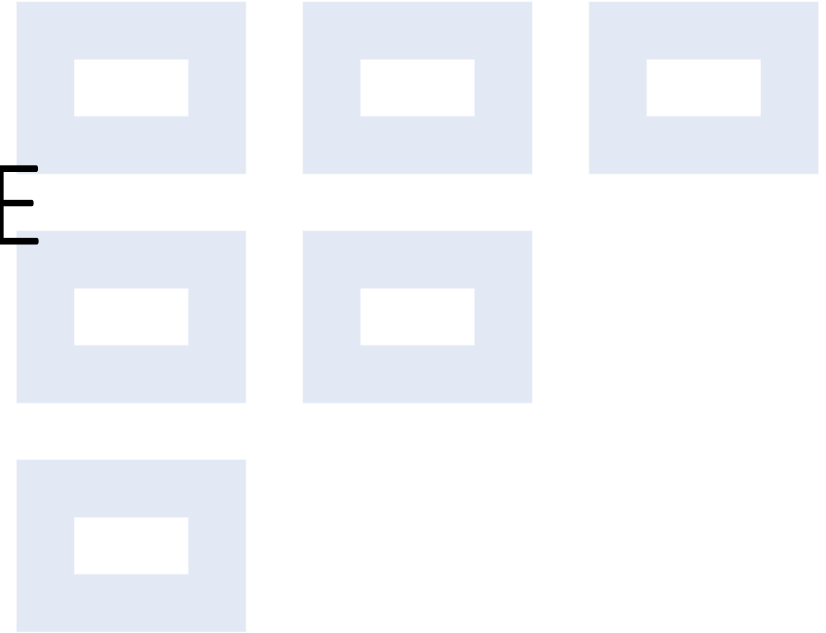# QUALITY ASSURANCE TRAINING DEVELOPMENT

Melissa Morris

Assistant Deputy Director - Office of Information Management and Analysis
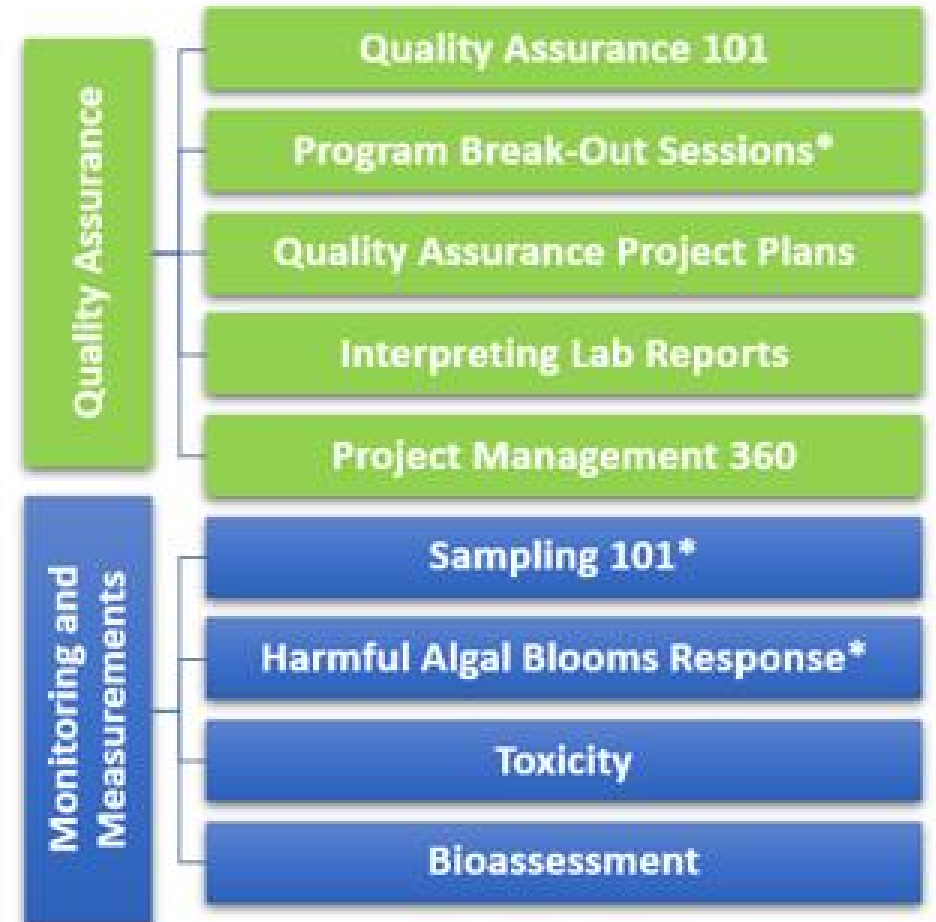
(916)-341-5868   melissa.morris@waterboards.ca.gov

Quality in a service or product is not what you put into it. It is what the client or customer gets out of it.

-Peter Drucker

Training Development

☐ **Topics**

- ☐ Quality Assurance 101
- ☐ Regulations and Drivers
- ☐ QA Project Planning
- ☐ Lab Report Interpretation
- ☐ **Project Management 360**
- ☐ Sample Collection and Handling
- ☐ Data Literacy & Science

Quality Assurance
- Quality Assurance 101
- Program Break-Out Sessions*
- Quality Assurance Project Plans
- Interpreting Lab Reports
- Project Management 360

Monitoring and Measurements
- Sampling 101*
- Harmful Algal Blooms Response*
- Toxicity
- Bioassessment

Training Development

✓Project Management Lifecycle
- ❑ Plan
- ❑ Document
- ❑ Implement
- ❑ Reflect
- ❑ Report

From Data Planning through Data Use!

Training Development

✓ Audience Matters
   ❖ Needs
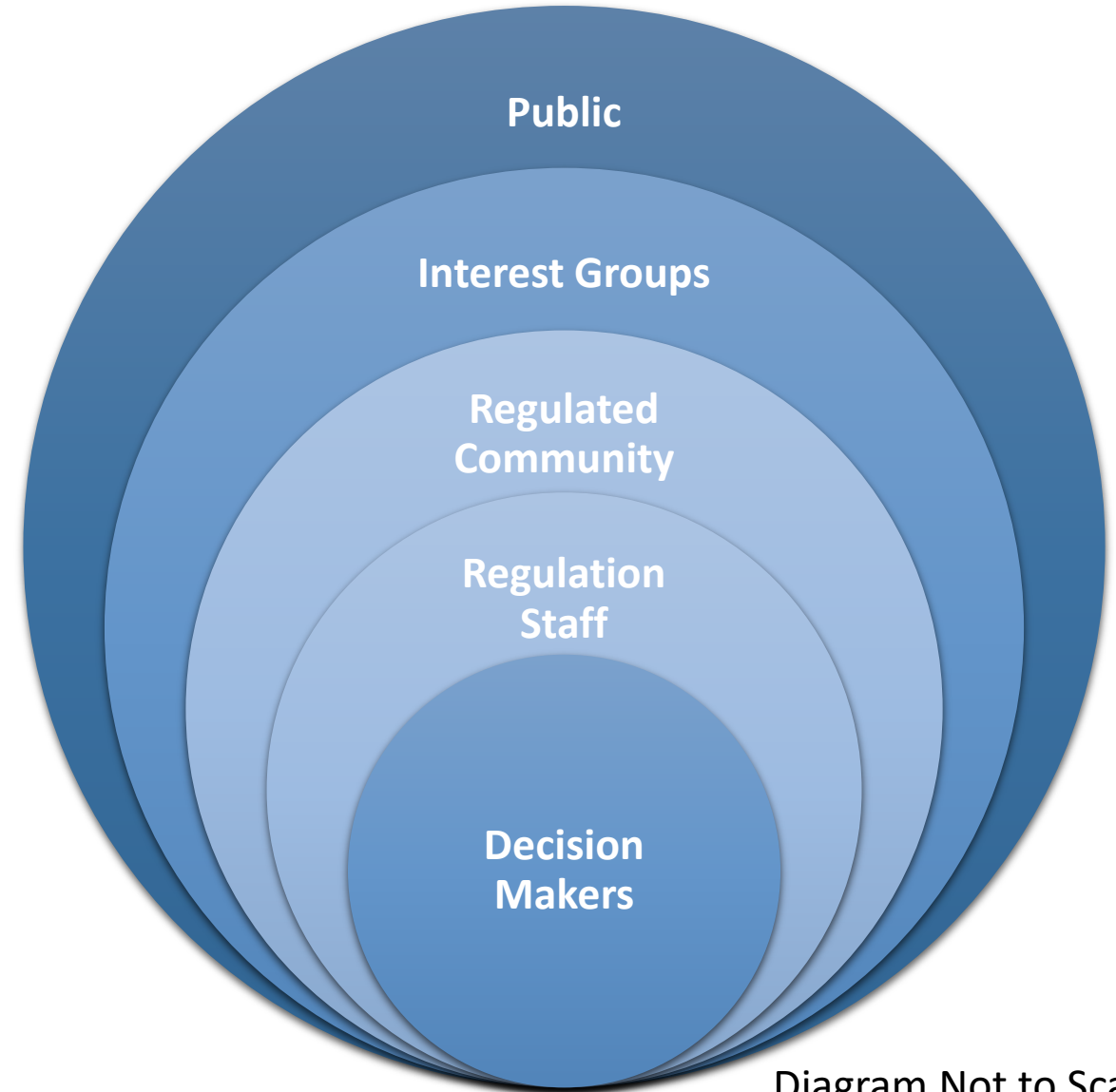   ❖ Interests
   ❖ Values
   ❖ Population
   ❖ Location

Who is your #1 Customer?

Public

Interest Groups

Regulated Community

Regulation Staff

Decision Makers

Diagram Not to Scale ☺

Why QA Training Matters….

A CEDEN QA Case Study

California Environmental Data Exchange Network

www.CEDEN.org

"a central location to find and share data about California's waterbodies"

CEDEN QA Case Study

Did you know that CEDEN records quality assurance activities?

Indirect Metadata

- ❏ QAPP Names
- ❏ Collection Methods
- ❏ Analytical Methods
- ❏ Project Names

Direct Metadata

- ❏ QA Codes
- ❏ Batch Verification Codes
- ❏ Compliance Codes
- ❏ Dates
- ❏ QC Sample Records!!

CEDEN QA Case Study

Tool Development

❑ **CEDEN Review Categorization Script**

    ❑ Publish to Open Data Portal

    ❑ Make Data Quality Accessible
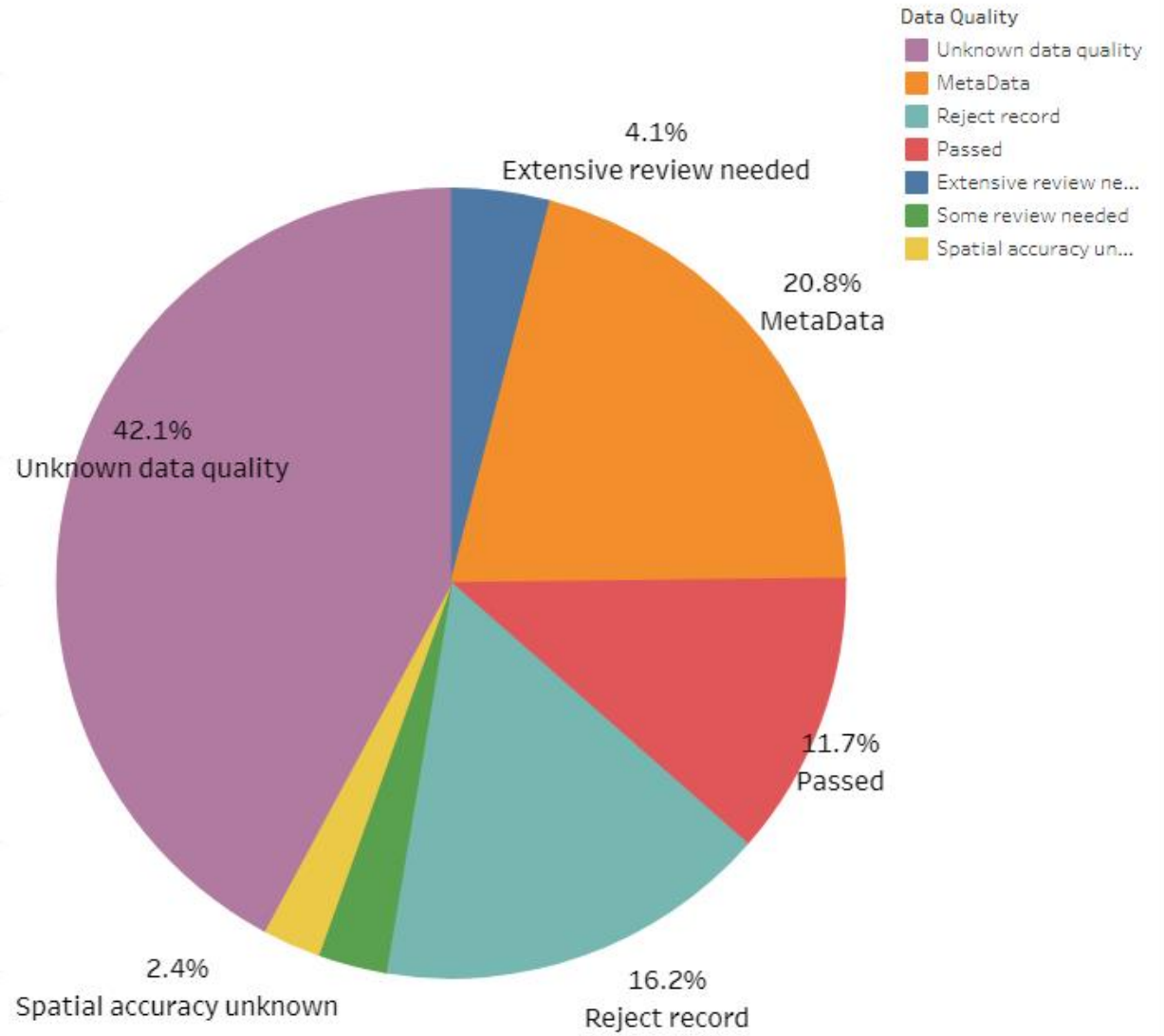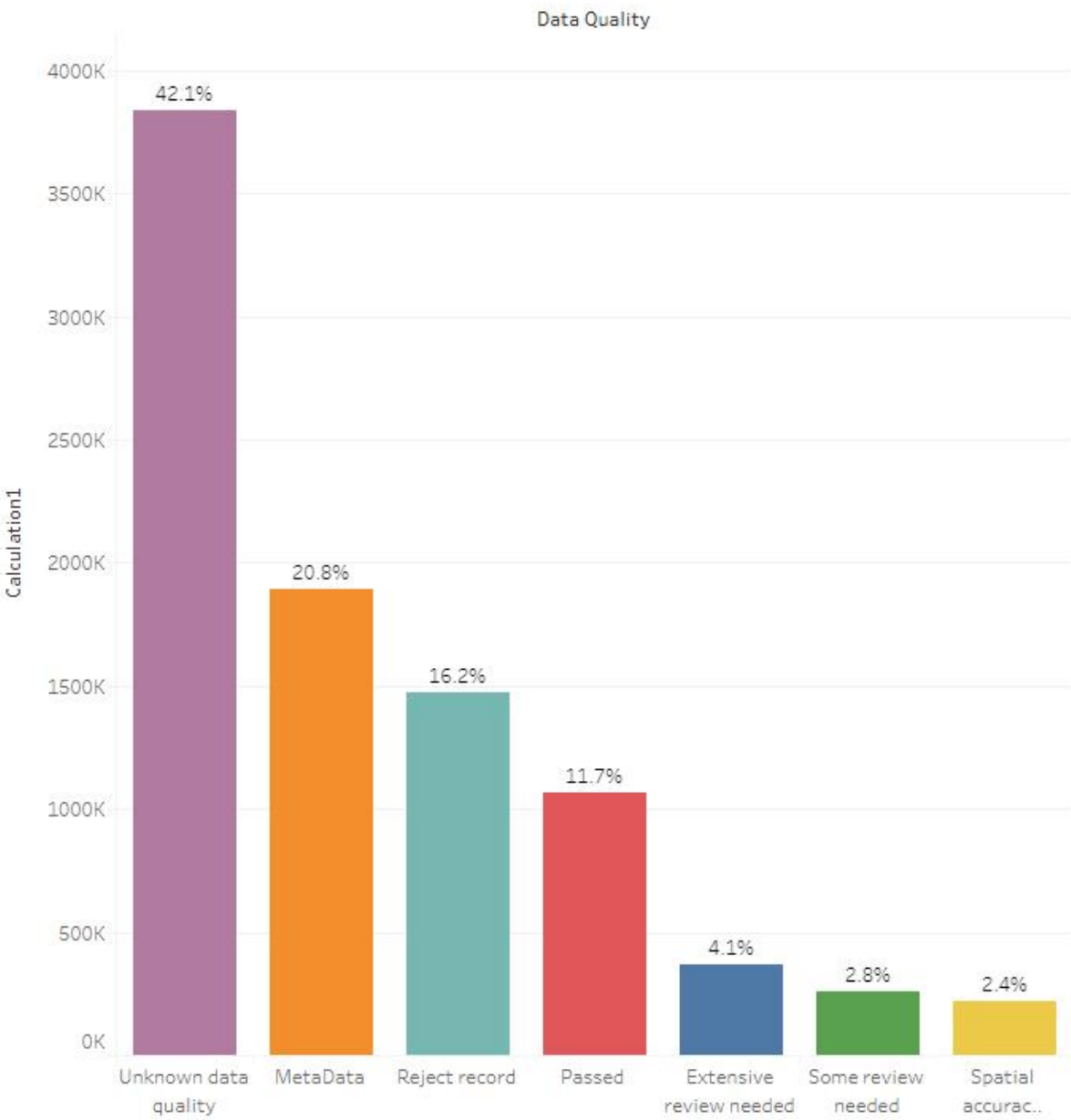
    ❑ Quickly Screen Data for Decisions and Dashboards
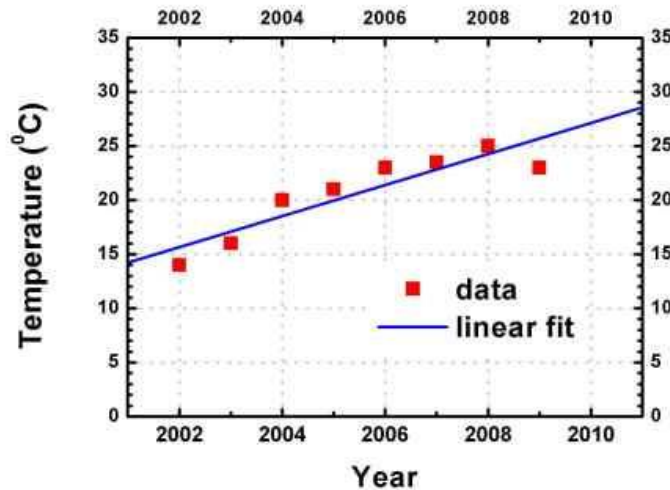
CEDEN DATA REVIEW CATEGORIES July 2018

Tier	Tier Description
0	Metadata- QC Records only. Not measurements of environmental conditions.
1	Passed - Data passed all QC checks
2	Some review needed -Data did not pass minor QC checks, some effort needed to review and defend data if used.
3	Spatial Accuracy Unknown- Data missing spatial datum information, data should not be used for fine scale spatial analysis.
4	Extensive review needed - Data did not pass QC some critical checks, high level of effort needed to defend data if used.
5	Data of Unknown Quality - Data was not reviewed by the project. Data will need review before use.
6	Reject Data - Data was rejected by the project or data did not pass all critical QC checks. Data deemed unusable.
7	Error in Data

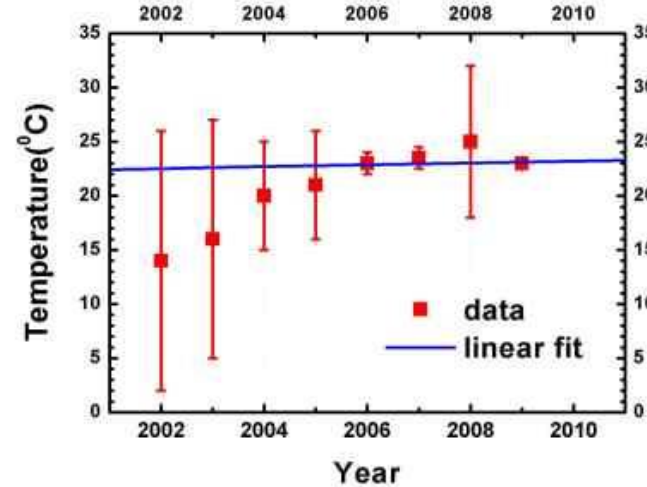| QACode	QAName	What does this mean?	Recomended Use (include, estimated, exclude, rule)	Tier
D	EPA Flag - Analytes analyzed at a secondary dilution	Data are OK, No Additional Steps Needed	Include	1
EUM	LCS is outside of control limits	High Level Effort Needed to Defend	Estimated	4
GB	Matrix spike recovery not within control limits	Data are likely OK, Additional Review Needed	Estimated	2
GN	Surrogate recovery is outside of control limits	High Level Effort Needed to Defend	Estimated	4
H	A holding time violation has occurred.	Data are likely OK, Additional Review Needed	Estimated	2
IL	RPD exceeds laboratory control limit	High Level Effort Needed to Defend	Estimated	4
J	Estimated value - EPA Flag	Data are OK, No Additional Steps Needed	Estimated	2

CEDEN DATA REVIEW CATEGORIZATION July 2018

ERROR

Conclusion: Temperature is going up!   Conclusion: Ugh...I have bad data!

"The uncertainty in the magnitude of a measured quantity is more important than the value itself"
- Ad Lagendijk, Ph.D, University of Twente Enshced, Netherlands.
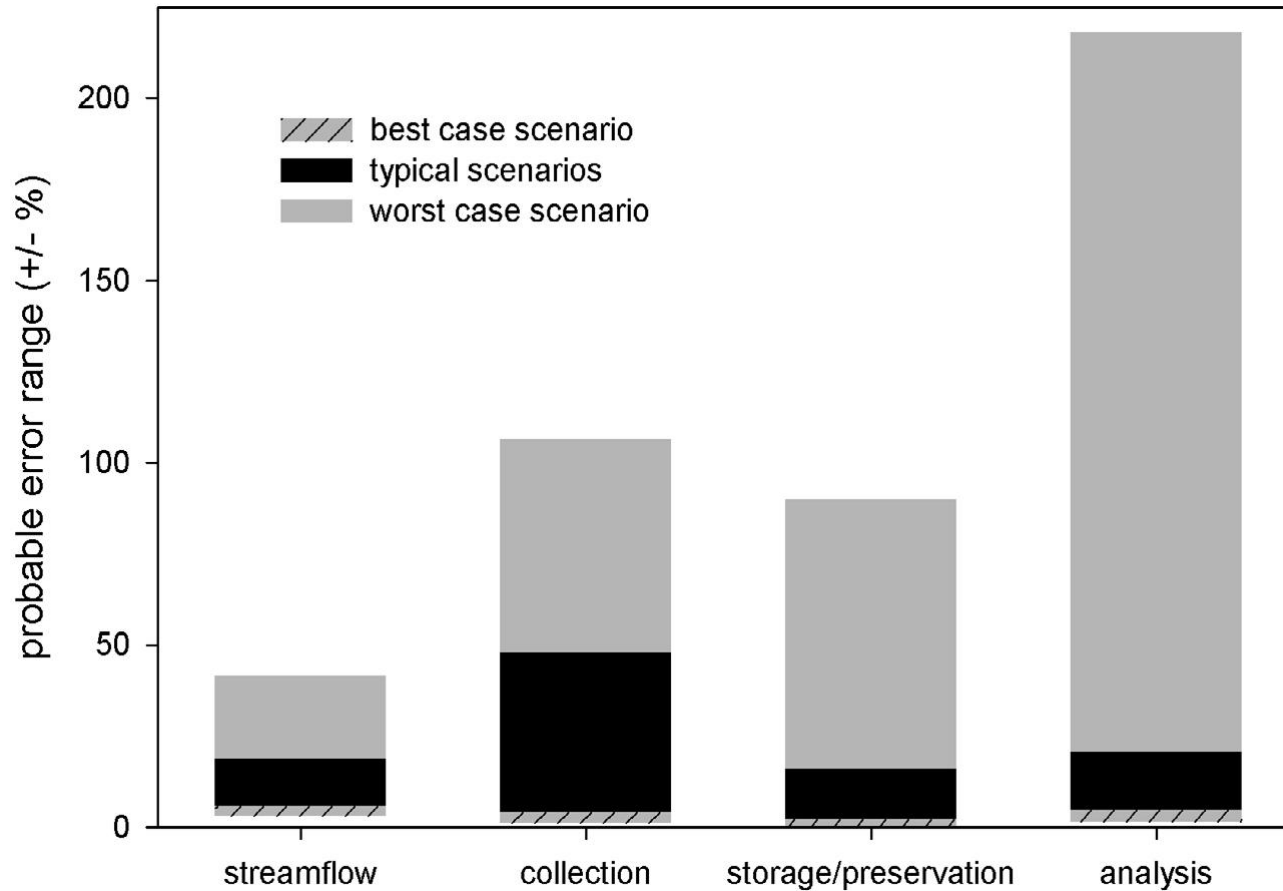
How much error are we talking about?

Figure 1. Comparison of probable uncertainty contributed by each procedural category for best case, typical, and worst case "data quality" scenarios; data presented were averaged across constituent type.

From: Harmel, R. D., Et al. 2006. Cumulative Uncertainty in Measured Streamflow and Water Quality Data For Small Watersheds. *Trans. ASABE* 49(3) 689-701.

OPEN DISCUSSION

So how can we improve?

❑ **Better Training Modules/Formats**

❑ **Make Information More Accessible**

❑ **Better Data Submission Tools**

❑ **Other Ideas?**

THANK YOU

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