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Sorting through the QAPP: The Importance of ELAP and Data Integrity

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So you want some data for your lake....



Why?



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Why collect or gather data?

NYSDEC DATA USES

Education

Public notifications

Identifying lake problems

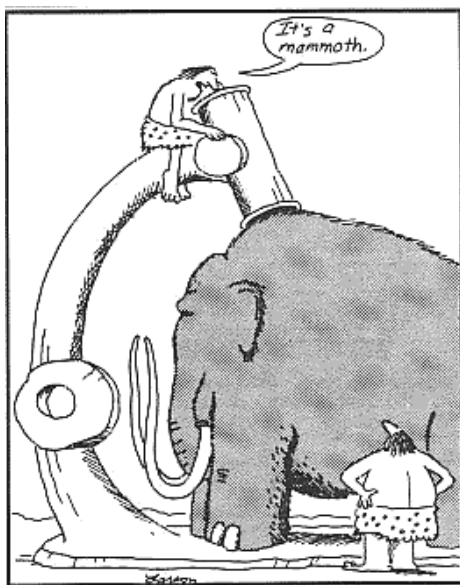
PWL / Assessments

Permitting / Compliance

Modeling / TMDLs

Research / NNC

Inventories



Early microscope

PUBLIC DATA USES

Education

Informing neighbors

Identifying lake problems

Supporting lake management

Supporting lake uses

Evaluating actions



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Quality in = quality out (garbage in = garbage out)

What is GIGO?



All data uses should be supported by quality data

The highest data uses require the highest quality data

Questions about data integrity (input) lead to questions about the use of these data (output)

Environmental Information Integrity

**Representative
Comparable
Complete**

**Reproducible
Defensible**



**Documented
Quality**

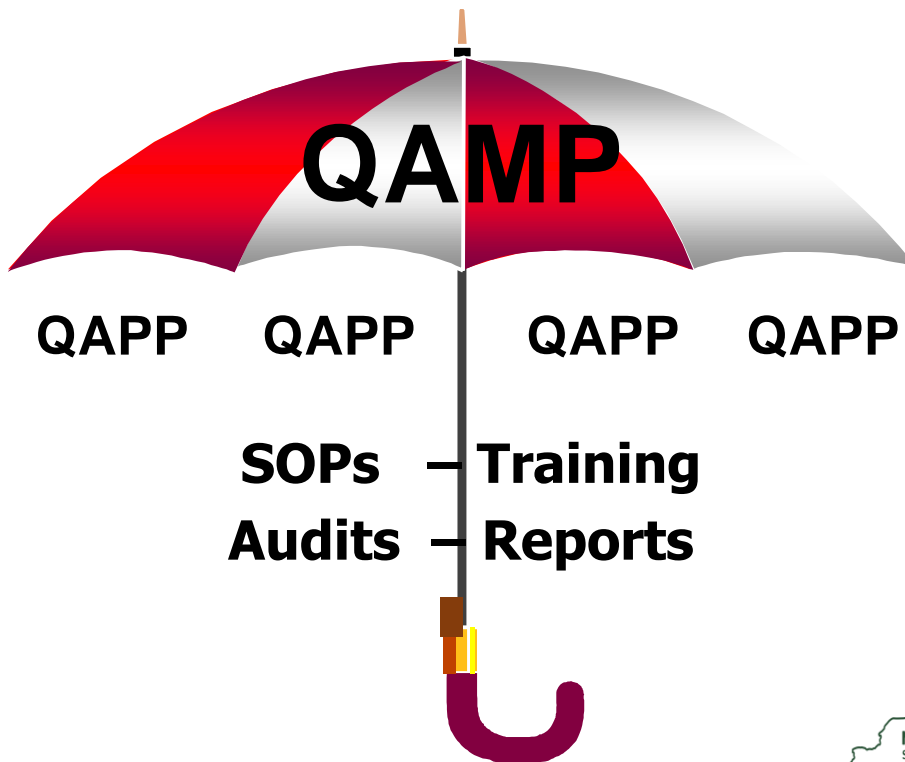
**Transparent
Unbiased**

Indicators



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Systematic Planning Tools



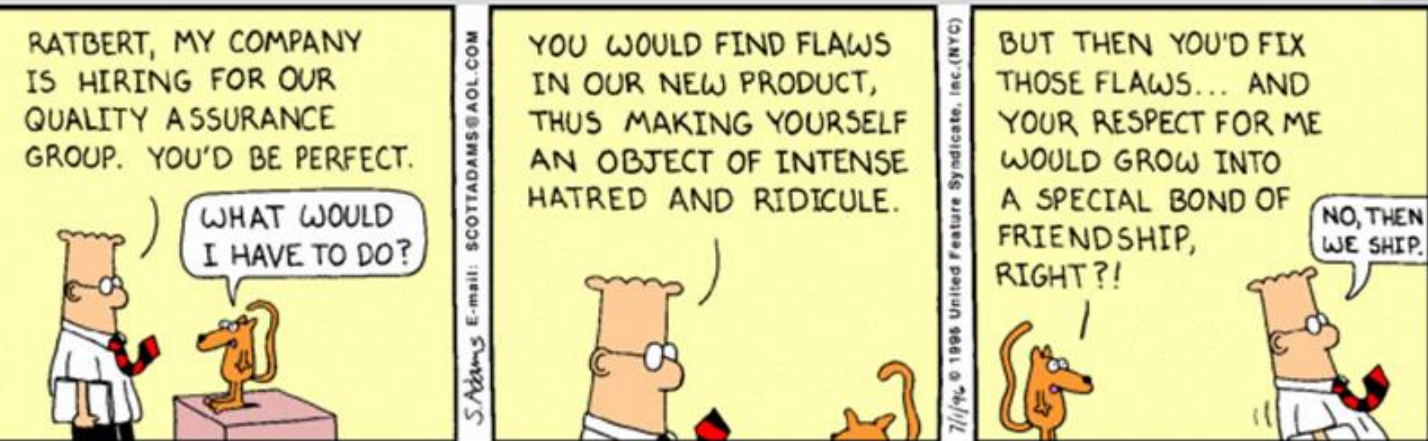
QAMPs vs QAPPs

QAMP = Quality Assurance Management Plan

The QAMP documents how an organization structures its quality system, defines and assigns quality assurance and quality control responsibilities

QAPP = Quality Assurance Project Plan

The QAPP integrates all technical and quality aspects of a project, including planning, implementation, and assessment



QAPPs need to be...

Clear

Concise

Specific

Kept Current

Accessible

Followed



Data Quality Indicators

DQOs – DQIs - Acceptance Criteria

Precision

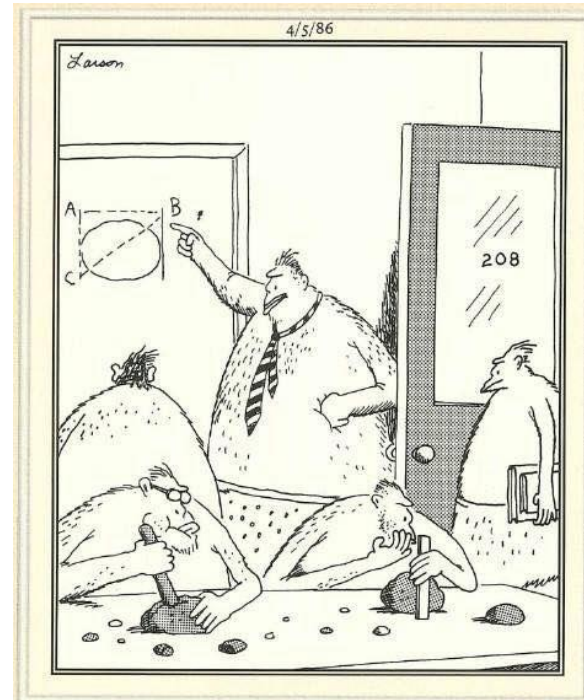
Bias

Representativeness

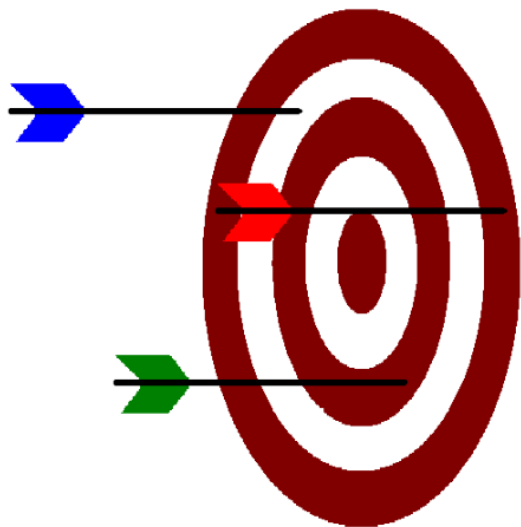
Comparability

Completeness

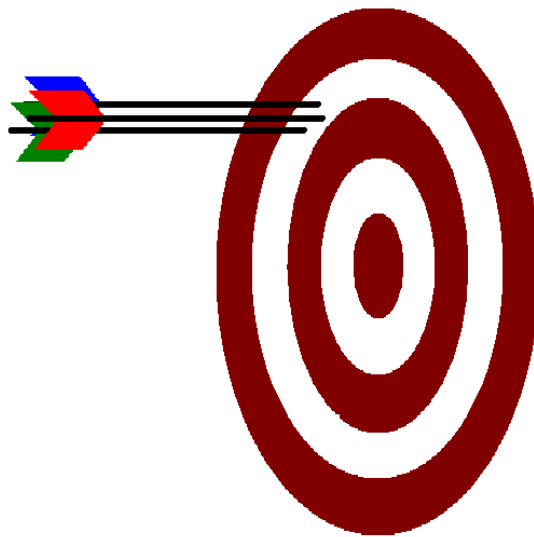
Sensitivity



Precision and Bias

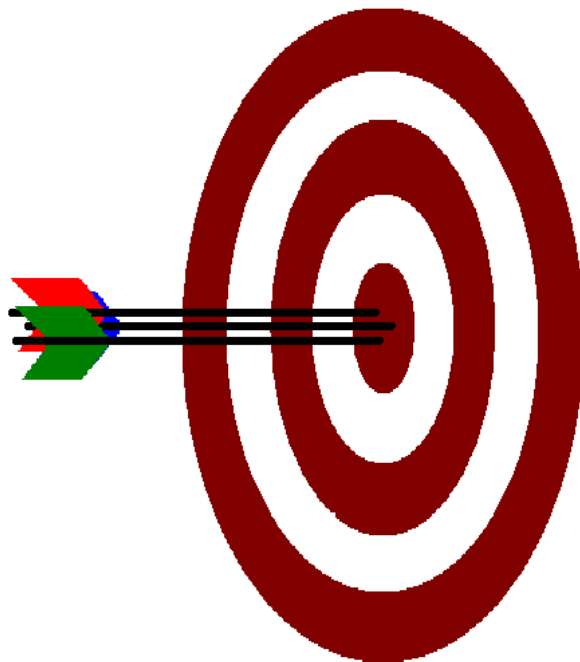


Low Precision



High Bias

High Precision + Low Bias = Accuracy



Fortunately....

Many data collectors, labs, data analysts, and data users maintain high levels of data integrity to support their data uses

Some measures of data integrity may not account for high quality data collected, analyzed, or used by some NYS lake communities, researchers, or laboratories

Each data set should be evaluated against its intended use



So why are we talking about this?

Public Health Law: 502 (1984)

No environmental laboratory may perform any examination on samples collected in the state of New York for which the commissioner issues a certificate of approval for such examination unless the laboratory has been issued such certificate of approval.

No state agency, authority, county, city, ... other political subdivision of the state shall contract with any laboratory for laboratory examinations for which the commissioner issues certificates of approval pursuant to subdivision three of this section, unless such laboratory has been issued such certificate



In lots of words.....what does that mean...?

Environmental Laboratory:

is any facility that examines or is available for the examination of samples or specimens including, but not limited to: air, stack emissions, water, wastewater, surface water, ground water, recreational waters, swimming pools, leachate, land runoff, solid waste, hazardous waste, soil, sediments and vegetation, as well as any substance that could contribute to the pollution of or that could be contaminated by material contained in such samples or specimens. Such examinations shall be limited to the qualitative or quantitative determinations of the biological, chemical, radiochemical or physical characteristics of such samples or specimens for the purposes of public or personal health protection or the protection of the environment or natural resources. It shall not include non- chemical testing associated with residential water softeners and residential swimming pools.



Environmental Laboratory:

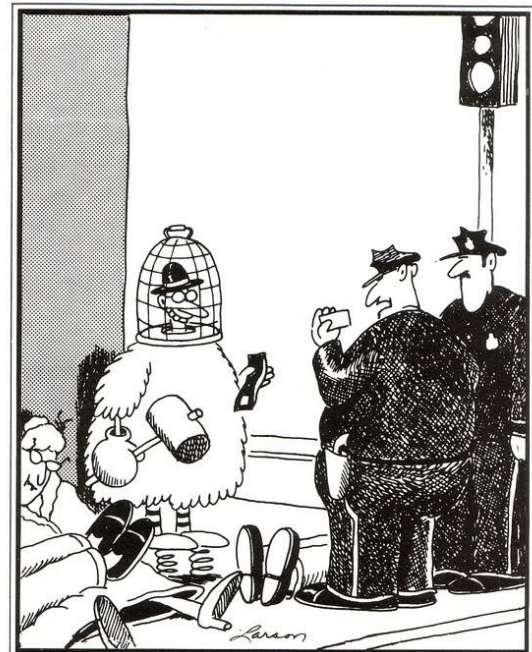
is any **facility** that examines or is available for the examination of **samples** or specimens including, but not limited to: air, stack emissions, **water**, wastewater, **surface water**, ground water, **recreational waters**, swimming pools, leachate, land runoff, solid waste, hazardous waste, soil, **sediments** and **vegetation**, as well as any substance that could contribute to the pollution of or that could be contaminated by material contained in such samples or specimens. Such examinations shall be limited to the qualitative or **quantitative** determinations of the **biological, chemical, radiochemical or physical characteristics** of such samples or specimens for the **purposes of public or personal health protection or the protection of the environment or natural resources**. It shall not include non- chemical testing associated with residential water softeners and residential swimming pools.



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Certificates of Approval cover the examinations of samples collected in NYS within the following categories or matrices (i.e. fields of accreditation (FOA)):

- **Drinking (Potable) Water (includes Dialysis Water)**
- **Non-Potable Water**
- Solid and Chemical Materials/
Hazardous Waste (includes Asbestos)
- Air and Emissions
- Medical Marijuana



"Well, I'll be darned . . . I guess he does have a license to do that."

What does certification mean?

Labs and methods are certified through the NYSDOH Environmental Lab Approval Program (ELAP)

Method certification:

- Demonstrates capability to analyze samples in accordance with the quality requirements of the method certified

Lab certification:

- ISO 9000 lab follows a set of international standards on quality management and quality assurance.
- Following the standards set for quality system elements helps ensure the lab is capable of producing data that is defensible, reproducible, unbiased and scientifically valid
- Extensive (1088 question) checklist



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ELAP? or no ELAP?

Total Phosphorus and SRP
Nitrogen series except TN
Bacterial indicators
Alkalinity
Chloride
Microcystins (ELISA)
Metals
Anions/Cations
Lab conductance

Field measurements
 Secchi disk
 Field probes
 Biological identifications
Soluble phosphorus
Total nitrogen
Chlorophyll a
Microcystins (LCMS/MS)?
Other cyanotoxins



What does that mean for DEC / NYS?

Grants/state funding

Education

Informing lake residents, neighbors, public
(notifications) about lake conditions

Identifying lake problems

PWL/ Assessments / TMDLs

Permitting and Compliance

Supporting lake management

Research- NNC development

Inventories

**AT PRESENT, DEC LEGAL
HAS DETERMINED THAT
ALL NEW YORK STATE
FUNDING PROGRAMS
AND DATA USES BY
NYSDEC ARE SUBJECT TO
ELAP CERTIFICATION AND
OPERATION UNDER A
QAPP (or QAMP).**

**“Regulatory” or
“Non regulatory”**



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DOW Standard ELAP Contract Language:

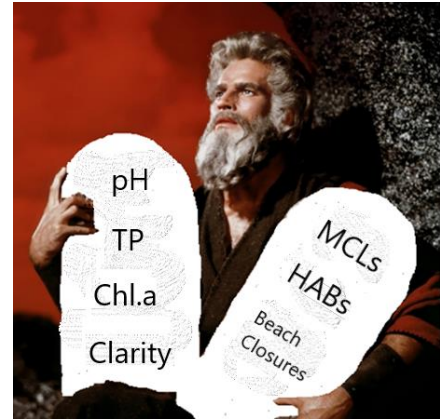
For proposed projects that have a water quality sampling component, NYS Public Health Law, Section 502, mandates the use of a NYS DOH ELAP certified lab for the analysis of environmental samples collected within NYS. Additionally, such projects shall include a Quality Assurance Project Plan (QAPP)



Assessment criteria

Rulebook for evaluating lake uses

Compares lake data to water quality and guidance values



Non ELAP

Water clarity: 4 feet to support safe swimming
(NYS Public Health Law)

Phosphorus: 20 ppb to protect aesthetics and recreational uses
(DEC guidance Value)

Chlorophyll a: 4-6 ppb to prevent DBPs, 10-15 ppb to reduce blooms
(draft DEC guidance value)

pH: between 6.5 and 8.5 to support aquatic life
(DEC water quality standard)

ELAP

Labs certified for one or more of these indicators for NYS monitoring programs

New York State Department of Health (drinking water toxins and beach sampling lab)

Upstate Freshwater Institute (CSLAP sampling lab)

ALS Global (DEC lake monitoring contract lab)

Some commercial and academic labs (CSI, Stony Brook,....)

SUNY ESF, Stony Brook, FLI,... (pending) (toxin testing, other)



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Issues with excluding non-ELAP data

- Many waterbodies analyzed with non ELAP labs

- Some indicators need means for evaluating quality measures

 - Non ELAP indicators at ELAP labs

 - Non ELAP indicators at non ELAP labs

- Some labs (academic and research) employ other quality measures

 - Out of state certification (NELAC)

 - Round robin testing

 - Peer review of sample collection, lab analysis,...

- ELAP certification does not automatically = highest quality

- Cyanotoxins- individual congeners lost if non ELAP labs excluded

- Significant increase in cost for data analysis

- Data usability assessment reports (DUARs)

 - Very time consuming way for DEC to review and accept data



Why we do it

NYSDOH Certification Program provides standardization and oversight to “assure” high quality data

Regulatory uses require highest quality data

NYS (DEC) decisions based on data have significant legal, fiscal and environmental consequences

If ELAP certification is not used, this responsibility would fall on NYS DEC



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What does that mean for you?

PUBLIC DATA USES

Education

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Each lake data user (lakefront resident, lake association, academic institution...) may consider using any data source if it meets their quality objectives

Agencies use of this data is governed by existing and future interpretation of PHL 502

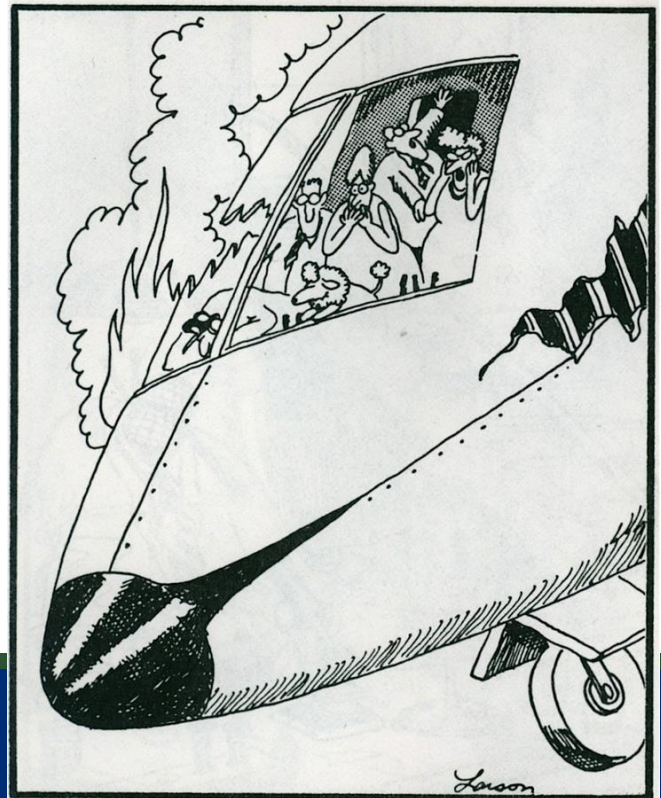


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Questions?



Suddenly, amidst all the confusion, Fifi seized the controls and saved the day.