DHS/NIST Virtual Workshop: Standards to Support an Enduring Capability in Wastewater Surveillance for Public Health

Overview and Goals for the 2021 SWWS Workshop

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June 14, 2021

National Institute of Standards and Technology
U.S. Department of Commerce

Topics

- Background
- Goal and Expected Outcome
- Agenda Overview
- Introduction to Standards and Measurement Assurance Concepts
- Guiding Questions

Wastewater Surveillance and COVID-19

nature

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nature › news › article

NEWS | 10 May 2021

The myriad ways sewage surveillance is helping fight COVID around the world

Wastewater tracking was used before the pandemic to monitor for polio and illicit drug use, but interest in the field and its applications has now ballooned.

Freda Kreier

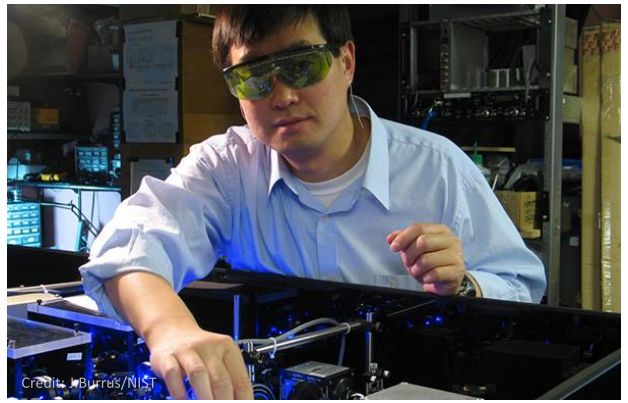
The National Institute of Standards and Technology

Part of the U.S. Department of Commerce

Developing standards to support international trade and commerce

The U.S. National Metrology Institute (NMI)

NIST MISSION: To promote U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology in ways that enhance economic security and improve our quality of life



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NIST AT A GLANCE

Industry's National Laboratory

3,400+
FEDERAL EMPLOYEES

5
NOBEL PRIZES

2 CAMPUSES
GAITHERSBURG, MD [HQ]
BOULDER, CO

3,500+
ASSOCIATES

10
COLLABORATIVE INSTITUTES

400+
BUSINESSES USING NIST FACILITIES

14
NATL OFFICE FOR MANUFACTURING INSTITUTES

51
MANUFACTURING EXTENSION PARTNERSHIP CENTERS

U.S. BALDRIGE PERFORMANCE EXCELLENCE PROGRAM

Unique NIST Products and Services

Million-Pound Deadweight Machine

Credit: NIST

1,200 Standard Reference Material (SRM) products

100 Standard Reference Data (SRD) products

600 measurement services

Every year:

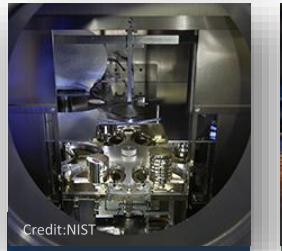
32,000 SRM units sold

13,000 calibrations and tests

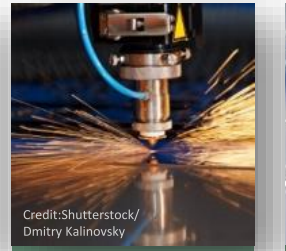
800 accreditations of testing and calibrations laboratories

NIST Laboratory Programs

Material Measurement Laboratory



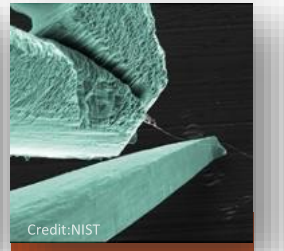
Physical Measurement Laboratory



Engineering Laboratory

Information Technology Laboratory

Communication Technology Laboratory



Center for Nanoscale Science and Technology

NIST Center for Neutron Research

June 2020 Webinar

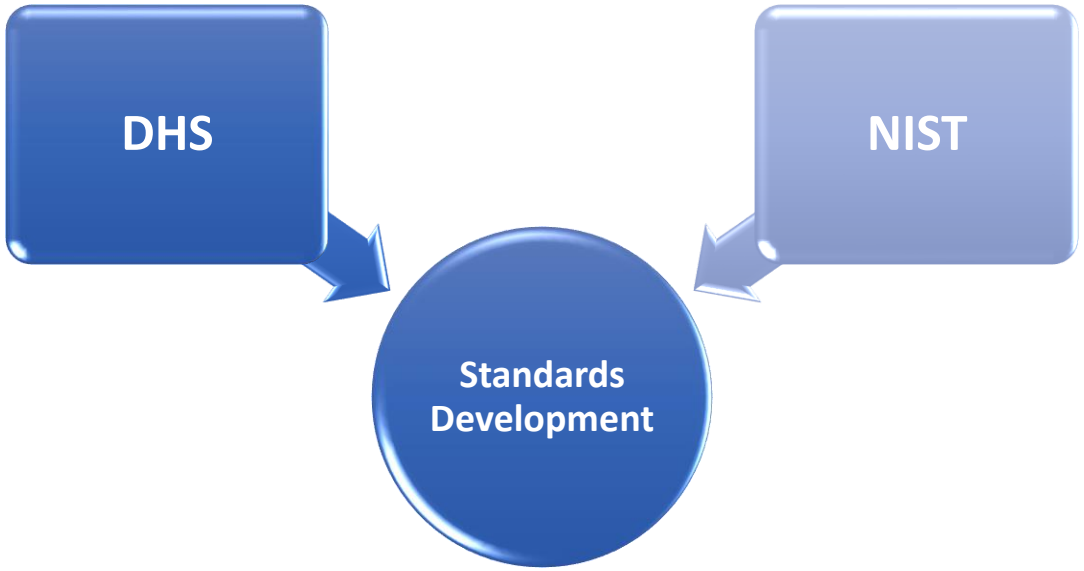
- Explored challenges associated with measurement of SARS-CoV-2 in human stool and wastewater
- Launched exchange of knowledge between NIST and stakeholders on standards needs to support detection and quantification of SARS-CoV-2 in fecal microbiome and wastewater matrices

- Highlighted the need for tools/approaches including:
  - Protocol harmonization to improve data comparability
  - Guidelines for establishing sampling plans to decrease technical variability
  - Reference materials that account for the heterogeneity of the wastewater matrix
  - Data sharing and use of metadata to improve robustness of statistical data
- **Proposed that NIST could develop RMs and/or guidance documents on the use of control materials to support confidence in test results**

DHS-NIST Collaboration

- Develop standards that support development of an enduring capability in wastewater surveillance
- Stakeholder input is critical

SWWS Workshop!!



Workshop Goal

To **identify and prioritize standards needs** and technology/measurement gaps

and **propose a path forward to develop standards**

that **enable an enduring capability** in wastewater surveillance *(beyond COVID-19)*

that provides **high confidence**, representative, comparable results

to **inform public health and safety decisions** across the nation.

Workshop Expected Outcome

Stakeholder input from the workshop will

- **inform standards development activities**, potentially including consensus-based documentary standards and reference materials
- **ensure that efforts are fit for purpose** and aligned with the needs of the community

Workshop output will include a **publication describing the workshop findings** (workshop report and/or peer-reviewed article)

Wastewater Surveillance (WWS)

SAMPLING

TEST METHODS

DATA REPORTING AND ANALYTICS

USE OF DATA

Technical Program

Days 1 & 2

Day 1: Monday, June 14, 10 AM to 3 PM (EDT)
Day 2: Tuesday, June 15, 10 AM to 3 PM (EDT)
Wastewater Surveillance - Lessons Learned, Challenges Remaining, Potential Roles for Standards

<u>Learning Objectives:</u>
At the conclusion of Days 1 and 2, participants will be able to:

- Give examples of the benefits of wastewater surveillance based on experiences from the current pandemic
- Recall critical challenges that hinder comparable, high quality data for the various steps in wastewater surveillance
- Summarize potential roles for standards in wastewater surveillance

Technical Program

Day 3

Day 3: Friday, June 18, 10 AM to 3 PM (EDT)

Next Steps Toward Standards to Help Build and Sustain an Enduring Wastewater Surveillance Capability

Learning Objectives:

At the conclusion of Day 3, participants will be able to:

- Describe key characteristics of an enduring capability from various perspectives
- List potential next steps toward standards to support this capability
- Determine where they would like to participate in future standards development activities

Agenda Overview

DAY 1: Mon, June 14

SWWS 101: Introduction to WWS

SWWS 201: Sampling

DAY 2: Tues, June 15

SWWS 202: Testing Methods

SWWS 203: Data Reporting and Analytics

SWWS 204: Role of Standards in Supporting the Use of WWS Data

3-4 PM: Virtual Poster Session

DAY 3: Fri, June 18

SWWS 301: Building an Enduring Capability

Concurrent Breakout Sessions:

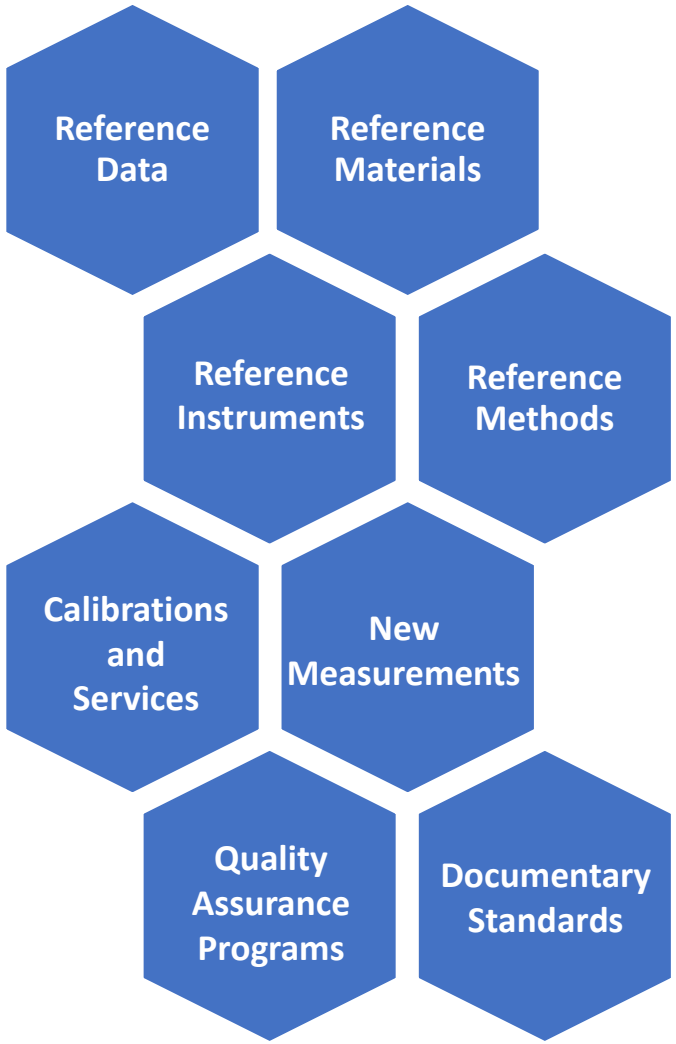
SWWS 302: Methods and Data Comparability

SWWS 303: Reference Materials

SWWS 304: Documentary Standards

SWWS 401: Breakout Summaries, Closing Remarks

The Many Forms of Standards



There is no pre-conceived notion of what is the "right standard" to address the needs of the WWS community

Reference Materials (RMs) are homogeneous, stable materials well-characterized for one or more chemical and/or physical properties

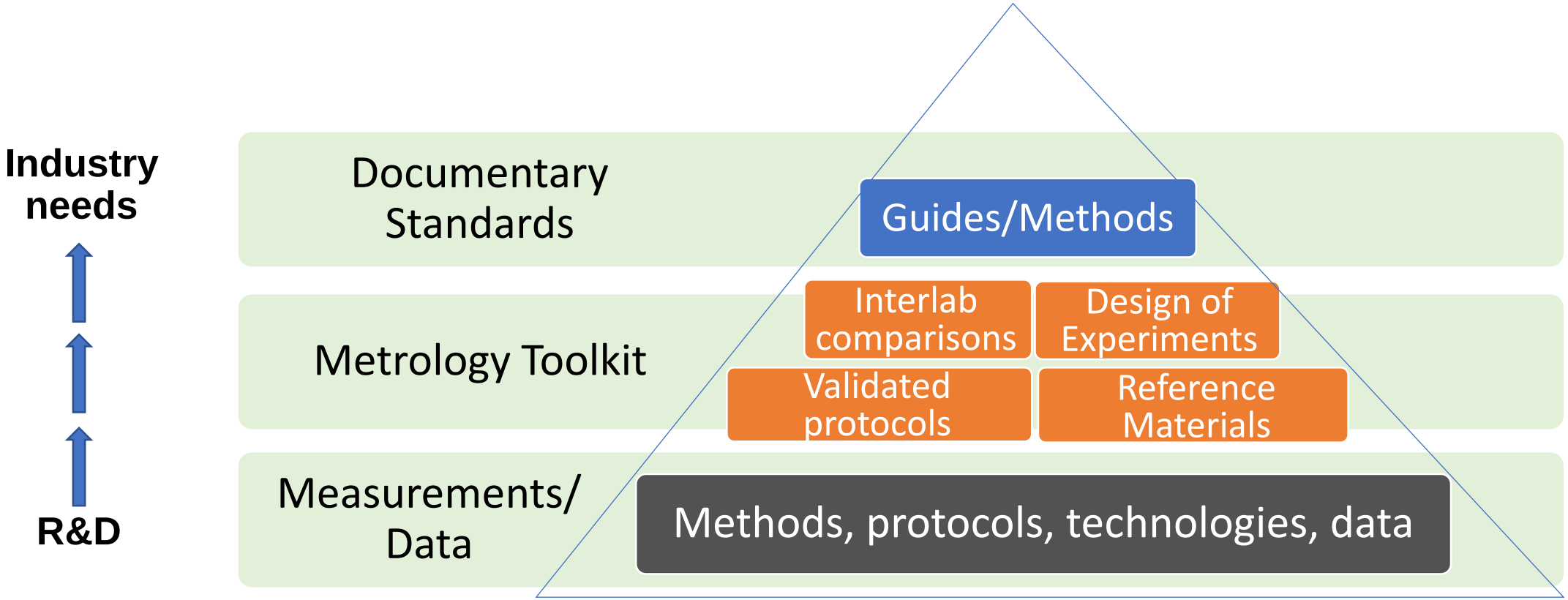
Wastewater RMs?
Target RMs?

Documentary Standards routinely specify definitions, classifications, delineation of procedures and processes, material and product specifications, test methods and sampling procedures

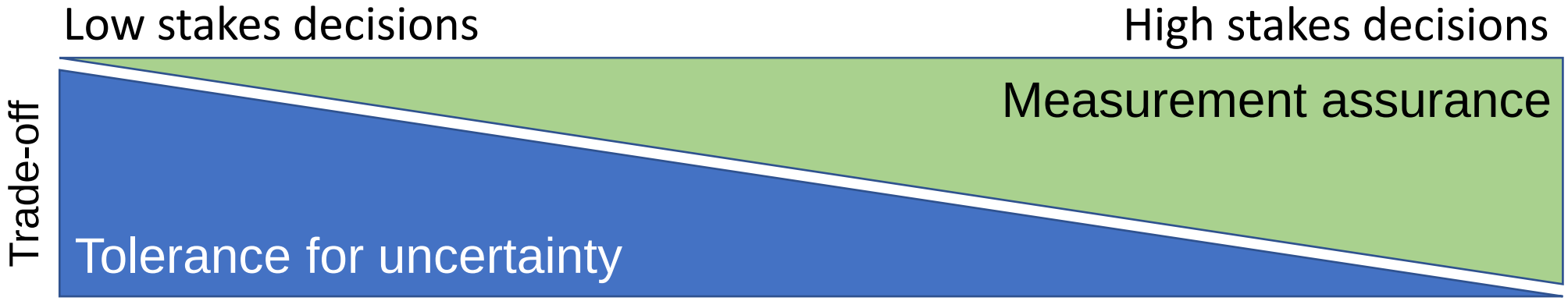
Standard guidance documents?

Measurement Assurance

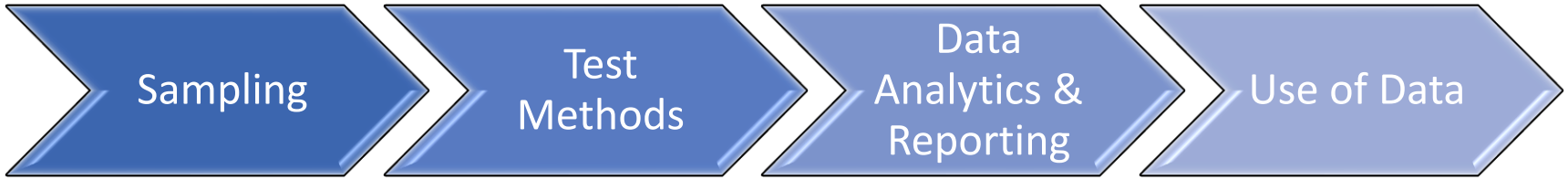
- Provides a known level of confidence to inform decision making
- Is based on supporting data and metadata to provide credibility
- Leads to accelerated technology development and translation



The Trade-Off



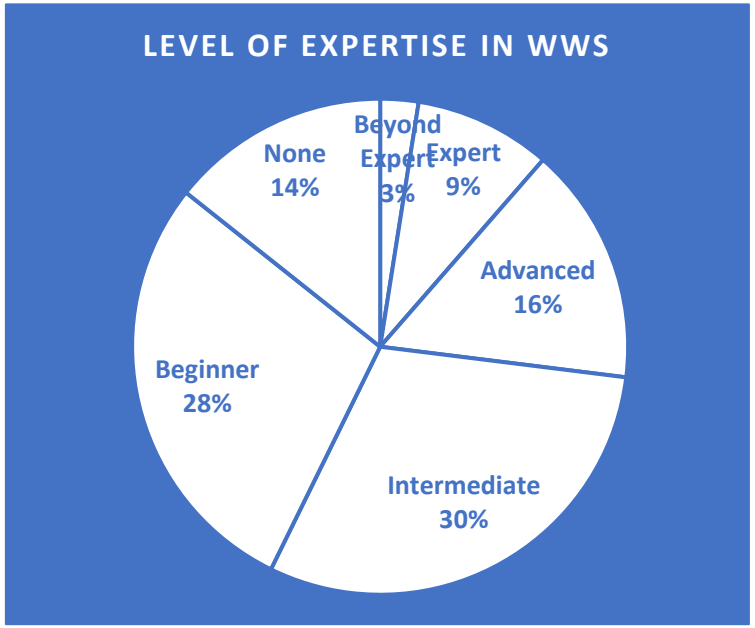
General Workflow for Wastewater Surveillance

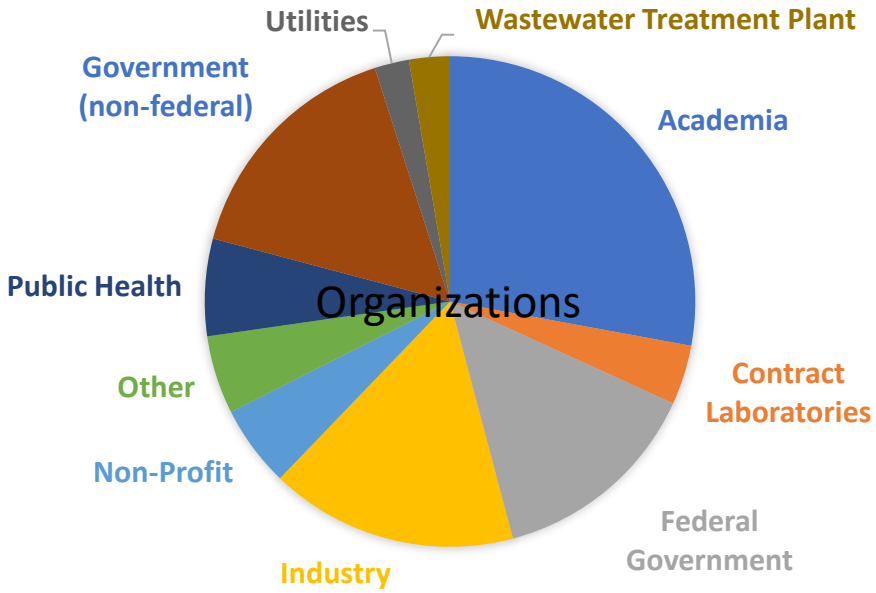


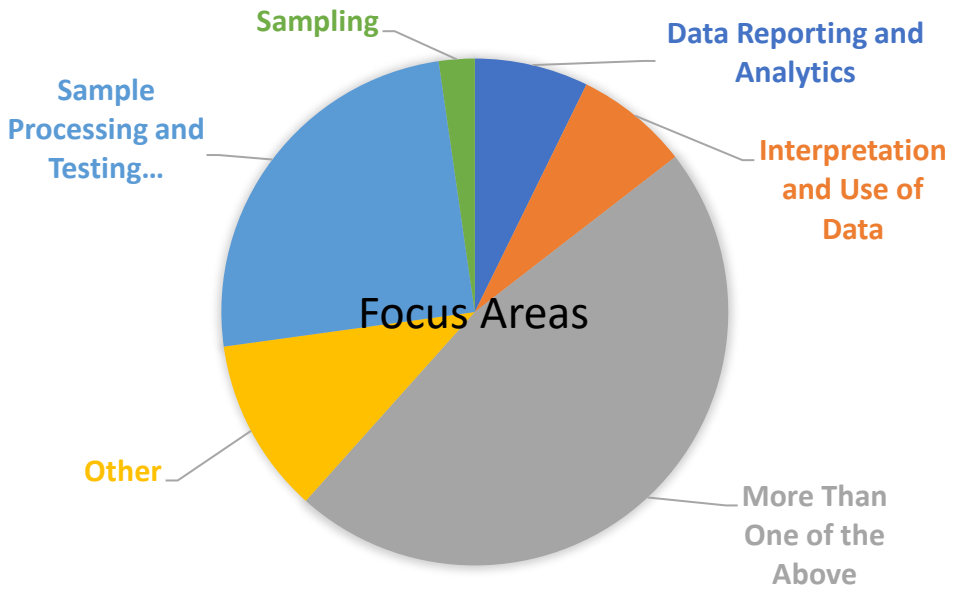
Incorporating measurement assurance strategies into each step will increase confidence in results

Workshop Registrants

Nearly 500 registrants from 28 countries







2021 SWWS Workshop
Department of Homeland Security

NIST National Institute of Standards and Technology U.S. Department of Commerce

Guiding Questions

- What methods/techniques/measurement technologies are currently being used in your area of WWS?
  - How do they successfully contribute toward comparable, high quality data, results, and/or decisions?
  - How do they compromise efficiency and reduce confidence in data, results, and/or decisions?
- What is needed to improve comparability and confidence in data and results?
- What are the barriers to filling these needs?
- How could standards help address the needs and overcome the barriers? What standards would you recommend?