

Welcome New River Guardians



Art Bass, Americorps member, trains new volunteer monitors.

A successful series of River Guardian Trainings in Eugene, Portland, Salem and Wilsonville brings a new group of volunteers to the program. With twenty-plus participants at each event, the program has almost doubled with volunteers interested in keeping an eye out for the Willamette.

Some participants have chosen to adopt a stretch of the river for monthly observational monitoring while others will help to increase the growing number of individuals on our Alert Action email list and get involved with river related issues on the entire river. Some of those trained in Portland and Wilsonville have become active in our Testing the Waters Program, collecting monthly water quality samples at sites within the lower 50 miles of the river.

If you live someplace that wasn't covered by this series of trainings, have no fear. Look out for a similar training series this fall in Corvallis, Albany, Springfield, Harrisburg and Independence. If you would like to have a special training for a group of neighbors, paddle clubs, classroom, or group interested in the River Guardian Program, contact Amy. Together we'll see what we can do to incorporate your group into the growing network of individuals who are working to protect the Willamette River.

*"The success
of our work
depends on our
volunteers!"*

Welcome:

Mary, Mari, James, Tom, Charles, Trey, Vivian, David, Patty, Ron, Mechelle, Justin, Jason, Jenny Sue, Marcia & Chris, Chant, Ed, David, Michael, Summer, Jason, Thomas, Jack, Doris & George, George, Laura, Gerard, Jeff, Gary, Lynn & Nathalie, Shelley, Tammi, Edward, Mark, David, Loretta, Heidi, Jill & Frank, Ephraim, Dolores, Cherry, Casle, Paige, Pamela, Dan & Peggy, Bill, Eric, Denise, Donn, Denis, Katie, Camas, Sondra & Mark, Vicki, Dale, Wally & Jeanne, Vonda, Don, and Jeff.

First Sundays at Sewallcrest – A Pesticide-Free Park

Portland Parks and Recreation and the Pesticide-Free Partners launched a Pesticide-Free Parks pilot program in three Portland Parks. Willamette Riverkeeper is showing support for the program by organizing work parties at Sewallcrest Park on 31st and SE Market. Starting on July 3rd, summer work parties will be held every first Sunday from 10am to 2pm.

Tools, gloves and snacks are provided. The largest task is weeding the park's open areas, like those around trees, structures and sidewalks. All are welcome to come for any part of the day. To sign up call or email Amy.



Together we can work to stop the unintentional impacts to our community from the use of pesticides for the health and well being of people, especially children, pets, wildlife and waterways. The Pesticide-Free Parks Programs aims to also educate community members about pesticide-free alternatives.

For more information on pesticides and alternatives visit www.pesticide.org.

Be on the lookout for new signs and alternative methods being used for the first time at Sewallcrest Park. This program is an example of what can be done to make our neighborhoods safer for everyone.

amy@willamette-riverkeeper.org

River Programs

Water Quality Update – A look at Seasonal Variations

This month's water quality update will look at the seasonal variation in some of the parameters that WRK's volunteers monitor. Physical properties of water vary throughout the year due to predictable changes in temperature, daylight hours, and precipitation. The data presented here represent sampling sites from Newberg to the confluence of the Willamette and the Columbia (about 50 river miles). Our dataset is composed of 172 samples taken by volunteers and WRK staff from 2001 to the present. As we collect and compile more data (you can help by becoming a water quality monitor!) we will start to see more definite trends and averages.

Understanding the Graphs on Page 7

The diamonds superimposed on the columns of points are centered on the mean (average) for each season (1 = winter, 2 = spring, 3 = summer, 4 = fall). The shape of the diamond describes the standard error for the season (basically the precision of the data). Since we have a similar sample size across the seasons, the diamonds are shaped similarly.

Temperature

We all know that water temperature varies with season as Figure 1 demonstrates. As we would expect, summer months create the highest water temps. Our data shows that the mean water temperature for summer is 21.5 °C. 25 °C is considered lethal to salmon and other fish and the DEQ standard requires water to be 20 °C or less.

Dissolved Oxygen

Dissolved oxygen is the amount of oxygen gas dissolved into the water and accessible to fish, plants, amphibians, and macro-invertebrates that respire underwater. Water temperature dictates the amount of Dissolved Oxygen a body of water can contain (higher temperatures = lower DO). Therefore, it is no surprise that the highest levels of Dissolved Oxygen occur in the winter while the lowest levels occur in the summer (Figure 2a). To further prove the point, we compare Saturation of Dissolved Oxygen to season (Figure 2b). Percent Saturation indicates how much dissolved oxygen water can hold based on temperature. Figure 2b demonstrates that when you factor out the effects of temperature, little else is causing a change in Dissolved Oxygen levels. One hypothesis to explain the lower mean for the fall season is the increased consumption of oxygen by decomposers breaking down fallen organic matter (i.e., leaves).

Conductivity

A strange pattern of seasonal variation arises with conductivity. Conductivity is an electrical measurement of Total Dissolved Solids (TDS). Higher conductivity levels suggest the presence of natural dissolved minerals or chemicals and pollutants. Although there seems to be little discernable seasonal variation in conductivity (Figure 3), statistical analysis tells us that there is a significant change. This significant effect of season could be a false result created by a small dataset. I'm open to other hypotheses that might be out there!

Of particular interest in Figure 3 are the nine outliers (points far from the average) that reside above 120 $\mu\text{S}/\text{cm}$. six of these nine outliers are from sample sites within six river miles of the confluence with the Columbia River. Two theories come to my mind: 1) Tidal action brings water from the Columbia into the Willamette and we are actually measuring conductivity from the Columbia (which, under this theory has more dissolved solids than the Willamette). 2) A significant amount of pollution enters the Willamette in the last 10 or so miles of its course. These 10 miles include the Portland Harbor and several industrial mixing zones. Willamette Riverkeeper will be sure to test both these theories. Some of the other outliers and many of the higher values were recorded at the confluence of the Tualatin and the Willamette. The Tualatin is a tributary that receives a fair amount of pollution from agriculture and sewage treatment plants.

pH

Our last and perhaps most puzzling comparison is that of season and pH (Figure 4). pH is a measure of the acidity (concentration of free Hydrogen ions) of a body of water. Photosynthesis and metabolism both greatly regulate pH as CO_2 joins with hydrogen to create carbonic acid (metabolism creates CO_2 while photosynthesis consumes CO_2). I have my theories about why Figure 4 looks the way it does, but I'd like to hear yours! Email me: arthur@willamette-riverkeeper.org. You could win the water quality prize of the month, a chance to become a water quality monitor!

Shout out to those volunteers currently monitoring water quality for WRK. You made today's report possible!

River Programs

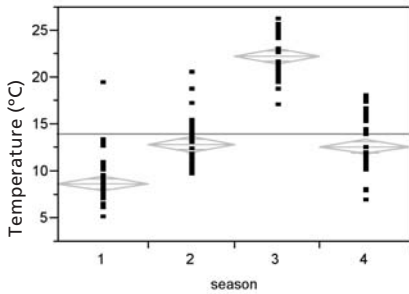


Figure 1:
The effects of season on Temperature (°C). 1=winter, 2=spring, 3=summer, 4=fall. Mean Temperature for winter=8.7, spring=12.8, summer=22.3, fall=12.6.

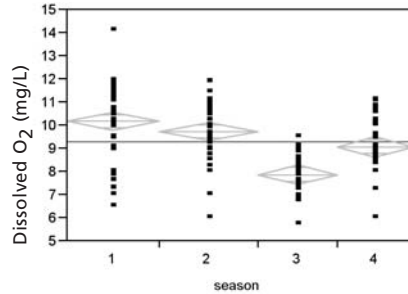


Figure 2a:
The effects of season on Dissolved Oxygen (mg/L). Mean DO levels for winter=10.2, spring=9.7, summer=7.9, fall=9.1.

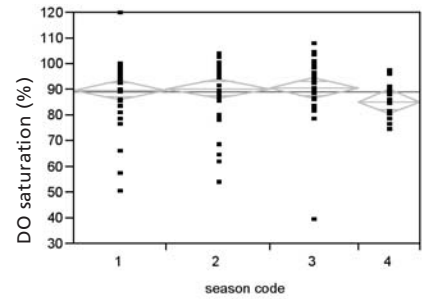


Figure 2b:
The effects of season on Dissolved Oxygen Saturation (%). There is no significant difference between seasons.

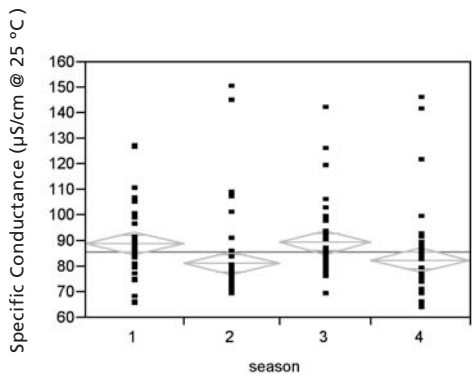


Figure 3:
The effects of season on Specific Conductance (µS/cm @ 25 °C). Mean Specific Conductance levels for winter=89.1, spring=81.4, summer=89.5, fall=82.6. There is a significant effect of season.

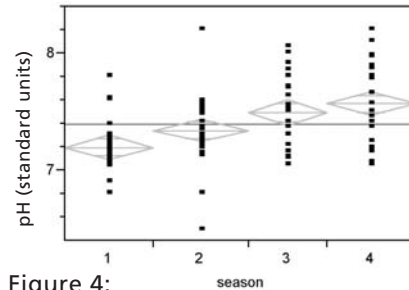


Figure 4:
The effect of season on pH (standard units). Mean pH for winter=7.2, spring=7.3, summer=7.5, fall=7.6. There is a significant effect of season. Notice that most points reside between 7 and 8 s.u.



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Oregonians care. They care about forests and fish, about clean water and air, about taking care of their communities. Every year, more working people in Oregon have chosen to show this commitment by donating to Earth Share of Oregon's 68 local and national member groups through workplace giving campaigns.

Earth Share works with employers to offer a payroll deduction program through which employees can either donate to Earth Share of Oregon (ESOR) as a whole or to designate a gift for one or more ESOR members.

Willamette Riverkeeper is a member of ESOR and it receives a steady source of income from Earth Share, as well as designated gifts from donors that support our mission.

Ask your employer today if there is an Earth Share campaign where you work, or look up your company at www.earthshare-oregon.org. If you are not part of ESOR, contact Ron Shoals, Earth Share of Oregon's business development manager, who can help bring a campaign to your workplace, at 503-223-9015 or email him at ron@earthshare-oregon.org.

River Recreations

RIVER DISCOVERY Paddle Trips

Our RIVER DISCOVERY Program gets people on the Willamette River. In our view, this is the most powerful way to learn about the River, its history, and its ecology. In general, our RIVER DISCOVERY paddles take place rain or shine from Eugene to Portland. However, they are subject to cancellation if we decide conditions on the river are unsafe.

WRK paddle trips are led by staff and volunteers who provide education and safety support to participants. All trips are free for those with their own craft or WRK members. WRK has canoes and paddling gear available for members. Memberships start at \$35 a year. To become a member, reserve a canoe and/or register for a trip call 503-223-6418.

NOTE: You must have experience in a canoe or kayak to go on these trips. BRING: Water, a snack or lunch, and a change of clothes in addition to your paddling equipment.

Saturday, August 13

Peoria to Corvallis, 9 am to 2 pm

Join WRK for this nine-mile paddle from Peoria Park to Crystal Lake Boat Ramp in Corvallis. Explore the habitat diversity, wildlife and scenery hidden in the backchannels around Kiger and John Smith Island. A shuttle will be organized with the help of participants.

Saturday September 24

PORTLAND PADDLE, 9 am to 2 pm

Join Willamette Riverkeeper for the 2nd annual PORTLAND PADDLE, a free canoe and kayak event for all ages. Spend a summer day experiencing the Willamette River from the water, explore Ross Island, check out the new Portland Boathouse, learn about river ecology, local wildlife, Oaks Bottom Wildlife Refuge, the future of Ross Island and the South Waterfront Project. The PORTLAND PADDLE is a chance to get people on the Willamette River to learn about it, enjoy it and foster appreciation of this amazing source of recreation and nature. Canoes and gear are available for free and all are welcome to bring their own craft. Those that use a WRK canoe are required to have one adult with recent paddling experience.

Registration is required.

www.portlandpaddle.org

WATER TRAIL continued from page 1.

In the coming months Willamette Riverkeeper will spearhead efforts to develop the next stages of the Willamette Water Trail from Eugene to Buena Vista, and from Wheatland to Portland. If you would like to get involved in the process, feel free to get us a call at 503-223-6418.

Willamette Water Trail Guides can be downloaded at www.willamettewatertrail.org.

Free maps are available from Willamette Riverkeeper and the following locations:

- City of Salem
- City of Keizer
- REI, Portland
- Oregon Canoe Sport, Salem
- Portland Boathouse, Portland
- Sportcraft Marina, Oregon City
- Oregon State Marine Board, Salem
- Portland River Company, Portland
- Alder Creek Kayak and Canoe, Portland
- G.I. Joe's, Portland area, Salem, Albany, Eugene



Clockwise from top; Group gathers for water trail dedication; campers enjoy the serenity of the river; Governor Kulongoski joins the paddle with his wife, Mary, and their dog, Hershey.