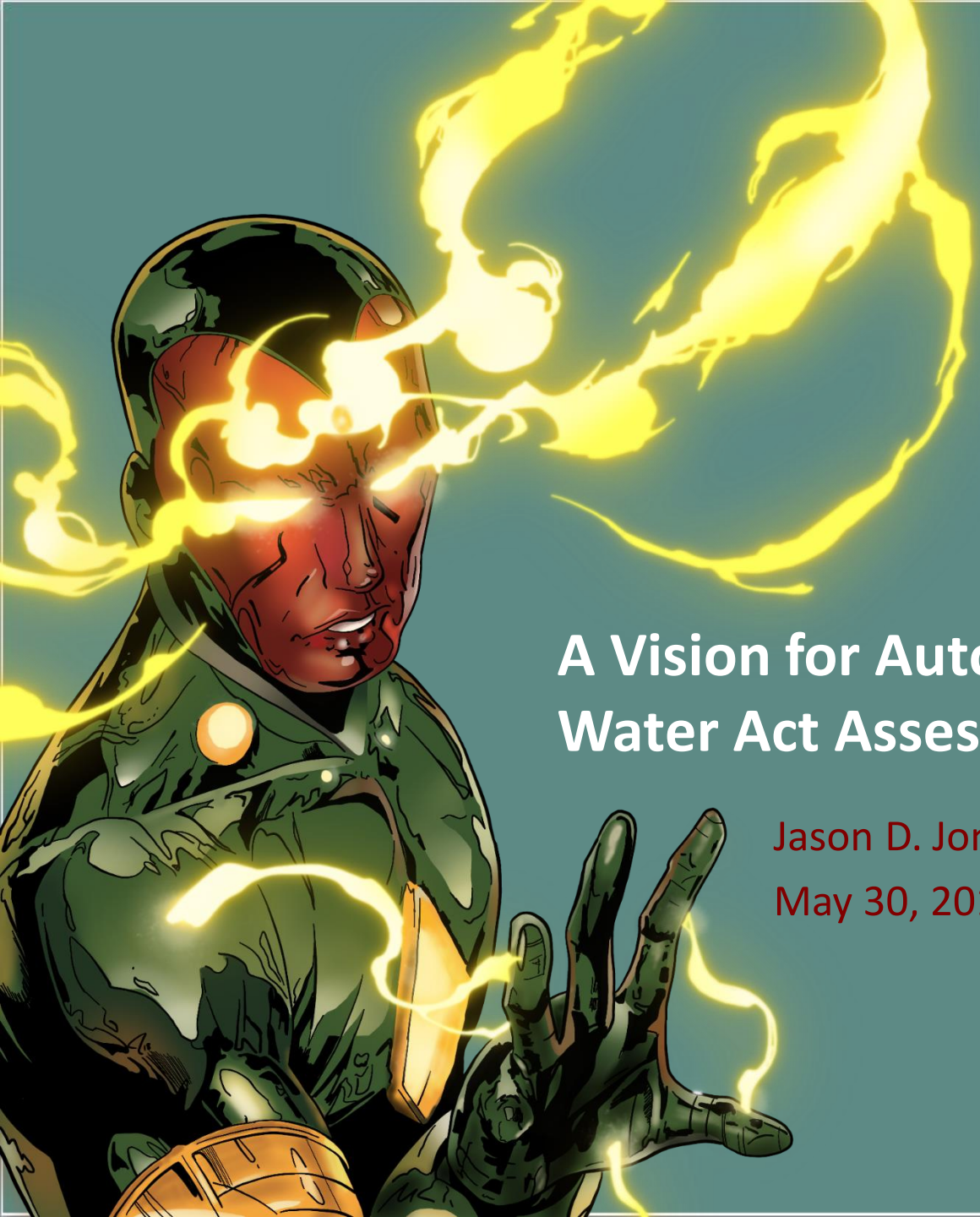


A Vision for Automating the Clean Water Act Assessment

Jason D. Jones, Senior Scientist

May 30, 2018

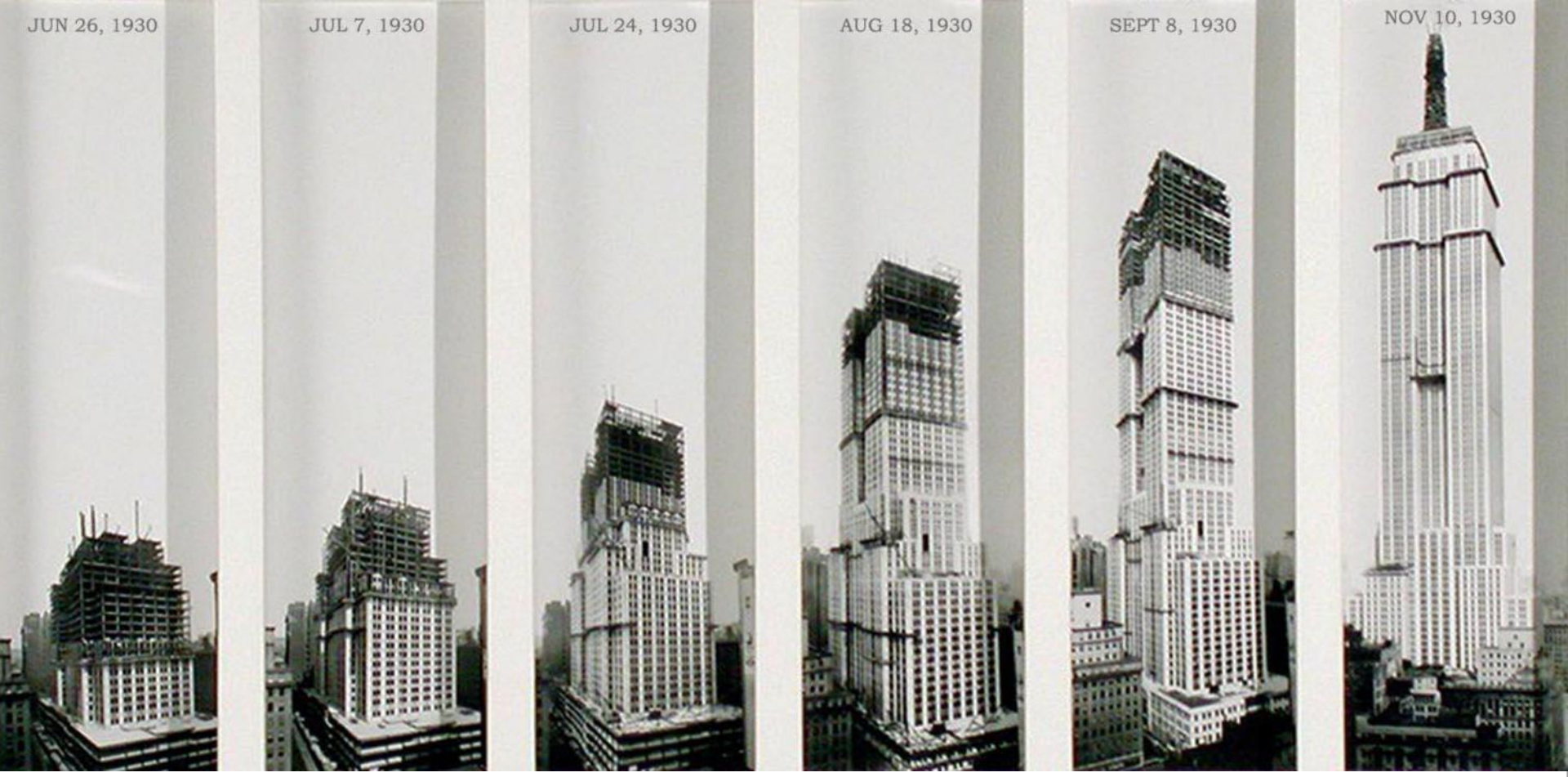
ADEQ Arizona Department of Environmental Quality

2016 Assessment Timeline

Step	Description	Date	Days
1	Get, format then assess data	7/1/2015	271
2	Draft Assessment & Internal Review	3/28/2016	77
3	Public Comment (45 day plus respond)	6/13/2016	109
4	Publish response to comments in Arizona Administrative Register	9/30/2016	76
5	Submit to EPA	12/15/2016	223
6	EPA Review	7/26/2017	61
7	EPA Publishes Changes in Federal Register	9/25/2017	

Total Elapsed Time = **817 Days**!

Deadline for submission to EPA 4/1/2016…so 258 days late



The Empire State Building was built in **410** days

(1/22/1930 to 3/8/1931)

Arizona CWA Assessment finished in **817** days

(7/1/2015 to 9/25/2017)

2016 Assessment Timeline

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126 days in public comment locked in

Leaves 149 days until April 1st

Percentage of states that submitted the Integrated Report to EPA by **April 1st** in FY12.

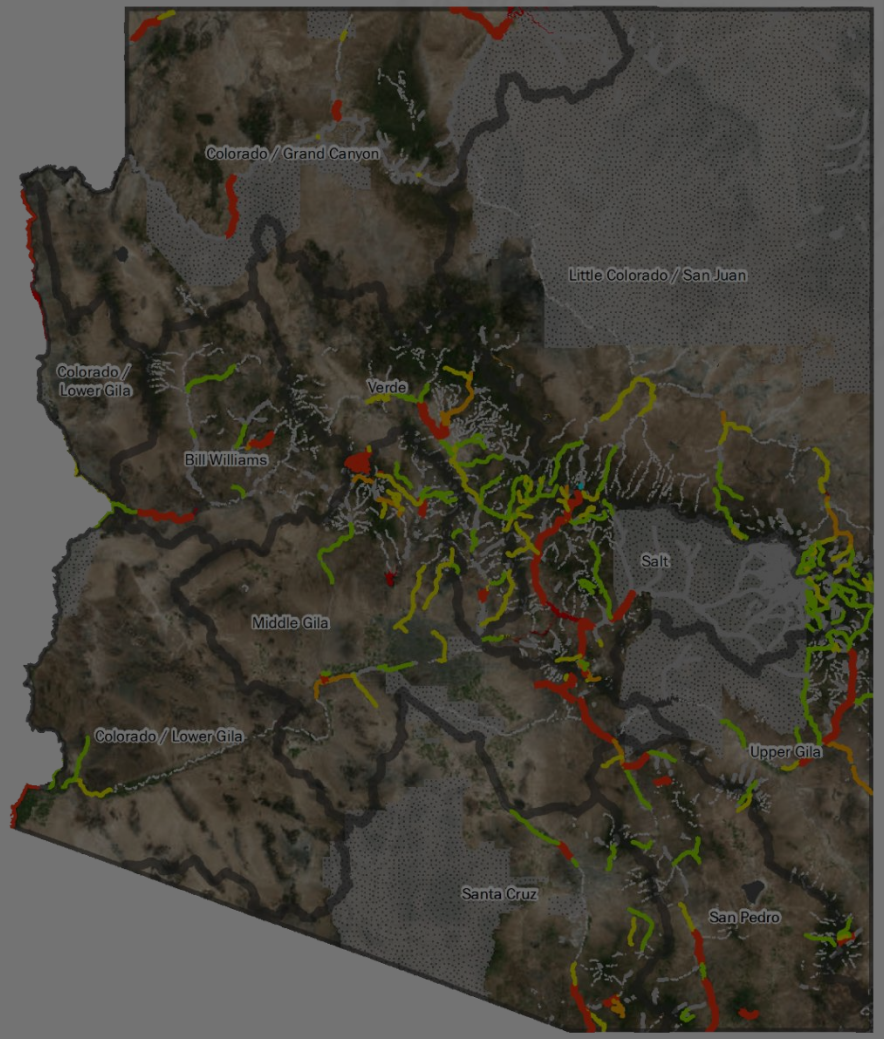
Source: 2014 EPA Integrated Report Requirements Memo

Data Gaps and Monitoring Needs

Exceedances Needing More Samples to Assess	*E. coli*
Missing Core Parameters	Zinc (dissolved), cadmium (dissolved), copper (dissolved), boron, manganese, copper, lead, mercury (or mercury in fish tissue)
Missing Seasonal Distribution	Zinc (dissolved), cadmium (dissolved), copper (dissolved), boron, manganese, copper, lead, mercury
Lab Detection Limits Not Low Enough	None

Priority	Monitoring Recommendations
Medium	Collect more *E. coli* samples due to the exceedance. Collect core parameters to represent at least 3 seasons during an assessment period.

- Waterbodies Assessed in 2016 Assessment (5 year window)
  - Attaining All = 20
  - Attaining Some = 92
  - Inconclusive = 94
  - Not Attaining = 75
  - Impaired = 68



Raw Data (Internal & External)

AZ Assessment Calculator
Automated

- Filter by Assessment Date Range
- Aggregate by Time (7 days)
- Tally Exceedances by Parameter
- Identify Data Gaps per Parameter (Core Parameters, Seasonal Distribution)

Excel Macros
Manual

- Tally Exceedances by Designated Use
- Aggregate by Reach
- Final Assessment (Category 1 – 5)
- Identify Data Gaps per Reach (Core Parameters, Seasonal Distribution)

Publish Report

Raw Data (Internal & External)

AZ Assessment Calculator
Automated

- Filter by Assessment Date Range
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- Tally Exceedances by Parameter
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Excel Macros
Manual

- Tally Exceedances by Designated Use
- Aggregate by Reach
- Final Assessment (Category 1 – 5)
- Identify Data Gaps per Reach (Core Parameters, Seasonal Distribution)

Publish Report

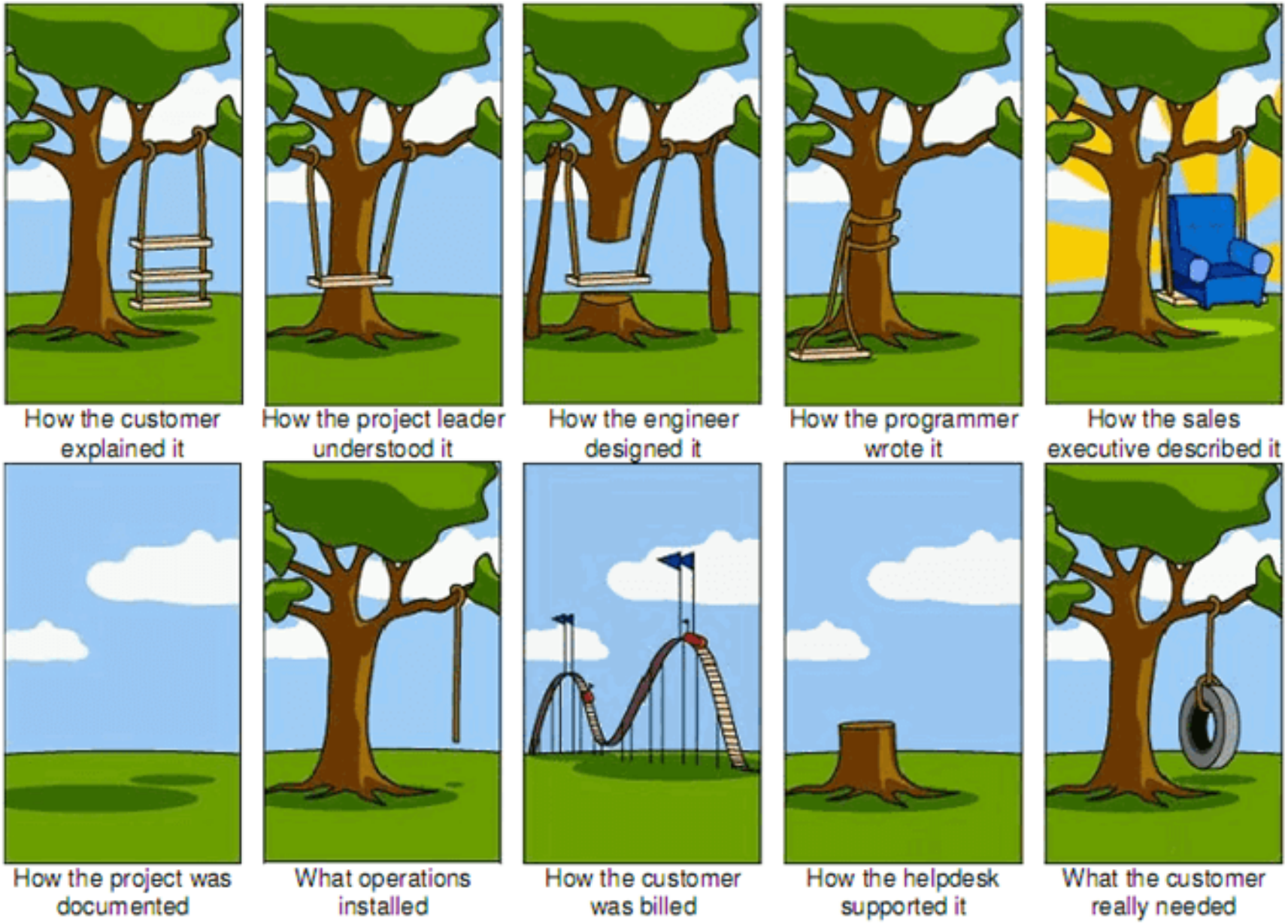
Vision

1. “Real time” assessments
2. Track assessment history
3. Button push loading to ATTAINS

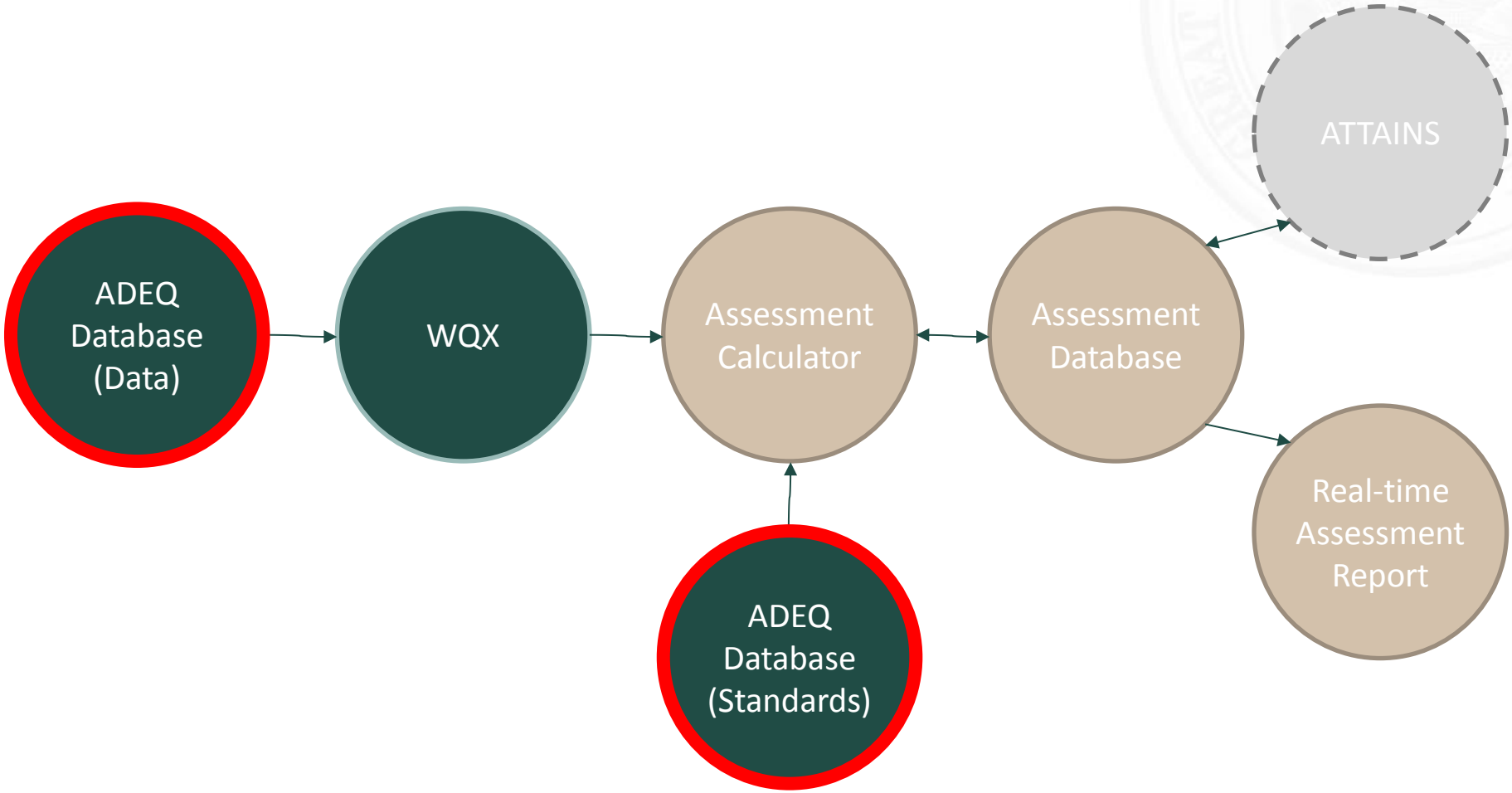
Vision

- Contract awarded on 5/17/2018
- Two Phases
  - Phase 1 – “Real time” impairment determinations
  - Phase 2 – Attainment determinations & load to ATTAINs.

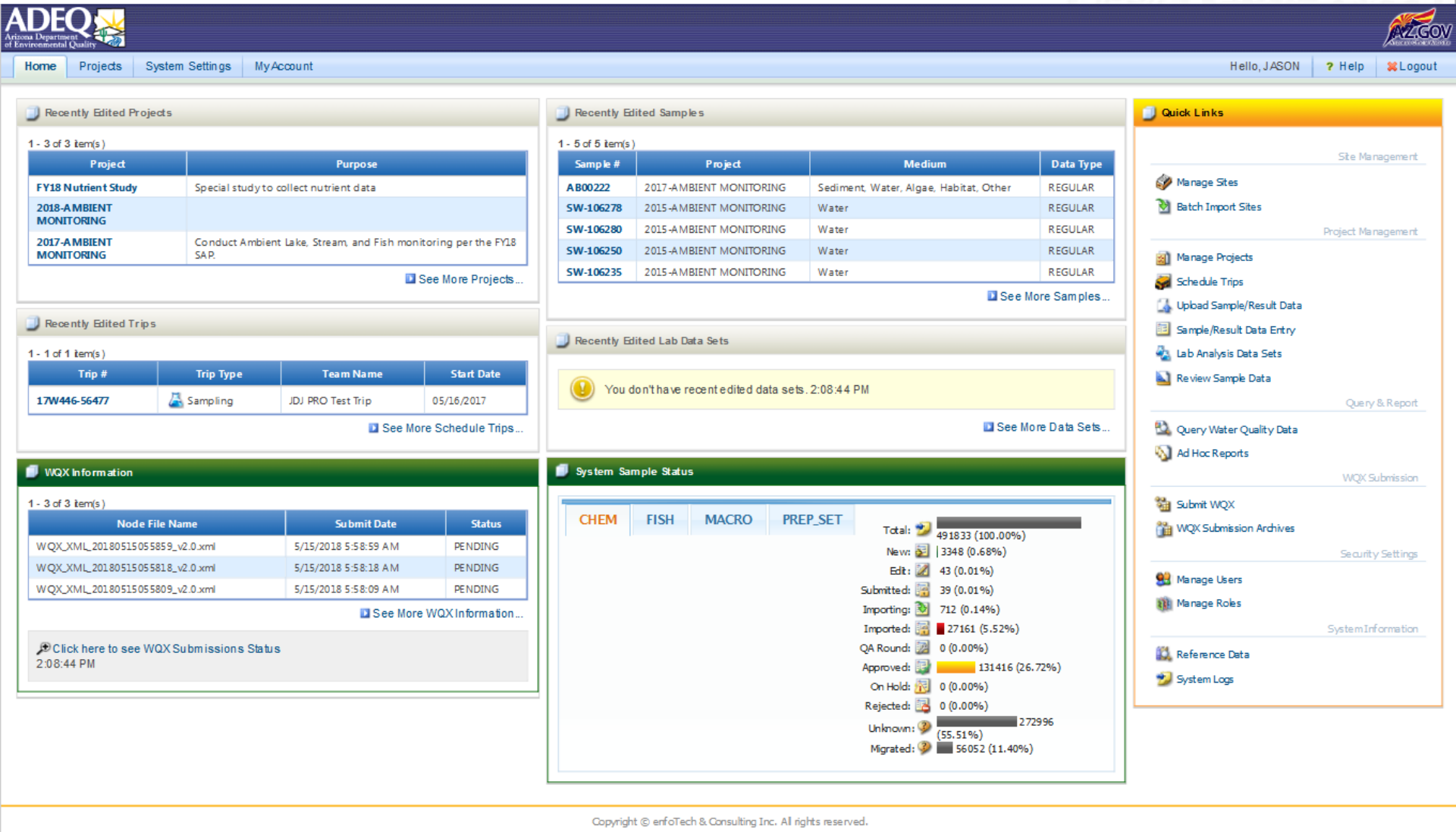
Hike to Chevelon Creek.


How the customer explained it
How the project leader understood it
How the engineer designed it
How the programmer wrote it
How the sales executive described it
How the project was documented
What operations installed
How the customer was billed
How the helpdesk supported it
What the customer really needed

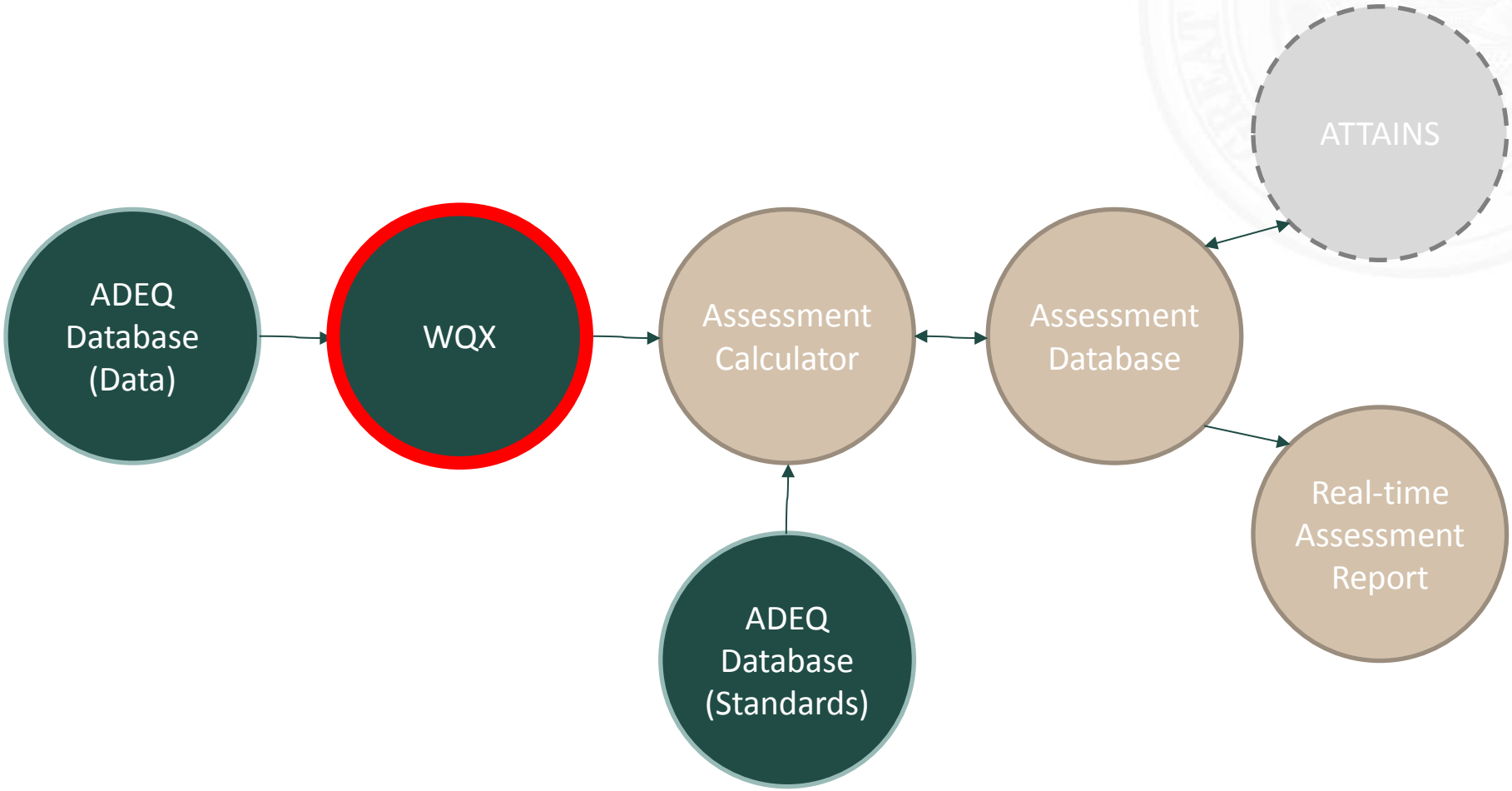
ADEQ Water Quality Database



ADEQ Water Quality Database



WQX


ATTAINS
ADEQ Database (Data)
WQX
Assessment Calculator
Assessment Database
Real-time Assessment Report
ADEQ Database (Standards)

WQX

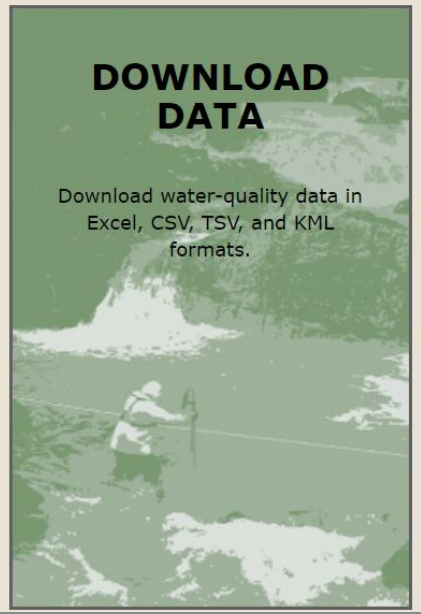
www.waterqualitydata.us

National Water Quality Monitoring Council

Working together for clean water

Water Quality Portal

The Water Quality Portal (WQP) is a cooperative service sponsored by the United States Geological Survey (USGS), the Environmental Protection Agency (EPA), and the National Water Quality Monitoring Council (NWQMC). It serves data collected by over 400 state, federal, tribal, and local agencies.



HOW TO USE THE WQP

User Guide
Web Services Guide
FAQs
Upload Data

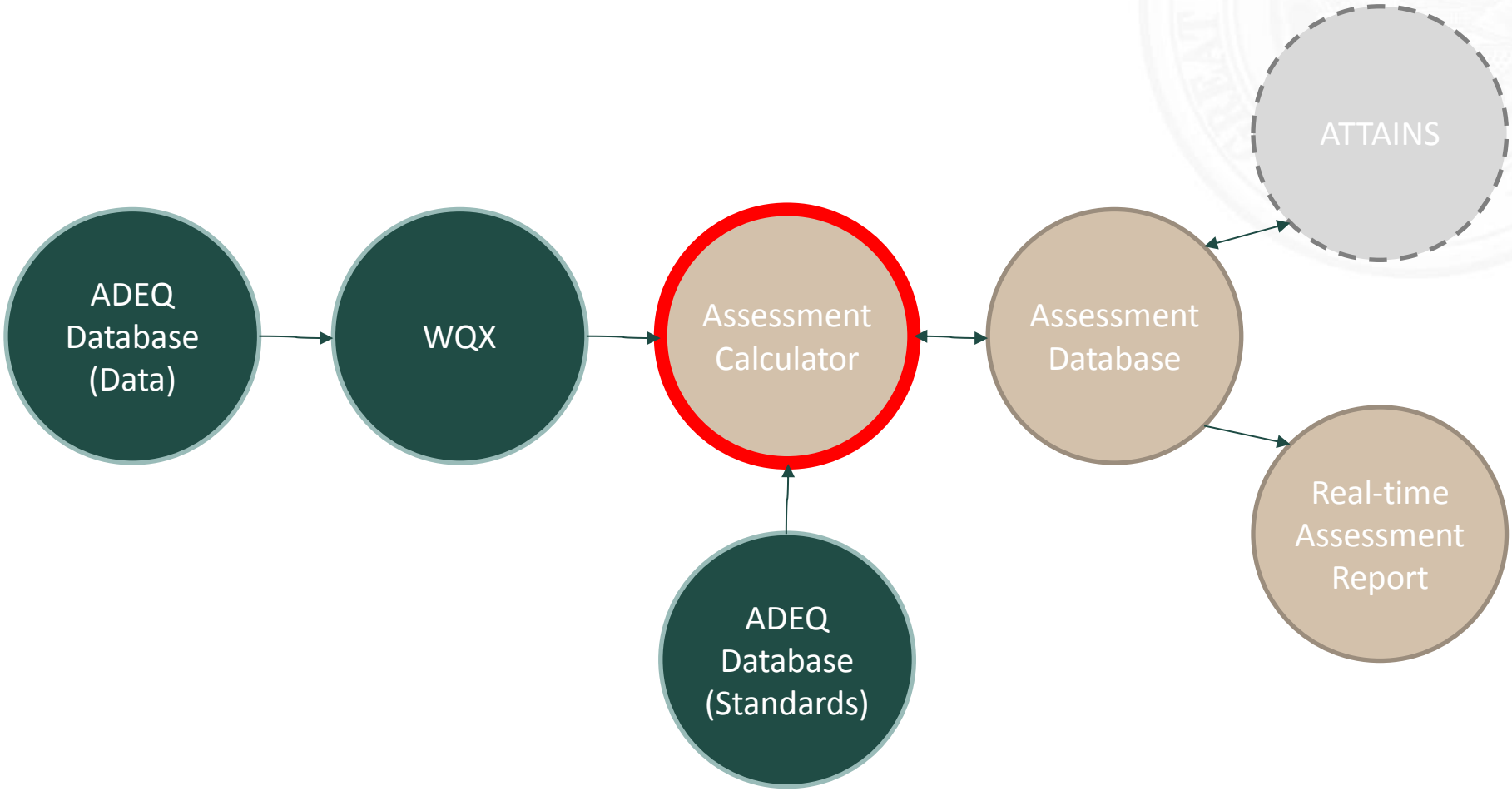
NATIONAL RESULTS COVERAGE

Water-quality data in your state.

ABOUT THE WQP

What is the WQP?
Contributing organizations
Other Water Quality Portals
Explore WQP Sites

Assessment Calculator



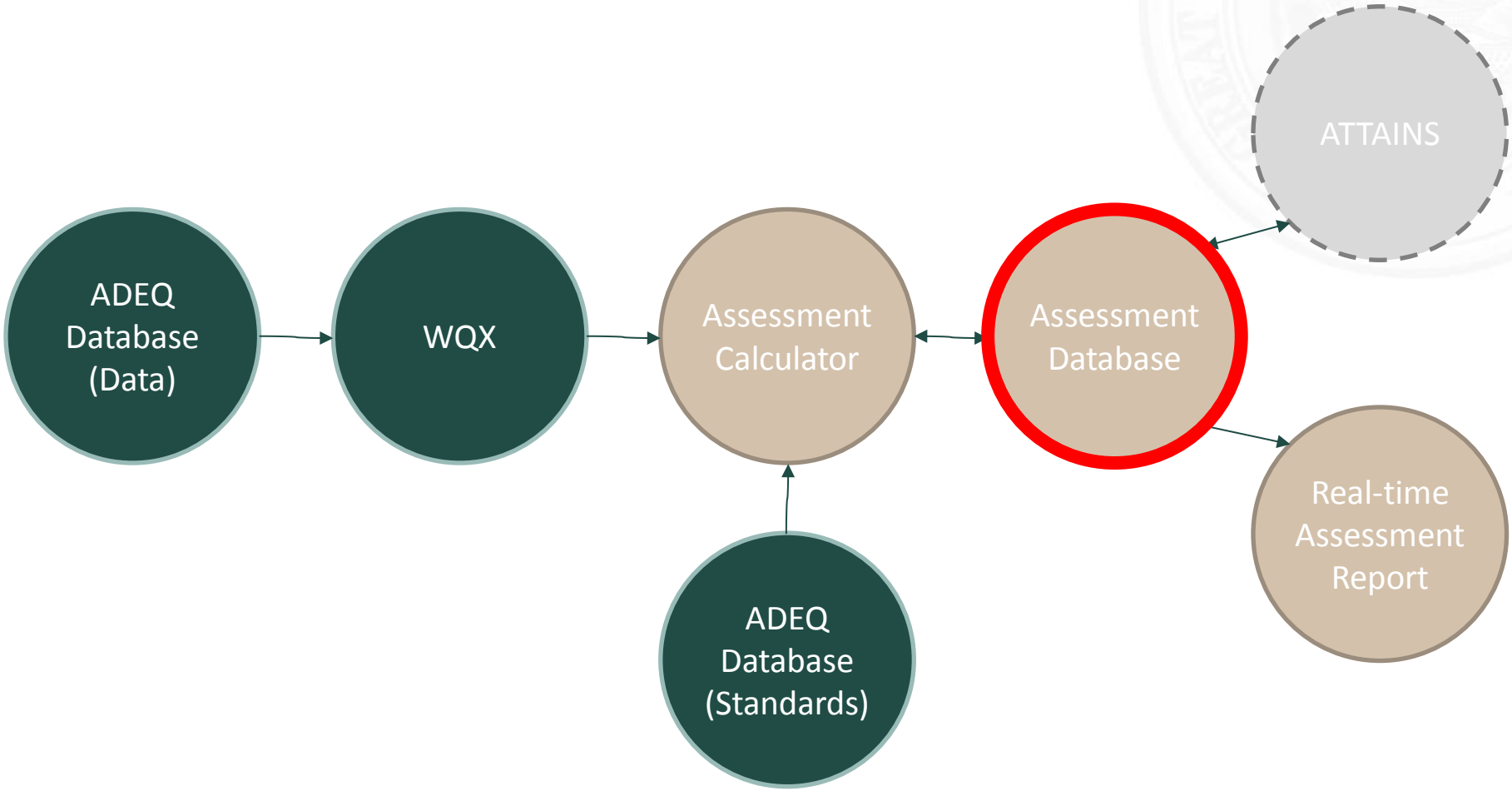
Assessment Calculator

- Resolve data formatting issues
- Resolve data credibility issues
- Aggregate data by time and space
- Find exceedances by comparing data to standards
- Make impairment / attainment determinations based on assessment methodology

Sampling on Mittry Lake

Saguaro Lake

Assessment Database



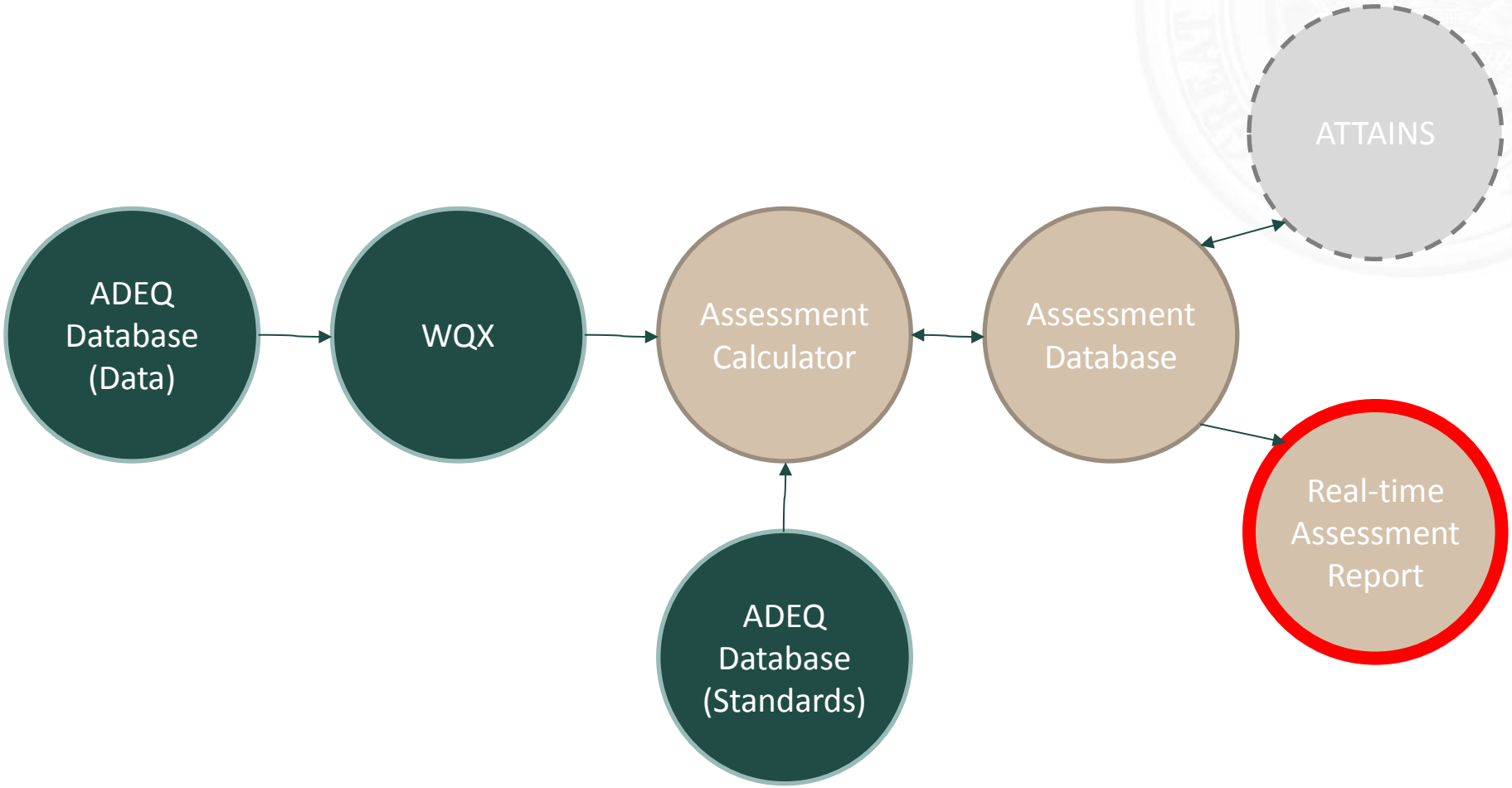
Assessment Database

- Maintain assessment history (assessment unit / parameter / use)
- User interface to track improvements / changes
- User ability to manually override automated decisions
- Ability to treat critical conditions and locations separately from dataset

Fossil Creek

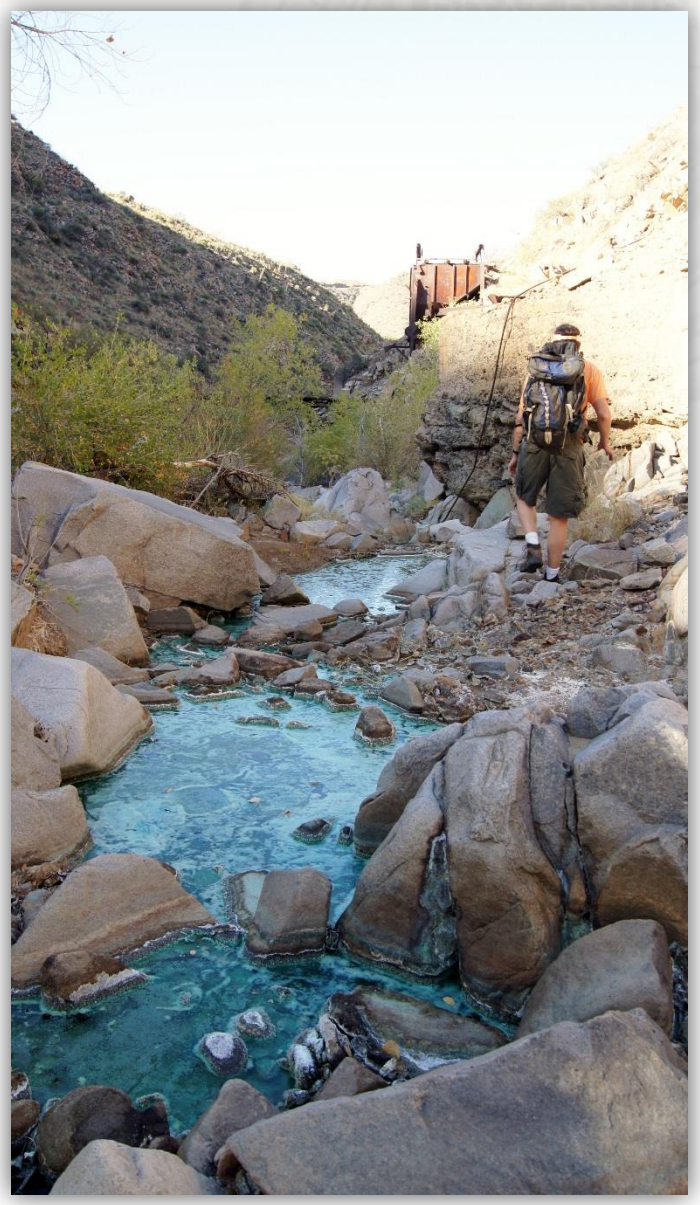
Santa Cruz River

Real Time Assessments



Surgical Strike by Assessment Unit

- Identify data gaps to make an attainment or impairment decision at the parameter level
  - Number of exceedances
  - Minimum number of exceedances to make an attainment or impairment decision
  - Number of samples
  - Minimum number of samples to make an attainment or impairment decision



Copper Creek

Boulder Creek (15030202-005A)

Impaired Water Sampling Worksheet

Goal: To determine if the waterbody is impaired or not using water quality data.

Impaired for: Arsenic, copper, and zinc (1998); Beryllium, manganese, and low pH (2006/2008)
Lead: Jessica

Critical Conditions: Stream flow less than 0.75 cfs, which is low flow, intermittent, or "base flow"
Critical Locations: Below Hillside Mine - 101010 Below MTP- 101011 Below UTP- 101439 Above Hillside Mine - 102023

Any Major Improvements/Changes that Impact Water Quality (like new treatment plants, BMPs, remediation, etc.)?
Upper tailings pile remediated in 2015, lower tailings pile remediated in 2017, middle tailings pile undergoing work on adit.

Sample Dates ≥ 7/1/2012 (2018 Assessment Window):

5/21/13	5/28/15	11/9/15	8/17/16	3/29/17
2017 Improvement	9/1/17	11/14/17	3/7/18	

Impaired Designated Use: Fish Consumption

Parameter	Standard	# Exceedances (see binomial)	Number of Samples
Arsenic (T)	< 80 ug/L	☒ ☒ ☒ ☐ ☐ ☐ ☐ ☐ ☐ ☐	☒ ☒ ☒ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Impaired Designated Use: Agriculture Livestock Watering

Parameter	Standard	# Exceedances (see binomial)	Number of Samples
Arsenic (T)	< 200 ug/L	☒ ☒ ☒ ☐ ☐ ☐ ☐ ☐ ☐ ☐	☒ ☒ ☒ ☐ ☐ ☐ ☐ ☐ ☐ ☐
pH	< 9 and > 6.5 SU	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	☒ ☒ ☒ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Impaired Designated Use: Full Body Contact

Parameter		# Exceedances (see binomial)	Number of Samples
Arsenic (T)	< 30 ug/L	☒ ☒ ☒ ☐ ☐ ☐ ☐ ☐ ☐ ☐	☒ ☒ ☒ ☐ ☐ ☐ ☐ ☐ ☐ ☐
Manganese (T)	< 130,667 ug/L	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	☒ ☒ ☒ ☐ ☐ ☐ ☐ ☐ ☐ ☐
pH	< 9 and > 6.5 SU	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	☒ ☒ ☒ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Impaired Designated Use: Aquatic and Wildlife Warm

Parameter		# Exceedances (must be 0)	Number of Samples
Arsenic (D)	150 ug/L (chronic)	☐ ☐ ☐	☒ ☒ ☒
Beryllium (D)	5.3 ug/L (chronic)	☐ ☐	☒ ☒ ☒
Copper (D)	Hardness Dependent	☐ ☐	☒ ☒ ☒
pH	< 9 and > 6.5 SU	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	☒ ☒ ☒ ☐ ☐ ☐ ☐ ☐ ☐ ☐
Zinc (D)	Hardness Dependent	☒ ☐ ☐	☒ ☒ ☒

In Process – Stream nutrient standards research with NSTEP help.

Finished – Probabilistic Intermittent Stream Monitoring – 6.25 % of intermittent streams statewide impaired.

In Process – Probabilistic Fish Consumption Monitoring. Should we have a statewide mercury advisory?