



Continuous Water-Quality Monitor Installation Example: An Air Purge System to Reduce Sediment Fouling and Improve Data Quality

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Overview

- Current study using a CWQ monitor
- Problems with the monitor fouling
- New anti-fouling system employed in March 2015
- Before and after comparison of data quality
- Other benefits
- Limits to the system

Operational Goal

- Obtain accurate and complete record...
- ...but labor intensive
 - Frequent field visits
 - Independent field measurements to verify in-situ sonde accuracy
- Drives up data costs



CWQ Monitor on the Boise River

- Bank mounted Continuous Water-Quality Monitor
 - Operational periods:
 - WY 2009 – 2010
 - WY 2014 – until present
 - Fouling became a problem in WY2014



Examples of Fouling



Early Anti-fouling Approaches

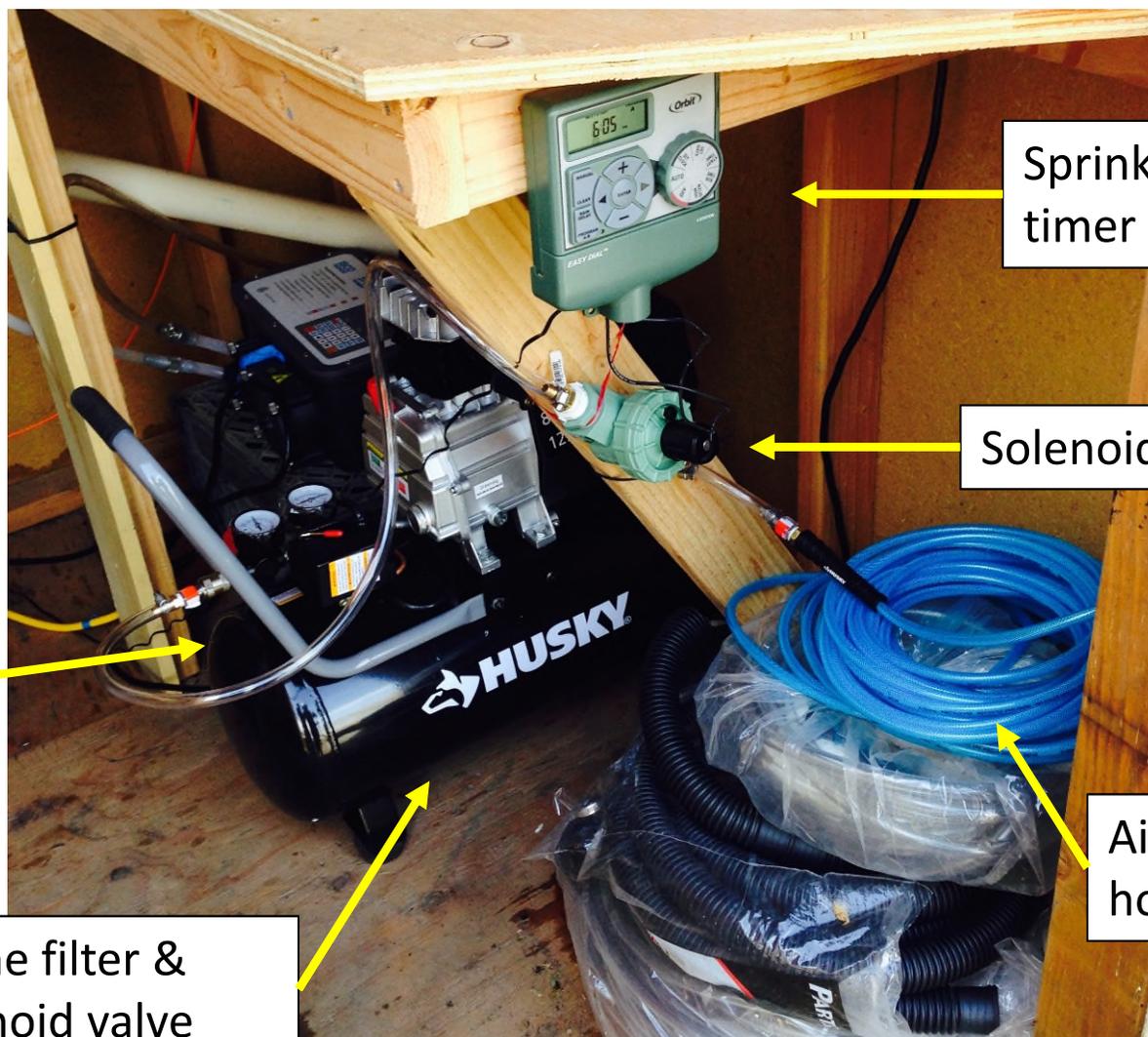


CWQ Monitor on the Boise River

- New air-purge system installed in March 2015 to combat fouling
 - \$300 in equipment and hardware
 - Est. \$10,000 in operational cost savings
 - Greatest improvements:
 - Turbidity and specific conductance
 - Most sensitive parameters to fouling



Air Purge System Components



Sprinkler irrigation timer

Solenoid valve

Air compressor

Air compressor hose

In-line filter & solenoid valve

Air-Purge System Operation



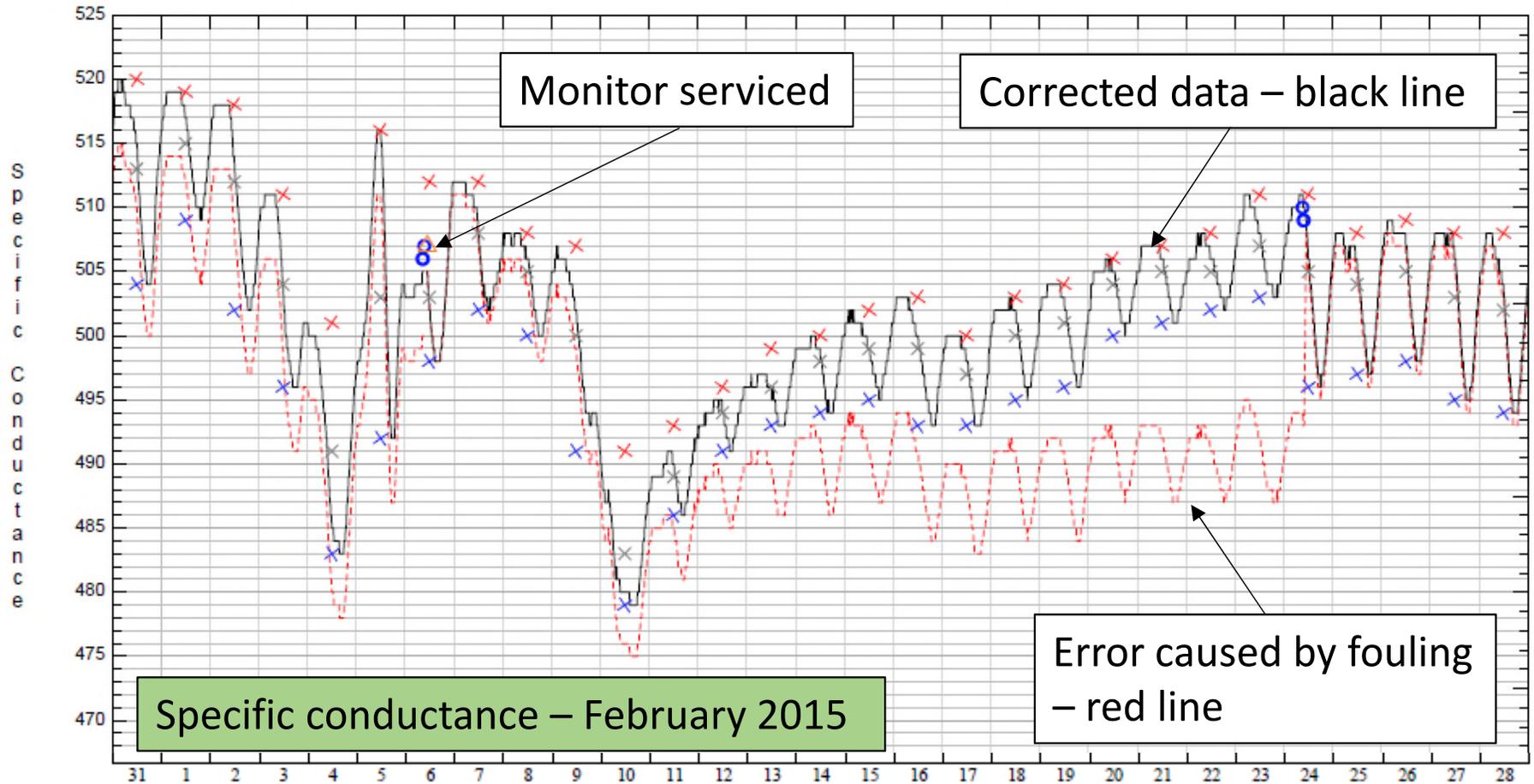
Air compressor line has barbed fittings to direct air toward the bottom of the sonde guard, and probes

Air compressor line and moisture check-valve

The system purges for 2 minutes 2 X a day using ~ 25 PSI

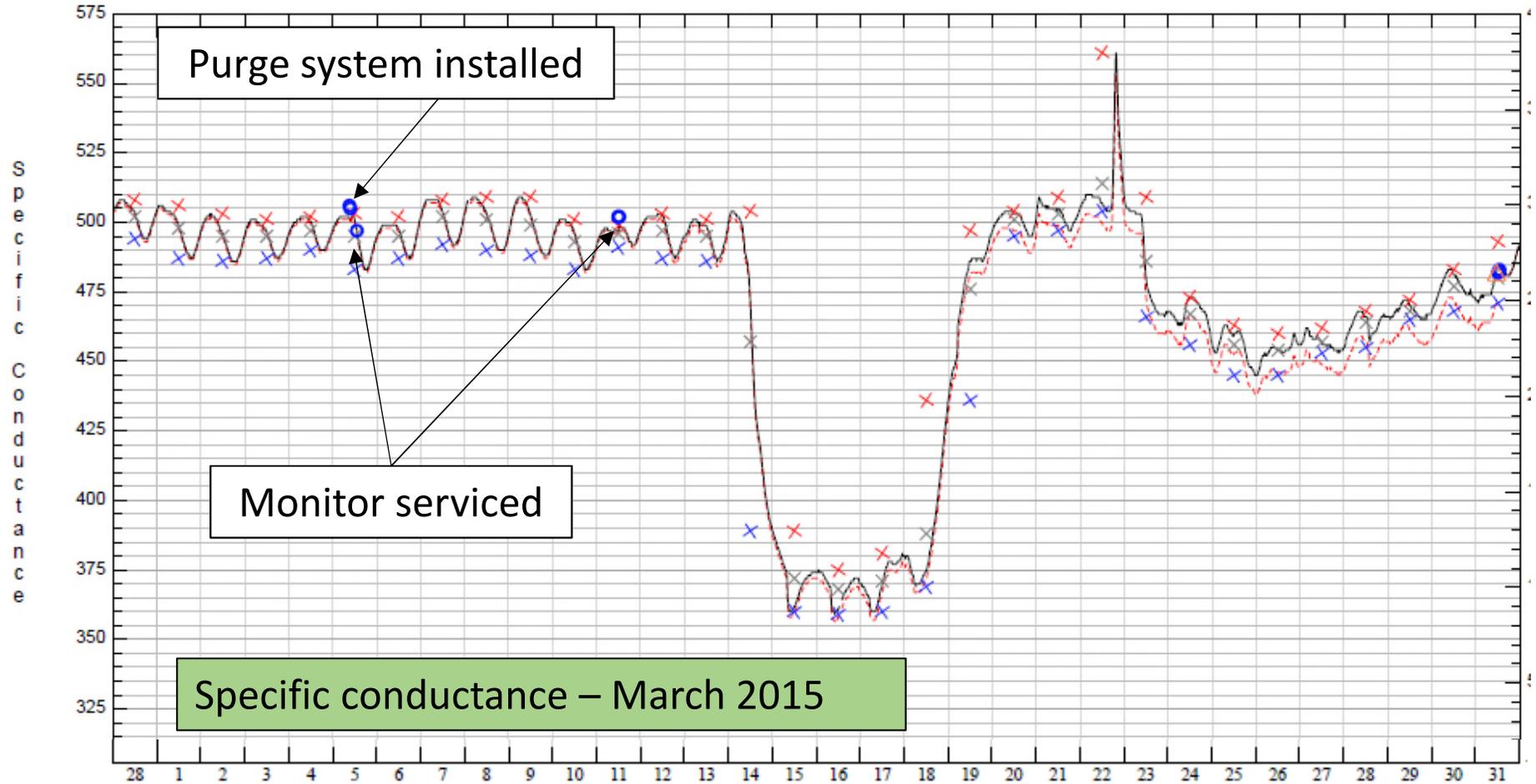
Before

13213000 – Boise River near Parma, ID



After

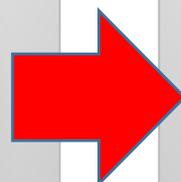
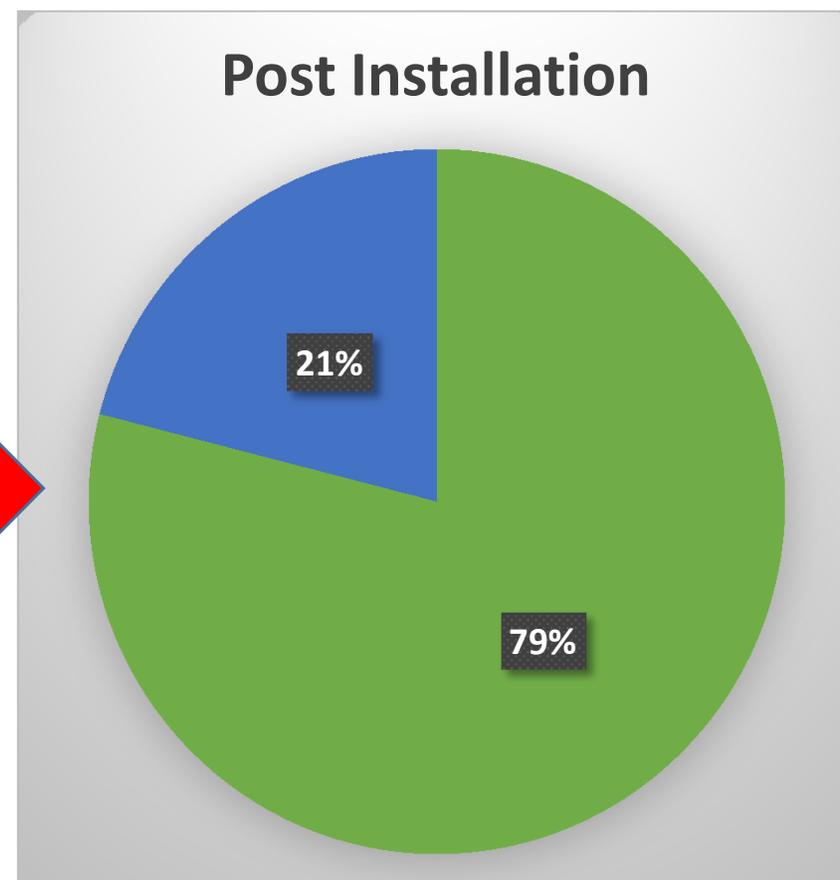
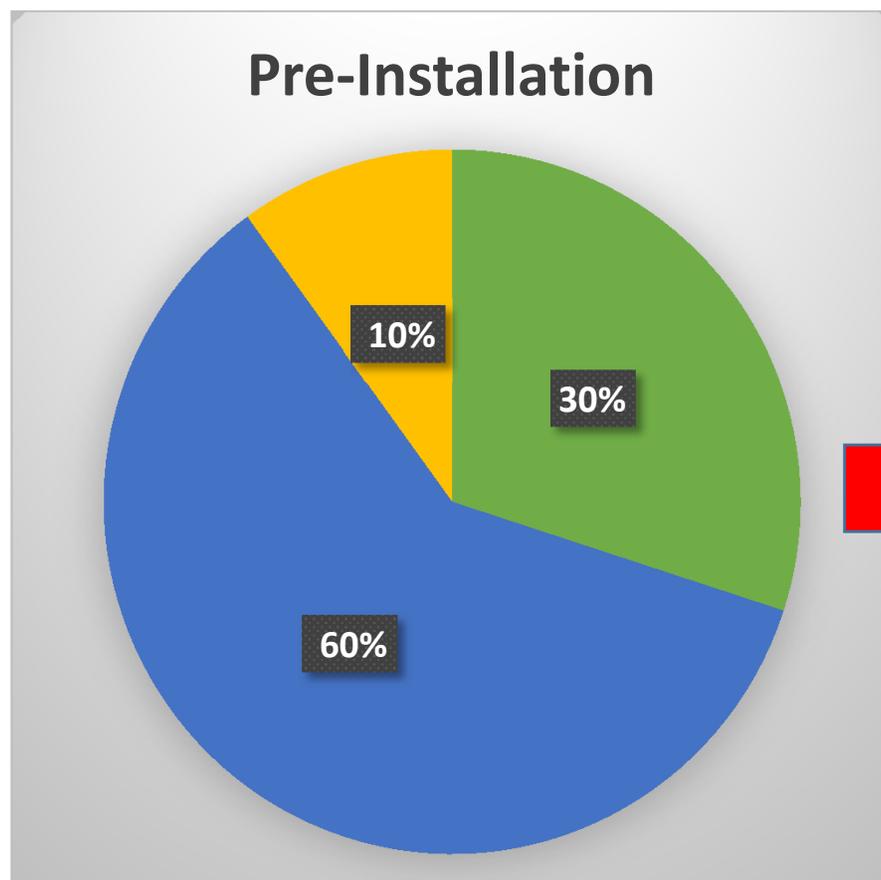
13213000 – Boise River near Parma, ID



Comparison: Data Quality Rating

March – December 2014

March - December 2015



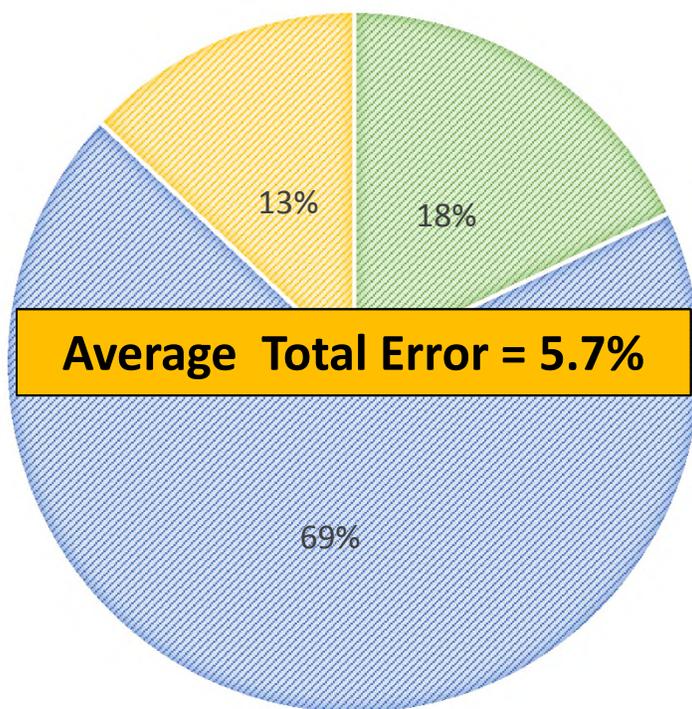
Excellent (<3% error)

Good (3-10% error)

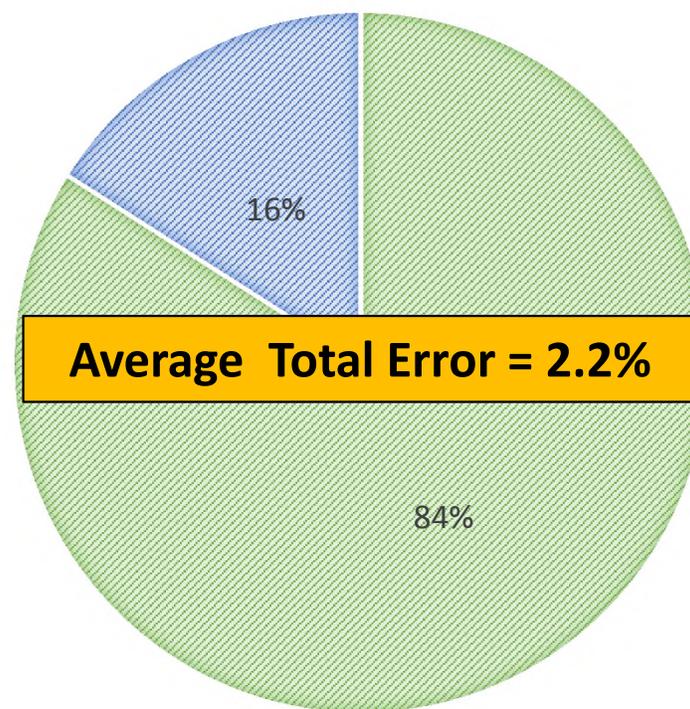
Fair (10-15% error)

Comparison: Average Correction

PRE-INSTALLATION



POST INSTALLATION



■ Excellent (<3% error)

■ Good (3-10% error)

■ Fair (10-15% error)

Trips and Staffing

March - December

	Site Visits	Time on Site
Pre-Installation 2014	20	1 ¼ hr
Post Installation 2015	14	¾ hr

Trips and manpower

March - December

	Site Visits	Time on Site
Pre-Installation	16	
Post Installation 2020		$\frac{3}{4}$ hr

30% Reduction in number of visits

40% Reduction in time on site

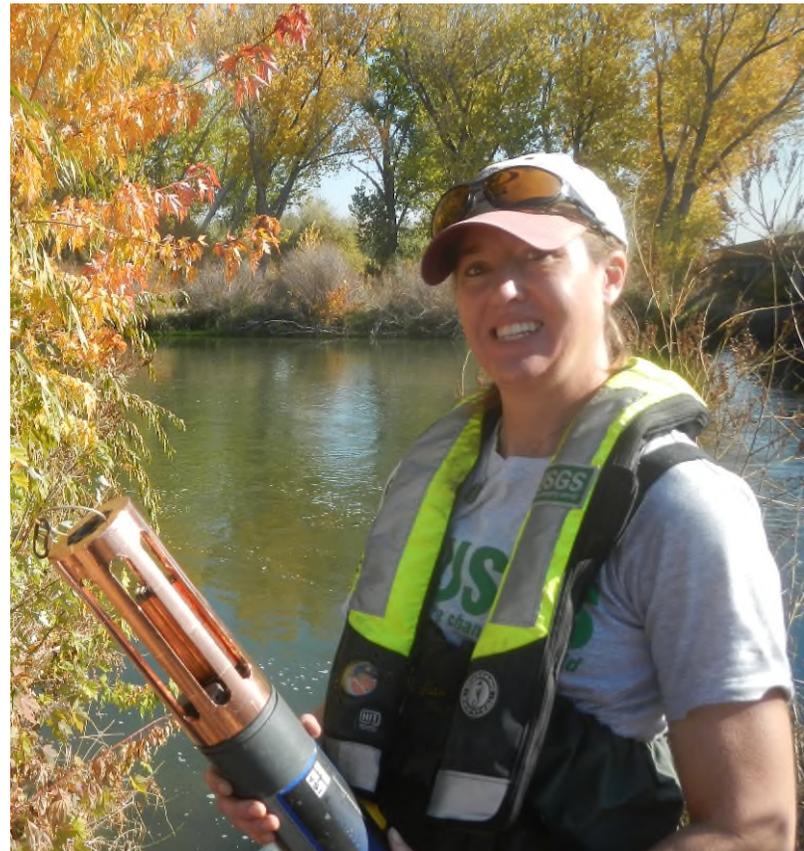
There are some limitations

- Bigger footprint
- 120 VAC power source



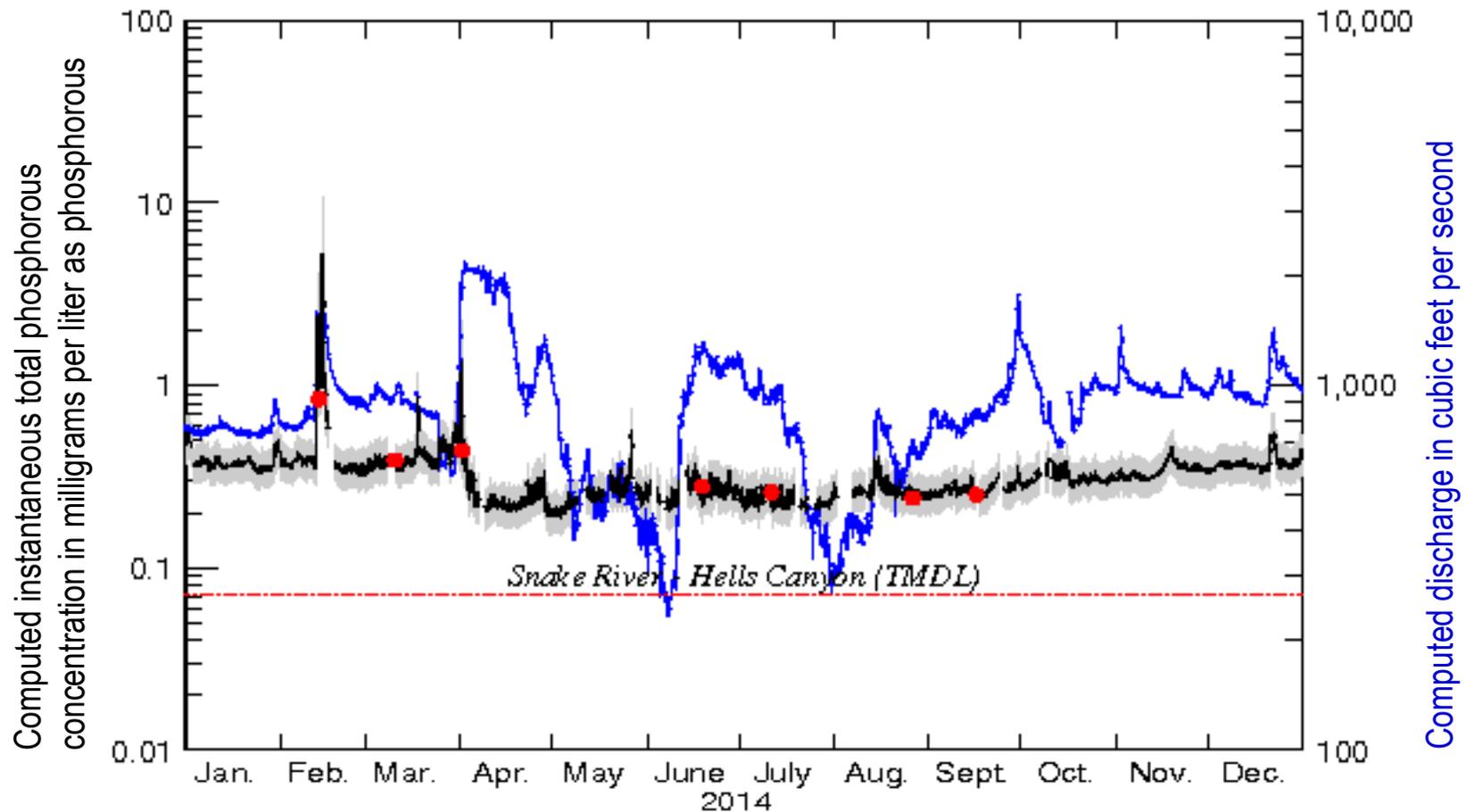
Summary of Benefits

- Increased interval between site visits
- Reduced time on site
- Improved data quality

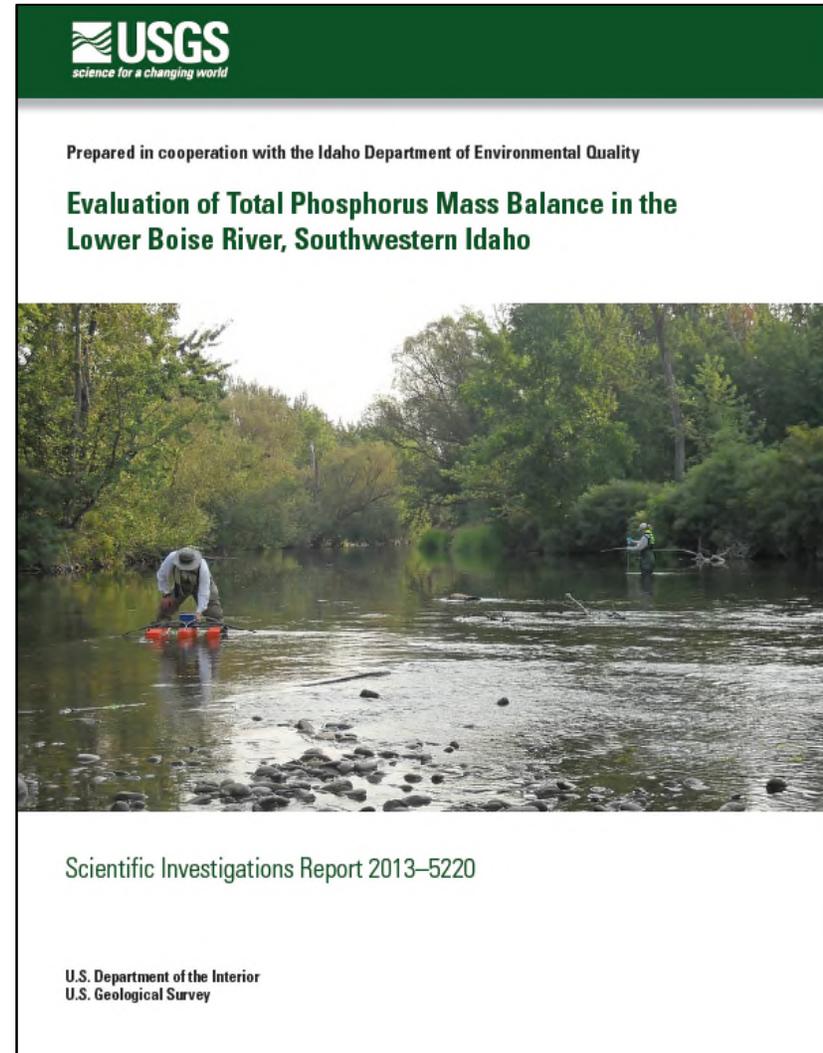
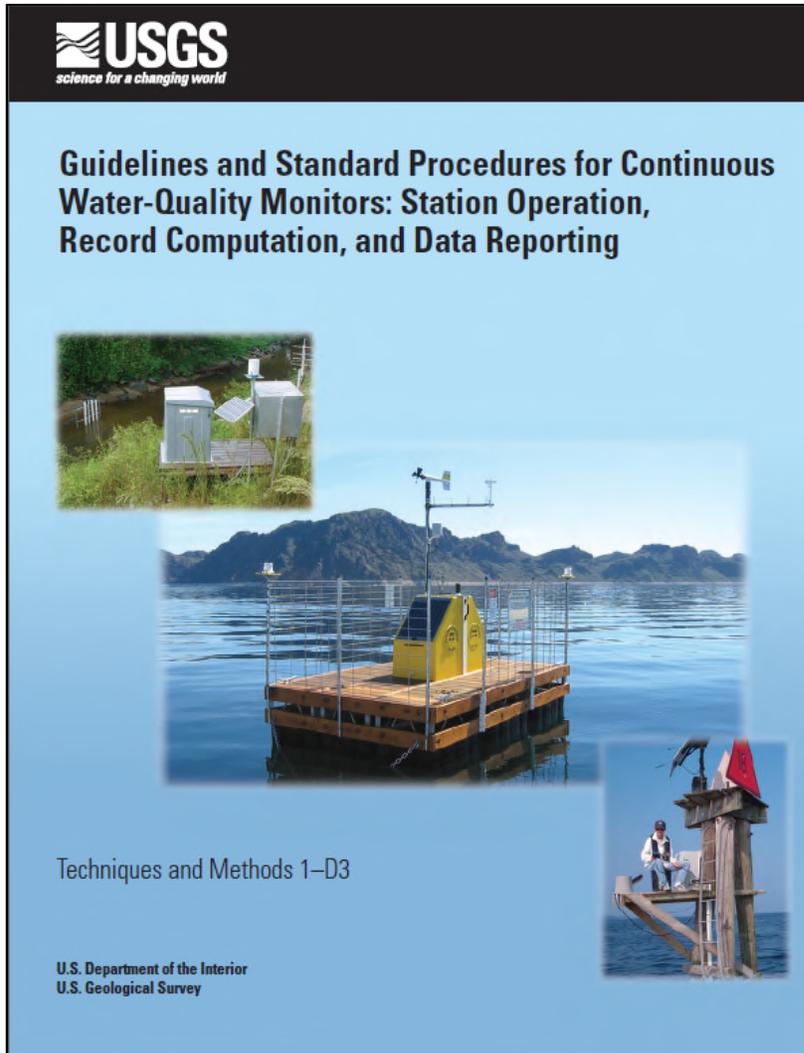


Summary of Benefits

- Continued use of existing surrogate models for TMDLs



USGS Resource



Questions?

