

Communicating the Availability and Applicability of Decision Support Tools – A Technology Matrix

*Federal Remediation Technologies Roundtable
General Meeting
Monday, December 1, 2003*

Dan Powell
U.S. EPA, Technology Innovation Program
powell.dan@epa.gov

FRTTR Roundtable Discussion of Decision Support Tools (DST)

- ◆ Decision support methods compile expert knowledge and expertise into a "stored" method or process.
- ◆ Goal: Provide a concise representation of the essential decision making issues for a particular problem.
- ◆ DST software output is typically in terms of decision variables (e.g., cost or risk), or it provides a direct comparison between alternative remedial strategies.

Key Functions of Environmental Decision Support Tools

- ◆ Data Management and Visualization
- ◆ Sample Optimization
- ◆ Characterization Analysis (soil, sediment, groundwater, etc.)
- ◆ Remedial Design (Cost, area of contamination, etc.)
- ◆ Risk (human and ecological)
- ◆ System Optimization

FRTR Roundtable Discussion of Decision Support Tools (DST)

- ◆ Increase project manager understanding of menu, benefits, and application to specific problems
 - » Improve mainstream understanding
 - » Increase “routine” use
 - » Create open understanding of assumptions
 - » Educate users on limitations of data
- ◆ Realize returns on significant (Federal) investment
- ◆ Useful to Identify those in the public domain or created with public support and rate them against various “usability” criteria in a matrix format

FRTR “Product”

- ◆ Develop “matrix” targeting project managers
- ◆ FRTR matrix experience
 - » Treatment
 - » Sampling and Analysis
- ◆ Past efforts, investments (i.e., DOE-Brookhaven)
- ◆ Select tools appropriate for matrix
 - » Develop criteria for inclusion
 - Functions
 - Public vs. private
- ◆ Develop rating criteria
- ◆ Since last meeting – “straw” outline

DST Matrix

- ◆ Preliminary criteria for DSTs on strawman matrix
 - » Developed in previous study by Brookhaven
 - » “DST software output is typically in terms of decision variables (e.g., cost or risk), or provides a direct comparison between alternative remedial strategies.”
 - » Publicly funded
 - » Provide unique answer
 - » Not models
- ◆ 11 “tools” from Brookhaven inventory fit
- ◆ Another 14 useful environmental models could be included-input into decision process, but not “yes-no” answer
- ◆ No private tools (too many issues, e.g., inclusion, endorsements)

Decision Support Tool	Developer/Funding	Description/Comment
BIOPLUME III	Air Force	Decision Support for MNA
BIOSCREEN	Air Force	Screening tool for decision support on MNA
DQO-PRO	Pacific Northwest Laboratory	Site characterization and data collection
ELIPGRID-PC	Pacific Northwest Laboratory	Site characterization, hot spot determination
FIELDS (Field Environmental Decision Support)	EPA	Extensions to ArcView for improved decision support on characterization and contaminant definition.
Johnson and Ettinger	FREE	Vapor intrusion-estimates relationship, indoor air to groundwater contamination
MNA toolbox	Sandia National Laboratory	Screening tool for decisions on the applicability of monitored natural attenuation at a site.
RACER	USACE licensed by Earth Tech \$3K	Remediation technologies cost estimates.
ROAM (Remedial Options Assessment Model)	EPRI	Compares effectiveness of remedial alternatives in reducing contaminant concentrations.
SADA (Spatial Analyst Decision Assistant)	University of Tennessee	Site characterization, contaminant characterization, cost/benefit, and human and ecological risk assessment.
VSP (Visual Sample Plan)	Pacific Northwest Laboratory	Helps develop a sampling plan to meet DQO objectives.

Useful Analytical Tools

- ◆ There are a number of public domain environmental software programs that do not meet the formal definition for DST
- ◆ The list is not complete but touches on the major environmental analysis problems (groundwater, DNAPLS, sediments, air, etc.)
- ◆ This would include packages such as GMS and SMS, models such as MODFLOW and display tools such as MT3D
 - » Should these be included in the matrix?
 - » What is the best way to select among them?

Where Do We Go

- ◆ Refine inclusion criteria
 - » Strict definition vs. other useful systems
 - » ID additional systems (?)
- ◆ Review and revise performance parameters
 - » What is really useful
 - » Use Internet capabilities to “cluster” parameters
- ◆ Determine rating scales, ratings for each parameter, tool
- ◆ Help!!-FRTR Team for:
 - » Design, development
 - » Review
 - General
 - Specialists
 - Users