Basics of Data Management

R9 STORET/WQX Workshop for Tribes

November 18, 2008

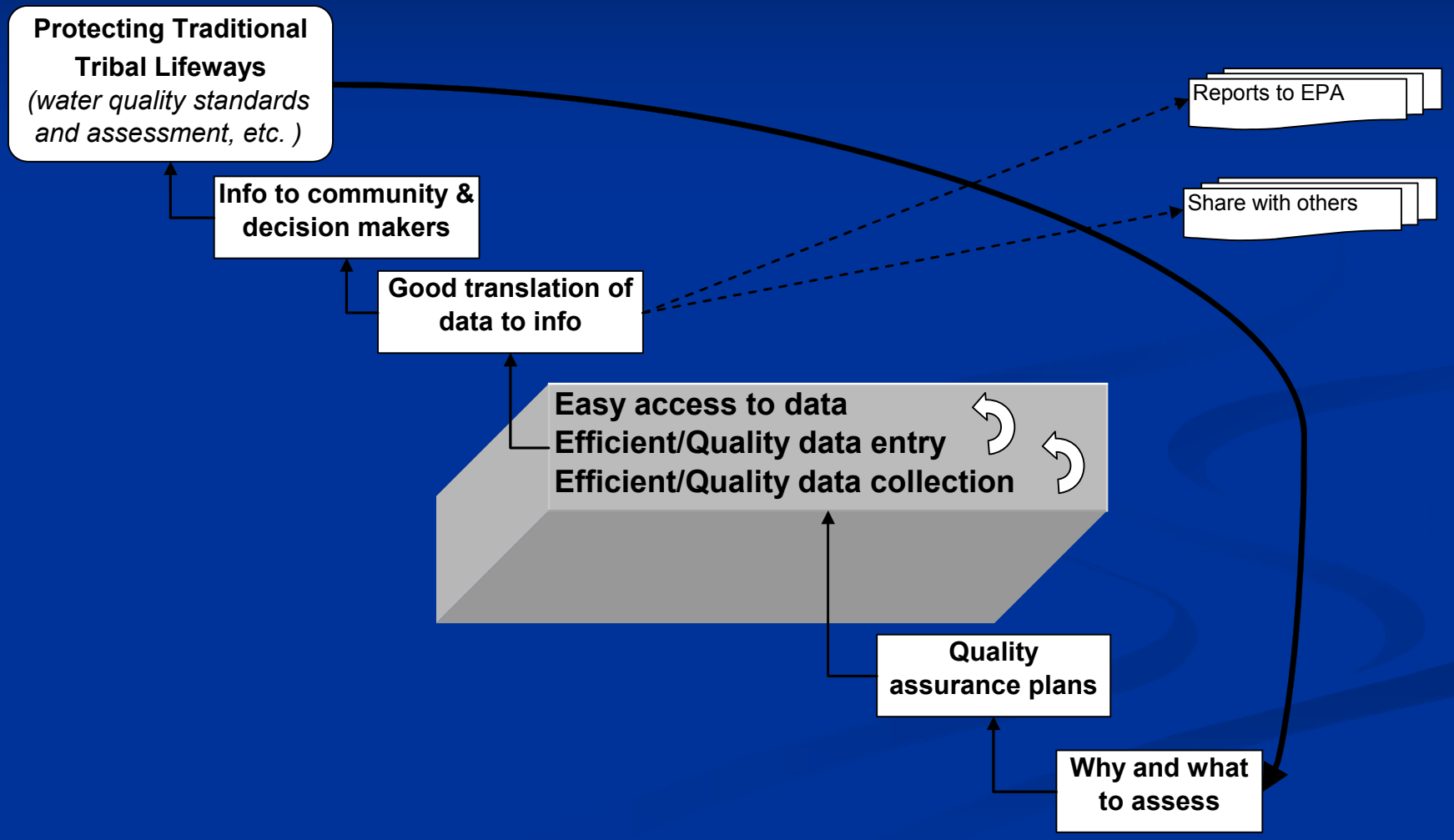
Data Management

- The process of organizing, storing, retrieving and maintaining the data you collect
- Having a data storage, management, and retrieval system is essential for every monitoring program (Volunteer WQ Monitoring factsheet)

Importance

- An important link between effective monitoring efforts and informed data analysis for assessing water quality is DATA MANAGEMENT
- An important link between doing water quality restoration activities and determining their effectiveness is monitoring and more DATA MANAGEMENT

The Bigger Picture



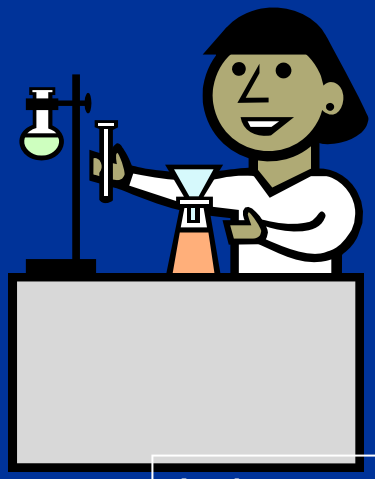
10 Elements of a Tribal Monitoring Strategy

I. Monitoring Strategy
II. Monitoring Objectives
III. Monitoring Design
IV. Core Indicators
V. Quality Assurance
VI. **Data Management**
VII. Data Analysis/Assessment
VIII. Reporting
IX. Programmatic Evaluation
X. General Support and Infrastructure

Data Management in Context

The life of a sample begins here

Field Sheets capture data



Labs generate data

Now what to do with all this data?

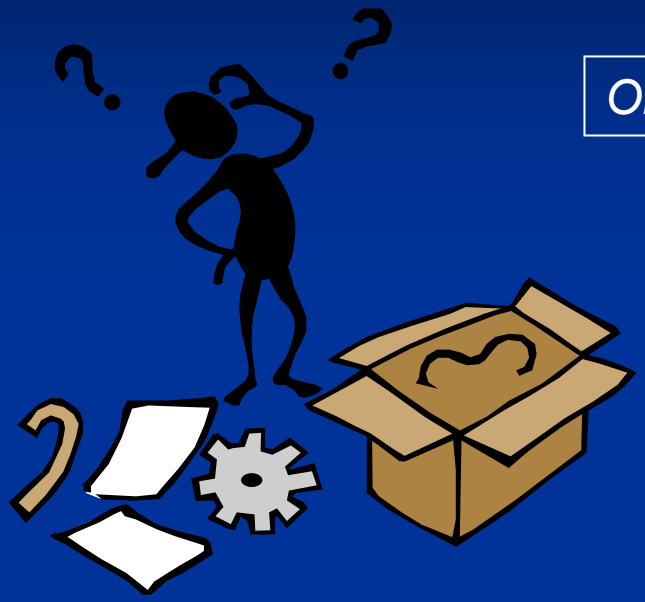
Essentials of data content

- What data do you have?
- Water Monitoring data consists of:
  - Where sample/measurement was collected
  - When it was collected
  - What was collected
  - How it was collected
  - Why it was collected
  - Who collected it
- It does not take a lot of information to create a good data set.

Some good questions to ask

- What do you want to do with the data?
  - Share it with others? Let multiple staff members access and change it?
  - Perform QA/QC?
  - Evaluate and assess for water quality condition?
  - Help prioritize your monitoring efforts?
- What kinds of reports do you need?
  - Graphs? Bar Charts? Trends?
- What resources do you have to manage your data?
  - Set up costs and maintenance costs

First, make sense of what you have



Organize data electronically

Use the tools you're familiar with:

- Access
- Excel
- Other higher-powered database management system (i.e. Oracle)

Have a plan for growth

Not only will your skill grow, but your data volume will grow. Be prepared for it.

Find out what's already available

Tools

- **MS Excel**
  - Spreadsheet software that tracks data in columns and rows
  - You can perform calculations on data and show graphs
- **MS Access**
  - A type of Relational Database
  - Data is stored in tables that can be related to each other via common IDs
  - Data can be manipulated via Queries
  - Data can be entered via Forms and retrieved via Reports
- **Other database management systems**
  - Oracle, SQL Server
  - Data storage and retrieval is much more robust
  - Can build custom applications to interact with the data

Data are valuable, plan for re-use

Electronic data are more valuable than data in file cabinets

The more data are re-used, the more valuable they become

Shared data are of even higher value

- Provide for better planning decisions
- Incentivize collaborative efforts
- Make the most use of the monitoring $$s being invested