Nature Trails

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Icemelt in Greenland. Photo courtesy ClimateState.

The Social Costs of Climate Disruption

Bob Doppelt

Executive Director of The Resource Innovation Group, and Adjunct Instructor in the Department of Planning, Public Policy and Management at the University of Oregon

Friday, 21 February 2014, 7:30pm, Room 100
Willamette Hall, UO Campus

Our speaker this month, Bob Doppelt, is well known in the local community, having been a regular contributor of thoughtful essays on climate change to the Eugene Register-Guard newspaper. Here is a biographical statement Doppelt provided: Bob Doppelt is Executive Director of The Resource Innovation Group (TRIG) an 18 year old non-partisan social science-based sustainability and global climate change education, research and technical assistance organization affiliated with the Center for Sustainable Communities at Willamette University, where he is also a Senior Fellow. In addition, Bob is an adjunct instructor in the Department of Planning, Public Policy and Management at the University of Oregon. He is trained as both a counseling psychologist and environmental scientist and throughout his career has combined the two to focus on how people and organizations can change their thinking and behaviors to sustain the environment. He is the author of three popular books on personal and social change for the environment: *From Me to We* (Greenleaf Publishing 2013), *The Power of Sustainable Thinking* (Earthscan Publishing, 2008) and *Leading Change toward Sustainability*(Greenleaf Publishing 2003).

Here is Doppelt's thumbnail sketch of what he will be talking about. "Climate disruption is the most serious problem facing humanity today. In response, scientists, governments, and activists have focused mostly on external changes such as emission reductions and preparing infrastructure and ecosystems to withstand the impacts of a changing climate. In contrast, little attention has been given to the internal human psychosocial reaction to the chronic stresses and acute traumas generated by climate change. Bob Doppelt will describe what the human reactions are likely to be and the Transformational Resilience program his organization has launched to address them." Please join us on Friday, 21 February at 7:30 pm in room 100 Willamette Hall to hear his presentation, "The Social Costs of Climate Disruption."

Razors By Tom A. Titus

In the new winter, Kim and I walked in darkness onto an open beach. A receding tide left the sand shiny and slick looking, and the rolling roar of surf seemed far away, white ghost breakers appearing briefly in the distance and occasionally sending sheets of foamy water spreading toward us across the glistening flat. A newborn crescent moon swung downward toward the horizon, a leftover holiday ornament hung in the southwestern sky so endless and clear and dark that a silhouette of the full-moon-to-be was visible. A gravitational pull emanated from this shadow child so imposing that even the vast Pacific Ocean, largest body of water on a planet composed mostly of water, contracted at its bidding. We turned on our headlamps, but the weak spheres of LED light became a limitation, a smallness imposed by humans on endlessly uncaring sky and water.

Yet the lights were necessary—we had timed this 200-mile drive to Gearhart, near the extreme northwestern corner of our geopolitical home, to intersect a strong minus tide, hoping to extract a few razor clams from that dark sand. Driving half that distance would have assured us a bucket of gapers and butter clams from a mudflat I know well. But for 10 years I'd been pining to go razor clamming since being thwarted by a series of toxic tides that were followed by less acceptable excuses like too far to drive and too much time out of an already too busy schedule. The noxious ocean that doused my first burn to dig razors was caused by blooms of a planktonic diatom in the genus *Pseudo-nitzschia* that possesses the peculiar biochemical gift of producing domoic acid. The tinker toy drawing of domoic acid looks harmless enough; and it is to the razor clams that bioaccumulate it by filter feeding. But in mammals domoic acid readily traverses cell membranes and does a lot of things that I don't wake up on a weekend morning wishing I had more time for: headache, dizziness, confusion, disorientation, loss of short-term memory, motor weakness, seizures, profuse respiratory secretions, cardiac arrhythmia, and coma. Give me a pile of dirty dishes or some vacuuming instead. Really.

Just after New Year's Day, I shed my excuses and gently cajoled Kim into a razor clamming road trip. Over the years, I've excavated hundreds of bay clams, which are literally stuck in the mud and don't dig while being dug, and I wanted to chase after a clam that could run from me. All right, so "running" might be overstating things. Razors can dig 12 inches per minute, and while this isn't exactly vanishing like a startled deer into the forest, their large muscular foot and thin oblong profile give them some vertical mobility when the sand around them is disturbed. My guess is that predator avoidance was not a driving force in the evolution of the razor clam's renowned digging ability. Rather, their morphology and behavior are beautiful adaptations to living on beaches of loose sand that are occasionally pounded

and eroded by the Pacific surf, providing these clams the option of retreat when life near the surface of the beach becomes too tough.

On this night *our* life on the beach was getting tougher. Ignoring the crescent moon and the bright pinholes of starlight, we focused on the pools of light at our feet. I made a preliminary stab or two at something that looked like a clammy dimple in the sand, a "show" indicating a subterranean siphon. Nothing. But there was no shortage of clams, only a shortage to us. We were on an 18-mile beach that produces over 90% of Oregon's annual razor clam harvest. An untouched population in the subtidal zone is always present to seed the beaches with new clams. Like other clams, razors are extremely good at making of themselves. After sexual maturity at 2 years, females can spew 6 to 10 *million* eggs into the surrounding water. Those that are fertilized become planktonic veliger larvae that in 5 to 16 weeks settle in the sand and in 1 or 2 years develop into adults. We needed a better excuse for our empty buckets than overharvesting by those who had come before us.

Lights approached us from the south. Soon a family of four materialized under the bright dabs of their headlamps. "Get your limit yet?" the pleasant woman joked. The limit is 15 clams, and we explained that the only limit we were approaching was measured in frustration. "You picked a tough night to learn." She explained that when the surf hits the beach hard the clams stay deep, invisible, and beyond the reach of even experienced diggers. Evolution has taught them well. She demonstrated how to hit the sand with our shovel handles, causing the siphon to retract and leave a telltale dimple in the gleaming wetness. So now we had driven 200 miles to walk a beach at night in winter while pounding the sand with our shovels and staring at our feet. Deranged? Yes, except that everyone else out here was doing it. A frothy sheet of water snuck in from behind, washing over my feet, and a tiny finger of freezing ocean slipped through a split in my left boot just over the first metatarsal, bathing my foot in icy water. Kim and I walked on, our enthusiasm waning. There was only small comfort in knowing that the clams thought it was a hard night to be out.

Kim was now so cold that her marrow was quivering, so I took her back to our room in Seaside. But my watch told me the tide had only just turned, and I drove beyond the motel to the end of the street, again leaving the warm car to traipse through a foredune lit by hotel floodlights, striding toward the glistening beach, the nearly invisible surf, the setting moon. There were a few clam diggers here as well. Crossing paths with a small woman and her even smaller son, we chatted about the clamming, and I admitted to being a neophyte. She had only two razor clams and was done for the evening. We parted ways and I continued my incessant tapping with the shovel handle under an increasingly dim headlamp, hoping for just one fleeting dimple in the sand from a retreating siphon. A few minutes later a light approached from behind, and the young boy was at my side.

"Do you want these two clams? My mom doesn't wanna clean 'em."

A small pause ensued while I wrestled my pride to the beach and suffocated it in the wet sand.

"I'd love to have your clams. Thank you. Very much."

They were delicious.

Rethinking Rivers by Reida Kimmel

Rivers may be our greatest natural resource, but we have done our best to pervert, maim and even bury them. Recently, however, there are hopeful signs that things are changing. The Colorado River Delta was once a huge wetland, home to 350 species of birds, and a vital rest area on the Pacific flyway, but for fifty years the river has rarely reached the sea. Its bed is dusty dry, while not far from its former banks are fields green with irrigated crops. Now, in spite of the dams, the Colorado may flow to the sea again. The United States and Mexico have agreed to release 105,000 acre-feet of water into the lower river. Along the last ninety miles of the Colorado, environmental groups are removing stands of invasive tamarisk and planting native willows in the hope that the water will come.

Alaska's Bristol Bay, fed by countless creeks and rivers, is still a paradise of clean water, unbelievably rich with spawning salmon and the predators they attract, from bears and eagles to the smaller creatures that feed on the remains of the feast. In the cold north, the salmon are the chief contributors of nutrients to the whole forest system. The huge importance of salmon, not just as food for us, was not realized until a few decades ago. Now, many studies explore the complex details of Alaska's rich coastal forest ecosystem. How can it be, then, that anyone could consider mining for copper and gold, always lethal polluters, in the Bristol Bay watershed? British mining company Anglo American and Canada's Northern Dynasty did just that, offering jobs and development, never mind the threat to Alaska's 1.5 billion dollar fishing industry. But for now Bristol

Bay is safe. Anglo American has withdrawn after a U.S. EPA study showed that the mine would destroy a hundred miles of salmon streams and thousands of acres of wetlands. An initiative to protect the bay, "Bristol Bay Forever" is on the 2014 Alaskan ballot.

When Europeans first came to our Atlantic Coast in the seventeenth century, they marveled at its towering forests and rivers full of many species of delicious fish. Then the settlers built dams to power their lumber and textile mills and discharged the effluent and all their other wastes into the rivers. The rivers died and remained dead until recent decades. Here in the West, the settlers and the dams came later, but the dams were mightier and controlled the rivers even more fiercely. Jeff Crane's book, *Finding the River, an Environmental History of the Elwa*, OSU Press, 2011, begins with a beautifully told natural history of this short river flowing down from the Olympic Range into the Strait of Juan de Fuca. He discusses the ecology of the six species of salmon that returned from the sea to breed in the river each year, and of the forest life they supported. The Lower Klallam Indians lived in balance with the fish and the river, enjoying a rich diet and a surplus of many things, food items and crafted goods that they traded widely. They were especially famous for their dried clams. In the second half of the nineteenth century the Klallam were decimated by disease, demoralized, and pushed out of the best parts of their lands. The Klallam hung on near the river's mouth, but then came the worst blow to their civilization, the damming of the Elwa. Two dams, the Elwa and Gilnes Canyon Dam upstream, completed in 1914 and 1927, were erected to provide power for the city of Port Angeles, and of course, to make a profit for the owners. The Elwa Dam was built without fish ladders, which even then was illegal, and not surprisingly the magnificent runs of salmon and the fishery they supported quickly came to an end. Though some chum salmon persisted in breeding below the Elwa dam, no cohos, Chinooks, pinks, sockeyes or steelhead returned. An effort to replace the fishery with hatchery fish came to naught, and because there was no flow of sediment to renew the river's delta, the beach retreated and the clams disappeared.

There were always people who opposed the Elwa's dams and especially after the Bonneville Dam was built and the BPA supplied Port Angeles' power, the dams on the Elwa seemed unnecessary. In 1992 Congress passed legislation to remove the dams, but not until 2012 did they finally fall. This was the largest dam removal in our history, and within a year salmon and steelhead returned, moving way up the river to breed. Gravel deposits carried by the now free-flowing river are providing good conditions for spawning where once there was only scoured bedrock. The beaches at the river's mouth are growing.

The movement to remove dams has fervent supporters all over America. Think of our own efforts to remove dams on the Klamath, and the successful destruction of the Savage Rapids and Dell Ray Dams on the Rogue, where, only two years later, large numbers of Chinook salmon returned to breed. In Maine, thanks to decades of work cleaning up the Kennebec River, and the removal of the dam at Augusta, sturgeon, shad, herring, alewives and striped bass are once again abundant in the river. Perhaps one day there will be Atlantic salmon as well.

But what if a dam cannot be removed? If the power or flood control it provides seems vital? Or if there is no political will for removal? If a dammed river could be made more hospitable to salmon, if the numbers of fish returning and spawning could vastly increase, then these key species would, in at least a limited way, be providing vital benefits to the forest ecosystem. In 2010, '11, and '12, at Fall Creek Dam on the main stem Willamette, the water was drawn down above the dam to the level of the original streambed for three-day periods during the winters. This enabled juvenile fish, naturally bred in Fall Creek, more easily to find their way to the dam and through its wide-open outlet. Fall Creek is the biggest contributor to the spring run population of Chinook salmon in the Middle Fork Willamette. In the years before these letdowns only 90 to 500 baby Chinook passed down from the reservoir into the river annually. The count of juveniles passing out of the reservoir during the drawdown in 2010 was in excess of 20,000. The fish take only a matter of days to reach Willamette Falls, and because they move out of the reservoir so quickly they are much less impacted by injury or predation. Similar drawdowns happened at Cougar Reservoir in 2012. In 2006 the courts demanded that the dams on the Columbia direct more water over the spillways and less into the turbines. This is hardly a drawdown returning the river to its original configuration, but it must have sent many more juveniles down the river instead of into the turbines. On 24 September 2013 the number of spawning Chinook passing the Bonneville Dam exceeded one million for the first time since 1938. Yes, there is still hope for our nation's rivers. The science and the creative approaches to dams and wild fish are exciting, and very worth our involvement both locally and on the national level.

Out and About

"Out & about" is a periodical encouragement to Eugene Natural History Society members to get out and experience our magnificent Oregon. Photos and descriptions provided by David Stone.

Celebrate the 50th Anniversary of the Wilderness Act

In 1964, President Johnson signed the Wilderness Act, protecting over 9 million acres across the nation, areas described in the Act as "*. . . area[s] where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain.*"

In Oregon, it gave the original protection to such areas as the Three Sisters Wilderness, Diamond Peak and the Eagle Cap Wilderness for a total of 663,000 acres in the state.

Less well known is the Oregon Islands Wilderness Area, composed of all those rocks jutting out of the Pacific Ocean along the coast of Oregon, such as this one seen from the Yaquina Head lighthouse.

These brown pelicans and other seabirds are the reason these islands are protected. Celebrate this 50th anniversary of the Wilderness Act with a visit to the Yaquina Head Outstanding Natural Area, just north of Newport.

For more information, go to: http://www.fws.gov/oregoncoast/images/maps/ORG_public_111607.pdf

Congratulations to Oregon Institute of Marine Biology

Many members of the Eugene Natural History Society feel a connection with OIMB, having either worked at, visited, or retreated to the Institute's marvelous facility. In just the past few years OIMB has twice been the destination of our annual spring fling. OIMB's Director, Professor Craig Young, gave us a marvelous presentation on his own research in October 2012, and we have been privileged to have two other members of OIMB's faculty as speakers within the past few years: Drs. Nora Terwilliger in November, 2009 and Jan Hodder in December, 2011.

So it is with more than a little pride and happiness that we congratulate the Institute on their recent good news. Here is what Craig Young told his fellow OIMBers in an announcement made on 9 December 2013:

Dear all,

Good news! We just heard this morning that Pacific Power will fund a 10kW wind turbine for the OIMB campus through their Blue Sky initiatives program. The grant proposal, written in collaboration with Steve Mital at the UO Office of Sustainability and with help from colleagues in the Physics department, Campus Operations, and the School of Architecture, provides $86,000 that will be supplemented by $31,000 that we acquired earlier from the Oregon Department of Environmental Quality for green energy installations at the Charleston Marine Life Center.

The exact turbine to be installed and the exact siting of the installation will soon be determined. Many factors, including sound and potential interference with sea birds will be taken into account. Notably, the Charleston Marine Life Center will [be] the very first building at the University of Oregon to provide all of its own power for operation. We will also have the first wind energy generation at the University, and the very first wind turbine anywhere in Coos County. Our goal is to have a public ribbon-cutting ceremony for the new installation on Earth Day, 2014.

We are also partnering with the Jordan Schnitzer Museum of Art on the UO campus to leverage the purchase of LED lighting for both museums. Campus operations has generously provided our portion of the contribution for the LED bulbs (about $5,000), so all of the lighting in the new center will be high-end, energy efficient LED lighting. The new center will be an excellent opportunity to educate the public about the value of energy efficiency, sustainable power, and the reduction of carbon emissions.

Finally, we learned last week that we will be funded by the Three Rivers Foundation (community money from the Coos, Lower Umpqua and Siuslaw Indians) for displays that incorporate native American themes into the biological displays throughout the Marine Life Center. We are working closely with anthropologists from the tribes and with archaeologists at the Museum of Natural and Cultural History in Eugene to highlight information about early fisheries, early interactions with sea otters and whales, etc. The grant includes funds for purchasing ancient fishing gear replicas hand-crafted by local native American artisans.

Once again, we welcome volunteers from among our faculty and students who would like to work on the development of content for the museum and aquarium displays.

Craig

The ENHS Board is on the lookout for new members. We meet monthly during the academic year. We are an amicable lot, and manage to enjoy ourselves while meeting the needs of our membership. If you enjoy the Society and would like to get more involved, talk to any board member.

Events of Interest in the Community

Lane County Audubon Society

You can access the current issue of *The Quail*, LCAS's excellent newsletter, from their website: http://www.laneaudubon.org/. A summary of their upcoming monthly meeting can be found there, as well as many other interesting avian tidbits. **See the February issue of *The Quail* for a summary of the recent Lane County Christmas Bird Count.**

Saturday, 15 February, 8 am-noon. Third Saturday Bird Walk. Meet at 8 am at the South Eugene High School parking lot (corner of 19th and Patterson), rain or shine, for car-pooling. Plan to return by noon. Our destination is still to be determined. If a location is identified before the 15th we will post it on the LCAS Facebook page and on the LCAS website for those who wish to go directly to the site. All levels of birders are welcome. A $3 donation is appreciated to help support LCAS activities.
Tuesday, 25 February, 7:30 pm. Birds as Villains? Dan Gleason will talk about the villainous side of birds providing an opportunity to consider birds from a different perspective and learn about who they really are. 1645 High St., Eugene.

Mt. Pisgah Arboretum

Saturday, 15 February, 10 am-noon. Lichens Walk. Join Botanist Daphne Stone on an easy stroll through the Arboretum exploring lichens, their habitats, and ecology. Learn a few names and enjoy the moist winter air that makes the Pacific Northwest such a great place for lichens to grow. This walk is appropriate for both children and adults. $5, members free. Meet at the Arboretum Visitor Center.
Sunday, 16 February, 8:30-11 am. Winter Birds of Mount Pisgah Arboretum. Join Nature Guides Julia Siporin and Chris Roth for a bird walk intended for people with all levels of birding experience,. We'll use multiple clues to identify our winter and year-round residents. Come discover or rediscover the Arboretum's avian diversity—rain or shine. Bring binoculars.

Friends of Buford Park and Mt. Pisgah

Saturday, 1 March, 1-4 pm. Breaking Trails: the Art and Science of Building Trails. Join Jim Nelson, former USFS hydrologist and chair of FBP's trail committee, on a tour to explore the art and science of trail construction. You might even be tempted to pick up a shovel or swing a pick ax! Even if you're not interested in volunteering, just come and take a walk with us on newly re-routed Trails 3 and 4 up and around Swing Hill. Go to http://www.bufordpark.org/tours/ to register.

Nearby Nature Go to http://www.nearbynature.org/events for information on these activities, or call 541-687-9699.
Sunday, 16 February, 1-4 pm. Restoration Celebration. Alton Baker Park.
Monday, 17 February, 8:30 am-3 pm. No School Day Adventure: Earth Art. Alton Baker Park.
Saturday, 1 March, 6:30-8:30 pm. Treefrog Tunes Naturequest. Amazon Park.
Wednesday, 12 March, 6:30-7:45 pm. Spring Volunteer Orientation. Eugene Public Library.

Native Plant Society of Oregon, Emerald Chapter

Thursday, 20 February, 7:30 pm. The Sex Life of the Bigleaf Maple and Other Plant Breeding Systems. David Wagner talks about how Bigleaf Maple seems to have perfected the ideal breeding system for maximizing outcrossing (to avoid inbreeding) while hedging bets for adequate seed production. Location: Conference Room at Lane County Mental Health. For more information, call 541-349-9999.

North American Butterfly Association, Eugene–Springfield Chapter

No meeting in February. Next meeting will be in March.

The University of Oregon's Museum of Natural and Cultural History

Exhibit Hours: Tuesday through Sunday, 11:00 am - 5:00 pm

Friday, 21 February, 5:30-6:30 pm. Wolves in Oregon – History, Ecology, Conservation, Coexistence. For the second in its 2014 series of Darwin Days Lectures, the Museum of Natural and Cultural History welcomes **Cristina Eisenberg** of the College of Forestry at Oregon State University. Explore the evolution and history of the wolf in Oregon. Dr. Eisenberg will discuss the wolf's recent return to Oregon and the ecological benefits and social challenges that come with conservation efforts and wolf/human coexistence. The lecture is free and open to the public. 110 Knight Law Center, 1515 Agate St., Eugene.

Current Exhibits

- Cruisin' the fossil freeway with artist Ray Troll and paleontologist Kirk Johnson.
- Site Seeing: Snapshots of Historical Archaeology in Oregon.
- Oregon - Where Past is Present. 15,000 years of Northwest cultural history and 200 million years of geology.
- Tradition Keepers: Cornhusk Weavings by Kelly Palmer and Joy Ramirez.
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WREN

Tuesday, 18 February, 3:30-5:30 pm. Volunteer Meet & Greet. Red House. 751 S. Danebo Ave. Go to http://www.wewetlands.org/ to register and for more information. You could make a difference.

We welcome new members! To join ENHS, fill out the form below. Membership payments allow us to give modest honoraria to our speakers, as well as to pay for the publication and mailing of *Nature Trails*. Our web address: http://biology.uoregon.edu/enhs

MEMBERSHIP FORM

Name_____

Address_____

City_____State & Zip_____ Phone_____

E-mail (if you want to receive announcements)_____

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Annual dues for renewing members are payable in September. Memberships run from September to September. Generosity is encouraged and

The following information is voluntary, but appreciated:

Would you like to: __lead field trips __teach informal classes __work on committees __

What would you like to hear a talk on? _____

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ENHS Schedule of Speakers and Topics for 2013

21 Feb. 2014 – Bob Doppelt – The Social Costs of Climate Disruption
21 Mar. 2014 – Robert Fleming **–** From the Impenetrable Forest to the Namib Desert: Biodiversity in sub-Saharan Africa
18 Apr. 2014 – Richard Pugh – Meteorites: Rock From The Sky
16 May 2014 – Robin Hartman – Energy from Waves: A Consideration of the Issues