

Making Decisions: Learning Objectives

Learn how to:

- ▶ Use ISM data to make decisions
- ▶ Evaluate data
 - Identifying sources of error
 - Quantify error
 - Interpret error
 - Isolate sources of error

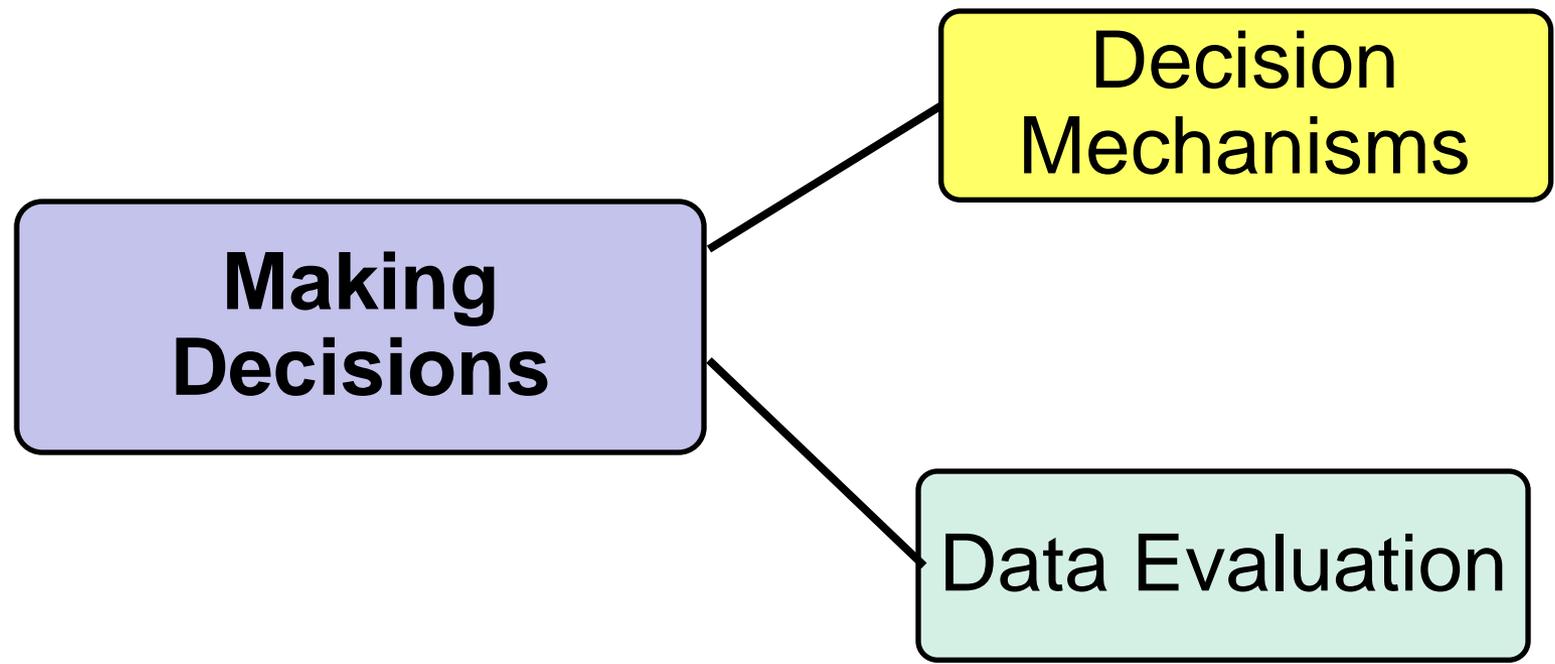
Report Documentation Page

Form Approved
OMB No. 0704-0188

Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

1. REPORT DATE MAR 2012		2. REPORT TYPE		3. DATES COVERED 00-00-2012 to 00-00-2012	
4. TITLE AND SUBTITLE Making Decisions: Learning Objectives				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Interstate Technology and Regulatory Council (ITRC),50 F Street NW Ste 350,Washington,DC,20001				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES Presented at the 9th Annual DoD Environmental Monitoring and Data Quality (EDMQ) Workshop Held 26-29 March 2012 in La Jolla, CA. U.S. Government or Federal Rights License					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 18	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

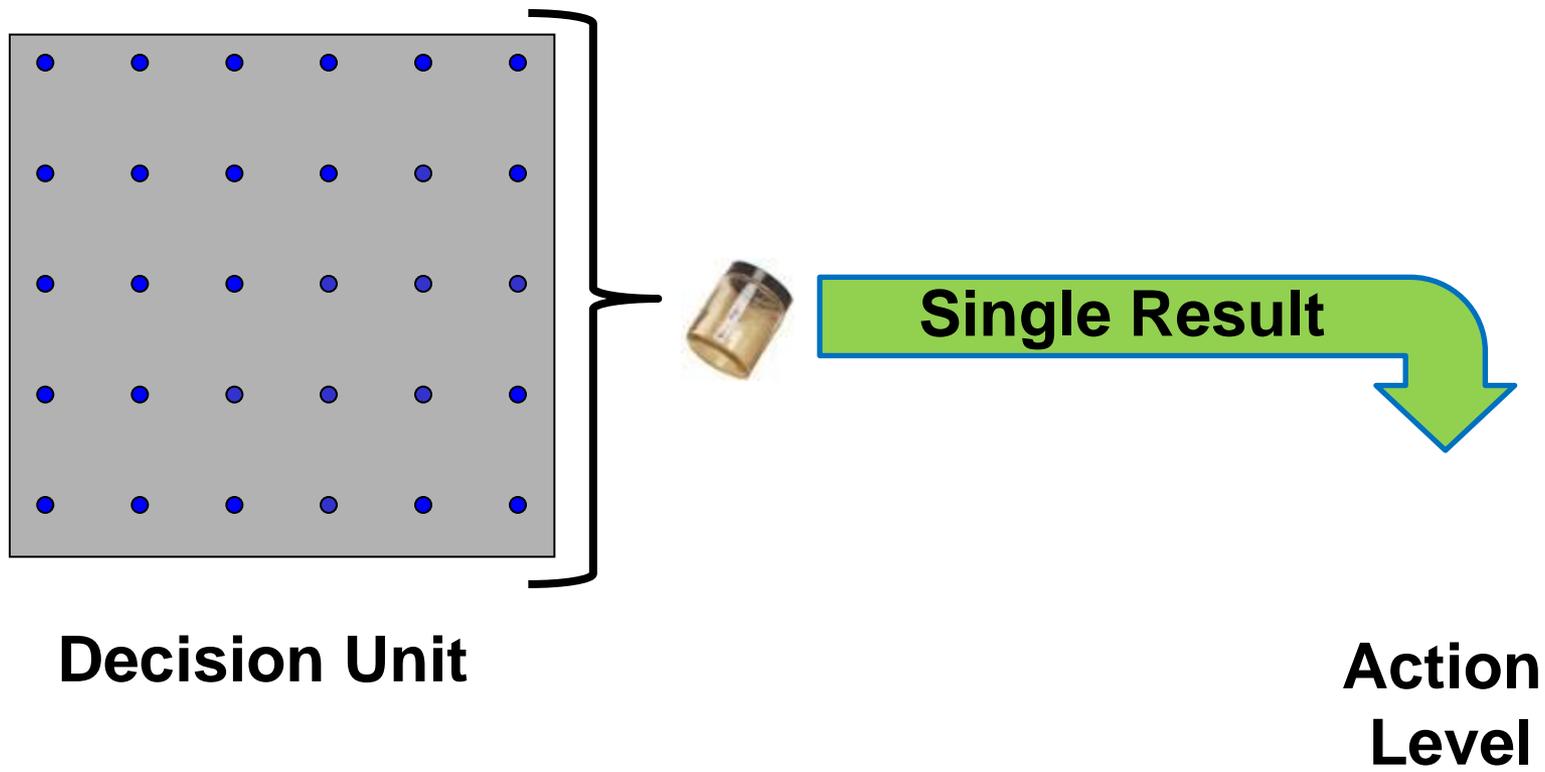
Making Decisions Using ISM Data



Making Decisions

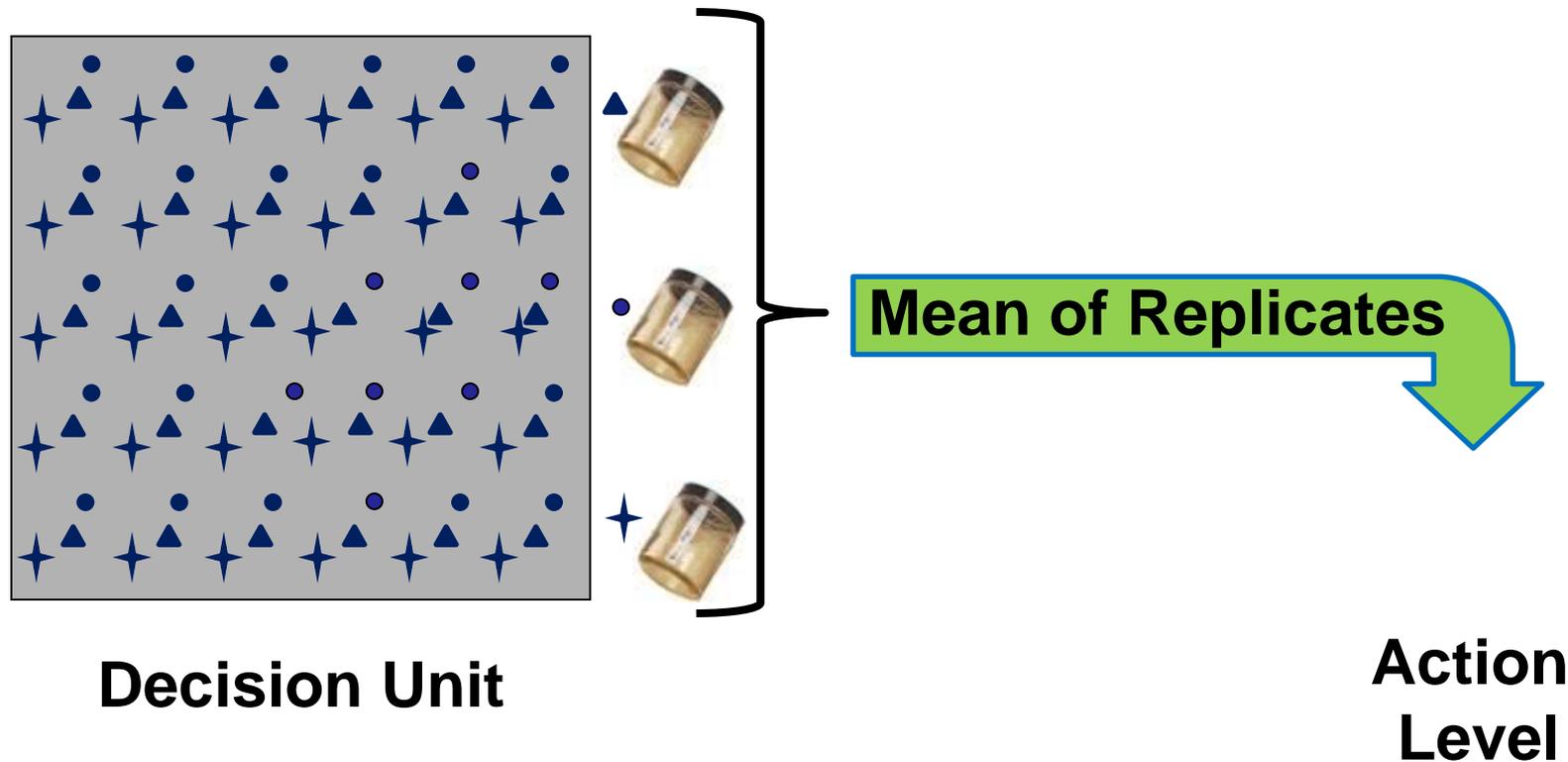
- ▶ Decision Mechanism (DM)
 - Structured approach to making decisions
 - Identified and agreed upon during Data Quality Objective (DQO) process
 - 6 common types of DM

DM 1: Compare One ISM Result to Action Level



DM 2: Compare Average ISM Result to Action Level

Slide 83



Florida Case Study: Decision Mechanism (DM) 2

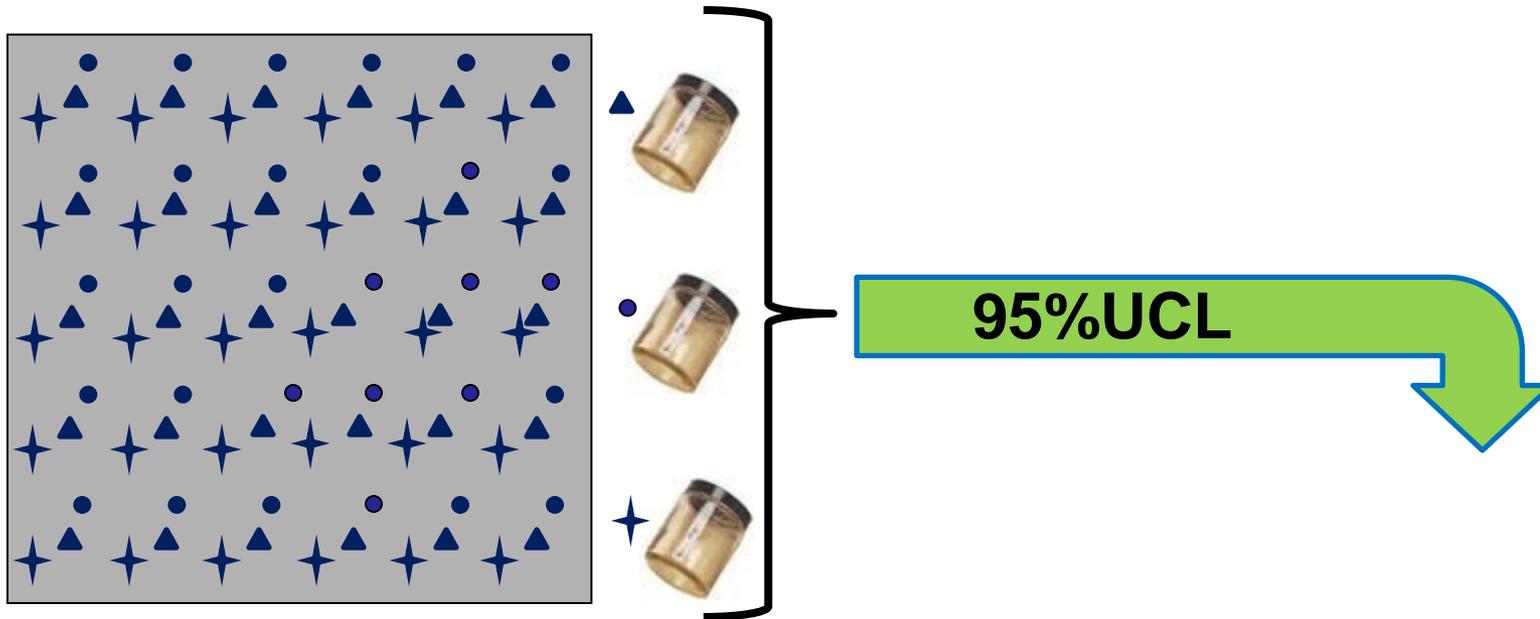
Mean arsenic concentrations (mg/kg)

	Discrete <i>n</i> = 30	Incr-30 <i>n</i> = 3	Incr-100 <i>n</i> = 3
DU 2	4.2	5	5.2
DU 3	7.5	10.5	9.5



DM 3: Calculate 95%UCL then Compare to Action Level or Use for Risk Assessment

Decision Unit



**Action level
or risk assessment**

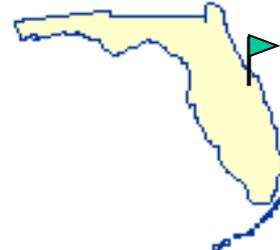
Florida Case Study:

Decision Mechanism 3: (DU 1)

Arsenic Data (mg/kg)

	Discrete n = 10 (mg/kg)	Incr-30 n = 3 (mg/kg)	Incr-100 n = 3 (mg/kg)
Mean	2	1.8	1.7
Std Dev	1.4	0.08	0.03
95UCL	3.0	2.0	1.8

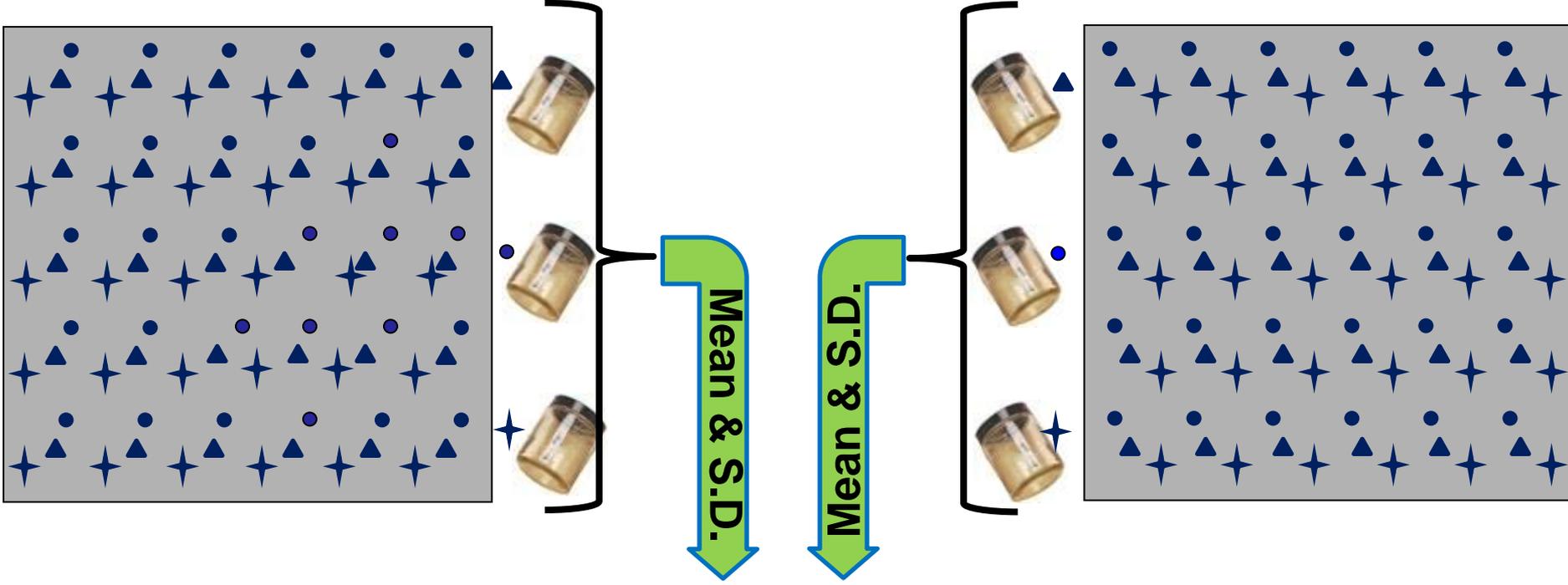
Florida Action Level: 2.1 mg/kg



DM 4: Compare to Background

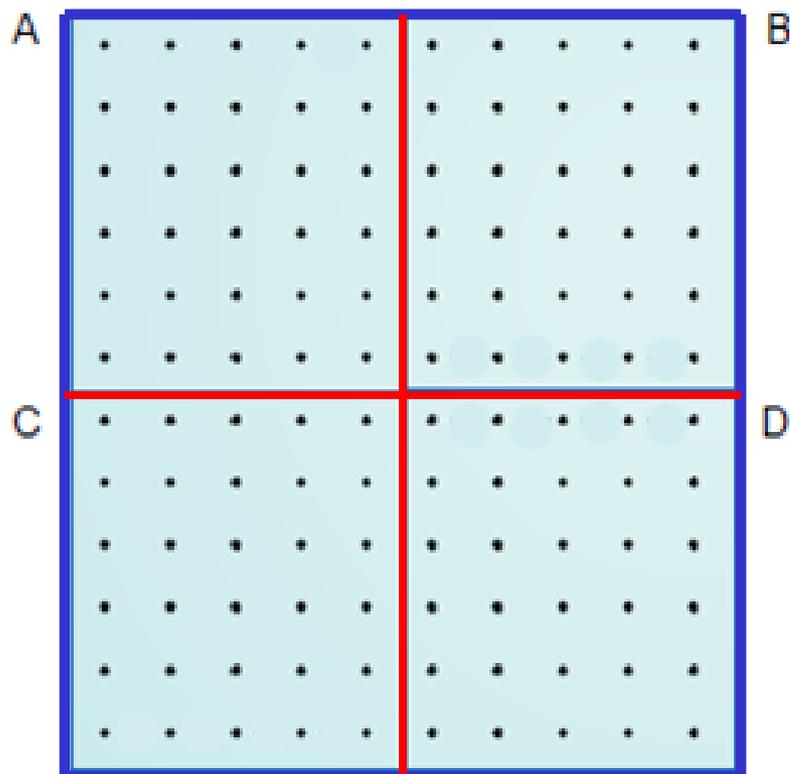
Decision Unit

Background



Comparison

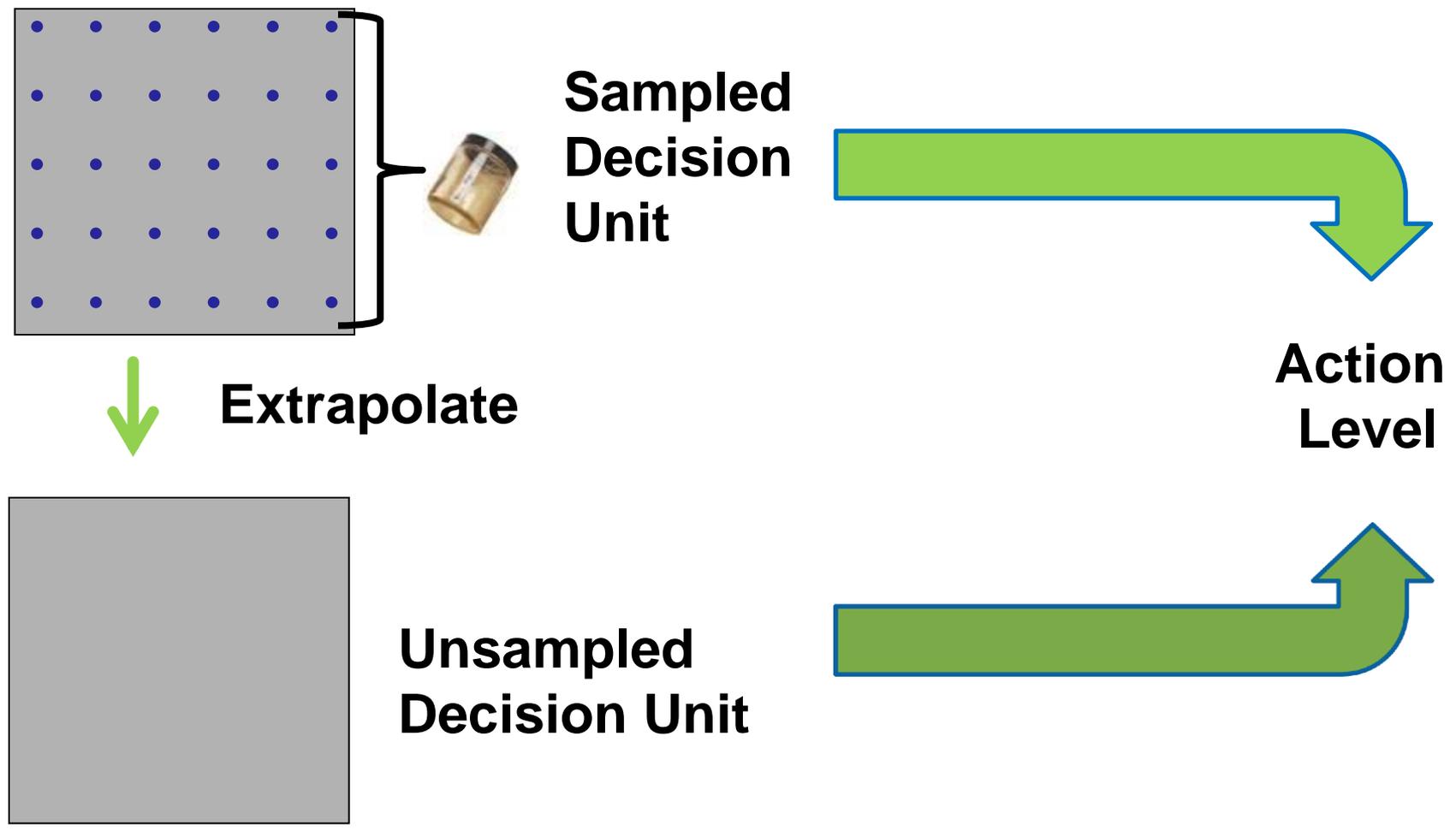
DM 5: Combining Decision Units



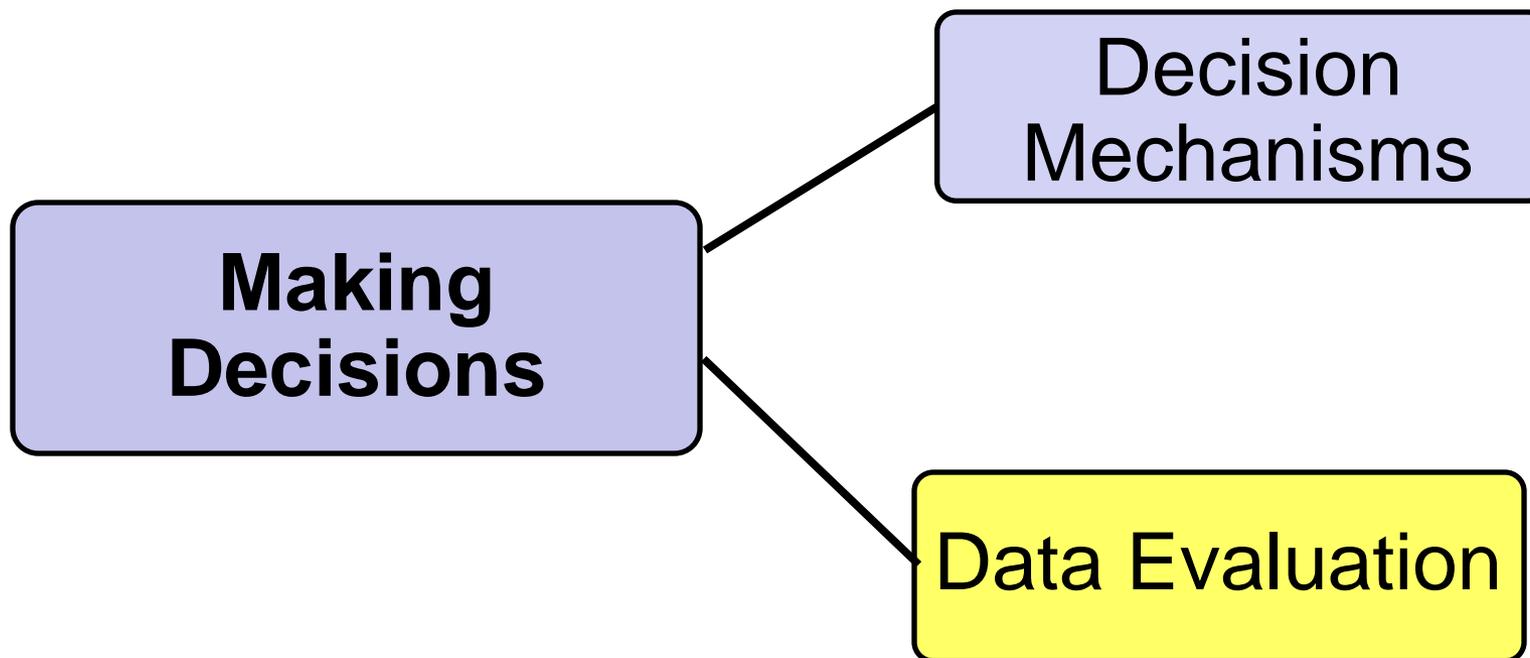
DU average
and
Weighted average

Action Level

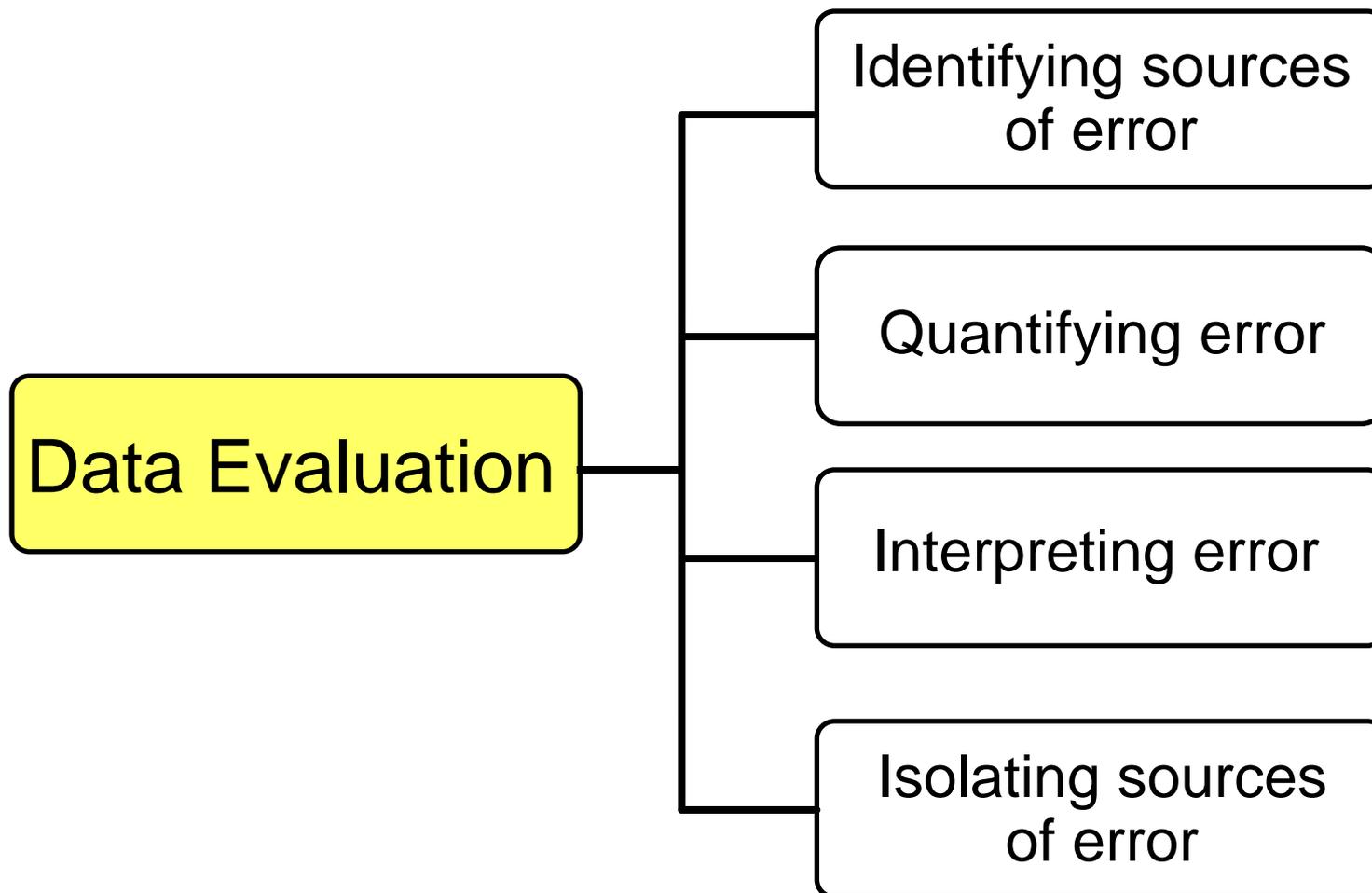
DM 6: Extrapolation to Unsampled Areas



Making Decisions Using ISM Data



Data Evaluation Components



Identifying Sources of Error

Field

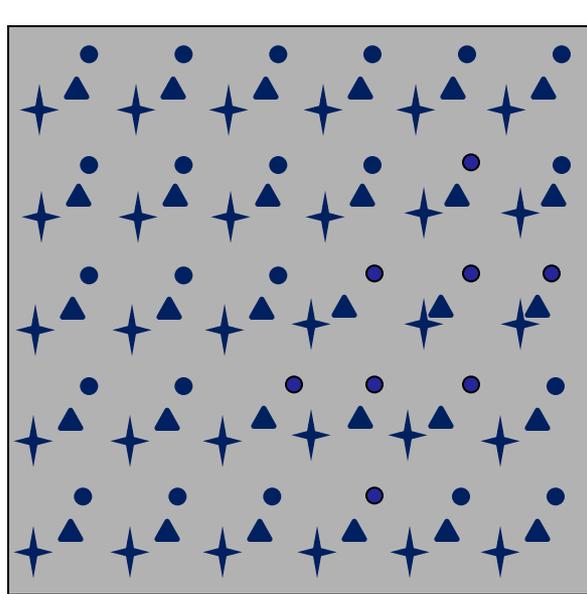
- ▶ Number of increments
- ▶ Increment collection
- ▶ Field processing
- ▶ Field splitting
- ▶ DU size and shape

Laboratory

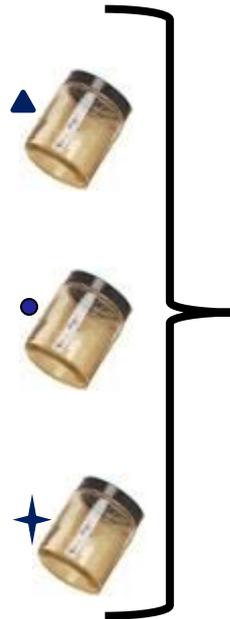
- ▶ Lab processing
- ▶ Subsampling
- ▶ Extraction
- ▶ Digestion
- ▶ Analysis

Quantifying Error

$RSD = CV = \text{standard deviation} / \text{arithmetic mean}$



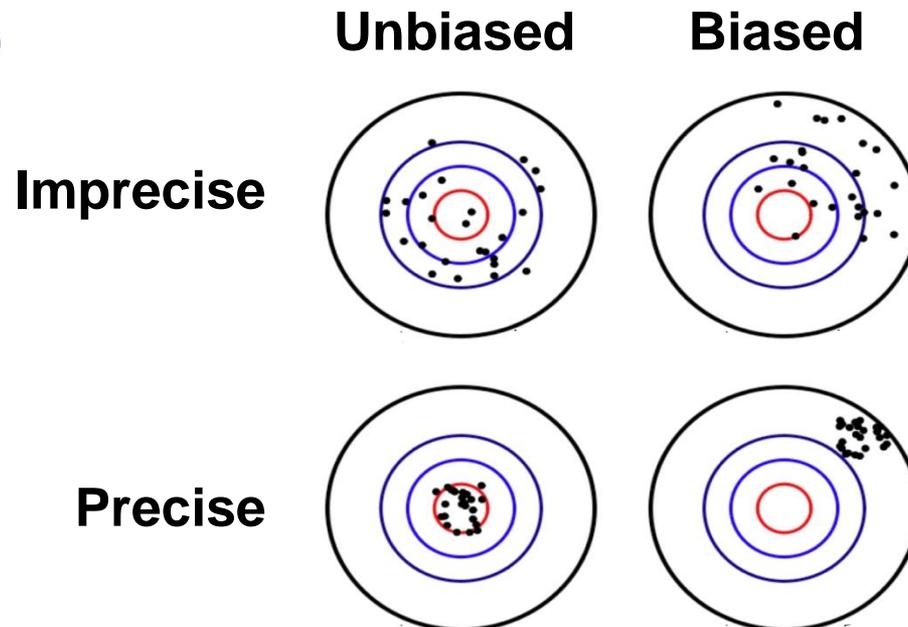
Decision Unit



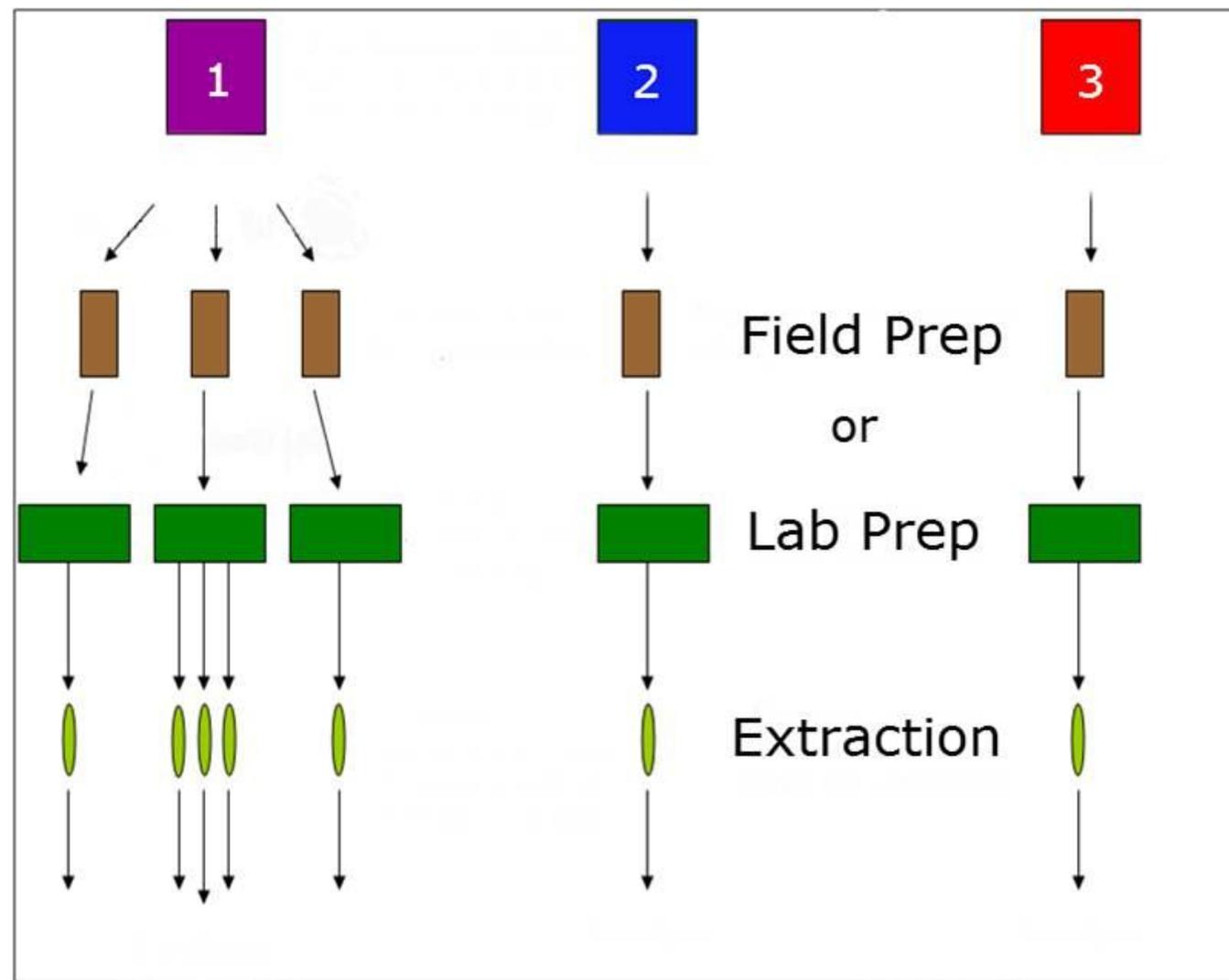
Data includes all sources of error

Interpreting Error

- ▶ “Unacceptable” RSD
- ▶ Low RSD
- ▶ High RSD



Isolating Sources of Error



Making Decisions Using ISM Data

Slide 96

