

Introduction to the Water Quality Data Elements



Objective:

To develop and recommend a “core” set of data elements for reporting water quality monitoring results, to be voluntarily implemented, that would allow data to be compared regardless of, but recognizing, the purpose of the monitoring activity



What are Water Quality Data Elements

- **Information about data that answer basic questions to facilitate data exchange:**
 - **Who?** (Which organizations are responsible?)
 - **What?** (What was monitored and found?)
 - **Why?** (Why was the monitoring conducted?)
 - **When?** (When was the monitoring done?)
 - **Where?** (Where was the monitoring done?)
 - **How?** (How was the sampling/testing done?)

Additional Types of Data Elements for Evaluating Comparability

- Information about the type of **media** sampled
e.g., well, surface water, sediment, soil
- Information about the type of **habitat** sampled:
e.g., the type of water body: stream, lake, ocean
- Information about **sample processing used** prior to analysis
e.g., compositing, homogenization, sorting, sieving, preservation

Additional Types of Data Elements for Evaluating Comparability

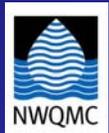
- Information about **sample testing/analysis methods**
e.g., subsampling, sorting, magnification, taxonomic keys
- Co-occurrence with other chemical, physical or microbiological measurements
- Quality assurance / quality control information
e.g., level of confidence in the reported results; training/certifications, QC flags

Data Element Modules

- 1 - Contacts
- 2 - Analyte / Endpoint Result
- 3 - Reason for Sampling
- 4 - Date/Time of Sampling
- 5 - Location
- 6 - Sample Collection Methods
- 7 - Sample Analysis Methods & QA/QC

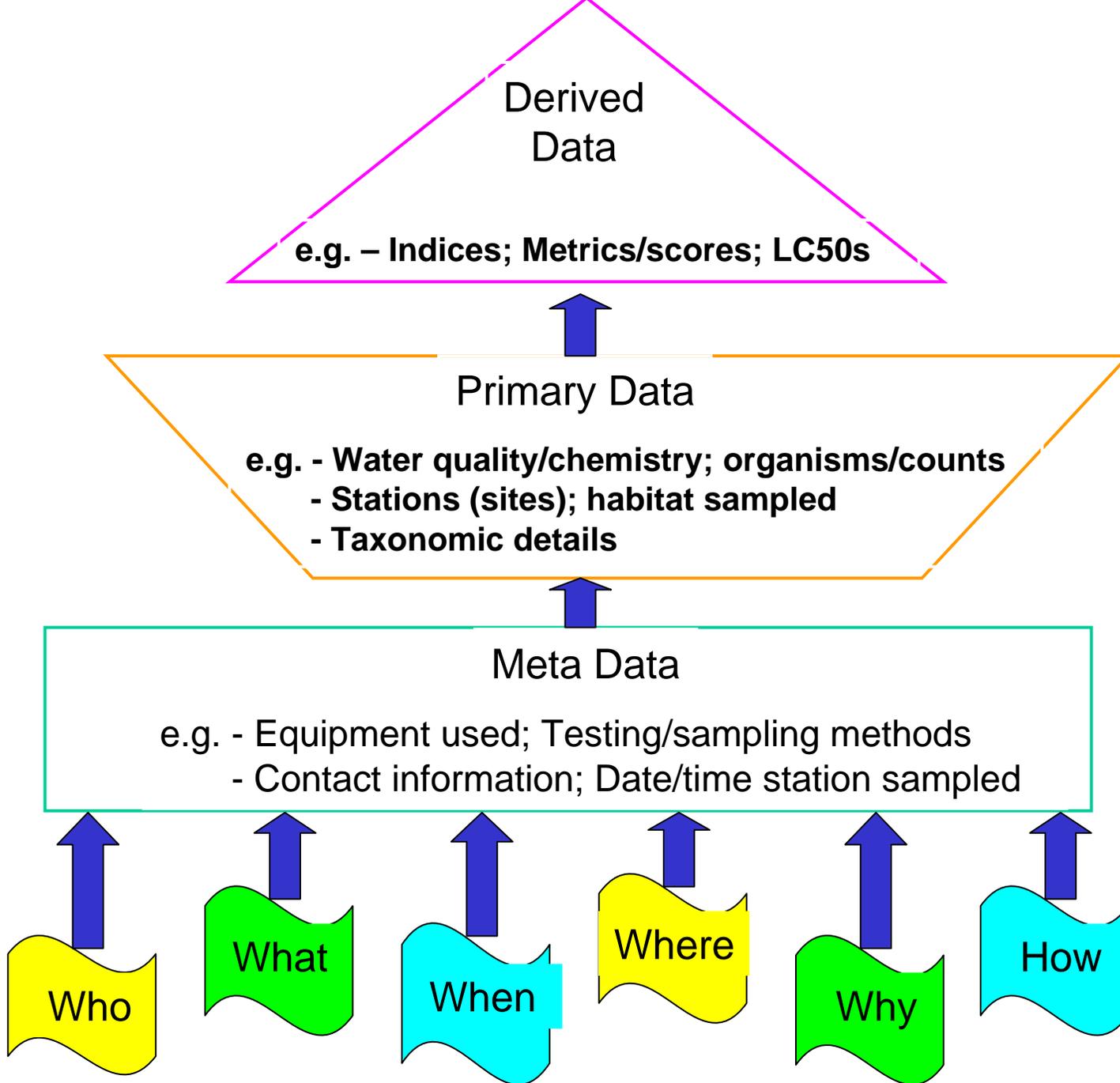
Status of Data Elements

- **Chemical and microbiological** elements approved by ACWI and being implemented / considered by several agencies
- **Population/community** elements approved by the Methods Board and Council – **subject of this workshop**
- **Toxicity** elements approved by the Methods Board and Council
- **Habitat** elements drafted – in progress **** Help is appreciated *****
- Plan to address **biomarkers** and **sediment** data elements soon ***** Help is appreciated *****



Biological data elements not included in current approved WQDE because:

- **Sampling methods and associated metadata very diverse and complex – no obvious consensus at the time**
- **Habitat characteristics important for biological data – not clear how best to incorporate**
- **Very broad range of data types and organism types possible – more discussion needed to appropriately address**



Biology Data Elements Workgroup Charge

To prepare a set of data elements to be used to structure the sharing and archiving of biological data.

The list of data and metadata elements is intended to *promote data sharing but without being an exhaustive list of every possible data element that could be reported.*



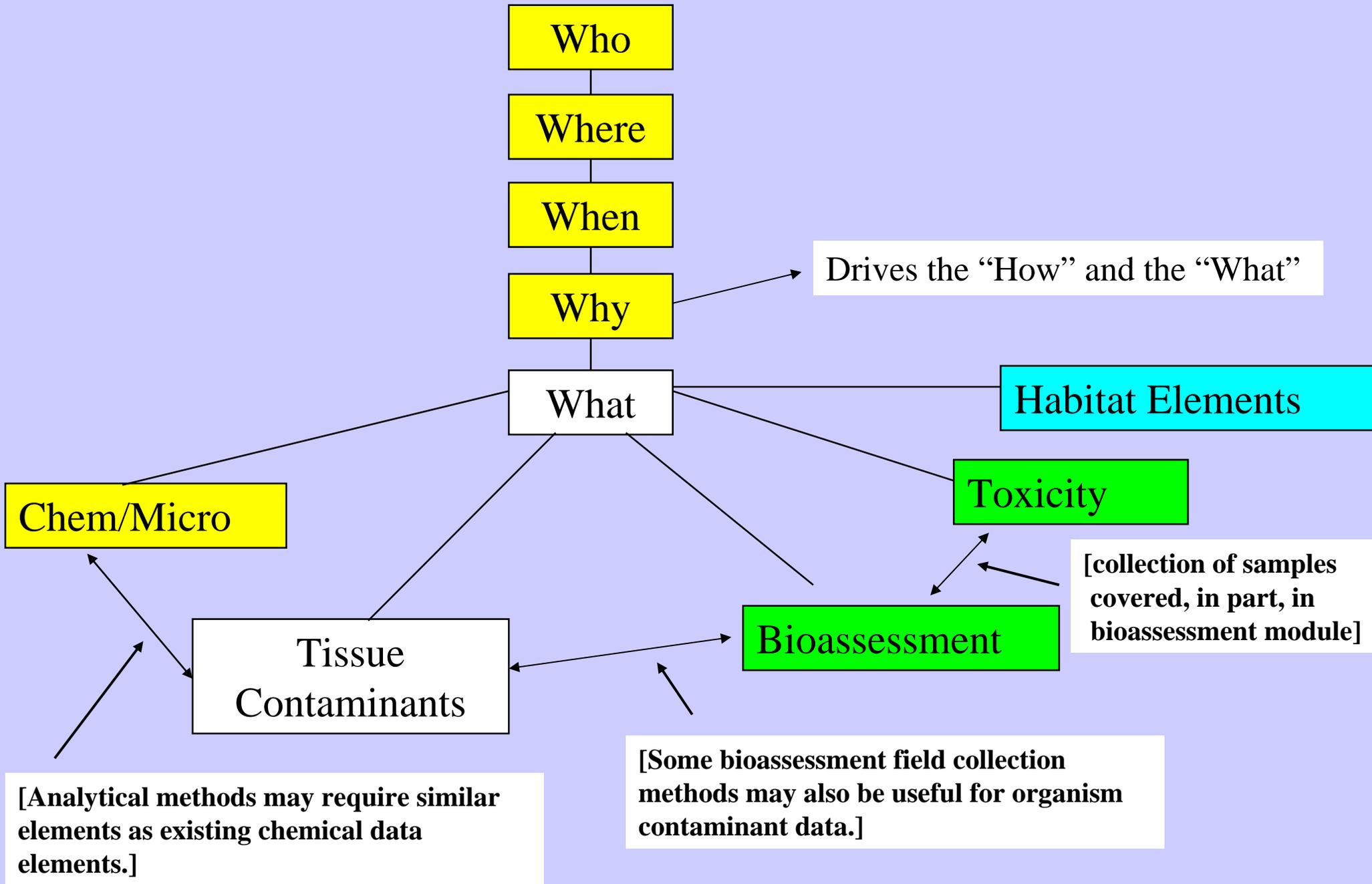
Biological Data Under Consideration

- **Aquatic biological assessment data (e.g., fish, algae, macroinvertebrates, plants)**
- **Organism tissue contaminant data (e.g., clam tissue, fish tissue, specific organ contaminant data)**
- **Organism toxicity data (e.g., acute and chronic toxicity, Microtox)**
- **Biomarkers (stress proteins, etc)**

Some Overlap in Elements Depending on the Type of Data Reported

- **Organism tissue chemical analysis - Chemical analysis elements**
- **Organism tissue sampling – population / community sample prep elements**
- **Toxicity sample collection - chem/micro sampling elements**
- **Plankton/algal surveys – chem/micro sample processing elements**





What: Organism Toxicity

How

Sample Collection

- temperature of sample
- [others same as for population /community]

Sample Processing

- temperature at lab
- [others same as for population /community]

Analysis

- test method used
- test duration
- statistical methods used
- laboratory certifications
- organism weight, length elements from population /community elements
- QA/QC
 - negative control results
 - control replicate precision
 - minimum significant difference value
- reference toxicant test results; QC flags; method issues

Questions for Discussion

- **Have we captured the core (primary) elements for population/community level data and assessments?**
- **Are the element definitions clear? Are there redundancies or important omissions?**
- **Do these elements adequately address all types of ecological entities? e.g., plants, algae, fish, frogs, etc**
- **What are the barriers to greater implementation, and how can they be overcome?**
- **What are some implementation options?**
- **Others?**