



# LAKE WISE

... a voice for quiet waters

NEWSLETTER FROM OREGON LAKES ASSOCIATION

MAY 2016

Laurie Carmichael, Newsletter Manager

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## Please Note:

**The 2016 OLA Scholarship application deadline has been extended to May 15. See application details at:**

**<http://www.oregonlakes.org/Scholarship>**

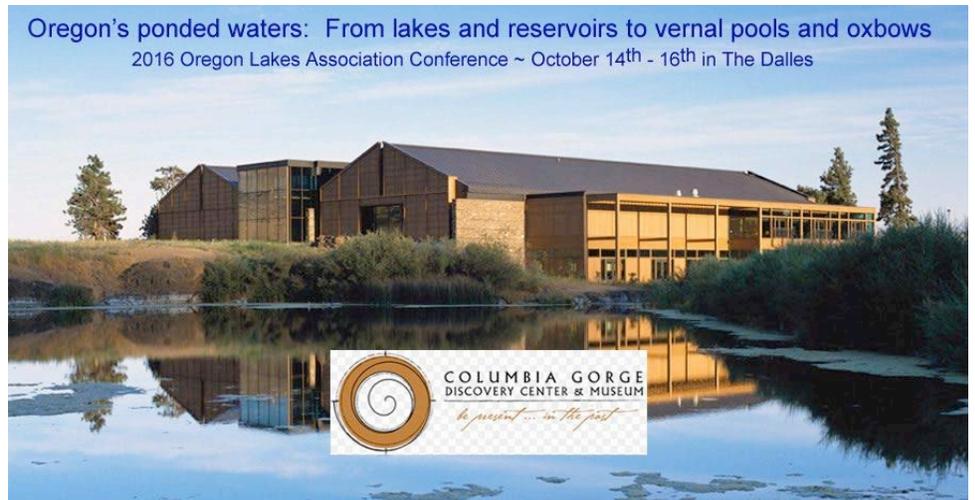
## 2016 OLA Annual Conference Contributed by Stephen Wille, OLA Board Member

Oregon Lakes Association [www.OregonLakes.org](http://www.OregonLakes.org) is planning their annual conference from October 14-16 at the Columbia Gorge Discovery Center and Museum (<https://www.gorgediscovery.org/>) in The Dalles, Oregon. The theme for this year is "Oregon's ponded waters: from lakes and reservoirs to vernal pools and oxbows." This year our primary objective is to gain and share a better understanding of impounded waters. Reservoirs and their hydrology are a dominant feature on the landscape in the Gorge, and what better spot to explore these dynamic systems than in The Dalles? Friday night we will sponsor an open public presentation by the Ice Age Flood Institute about the local impacts from the raging Missoula floods. Saturday features a full venue of talks, including a midday raffle and auction to support our scholarship program. For our always enjoyable Sunday field trip, we are going exploring in the Gorge with local guides; on tap are columnar basalt cliffs, scabland ponds, petroglyphs, and locally produced beverages.

Sponsorship opportunities available! See <http://www.oregonlakes.org/Sponsorship> to get a booth, registration fees for one attendee, and bonus advertising packages through our Lake Wise newsletter. If you have any questions please contact Rich Miller at [richm@pdx.edu](mailto:richm@pdx.edu) or (503) 725-9075.

**Cancellation Policy:** Registrations are refundable through October 1, 2016, minus a \$10 or 3% processing fee whichever is greater. Refunds will not be available after this date.

Oregon's ponded waters: From lakes and reservoirs to vernal pools and oxbows  
2016 Oregon Lakes Association Conference ~ October 14<sup>th</sup> - 16<sup>th</sup> in The Dalles



## Oregon Lakes in the News

Contributed by Paul Robertson, OLA Board President



A 19th-century utility wagon was found lying lakeside in the mud when the Detroit reservoir drained to 143 feet below capacity.  
(Photo: Courtesy of Dave Zahn)

### Wheeled relics uncovered from Old Detroit

According to the Statesman Journal, due to last year's record low levels in the reservoir, wheeled artifacts from Oregon's "Motor City" have been uncovered. As detailed and photographed by Dave Zahn, a utility wagon from the late 19th century lies at the bottom of Detroit Lake, visible only when the level drops nearly 150 below its capacity.

See this link for more information:

<http://www.statesmanjournal.com/story/news/2015/12/26/low-lake-levels-reveal-glimpse-old-detroit/77915596/>

### Salem to provide assistance for septic systems around lakes

With an unanimous vote in the Senate and only one vote in the House, Governor Kate Brown signed into law

Senate Bill 1563A. This bill directs Oregon DEQ to provide funds for establishing low-interest loan programs to fund rehabilitation of septic systems that pollute waters of the state, particularly some of our coastal lakes. See the links below for more details.

<http://gov.oregonlive.com/bill/2016/SB1563/>

<https://olis.leg.state.or.us/liz/2016R1/Downloads/MeasureDocument/SB1563/Enrolled/>

### Invasive species — no passing zone!

As the boating season gears up, Oregon Department of Fish and Wildlife will be stepping up its inspections of boats and trailers on I-5, as reported in the Mail Tribune. Fines up to \$287 await any boater launching a boat found to have vegetation on it. Watch the short informational video from Mark Freeman and also see the links below to learn more.

<http://www.mailtribune.com/news/20160229/mandatory-boat-inspections-resume-tuesday-on-i-5>

<https://twitter.com/MTwriterFreeman>



## Oregon's Lakes and Reservoirs Need Your Help

Contributed by Rich Miller, OLA Board Member

If you're reading this newsletter, chances are you're already a lake lover. Did you know that you could help our lakes by visiting your favorite lake and doing some easy citizen science? The Oregon Lake Watch program (OLW) is looking for volunteers to survey for aquatic invasive species (AIS) and monitor water quality in our lakes, ponds and reservoirs. The program is adminis-

tered by the Center for Lakes and Reservoirs at Portland State University and was started in 2013 to educate the public about threats of aquatic invasive species, provide early detection of aquatic invasive species, and provide long-term water quality data for better management of Oregon's lakes and reservoirs. Funding for the program has been provided by the Oregon State Marine Board,

the Oregon Department of Agriculture, the Oregon Department of Environmental Quality, and the Washington County Flyfishers. Forty volunteers have been trained and 31 waterbodies have been surveyed since 2013.

To become part of the program, volunteers attend a four-hour training session, adopt a lake, survey for AIS and water quality at least twice during the year, and enter their survey data on our online data entry portal. In return, volunteers are issued sampling equipment, learn valuable information about aquatic invasive species and water quality, spend quality time on their lake, and will have the satisfaction of knowing they are contributing to the better management of our water resources. Membership in the Oregon Lakes Association is included for active OLW volunteers.

This year, ten new volunteers were trained and 16 waterbodies were surveyed throughout the state. Volunteers found several aquatic invasive species including red swamp crayfish (*Procambarus clarkii*) in Cooper

Creek Reservoir, Chinese mystery snails (*Cipangopaludina chinensis*) in Northeast Salish Pond, Eurasian watermilfoil (*Myriophyllum spicatum*) in Suttle Lake, and yellow flag iris (*Iris pseudacorus*) in Clear Lake, Clatsop County. Although data has not been collected long enough to determine water quality trends, lake trophic status, as estimated from Secchi disk transparencies, ranged from ultra-oligotrophic to eutrophic. You can read more details about the surveys at: <http://www.pdx.edu/oregon-lake-watch/volunteer-monitoring-reports>.

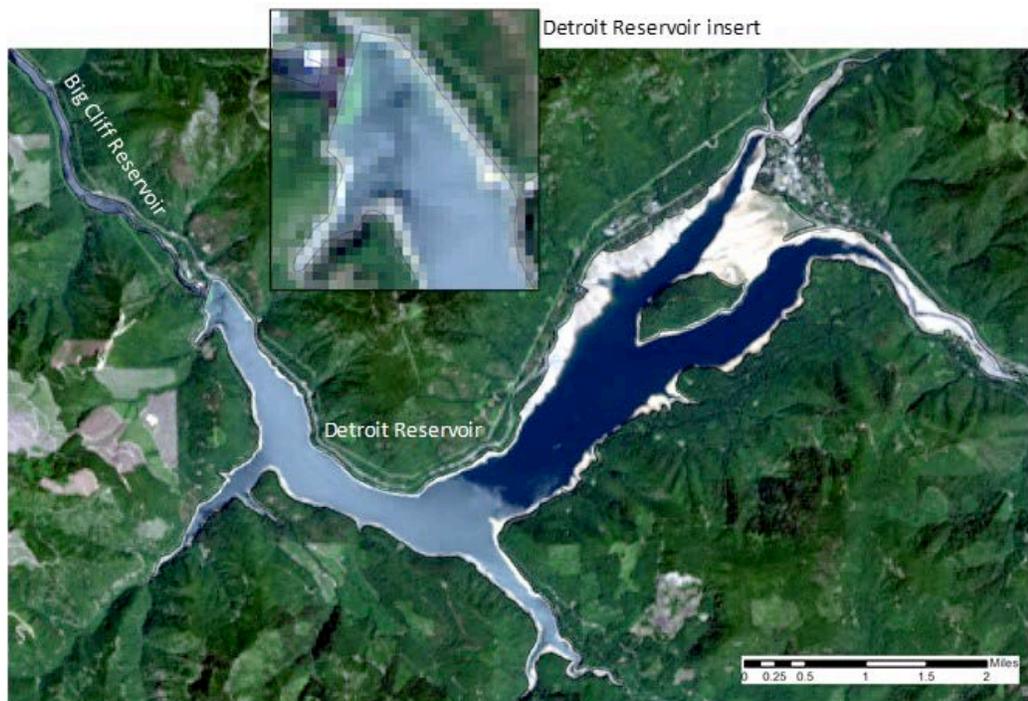
Five or six training sessions are planned for late May or June of 2016 in the in the Portland, Bend, southern Willamette, Rogue, mid-coast, and north-coast and eastern Oregon region. Visit our website at: <http://www.pdx.edu/oregon-lake-watch> to learn more about the program, sign up as a volunteer, and fill out a survey that will help us schedule the training sessions (<http://tinyurl.com/z2gny7q>).

## Using Satellite Imagery for Visual Evaluation of Lakes

Contributed by Dan Turner, US Army Corps of Engineers, Portland District, April 2016

Combining freely available satellite images with local knowledge can provide useful lake information in near real-time and for historic analysis. I have been impressed by the quality of images from the Landsat 8 satellite that was launched in 2013 (<http://landsat.usgs.gov/landsat8.php>).

Images of water still contain information despite the fact that the sensor is optimized for land. The resulting images are easier to interpret than previous Landsat missions because of increased radiometric resolution (i.e. the change in intensity level that can be detected). The Landsat 8 satellite revisits a specific location on a 16-day cycle. Clouds, haze and reflection of sunlight frequently degrade an image (**Figure 1**). In the Willamette Valley and Oregon Cascades, I process about 10 useable images per year. The satellite paths overlap to some extent, so some lucky locations are visited twice as often. Each pixel or cell of data is 30 x 30 meters. However, a large part of visual interpretation is contrasting



**Figure 1. Detroit and Big Cliff Reservoirs, Oregon on June 7, 2015.** The pale blue surface of the lakes is believed to be the result of sun glint caused by wind driven waves. The eastern portion is darker blue and is not impacted by sun glint. Prior to the fly-over, the wind was from the south-southeast at 2 mph, as measured near Detroit Dam. The inset box enlarges the area closest to Detroit dam and highlights approximately 10 pixels (9000 sq. meters) of bright green, possibly indicating algae accumulation.

intra-lake variability, so this method improves with lake size. For example, Detroit Reservoir is 3580 acres at full pool, Big Cliff Reservoir is 141 acres but typically only 100 meters wide, and the portion of Detroit Reservoir in the insert is 80 acres (see **Figure 1**).

For evaluation of Corps' reservoirs in Oregon, I developed a custom computer program that automatically downloads, processes and distributes images based on Landsat 7 and 8 data since 2014. I found that enhancing true color images using default parameters worked well except when clouds were present or the waterbody was surrounded by bright features like dry grass or bare soil. Differences and similarities between lakes in the same image can help with interpretation, so some non-Corps lakes have also been processed. Images of Corps lakes can be viewed here: [http://www.nwd-wc.usace.army.mil/nwp/wm/wq\\_reports.html](http://www.nwd-wc.usace.army.mil/nwp/wm/wq_reports.html). At present, non-cloudy images from all processed lakes are posted here: <https://picasaweb.google.com/110523923766670537986>. The images have been helpful for seeing spatial variation of algae blooms and suspended sediment within a lake, however it can be challenging to distinguish between the two (**Figure 2**). The most common frustration is the long period between useable images.

### Instructions:

#### I. Download the image.

- a) Go to: <http://libra.developmentseed.org/>
- b) Use the map to zoom in to the area of interest. Use the filters at the top left to limit your search to using time period, percent cloudiness or sun angle. Previews of the images that meet the requirements of your search appear to the right of the screen.
- c) Select the image you wish to download and click '**Download Bands**'.
- d) Click the box next to '**B2-Blue**', click '**Download Bands**' and save to your computer. Also download '**B3-Green**' and '**B4-Red**'. These are the three spectral bands needed to make a true color image. You should end up with three files with names like:

**LC80470282015229LGN00\_B2.TIF**. In this example, the filename refers to the satellite (LC8), the path and row (047 and 028), the year and day of year (2015 and 229) and band 2 (B2).



**Figure 2. Fern Ridge Reservoir, Oregon on Sept. 11, 2015. Areas of light brown are believed to be dominated by high-suspended solids, while green streaks are believed to be high algae concentrations.**

#### II. Combine the three bands into one color image.

- a) Using ESRI ArcMap (<http://desktop.arcgis.com/en/arcmap/>) (spatial analyst not required): Search for and open the "**Composite Bands (Data Management)**" tool.
- b) Click the file open symbol next to the '**Input Rasters**' box to add your three images. Add them in this order: **B4, B3, B2**.
- c) Click the file open symbol next to the '**Output Raster**' box to name your output file. I prefer to name the file with the extension '**.img**', to designate the ERDAS IMAGINE file format.
- d) Select **OK** and wait for the tool to run.
- e) ArcMap should open your new raster file and it should be in true color.
- f) For better enhancement over water, I right-click on the image name and select '**Properties**'. On the '**Symbology**' tab, under '**Statistics**', select '**From Current Display Extent**'. As you zoom into the image, the image will be enhanced and hopefully show resolution of darker features like water.

Unfortunately, I don't know of a similar, menu-driven method without using licensed software. More tips and directions for Photoshop can be found here:

<http://earthobservatory.nasa.gov/blogs/elegantfigures/2013/10/22/how-to-make-a-true-color-landsat-8-image/>

## Defining the Waters of Ross Island: Lake, Lagoon, Reservoir, or River?

Contributed by Stephen Wille, OLA Board Member

Here's something to think about. The Ross Island complex sits in a rather unique position on the Portland landscape, the most obvious being that Ross Island is really made up of four islands, known locally as "Ross Island", with Ross Island merely being the largest. The interest of OLA is represented by the lagoon in the middle of the island, an island with deep (130 feet) standing water in the middle of it that has a contemporary history of initiating harmful algal blooms. Or, is it a floodplain lake — with a hole in it — that leads into the Willamette River? Then again the lower Willamette River acts like

a reservoir, produced by a combination of Pacific Ocean tides and the Columbia River, giving us standing water twice a day around Ross Island. We define a reservoir as a combination of a lake and a river, with a dam. We can all agree the upstream end (Willamette Falls at Oregon City) has river-like qualities, whereas as the water moves closer to the dam (the confluence of the Willamette and Columbia Rivers) the current slows and the reservoir becomes more lake-like. So, what is it to be? However you define it, the waters of Ross Island deserve our consideration.

## Ross Island: What Next?

Contributed by Mike Houck, Director, Urban Greenspaces Institute

With the recent donation of 2.7 acres, nearly fifty acres of the Ross Island archipelago are now in public ownership, including all of Toe Island and a significant chunk of Ross Island where Bald Eagles and Great Blue Herons continue to nest. East Island and all of Hardtack Island remain in Ross Island Sand and Gravel (RIS&G) ownership.

When Dr. Robert Pamplin donated 45 acres of Ross Island to Portland Parks and Recreation he indicated the sand and gravel company had no intention of closing its processing plant on Hardtack Island anytime soon, if ever. The company ceased dredging operations over a decade ago when Chinook salmon and steelhead trout were listed under the Endangered Species Act and their window of operations narrowed to the extent it was no longer feasible to extract from the island and lagoon. They had already taken most of Ross Island and dredged to -130 feet of the lagoon from the previous -20 foot depth of the lagoon.

As noted in *Reimagining Ross Island*, the 1979 restoration plan was dramatically altered in 2002. These changes resulted in far less fill in the lagoon, allowing it to remain at 130 feet deep, and focused on shallow water and emergent wetland habitat in the southern end of the lagoon and on the riparian habitat on the berm connecting Ross and Hardtack Islands that was built by the Corps of Engineers in 1926. The *quid pro quo* for the modified restoration was that work would be completed by 2013, a deadline long past.

So, what are the outstanding issues for the four-island archipelago?

1. Despite guarantees that restoration would be completed by 2013, Oregon Department of State Lands indicates that so long as RIS&G refuses to purchase fill material, the restoration process could drag on for another twenty years, or longer.
2. The lagoon has become a source of annual blooms of blue-green algal growth (cyanobacteria), the most recent of which resulted in closing the Portland Harbor to water contact activities.
3. With the exception of the black cottonwood stand where Bald Eagles nest and the city-owned downstream portion, Ross Island has been dramatically reduced on the main channel to an 80-foot wide berm which appears to be eroding. There is great potential for breaching this "berm", which would seriously compromise future management of the island and lagoon.
4. Recent camping, fires, and other disturbances threaten the ecological integrity of the islands. Current public access needs to be addressed.

Is there a role for the Oregon Lakes Association? OLA states its mission is to "promote understanding, protection, and thoughtful management of lake and watershed ecosystems in Oregon." OLA also holds an annual conference, and sponsors Harmful Algal Bloom trainings.

While strictly speaking, issues related to Ross Island are not lake-oriented, I would argue that current conditions in the lake-like lagoon and the importance of Ross Island

to the downstream portion of the Willamette River watershed, make Ross Island a great candidate for OLA's attention, particularly addressing the cyanobacteria issue. Even more broadly, OLA could assist the potential future restoration efforts beyond Ross Island Sand and Gravel's regulatory obligations. I would like to invite OLA's involvement in helping address these issues as well as a possible symposium that might bring in other professional associations, government agencies,

nonprofits and the private sector to focus on one of the region's most iconic landscapes and ecologically significant natural resources.

Some figures from *Envisioning Ross Island* follow. To see a full pdf copy go to [www.urbangreenspaces.org](http://www.urbangreenspaces.org) and click on **Creating a Healthy Willamette River, Envisioning Ross Island**.

# ENVISIONING ROSS ISLAND

Ross, Hardtack, Toe, and East Island sit smack in the middle of the Willamette River, just one mile south of the city's downtown core. Although these islands, (which are colloquially known as Ross Island) once measured a mile and a half long by a quarter mile wide, over 75 years of sand and gravel mining have carved them into a freshwater lagoon encircled by a thin arc of upland forest. After a lifetime of resource extraction, Ross Island is an **ALTERED LANDSCAPE**. Rusted pilings, abandoned machines, and corroded barges are scattered everywhere, and piles of loose sand and rocks line the hulking skeleton of mining equipment. But despite the aggressive digging and the discarded parts, Ross Island teems with wildlife: great blue herons nest on the northern tip; beaver and river otter occupy the edges; deer and raccoons inhabit the upland territory; and juvenile salmon migrate through the eastern river channel. All told, these islands are a complex **CONTEMPORARY LANDSCAPE** where multiple histories, industrial activities, and wildlife habitats overlap and intertwine.

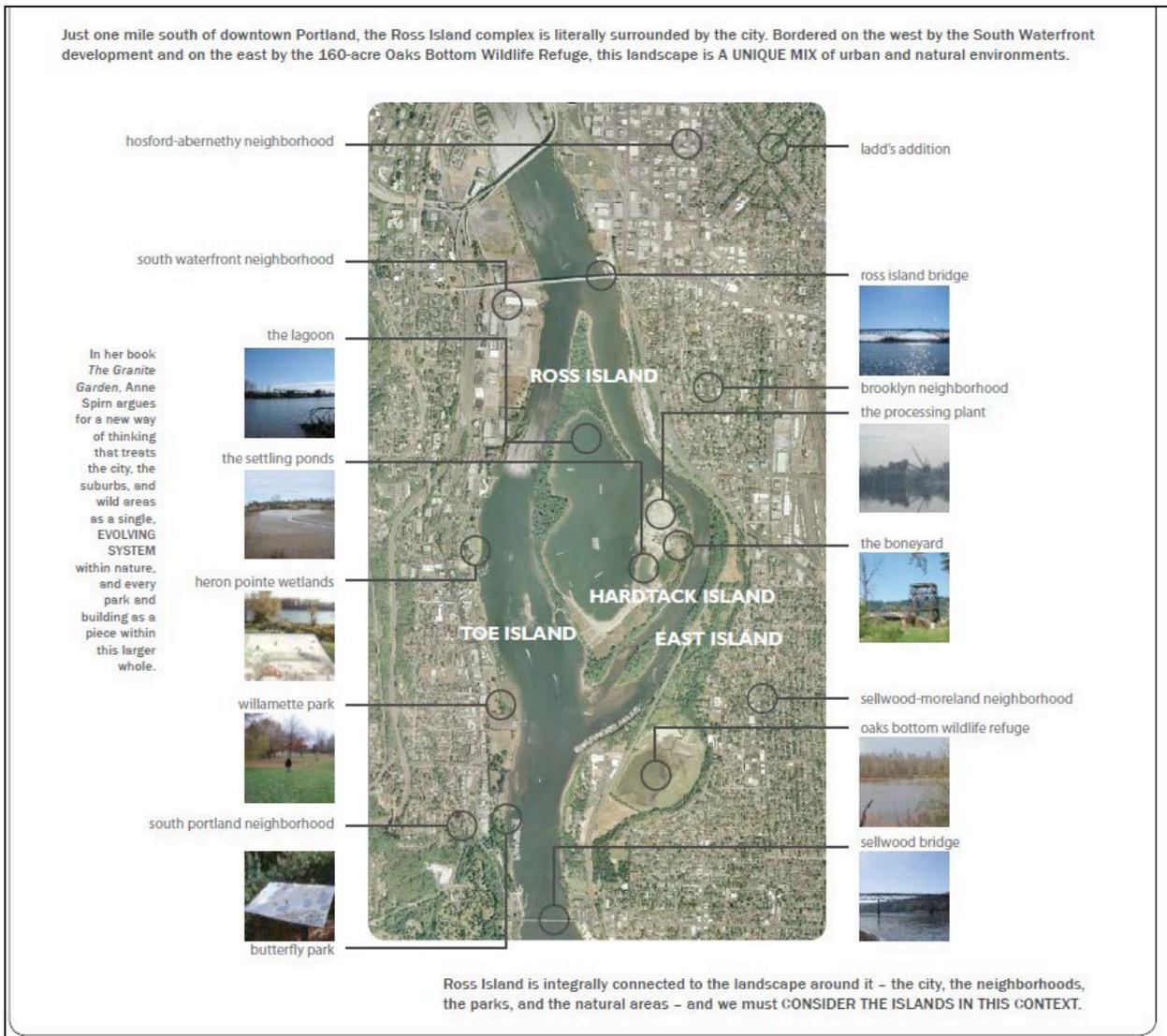
Ross Island's proximity to the heart of downtown makes it an even more compelling and important place. Although few Portlanders have actually set foot on it, the island is an **ICON** in our collective consciousness. Somehow we all care about it. Even those of us who don't know much about it, or who only see it for a fleeting moment from the highway, the bridge, or the trail. And though most of it is privately owned, we all sense that it is somehow ours – Portland's own wild island in the midst of its bustling metropolis.

These islands are simply too valuable as habitat to become a 'park' or recreation area, and are too filled with history and memory to become a typical urban wildlife refuge. With this abundant landscape, the question now becomes: **WHAT KIND OF PLACE CAN THIS BE?**

We are the Ross Island Vision Team – a self-appointed, ad hoc group who shares an enthusiasm for Ross Island – and this document offers our vision for its future. Though it is impossible to know the exact shape these islands will take, we hope this document will guide the types of futures that are possible here. Most importantly, we hope that our vision inspires others to see the deep potential in this incredible resource.

**NOW IS THE TIME FOR DREAMING BIG.**

Cover, *Envisioning Ross Island*. *Envisioning Ross Island* was initiated by discussions between Mike Houck and Christina Frank, a landscape architecture student at University of Washington. Her Master's Thesis on Ross Island proposed possible futures for the island. Houck and Frank were joined by her friend and colleague landscape designer, Melissa Maderios; Bob Sallinger, conservation director at Audubon Society of Portland; Travis Williams, director of Willamette Riverkeeper; and Mike Faha principle and landscape architect at GreenWorks, PC. The hope was, and continues to be, that *Envisioning Ross Island* will catalyze planning for the future of Ross Island and its sister islands, Toe, East and Hardtack.



**From *Envisioning Ross Island*: As with habitat connectivity, the future of Ross Island must be considered in the context of adjacent Holgate Channel, 160-acre Oaks Bottom Wildlife Refuge, and surrounding neighborhoods.**

**Please Note:**

**MEETING UPDATE:** Stephen Wille, OLA Past President, continues to meet with Mike Houck, and others, to develop plans and clarify OLA's role in an "Envisioning Ross Island" meeting this summer. A tentative target date of either July 19, 20 or 21, 2016 on the Portland State University campus has been selected. Associated with the meeting, a site visit for interested participants may be arranged. Field trip participants would be compiled from the invitation list of primary decision-makers attending the meeting. With algae bloom events being a major concern, OLA's role would include arranging a speaker to discuss the impacts of HAB's and how future blooms could be addressed.

## Harmful Algae Blooms (HABs) Corner

Contributed by Wayne Carmichael, OLA Board Member

Spring brings the beginning of HAB season here in the Pacific Northwest. This means monitoring programs get ramped up at water bodies around the region. In this HABs corner segment, I will list a couple manuals that are useful for monitoring our inland waters.

The USGS has published a useful **photo guide** to cyanobacteria harmful algae. Although the title indicates it was designed for Native Americans, it has a general usefulness to anyone working with cyanoHABs. It is titled: Rosen, B.H., and St. Amand, Ann, *Field and laboratory guide to freshwater cyanobacteria harmful algal blooms for Native American and Alaska Native Communities: U.S. Geological Survey Open-File Report 2015-1164*, 44 p. The manual guide can be accessed at: <http://pubs.er.usgs.gov/publication/ofr20151164>

A more extensive **E-book guide** is now available from <http://cedar.wvu.edu/cedarbooks/6/>. It is titled: *Freshwater Algae in Northwest Washington, Volume I. Cyanobacteria*. This E-book is an open source pdf file with active links between the keys, genus descriptions, and annotated images. (The active links work best when using Adobe Acrobat.) Using minimal technical terms, the keys and descriptions are accessible to students and "citizen scientists" who have no background in algal taxonomy. The guide contains >400 pages, with many high resolution, annotated images to help with identification.

Although this guide's focus is on the Northwest US, most of the local HAB species are common throughout the US. All of the images are open-source, so they may be used for non-commercial educational purposes. The guide was produced by:

Dr. Robin A. Matthews, Director  
Institute for Watershed Studies  
Huxley College of the Environment  
516 High Street  
Western Washington University  
Bellingham, WA 98225

The US EPA is continuing its inland HAB discussion group webinars and posts the proceedings at: <http://www2.epa.gov/nutrient-policy-data/inland-hab-discussion-group>

The most recent webinar was on March 10 and those proceedings can be found at: <https://www.epa.gov/nutrient-policy-data/webinar-march-10-2016>

**PUBLIC MEETING:** The EPA Office of Water is holding a public meeting

(<https://www.federalregister.gov/articles/2016/03/30/2016-07173/notice-of-a-public-meeting-and-webinar-managing-cyanotoxins-in-drinking-water>) for interested parties to provide input either in person or online via a webinar on lessons learned after the release of the June 2015 Recommendations for Public Water Systems to Manage Cyanotoxins in Drinking Water (<https://www.epa.gov/nutrient-policy-data/recommendations-public-water-systems-manage-cyanotoxins-drinking-water>). The agency plans to use this information to aid development of additional tools to support states and/or utilities in managing cyanotoxins in drinking water. The public meeting will be held on April 29, 2016, from 9:15 a.m. to 12:30 p.m. Central Standard Time at 77 West Jackson, Blvd, Chicago, Illinois, in the Lake Michigan conference room on the 12th floor. Persons wishing to attend the meeting in person or online via webinar must register no later than 5:00 p.m., Eastern Daylight Savings Time, on April 28, 2016.

The US EPA HABs website is at:

<https://www.epa.gov/nutrient-policy-data/cyanohabs>

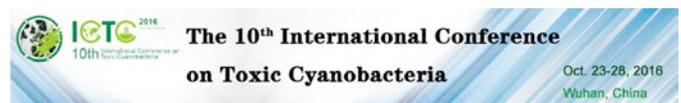
The latest CyanoHABs Newsletter can be found at:

<https://www.epa.gov/nutrient-policy-data/cyanohabs-newsletters-2016>

### HAB CONFERENCES 2016

The City of Akron and the Akron Global Water Alliance will host **The US Algal Toxin Conference 2016** on **May 9-11, 2016** at the University of Akron, Akron, Ohio. <http://www.agwaevent.net/#!register/sonxy>

**The 10<sup>th</sup> International Conference on Toxic Cyanobacteria (ICTC) will be held in Wuhan, China from October 23 to 28, 2016.** China's rapid development at the expense of air and water quality has led to the most severe cyanoHAB events in any part of the world. As a consequence, China now has more research and resources being expended to manage and mitigate cyanoHABs than any other country in the world. See: <http://www.ictc10.org/dct/page/1>



The **17<sup>th</sup> International Conference On Harmful Algae** will be held October 9-14, 2016 in Florianópolis, Santa Catarina State, Brazil. See: <http://www.icha2016.com/>



**Oregon Lake Watch Volunteer Marla Chaney about to measure Secchi transparency on a beautiful day at Pine Hollow Reservoir, Wasco County.**

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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 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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