Tech for Trade Survey Summary
Sept 2, 2021

Background

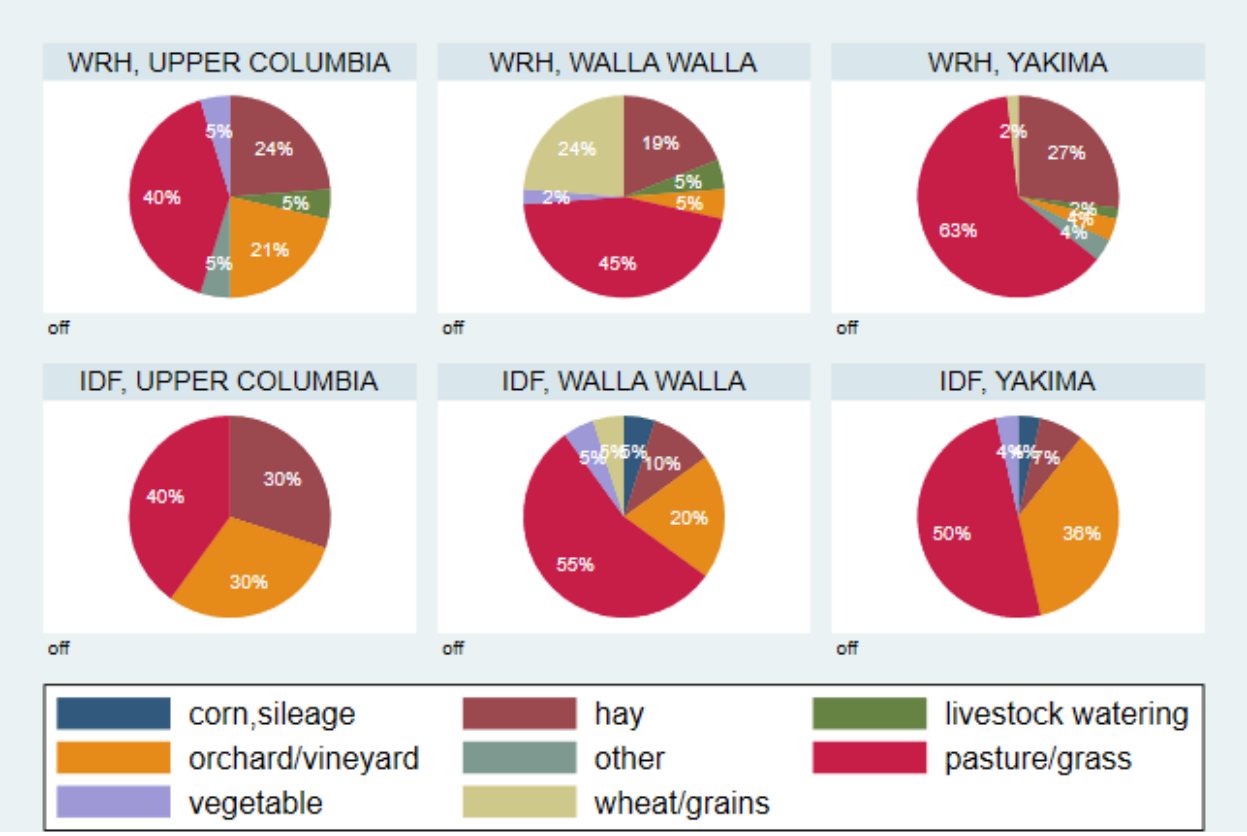
Washington State University and the State of Washington Water Research Center conducted a survey of water rights holders and irrigation district growers in the Okanogan, Methow, Walla Walla and Yakima river basins in Washington State. The survey was part of a larger project that is exploring the development of information technologies that could enhance water use now and in the future. The intent of this summary is to report back to survey participants what we learned.

The survey was conducted between December 2020 and March 2021. The survey elicited responses from two groups in the four basins. The first group was landowners who have a water right registered with the Department of Ecology in the state's Water Rights Tracking System. We refer to these as water rights holders (WRH). The second group includes landowners who own property within an irrigation district, whom we refer to as "irrigation district farmers" (IDF). The survey asked people about their use of weather forecasts, basic information about their operations, their views on water management policies, and their views and experience with water transactions. In total, 248 people responded. For more details on how we selected participants to invite and response rates, see the "Sampling and Response Rates" section at the end of this document or the "Summary Statistics and Survey Documentation" at https://bit.ly/2YbKn07.

Respondents

The final number of completed surveys (including a small pretest in March 2020) was 248; 181 water rights holders (WRH) and 67 irrigation district farmers (IDF). We group respondents in the Methow and Okanogan Basins together, referring to the region as the "Upper Columbia". The median farm size is 10-50 acres; twenty percent own farms over 100 acres. The main irrigated crop for respondents is grass/pasture and hay, with a higher fraction of wheat/grains in Walla Walla and a significant fraction of orchards/vineyards in all three Basins (Figure 1). Three quarters of respondents are men, with a median age of 60-69. The median respondent has a Bachelor's degree. Ninety percent report having a non-farm source of income.

Figure 1. Main crop grown by respondent, by Basin.



Six key findings

#1 *Water markets bring up complex and sometimes conflicting views*.

We asked two questions to gauge how respondents thought about the balance between water rights as private property and water as a public natural resource. We first asked whether respondents agreed with this statement: “Water should be put to use according to the desires of the owners of water rights.” Seventy-one percent (71%) either agreed or strongly agreed with this affirmation of private property rights. We then asked about this statement: “Water transfers that involve water leaving the County should be prohibited, regardless of how valuable the water may be to users outside the Basin,” and 64% agreed or strongly agreed. Interestingly, 49% of respondents agreed or strongly agreed to *both* statements about protecting property rights and preventing out of basin transfers.

#2 It is difficult for water rights holders and farmers in irrigation districts to know what a "fair" price is for a water right, and there is some support for a mandatory price disclosure policy.

Unlike real estate transactions, the state of Washington does not mandate that participants in water markets disclose sale prices. We were interested in whether this made it difficult for respondents to know what a "fair" price (i.e., a price that most buyers would expect to pay and sellers would expect to receive) was or should be. Two thirds of respondents said it was "difficult" or "very difficult" to know a fair price.

When asked if the respondent would support state-mandated price disclosure for water market transactions (like real estate transactions), 60% of respondents said they would vote yes in a hypothetical county referendum mandating price disclosure. Support was higher in Methow (89% yes) and Walla Walla (65% yes). In Yakima, 60% said they would vote yes, but only a minority supported it in Okanogan (36% yes). Thirty-seven percent (37%) said that such a policy would make it more likely that they would participate in a transaction. Notably, only 6% of respondents were aware that the state has required that mitigation water banks disclose prices since 2016.

#3 Familiarity with water markets is relatively low and potential for computer-aided markets may be substantial.

Overall, only one third of respondents said they were "comfortable" or "very comfortable" with buying, leasing, or selling water. Comfort levels were somewhat higher in the Yakima Basin (40% comfortable or very comfortable) and somewhat lower in the Upper Columbia (21%). Half of water rights holders were "familiar" with permanent water rights sales, a third were familiar with temporary leases, and one quarter were familiar with mitigation banks.

While two-thirds of people who participated in a transaction were "satisfied", one third were "somewhat unsatisfied" or "very unsatisfied". Some of the main challenges reported could be eased with computer-aided water markets. Respondents listed regulatory hurdles and finding counterparties as two challenges; computer-aided markets may be able to match sellers and buyers both on their willingness to buy and sell but also on the potential for their transaction to receive regulatory clearance. This is similar in principle to the "suitability maps" used in Kittitas Valley water banks. Other challenges mentioned were estimating a fair market price (see above) and the risk of the seller needing to relinquish a portion of the right.

#4 *Relinquishment rules are unpopular and may be leading to "wasteful" water use.*

Relinquishment law (RCW 90.14.160) requires that a water right be put to beneficial use at least one year in any consecutive five year period since 1967 or risk loss of the right ("use-it-or-lose-it"). The survey noted some possible drawbacks of such a policy, such as increasing unnecessary water use, weakening investment in efficient irrigation systems, and limiting water market transactions. It also noted possible advantages, such as preventing water speculation, encouraging use of unused water, and protecting water availability for junior rights holders. We then asked respondents if they would prefer the state to keep or repeal relinquishment law. Eighty-three percent (83%) of WRH supported repeal. Support for keeping relinquishment rules was somewhat higher among IDF: 37% voted to keep relinquishment rules.

Twenty percent of WRH said they have experienced some sort of diminishment as a result of the rules, and approximately one quarter (27%) said that they have used more water than needed in order to secure their water right One-fifth of water rights holders were not even aware of relinquishment rules.

#5 *Most irrigators are not estimating consumptive use*

One quarter of IDF respondents reported estimating their consumptive use (CU, the amount of water that is lost to evapotranspiration); only 17% of WRH did. The largest group did not estimate CU and were not interested in doing so (42% IDF, 51% WRH); approximately 16% did not estimate CU but were interested. Seventeen percent did not know the meaning of the term consumptive use (17%).

Among those who did estimate CU, 31% said they estimated it to establish their water use history in support of maintaining their water right. The remainder estimated it to improve on-farm water use efficiency. Nearly half (40%) used an approach that assumed CU was a fraction of applied irrigation water. One quarter used soil moisture sensors, 11% used weather-based evapotranspiration estimates, and 7% used the Washington Irrigation Guide.

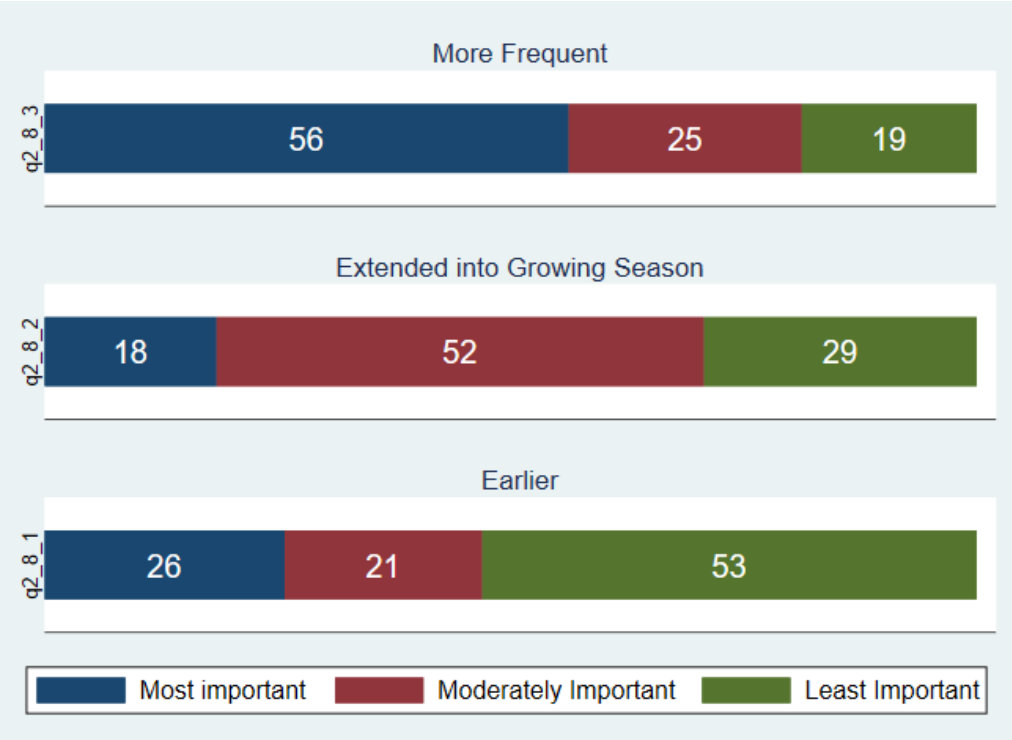
#6 *Only about a third use long-range forecasts, and there is room for improving forecasts*.

Approximately one-third of respondents said they use forecasts of precipitation, snowpack, temperature and water availability that are "long-range," covering the coming 1 to 7 months. IDF respondents are more likely to use them (39%) than WRH respondents (27%). Half of respondents with an orchard or vineyard said they use them. Water for irrigation and precipitation were rated as more important metrics than frost

and temperature. We asked respondents when they wanted to receive forecasts and for which time periods. Most respondents want to receive forecasts in March and April to cover the April - August portion of the growing season.

There is scope for improving forecasts: only about half of forecast users are satisfied or very satisfied with the accuracy and timing. Respondents ranked more frequent forecasts throughout the growing season as more important than earlier forecasts or forecasts deeper into the growing season (Figure 2).

Figure 2. Ranking of priorities for how to improve forecasts



Next steps

The larger study is examining how three new technologies – enhanced seasonal forecasting, improved measurement of consumptive water use by crops, and computer-aided water markets – can help improve water management. As the project continues, researchers will continue to explore irrigated farmers' attitudes towards water markets, and explore how market constraints can be removed to improve water management.

For more details on the survey implementation, to see a copy of the exact questions asked and responses by question, please see the “Summary Statistics and Survey Documentation” at https://bit.ly/2YbKn07.

For more information, please contact survey lead Joe Cook (joe.cook@wsu.edu), extension lead Georgine Yorgey (yorgey@wsu.edu) or project lead Jonathan Yoder (yoder@wsu.edu).

Appendix: Sampling and response rates

We contacted IDF respondents using property assessor records. For IDF, we used spatial analysis to select property parcels that were located within the boundaries of an irrigation district and were within an area that the Washington State Department of Agriculture's Agricultural Land Use Geodatabase showed as growing an agricultural crop. We combined parcels owned by the same person. This produced 7,191 eligible IDFs.

For WRH, we first matched a water right to the geographic coordinates of its "place of use" and then matched those coordinates to a parcel in the property assessor records. In cases where we could match the place of use to a parcel in the assessor data, we contacted the parcel owner. Where we could match to a parcel, we used the contact information for the water rights holder in the Water Rights Tracking System (WRTS). We dropped water rights with an annual use less than four acre-feet. This resulted in 2,186 WRH eligible to participate.

Of the 9,377 eligible contacts (2,186 WRH + 7,191 IDF), our budget allowed us to contact approximately 1,600 addresses to invite them to participate. We combined the Methow and Okanogan Basins into a region we refer to as the "Upper Columbia", and split the available survey invitations equally across the three regions. Addresses were randomly selected. We sent 70% of invitations to WRH.

A private survey research firm, Pacific Market Research, implemented the survey. Over the course of four weeks, they sent a pre-invitation postcard (week 1), an invitation letter with a printed survey and a $2 bill (week 2), and reminder postcards in weeks 3 and 4. Respondents could fill out the survey on paper, on the phone, or on the web.

The overall response rate to the survey was 16.7%. Response rates were highest among Yakima and Methow IDF (24%), and lowest among Okanogan IDF (5%). For more details, see the "Summary Statistics and Survey Documentation" at: https://bit.ly/2YbKn07.