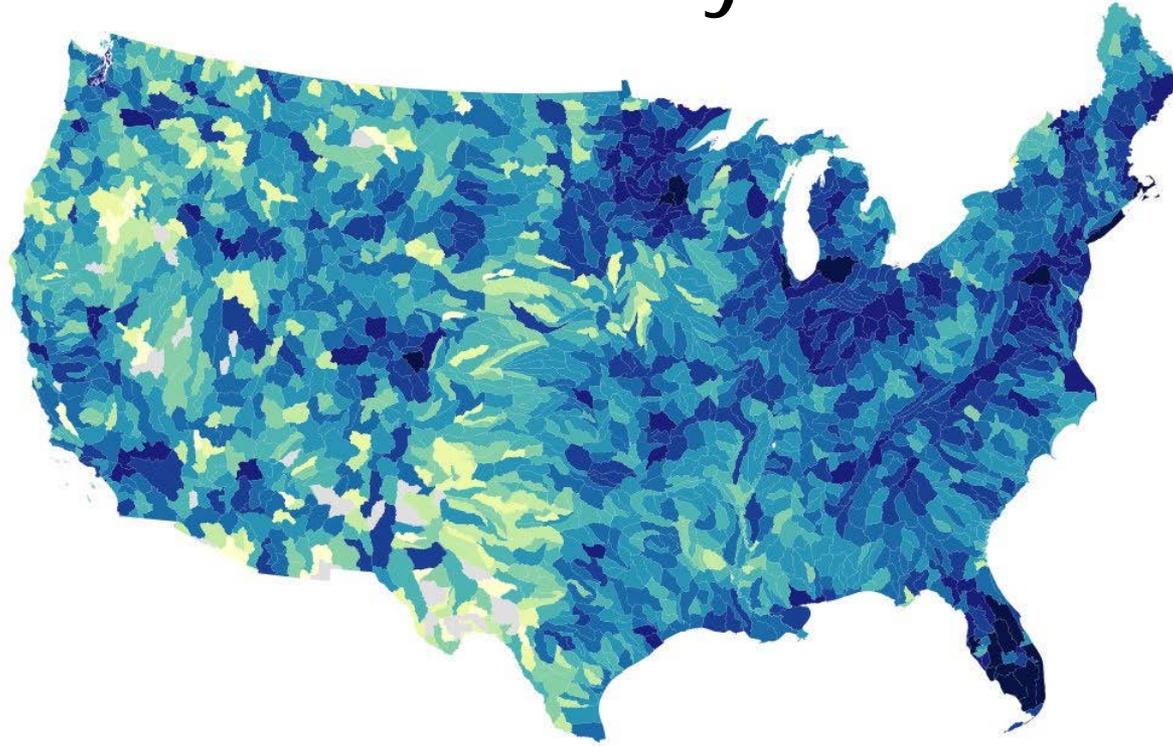


Water Quality Portal



Jim Kreft

USGS Water Mission Area

ACWI Streamflow Information Collaborative (SIC)

March 5, 2018



Water Quality Portal Background

- The WQP **is** standalone web-service that allows users to easily download USGS, USEPA, and USDA water-quality data from a single website
- The WQP **is not** a system of record; instead it retrieves data from over 400 local, state, and federal databases (USGS-NWIS, USEPA-STORET, USDA-STEWARDS)
- The WQP **includes** water-quality data only (physical, chemical, biological, and monitoring site metadata)
- The WQP **does not include** climatic (precip/snowpack), hydrologic (flow, groundwater levels), or water-use data
- Data **must be** organized and formatted using the Water-Quality Exchange (WQX) template
- We **are implementing** WQP 5-yr strategic plan finalized in 2017



Water Quality Portal Benefits

- 💧 One- Stop Data Shop (except for continuous)
 - Publicly available and easily accessible
- 💧 Standardized data protocol
- 💧 Standardized data output
- 💧 Easy to use interface with help desk
- 💧 Data updated regularly from sources
- 💧 Increases visibility of your data and your agency



Data become important beyond the
scope of their project

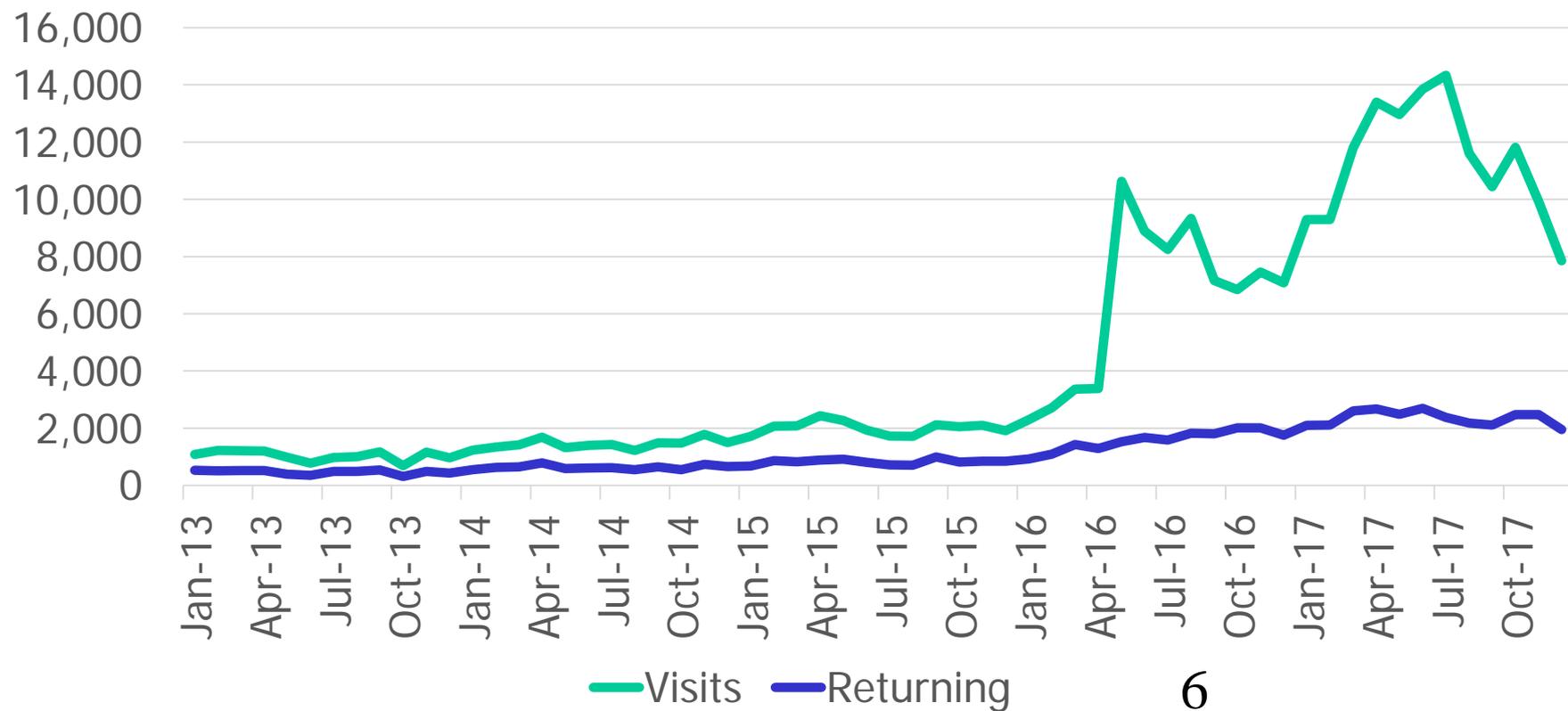


Multiple Data Sources and Types

- 💧 Portal Data Records (349 million total)
 - USGS
 - Biodata: 1.4 million
 - NWIS: 101 million
 - EPA (STORET/WQX): 246 million
 - ARS/STEWARDS: 1.2 million
- 💧 Data Contributors
 - Federal- EPA, USGS, USCOE(regional), NPS, USBR
 - States and Territories- 50+ multiple in progress
 - Tribes- over 250
- 💧 Data Types
 - Physical/Chemical
 - Biological
 - Metrics
 - QA/QC (Coming soon)
- 💧 Depends on the WQX Data Model

Portal Usage- Visits

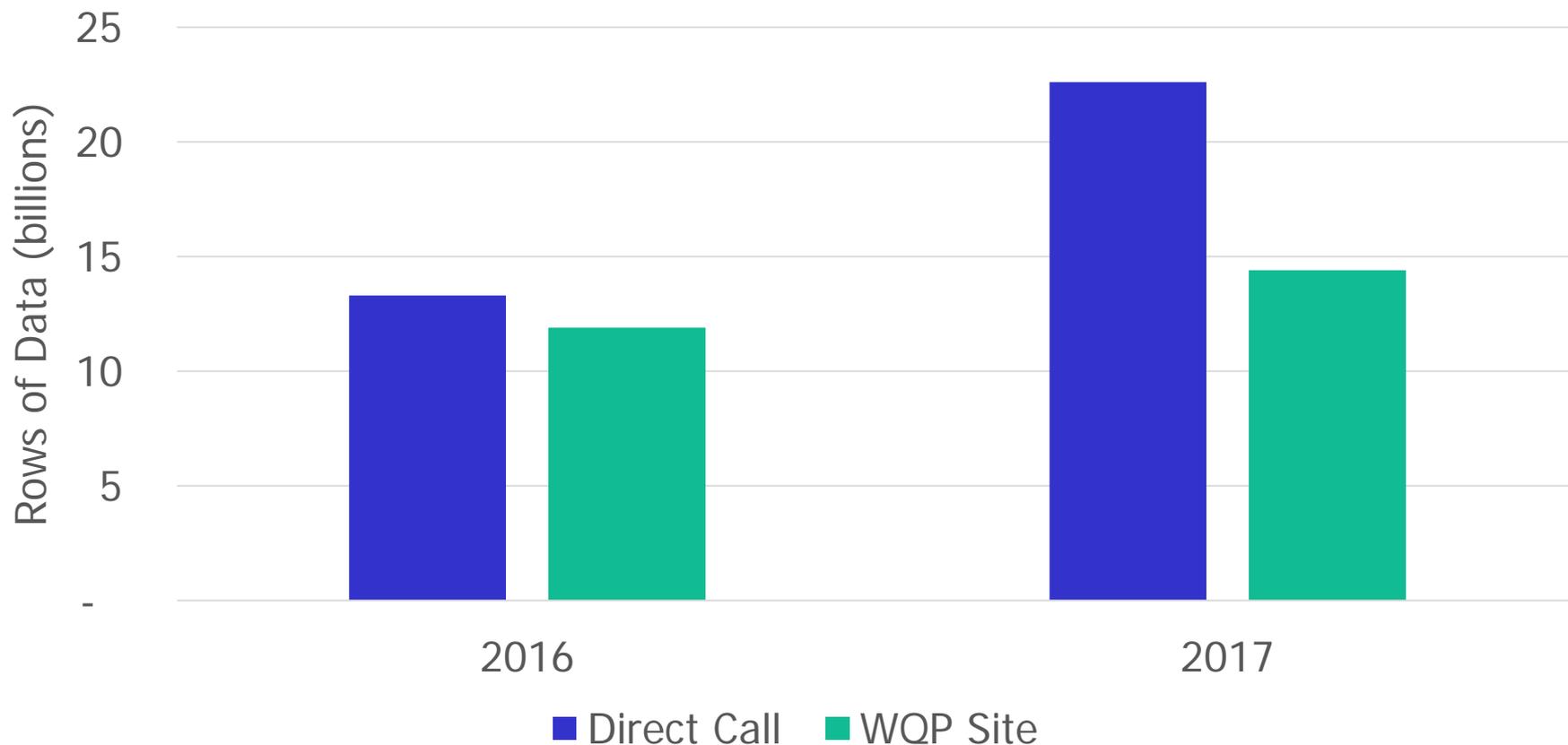
Monthly Visits and Returning Visitors, 2013-2017



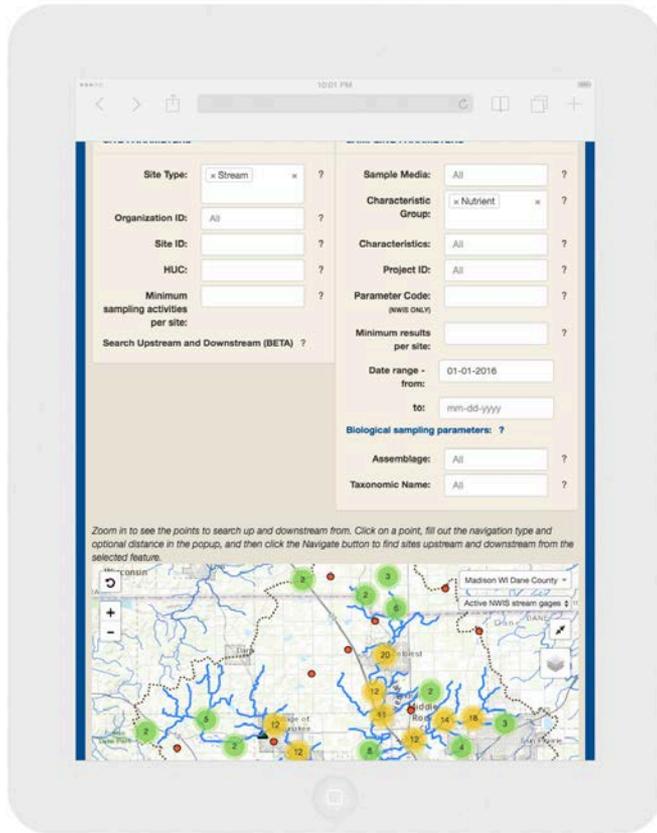


Data Downloads

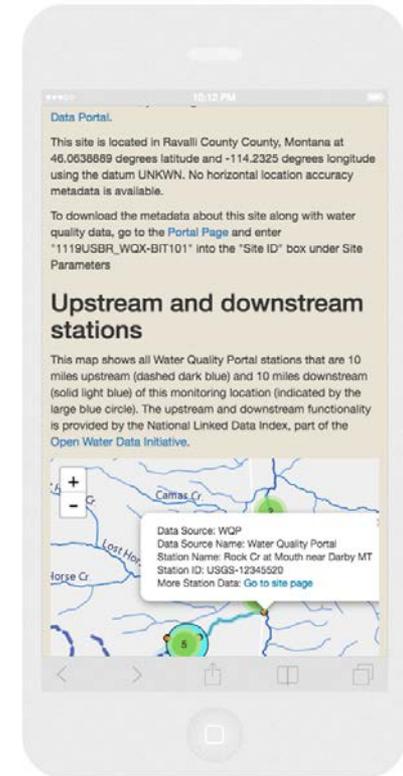
Rows of Data Downloaded (billions) 2016 vs 2017



Built Using Responsive Design



Water Quality Portal works on any device with a modern web browser





FY17 WQP Strategic Plan Progress

💧 System Performance

- Core improvements of technical infrastructure
 - Documentation and standardization ([Swagger docs](#))
 - Cloud readiness
- Extension of EPA Data load to to more components
- USGS- ensuring NWIS Modernization aligns with portal

💧 Data Quantity and Quality

- EPA team is doing significant out reach and training efforts
- Portal is serving out metrics and reporting levels
- Multiple best practices workgroups: Nutrient, Metals, and Biological Data
- 349 Million result records available

FY17 WQP Strategic Plan Progress

💧 Data Display and Discovery

- Upstream/downstream querying is possible
- Working with stakeholders to develop a summarization service
- EPA team developing data analysis tool

💧 Outreach/Education

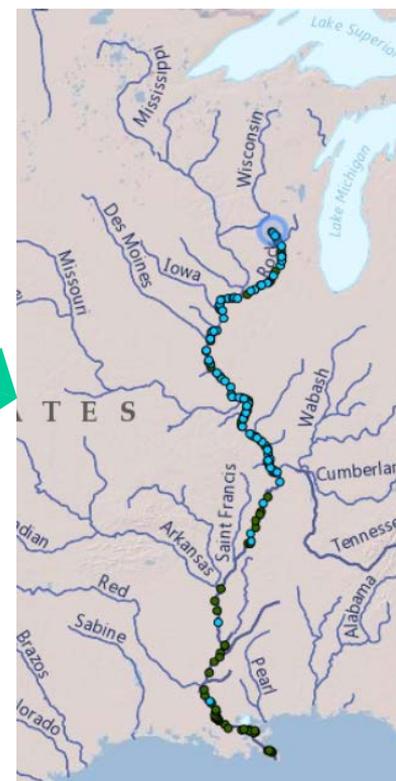
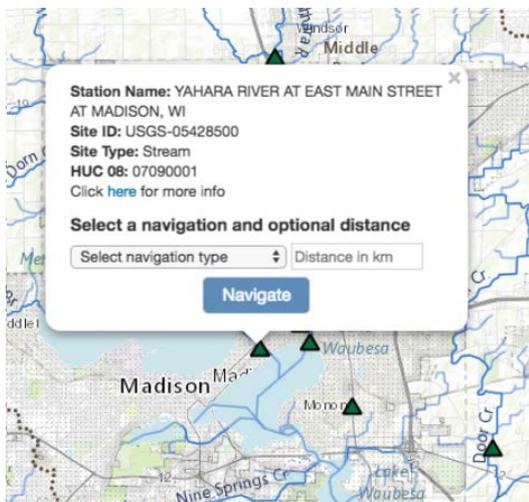
- Peer Reviewed paper:

<https://doi.org/10.1002/2016WR019993>

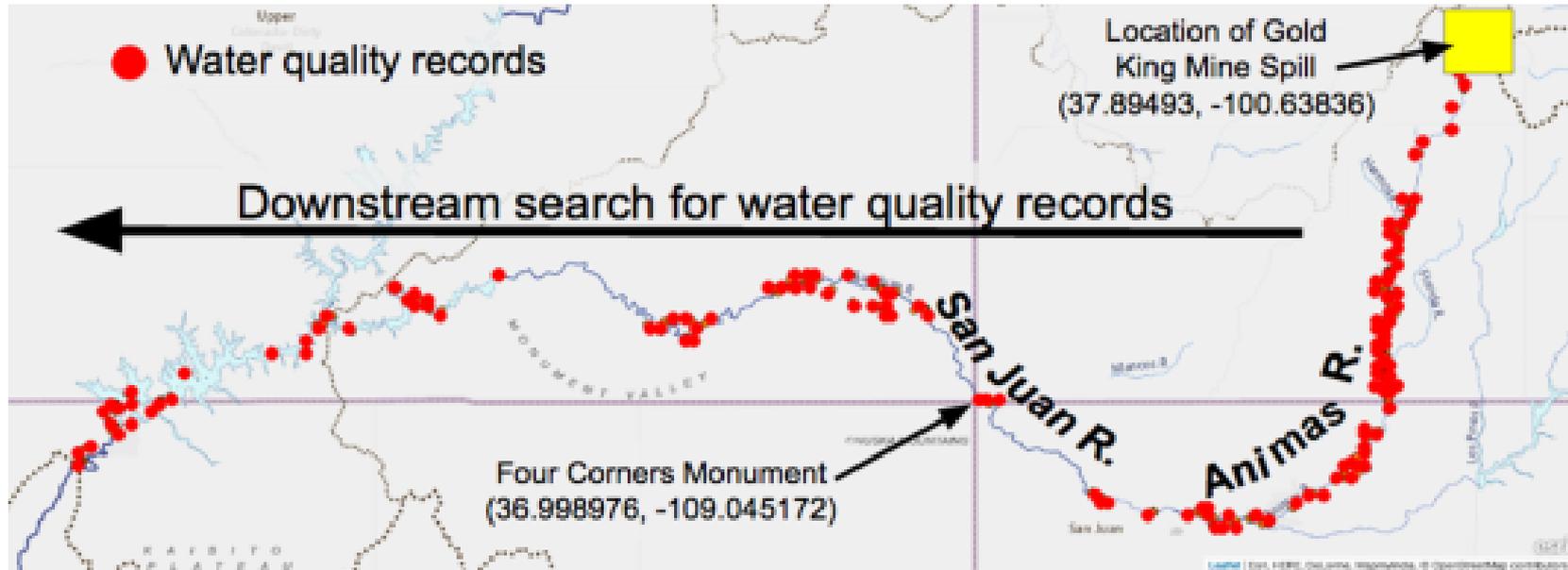
- Communication plan drafted

Sites with Nutrient data, downstream from the Yahara River bridge

SITE PARAMETERS	SAMPLING PARAMETERS
Site Type: <input type="text" value="x Stream x"/> ?	Sample Media: <input type="text" value="All"/>
Organization ID: <input type="text" value="All"/> ?	Characteristic Group: <input type="text" value="x Nutrient"/>



Leveraging Downstream Queries



Can answer questions in minutes that took days or weeks previously- see Young 2016

Water Resources Research

Volume 53, Issue 2, pages 1735-1745, 12 FEB 2017 DOI: 10.1002/2016WR019993

<http://onlinelibrary.wiley.com/doi/10.1002/2016WR019993/full#wrcr22485-fig-0003>

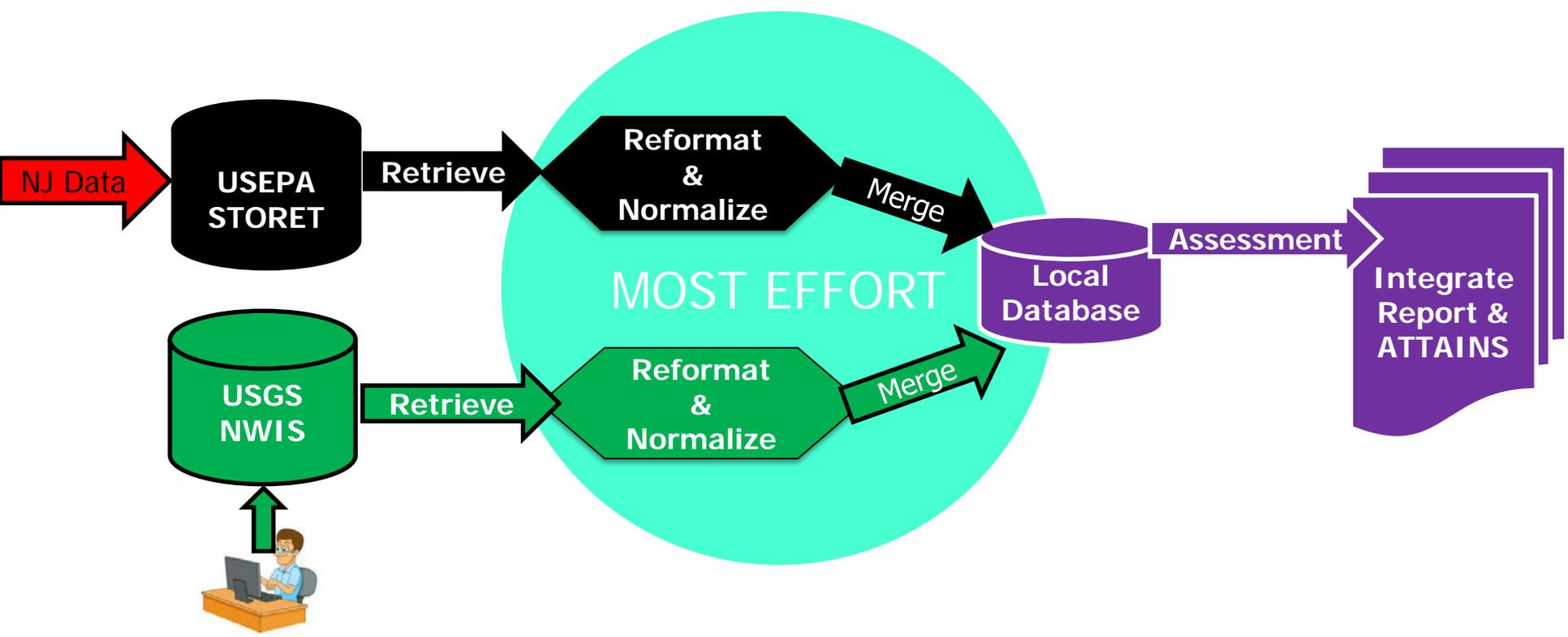
Young, Dwane, 2016 NWQMC

[https://acwi.gov/monitoring/conference/2016/2_wednesday_may4/G3/2-](https://acwi.gov/monitoring/conference/2016/2_wednesday_may4/G3/2-G3_Young_Portal_inTight_TimeFrames_secure.pdf)

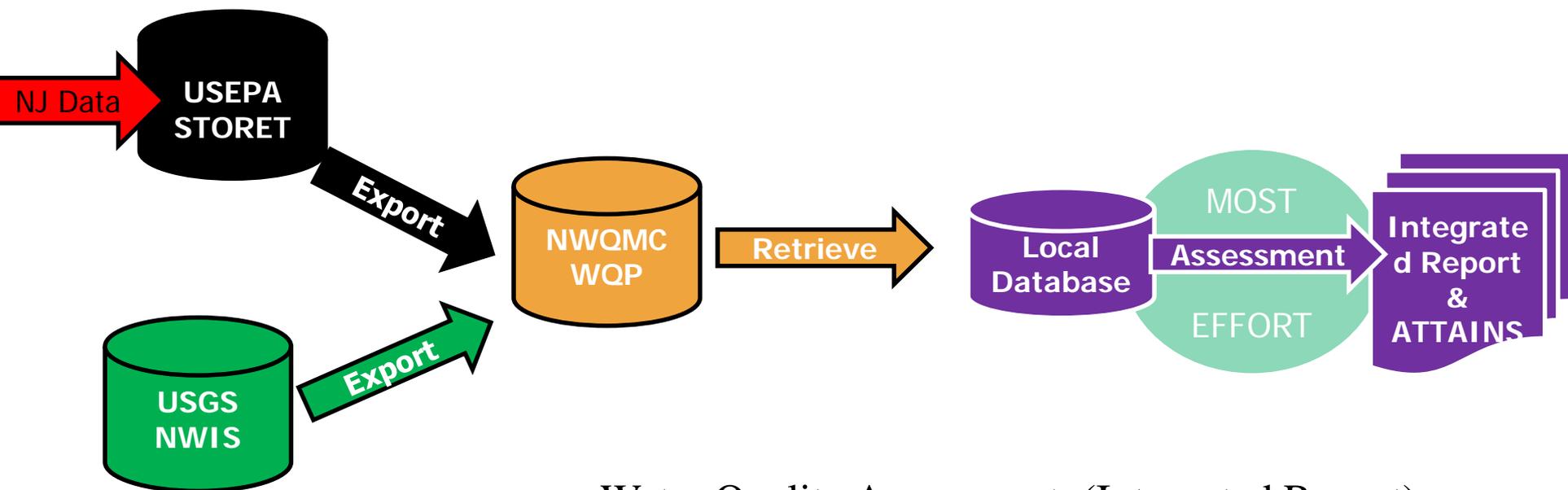
[G3_Young_Portal_inTight_TimeFrames_secure.pdf](https://acwi.gov/monitoring/conference/2016/2_wednesday_may4/G3/2-G3_Young_Portal_inTight_TimeFrames_secure.pdf)



Data Access & Assessment BEFORE the Water Quality Portal



Data Access & Assessment in AFTER the Water Quality Portal



Water Quality Assessment (Integrated Report) –
~ 40 % time savings estimated in NJ

Over 70 publications cite the WQP

- 💧 A GIS-Based Compilation of Spring Locations and Geochemical Parameters in the Appalachian Landscape Conservation Cooperative (LCC) Region
- 💧 Global aquifers dominated by fossil groundwaters but wells vulnerable to modern contamination
- 💧 Large-scale modeled contemporary and future water temperature estimates for 10774 Midwestern U.S. Lakes
- 💧 A database of georeferenced nutrient chemistry data for mountain lakes of the Western United States.
- 💧 Late-Pleistocene precipitation $\delta^{18}O$ interpolated across the global landmass
- 💧 Watershed-scale impacts of stormwater green infrastructure on hydrology, nutrient fluxes, and combined sewer overflows in the mid-Atlantic region
- 💧 https://www.waterqualitydata.us/apps_using_portal/

FY18 goals

- 💧 System Performance
 - Explore hosting alternatives (e.g. cloud)
 - Continue incremental data loading improvements
- 💧 Data Quantity and Quality
 - Additional endpoints: Project, Indexes, Files
 - Continue discussions around data quality
 - Work with new organizations to submit data
- 💧 Data Display and discovery
 - Summarization service- lead to summary data on user-relevant pages
 - EPA team working on data analysis tool
- 💧 Outreach/Education
 - Portal Communication Plan (With NWQMC WIS)
 - Factsheets and other outreach materials
- 💧 Strategy and status- Continued discussion with NWQMC

Future challenges

- 💧 Integration of network concept
- 💧 Integration with continuous monitoring data
 - WQP data model (WQX) is discrete focused
 - Continuous monitoring data is ever more important for water quality monitoring
 - Interagency integration of continuous data is an unsolved problem

Questions?

💧 jkreft@usgs.gov

💧 Shumway.Laura@epa.gov

💧 Happy to schedule a demo with anyone!