



# LAKE WISE

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NEWSLETTER FROM OREGON LAKES ASSOCIATION

SEPTEMBER 2019

Connie Bozarth, Newsletter Manager

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## High Desert and Mountain Lakes of Oregon **Annual Conference of the Oregon Lakes Association** **October 25-26**

**Riverhouse on the Deschutes, Bend, OR**

**EARLY REGISTRATION ENDS SEPT 29**  
**ABSTRACT SUBMISSION ENDS SEPT 15**



Enjoy the OLA conference together with Bend's outdoor and food & drink attractions! The conference will run from midday Friday to midday Saturday, with a field trip on Saturday afternoon. Attendees will include students, lake association members and residents, outdoor recreationists, researchers, educators, tribal representatives, legislators, agency personnel, and anyone else interested in lakes.

Oral and poster presentations will cover a broad range of topics related to Oregon's lakes such as harmful algae blooms, water quality, lake and watershed restoration, aquatic invasive species, nutrient cycling, effects of climate change, hydrology, fauna and flora, coastal, mountain, and dryland lakes. The full conference agenda will be available after the abstract submittal deadline

[A limited number of reduced rate reservations are available at the Riverhouse on the Deschutes](#) for Friday night, so don't hesitate to make your reservation. [Other accommodations are available throughout the Bend area.](#)

Questions? Contact conference chairperson, Toni Pennington at [TPennington@esassoc.com](mailto:TPennington@esassoc.com).

See you all in Bend!

## Draft Conference Agenda Overview

- Friday afternoon - oral and poster presentations. [Abstract submittal](#) is open through September 15th.
  - Friday evening - "Science on Tap" presentation on Deschutes Basin water management by Jason Gritzer, Hydrologist, US Forest Service and Jen O'Reilly, Biologist, US Fish and Wildlife Service.
  - Saturday morning - oral and poster presentations.
  - Saturday afternoon - [optional field trip to three of the local mountain lakes](#) to be led by Dr. Daniele McKay, geologist, University of Oregon, Kyle Wright, hydrologist, US Forest Service, and Thomas Walker, fish biologist, US Forest Service.
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## 2019 Oregon Lakes Association (OLA)

### Academic Scholarship Recipients

Contributed by Wayne Carmichael, OLA Board Secretary

**Yes-make that plural!** OLA was able to make two awards for 2019 and both recipients are at Portland State University. Both are also currently doing their research projects in the laboratory of Dr. Angela L. Strecker, Associate Professor in the Department of Environmental Science and Management.

Crysta Gantz is a 4th year PhD Student originally from Renton, Washington. Crysta earned an undergraduate degree in Botany from the University of Washington and after working in a private microscopy lab for a couple of years, moved to Scotland to pursue an MSc at the University of Edinburgh. After finishing the degree, she



returned to the US, moving to Florida, where she worked as a researcher at the University of Florida.

After working on this project for two years, she joined a group that was developing a risk assessment for terrestrial plants. In 2007, she began working on risk assessment for aquatic plants.

In 2011, Crysta was hired to work on a grant-funded project on risk assessment at the University of Notre Dame. This project involved developing risk assessment tools for multiple aquatic organisms in the Great Lakes basin. Following this effort, she wanted to pursue a PhD on projects that help preserve and protect lakes, preferably on the West Coast so that she could return to the Pacific Northwest and be closer to family. She was accepted to work with Dr. Strecker so that she could learn more about limnology and aquatic ecology.

Crysta's research project is in the Columbia Basin in Washington State. The dissertation work combines several aspects of her past research: population genetics, aquatic ecology, landscape ecology, and aquatic invasive species. Crysta plans to use funding from the scholarship to attend the Association for the Sciences of Limnology and Oceanography Summer Meeting in Madison, WI, where she is planning on presenting her research on landscape genetics of a keystone species. These funds will give Crysta a chance to interact with the top researchers in her field, which will be an invaluable opportunity. Crysta is an active student Board member of the Oregon Lakes Association and will present her research at [OLA's 2019 annual meeting in Bend](#).



Crysta Gantz, Kenosha WI, August 2019

OLA's second scholarship recipient for 2019 is Lara Jensen. Lara completed her undergraduate at UC-San



Lara Jensen, Yosemite National Park, July 2015

Diego (BS, Environmental Systems), graduating *cum laude*. There, she carried out her senior thesis testing for local adaptation in zooplankton to high carbon dioxide levels. She was also a field assistant for a PhD student, sampling lakes in and around Yosemite National Park. It was these experiences studying the ecology of mountain lakes that led her to pursue her doctorate degree at Portland State University, where she plans to examine the factors that influence algal blooms in high elevation lakes.

As a Master's student at Humboldt State University, Lara carried out a comparative study of benthic community structure in dam-regulated versus unregulated river reaches for her thesis. The project was intended to inform the upcoming 50-year FERC relicensing of the Potter Valley Project on the mainstem Eel River in Northern California. Her research examined shifts in algal and invertebrate communities over a summer/fall season and compared this against past studies in the Eel River watershed as well as a comparison with the unimpaired Middle Fork Eel River.

Lara's PhD thesis is entitled "Do changes in climate, fish & nutrients promote harmful algal blooms in mountain lakes?" As Lara explains it: Mountain lakes are important freshwater resources due in part to their perceived pristine state, yet their isolation does not preclude them from anthropogenic disturbance. While drivers of certain shifts like species loss are generally known and some can be mitigated, the drivers of other environmental changes, like freshwater harmful algal blooms (FHABs), remain unclear and are of special concern for management. A changing climate, atmospheric nutrient deposition, and the introduction of non-native fish are among the most widespread disturbances to mountain lakes and may create favorable conditions for FHABs. The frequency of FHABs is increasing across lakes in this region, but the key factors causing these blooms are not well known.

Lara will survey 30 lakes in the Oregon Cascades across gradients of temperature, fish stocking and nutrient concentrations. She will characterize the algal and invertebrate communities of the study lakes to examine the prevalence of cyanobacteria and key grazers. Sampling will occur twice in the summer, along with continuous monitoring of temperature using loggers and cyanotoxin levels using Solid Phase Absorption Toxin Tracking (SPATT) passive samplers in order to capture temporal variability. The effects of temperature, nutrients and fish on cyanobacteria dominance will be examined through mixed effect models and calculations of the predicted additive effect. Similar analyses will be conducted to examine the effects of temperature and nutrients on cyanotoxins.

Lara will use her scholarship funds to purchase supplies for deploying SPATT samplers, which allow for time-integrated samples. Since Lara's research is just beginning she will not be presenting at OLA's annual meeting. However, she will be present, so please join us and meet and greet both our Scholarship applicants for 2019.

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## Harmful Algae Blooms (HABs) Corner

### The 11<sup>th</sup> International Conference on Toxic Cyanobacteria (ICTC 11)

Contributed by Wayne Carmichael, OLA Board Member

Thirty-nine years after the first international conference on toxic cyanobacteria was held at Wright State University in Dayton, Ohio, Kraków, Poland was the site chosen in Wuhan, China (site of ICTC 10) for [ICTC 11](#). Kraków is located in southern Poland on the Wisła river. It is the second largest city in Poland, a former capital of Poland, Royal Capital City and necropolis of Polish kings, as well as the capital of Małopolska Region. ICTC 11 was held at Auditorium Maximum, a modern conference and teaching facility and part of the Jagiellonian University, which is the oldest higher education institution in Poland.

The conference theme was “[Learning from the Past to Predict the Future](#)” and was ably hosted by Dariusz Dziga, Faculty of Biochemistry, Biophysics and Biotechnology, Jagiellonian University and his local organizing committee. Over 250 delegates, from 45 countries were kept busy, from May 1-5, 2019, addressing 9 session topics with 89 oral presentations and 136 poster presentations.

**Scientific Highlights of ICTC 11.** Each morning and afternoon session began with invited plenary speakers who covered topics including: phylogeny (Muriel Gugger), omics (Kaarina Sivonen, Steven Wilhelm), rising CO<sub>2</sub> and global warming (Jef Huisman), new cyanopeptides (Hanna Mazur-Marzec), photo protection in cyanobacteria (Diana Kirilovsky), adverse effects of cyanotoxins beyond acute toxicity (Bojana Zegura), treatment strategies for cyanotoxins in water supplies (Linda Lawton) and toxic benthic cyanobacteria (Susie Wood). Evening roundtable discussions included, molecular and morphological concepts in cyanobacterial taxonomy (Muriel Gugger and Nico Salmaso), and future directions for the ICTC-including discussion of setting a more formal operating structure for ICTC and inclusion of sessions on applied cyanoHAB remediation studies (Wayne Carmichael and Geoff Codd). Closing presentations were by Ingrid Chorus, “The new World Health Organization guidebook: Toxic Cyanobacteria in Water” and Jussi Meriluoto, “From Cyanobacterial problems to blue-green solutions”.



Vitor Vasconcelos (Portugal), Kaarina Sivonen (Finland), Wayne Carmichael, Sandra Azevedo (Brazil). Former PhD students of Wayne Carmichael, all now well established in their own institutes.

**Free Time Events.** Several well-organized excursions included a walking tour of old town Kraków, tours outside of Kraków to historic sights and locations, plus a cultural event and banquet. Thursday night concluded with a banquet, awards presentations and selection of the site for ICTC 12, in 2022. Two locations were bid for ICTC 12 with a joint hosting being selected from the USA (Tim Davis, Bowling Green University, Bowling Green, Ohio) and Canada (Mike McKay, GLIER, Windsor, Ontario). Venue site will be Toledo, Ohio, site of the [well publicized drinking water contamination by microcystin in 2014](#).

Special thanks go to Jagiellonian University, the city of Kraków, the many sponsors of ICTC 11 and all the members of both the local and international organizing committees.

## **Legislative action towards a comprehensive CyanoHABs Program in Oregon**

Contributed by Theo Dreher, OLA President

You might recall from the May newsletter that a comprehensive bill to strengthen Oregon's CyanoHAB responsiveness, HB 3326, was introduced by the House Committee on Energy and Environment, championed by Rep. Ken Helm. As the legislative session progressed, and the focus on passing a carbon cap-and-trade bill intensified, it became clear that there would not be sufficient energy to push HB 3326 in its original form. Consequently, it was modified to be an emergency funding vehicle to support OR-Dept of Environmental Quality and Oregon Health Authority, particularly in meeting the cyanotoxin testing and regulatory requirements instituted following the Salem water crisis of June 2018.

In the end, HB 3326 did not pass at all, but 1 year of funding for DEQ to continue to provide current levels of monitoring/testing was approved as part of the DEQ budget. The amount funded was \$579,590 General Fund appropriation and two permanent full-time positions (a Chemist and a Project Manager). The positions were originally approved by the September 2018 Emergency Board to analyze and monitor water samples as part of Oregon Health Authority's rules for drinking water testing for HABs. So there has been a permanent addition to DEQ's capacity to analyze cyanotoxins and to allow knowledge and expertise around CyanoHABs to be built up. With regard to support for OHA's CyanoHABs activities, [SB 27 \(2019\)](#) was passed to authorize OHA's Drinking Water Services to adopt a schedule of fees charged to water suppliers/utilities. This is a shift from other funding that has not added to OHA capacity.

In order to build on this year's efforts and to bridge to the next legislative session, [Rep. Helm](#) has tasked his committee colleagues [Rep. Marty Wilde](#) (D, central Lane and Linn counties) and [Rep. Jack Zika](#) (R, Redmond) with organizing discussions. There will be sub-workgroups on three topics: Monitoring; Prediction, Prevention and Treatment Technology; Response and Mitigation. OLA (Wayne Carmichael and/or myself) will participate in these workgroups. The hope is that these discussions will coalesce support and consensus as a set-up for successful legislative action at the next opportunity.

As part of a CyanoHABs session at our October conference in Bend, we hope to hear from Rep. Helm or Zika, or both.



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## Oregon Lakes in the News

Contributed by Paul Robertson, Past OLA President

### COMA lasts 25 years

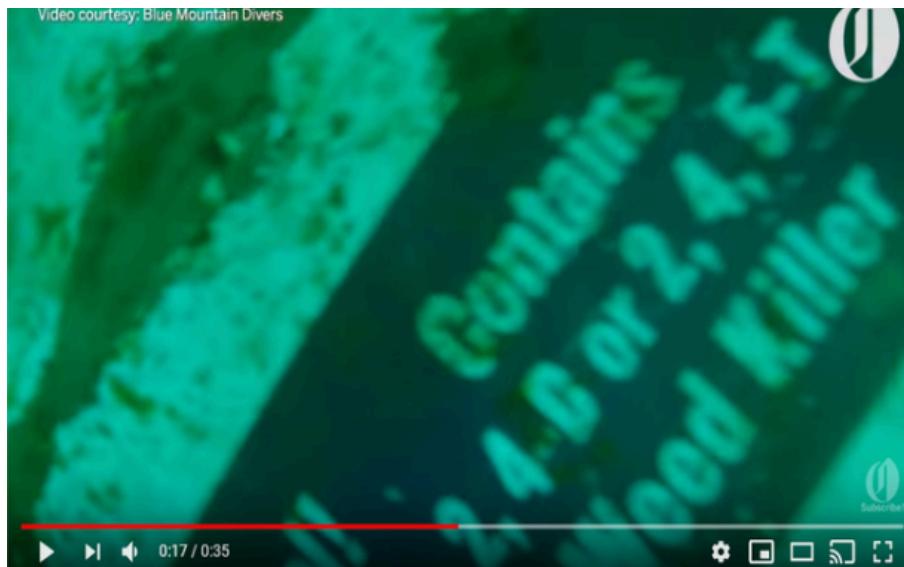
It was an early morning in 1994 when 40 intrepid open-water swimmers woke up to participate in the first of what would become the Cascade Lakes Swim Series. The rush of waters must have gotten their hearts pumping, as it has grown ever since with nearly 250 participants now. The site of this year's event, Elk Lake, about 35 miles southwest of Bend and at an elevation of about 4900', is a perennial favorite according to 71 year-old Bob Bruce interviewed by the [Bend Bulletin](#). The event run by the not-for-profit [Central Oregon Masters Aquatics](#) you might say has (Ag)ed well, as it just celebrated its Silver anniversary.



Photo Credit: Central Oregon Masters Aquatics

### Barrels roll out of Wallowa Lake #NotFun

In June 2019, the first of the mysterious 55-gallon drums was pulled out of Wallowa Lake. Divers spotted some of the barrels last year, and since then an underwater remotely operated vehicle has identified at least 69. Labels on at least one of the barrels included "2,4-D or 2,4,5-T", the chemical combination of which is Agent Orange. Another label according to [OPB](#) had the word "diesel" on it, but thus far, according to US EPA, all barrels have been determined to be full of lake water. Most of the barrels remain at the bottom of the lake pending chemical investigation. Samples have been taken from the sediments as well as the surrounding waters. Results and any further actions are pending.



Barrel with possible Agent Orange ingredients discovered at the bottom of Wallowa Lake

Video courtesy: Blue Mountain Divers

## Waldo and Crater Lakes to be declared Oregon Outstanding Resource Waters

Contributed by Theo Dreher and Rich Miller, OLA President and Board Member

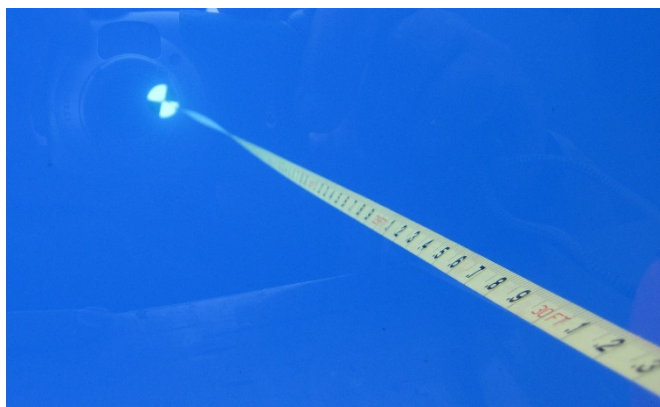
A little used provision for protecting exceptional lakes, rivers or watersheds in Oregon is their designation as an [Outstanding Resource Water of Oregon](#). The North Fork of the Smith River and its tributaries and associated wetlands are currently the only resource so designated. Outstanding Resource Waters (ORW) are high quality waters that constitute an outstanding state resource due to their extraordinary water quality or ecological values, or where special protection is needed to maintain critical habitat areas. Oregon's ORW policy, part of the state's antidegradation policy, was adopted by the [Environmental Quality Commission](#) (EQC) in 1991 and is described by [OAR 340-041-0004\(8\)](#). The designation adds protection from activities that would negatively impact water quality.

The decision on awarding this designation is made by the Oregon Environmental Quality Commission, which oversees OR-DEQ. In April, the [Northwest Environmental Defense Center](#),

associated with the Lewis & Clark Law School, submitted a petition for the designation of Waldo Lake (Fig. 1) as an Outstanding Water Resource. The petition was supported by a number of organizations including the Sierra Club and Oregon Environmental Council. OLA, Portland State University's Center for Lakes and Reservoirs, and three other organizations provided letters of support. A total of 1945 individuals submitted comments in support of the petition, with no comments opposing. At their 18 July meeting, the EQC supported DEQ's recommendation to accept the petition's request, and Waldo will now become an Outstanding Resource Water of Oregon. The same action is being taken to protect Crater Lake.



**Fig. 1.** The blue waters of Waldo Lake with Maiden Peak, Diamond Peak and Fuji Mountain in the background (Photo: Rich Miller).



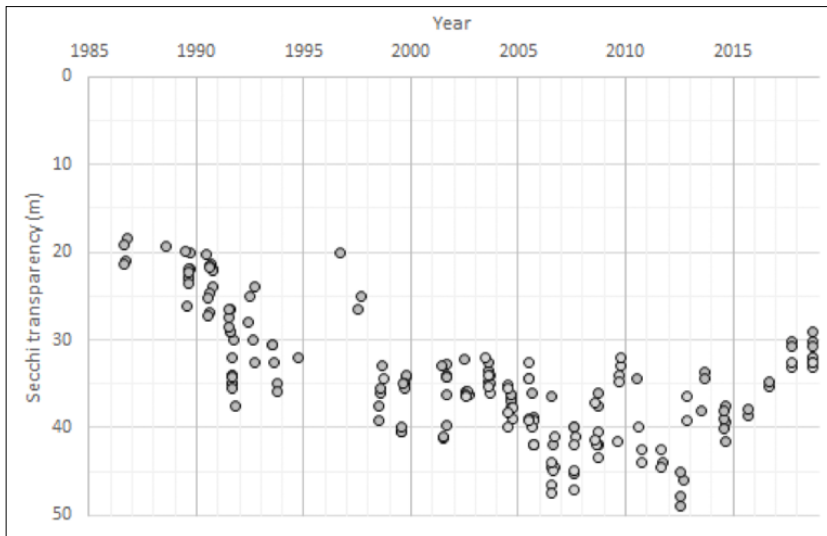
**Fig. 2.** A Secchi disk in Waldo Lake clearly visible at 10 m on 9/21/2010. The Secchi transparency measurement on this date was 41 m (Photo: Rich Miller).

The overwhelming support for protecting the pristine nature of Waldo Lake is appropriate for such a gem of a lake. The lake sits high in the Cascades (5,420 ft) in the Willamette National Forest, and owes its exceptional water purity and clarity (Figs. 2, 3) to the fact that much of its watershed falls in the heavily forested Waldo Lake Wilderness, which has seen limited human development. Further, Waldo Lake itself occupies about a third of its watershed, providing little opportunity for the inflow of nutrients or suspended matter. Due to the extremely low nutrient concentrations, the lake is particularly sensitive to management activities and other stressors. For instance, this naturally fishless lake was stocked with trout and kokanee until 1990, after which time water clarity improved and reached an astounding 49 m on 7/23/12 (Fig. 3) — one of the deepest freshwater Secchi readings on record, anywhere! The negative effects of increased, though fortunately short-lived, nutrient loading can be seen in de-



creased water clarity during 1996 and 1997 following the 1996 Charleston Butte Fire along the north shoreline (Fig. 3).

Waldo Lake's exceptional water quality and its outstanding and unique opportunities for nature-focused recreation were key factors in supporting the Outstanding Resource Water designation, as were the watershed characteristics (public ownership, wilderness designation, small size) that would allow effective protection into the future. With this well-deserved designation, we can look forward to continued and improved protection of water quality and recreational opportunities. And continued absence of motorized boats from the lake.



**Fig. 3** Clarity of Waldo Lake water indicated by the astounding Secchi depth measurements of 20-49 meters. Data provided by John Salinas (Rogue Community College, Cascade Research Group, retired), Doug Larson, (USACE, retired) and personnel from the Center for Lakes and Reservoirs, Portland State University.



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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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