

Implementation of the NWQMC Framework at the Monitoring Project Level

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What is this presentation about...

- Some insights from the trenches
- Project Planning and Communication tools developed from the ground up
- Potential for use of tools in Expert Systems

My Objectives

- Move with NWQMC towards comparability
- Participate in development of common language for communication
- Help non-scientists make the best use of monitoring resources

Focus: How to make sure the data are usable:

- Can they answer questions, support decisions
- Do they include complete parameter packages
- Are they comparable with other data
- Do they have adequate DQOs
- Do they have adequate statistical power
- Are they scientifically defensible
- Are they presented in accessible formats

Roles, tasks, guidance, and tools

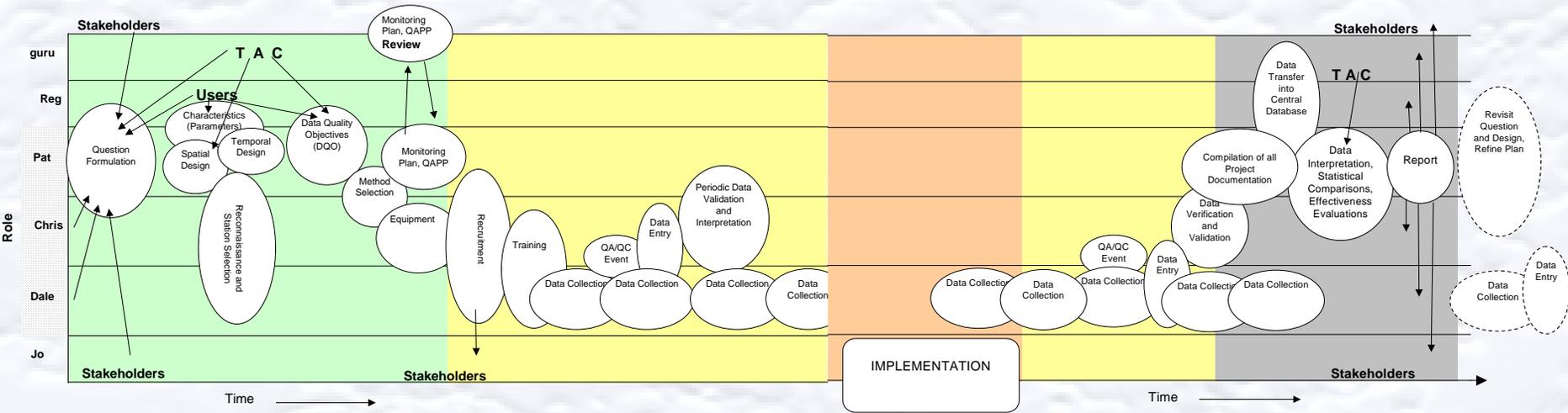
Tasks are performed by Project Personnel playing three major Roles:

- Field Operator
- Trainer
- Technical Leader

Need different support for each Role:

- Data Sheets
- Templates
- Spreadsheets
- Written Guidance
- Training

One of my best teaching tools



The "Egg Race" poster

Examples of concepts to convey

How you ask the question is really important

Don't forget to measure essential parameters

Collaboration will make your data more valuable

Think “design Principles”

Separate the conditions

If you plan comparisons, you need power (analysis)

Use templates and expert systems judiciously

Life is a juggling act

See or skip the next 9 slides ...

Is your Question
specific enough?

**Example: What are
the major sources of
sediments and
which sources are a
result of human
activities and which
ones can be fixed?**



**SEPARATE
The
Questions**

Parameter Package

“If you measured 7 mg/l of dissolved oxygen in your Station, it could be very good or very bad, but I cannot tell if I do not have information about flow”.

“Never try to assess ammonia toxicity if you do not know the pH”



Enhance

Make the value
of your
resources

higher

by combining
your data with
data collected
by others in
your watershed



Apply Sampling Design Principle*
when you decide...

Where to monitor

Station selection within Watershed,
stream channel, or water column

When to monitor

Timing of sampling within seasons,
hours of the day, or point in special events

* systematic, directed, random, or anecdotal

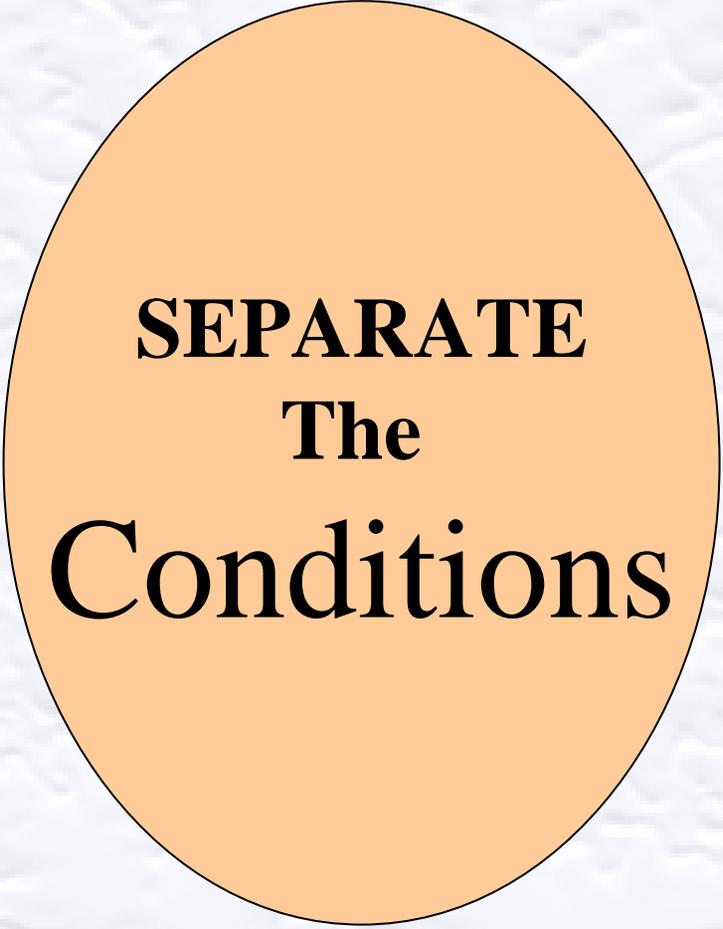
Separate the Conditions

Examples:

Dry versus wet
weather;

Low versus high
flow (seasonal);

Worst-case versus
best-case versus
“normal” (whatever
that is)



SEPARATE
The
Conditions

Comparisons:

Before vs After

Problem: 'Conduit Memory'

Paired Watershed

Problem: Hard to find match and/or to stagger implementation

Power Analysis

Example: Based on inherent variability, determine how many samples are needed to show statistically significant change



Common Wisdom

“People who use templates without critical thinking should not be using templates”

Juggle

The “What”
“Where”
“When”
To fit your
budget



Suggested Language for communication

Spatial descriptors

Station Type : creek, outfall, ditch

Station Selection Intent: Impact assessment, source ID

Reach Selection Design: systematic, directed, random, anecdotal

Station Selection Design: (same options)

Temporal descriptors

Storm runoff flows (wet) or base flow (dry) weather

Sample Timing Intent: worst case, snapshot, routine monitoring

Seasonal Sampling Design: systematic, directed, random, anecdotal

Diurnal Sampling Design: (same options)

Season of interest: summer, fall

Finally..... Monitoring



(The clipboard & datasheet is there: you just cannot see it in the picture)

Then what? Need Data Quality Management tools!

What

How Good?

(worksheets)

Station ID	Collection Date	Collection Time	Sampling Device	Position in Water Column	Instrument ID	Characteristic (Parameter)	Results Units	Result	Replicate Measurements (if Result)	Duplicate Measurement	Blank or Instrument Resolution	Depth (From Surface)	Depth Unit	Depth Interval	DQM-SCP ID	Protocol/SCP Reference	Field Operator Name	Operator's Specified Error Range	QA/QC Review Date	QA/QC Review Person	Combined Accuracy and Precision	Resolution Uncertainty Factor	Documentation Level	Validity Qualifier	Error Range Category	Fidelity of Data Entry	Data Use Potential
V1	6/22/2003	11:23:41	none	surface	TTP-STB01	Temperature, water	C	14.74	14.74	0.01							R. Katznelson		10/24/2003	Katznelson	1.51	0.0	Adequate	Valid	0 to 2%	nap	any use
V1	6/22/2003	11:23:41	none	surface	ECP-STB01	Specific conductivity	uS/cm	929	929	0.1							R. Katznelson		10/24/2003	Katznelson	0.64	0.0	Adequate	Valid	0 to 2%	nap	any use
V1	6/22/2003	11:23:41	none	surface	DOP-STB01	Dissolved oxygen (DO)	mg/l	2.65	2.65	0.01							R. Katznelson		10/24/2003	Katznelson	11.92	0.0	Adequate	Valid	10 to 20%	nap	any use
V1	6/22/2003	11:23:41	none	surface	PH-STB01	pH		7.59	7.59	0.01							R. Katznelson		10/24/2003	Katznelson	0.83	0.13	Adequate	Valid	0 to 2%	nap	any use

Who

Where

When

How

Why

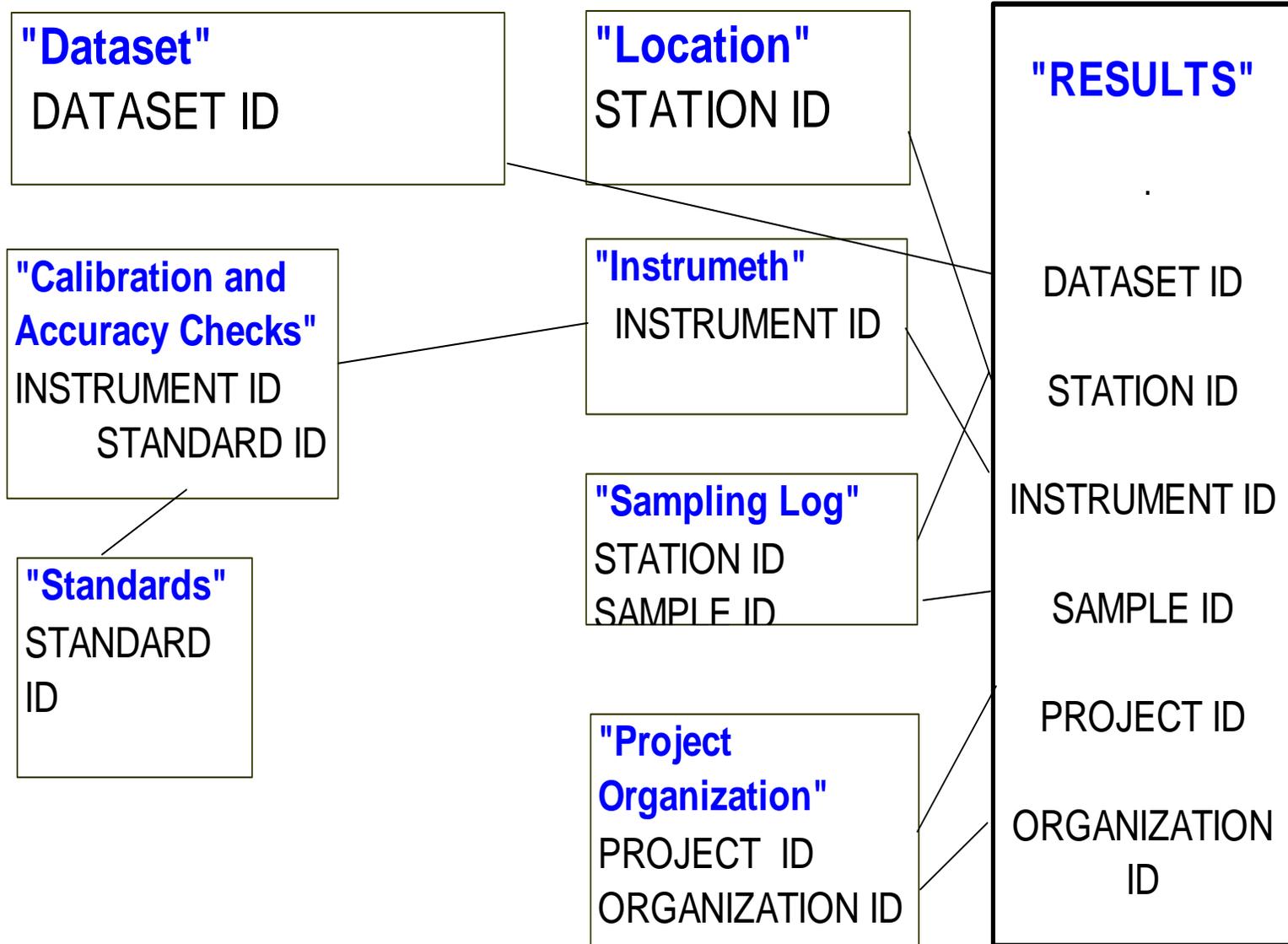
OSR Project ID	Organization Name	Team Name	Organization Entry Category	Organization Entry Type	Organization Entry Contact ID	Contact Last Name	Contact First Name	Contact Title	Contact Position	Address Line 1	Address Line 2	City
WDCM	Wildcat Creek Monitor	WCM Core	Resource	Volunteer		Katznelson, R	Michael	Technical Leader	Volunteer			Berkeley

Station ID	Dataset ID	Scenario or Question	Station Type	Land Use Setting	Activity or Facility	Station Selection Intent	Sample Timing Intent	Reach Selection Design	Station Selection Design	Seasonal Sampling Design	Season of Interest	Diurnal Sampling Design	Total Number of Station-Visits	Date of Station Visit Tally
WIL03	WILD01	what is the inter-habitat variability in Wildcat Creek during summer?	River/Stream	urban	recreational park	not applicable	characterization	directed	directed	directed	summer	directed	14	10/24/2003

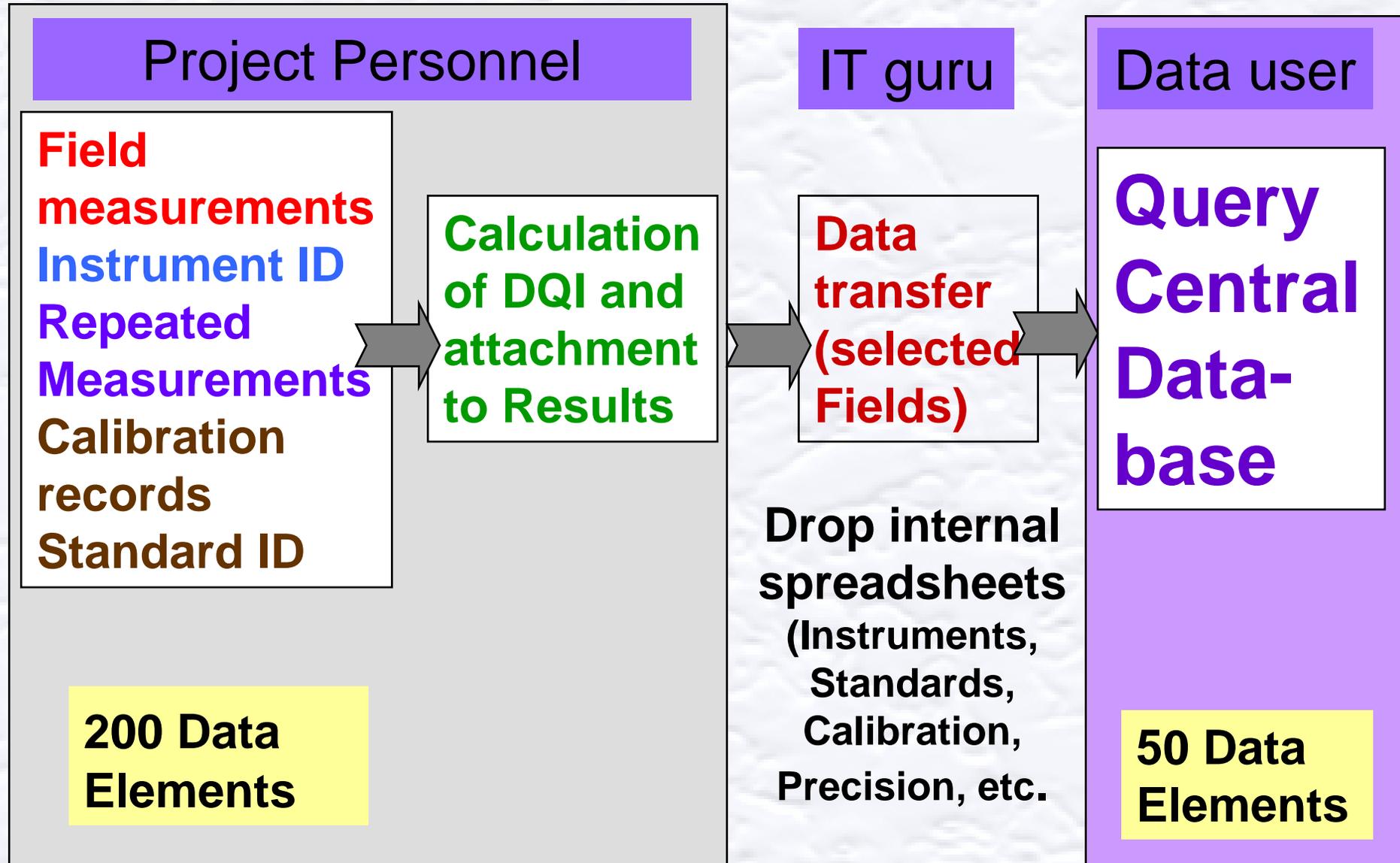
Sequence	Instrument ID	Param/Meth ID Code	Depth Code	Agency Inventory #	Inst #	Instrument Name	Characteristics (Parameter)	Unit	Method	Notes	Collection Mode (manual or auto & standard subject)
1	DOP-STB1	DOP	STB	nap	030816	Dissolved Oxygen probe	Dissolved Oxygen	mg/L	Photographic, Redox Probe	7 cm long, 1 cm diameter, NIST certified in production	automatic
2	PH-STB4	PH	STB	nap		Temperature probe	Temperature	°C	Homemade	1 cm long stainless steel from probe	automatic
3	TTP-STB1	TTP	STB	nap	13302	Temperature probe	Temperature	°C	Homemade		automatic

What does it represent?

You can package it all in the Project File...

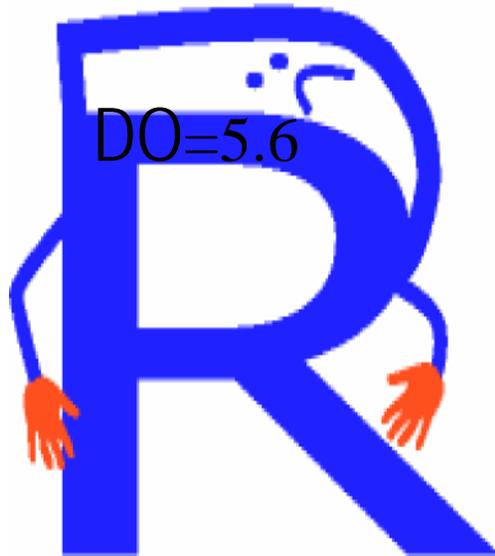


Then transfer only selected elements to the Central Database



And let your monitoring data speak for themselves!

I *am* the worst case scenario



I have been collected in a stagnant ditch at 14:00

