LAKE WISE

... a voice for quiet waters

NEWSLETTER FROM OREGON LAKES ASSOCIATION

DECEMBER 2016

Laurie Carmichael, Newsletter Manager

IN THIS ISSUE

Nods from the Board: The OLA Board extends many thanks to outgoing President Paul Robertson (above) for the excellent job, and welcomes Theo Dreher as our incoming President.

OLA 2016 Annual Conference Summary

Contributed by Theo Dreher, OLA Board President

Conference activities began on Friday afternoon with a tour of petroglyphs and pictographs at Columbia Hills State Park led by Ranger Brock with the Washington Department of Natural Resources. The highlight of the trip was seeing "She Who Watches" or *Tsagaglalal*.

Ranger-led tour of pictographs and petroglyphs near The Dalles. (Photo by Wayne Carmichael)

Science on Tap: Friday evening **Mary Edwards**, Nez Perce Tribe Fisheries Biologist, presented a pictorial description of the challenges faced by salmon returning to spawn in the streams of the Wallowa Mountains in NE Oregon. By snorkeling among the fish, she was able to capture compelling and beautiful pictures of fish behavior at weirs and steps that are difficult for the fish to pass. Her talk was a reminder that pictorial illustrations can recruit an audience's emotions and strengthen arguments based on data. Salmon returns to the Wallowas have increased over recent years based in part on measures implemented to ease migration upstream.

Saturday Program: The Columbia River Discovery Center was a wonderful site for our conference, attended by 47 participants. **Bob Spateholts**, Senior Fisheries Biologist, Portland General Electric Company, presented the plenary lecture, describing the properties of Round Butte and Pelton dams on the Deschutes River, which impound Lake Billy Chinook and Lake Simtustus. The original fish ladders did not work, resulting in the installation of a hatchery to augment salmonid numbers in the lower Deschutes system. The collection of smolts from Lake Billy Chinook for passage by truck downstream also was largely unsuccessful. This was mostly due to currents in the upper water column moving between the Metolius and Crooked/Deschutes arms of the lake, bypassing the area of the dam and directing fish away from the collection intake. In 2010, a retrofit to the outlet tower was completed, adding an upper intake to allow the passage of warmer water in addition to the original deep, cold water outlet through the power generators. This has allowed rectification of the anomalously cold early-season downriver water temperatures that were retarding fish embryo incubation, and has allowed currents to bring smolts towards the dam and collection skimmers. It is hoped that the ability to discharge the warmer

The Discovery Center and Museum in The Dalles was the setting for the OLA 2016 Annual Meeting. (Photo by Laurie Carmichael)

surface waters will decrease the volume of warm nutrient-rich waters that are hospitable to cyanobacteria and thereby decrease blooms in Lake Billy Chinook; however, such results have not yet been realized. Parallel changes have improved the upstream passage of adults, resulting in a re-colonization by salmonids upstream of the dams. These improvements are the product of a Warm Springs Tribe/PGE collaboration. Additional beneficial adjustments that may be implemented include nighttime power generation to draw water currents that guide smolts towards the skimmers during their annual downstream migration.

Following the plenary talk, there were four sessions of 20 minute presentations, covering a range of topics, especially around the meeting's theme of reservoirs and river-associated water bodies. Prior to the first session, OLA Board Member **Wayne Carmichael** announced our 2016 OLA Scholarship Award winner—Ariana Chiapella of Portland State University—and summarized our four prior award winners. **Dan Turner** and **Tina Lundell** (US Army Corps of Engineers) talked about Landsat monitoring for cyanobacterial blooms in small impoundments formed by the roads and railroads along the Columbia River, and about Columbia River dam management to prevent excessive dissolved gas levels that harm fish. **Norm Buccola** (USGS) described off-channel pondages along the Willamette River that can be subject to farm runoff pollution but that may be cooler refuges for fish due to ground water inflows. **Kurt Carpenter** (USGS) described his first year of extensive sampling of Willamette Valley rivers for benthic cyanobacteria, finding several examples of toxin-producing periphyton mats, as other recent studies have reported in California and the US Southeast. **Sherri Johnson** (USFS PNW/OSU) described her group's study on the effects of full reservoir drawdown to streambed, which has been conducted in Fall Creek Reservoir (east of Springfield) in late fall each year since 2011. Drawdown is being used to flush juvenile spring Chinook downstream towards their ocean migration. After refilling, the responses include lower light transmission in the water column due to suspended sediment and a shallower thermocline. The zooplankton community remains similar to other reservoirs, but attains high summer densities earlier. Although salmonid numbers have remained steady, other species, including bass and bluegill, have declined.

Three talks addressed the cyanobacterial blooms in Willow Creek Reservoir near Heppner on the high plateau south of the Columbia River in Eastern Oregon. **Frank Wilhelm** and past OLA scholarship recipient **Sarah Burnet** (University of Idaho) described unsuccessful past attempts to mitigate the blooms with aerators and Solar Bee mixers, but success through adding ammonium nitrate to balance the high phosphate levels and decrease the advantage for N-fixing cyanobacteria. This approach has decreased blooms in enclosure experiments in Willow Creek Reservoir and is being trialed elsewhere. Dr. Wilhelm emphasized that nutrient augmentation would only ever be done in a system that is already eutrophic. Sarah Burnet determined that most of the P in the reservoir is due to inflow, with a minority (less than 30%) derived from internal loading. **Casie Smith** (USGS) described real-time monitoring of bloom conditions with a web-connected camera mounted on the dam wall, as well as mapping bloom and physicochemical conditions with a sonde mounted behind a boat making criss-cross transects at slow speed across the entire lake. These approaches can help to assess the well-known variability of blooms in time and space.

John Rueter and two of his students from PSU (**Roberta Brunkalla** and **Arick Rouhe**) discussed the role of buoyancy and vertical migration in the competitiveness of cyanobacteria in the stratified epilimnion, focusing on *Aphanizomenon flos-aquae* from Upper Klamath Lake. **Brian McGann** (PSU) described zooplankton responses to the fairly common practice of treating entire (small) lakes with rotenone in order to remove invasive fish species. Zooplankton are removed, but rebound after about 6 weeks and reach relatively normal popu-

Paul Robertson, outgoing OLA President, at OLA 2016 Annual Meeting. (Photo by Theo Dreher)

lations after about 5 months. **Crysta Gantz** (PSU) discussed the use of environmental DNA detection for monitoring invasive species and the success of eradication attempts. **Joe Ortiz** (Kent State University, visiting OSU) described a statistical approach to deconvoluting the spectral information that can be acquired from *in situ* or remote-sensing hyperspectral detectors, aiming to deduce the phytoplankton pigments present. His work has been largely in Lake Erie, but together with OSU, has also studied Dexter Reservoir east of Eugene. **Theo Dreher** (OSU) discussed genomic studies of cyanobacteria of the *Anabaena/Aphanizomenon/Dolichospermum* group of N-fixing filamentous cyanobacteria, which are common on both sides of the Cascades, with both non-toxic and toxic representatives present. Genetic studies assist in improving taxonomy, recognizing toxic strains, and in supporting advanced research and molecular monitoring.

Finally, **Joe Eilers** (MaxDepth Aquatics) gave an update of the sad loss of water from Lake Abert in eastern Oregon due to excessive pumping for irrigation. Hundreds of thousands of birds now lack a stopover with abundant brine shrimp as food on their migratory flights, but agencies and NGOs appear to be unconcerned and even support a questionable plan to establish local wetlands for ducks. Joe finished where Mary Edwards began, with eloquent photos that document a tragic loss.

During the meeting, **Rich Miller** (PSU) highlighted the Oregon Lake Watch Program and efforts to monitor for invasive aquatic and riparian plants. **Dick Likens** updated the audience on the state of the online *Atlas of Oregon Lakes* (https://aol.research.pdx.edu).

On Sunday, conference activities ended with Ranger Amber (Corps of Engineers) guiding a small party on a tour of The Dalles Dam. Kathryn Tackley, also with Corps of Engineers, helped arrange the tour for OLA and was part of the tour group.

See the OLA website for pdf versions of the talks presented at the conference. OLA thanks CH2M for their support of our annual meeting.

Ranger-led tour of The Dalles Dam. Kathryn Tackley and Theo Dreher listen as Ranger Amber relates details. (Photo by Wayne Carmichael)

Turbines inside The Dalles Dam. (Photo by Wayne Carmichael)

Oregon Lakes in the News

Contributed by Paul Robertson, Former OLA President

High Stakes for Lake Abert

With no right to water, Lake Abert has become the hotbed for controversy surrounding migratory birds, brine shrimp, irrigation, and terminal lakes in Oregon. The Chewaucan River with its measurable losses to irrigation, notably only dribbles into Lake Abert in recent years. Climate change is no friend either. With no official claim to water, Lake Abert may be cause for redefining our nomenclature as the idea of being a "lake" is becoming less and less of a reality for Abert. Hillary Rosner of High Country News posted this report:

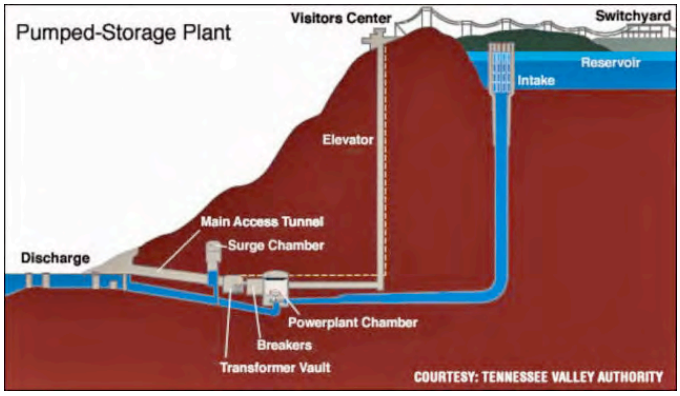
http://www.hcn.org/issues/48.10/when-water-turns-to-dust

"Lake Abert water levels had yet to reach this gauge in early May despite a good water year in southern Oregon." **(Image courtesy High Country News and credited to Eli Reichman)**

Lakes, not Rivers, as Hydropower?

With the *potential* to store electricity, pumped-hydro projects are getting an *elevated* look as of late. Swan Lake in Klamath County is poised to become the largest example of the resurgence of this technology. Jes Burns of OPB and Earthfix recently filed this report….
https://soundcloud.com/earthfix/making-lakes-work-like-batteries

http://www.pbs.org/newshour/rundown/oregon-transform-lake-battery-charge-electricity-grid/



"***An example of a pumped hydro system. The pipe, or penstock, for the Swan Lake North project would be run above ground along the hillside. Illustration by Tennessee Valley Authority.***"

Rare White Sturgeon in Lake Ewauna

Easily topping 300 pounds and at an estimated 63 years of age, the last of a 1950's era fish stocking program was caught in this reservoir at the headwaters of the Klamath River earlier this year. Released back into the environment unharmed, this 8'-10' behemoth is a reminder and remnant of the legacy of anthropogenic influences in the region. According to Wikipedia, the reservoir itself served the mill industry of the day, which according to the article reprinted from the Associated Press by Oregon Live, was stocked with just 220 White Sturgeon as a sport fishery, the last of which might have just been seen. Read the full article here…

https://en.wikipedia.org/wiki/Lake_Ewauna

http://www.oregonlive.com/pacific-northwest-news/index.ssf/2016/03/rare_white_sturgeon_found_in_s.html

"***An eight to 10-foot white sturgeon was netted in Lake Ewauna on Monday by Bureau of Reclamation personnel. It was released unharmed.***" **(Image Courtesy The Associated Press)**

The Origins of OLA

Contributed by Andy Schaedel, Treasurer OLA Board, First OLA President

Did you ever wonder how the Oregon Lakes Association (OLA) got its start? This article gives you a little background on OLA's origins.

Clean Lakes Program: A good share of OLA's roots go back to Section 314 of the Federal Water Pollution Control Act Amendments of 1972 (P.L 92-500 or the Clean Water Act). This section was drafted and introduced by Senators Walter Mondale (D-Minn) and Quenton Burdick (D-NDak). It set forth the principal administrative and technical requirements associated with developing a national program to enhance the quality of lakes. Section 314 required a State to survey its publicly owned lakes and report the results to EPA. After establishing an understanding of lake problems, States were to define the pollutant-loading problems of their lakes, develop plans to control the source of pollution, and then implement both watershed and in-lake measures to improve lake quality. The U.S. Environmental Protection Agency (EPA) was to develop and implement a program of financial assistance to carry out the provisions of the program.

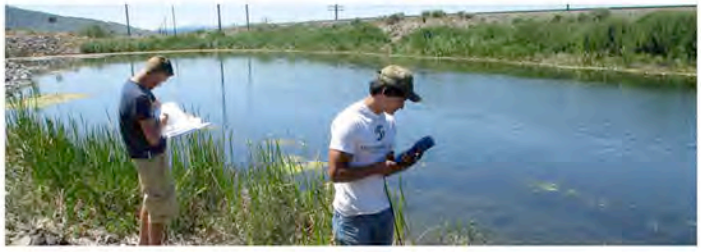
In January 1980, EPA awarded a $100,000 grant to Oregon Department of Environmental Quality (DEQ) to survey and classify its lakes according to their water quality status. This grant led to the development of the *Atlas of Oregon Lakes* by Portland State University (PSU), which was used, in part, to fulfill the requirement of classifying Oregon Lakes. The Atlas compiled detailed information on the chemical, biological and geographical characteristics for 202 Oregon lakes and their watershed.

In late 1987, EPA convened a Clean Lakes Work Group consisting of members of states, tribes, NALMS, EPA and others to develop further Clean Lakes Program Guidance. The 1987 guidance authorized EPA to issue lake water quality assessment grants to help states meet their reporting requirements and to enhance their lake monitoring capabilities. Oregon applied for and received another $100,000 grant in FY1989. Under this grant, DEQ initiated a Citizen Lake Monitoring Program, ran a Challenge Grant Program for lake studies, and sponsored a series of workshops to bring together a variety of people working on or interested in Oregon lakes to discuss lake issues. The thinking behind this grant was to get people more involved in the monitoring and management of Oregon lakes.

Clean Lake Workshops: DEQ held two Clean Lake workshops on the PSU campus on July 12, 1989 and April 10, 1990. Forty and 75 participants, respectively, from various backgrounds attended the workshops (see list of workshop participant groups below). A variety of topics were presented to seed brainstorming sessions about the needs and functions for an Oregon lake program. Common concerns/interests included (not in priority order):

- A need for a state supported lake management program;
- A stronger aquatic weed/nutrient control program;
- Better protection of high quality waters;
- Expanded volunteer monitoring program of lakes;
- Development of lake water quality standards;
- Development of regional or lake specific management plans;
- Stronger assistance to lake associations;
- A statewide lake organization.

Oregon TECH



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Given that a large number and variety of organizations were involved in managing activities that can affect lake water quality, it became quite apparent that one of the first steps needed would be the creation of a state chapter of the North American Lakes Management Society (NALMS), similar to the Washington State Lake Protection Association.

During 1989 and 1990, a work group consisting of at least 11 members (and I apologize if I omitted anyone) worked on developing a set of by-laws and other paperwork needed to form OLA. This group met monthly in a conference room at the Salem Department of Forestry—a central location for people coming from Bend, Corvallis, Lincoln City and Portland. The work group included: Larry Caton, John Collins, Angela Ehelebe, Joe Eilers, Stan Geiger, Dave Humphrey, Del Isham, Richard Petersen, Andy Schaedel, Dave Smith, and Ela Whelan. Many of the concerns listed above were identified as OLA objectives in the OLA by-laws.

The Oregon Lakes Association officially was formed at its first annual conference held during the Devils Lake Grass Carp Days on 9/8/90. OLA became an official chapter of NALMS in November 1990.

Workshop Participant Groups:

- Tribes—Confederated Tribes of the Warm Springs;
- Federal Agencies—Corp of Engineers, Bureau of Land Management, EPA, Forest Service, National Park Service, Soil Conservation Service (now NRCS);
- State Agencies—DEQ, agriculture, fish and wildlife, forestry, legislature, marine board, state lands, transportation;
- Local Government—City of Klamath Falls, Metro, Portland Parks, Tigard, Washington County;
- Universities—Central Oregon Community College, Oregon State, Oregon Graduate Center, PSU;
- Organizations—Jackson Bottom Wetlands, Nature Conservancy, Oregon Nature Resources Council (now Oregon Wild), WALPA/NALMS;
- Consultants—Aquatic Analysts, CH2M-Hill, E&S Environmental, Klamath Consulting Services, Kramer Chin & Mayo, Omni Environmental, and Scientific Resources;
- Lake Associations—Devils Lake, Garrison Lake, Lake of the Woods, Lake Oswego, Woahink Lake.

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Harmful Algae Blooms (HABs) Corner

Contributed by Wayne Carmichael, OLA Board Secretary

Projection screen for ICTC 10. (Photo by Wayne Carmichael)

TENTH INTERNATIONAL CONFERENCE ON TOXIC CYANOBACTERIA (ICTC) HELD OCTOBER 23-27 IN WUHAN, CHINA

East Lake International Conference Center in Wuhan China was the site of the **10th International Conference on Toxic Cyanobacteria (ICTC)**. Wuhan is the capital of Hubei province, and with almost 11 million inhabitants is the most populous city in central China. Located on the Yangtze River, Wuhan is an important transportation and business hub, with a history spanning 3,500 years. Hosted by faculty, staff and students from the State Key Laboratory of Freshwater Ecology and Biotechnology at the Institute of Hydrobiology, Chinese Academy of Sciences, almost 300 delegates spent October 23-27 presenting research on the conference theme, "**Cyanobacteria and Cyanotoxins: from Research to Risk Managemen**t."

Registration and a reception on Sunday evening October 23, allowed participants to renew acquaintances from the nine previous ICTCs held since 1980 in the USA, Great Britain, Denmark, Australia, Norway, Brazil, Turkey and South Africa.

Plenary presentations included: Toxic Cyanobacteria Studies in China, Past, Present and Future by Prof. Yongding Liu (China); Strategies Used by *Cylindrospermopsis raciborskii* for Global Success by Prof Michele Burford (Australia); and Ecology and Community Structure of River Mats of Anatoxin-a Benthic Producers by Prof. Antonio Quesada (Spain).

Eighty-two oral presentations were divided into 9 Session topics:

- S-1: Toxicology and Toxicity Assessment;
- S-2: Risk Management;
- S-3: Cell Physiology and Molecular Biology—Part 1 and Part 2;
- S-4: Cyanotoxin Analysis—Part 1 and Part 2;
- S-5: Ecology and Cyanobacterial Bloom Dynamics—Part 1 and Part 2;
- S-6: Cyanotoxin Compartmentation and Persistence—Part 1 and Part 2;
- S-7: Secondary Metabolites Production and Functions—Part 1 and Part 2;
- S-8: Interactions Between Cyanobacteria and Other Organisms;
- S-9: Cyanobacteria Detection.

In addition, 40 posters were displayed and discussed in three poster sessions and two evening round table discussions were held; one on mitigating cyanobacteria blooms and the other on the ongoing debate as to the presence and health risk from the modified amino acid neurotoxin BMAA (beta-N-methylamino-L-alanine) identified in cyanobacteria almost 20 years ago.

Organizers plan to publish the proceedings from ICTC 10 in a special issue of the "*Journal of Oceanology and Limnology*", in 2017. Look for more details of this in future *Lake Wise* Newsletters.

Following presentations by delegates from The Netherlands and Poland, a vote by those present chose Poland as the site for ICTC 11 to be held in 2019.

The website for ICTC 10 can be found at:

http://ictc10.csp.escience.cn/dct/page/1

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OREGON LAKES ASSOCIATION—2016 Scholarship Fundraiser Donors

Contributed by Stephen Wille, OLA Board Member

The Saturday afternoon raffle/auction netted about $850 towards the OLA Scholarship Fund. Thanks to all the donors for their contributions. Please support our donors!

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Congratulations to our 2016 recipient: Ariana Chiapella, PSU

New Changes to the OLA Board

At the 2016 Annual Meeting, a new slate of officers was presented. The Board is grateful to Stephen Wille and Kit Rouhe for their years of service. See box below for a list of current board members.

OLA BOARD OF DIRECTORS

Theo Dreher, President
Unfilled, Vice President
Paul Robertson, Past President
Andy Schaedel, Treasurer
Wayne Carmichael, Secretary
Gary Larson, Director
Richard Litts, Director
Rich Miller, Director
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Lake Wise
Oregon Lakes Association
P.O. Box 345
Portland, OR 97207-0345

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 Bloom trainings, and works as an advocate for lakes in the legislative arena. For additional information on OLA, write to the address above, or visit our website.

OLA and Lake Wise welcomes submissions of materials that further our goals of education and thoughtful lake management in Oregon. OLA is grateful for corporate support that helps sustain the organization. Corporate members are offered the opportunity to describe their products and services to Lake Wise readers. These descriptions are not OLA endorsements and opinions appearing in Lake Wise are not OLA policy statements.

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