

# *EMMA*\* as a Model for a Water Monitoring Expert System

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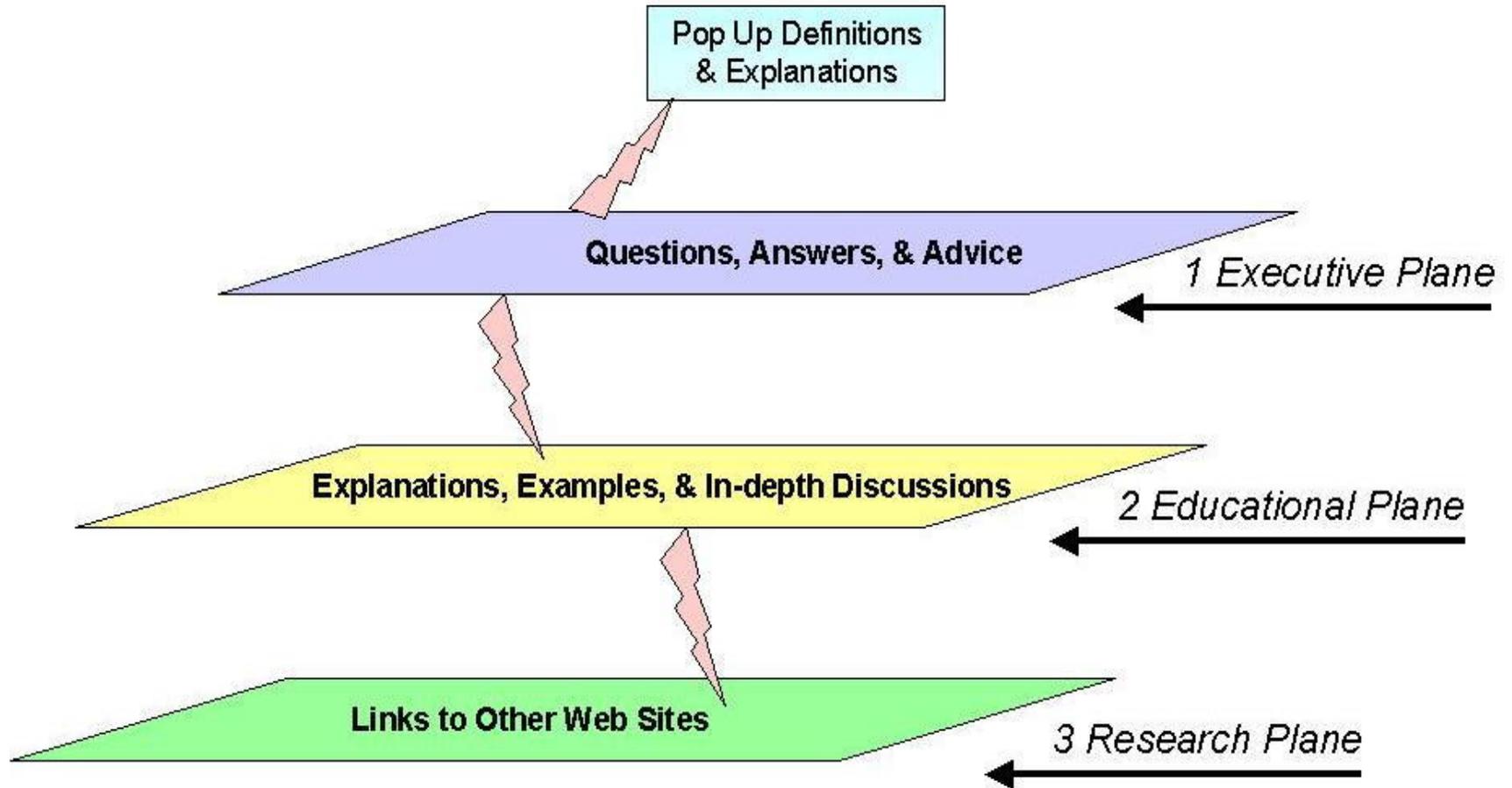
NWQMC Meeting  
December 9, 2004  
San Jose, CA

# What is an Expert System?

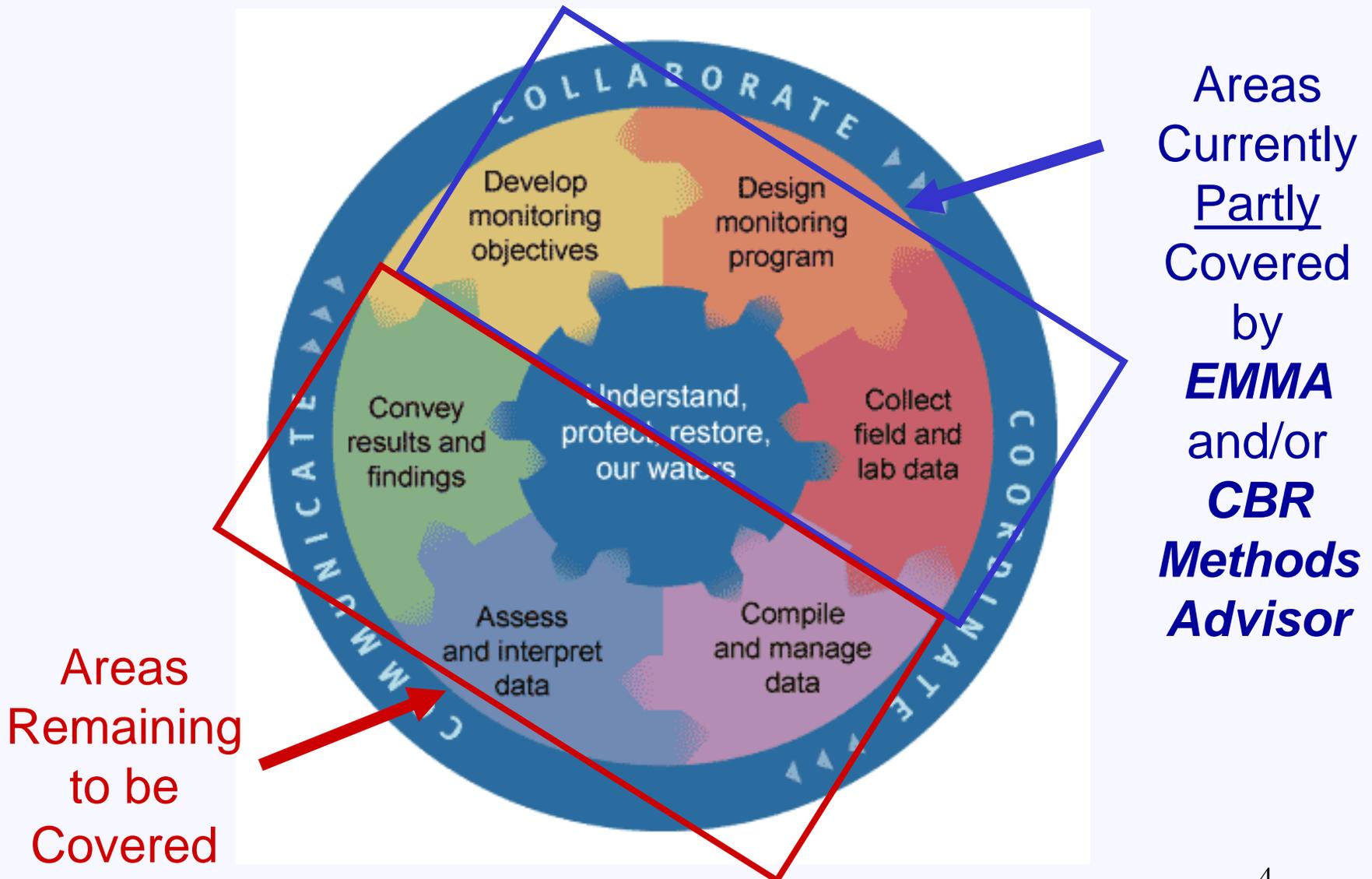


- ☠ An expert system is an interactive computer program that incorporates the knowledge of one or more people into a series of decision trees so that answers (**as advice**) to specific questions are the same ones that a human would give.
- ☠ Advantages include:
  - ◆ Help and advice when a human expert isn't available
  - ◆ Answers are consistent (versus human answers)
  - ◆ **Ensures that all important factors are considered** so that none are forgotten during decision making
  - ◆ Get right to answers needed quickly and efficiently

# 3 Planes of Information in *EMMA*



# Expert Systems for Monitoring Framework Areas



# What an Expert System Could Do

## 1. Help to Develop Monitoring Objectives

- ◆ Consider objectives, regulatory requirements, DQOs, resources

## 2. Help Design Monitoring Programs

- ◆ Determine what, when, where, frequency, type of sampling, QA/QC

## 3. Aid in Collecting Field and Lab Data

- ◆ Help select sampling & analytical methods (consider detection levels, bias, precision, interferences, cost, instrument availability, etc.)

## 4. Assist in Compiling and Managing Data

- ◆ Data entry, preservation, search, retrieval, and metadata

## 5. Help Assess and Interpret Data

- ◆ Statistical analysis, models, comparisons, trends, patterns

## 6. Facilitate Conveying Results and Findings

- ◆ Reports, formats, diagrams, summaries, tables, graphs, plots, etc.