

## Notes taking by Kyle Onda

### Question 1: Regulatory and data challenges

-Washington State/ Andrea Laudon/ Dept of Ecology: Data completeness, requires users over a certain amount to report water use data. Have not made contact to all those people. Water rights got back to 1916. Challenge contacting those required to report by statute. And for the ones that are, making sure getting data every year

-Lauren Mack/MO: Missouri has similar issue. Statutes are not regulatory in nature. Not everyone knows about reporting requirements. There hasn't been a focus in the department on letting people know. Contacting people is an issue about what they are using. The data can get confusing. Multiple wells belong to several people. Hard to tell what's duplicated. Reports from owners vs farmers.

-Joseph Cleys/NDSU/ND What is in the data? Various databases? No consolidation.

-Andrew Weinberg/TWDB/TX: Robust methods for reporting water use. But questions about Ag use, estimates of actual application are somewhat lacking. Issues of quantifying self-supplied domestic. No requirements for reporting domestic wells. Sand and gravel mines with fracking, finger pointing about mining taking groundwater for dust control, but little data reporting for them.

-Vlad Iordache/Illinois State water survey/IL: voluntary program. Public supplies have to report it anyway, but for other facilities demand confidentiality. Have to do source masking. They don't collect data for regulatory purposes, just for science.

David Ketchum/ Montana DNR/MT: Don't require water use reporting unless written into new water right applications. Basic lack of reporting. That hinders ability to do water planning. Informing water rights management. Hard to be hydrological advisors without technical data. Limited ability to measure water.

Rosemary Hatch/ Wyoming Water Data System/WY: Don't require reporting usage. The Water Planning and State Engineer's office are different. Planning is with the university. There is some groundwater regulatory (groundwater control areas in SE). Send out voluntary survey alternating between PWS and Irrigation districts. Irrigation contact info is usually home phone, hard to get in touch. Usually no internet access.

### DO YOU HAVE ADEQUATE INFORMATION ON SURFACE/GROUNDWATER ISSUES:

WA: No. Don't have data that they are required to be collecting. Don't have enough to do a lot of planning. Get asked for water use or water budget data for planning purposes, but they don't have.

MO: Compliance at 70% reporting for people in the system. Wells after 1987 are supposed to have certification information but not tied to system. There is nothing for surface water. If they know how much they are able to pump.

TX: Surface water is good. Groundwater is sparser. Database covers ~10% of wells, going back to 1904, don't know if still there. Lots of gray. Groundwater conservation district data of mixed quality. GW/SW interactions a gray area that is an issue for the state. As people pull water out of groundwater that may be linked to surface water discharges/rights

IL: generally have good source water data. That's because there is centralized water use. IL GS knows where wells and withdrawal points. The issue is the withdrawal amounts. Self reported, using assumed pump break capacity.

MT: Answer is No. WUDR has helped with PWS. Crop consumption also helped by WUDR. They have real time stream gaging network in cooperation with USGS. But that's more availability than use. Can use as proxy sometimes, but not a water estimator.

WY: Bifurcation between State Engineer database and water planning office, can only download 10,000 records at a time. That's just permits, not even metering. Unclear as they adjudicate rights.

### PLANS to Address Challenges with data access

WA: Challenges have been staffing with more compliance staff out to collect data. Combing through data more, finding more people who should be reporting. Developing telemeter meter program, where required reporters can buy a telemeter to send data directly. Not subsidized (yet). Subsidy would be \$200 but would save reporting time a lot. Developing QA/QC functions for outlier amounts and such

MO: Some staffing issue but recent hires help. Trying to clean data by contacting people. Clean outdated data from database. With WUDR grant, trying to contact groups that might be required.

ND: getting automated meters out there. Getting people to buy in to that is hard. WUDR grants to push more data out there.

MT: Some WUDR grants have been for telemetering. Does NRCS have programs for telemetering AND IRRIGATION?

TX: Water boundary viewer will be helpful for assessing number of wells on self-supplied domestic water. Where they know there is a lot of wells in suburban communities has been

helpful. Experimenting with Remote sensing for estimating Ag use. Being able to use consistent technique and go back historically to benchmark other estimation methods.

IL: WUDR grant helped hire staff, developing automated QA/QC, know databases. Looking for proxies for uncollected data. Trying to find ways to disaggregate aggregated way.

MT: The solution is to acquire accurate withdrawal and consumptive use data. Metering, remote sensing. Need it though. Montana could use modernization of internal processes.

WY: The politics of have people willing to change. Ag consumptive use, trying to figure out how to use OpenET.

**QUESTION 2: Part 1 What water use reporting for regulatory and institutional purposes are most important. What data standards for QA/QC do you use?**

WA: Most important is to meet statutory goal towards “fish critical” basins and larger users. Mostly PWS and Irrigation. Most water use data is used for. Compliance rather than planning. Some standards are built in the database. There is notification of off reporting based on previous reports, but they are self reported data. Telemeter meters would fix everything. ALSO PEOPLE DON'T WANT TO BE REPORTING.

MO: Focus is on data cleaning. Implemented some checks, realizing that older data didn't go back and check anything before, and kept updating with wrong information about locations and water use. Put in check to say they cant be using more water than their pump capacity. But it doesn't give data enterer an error. Locations are also bounding boxes, which is often in other states. Want people to put in location via point and click map interface.

NDSU: Need accurate and consistent reporting. That can be used for future legislation. Data standards, consistent identifiers.

TX: Bill Billingsley is more responsible for it. For regulatory and institutional purposes, have a robust system for gathering data in the planning process. So, data problems tend to be issue-driven. QA/QC, have a 21-step QA/QC process, including built in checks. Time series does bounce around, so still questions about data quality over time.

IL: Importance of the data can fluctuate depending on who they are working with. Thermoelectric/ hydroelectric seems important to DOE grant makers now. Communities needing to switch sources from depleted aquifers have needs for data. But they are flexible to react to issues. QA/QC is ongoing, trying to create filters to flag for human checks. It always come downs to contacting people about why. In general, 2-year lag for QA/QC before use

MT: 96-98% of consumed water that has been diverted is agricultural. Conflicts with Wyoming, Alberta or downstream states, the issue volumetrically is ag use. Montana aspires to meet USGS standards on the tier system in WUDR. With new types of data, remote sensing, there is no comprehensive QA/QC for consumptive use estimates.

WY: Heavy agricultural importance. All diversion records from state engineers office, manual entry. On planning side of things, for geospatial data. For planning, Wyoming hires consultants that do basin plans. Have started to implement standards for consultant data. For PWS and Irrigation surveys that goes into Access database, wants better QA/QC.

### Question 3: Gaps in water use reporting system gaps in technical supply and methods.

Washington: Online reporting mostly in use. Gaps in technical support, IT is on their own.

Missouri: 40% of people elect to not use online system due to lack of email address or internet. The current system is not user friendly. But the IT department is stretched thin and all changes have to go through them

ND:

TX: Online system, includes video tutorials that have been helpful.

IL: No IT support, one software engineer have some % of the time. A lot of solutions are home brewed. Self-taught programmers. Users tend to do QA/QC, have problems, try to fix quickly.

MT: No water use reporting system and no plans to develop one

WY: No water use reporting system and no plans to develop one.

### Q3\_2: Plans for data collaboration, models and services.

WA: Allow access data to USGS. Currently not setup to export a lot of data at once.

MO: Making database more user friendly for the public. Tied to Access database. Difficult on their end to find anything that is not year-specific. Want to transition to something more user friendly.

TX: Decent capabilities to export data currently. Unaware of plans to update water use reporting. There is an enhancement for evap modeling, so there will be more data there that goes into the same planning process.

IL: New task is making data public. Currently requires public to ask staff to look up stuff. Put some kind of data disclaimer for public data might be a need.

WY: From planning office, trying to standardize data, reporting for “info use only” disclaimer.

MT: Want to change internal processes.

### If water use data is voluntary, are there reporting guidelines?

WA: All data is self-reported. There is a step-by-step guide for how to report to database. Guidance on what kind of meter to buy, what kind of information needs to be collected.

MO: All reporting is voluntary, trying to help people how to estimate in a broad sense for people that have no idea. Trying to put calculator tools on website tailored to different groups. Mostly its on a contact-staff basis

TX: video tutorials

IL: It's on the website, do people use it? There is a phone hotline, email address. To give help for water use estimation. Form is one-size fits all, so depending on industry, much of the survey is not applicable.

MT; water use not typically reported, when it is reported it has a form.

WY: Water use not reported, just a broad survey.

### Q4\_1:What is acceptable lag time given reporting schedules:

WY: Depends on sector. Ag would be different than a PWS or industrial.

MT: Monthly time step yes, acceptable lag as short as possible. Spatial—county or HUC-8

IL: lag time is by sector. Irrigators only use 3 months. PWS, some have FY, some have annual data, some have water year. There are spikes by sector. Private sector can give provisional data but then they have to give final data. Like monthly time step, important for seasonality. But only mandated to collect annual. Easier when parts of service provision to get monthly data. At County data, but can do HUC-8. They have site specific data. Can get to 10 acre plot-level location.

TX: Water use information that is collected is generally annual. Optimally, we'd love daily data. A lot of people need that, dam managers. Want to know when nearing regulatory limits for flows.

ND: current annual reports, would like monthly.

MO: Generally collect in January of next year. January-march is “reporting season”. Constantly QA/QCing that. They don’t ask for monthly data. Can give estimate for breakout by months and days/month. Online system will calculate average use/day. Site-specific data. They ask for lat/lon in both decimal and minutes/seconds. Some farmers only know township and range, but should be within a mile. A lot of people have no idea how to find their location. Guidance for location of wells.

WA: Requires reporting by January 1<sup>st</sup>, and have ability to penalize but don’t. System only catches users who have reported in the previous five years. Temporal resolution varies by use, some annual, some daily. Most somewhere in between. Usually required to submit maximum rate of withdrawal. A couple of compliance actions to require telemeters. Spatial resolution—site-specific, not required to report lat/lon, but usually have Q-Q so 10 acre area. Big issues mostly about impairing other users

#### Q4\_2: Challenges with working in a common spatial unit?

MT: typical geospatial data management problems

IL: have good point data, so can aggregate to whatever. HUCs aren’t super useful for Illinois, b/c deep groundwater is common.

TX: Most use data is for planning purposes, so done for administrative rather than hydrological data. Not all data has lat/lon data, but in general that’s good. But GW is a different beast.

MO: Report surface intakes with HUC-8. Public won’t put in or see unless they look at final report. MO adds HUC 8 based on location given to them.

USGS: sometimes lat/lon is at building, not the intake, and the intake might be in different HUCS

WA: Don’t use HUCs

#### Q5: What can WaDE or WUDR do to help?

WY: Update permitting databases to allow for better information update. Surveys, how to improve responses from voluntary surveys. Response rate is 30%

MT: Funding and technical support. Learn from other states. Copy-pasting wheels. Can create comparable data if you keep things similar enough.

IL: focused on data outflow, keeping conferences going.

TX: Support for technical innovations, OpenET type stuff. Reservoir evap component to OpenET.

ND: Provide initiative to consolidate databases, clean up, get organized. SO can get started on mapping areas.

WA: Staffing is largest issue. Have mechanisms to require reporting, but no capability to enforce requirements. Technical support for tools to make data reporting more efficient. Web application to export data would save time.

### Q6: Any lessons learned:

WY: Communication between agencies. There is a lot of information out there, but its getting it together and keeping it consistent. Multiple agencies + university.

MT: apply for more money. There is a willingness to do new things if someone else is paying for it. If you write the grant, you will be able to do.

IL: For voluntary programs, be persistent. The data is out there. Work political connections, hierarchies. Find the network to find the person who knows the most about the most wells.

TX: Moving from database forms to csv, to presenting on tableau, PowerBI

ND: Keep people involved, coordinate. Want consolidated database.

MO: Persistence for voluntary programs. Find who you need to contact.

WA: database was set up to query data by a lot of different elements. BY right, by water use, ownership. Have separate database for well construction. Did accuracy study.