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Editor:
Roger Edwards

LAKE WISE

A Voice for Quiet Waters

The Oregon Lakes Association Newsletter

National Lake Assessment Sets Baseline Values

The US EPA began planning for a comprehensive measurement of chemical residues in the tissues of lake fish in 1998. The study was designed to establish the current levels of detectable residues throughout the nation so that remedial measures could be judged by noting any change in the measured concentrations. It was agreed that 500 lakes or reservoirs would be sampled in the lower 48 states and these samples would be examined for the presence of 268 chemicals.

A "lake" was defined for this study as standing water with a surface area ≥1 hectare and at least 1000 m^2 of open water, a depth ≥1 m, and a permanent fish population. Lakes were then selected in six size categories ranging from 2.5 to 900,000 acres, excluding the Great Lakes. There were an equivalent number of lakes chosen in each category. Approximately one quarter of the lakes were sampled in each of four years. The lakes were divided among the 48 states so that 16 states had 1-5 lakes sampled, 17 states had 6-10 lakes, 10 states had 11-20 lakes, 3 states had 21-40 lakes, and 2 states had 41-60 lakes sampled. Oregon had 9 lakes sampled for the study.

A sample consisted of five, similarly sized fish, and caught within one week of one another. Bottom dwellers or resident predators were the target sample categories. Either or both categories were collected from each lake. For the analyses, bottom dwelling fish were completely homogenized, and defined fillets were homogenized from the predators.

The chemicals of concern have a known toxicity, they persist in the environment, and they bioaccumulate in organisms of the food web. The analyses to measure these chemicals produced results for 6 forms of the metals mercury and arsenic, 17 dioxins and furans, 44 organo-halide pesticides, 9 organo-phosphorus pesticides, 88 other semi-volatile organic compounds, and 170 polychlorinated biphenyls.

The raw data for what came to be known as the "National Chemical Residue in Lake Fish Tissue Study" became available in late February 2006. The study is described at www.epa.gov/waterscience/fishstudy. The analytical results list the tissue concentrations found in 486 lakes, 8 of which are from Oregon. The final report is expected to be released later this year. Sorting these raw data to observe meaningful conclusions will take some time. Initially, it has been noted that mercury was detected in all 486 lakes, and all of the lakes had traces of some PCBPs. Some dioxins or furans were detected in 395 lakes, chlordane was present in 96 lakes, but only 24 had measurable levels of dieldrin.

The threshold of detection in this study is at the level of parts per billion or parts per trillion. That translates to micrograms per kilogram or nanograms per kilogram, respectively, which, in themselves, are below the level of toxicity. There is also some uncertainty in the relationship between tissue residues and lake

concentrations. It must be remembered too that the purpose of the study was to determine the pervasiveness of the chemical compounds rather than the examination of specific lakes.

The Oregon lakes in this study were Lake Umatilla, the Columbia River pool behind the John Day Dam; an unnamed gravel pit on the Linn/Benton County line east of Corvallis in the Fischer Island area; Elk Lake, a glacial lake in Marion County north of Detroit; Dently Reservoir, a 16 acre irrigation reservoir in Douglas County upstream of Plat 1 Reservoir; Malheur Lake, the large marshy lake in Harney County east of Harney Lake; Lake Owyhee, the Malheur County reservoir on the Owyhee River south of Ontario; Barney Reservoir, the Washington County reservoir on the Trask River; and Wickiup Reservoir in Deschutes County below Crane Prairie Reservoir on the Deschutes River. Crater Lake was also sampled as a backup lake. This selection provides an interesting contrast in water quality and suggests the results of the national study will also be representative of existing conditions. An initial summary of the Oregon results are presented below. When reviewing these data, remember the difference between detection levels and dangerous levels. The mercury concentration detected in Elk Lake was 39.4 ppb, which is well below the danger value of 350 ppb. The level in Lake Owyhee however was 600 ppb, which accounts for the active advisory for mercury that is in place at this lake. Yet both Elk Lake and Lake Owyhee are seen below with a positive detection of mercury.

Chemical Detection Totals

Chemical Group	Metals	Dioxins/Furans	Org Halo Pest	Org Phos Pest	SVOC	PCBP
threshold level	ppb	ppt	ppb	ppb	ppb	ppt
L. Umatilla	4	3	7	0	0	151
unnamed lake	1	14	12	0	0	142
Elk L.	1	1	6	0	0	97
Dently Res.	4	4	2	0	0	92
Malheur L.	1	2	2	0	3	88
L. Owyhee	1	7	5	0	4	119
Barney Res.	1	4	5	0	2	104
Wickiup Res.	1	1	6	0	2	115

Interagency Cyanobacteria Meeting Convenes April 5th

The group that sets the Oregon response to summer blooms of cyanobacteria has scheduled their next meeting in Room 328 of Portland State University's Smith Memorial Center. The meeting will get underway at 1000 on Wednesday, April 5th. The agenda will include a discussion of *Anabaena* taxonomy; the sampling and communication that PGE is conducting at Timothy Lake and their North Fork Reservoir; and the special consideration needed when blooms occur in drinking water supplies. The advisories placed on lakes in recent summers have mostly cautioned vacationers about recreation activities in the posted lakes. There have been some drinking water advisories, but a discussion about the different risks at play in these incidents is warranted.

The afternoon session will consider the reports of committees assigned last November to investigate the edibility of fish from posted lakes and to devise an education campaign beyond distribution of the informational bulletin. Questions about the safety of eating fish caught during cyanobacteria blooms are regularly posed to lake authorities so clarity on this issue is needed. Increasing public awareness about cyanobacteria has been recognized in previous meetings as an essential approach to overcome the physical difficulty of placing and

removing warnings on the shores of posted lakes. The protocols for the coming season's sampling and testing will be presented, and the roles and responsibilities for making and communicating decisions on advisories will also be put into place. The meeting is scheduled to adjourn by 1430 to allow travel time for distant commuters.

Update: Oregon Water Rights, DSL Easements and Woahink Lake

by John Stead, Board Member, Woahink Lake Ass. & vol. for Dunes City's Water Quality Control Committee

The legitimate use of Oregon's surface water generally requires authorization by the Oregon Water Resources Department (OWRD). Authorization is gained by application, including evidence of an easement authorizing the placement of pumps and water lines on land not owned by the applicant. Following application approval, a temporary permit is issued. The permit can be converted into a water right certificate after the water has been put to beneficial use for least a year. It is wise for eligible permit holders to obtain certificates as soon as possible since application dates are important and certificates run with the land without renewal. To review water rights visit OWRD's "Water Right Information Query" website at http://stamp.wrd.state.or.us/apps/wr/wrinfo/wrinfo.php.

Placement of Pumps and Water Lines on State-owned Land

On September 18, of 2001, OWRD sent letters to 17 Dunes City residents who had been using water under their individual permits for at least six years. The letter stated, "It appears you have placed your works (pump and pipe) on State of Oregon Property (Woahink Lake). Failure to obtain the necessary easement may result in the cancellation of your permit . . .". The Oregon Division of State Lands, now the Department of State Lands (ODSL), followed up on October 5, 2001 with letters containing application materials and indicating an application fee of $750 for a 30-year easement.

The Woahink Lake Association (WLA) learned that a single application for all 17 members would suffice and filed a single application, including the diversion points for each member resident. Soon afterwards, OWRD forwarded the needed authorization and the residents received their water right certificates. However, the 30-year joint easement from ODSL was subject to renewal and the water right permit application process continued to require that individuals gain authorizations from two separate state agencies, paying $450 to OWRD and an additional $750 to ODSL. This cumbersome situation prompted the WLA and others to enlist the help of Senator Kenneth Messerle and Representative Joanne Verger. Through their efforts Senate Bill 82 was enrolled in June of 2003. This bill removed the requirement that two state agencies be involved in the issuance a single permit when the water is to be used for domestic or irrigation purposes. SB 82 added Oregon Revised Statute 274.040(3(b). It states:

> ". . . a person holding a water right permit or certificate. . . may occupy state-owned submersible lands for the construction, maintenance and operation of any structure or facility necessary for the use of water if the proposed use under the permit, certificate, order or decree is for irrigation or domestic use. The department may not charge for the occupation of state-owned submersible lands pursuant to this paragraph, nor may the department require that a person obtain written documentation to substantiate the permission granted under this paragraph."

Unauthorized Use of Water from Woahink Lake

Shortly after the easement issue surfaced, a citizen from a neighboring community complained to OWRD that many of Dunes City's residents were using water from Woahink Lake without authorization. OWRD

investigated, finding that an estimated 140 residences were out-of-compliance. See the related article in the March 2003 issue of *Lake Wise*, found on the web at www.oregonlakes.org/publications. Water users seeking to come into compliance and use water for domestic purposes soon discovered the importance of application filing dates. This date normally becomes the permit's priority date — the date used to determine water availability based on the principle of prior appropriation. That is, when water flows are inadequate, water rights that are junior must yield to the older water right.

OWRD determined that water is unavailable for domestic use from Woahink Creek and its tributary Woahink Lake, during the seven months of the year that creek flows are inadequate to meet OWRD's 1974 Instream Water Right (ISWR) S-59892. This determination is based on data from OWRD's Water Availability Table for Woahink Creek [Watershed ID #517]. Beginning July 17, 1992, statewide rules were changed to require that instream water be available at least 80-percent of the time, instead of the earlier allowed 50-percent [Oregon Administrative Rule (OAR) 690-400-0010(11)(a)(A)]. According to the Water Availability Table, flows are inadequate during April and June through November, thus precluding water use for any purpose other than human consumption. "'Human Consumption' means the use of water for the purposes of drinking, cooking, and sanitation" [OAR 690-300-0010 (24)]. Small wonder that residents had not sought water right permits.

The Solution

Dunes City holds unused 1968 water right permit S-33923 for "domestic supplies," and since this permit has priority over the Woahink Creek 1974 ISWR, a collaborative effort was initiated between OWRD and Dunes City. It was proposed that the City sub-allocate its domestic use permit to existing residents and others, despite some concern that the City's unused permit may go into default as a result of non-use. Applicants signed agreements with the City and placed markers in the ground along the shoreline to identify the location of the diversion point for each residence or vacant lot. The coordinates for each point were logged with the aid of a boat and GPS positioning device. These data were recorded on the City's Permit Amendment Transfer Application and the application was processed per ORS 534.211. The Dunes City's Permit Amendment T-9854, listing the 217 new points of diversion was issued on December 13, 2005. This solution was strengthened during the 2005 legislative session by the passage of House Bill 3038, which amends ORS 537.230 to allow 20 years for the development of municipal water permits instead of the five years mentioned above. It provides that OWRD grant the additional time extension if the user can demonstrate need and "maintain the persistence" of fish species listed under the Endangered Species Act. See also OAR 690-315, Water Right Permit Extensions. This legislation resulted from litigation initiated by WaterWatch and others over municipal development on Tenmile Creek near Coos Bay.

Help Document Oregon's Lakes

by Richard Lycan, Ph.D, PSU Professor Emeritus of Geography and Urban Studies

The Oregon Lakes Association and the Center for Lakes and Reservoirs (CLR) at Portland State University encourage you to submit photographs of Oregon lakes for use in publications by CLR. Our hope is to use them in an on-line reference source on Oregon lakes and possibly for the re-publication of the 1986 *Atlas of Oregon Lakes*. In submitting images you will be giving all rights for use of these photos to Portland State University for them to use or modify as they see fit. Only send photos that you own; not photos from other sources.

Photo content.

Select pictures that capture that which is unique about the lake. Photos that have some foreground detail (e.g.

vegetation, shoreline development, human activities) are desirable. Photos from a high point can give a more comprehensible view of the lake. Avoid photos that show persons where they can be recognized as this requires permission of the subject. We would prefer to get a few photos of many lakes rather than many photos of one lake.

Submit on line.
You can submit photos on line as an e-mail file attachment. If they are photos taken with your digital camera, ideally they should be at a medium or high resolution and with little data compression. If you are scanning the photos from slides they should be at a very high resolution. If you are scanning prints use 400 lines per inch. TIF format data are preferred. If you are using JPG format, do not crop or modify the photo as detail will be lost. Send the photos as an e-mail attachment to *lakepics@pdx.edu*. Each e-mail can include a number of photos depending on the file size and the limitations of your internet service provider.

Send photos to CLR for scanning.
If your photos are in the form of 35mm slides or paper prints and you are willing to loan them to CLR for about 10 days, we can scan them, enter them in our database, and return them to you. You also will need to supply metadata for each of the photos. Contact CLR using the *lakepics@pdx.edu* e-mail address.

Make sure you identify the lake correctly.
You can download a list of 832 Oregon Lakes in PDF format (Lake List.pdf) or an Excel application (Virtual Earth – Oregon Lakes.xls) from Center for Lakes and Reservoirs web site, http://www.clr.pdx.edu/news/lake_photos.html. You can use these resources to help confirm the identification of the lake. The Excel application provides an aerial view and map to verify the identification. You should download the Excel application to your hard drive and run it from there rather from the web link. To run this application you will need to set your security level in Excel to "medium".

The following data need to be provided when you submit photos. In the case of photos submitted on-line include the data below in the body of the message and attach the files for the photos to the e-mail. If we use you photo in publication we will need to contact you to obtain a written release for use of the photo.

1. Your identification:
   a. Last name, first name
   b. Mailing address
   c. Telephone (home, business, or cell)
   d. E-mail address

2. Metadata for each photo:
   a. Lake name
   b. County
   c. File name for image
   d. Date of photo, at least estimate of year
   e. View looking (N, NE, E, SE, S, SW, W, NW, vertical)
   f. Photo from (shoreline, high point, boat, aircraft, other)
   g. Suggested caption for photo
   h. Comments, other

A Dissection Microscope Can Be A Useful Tool

Are there any homes in America without a single crescent wrench? Possibly, but they are surely in the minority. This useful tool can do the work of a complete set of open-end wrenches, either regular or metric. They also serve admirably as a pry bar, doorstop, and for warding off muggers.

A dissection microscope is another tool that can be used for a wide range of purposes. The low power magnifications that these instruments provide are commonly used to identify or examine small plants and animals, but they are equally adept for all manner of hobbies, splinter removals, or even reading legalese. They have a great advantage over true microscopes in that they just magnify things you can already see and so can satisfy your curiosity about long-standing questions. True microscopes show you things that you didn't know existed, and therefore have never much cared about.

Cost is another advantage that dissection microscopes have over their high magnification relatives. The lenses needed for magnifications of 100x and greater introduce aberrations into their images as refracted light is separated into its component colors, and flat objects produce spherical images due to the curvature of the magnifying lenses. These aberrations must be corrected for high magnification microscopy to be a useful tool. Corrections are possible, but they quickly move the cost of a true microscope beyond the reach of the casual user. The lower magnifications of dissection microscopes do not require such expensive lenses and so these instruments are well within an affordable price range. Scanning the internet for "dissection microscope" quickly shows that it is difficult to find one costing more than $2000. A very fine one can commonly be purchased for $500, and perfectly good ones are available for $250. The difference in price between models is mainly in their features. These key features are discussed below.

Dissection microscopes are also known as stereomicroscopes because their binocular lens configuration is designed to provide a three dimensional image. Trinocular configurations are available for uses where a lot of photography is anticipated. This feature adds significantly to cost. Quality photos can be taken through either port of a binocular microscope.

Magnification has a bearing on cost. Few dissection microscopes reach 100x, and 70x is more often seen as an upper limit. But field books recommend that magnifications of just 10-12x are adequate for moss identifications so here is a way to control costs.

Resolution is an important aspect of magnification. It refers to the ability of the lens to discern fine detail. It is measured by the number of fine lines per mm that can be distinguished through a lens. Lenses that increase magnification without increasing resolution are of limited value.

Zoom microscopes offer a continual range of magnifications between an upper and lower limit. This kind of microscope is different than those where only distinct magnifications are possible. A common fixed magnification microscope offers just 10x and 20x images. A zoom microscope with these limits provides images from 10x to 20x magnification.

Microscopes that remain in focus when the magnification is changed are described as "parfocal". This is a desirable feature that is not found in all fixed magnification microscopes. Zoom microscopes all require refocusing as the magnification is changed.
Working distance is the linear distance between the specimen stage plate and the lens. This distance decreases as magnification increases. It can be limiting in dissection microscopy when the object being viewed is so large that there is insufficient working distance to permit focusing. For cases like this, a boom microscope gives the option of placing the microscope pod of lens and eyepiece anywhere along the length of the boom and so allowing larger objects to be examined.

Eyepieces are the microscope lenses you look through. The magnification of the microscope is determined by multiplying the power of the eyepiece by the power of the lens closest to the object under examination. Accessory eyepieces of different power are often available as a way to increase the magnification of a microscope.

Interpupillary distance measures the spacing of a person's eyes. This distance varies among people and the microscope must have this adjustment for its eyepieces to provide a three dimensional image.

Diopter adjustments allow the two eyepieces to be individually focused to match the eyesight of the user. It is especially useful for users who have better sight in one eye or the other. By using the diopter adjustment, the need to adjust the microscope focus is minimized because both eyes can view the focused image simultaneously.

Illumination of the specimen is required for microscopic examination. Whether provided by a mirror or a light, both the light path and the light quality are important considerations. Microscopes are commonly offered with both incident and transmitted light paths. Incident light shines directly on the specimen from above. It can be from a built in light source or from a separate lighting device. Solid objects are viewed by incident illumination. Transparent objects are best viewed by shining light through them from below. But because most objects that you can see and want to examine microscopically are not transparent, there is little cause to use transmitted light with a dissection microscope.

The best choice for incident illumination is neon. It provides even illumination without shadows because its light comes from the entire length of its tube. It is also cool light that does not subject a live specimen to heat stress. Incandescent lights can be adjusted for brightness, which is sometimes useful.

A dissection microscope configured with these features in mind will open a new world to anyone with a fondness for small things. And it should last as long as a crescent wrench.

"Eeuw, there's a "bug" in my glass of water!" or the application of zooplankton ecology and taxonomy to water quality studies and fishery management in lakes

by Allan Hayes Vogel, Ph.D., ZP's Taxonomic Services, POB 18646, Salem, OR 97304, llvogel@teleport.com

Zooplankton are small invertebrates that live in the water column of lakes and the upper portion of the World Ocean, and which lack the ability to swim against currents. Scientists, as well as lake and fishery managers, look at (or collect samples for technical specialists like me to look at) zooplankton as a means of answering three possible questions about lakes: how is the lake's water quality, are the fish stocking rates appropriate for

the particular lake, and might there be a public health hazard present if the water from this lake is used for drinking purposes?
Fortunately thanks to water filtration systems and modern methods of chemical purification, I have seldom been involved in public health investigations; however, this is due to the fact that we live in a developed country and already routinely take care of such things, not that the dangers don't exist here (as on occasion I've seen disease-causing animals in my samples). Nonetheless, although one should be aware of such things, the public health aspects of zooplankton are rarely of concern for most people in developed countries unless they backpack into wilderness areas (or swallow large amounts of water while swimming in their local lake). Instead, water quality studies and fisheries investigations make up the bulk of applied work that zooplankton specialists are involved in. The interesting thing about these two kinds of zooplankton research is that any educated layperson can also get a basic idea about what's going on if they have a dissecting microscope and a simple picture key; hence such people can become a reliable member of a network of lake monitors, observing these exotic-looking "bugs" in their local lake. The reason such is possible is that, while there exist several hundred species of freshwater zooplankton in North America, most lakes have only between 5 and 40 species, and there are relatively few common and/or ecologically important forms. Furthermore, these organisms are typically long-term inhabitants of lakes, making monitoring them fairly easy to do for anyone with a good quality, 10-35x power dissecting microscope; provided that the "key players" are known and the reasons for why they are essential is understood.

Long-term zooplankton monitoring is important to do for several reasons. The populations of these animals not only vary with time of the year; their numbers also change from year to year due to long-term weather cycles and episodic inter-annual variations (such as El Niño). Both the changes within a given year and between years can vary by one to three orders of magnitude. To make sense of this variation, both long-term and consistent monitoring is essential to adequately answer questions for both water quality and fisheries (i.e., it isn't necessary to take a lot of samples at any one time, but regular collections over a long time scale are). Changes, particularly of known "keystone taxa", i.e., the "key players", frequently signal significant changes in water quality, like the presence of an invasive organism and/or the imminent decline of a valuable fishery, long before the actual event is directly observed. For example, the disappearance of a keystone taxon of zooplankton from Diamond Lake was one of the first pieces of evidence that there was a problem in the lake, namely the re-introduction of the tui chub. And it was only in hindsight (and some serendipitous zooplankton collections by Drs. Jack Donaldson and Doug Larson in the 1960s) that enabled Dr. Judith Li and me to determine what had happened in Waldo Lake (see Vogel & Li; 2000; Recent Changes in the Zooplankton Assemblage of Waldo Lake, Oregon; Lake & Res. Mgmt.; 16(1-2):114-123).

Probably the single most important zooplankton taxon to monitor for both long-term water quality and fisheries is the large daphnids, also known as water fleas. Big *Daphnias* are easy to see in a sample using a low power dissecting microscope, and determining both their absolute density and relative numbers compared to other crustacean zooplankton is a simple way to learn what shape the zooplankton assemblage is in. The reasons that they are a keystone taxon are first, fish like to eat them (and for many salmon and trout, an adequate number of *Daphnia* in late spring is essential for their survival while young), and second, they are highly efficient grazers of phytoplankton, out-competing the smaller grazers in several ways, including eating types of phytoplankton that the smaller ones can't consume. The latter characteristic is the one primarily involved in their significance in water quality studies as they frequently are the only organisms in the water column that will eat bloom-forming cyanobacteria. For example, their disappearance in Diamond Lake after the chubs arrived foreshadowed by several years the subsequent deterioration in water quality there due to cyanobacterial blooms.

Another important group of zooplankton, though only for water quality investigations, are the rotifers. Knowing the kinds of rotifers present gives researchers and lake managers an idea as to the general level of water quality, and consistent changes in their representation in the zooplankton assemblage from year-to-year often indicate important changes in water quality. These animals possess a wide (and quite interesting) variability in their appearance, hence they are easy to identify to the genus level (though not to species). They are generally worldwide in distribution, but also very specific to the kind of chemistry and level of productivity of the particular lake where they're found. They can vary wildly in their occurrence in a given ecosystem from year-to-year as they are quite sensitive to changes in these parameters as well as inter-annual temperature changes, and the causes for these population changes can sometimes be difficult to determine. For this reason, a detailed enumeration of the rotifers present in a sample is frequently less useful than a simple presence/absence table that also notes relative abundances (in order of magnitude terms). This again is something that an interested layperson or non-specialist lake manager who possesses a dissecting microscope can do, although the interpretation of the data usually requires the assistance of a specialist (and good species identifications can sometimes be critical in successful interpretation).

The second most important group of zooplankton for fishery investigations are the large calanoid copepods such as *Epischura* and some of the larger species of the diaptomid subgenus, *Hesperodiaptomus.* These animals represent another good source of food for young fish and regularly consume both rotifers and the immature stages of other copepods (though apparently not their own), and so they alter grazing pressure on the phytoplankton. The combined numbers of the big *Daphnias* and this group are frequently used to determine fish stocking rates, and indices, utilizing the densities of these two groups of crustaceans relative to other zooplankton, have been developed to assess the potential fisheries condition of lakes and reservoirs throughout the country. Consequently, long-term monitoring (such as monthly collections during the growing season, or even sampling once a year at the same time of year for a number of years) of just the large edible crustacean zooplankton, i.e., the big *Daphnias* and the large calanoid copepods, can provide both professional lake managers and fishery biologists, as well as curious lakeshore residents, with an idea as to what is going on in their lake and can enable all of them to make predictions as to what will happen in both terms of future water quality and fishing success. Furthermore, due to the relatively few paid professionals in this field, lakeshore residents have the potential of providing an important service by monitoring the large zooplankton in their lake, bringing a possible problem to the attention of professionals before it harms either the water quality or fishing success of their particular lake.

Lake Grants from OWEB

The Oregon Watershed Enhancement Board met in Roseburg on March 16th to consider grant applications. They approved 118 projects for a total of 14 million dollars. The single largest grant was for 2 million dollars to restore 5600 acres in the Williamson River Delta by Upper Klamath Lake. The project will remove large levees along the east bank of the river and reconnect the delta with the lake as it was before the land was drained for farming. Short-nosed and Lost River suckers in the lake should benefit from this restored habitat. OWEB also approved a $100,000 grant to purchase rotenone for the scheduled poisoning of Diamond Lake this Fall.

OWEB meets in March and September each year to fund grant requests. Applications for the September meeting are due by April 26, 2006. While this date will soon be here, the next deadline of October 23rd will allow more time for preparation. See www.oweb.state.or.us for application requirements and guidelines.

LAKE WISE
The Oregon Lakes Association
Newsletter 2006 #1

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OLA Mission: The Oregon Lakes Association, a non-profit organization founded in 1988, promotes understanding, protection, and thoughtful management of lake and watershed ecosystems in Oregon. For additional information on OLA, write to the address above, or visit our website.

OLA welcomes submissions of material that furthers our goals of education and thoughtful lake management in Oregon, and is grateful for the corporate support that helps sustain the organization. Corporate members are offered a one-time opportunity to describe their product or service to Lake Wise readers. These descriptions are not endorsements, and opinions appearing in Lake Wise are not OLApolicy statements.

Visit our website: www.oregonlakes.org

SAVE THE DATE: September 13-15, 2006

Pacific Northwest Regional Conference:
"Research and Management Trends in the Pacific Northwest"

This year, the Oregon Lakes Association and the Washington State Lake Protection Association will be co-hosting their annual conference with support of the North American Lake Management Society. The benefit for holding a regional conference allows the opportunity to learn the concerns and challenges experienced by other Pacific Northwest states while forging connections among lake and resource managers, researchers, and citizens.

The Pacific Northwest Regional Conference will be held at Portland State University in Portland, Oregon on September 13th and 14th, 2006 with Friday the 15th being reserved for various field trips. Tentative session topics include: Pacific Northwest Lakes; Native & Non-native Macrophytes; Fisheries in Lakes; Lake Restorations/Lake Management Techniques; Public Education/Resident Involvement; Invasive Species/Endangered Species; and an Exhibitor Session - New Instrumentation, field applications and technical presentations.

A Call for Papers will be released soon. For more information before then, contact Mark Sytsma at (503) 725-3833; sytsmam@pdx.edu or Vanessa Howard at (503) 725-9706; vhoward@pdx.edu.