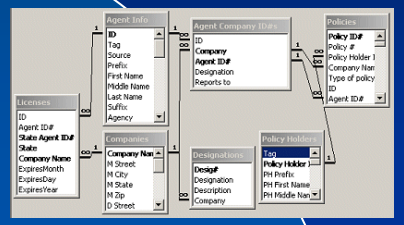
Collect Data
Share Data

Store Data
Process Data



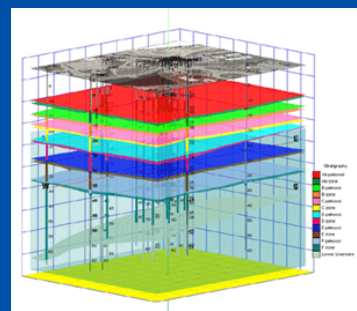
Scriplets
Scribe.net
Forms II Lite
SEDD

STORET/WQX
Scribe
EQuIS®
CLPSS
ADR



Database

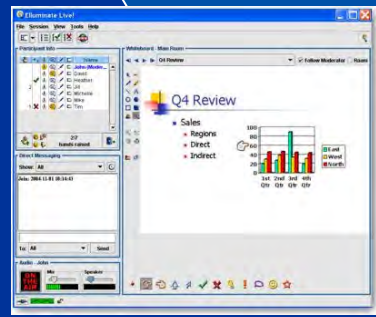
Field Data
Lab Data



Evolving Conceptual Site Model

Communicate

Make Decisions



Quickplace
Collaboration Pages
WebOSC
Sametime
Web Conferencing

Documentation
Records

VSP
SADA
DST Matrix



Decision Support Tools
Data Visualization Tools

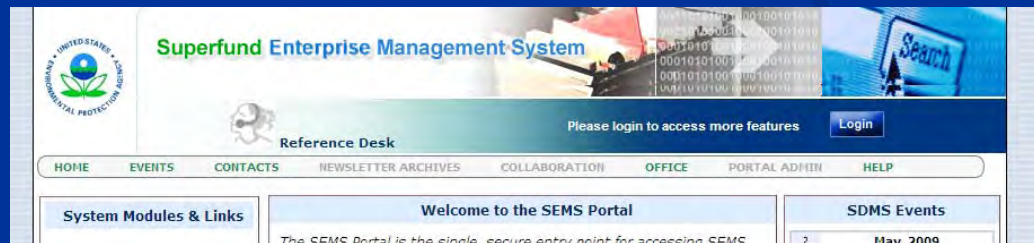
Distance Collaboration

OSWER Data Systems

- **Several systems used to collect and manage information at national level:**
 - Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) → Program data
 - Institutional Controls Tracking System (ICTS)
 - Superfund Document Management System (SDMS)
 - Superfund E-Facts → Government Performance and Results Act Data
 - Contract Laboratory Program Support System (CLPSS) → analytical data from CLP
- **What about information for site-level decisions? Program wide reviews site conditions, cross program studies?**

Data Partners & Efforts

- OSWER is developing the **Superfund Enterprise Management System (SEMS)**
 - Integrate three primary Superfund data collection, reporting and tracking systems: CERCLIS, SDMS and ICTS
 - May include analytical data from CLP as well as Removal program
 - Issue: format of data, validation of data, method/format of storing data

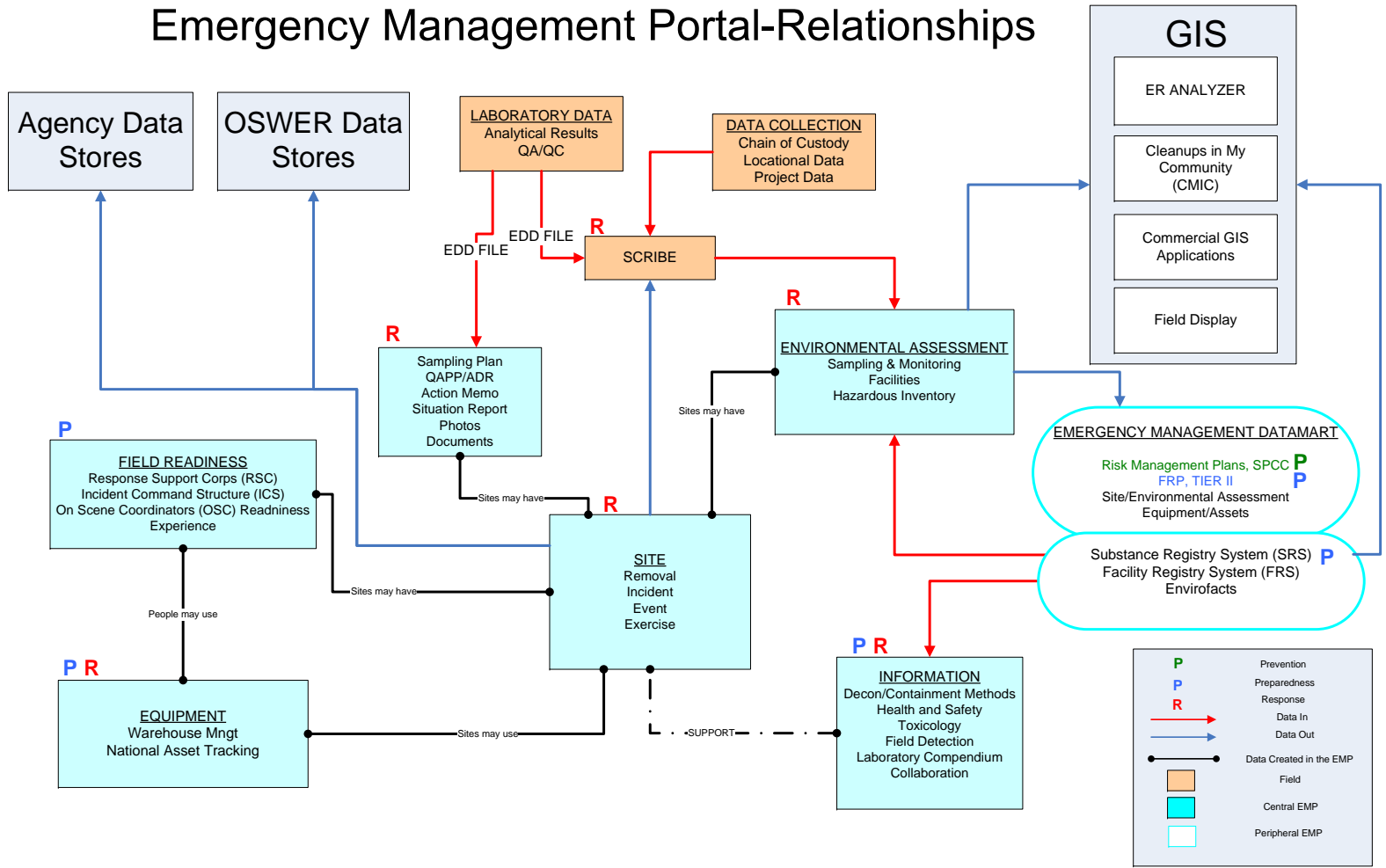


Data Partners & Efforts

- OEM is building the **Emergency Management Community on the EPA Portal**
 - <http://portal.epa.gov>
 - Will encompass the WebEOC (emergency operations center) as well as include removal site data from/with Scribe/Scribe.net
 - Possible inclusion of other site data (SF remedial, BF, RCRA, UST)
 - Under construction, may have operational pieces in '09
 - Issues: coordinating efforts and data formats between ERT and OEM

Map Data Flow Regional Remedial Programs

Emergency Management Portal-Relationships



Data Partners & Efforts

- **Regions have adopted wide variety data management solutions**
 - R2, R4, R5 → EQuIS
 - 5 regions have EQuIS licenses
 - All at varying stages of deploying
 - Goal for some to use for managing ALL data from ALL programs
 - Plan/willing to export data to other system when required
 - Other regions using and exploring STORET/WQX and/or Scribe/Scribe.net for same purpose
 - R8, R9, R10
 - Contractor databases widely used in many regions
 - R1, R5, R3, R9, R10
 - Issues: variation in format of data and individual needs of each region, wide difference in effort to support data management in regions

Data Partners & Efforts

■ Region 4: DART

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EQUS 5 Enterprise


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Password:

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Version: 5.3.2.131



Region 4 Data Archival and ReTRieval

Welcome to Region 4's Data Archival and ReTRieval System

For the past year, Region 4 has been involved in a pilot test to evaluate software for the improvement of data management. The focus of this pilot has been a software package called [D.A.R.T.](#) The test involved data from several of the environmental programs administered or overseen by the Region, including Superfund, TMDL, AQS, Environmental Justice, UIC, Air Toxics, and the Everglades Study. The pilot phase has been successfully concluded, and the Region is beginning the process of acquiring and implementing the [D.A.R.T.](#) software.

D.A.R.T Step-by-Step

Following is a step-by-step outline of how to plan and manage the data for your project to ensure that your data can easily move into DART.

1. Create the Site or Waterbody. This is the crucial first step to getting the data stored into DART. Do this first.
2. When you book samples into the R4LIMS Project Log, complete the fields in the DART box:
 - a. In the Site/Waterbody dropdown box, select the site that was created in Step 1.
 - b. In the Program/Activity dropdown box, select the most appropriate option.
 - c. Enter a Project ID.
 - d. Check the 'Send data to DART' checkbox.
 - e. In the 'Sampling Company' dropdown box, select your organization (PL-SESD for projects EAB and EIB are responsible for).
3. Before you release your samples to the lab, be sure that there is a Station ID for every field sample (not blanks) on the chain-of-custody.
4. Submit your Locations EDD and Field Results EDD to R4DART@epa.gov BEFORE your data is reported by the lab.

Following these steps will help to make sure that the data from your project is loaded into DART in a timely fashion, well before you need to issue your final report.

For assistance, email Fred Sloan and Muhammad Shoab at R4DART@epa.gov.

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Data Partners & Efforts

■ E-datawork group

- Grass-roots collection of regional & HQ staff
- collaborate and share experience with issues related to electronic environmental data

EPA E-Data Workgroup

Tools: /EPA E-Data Workgroup/Discussions/Data Mgmt

Type	Title	Created On	Updated By	Modified On	Download
Folder	Urgent: EQuIS and Section 508 compliance?	08/18/2008	Matthew Mellon	08/18/2008	
Message	508 compliance	08/18/2008	Jean Balent	08/18/2008	
Message	Re: Urgent: EQuIS and Section 508 compliance?	08/18/2008	Carolyn Casey	08/18/2008	
Message	Re: Urgent: EQuIS and Section 508 compliance?	08/18/2008	Matthew Mellon	08/18/2008	
Message	Re: Urgent: EQuIS and Section 508 compliance?	08/18/2008	Fred Sloan	08/18/2008	
Message	PR details... Re: Urgent: EQuIS and Section 508 compliance?	08/18/2008	Matthew Mellon	08/18/2008	
Message	508 compliance	08/19/2008	Diann Cox-Tramel	08/19/2008	
Message	Re: 508 compliance	08/19/2008	Matthew Mellon	08/19/2008	
Folder	EPA & Google Earth?	04/28/2008	Jean Balent	04/28/2008	
Folder	Envirofacts & ID numbers???	08/10/2007	Robert Alvey	08/10/2007	
Message	Re: Envirofacts & ID numbers???	08/10/2007	Fred Sloan	08/10/2007	
Message	Re: Envirofacts & ID numbers???	08/10/2007	Matthew Mellon	08/10/2007	
Folder	Existing data management, visualization and decision tools	06/28/2007	Jean Balent	06/28/2007	
Message	Re: Existing data management, visualization and decision tools	06/28/2007	David Wilson	06/28/2007	
Message	Anyone willing to give an EQuIS demo?	09/13/2007	Jean Balent	09/13/2007	
Message	Re: Anyone willing to give an EQuIS demo?	09/13/2007	Fred Sloan	09/13/2007	

Data Partners & Efforts

Pemaco Superfund Site
Maywood, California

MAIN MENU
 FRONT PAGE
 LOGIN FORM
 Lost Password?

Username:
 Password:
 Remember me

Site Superintendent:
Mark Prostko: 856-491-6950

Shipping Address
Pemaco Superfund Site
5973 S. District Blvd.
Corner of District Blvd. & 60th St.
Maywood, California 90270

Site Phone: 323-771-0414
Site Fax: 323-771-0014

Pemaco Superfund Site
Maywood, California

Monitoring Wells

Monitoring Well Map

EW1	EW2	EW3	EW4	EW5
EW6	EW7	EW8	EW9	EW10
EW11	EW12	EW13	EW14	EW15
EW16	EW17	EW18	EW19	EW20
EW21	EW22	EW23	EW24	EW25
EW26	EW27	EW28	EW29	EW30
EW31	EW32	EW33	EW34	EW35
EW36	EW37	EW38	EW39	EW40
EW41	EW42	EW43	EW44	EW45
EW46	EW47	EW48	EW49	EW50
EW51	EW52	EW53	EW54	EW55
EW56	EW57	EW58	EW59	EW60
EW61	EW62	EW63	EW64	EW65
EW66	EW67	EW68	EW69	EW70
EW71	EW72	EW73	EW74	EW75
EW76	EW77	EW78	EW79	EW80
EW81	EW82	EW83	EW84	EW85
EW86	EW87	EW88	EW89	EW90
EW91	EW92	EW93	EW94	EW95
EW96	EW97	EW98	EW99	EW100

Ground Water Sampling Summary

MAIN MENU
 FRONT PAGE
 FILES & DOCUMENTS
 CALENDAR / EVENTS
 CONTACT LIST
 PUBLIC MEETINGS

SYSTEM DATA
 SYSTEM SUMMARY
 PERFORMANCE METRICS
 PLC SCREEN
 PROCESS EQUIPMENT DATA
 WELL FIELD DATA
 MONITORING WELL DATA
 SV PROBES
 TEMPERATURE DATA
 ERH SUMMARY
 GV GRADIENT
 PLUME MAPS
 RESIDENTIAL DATA
 EISB PILOT
 VAPOR EFFLUENT DATA
 WATER EFFLUENT DATA

USER MENU
 YOUR DETAILS
 LOGOUT

LOGIN FORM
 Welcome, tourist

Custom, project-specific regional websites and databases for storing data, visualizing and exchanging information

Data Partners & Efforts

■ FIELDS (FIeld Environmental Decision Support) Team

- Collaboration of Region 5 employees and Research Associates

- Assisted in the characterization of 50+ sites

- Rapid Assessment

- Tools (RAT) Software

Real Time Mapping

- R.A.T. integrates real time GPS positions with data from external sensors to provide instantaneous snapshots of field conditions.
- R.A.T. can be configured to work with continuous data, single point collection or manual data (for sensors without a digital output).
- Thresholds can be designated in the field or office for different devices to allow for easy visualization of contaminant concentrations.
- Data is stored in Microsoft Access eliminating need for conversion or manual data entry.

Trend Monitoring

- Sensor data can also be viewed and monitored through multiple line plots and histograms.
- Non GPS or GPS assigned data can be viewed based on GPS time-stamps or computer clock.

Sample Design

- Built in Sample Design Methodology: Judgmental, Random, Aligned Grid (Hot Spot), Unaligned Grid

3D Visualization

- Data collected in R.A.T. can be displayed and modeled in F5plus. F5plus has been developed jointly by the FIELDS Team and SADA.

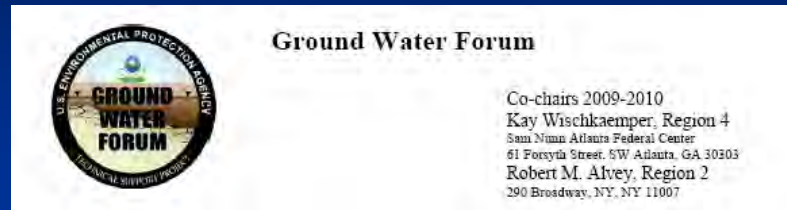
Contouring & Statistics

- Natural Neighbor interpolation of points allows creation of contour maps to aid in the identification of contaminant plumes.

Data Partners & Efforts

- **Other Data Sponsors/Partners have their own tools and formats for site data**
 - Multiple EDDs exist among the regions and SF Lab programs for various functions
 - Lab EDDs to transmit data (200 EDDs)
 - EDDs to transfer data to storage systems
 - SEDD for data review/validation (5 stages)
 - Contractor EDDs
 - Other agencies and states require or have their own EDDs which regions are working to comply with
 - PRP EDDs also exist
 - Field Data may also have their own EDD

Data Partners & Efforts



- EPA GW Forum believes this should be a priority for Agency
 - an Agency-wide initiative to expedite implementation of a **uniform data storage and management system for all chemical, biological and supporting hydrogeologic and locational information** collected at sites as part of routine EPA activities, starting with Superfund
- Other regions have expressed similar views to EPA management in the past

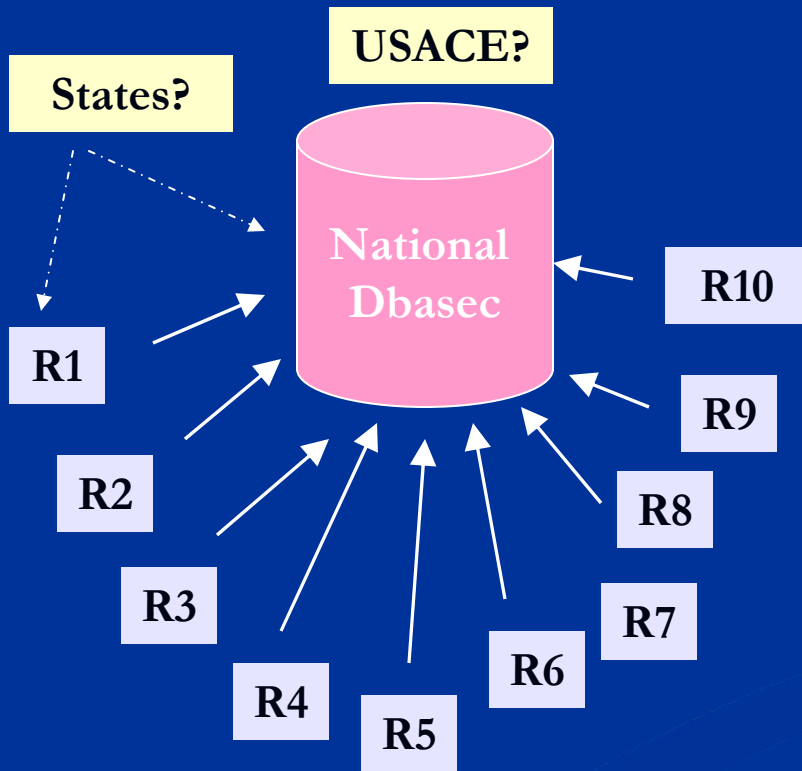
The Problem

- Increasing demand for readily accessible data
 - Recognized **growing volume** of data
 - Maturity of SF program (years of data, staff turn-over)
 - Accountability for decisions made with data
- EPA Superfund offices need access to better methods and resources to consistently store, access, interpret, analyze, visualize, and assure quality of environmental data

Is the Solution...

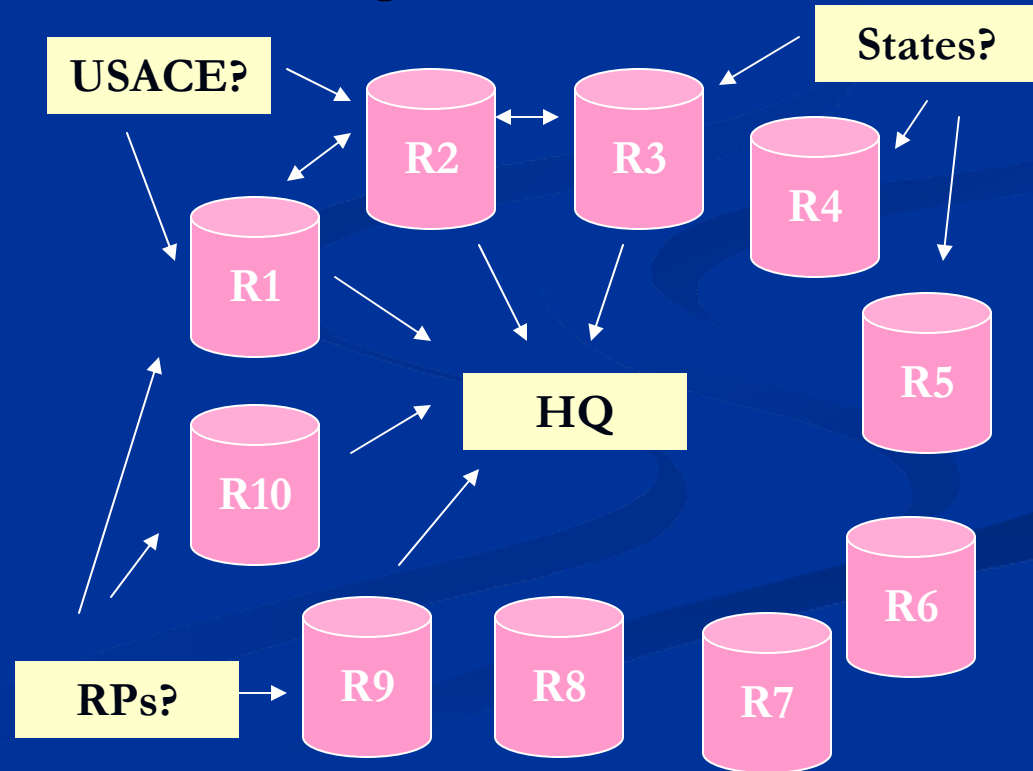
■ National Repository

- All report to one
- HQ has ownership



■ Regional repositories

- Communicate between
- Regions are data owners



Key Elements to the Solution

- **EDD (electronic data deliverables)**
 - Format in which data are stored and exchanged
- **Repository**
 - Place/object used to store the data
- **Tools**
 - Applications to review, analyze and understand data
- **Ownership**
 - Who controls the data, responsible for it

Issues surround each element!

Other issues

- Concerns to open access
 - SF Program does not have shape files for site boundaries
- Flexibility to regional needs
 - state well survey, new field in regional database to create unique well IDs
- How will data be used
 - If we build it, will they come?
 - Training/application needs for proper usage of information

Possible Next Steps for TIFSD

- Identify those who are “doing it better” and document their successes
- Work with these data “champions” to support an information exchange network
 - E-data WorkGroup
- Share information on these approaches, tools, and contacts with other regions and offices
- Look for new areas to improve
 - Push for “standard” approaches, consistent formats
 - Creation of a Data Support Center?
 - Deploy certain tools agency-wide?
 - Ongoing Needs-Analysis for Program?

Summary

- OSWER does not have a comprehensive solution for site-level data access and usability
- Many parties are involved and working on possible/partial solutions
- No one sole leader exists to coordinate all efforts and lead communication between players
- Is the answer:
 - Centralized Data Warehouse?
 - Regional Databases with access for other parties?
 - Standardizing a data format across programs?
- Work with OSWER management & Regions to start dialogs for a program-wide solution

Comments

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