



Data Automation and Visualization to Support Fisheries Management at High-Head Dams

Megan Stachura, Sam Haffey, and Josh Murauskas,
Four Peaks Environmental Science & Data Solutions

Nick Ackerman, Portland General Electric

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Data to Support Improved Fish Passage

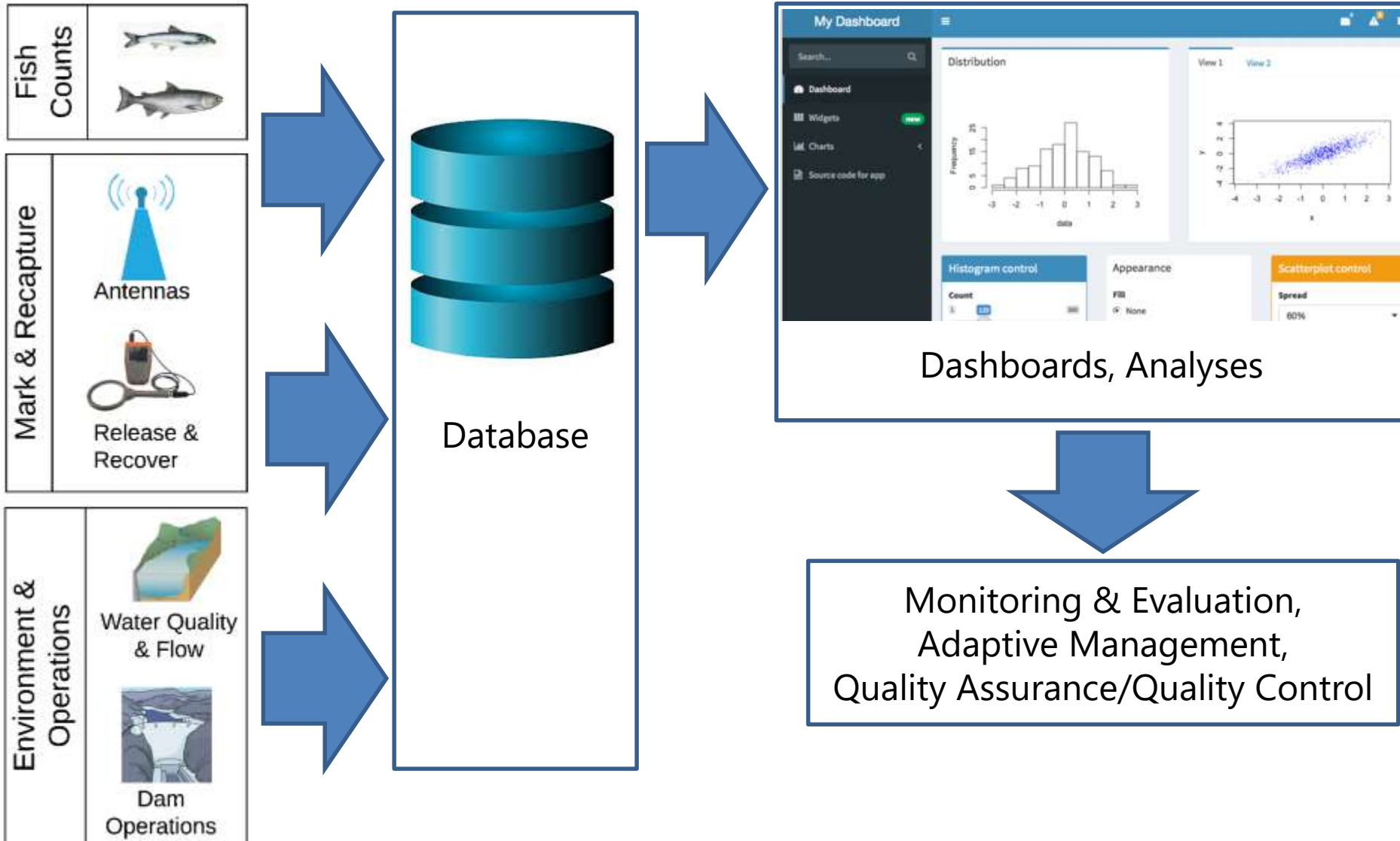
- Monitoring is essential to improving the performance of fish passage facilities
- Effective data collection, management, and analysis can enable rapid diagnostics and adaptive management to improve fish passage



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Data Management Process



Efficient Data Acquisition

Home Dashboard Enter Data Access Data Logout shaffey

Enter Upstream Counts

Start date* 10/10/2018 Species* Early Coho Age class* Adult Mark* NOMARK Distribution* Upstream (previously) Clear

Date*	Live*	Dead*	Delete
10/10/2018	26	0	
10/11/2018	14	0	
10/12/2018	15	0	
10/13/2018	20	0	
10/14/2018	12	0.0	

Save & Next

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- Automate when feasible
- Streamline data entry
 - Collaborate on design
- Integrate quality control
 - Encode validation in forms and loaders
 - Enforce data integrity



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Leveraging Existing Systems

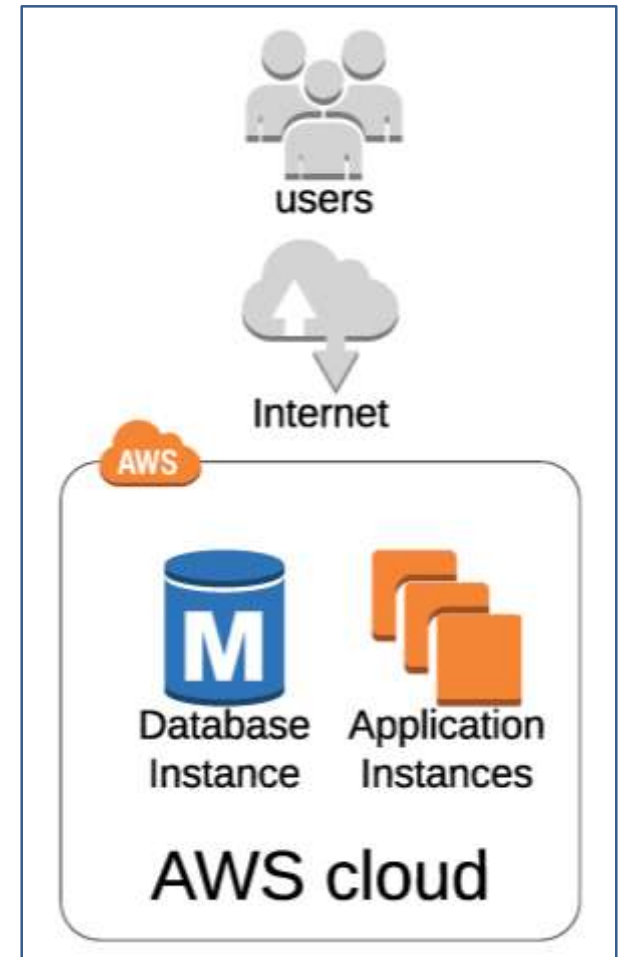


PIT Tag Information System
Columbia Basin | ptagis.org

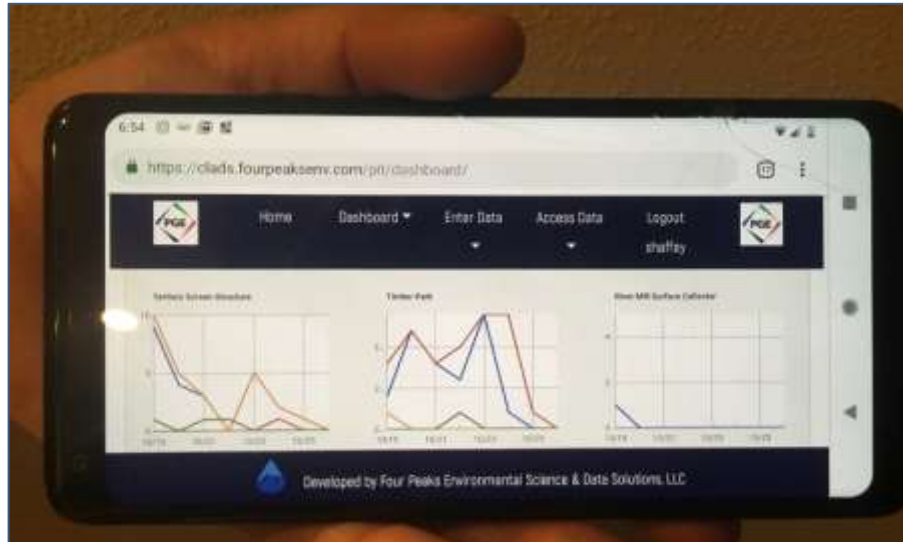
The image displays two screenshots from the PIT Tag Information System. The left screenshot is the "Session Data Entry" form, which includes fields for "PIT Tag" (3AD.043C09A89A), "SRR Verbose" (Sockeye), "Event Type" (Mark), "Length" (141), "Weight" (28.0), and "Conditional Comments" (AD x New...). The right screenshot shows the "Design Mode: Complete Tag History" interface, featuring a list of attributes for selection, such as "Acoustic Tag", "Arterio", "Arterio Group", and "Arterio Group Configuration". A "Selected" list on the right side of the attribute selection window shows the chosen attributes: Tag, Event Type, Event Site, Event Date, Event Release Site, and Event Release Date.

Database

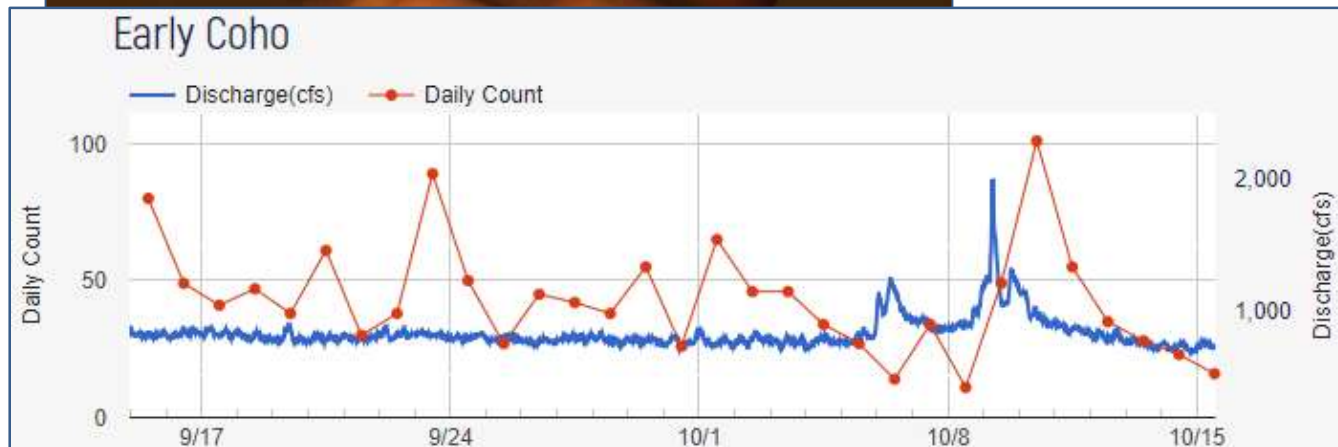
- Limits data loss and versioning errors while improving data access
- Cloud-based allows access anywhere with internet
- Many options
 - Access, MySQL, SQL Server



Visualization and Analysis



- Visualization of key metrics
- Identify issues early

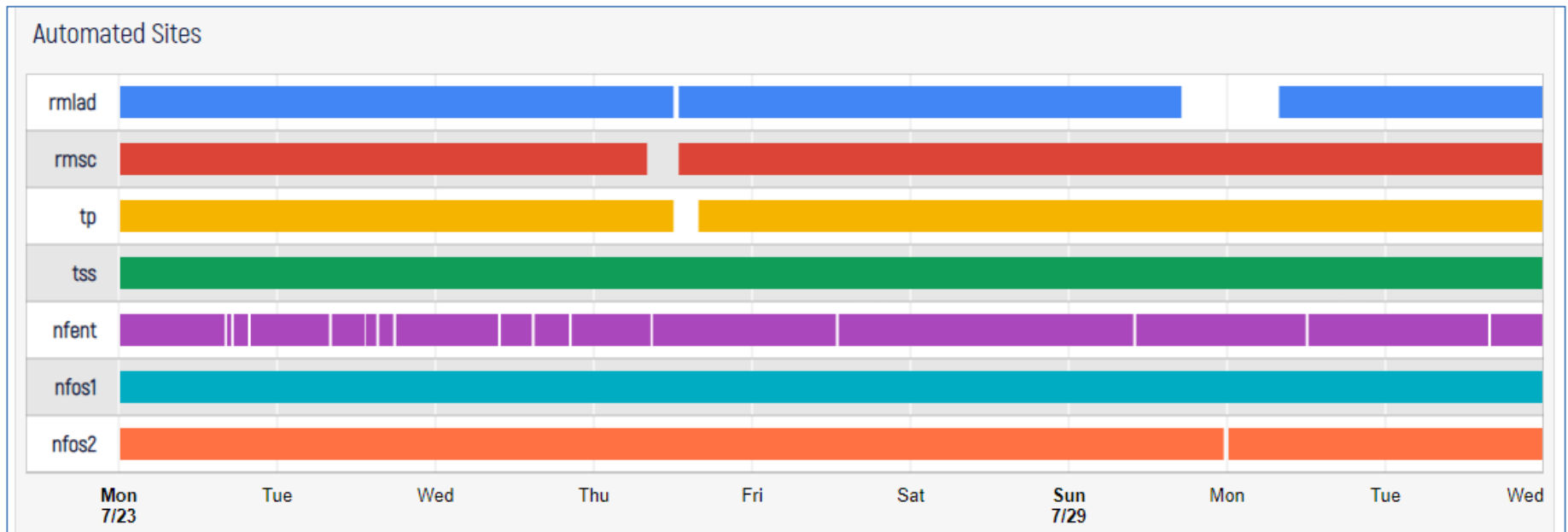


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Diagnostic Visualization Example

- PIT antenna performance diagnostics
 - Solid lines indicate normal operation
 - Gaps indicate times when antennas were not functioning



Convenient Data Reporting

- On-demand reports
 - Report ready spreadsheets and figures
- Online data access
 - Powerful query interface exports data in analysis ready formats

Home Dashboard Enter Data Access Data Logout shaffey

PIT Query Interface

RELEASE GROUP QUERIES RECOVERY QUERIES DETECTION QUERIES

Release location: Control Insulated 1, Estacado Lake Ran, FDD tailrace, FSC Sump

Study: RMSC sampler rates, RMSC evaluation, ODFW bulltrout tags, NF Spillway Net evaluation

Species: bull trout, brown trout, chinook, coho

Life stage: adult, ammocoete, jack, macrophthalmia

Release group: 12.2216.03, 12.2216.02, 12.2216.01, 12.2215.02

Origin: [dropdown]

Earliest Release: mm/dd/yyyy

Latest Release: mm/dd/yyyy

Data exports: Release Group Table Released Fish Table Wide Detection Table Long Detection Table Recovery Table

Export Datasets Edit Rel. Groups

Release Group ID	Study	First Release	Last Release	Release Location	Click to Edit
12.2215.02	Internal	Dec. 22, 2015, 11:12 a.m.	Dec. 22, 2015, 11:12 a.m.	FSC Sump	Edit
11.0917.02	2018 NF downstream passage eval	Nov. 9, 2017, 1:48 p.m.	Nov. 9, 2017, 1:48 p.m.	FSC Sump	Edit

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Gaining User Acceptance

- Collaboration through iterative development
- Leverage cloud platform to efficiently streamline releases
- Web development language facilitates prototyping



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Summary

- Gain efficiency through effective interface design
 - Achieve consensus on workflow and design
 - Automate where practicable
- Improve data quality with validation and diagnostics
 - Encode validation into forms, loaders, and database
 - Enable convenient access to routine diagnostics
- Convenient access to reporting and decision making tools
- Consider project goals and team input



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Questions?

Megan Stachura

mstachura@fourpeaksenv.com