Oregon Water Coalition
Member Newsletter

Inside this Issue:

- Reaction to water well bills
- Columbia Basin runoff forecast
- Studying dams' effect on rivers

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Storm provides Northwest irrigators with much-needed moisture

February has brought most of the Pacific Northwest badly needed wet storms and an outlook for more moisture, but weather experts warn irrigators still face a huge deficit due to extreme dryness through January.

Basins across central and southern Idaho received 75-95 percent of their full February precipitation during the first 11 days of the month, said Ron Abramovich, Idaho water supply specialist with the NRCS.

"We've got about 18 days to go, and there's wet weather moving in. We're off to a great start," Abramovich said, emphasizing it will still take a series of storms to get Idaho back on track.

Gary Wicklund, an Idaho meteorologist with the National Weather Service, said Pacific Ocean conditions have shifted toward a wet pattern known as a Pineapple Express.

Systems south of the Aleutian Islands have grown strong enough to push warmer, wetter systems from as far west as Hawaii into the Pacific Northwest, nudging a high-pressure ridge pervasive throughout January southwest.

Wicklund said such conditions were expected to persist through at least Feb. 19, bringing slightly warmer temperatures and decent storms into the region every couple of days.

Oregon NRCS hydrologist Julie Koeberle said three storm systems have hit her state's northern basins from early January through now.

Southern basins in the Klamath and Siskiyou mountains and the Southern Cascades, however, have been mostly missed.

Koeberle remains hopeful that the Pineapple Express may still reach southern Oregon, where snowpack is about a third of normal, reservoir storage is meager and irrigators have requested state disaster declarations.

She said several snowpack monitoring sites in southern Oregon are at or below the record-low levels of 1977.

"It's a dire situation to be honest in those areas," Koeberle said. Even in Northern Oregon, she said, precipitation at most snow survey sites only ranges from 60-75 percent of normal.

Washington has fared no better, NRCS water supply specialist Scott Pattee said in a press release.

"We would need to see 200 percent of normal snowfall over the next two months to catch up to normal," Pattee said. "Today's best advice would be conservation and conservative planning for summer water use."

Through Feb. 1, Pattee said Washington had received just 35 percent of its annual snowfall, half the amount of a normal year. Readings in the Olympic Peninsula were the state's lowest, at a quarter of normal.

Idaho ended January with about a third of its snow telemetry stations reporting record-low precipitation for the water year and the NRCS warning of likely shortages in the Owyhee, Salmon Falls and Oakley basins.

Idaho basins along the continental divide, including the Upper Snake Basin, reported near average snowpack but dismal storage water carryover.

Steve Howser, general manager of Aberdeen-Springfield Canal Co., which utilizes Upper Snake storage, said his water outlook has changed dramatically during the past two weeks.

At lower elevations, Howser is optimistic that melting snow will replenish soil moisture, and he's now anticipating a normal season for utilizing the Snake River's natural flows.

Idaho water officials were scheduled to meet Feb. 14 in Boise to update their extended irrigation outlook.

"If this Pineapple Express keeps coming for the next few weeks, we'll probably not have any more difficulty than we had last year," Howser said.

John O'Connell, Capital Press

New Oregon legislative water well bills receive mixed reaction

Legislation that would affect the ability of Oregon water regulators to shut down irrigation wells is proving divisive in the farm industry.

Several bills — HB4044, HB4064 and SB1527 — would require the Oregon Water Resources Department to prove that individual wells are interfering with surface water rights before shutting them down.

Proponents of the bills claim that due to complicated hydrology, some wells can pump water without depleting nearby creeks and streams.

They say the OWRD shouldn't be able to shut down wells based on regional models that aren't precise as to the effect of individual wells.

Opponents of the bills, including groups that represent irrigators, fear they will impede the OWRD from protecting holders of senior water rights.

The legislation was inspired by water shortages in the Upper Klamath Basin, where the OWRD is planning to shut down more than 100 wells based on a regional computer model, proponents claim.

Erika Bentsen, a rancher in the area, said she had to sell half her cattle last year when drought prompted the agency shut off her surface irrigation rights.

In 2014, she faces losing the rest of her herd if OWRD prohibits her from using well water to irrigate, Bentsen said.

"I don't have a choice. I will be forced out of business," she said during a legislative hearing on Feb. 6.

The legislation would not stop the agency from shutting down irrigation wells if necessary — officials would simply need to prove each well is actually causing interference.

"If they think they have the science to back it up, what difference does it make to them?" Bentsen said.

Tom Mallams, a Klamath County commissioner, said that people in the U.S. are supposed to be considered innocent until proven guilty.

"This is an upside-down process," Mallams said, noting that it would be impossible for a farmer or rancher to ever prove a well isn't interfering with surface water. Brent Cheyne, a board member of the Klamath Irrigation District, said the legislation merely calls for sound science.

The bills don't actually change the law but clarify it to ensure the Oregon Water Resources Department doesn't overstep its authority, he said.

"This has the potential to mushroom out and affect every irrigation well in the state of Oregon," Cheyne said.

However, it doesn't appear that irrigators in the Klamath region are unified in their support of the legislation.

Mark Stuntebeck, manager of the Klamath Irrigation District, submitted a letter in opposition to the bills because they "will prevent OWRD from doing their job."

Proving that each individual well affects surface water would require a major increase to the agency's budget, Stuntebeck said.

"It requires unachievable scientific burdens put on the department, which would all but prevent its ability to regulate water in the Klamath Basin, if not the rest of the state," he said.

The legislation would "upend" the current system of water law, under which senior water rights holders can cut off water from owners of junior rights, said Kirk Maag, attorney for the Oregon Water Resources Congress, an association of irrigation districts.

"In times of drought, someone has to bear the burden of the loss," Maag said.

Jeff Stone, executive director of the Oregon Association of Nurseries, said his group opposes the bills as they're currently written.

However, Stone said he hopes the legislation will "open the door" to a constructive discussion about how water is delivered to farms.

During the hearing, representatives of the Oregon Farm Bureau and Oregon Cattlemen's Association voiced their support of the bills.

Mateusz Perkowski, Capital Press

Latest forecast has Columbia Basin water runoff at 82 percent of average

Precipitation totals across the Columbia River basin so far this water year (since Oct. 1) through Feb. 4 have been only about half of the 30-year average, leaving spring-summer water runoff expectations at only 82 percent of average for the January-July period as measured at The Dalles Dam.

The Dalles Dam passes water streaming down from the upper and mid-Columbia and from the Snake River, which flows out of Wyoming and across southern Idaho before joining the Columbia in southeast Washington.

The latest forecast (dated Thursday) from NOAA's Northwest River Forecast Center says that, in the most likely scenario, 83.47 million acre feet of water should flow down out of the mountains of British Columbia, Montana, Idaho, Oregon and Washington, which would be the 44th highest volume (or 11th lowest) on the 54-year record (1960-2014). The NWRFC forecast is based on the latest snowpack, precipitation, runoff and soil moisture conditions, as well as other factors. It incorporates the most recent 10-day weather forecast.

"Most of the forecasts have been progressively declining because of dry conditions" that essentially started in early winter and continued through January and early February," the NWRFC's Joanne Salerno. The Wednesday forecast for The Dalles runoff forecast is down 11 percent from a forecast made a month earlier.

As of Feb. 4, precipitation totals for the water year were at 45 percent of average in the Snake River basin upstream of Ice Harbor Dam on the lower Snake in southeast Washington. That area includes headwaters in western Wyoming and much of southern Idaho. Ice Harbor is the first dam spawning salmon encounter on their way upstream. Lower Granite is the fourth that the fish pass during their upstream journey.

"The plains are very dry," Salerno said of the southern Idaho area.

Overall, the Feb. 5 water volume forecast says that runoff past Lower Granite Dam on the lower Snake River will be 88 percent of average from April through September. That's down 2 percent from the early January forecast issued by NWRFC.

That water volume forecast, while below average, is helped by the fact that "snow in the upper elevations have increased" in west-central Idaho's Clearwater River, Salerno said. The NWRFC's latest forecast is for 111 percent of average runoff from the Clearwater.

The snow-water equivalent in snowpacks feeding the Clearwater and Salmon rivers, both of which empty into the Snake upstream of Lower Granite's reservoir was at 85 percent of normal through Wednesday. The Snake River contribution to the overall flows are also boosted to some degree by a forecast of outputs from southwest Wyoming's Jackson Dam reservoir at 98 percent of average. Jackson passes water from the Snake headwaters in Wyoming.

The SWE in snowpacks feeding into the Snake River above south-central Idaho's Palisades Dam reservoir are at 100 percent of average.

The upper Columbia region in British Columbia, western Montana, northern Idaho and Washington is expected to provide less than average water volumes to the system from April-September, about 84 percent of average as measured at central Washington's Grand Coulee Dam on the mid-Columbia. Due to the dry January, that estimate is down by 11 percent.

Some upper Columbia drainages are at the top of the charts. The Upper Clark Fork River drainage has 110 percent of its average SWE through Feb. 4; the Flathead River basin had 104 percent and the Bitterroot had 105 percent. The Kootenai River basin in Montana had 86 percent of its average SWE, and figured to provide 88 percent of its average water volume.

Temperatures across the basin in January were typically warmer than average. "That explains why most of our areas have little low-level snow," Salerno said.

According to the NWRFC, there are near and above normal snow amounts in western Montana, eastern British Columbia, the very upper Snake, and northeast Oregon.

"Large swaths of below normal snowpack exist along the Oregon Cascades and the southern half of the region," according to the NWRFC.

Among the lowest water supply forecasts is that of the Chelan basin in central Washington. The April-September outpouring into the Columbia is expected to be only 57 percent of average.

Columbia Basin Bulletin

Managing Eastern Snake River Plain aquifer recharge complicated

Flood-irrigation practices in the early days of irrigation on the Eastern Snake River Plain boosted water levels in the aquifer, which lay beneath it. But as irrigation efficiencies improved, less water reached the aquifer, contributing to its decline.

One issue now is in trying to get more water to the aquifer by recharging it.

The state of Idaho and irrigation and canal companies have been attempting to "balance the budget" of water going in and water coming out, but it's a complicated endeavor, said Mike McVay, technical hydrologist with Idaho Department of Water Resource.

Managed recharge of the aquifer does offer a way to balance the budget, but it depends on where you recharge, he said during the Idaho Irrigation Equipment Association's January conference in Burley.

Water injected for recharge doesn't stay in the aquifer and instead goes back to the Snake River fairly quickly, making balancing the budget a continuous effort, he said.

To assist in analysis of recharge, McVay has modeled the results of recharge efforts from 2007 to 2011.

During that time, irrigation and canal companies on the Eastern Snake River Plain participated in recharge efforts at several locations, sending 100,000 acre-feet per year into the aquifer.

But "the aquifer is not a very good bathtub, it leaks a lot," he said. "Water tends to go back to the river."

That's not necessarily bad. It depends on water-management goals, with different benefits at different sites.

In addition to raising aquifer-storage levels, those goals could be increasing flows in the river, springs and reservoirs, he said.

The goal of the state is to keep water in the aquifer for people to use, but it's a complicated issue. The state has to balance obligations for the Swan Falls Agreement — which balances water uses for agriculture and water needs for hydropower generation — and river and spring flows to keep water rights whole, he said.

McVay's models help evaluate recharge efforts by analyzing where the water is going.

In the theoretical modeling, McVay kept pumping water into the model, much more than the recharge sites can take, to see where the water would go. In both the theoretical and actual modeling, the impact on the aquifer was small.

If it isn't continuously recharged, the water will leak into the river, no matter how much is put in. That's because the aquifer is like a big bowl with a hole in the bottom, he said.

In addition, the theoretical modeling doesn't take into account other factors, such as weather or physical limitations, he said.

It is a tool that shows how the aquifer behaves. But the bottom line is the aquifer leaks and sooner or later, water is going to go back to the river, he said.

The take-home message is the aquifer has to continually be recharged or it will all leak out, he said.

Carol Ryan Dumas, Capital Press

USGS develops model for studying impacts to rivers affected by dams

In a case study of dams on the upper Missouri River, USGS researchers have demonstrated that an upstream dam is still a major control of river dynamics where the backwater effects of a downstream reservoir begin.

In light of this finding, the conventional understanding of how a dam can influence a river may have to be adjusted to account for the fact that effects of river dams can interact with one another. "We have known for a long time that dams have dramatic effects on river form and function," said Jerad Bales, acting USGS Associate Director for Water. "In the past, however, the effects of dams generally have been studied individually, with relatively little attention paid to how the effects could interact along a river corridor."

One of the greatest modifications of rivers by humans has been the construction of dams that provide valuable services such as irrigation, hydroelectric power, navigation, flood protection, and recreational opportunities. Hundreds of thousands of dams have been built worldwide, beginning for the most part in the 20th century.

The downstream effects of river dams have been well documented by previous researchers. In the presence of a dam, it can often take hundreds of kilometers for a river to adjust to its natural state. The upstream impacts of dams have also been widely considered, particularly sedimentation of reservoirs. These effects may extend upstream for many kilometers.

"In addition to documenting dramatic changes to a section of the Missouri River during the 2011 floods," Bales continued, "the unique contribution of this important study is development of a conceptual model that establishes a framework for future studies of the many rivers affected by dams in series."

Working with historical aerial photography, streamgage data, and cross sectional surveys in a careful analysis of the Garrison (N.D.) and Oahe (S.D.) dams on the Missouri River, the USGS researchers propose a conceptual model of how interacting dams might affect a river's physical characteristics (geomorphology). This model applies to dams on large rivers and divides the river into various zones of predictable behavior.

The researchers also conducted a geographic analysis of dams along 66 major rivers (as listed in a standard professional reference) in the contiguous United States to determine how often dams occur in a series.

Of the rivers analyzed, 404 dams were located on the main stem of 56 of the rivers. Fifty of these rivers had more than one dam on the river creating a total of 373 possible interacting dam sequences.

The results from this work indicate that more than 80 percent of large rivers may have interactions between their dams. Given this widespread occurrence, the USGS investigators suggest that dam interaction is prevalent and should be the focus of additional research.

Columbia Basin Bulletin

Study: How will climate change impact streamflow in Columbia Basin

University of Washington environmental engineers are launching a new study to try to understand how climate change will affect streamflow patterns in the Columbia River Basin.

The team will look at the impact of glaciers on the river system, the range of possible streamflow changes and how much water will flow in the river at hundreds of locations in future years.

"Getting a new set of streamflow predictions factoring in climate change will help guide long-term decision-making for the Columbia River Basin," said Dennis Lettenmaier, a UW professor of civil and environmental engineering. He is leading the project with Bart Nijssen, UW researcher in civil and environmental engineering, and Philip Mote of Oregon State University.

The Columbia River's headwaters are in the Rocky Mountains of British Columbia, and the waterway winds about 1,200 miles through Washington and along the border of Oregon before emptying into the Pacific Ocean.

Hydroelectric dams provide cheap electricity to roughly three quarters of the Pacific Northwest's population and help with flood control throughout the basin, particularly in the Portland metro area. It's also an important waterway for migrating salmon, steelhead and sturgeon, and for navigation, irrigation and agriculture.

Changes in streamflow due to climate change could affect hydropower and flood control operations on the Columbia as well as fisheries management and future policy decisions, including a possible treaty renegotiation between the U.S. and Canada.

The UW researchers will use the most recent projections from the Intergovernmental Panel on Climate Change along with climate and hydrology models to come up with a dataset of streamflow predictions for Bonneville Power Administration, the U.S. Army Corps of Engineers and the Bureau of Reclamation, which jointly commissioned this study.

BPA's Technology Innovation Office, Oregon State University and the UW are funding the study, which leverages glacier model developments from a NASA-funded interdisciplinary science project.

"Hopefully, this study will be able to better bracket the uncertainty that exists methodologically between all these climate and hydrology models. If we want to be able to plan ahead on a 20- to 50-year timescale, we need to know what range of uncertainty to expect," Nijssen said.

The impact that declining glaciers could have on the basin hasn't fully been studied by U.S. scientists until now, though Canadian researchers recently started to look at

their role. Glaciers are receding across the region and, as temperatures warm, they will continue to melt and erode. In 2005, glaciers covered about 420 square miles in the upper reaches of the Canadian Columbia Basin, or roughly 5 percent of that area. Twenty years before glaciers covered 490 square miles.

Melting glaciers put more water into the river system and boost its flow, but only for a period.

This short-term boost could actually benefit the river – especially during low-flow periods in the drier summer months – but only in the short term.

As the glaciers eventually disappear, perhaps as early as 2100, this added water will also disappear and further reduce already low summer flows, researchers say.

But the river's yearly flows depend mostly on melting snowpack. Cooler spring and early summer temperatures can preserve mountain snowpack until the drier months, when water from melting snow is important to keep river flows high enough for migrating fish. As climate warms, though, the timing of when that crucial snow melts and discharges into the river also is likely to change.

"The hydrology of the Columbia River basin is really driven by winter snow accumulation and melting in the spring and summer months. When it warms up, you change that balance," Lettenmaier said. The UW's data could have policy implications for the Columbia River. Since 1964, a treaty between the U.S. and Canada has governed the river for hydropower production and flood control.

But starting in 2014, each country can notify the other of an intent to terminate or modify this treaty. Changes to the treaty could be implemented as early as 2024.

"We want to have the best scientific information possible to help federal agencies and other regional stakeholders in long-range decision-making," said Erik Pytlak, manager of the weather and streamflow forecasting for the Bonneville Power Administration.

"With or without a treaty, climate change is coming. It will be beneficial for all of our partners and customers in the region to have an updated understanding of what climate change is doing to the region."

The UW's streamflow predictions will be publically available after the study is finished in three years. Similar studies are underway at Portland State University, also funded by Bonneville, and by climate scientists in Canada.

Columbia Basin Bulletin

NRCS programs dramatically improve efficiency on Oregon ranch

Installing underground irrigation pipes and isolation valves can help reduce leaks caused by exposure and increase water efficiency, said cattle rancher John Prock of Midland, Ore.

He increased production on his family's 1,200-acre property with a series of cost-sharing programs through the Natural Resources Conservation Service.

When the Procks purchased the property in 2006, the irrigation piping was above ground and leaked. None of the irrigation piping was fitted with valves, and just one pump pushed water through the entire system. In addition, irrigation wheel lines were spaced one per 40 to 60 acres, he said.

"It'd take all day long to fire the system up, and once you were going, you were going unless something broke," he said. "Now if something breaks, I can just shut a valve." With the help of the NRCS programs, Prock was able to move his irrigation piping underground and coupling joints were placed at 50-foot intervals. The underground pipe immediately minimized gasket leaks, and the new risers mean Prock only has to move the wheel lines six rolls at a time, he said.

The NRCS programs also helped pay for flow meters, additional pumps and soil sampling. Irrigation improvements were made through the Agriculture Water Enhancement Program, which David Ferguson, Klamath Falls NRCS manager, said is no longer available.

But an energy audit through Environmental Quality Incentives Program, which helps pay for cost-saving energy measures, may be able to be linked to consumption services like water. The energy program is available under the current Farm Bill, Ferguson said.

Prock said it used to take 12 to 14 days to irrigate a field. Now, with the new risers and only 1 wheel line per 20 acres, it only takes six days. Since the improvements, the ground stays more hydrated and his alfalfa grows faster.

"In the long run you don't have to use as much water and the crop is coming back faster and better, so you're getting more productivity," Prock said.

A New Holland H8040 self-propelled windrower, purchased separate from the NRCS program, with a wide conditioner also increased Prock's efficiency. He said the machine lays the hay out in a wider swath, and it dries and gets baled faster. That allowed him to get water back on the field quicker and gained him about three days per field.

"It used take seven to eight days, now I can almost get it in five. It actually gained us an extra cutting," he said.

Previously, Prock harvested three cuttings from an alfalfa field. Now he gets four cuttings, and his product has improved substantially.

"A lot of his objectives have been met. They are using up to 30 percent less water and we helped figure out where the weak spots are," Ferguson said.

According to Ferguson, the goal of NRCS programs is to improve farm operations to meet society's demand on resources.

"It's the key thing; everybody wants more water," he said.

The first step is meeting with NRCS to find out which options are available for your farm and determine if they are in line with the farm objectives, Ferguson said. He suggested having property maps and any relevant property or asset statements available for review.

Lacey Jarrell, Capital Press

Oregon State Lands department considers sale of Columbia River parcels

Oregon's Department of State Lands is considering the sale of several properties near Astoria, possibly for a log storage facility.

The State Land Board, meeting here Feb. 11, directed the agency to evaluate selling the parcels, which total 90 acres along the Columbia River. A decision on the sale will be made this year, possibly as early as this spring.

Last year, the Warrenton Fiber Co., a local wood chip and bark producer, inquired about buying the property.

Dave Nygaard, a co-owner of the firm, said the company's immediate interest in the property is for log storage and a possible dock site. The company leases about 40 acres from the City of Warrenton and occasionally runs out of room, he said.

Warrenton Fiber has been looking at the state property for years and would prefer to own the land rather than lease it, Nygaard said.

The Department of State Lands said the property could provide an "expansion area for its (the company's) fiber wood products and shipping," according to an agency document. Warrenton Fiber primarily chips logs for sale to paper mills, Nygaard said.

The agency doesn't typically conduct direct sales, but may decide to put the parcels up for auction as early as this spring, Jim Paul, assistant director of the department's land management division, said.

The timing of the potential auction will depend on the due diligence process, which includes getting the property values appraised, he said.

The parcels were created with soil dredged from the Columbia River for navigation channels by the U.S. Army Corps of Engineers between 1948 and 1976.

The property was transferred from federal to state ownership about 20 years ago, with the goal of developing the land into a deep water port, Paul said. "That plan really hasn't panned out," noting a lack of interest from developers. "It's all dependent on the private sector."

While some adjoining property is leased to Clatsop County Community College, Paul said the parcels in question aren't generating any revenue for the state.

The department believes it's "not probable" that an industrial company would want to develop the properties while leasing them, according to an agency document.

The parcels are "one of the last large-lot industrial sites on the deep-river channel" and have access to Highway 30 and rail transportation, the document said.

The State Lands Department can consider broader public benefits — such as fishing, navigation and recreation — in deciding whether to sell, not just the potential revenues, Paul said.

Mateusz Perkowski, Capital Press

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Inside February 2014 Newsletter

1. Storm provides NW irrigators with much-needed moisture
2. New Oregon water well bills receive mixed reaction
3. Forecast: Columbia Basin water runoff at 82% of average
4. Managing Eastern Snake Plain aquifer recharge complicated
5. USGS model will study impacts to rivers affected by dams