



LAKE WISE

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NEWSLETTER FROM OREGON LAKES ASSOCIATION

DECEMBER 2019

Connie Bozarth, Newsletter Manager

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Report from the High Desert and Mountain Lakes of Oregon Conference

October 25-26, Bend, OR

Contributed by Theo Dreher, Toni Pennington & Steve Wille



Todd Lake with Broken Top in the Background
Photo: Wayne Carmichael

The 2019 OLA annual conference in Bend spanned scientific sessions with talks and poster presentations during Friday afternoon and Saturday morning, an evening lecture on Friday sponsored jointly with the Deschutes River Coalition, and a high lakes field trip on Saturday afternoon. At 83 persons registered, this was by quite a margin the biggest meeting OLA has sponsored in recent years (excepting our joint meetings with WALPA). Attendance was likely buoyed by Bend being an attractive place to visit and a hotbed of environmental interest. We also attracted several graduate students and academic researchers who had not previously presented at an OLA conference. There was wonderful sponsorship support from vendors, whose advertisements appear in this newsletter.

Adding to Scholarship coffers. Together with active fundraising led by Board member Steve Wille, high attendance and active sponsorship meant that we were able to add \$1,050 to our scholar-

ship and Outreach Fund. The immediate goal of this fund is to establish an investment base that will sustain our Graduate Student Scholarship into the future. The fundraiser started off with a generous donation of vacation package offerings, two from [Chinook Winds Casino Resort](#) in Lincoln City and one from [Three Rivers Casino and Resort](#) in Florence. With the inclusion of a wireless TROLL communication device from [In-Situ](#), a professional-level NALMS membership, carnivorous plants, beautiful lake pictures, and beer, we had the makings of an interesting fundraiser. Inspired bidding and raffle ticket purchases contributed to an overall successful effort. In addition to the contribution to our Scholarship fund, we also contributed \$150 to our Friday evening session co-sponsors, the [Deschutes River Conservancy](#).



Friday evening social and presentation at Ten Barrel Brewing Co co-hosted with the Deschutes River Conservancy
Photo: Toni Pennington

Friday afternoon scientific sessions: High Desert and Mountain Lakes. The conference started on a positive note with a report from Debra Sturdevant on DEQ actions to declare Waldo and Crater Lakes Outstanding Waters of Oregon. This is a designation that will help preserve the natural state of these treasured lakes, and as reported in the September *LakeWise*, OLA submitted a letter in support of this designation. We also heard from Ron Larson that recent years have seen high lake levels and low salinity in Lake Abert, allowing a recovery in the numbers of migratory birds visiting during the summer. However, the numbers seen before Lake Abert nearly dried up in 2014 have not been fully restored, and there is the continual concern that another dry year could drive salinity above 15%. This is the threshold that stops the productivity of the brine shrimp and alkali fly populations on which migratory birds rely. Further interruptions to the flyway could cause irreparable damage. Two reports on Crater Lake described the ongoing displacement of native newts by introduced signal crayfish (Scott Girdner) and modeled the consequences of warming over the coming decades (Tamara Wood), with possible disruption of deep ventilation events resulting in less oxygenation at depth.

Cyanobacterial Harmful Algal Blooms (CyanoHABs). With OLA's recent emphasis on promoting legislation for a comprehensive Oregon CyanoHABs Program, we were pleased that Representative Jack Zika (Redmond) attended part of this session. His district includes or is near lakes with CyanoHABs (e.g.,

Crane Prairie Reservoir and Lake Billy Chinook). Theo Dreher reported on the genome sequences of three different microcystin-producing *Anabaena/Dolichospermum* in Oregon lakes; one of these produces blooms in both Lake Billy Chinook and Odell Lake in the Deschutes watershed. Wayne Carmichael emphasized the need for remediation to control CyanoHABs and described an example of an approach that can mobilize sediment into food webs that compete with cyanobacteria. Jonathan Todd discussed floating islands as an option for remediation. Desiree Tullos reported the results of modelling various options for suppressing the CyanoHABs that grow in Ross Island Lagoon and wash downstream through Portland. The simplest solution would be to allow the Willamette River to flow through this mid-stream lagoon, but the unwise placement of low-level toxic waste material in the lagoon is a major constraint on where flow could be introduced. Unfortunately, there is insufficient understanding to predict whether suboptimal flow through the lagoon would produce any benefit. Finally, Dan Sobota reported on combining in-situ sonde with satellite-based remote monitoring with the goal of detecting blooms in the early stages of development.

Friday Evening: Ecosystem Function and Water Management in the Upper Deschutes River Basin.

OLA and the [Deschutes River Conservancy](#) (DRC) partnered for a special presentation by local scientists working to assess the effects of reservoir storage and release on river and wetland ecosystems in the Upper Deschutes River basin. This collaborative work between Jason Gritzner, US Fish and Wildlife (USFWS) and Jennifer O'Reilly, US Forest Service (USFS), focuses on efforts to elucidate how flows interface with and support the function of the Deschutes River and its adjacent riverine wetlands. Jason Gritzner is the Forest Hydrologist and Watershed Program Manager for the Deschutes and Ochoco National Forests and Crooked River Grassland and has worked as a Hydrologist with USFS since 2003. He oversees an active and innovative restoration program of the upper Deschutes River and its wetlands, working with partners on some of the most challenging water resource management issues in the basin. Jennifer O'Reilly has worked as a Fish and Wildlife Biologist for the USFWS in central Oregon since 2001. As the Service's species lead for Oregon spotted frog in Oregon, Jennifer is immersed in the issues that involve water management in the upper Deschutes River basin and is challenged with developing recovery criteria for the species listed under the ESA in 2014. A spotlight was shone on the endangered Oregon spotted frog, featured in an excellent video narrated by Gritzner and O'Reilly. Approximately 60 people attended the event, held in the event space on the second floor of 10 Barrel Brewing Co. in Bend (east side location). The event provided a great opportunity for old friends and colleagues to visit and make new connections within OLA as well as friends of the DRC.



Presentation by Jason Gritzner and Jennifer O'Reilly at Ten Barrel Brewing Co.
Photo: Connie Bozarth

Saturday Morning scientific sessions: Water quality management. Two speakers described limited herbicide use in controlling invasive aquatic weeds, *Ludwigia* along the Willamette River margins near Corvallis

(Laura Brown) and various plants in small residential lakes in Washington (David Kluttz). Norman Buccola reported on water quality studies in Detroit Lake, of great interest because of the breakthrough of toxins into finished water in the City of Salem in 2018. Kurt Carpenter discussed the plans for continuous monitoring with 5 sondes in the North Santiam and McKenzie Rivers and their reservoirs to better track conditions in these watersheds and to alert downstream drinking water intakes to changes in conditions. Joe Eilers described a detailed 2015-17 study characterizing the changes to water flow and water quality in Lake Billy Chinook as a result of adding Selective Water Withdrawal capabilities to the outlet structure. These changes were driven by consideration of optimizing conditions for downstream fish populations, and they allow control over the temperature of released waters by mixing water drawn from different depths. Lake Billy Chinook is fed by the Metolius (cold, high TP, low TN), Deschutes (intermediate temp and TN, high TP) and Crooked (warmer, high TP, high TN) Rivers. The changed water passage through the dam, which has coincided with increases in the planktivorous fish population, has altered the mixing dynamics in the lake, bringing more CyanoHABs and increased surface pH and DO to the forebay and the popular nearby beach area. *Aphanizomenon* blooms have switched to *Anabaena/Dolichospermum* blooms. This study emphasizes the risks of focusing management too narrowly, in this case on salmonid fish while not considering the effects on hydrology and phytoplankton.

Two talks reported on the use of novel fatty acid biomarkers to untangle trophic pathways and the diet of endangered juvenile suckers in Upper Klamath Lake (Julie Schram and Michael Brett). *Daphnia pulicaria* zooplankton commonly coexist with the large *Aphanizomenon flos-aquae* (AFA) cyanobacterial blooms. However, *Daphnia* grazed heavily on the minority, but more nutritious, phytoplankton (diatoms, cryptophytes, green algae), while the dominant AFA comprised only 35% of the diet. The abundant *Daphnia* were only a minor part of sucker diets (1-16%), which consisted mostly of chironomids and oligochaetes. This emphasizes the importance of benthic food sources for suckers. The final two talks were from this year's (Crysta Ganz) and last year's (Laura Costadone) OLA scholarship recipients. Crysta studied the genetic diversity of *Daphnia pulicaria* across lakes in Eastern Washington, which includes Channeled Scabland lakes and Columbia River reservoirs. Ehippia (eggs) from *Daphnia* can be identified in sediment cores, allowing a retrospective analysis by DNA analysis. The analyses are indicating that populations connected by water are more similar, although some long-range dispersal, perhaps by birds or humans, does seem to have occurred. Laura described her analysis of how different land use scenarios are likely to affect the ecological state of Lake Sammamish, east of Seattle, in the face of climate change. Initial results suggest, rather counter-intuitively, that unmanaged development could preserving mixed forest, an important ingredient in maintaining watershed health.



Head of Deschutes River, near Little Lava Lake
Photo: Connie Bozarth

Poster presentations. OLA recipient Lara Jansen presented early results on collecting biotic and physico-chemical data in a range of Oregon mountain lakes with the intention of discerning likelihoods for the development of CyanoHABs. Fellow PSU graduate student Victoria Avalos outlined her plans for validating the remote sensing-derived Cyanobacteria Assessment Network (CyAN) data in Oregon lakes with direct cyanobacterial cell counting. OSU graduate student Lindsay Collart reported on her progress in using volatile organic compounds (VOCs) released by CyanoHABs from Upper Klamath and other lakes as an indicator or identifier of CyanoHAB type and composition. It is anticipated that machine learning can be used to distinguish patterns in these complex signals to allow the use of VOC for automated CyanoHAB identification. Other posters reported on CyanoHABs in Upper Klamath Lake as possible stressors responsible for sucker mortality, CyanoHABs detection in lake sediment to infer past bloom characteristics, endemic annelids in Upper Klamath Lake and Lake Abert, correcting past shoreline elevations of ancient Lake Chewaucan, early detection and monitoring of invasive aquatic weeds, and the causes of turbidity in Malheur Lake.



Cold north winds and snow at Lava Lake made for a quick last stop on the Saturday afternoon field trip.
Photo: Connie Bozarth

Saturday afternoon field trip. After two days of presentations, 20 attendees boarded vans and headed west from Bend along the Cascades Lakes Highway. We were fortunate to have along three experts on the region, geologist Dr. Daniele McKay, University of Oregon, and fish biologist Thomas Walker and hydrologist Kyle Wright, both of Deschutes National Forest. The first stop was Todd Lake, located at 6,100 feet elevation and

surrounded by high mountains including Mt. Bachelor to the south and Broken Top and the Three Sisters to the north and northwest. Dr. McKay unrolled a series of maps she developed for previous geological field trips she has led and treated us to an amazing overview of the volcanic history of this part of the Cascades and its unique hydrogeology. Then we trudged over packed snow to Todd Lake, which presented us with a spectacular view of deep blue water and the snow-capped Broken Top and several of the Three Sisters Mountains. After learning about the glacial origin of Todd Lake and the ecology of the lake, we headed back to the vans and then on to Hosmer, a favorite with kayakers and canoeists. After Hosmer our next stop was Little Lava Lake. There, we walked over to what is the head of the Deschutes River. It was hard to believe that downstream it is such a large river, but here it was little more than a shallow creek, which in some summers even stops flowing at this point. Finally, we drove over to Lava Lake. By this time, it was getting late in the afternoon. Earlier, we had noticed ominous clouds building to the north around the Three Sisters, and finally at Lava Lake strong north winds created whitecaps on the lake, and the wind carried with it snow, and much colder temperatures, which sent us scurrying back to the vans. Heading back to Bend, a light blanket of snow had already covered the highway nearly to the Mt. Bachelor exit. That snow flurry gave us a better appreciation for mountain weather and an insight into how the snowpack forms that drives the hydrology of this amazing watershed.

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## Community Pints

### Deschutes Brewery Program at Portland Brewpub helps OLA Publicity & Fundraising

Contributed by Steve Wille

In December, OLA will be the beneficiary non-profit at the [Deschutes Portland Public House](#), 210 NW 11<sup>th</sup> Avenue. As the selected non-profit of the Community Pints Program of Deschutes Brewery we will receive \$1 from every pint sold on each Tuesday of the month. We are very pleased to have been selected for this opportunity to do a fundraiser partnering with the Portland Pub. The money raised will be added towards the goal of creating an endowed scholarship fund. We also appreciate the opportunity to tell people about OLA's activities. The story behind our selection as the Portland Pub beneficiary for the month of December 2019 started over a year ago. We received the initial notice of our selection on November 8, 2018, after Board member Stephen Wille submitted in-kind request forms expressing our interest in the program. Since then we have provided additional information about OLA, and Rich Miller and Crysta Gantz were recruited to help compose a poster and some eye-catching tabletop displays.

The month is now upon us! Each Tuesday of the month of December, OLA will be highlighted in the Portland Pub. We have been advised that the more engaged we can be in promoting our cause, the more we can benefit. We will have a table set up to speak to customers during the busiest hours (usually between 5-8 pm). The Brewery will have posters hung around the Portland Pub, verbiage on the beer menu and will promote us via social media. This is going to be fun. Come join us!



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A photograph of the In-Situ Aqua Troll 500 Multiparameter Sonde, a cylindrical device with a black and yellow body and a blue sensor head.

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## Spotlight on Citizen Action: Peggy Lynch, League of Women Voters of OR

Contributed by Theo Dreher

### ***Q. How did you develop an interest in legislative action around Oregon's natural resources?***

Peggy, whose family moved to Oregon in 1842, has always been interested in the outdoors. Her husband's family comes from timber roots in the Oakridge area, and visits to the nearby Waldo Lake have been an annual tradition for many years. An interest in land use planning and the role of legislation began when she noticed apartments being built (unwisely) on wetlands near her home in the Portland metro area; wetlands were lost and flooding became problematic. She became involved as a Washington County citizen member of the Portland-area Metro Policy Advisory Committee at the time of the development of its Comprehensive Regional Framework Plan. After moving to Corvallis in the late 1990's and becoming involved with the League of Women Voters (LWV), she was mentored by long-time activist Liz Frenkel to focus on environmental and natural resource issues, including water. Before about 2008, water quality and quantity tended to be discussed as separate issues, but more recently they have been linked because of the many interconnections. Peggy worked on the 2009 educational report on [\*Water in Oregon: Not a Drop to Waste\*](#), which was produced after extensive research and listening to people in all walks of life around the state. Peggy served on the policy advisory group of the Integrated Water Resources Strategy (IWRS), adopted first in 2012 and updated to include issues of climate change and drought 2017.



### ***Q. What is your current role with the LWV?***

Peggy is the Coordinator of Natural Resources issues for LWVOR's Action Committee, which follows the policies and budgets of 14 state natural resources agencies. Budgets are especially important, since it is the budget allocation that determines what agencies can actually achieve.

### ***Q. What are your short-term priorities in advocating for natural resources on behalf of the LWV?***

For the coming year, the top LWV emphasis will be on seeing a comprehensive climate bill passed in Oregon, one such as the HB 2020 Carbon Cap & Trade bill that was debated in the 2019 legislative session. A priority is for a bill based on scientifically established information and to embrace environmental justice, since disadvantaged populations will likely be more affected by climate change, including wildfires. The second priority for the 2020 short legislative session is to jump-start the Governor's 100-Year Water Vision with \$6.4M funding for collecting data and for staff help. The third priority is to allocate funding for the Governor's Council on Wildfire Response to address public safety and land use issues around wildfire risk.

### ***Q. What are the most effective ways you have found to be influential in advancing your goals for addressing environmental problems with legislation?***

First, it is critical to be well informed, to know your subject and be able to speak with authority and accuracy. This includes understanding the viewpoints of other people, in order to anticipate opposition and find compromise. Second, be honest, build credibility and respect by being accurate, and following up with corrections or answers if appropriate. Third, build relationships, as that is critical in politics. Peggy emphasizes taking a non-partisan approach, learning people's motivations and finding connections and compromise.

### ***Q. What is your feeling about the potential for transformative changes coming through the Governor's 100-Year Water Vision?***

[\*The Vision\*](#) has emerged out of IWRS recommendations that were based on a lengthy study, and Peggy believes that the Vision can have a strong and positive impact. There are certainly many problems that need to be addressed. With regard to water consumption, much of the built infrastructure was established in the 1950's and



has been inadequately modernized. Infrastructure and behavioral changes can help conserve water, as has been achieved by the Regional Water Consortium in the Portland Metro area. Some 85% of Oregon's water is used for agriculture, and in this sector, improvements can also conserve clean water. Technology is helping the industry target both water and nutrient usage. To achieve comprehensive, transformative legislation in support of the Water Vision, it will be important to be creative in establishing various funding sources and addressing the needs and concerns of multiple population groups. HB 2017 (2017), a recent transportation bill, is an excellent model for a bill that meets multiple needs with funding from multiple sources.

***Q. How can OLA and its members be most effective in influencing legislation that support healthy lakes?***

Peggy advises attending legislators' local town hall meetings to raise awareness in the issues that you support. Legislators have to track many issues and cannot be expected to necessarily have specific awareness of issues that you think are a priority. She emphasizes that connections are critical in advancing an agenda, connections both with parties that are opposed to some of your goals so that compromise might be reached, as well as groups that can be allies. Get involved!



Paddling on Todd Lake  
Photo by Peggy Lynch

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## OLA and the Oregon Hundred Year Water Vision

Contributed by Theo Dreher

Over the last month, a group led by Meta Loftsgaarden, the executive director of the Oregon Watershed Enhancement Board, has conducted [Community Conversations](#) around Oregon to collect input on priorities that will shape Oregon's 100-Year Water Vision. This public input is being added to the recommendations of the [Integrated Water Resources Strategy](#), which led to the Vision becoming an important part of the Governor's environmental platform. The meetings have emphasized that the Water Vision program is still in a data-gathering phase. Our conference in Bend overlapped with the 25<sup>th</sup> October Community Conversation in Bend, and we were fortunate that the facilitator of these meetings, Bobby Cochrane, briefly addressed our meeting. On 14 November, Ron Larson and Theo Dreher represented OLA at an all-day technical workshop in Salem focused on identifying gaps in data that are needed to craft a comprehensive Water Vision. We focused on core OLA interests: CyanoHABs and dryland lakes of eastern Oregon, emphasizing our concern for the environment and

aquatic ecology. OLA will continue to be engaged in this process. If you would like to help or provide input, please contact any Board member or OLA President [theo.dreher@oregonstate.edu](mailto:theo.dreher@oregonstate.edu).

There will be many competing interests attempting to influence water policy, and safety and economic issues always lend themselves to politically powerful arguments. If you would like your concerns for healthy lakes and watersheds to be heard, please visit the Water Vision [Share Your Thoughts](#) website portal. **You will need to do so before 13 December.** At that point, the feedback received will be compiled and analyzed, with a report going to the Governor and Legislature in early 2020 in order to determine a path forward for the 100-Year Water Vision.

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## New Member OLA Board of Directors: Dan Sobota

Contributed by Theo Dreher

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Dan is originally from the Washington, DC area. He attended Virginia Tech for his undergraduate degree, a B.S. in Biology, earned in 2000. He moved to Oregon shortly thereafter, earning a M.S. in stream ecology in 2003 and a Ph.D. in stream ecology in 2007. For his Ph.D., Dan examined controls on nitrate dynamics in streams in the upper Willamette Basin. Following his Ph.D., Dan held post docs at Washington State University-Vancouver and at the US EPA laboratory in Corvallis. In these post docs, he focused on examining watershed scale sources and impacts of reactive nitrogen. In his current position with the Oregon Department of Environmental Quality, he develops watershed scale models for examining water quality and works with stakeholders to develop management plans to reduce pollution and improve water quality. He also advises graduate students in the Environmental Science & Management program at Portland State University. Dan's goals for serving on the OLA board are to continue to increase awareness of HABs in Oregon lakes and reservoirs and to focus on how managing watersheds can help mitigate effects of climate change on HAB frequency, duration, and magnitude in Oregon lakes and reservoirs.



Dan Sobota on Diamond Peak in the Cascades, with Summit Lake in the background.

Leaving the Board after several years of service is Richard Litts, who is looking forward to spending more time on his leisure and work activities around Tenmile Lake, north of Coos Bay. Richard is the Monitoring Coordinator for Tenmile Lakes Basin Partnership (TLBP). Thanks for your service to OLA, Richard!



Richard Litts checking the mail, delivered by boat, at his home on Ten Mile Lake



## Oregon Lakes in the News

Contributed by Paul Robertson

### Upper Klamath Lake gets Respiratory Fix

Climate driven elevated temperatures have aggravated fish recovery in Upper Klamath Lake. As reported by [OPB reporter Jes Burns](#), students at Oregon Tech have devised a pair of floating, solar powered aeration systems to breathe life into the waters supporting threatened and tribally significant Shortnose and Lost River suckers. Guised as a sort of Neonatal Intensive Care Unit or NICU these aeration systems are aimed at supporting juvenile fish which are, as of now, largely not surviving to adulthood. The Klamath Tribes are monitoring the sites and students plan on deploying two more units next year



Mohammed Bawazeer (left) and Ian Riley carry a battery that will power the aeration system on Upper Klamath Lake for 32 hours, even if the sun isn't shining

Photo: Jes Burns/OPB

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***Lake Wise***

Oregon Lakes Association

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**The Oregon Lakes Association Mission**

OLA, a non-profit organization founded in 1990, promotes understanding, protection and thoughtful management of lake and watershed ecosystems in Oregon. Serving entirely through volunteer efforts, the Oregon Lakes Association puts on an annual conference, publishes a tri-annual newsletter, sponsors Harmful Algal

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