



Water Data Integration

Dwane Young

US EPA Office of Water



What can you tell me about my water?

Is it safe to drink?

Is there enough water?

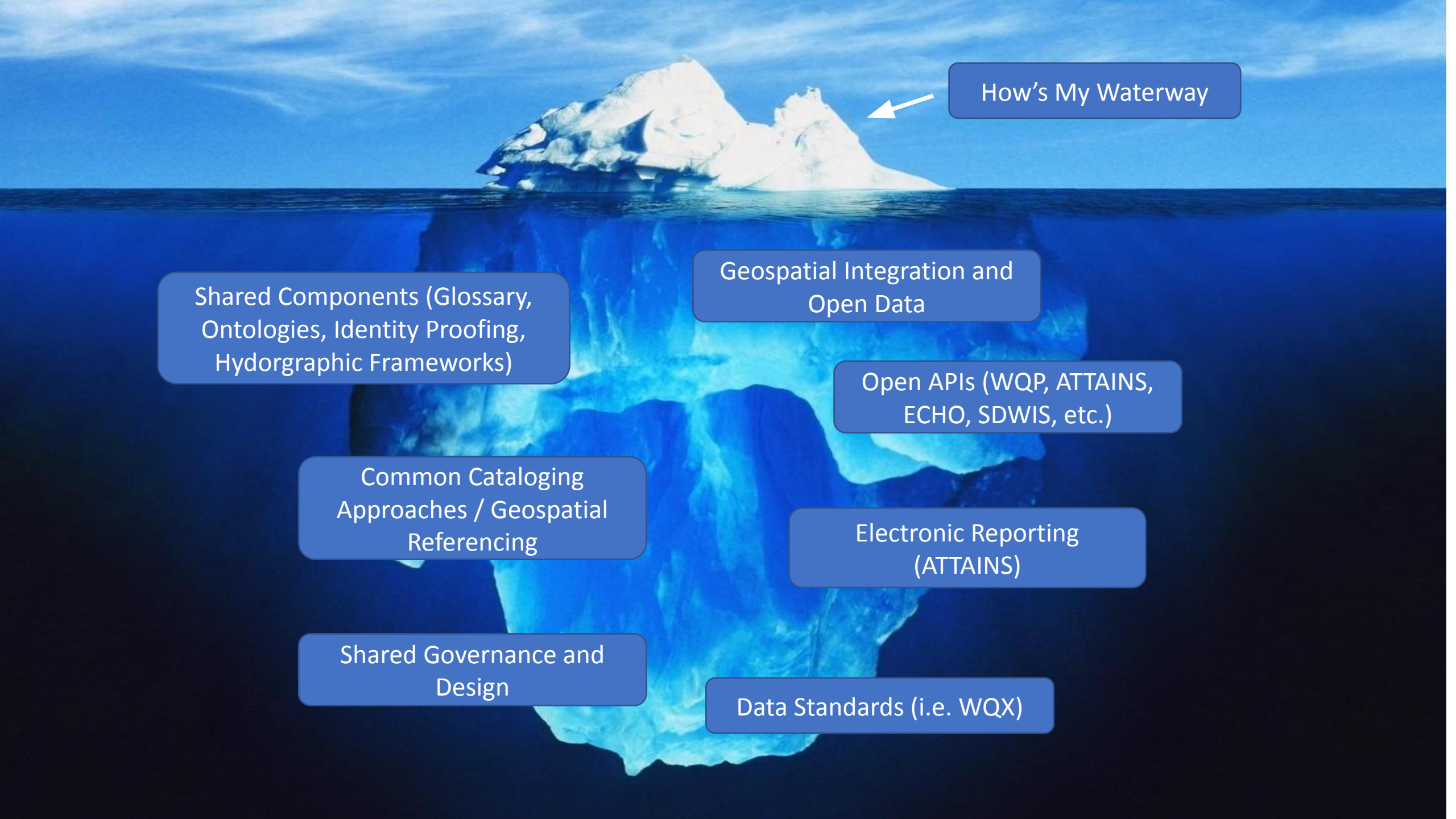
Can I swim in it?

Is it polluted?

If it is polluted, what are you doing about it?

If it isn't polluted, what are you doing to protect it?

What can I do to help?



How's My Waterway

The image is a conceptual diagram using an iceberg metaphor. The visible tip of the iceberg represents the 'How's My Waterway' program. The much larger submerged portion represents foundational components. These components are organized into two columns: a left column with 'Shared Components (Glossary, Ontologies, Identity Proofing, Hydrographic Frameworks)', 'Common Cataloging Approaches / Geospatial Referencing', and 'Shared Governance and Design'; and a right column with 'Geospatial Integration and Open Data', 'Open APIs (WQP, ATTAINS, ECHO, SDWIS, etc.)', 'Electronic Reporting (ATTAINS)', and 'Data Standards (i.e. WQX)'.

Shared Components (Glossary,
Ontologies, Identity Proofing,
Hydrographic Frameworks)

Geospatial Integration and
Open Data

Open APIs (WQP, ATTAINS,
ECHO, SDWIS, etc.)

Common Cataloging
Approaches / Geospatial
Referencing

Electronic Reporting
(ATTAINS)

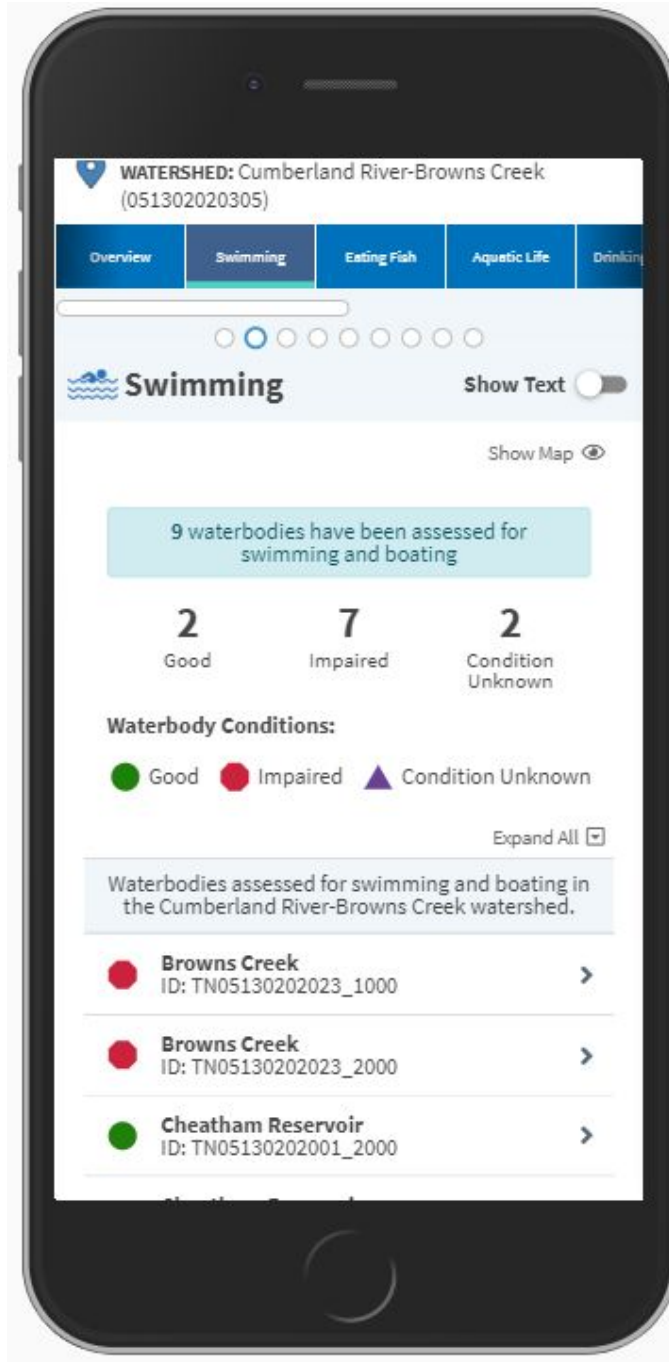
Shared Governance and
Design

Data Standards (i.e. WQX)

How's My Waterway: Principles

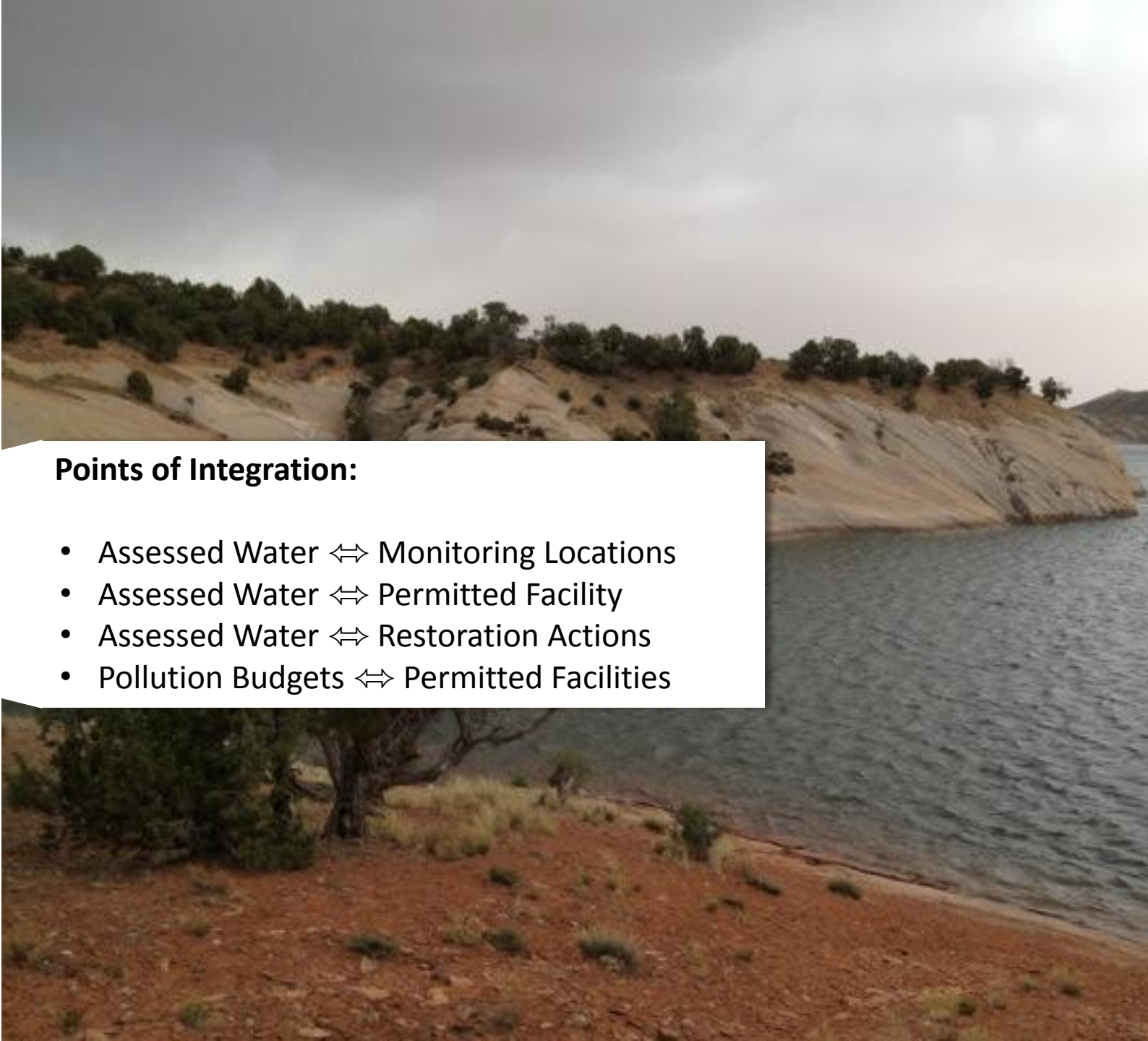
- All information is based on a service (API First Strategy)
- Data standards matter
- Mobile first design
- Integrate data across systems
- Shared ownership between states/tribes/EPA
- User centered design
- Strategy for navigating 'Change'

<https://mywaterway.epa.gov>



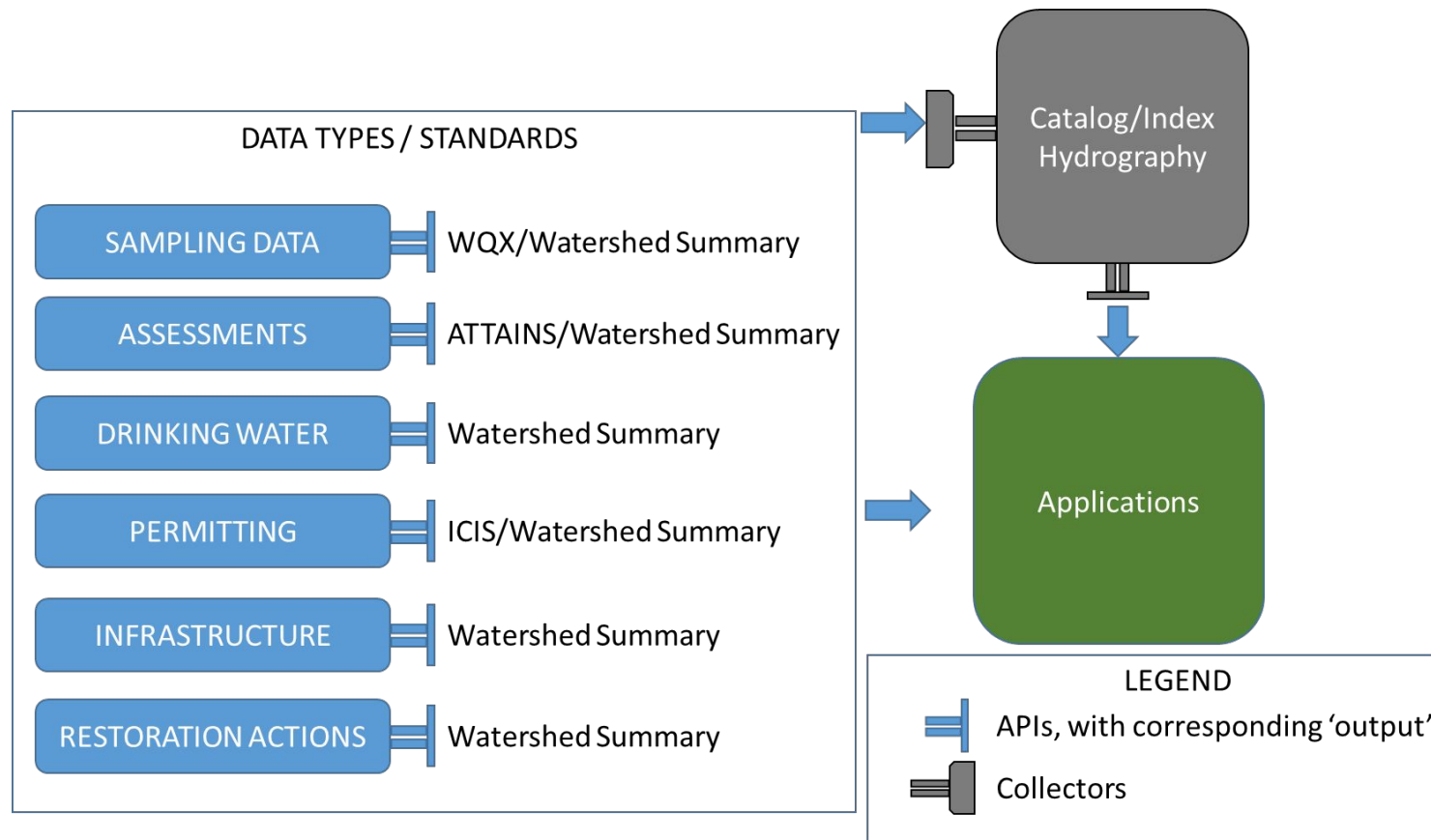
Principles of Integration

- No direct database access. All interaction is through an API (this is true for the system owners as well)
- Identify points of integration between systems to enable easy discovery and entry points across systems
- Data indexes (catalogs) allow quick discovery of data
- Data indexes can also facilitate common search functionality across systems
- Data are all connected to a common Hydrography



Points of Integration:

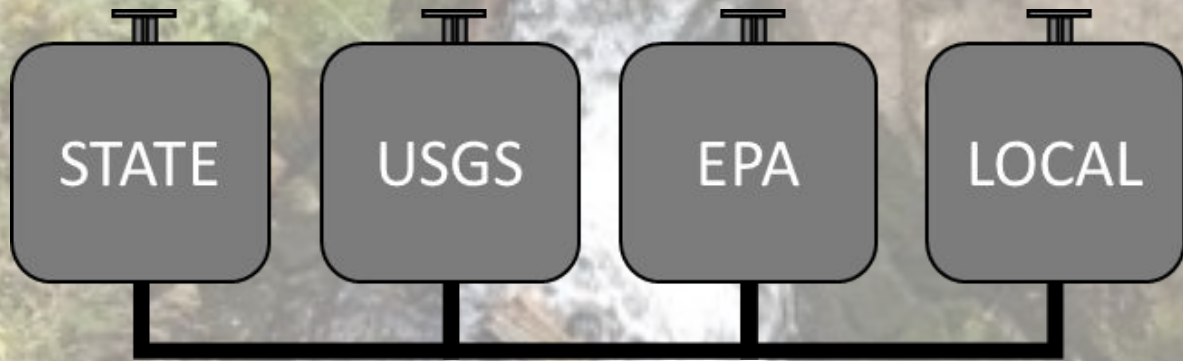
- Assessed Water $\Leftrightarrow$ Monitoring Locations
- Assessed Water $\Leftrightarrow$ Permitted Facility
- Assessed Water $\Leftrightarrow$ Restoration Actions
- Pollution Budgets $\Leftrightarrow$ Permitted Facilities



- Each system supports an API with a defined output
- Where common, generic outputs can be defined, those outputs are used
- Points of integration are also defined between systems
- All data are indexed for quick discovery as well as referenced to a common hydrography to enable advanced searches/discovery

Using Standards to Integrate

Connecting Outside Data



- Catalogs/Indexes allow for quick discovery of data across entities and programs
- A Common Hydrography enables search across entities
- Defined data standards enable data sharing across catalogs



Future Opportunities

- Working across Federal agencies to promote data interoperability and supporting USGS and USFWS in improving hydrographic frameworks
- Supporting enhanced modeling capability and analytics that would be built on top of these improved frameworks
- Promoting Internet of Water principles within EPA
- Bipartisan Infrastructure Law authorizes a \$15M/year grant program to pilot water data interoperability. (also proposed in the FY23 President's Budget)

Thank You!

Dwane Young

U.S. EPA Office of Water

202-566-1214

Young.dwane@epa.gov

