Nature Trails

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Photo by Paul Cziko

Opening a "Window" Into Antarctica's Frozen Ocean

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Friday, 21 February 2020, 7:30 p.m.
Room 100 Willamette Hall, UO Campus

We all have a special place: maybe where we grew up, or where we went to school, or had a wonderful vacation, or an unforgettable adventure. For Paul Cziko, although he's a Midwesterner by birth, growing up in Urbana, Illinois, that special place almost certainly is not where he grew up, but Antarctica. More specifically, under the sea ice in the coldest liquid seawater on the planet. Cziko's favorite place is where he does much of his work; he is one of the lucky few who can say such a thing.

Cziko's attachment to our southernmost continent began during his undergraduate years at the University of Illinois. His first academic interest was architecture, but then he took a biology class from Art DeVries, whose Antarctic experience had begun decades before Cziko was born. The young Cziko was enthralled by what DeVries told the class about his adventures, and his discovery of how fishes survive in those waters, the temperature of which is always below the freezing point of fresh water. After one class Cziko approached his teacher and told him if DeVries needed someone there on his next trip Cziko would volunteer. DeVries said, "Right. How about this fall?"

So Cziko took that fall term off and went to Antarctica for six months. The experience was overwhelming but he loved it. In this, his first exposure to fieldwork, he began to learn how to deal with the unforeseen problems that are inevitable in any kind of field research: quirky equipment in need of speedy repair, inclement weather, and, you might think, cold. He found, though, that the constant cold didn't bother him as long as he was prepared. During this first stay Cziko did not get into the water—two divers took care of that aspect of the research program. His own project involved extracting blood from a species of Antarctic dragonfish, caught by the divers. He didn't get to dive, but he wanted to.

Back at the University of Illinois he finished his degree, graduating with B.S. degrees in biology and biochemistry in 2004. He was fortunate during his undergraduate tenure to be in an honors program, with the small classes and individual attention that such programs provide. He graduated with Biology Honors with Highest Distinction—and immediately left for another stint at McMurdo Station in Antarctica.

While finishing his degree he had taken the opportunity to become a certified SCUBA diver, so during that second trip he had his first experience diving in Antarctica. He described it as "harrowing and scary, but wonderful." And wouldn't you know it, during that expedition, quite close to the Station, Cziko discovered a new fish species!

When that trip was finished Cziko went back to the University of Illinois and worked as a lab tech for 18 months, did some traveling, and then began graduate study at the University of Oregon in 2008. His Ph.D. research was a lab project, on the evolution of steroid receptor proteins. He said it was interesting but it wasn't Antarctica, so he took time off in 2008, 2011 and 2012 to do further work in Antarctica, at McMurdo and Palmer Stations. Each of these breaks lasted about three months.

After finishing his Ph.D., in 2014, Cziko began an effort to become his own boss doing research in Antarctica. His experience as a SCUBA diver in the frigid Antarctic waters had convinced him that new knowledge was there, waiting to be observed. As part of a proposal to the National Science Foundation to study the risks to Antarctic fishes that live in subfreezing seawater he included also "a first-of-its-kind live-streaming science and outreach platform positioned 70 feet below the solid sea ice in the world's southernmost accessible marine environment." He called it the McMurdo Oceanographic Observatory (MOO). NSF funded the proposal, but the timing put Cziko and his staff under a severe time constraint for the construction phase. He had less than three months after getting final word that the proposal was funded prior to needing to be in Antarctica to install MOO—the most complex diver-supported project in McMurdo Sound so far. That was a *very* short timeline for doing the engineering, ordering parts, assembly, shipping, hiring a team of people including divers, getting everyone medically qualified to go to Antarctica, getting approval for integrating into the Station's network, and then actually getting there and doing the work. Cziko said, "And then there were all the hurdles once we got to the ice, where site conditions weren't what we were planning on and we had to account for all the things that could go wrong. My programmer wrote about a year's worth of code in only a month—in Antarctica. Definitely a stressful time with lots of improvisation, but we made it and it ended up working great."

Cziko is now a research faculty member in the University of Oregon's Institute of Ecology and Evolution. He describes himself as an evolutionary biologist, physiologist, tinkerer, and Antarctic SCUBA diver. He has completed eight seasons in Antarctica and 180 dives under the ice in support of Antarctic research projects. He will tell us how—with this technology along with field and laboratory experiments— he works to better understand the

challenges of and solutions to organismal freezing risk in Polar fishes and invertebrates. Expect also some digressions into new findings on the vocal capabilities of Weddell seals, the discovery of a new sub-ice "seamount" in McMurdo Sound, Antarctica, and the special challenges of working on—and under—the 8- to 20-feet thick sea ice. His talk will be augmented with photos, video, and audio recorded under the sea ice of Antarctica. Please join us at 7:30 p.m. on Friday, 21 February, in room 100 Willamette Hall on the U of O campus to hear **Opening a "Window" Into Antarctica's Frozen Ocean**. There might be a cookie or two in the offing. John Carter

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Winter Reflections by Tom A. Titus

Newborn crescent moon arced toward the orange horizon, earliest sunset in this season of early sunsets. By morning, clouds the color and texture of untrowelled concrete were poured between flanking foothills. A charcoal skein of Canada Geese quivered eastward across Etch A Sketch gray. For some goosely reason, they wavered, broke ranks. I understand. Here at the somber end of a year when our spring is drying and trees are dying and democracy seems as shallow as a Russian Facebook feed or a Big Oil lobbyist, here in this season of darkness just before Light returns, my Etch A Sketch knobs are twirling. The geese restored their wandering line. The verdict is out on humanity. I went to work anyway.

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The gentling sounds of New Year's Eve morning swirl inside the cabin in the Coast Range. Woodstove whispers and creaks. Fly snaps out of torpor, buzzes in rare winter warmth. Beyond thin windows, Steller's Jay squawks from conifers straining upward through the foggy mystery of morning.

In our manufactured world, quiet is rare in any form. Holiday noise is especially incessant: cars, trains, planes, phones, people talking yelling singing snoring, parties, shopping, resolutions, televisions blooming with Rose Bowl, Orange Bowl, Participation Ribbon Bowl.

Wise Teachers have for ages told us that quiet is an internal state, portable into all external circumstances. I'm not that highly evolved. Noise is an addiction that stretches the skin of my soul to the point that I am in danger of disappearing with a *BANG* or a slow withering leak. From somewhere beyond conscious recognition I find myself thirsty for a long cool drink of quiet. Occasionally an intervention becomes necessary. I send myself to the hills.

In this place, quiet is more than silence, more than not-sound. Quiet is a liquid. I can drink it, bathe in it. Quiet is a gas I draw into the wet recesses of my lungs. Quiet is stillness, an absence of busy-ness, space between noise, pause between heartbeats, blackness between stars, the exuberant rotting of winter leaves. If I were a torrent salamander with skin and gills constantly bathed and breathing in a cool pool of quiet, would quiet even have a name?

Here I can stretch my arms, gather in the quiet. I'm grateful for fly buzz and jay squawk, the pause before another life-giving inhalation.

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Five a.m. and I am thirsty for the music of rain. My house is tight, with a heavily insulated ceiling and high-R windows. But I barely hear the rain. I pull on a puffy jacket and warm hat, slip out the back door into damp darkness, and settle into a cold metal lawn chair under the awning.

The rain is steadying but not steady. Beneath the driving downpour lives a subtle undercurrent, a gentle undulation that feels like my wet breathing, inhalation less intense, exhalation slightly more forceful. Unimpeded drips form a round rattle on the polycarbonate roof, interspersed with deeper more resonant drops that fall from bare branches of the cherry tree reaching into the darkness, stretching toward spring.

I miss the ticks and plops of forest rain. But this morning I'm grateful to be dry, relieved that eventually I can rise from this metallic chill seeping into my backside, slide back inside the warm womb of my house, the soft nest of my easy chair by the woodstove.

The physicality of falling rain seems a little miraculous. Individual water molecules are slightly unbalanced by shared quantum forces of the two hydrogen atoms and an oxygen atom. Each hydrogen is a little positive, the oxygen a little negative. Opposites attract. Molecules become gregarious because hydrogens of one molecule are drawn to the oxygen of another. But heat makes them brave and they separate, rising like tiny angels into the atmosphere.

Eventually cooler air causes them to huddle in droplets too large to remain airborne. They become fallen angels that sing to me from my patio roof. These once-heavenly hosts stream together into drainpipes into gutters into Amazon Creek into Willamette and Columbia Rivers into Pacific Ocean.

Rise and fall of tides. Rise of vapor and fall of drumming rain. Rise and fall of my chest, of words on a dark morning.

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Coastal mountains stretch along the western edge of North America like an undulating salamander, green and moist and cool. Perch somewhere along her spine. Make yourself small and unnoticeable. Become dark and still on a winter evening when night seeps in like cold spring water. You feel the rise and fall of her breathing, slow and intermittent, barely perceptible, as though breathing were optional, and she could inhale the universe through conifer skin covering the ridges of her ribs and vertebrae.

After you become tiny and alone, let your eyes close in the easy darkness. Notice that each subtle breath of these mountains is really a summation of many small breaths: inhalations of moss, sword fern, salal; becoming larger: vine maple, yew, cascara; becoming still larger: western hemlock, Douglas-fir, red cedar. There are exhalations of elk, bear, deer; becoming smaller: mountain beaver, rough-skinned newt, Pacific Wren; becoming still smaller: centipede, millipede, longhorn beetle; becoming microscopic: protozoa and bacteria more numerous than stars in the universe stretching infinitely away above black ridges.

You are very small. Perhaps you are discomfited by your inconsequential existence. You might pretend to be large. This is of no real help. The vastness of these heaving mountains, the sheer weight of their being and all the beings that reside within them is overwhelming. You might try to disappear. This is of no help either. Cold air on your cheeks, the smell of winter leaf rot, twitter of a Screech Owl from the valley bottom, or maybe the cold seep of pain from an arthritic joint are reminders of your one-and-only existence.

Recognize that you squirm for a reason. It is the illusion of your separate life. There is only one remedy for your insignificance. Take a breath. Inhale the swirl of oxygen gifted by slowly breathing conifers. Feel each molecule cling to the iron redness of your blood. Let your steamy exhalation join the vapor emanating from wet nostrils of the pregnant doe bedded at the base of a rotting stump. This collective outward rush forms a vast pool of carbon dioxide, a reciprocal offering to the trees.

Then do one more thing. Open your skin to the universe. You will expand to the measure of your awareness.

[Excerpts from Tom's latest book, *Palindrome: Grateful Reflections From the Home Ground*, https://tomtitus.com/books/]

Lessons of Compost by Evelyn Hess

Built, maintained and used by my parents, the enormous, shaggy compost pile of my childhood held me in its thrall.

My dad was a lawyer, but in the hours before he was due at the office, his hands were in the soil of our green Pacific Northwest acre, or they were pushing the lawnmower, or, with bucket at the ready, clipping spent flowers from his roses. Except in winter's short days, after a Superman-worthy change from suit and shiny shoes to jeans and work boots, he'd be out the door and into the garden minutes from returning home.

When Mother wasn't in the garden, she was thinking about it. Between canning and baking, washing and ironing, she was weeding, planting seeds, arranging flowers and dreaming of new combinations. Her primary social life included the garden club and rose society, both of which culminated in entries in rose shows and the Southwest Washington Fair.

All of that clipping and mowing, pruning and canning, weeding and peeling, arranging and entering produced volumes of compost. We kids were proud (or indoctrinated) members of the Clean Plate Club, so no contents of unfinished plates went to that imposing heap, and in those careful depression and war years, the compost claimed no spoiled garden produce. But it didn't suffer from the lack.

Before I was old enough to do my own gardening, my favorite things were swinging, wondering, and tagging behind my parents, asking questions. A major source of wonder and questions was that heap where my parents contributed the organic residue from their preserving and tidying activities.

In my earliest memories, I think of our compost pile as being a mini mountain. Sky high. But as I was probably all of two or three feet high myself, my memory should likely be downsized accordingly. Sometimes I'd see steam curling from its top. I'd watch, wondering if flames would leap out, but they never did. When Daddy turned the pile, beetles would scurry, worms writhe, centipedes wriggle fast away. They all fascinated me. One particular day is seared in my memory: Daddy stood in the pile, forking the deep middle, when his fork plunged clean through a humungous wasp nest. The demons swarmed their attacker, flying up his pant legs and

plastering his upper body. My dad didn't yell. I doubt he even swore, with me in hearing range. (I was probably in my twenties before I was aware he even knew such words.) Inexplicably, my memory is one of awe, not of fear. The event only added to my captivation.

Part of what attracted me to compost piles was the mere fact that creatures lived there, but the real magic for me was in the transformation. My parents dumped on leaves, weeds, lawn clippings, potato peels, but far beneath those recognizable layers was dark, soft, fluffy soil. How did it get there? I couldn't begin to understand, but I accepted it, as I did the magic of dough turning into bread or flour sacks becoming dresses. Grown ups knew all sorts of magic. Then when my parents spread that lovely dark brown soil on the garden, I thought of it like the frosting on a cake. It sure made the beds pretty.

Eventually I learned that adding compost was not just for beauty. Rather it was to add more life to an already living system. It was hard to believe that the ground beneath my feet, rather than being a solid dead surface like a floor or sidewalk, was in fact an ecosystem: its own mini-world. Beyond the obvious creatures, centipedes, earthworms, spiders and others—some that I had seen and many more that I had not—were nematodes, bacteria, fungi, and other microscopic organisms. Soil scientist and author Edward J. Plaster estimates that a quarter teaspoon of fertile soil contains about 50 nematodes, 62,000 algae, 72,000 protozoa, 111,000 fungi, 2,920,000 actinomycetes and 25,280,000 bacteria. Just imagine!

Later lessons were in the complexity and inter-relationships of the underground system, fueled by plants and other photosynthetic organisms above ground, but with the soil creatures earning their daily piped-in sugar. Each of those multi-million sub-soil animalcules has an essential role. As they eat and excrete, reproduce and die, they feed and consume other organisms; they decompose organic matter and cycle nutrients such as atmospheric nitrogen, all of which then become available for the plants. The microorganisms improve soil structure, helping the soil to hold moisture, and they control populations of soil organisms, including some that are plant pests. The plants feed the soil organisms and the soil creatures feed the plants along with their root environment. Like good residents, both improve their soil home.

I am reminded that it was *fertil*e soil, like the finished product in the bottom of my parents' compost pile that Edward Plaster was measuring. Life in the soil is in that top layer, making it clear why adding living compost contributes to its health. But such soil is becoming endangered. With conventional agriculture practices, where plants and soil are poisoned and the subterranean world is routinely sliced and diced, life below ground is depleted or extinguished. Losing the structure formed by living roots and microorganisms, soil more easily washes away. The world has lost about half of its most productive soils in the last 150 years. In the US alone, arable soil is being eroded away ten times faster than it can be naturally replaced. The UN's Food and Agriculture Organization reports that at the current rate, the world could run out of topsoil in about sixty years.

But microbiologist and soil scientist Elaine Ingham points out that the world's soils, even the most degraded, have the basic nutrients essential for plant growth. What they require to be productive again is life—soil biology—to make those nutrients available to the plants and give the soil good structure. Dr. Ingham, as founder of Soil Foodweb Inc, author of USDA's *Soil Biology Primer* and chief scientist at The Rodale Institute, lectures internationally, showing how good compost can revitalize the soil. After testing soils, she introduces or rebalances essential microorganisms into compost tea to be added to the depleted ground. Her work has helped restore over five million acres worldwide, lowering farmers' costs, increasing yields and sequestering soil carbon.

I've learned a lot from my parents' mile-high compost heap, the first thing being how much I still don't know. But I faithfully do my own composting now and consider it a sacrilege to throw anything organic into the landfill. And I'm a convert to the idea that a viable component to feeding the world and fighting climate change is scaling up regenerative agriculture as widely and quickly as possible, renewing soil biology with good compost, holding the soil, retaining moisture, sequestering carbon.

I've also been meditating on metaphors. This country was once called a melting pot. Many have pointed out that a melting pot could disintegrate its contents into a formless gray blob—an unhealthy and unpleasant homogeneity. So how about a metaphor implying sufficient complexity and diversity to get all of the necessary jobs done—an intricate, cooperative, restorative, sustainable community? "America, The Fertile Compost" has a nice ring to it. Then together, we can make it so.

Events of Interest in the Community

McKenzie River Trust

Sunday, 1 March, 2 to 4 p.m. National Geographic Live! Ami Vitale: Rhinos, Rickshaws and Revolutions. Experience our world through the eyes of an award-winning photographer whose career has brought her face-to-face not just with violence and conflict, but also with surreal beauty and the enduring power of the human spirit. Recently, she has turned her lens to compelling wildlife stories, such as returning critically endangered captive born species like the giant pandas back to the wild, and attempts to save the last living northern white rhinos from extinction. Vitale's work is exhibited worldwide in museums, galleries, and private collections. Hult Center, Eugene.

Lane County Audubon Society

Saturday, 15 February, 8 a.m. Third Saturday Bird Walk. Details will be posted on the LCAS Facebook page: facebook.com/pages/Lane-County-Audubon-Society/330177413824, and on the website: laneaudubon.org. Bring binoculars, if you have them. To carpool, meet at 8 a.m. at the South Eugene High School parking lot, corner of 19th and Patterson. We plan to return by noon. A $3 donation is suggested. FMI: Rebecca Waterman at fieldtrips@laneaudubon.org.com, or 541.653.3354
Tuesday, 25 February, 7 p.m. History of Birding in Oregon with Alan Contreras. Alan Contreras is currently collaborating on *A History of Oregon Ornithology* for OSU Press. This program will illustrate how bird study has changed in Oregon from the early 1800s through the Internet age. Eugene Garden Club, 1645 High St.

Mt. Pisgah Arboretum (all these MPA events will occur rain or shine; meet at the Arboretum Visitor Center and don't forget your parking pass.)

Saturday, 22 February 10 a.m. to noon. Life Among the Mosses Walk. This is our annual celebration of the little folks of the plant world. Botanist David Wagner will tell moss stories and weave lichen yarns to help us understand the elfin world of mosses, liverworts, and lichens. Fee: $5, members free.
Saturday, 7 March, 10 a.m. to noon. Nature's Slimy Creatures Walk. Learn about the lives of our slimy friends here at the Arboretum with Education Manager Jenny Laxton. Finish the walk by creating some slime of your own to take home. Members $5 per family, non-members $8 per family.
Sunday, 8 March, 8 to11 a.m. Bird Walk. Join Julia Siporin and Joni Dawning for another monthly bird walk. We'll use vocalizations, habitat, and behavior clues for identification of our spring migrants and year-round residents. Please bring binoculars. Option to continue the walk until noon for those who are interested. $5, members free.

Friends of Buford Park and Mt. Pisgah

Monday Morning Regulars. 9 a.m. to noon. Contact volunteer@bufordpark.org for more information.
Tuesdays and Thursdays Nursery Work. 9 a.m. to noon. Meet and work at the Native Plant Nursery at Buford Park. Enter Buford Park from Seavey Loop Road. Turn LEFT after crossing the bridge and drive 1/4 mile to the nursery.

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

Go to https://mnch.uoregon.edu/events for a complete listing of MNCH's upcoming events.
Friday, 21 February. Little Wonders: Museum Fun for Preschoolers. This month's theme is Playing in the Rain, with fun crafts and science activities about clouds, rainstorms, and rainbows. Included with regular admission; free for MNCH members and UO ID card holders. Show your Oregon Trail or other EBT card for an admission discount.
Thursday, 5 March, 7:30 p.m. On Rising Together: Creative and Collective Responses to the Climate Crisis. First United Methodist Church, 1376 Olive St. in Eugene. Elizabeth Rush, the Oregon Humanities Center's 2019–20 Robert D. Clark Lecturer, will speak about a small community on the eastern shore of Staten Island—a place that hurricane Sandy both undid and remade from the ground up—investigating the storm's aftermath and the radical decisions residents made about how to overcome their shared vulnerability. Rush is the author of *Rising: Dispatches from the New American Shore* and *Still Lifes from a Vanishing City: Essays and Photographs from Yangon, Myanmar*.
Saturday, 7 March. GRAND OPENING WEEKEND: Natural Athletes. Hightail it to the museum for a track and field competition like no other—with cheetahs, kangaroos, chimps, and other mammals all going for gold! From the javelin throw to the high jump, learn which animals would triumph on the track, and explore the amazing adaptations that make it all possible.
Exhibits: (Exhibit hours: Tuesdays through Sundays 11 a.m. to 5 p.m.) **Oregon—Where Past is Present.** Delve into Oregon's story, from the archaeology of the First Americans to the dynamic cultures of today's Tribes. **Explore Oregon**. Experience the dynamic forces that shape Oregon's landscapes, climate, and ecosystems. Meet giant salmon, Ice Age sloths, and other amazing animals from across the millennia. **Native Plant Courtyard.** The Glenn Starlin Native Plant Courtyard is a living research collection of Oregon's native plants. To learn more go to https://mnch.uoregon.edu/about-museum

Native Plant Society of Oregon, Emerald Chapter

Monday, 17 February, 7 p.m. Maximizing Ecosystem Services in the Eugene/Springfield Area Through the Strategic Planting and Management of Trees. Scott Altenhoff, a municipal arborist & urban forester with the City of Eugene's Parks and Open Space Division, will discuss current efforts by the City of Eugene and its community partners to better understand and address the many social, economic, and environmental challenges that face our community, especially those efforts related to long-term urban forest planning/management and the planting of trees. Special emphasis will be given to the City's 2021 x 2021 Planting Initiative. Amazon Community Center, 2700 Hilyard St.

Nearby Nature

Monday, 17 February, 8:30 a.m. to 3 p.m. No School Day Adventure: Nature Gamers. Play Giant Jenga, create a salmon obstacle course, build a tree, melt a mountain and more. Create your own game from natural and recyclable materials to take home! $50 members/$60 non-members. Scholarships available. Ages 6-9, max 12 kids. After-care 3 to 4 p.m. Outdoors in Alton Baker Park. Register online or call 541-687-9699. 622 Day Island Road.

Saturday, 22 February, 1 to 3 p.m. Citizen Science Saturday: Oh My, Look Up High! This month we will learn about Ospreys and Herons in Alton Baker Park as we document water bird activity in and near the Canoe Canal. Event designed especially for adult participants. If you have a smartphone or a camera, please bring one to take pictures. Smartphone users please load the iNaturalist app (https://www.inaturalist.org/) onto your phone if possible. Members free, non-members $7. Pre-register at 541-687-9699 or online. Meet on the Water Wise Garden Patio outside the Alton Baker Park Host Residence.

Tuesday, 10 March, 10 to 11:30 a.m. Green Start Play Day: Nature Notes. Discover who's singing in nature this month as we listen to animal songs, make musical instruments, and enjoy a visit from a special guest. Kids 5 and under only, with an adult. Rain or shine. Members free, non-members $7/family. Pre-register online or call 541-687-9699.

Friday, 13 March, 8:30 a.m. to 3 p.m. No School Day Adventure: Misty Mount Pisgah Magic. Hunt for natural treasures, do a Gnome Roam, and make fairy houses in the forest! Ages 6-9, max 12 kids. After-care 3 to 4 p.m. Outdoors in Mount Pisgah Arboretum. $55 members/$65 non-members. Scholarships available. Register online or call 541-687-9699.

WREN (Willamette Resources and Educational Network)

For WREN's upcoming events go to http://wewwild.blogspot.com/

ENHS welcomes new members! To join, 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)_____
I (we) prefer electronic copies of NT rather than paper copies. ___Yes ___No
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ANNUAL DUES: Family $25.00
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Life Membership 300.00
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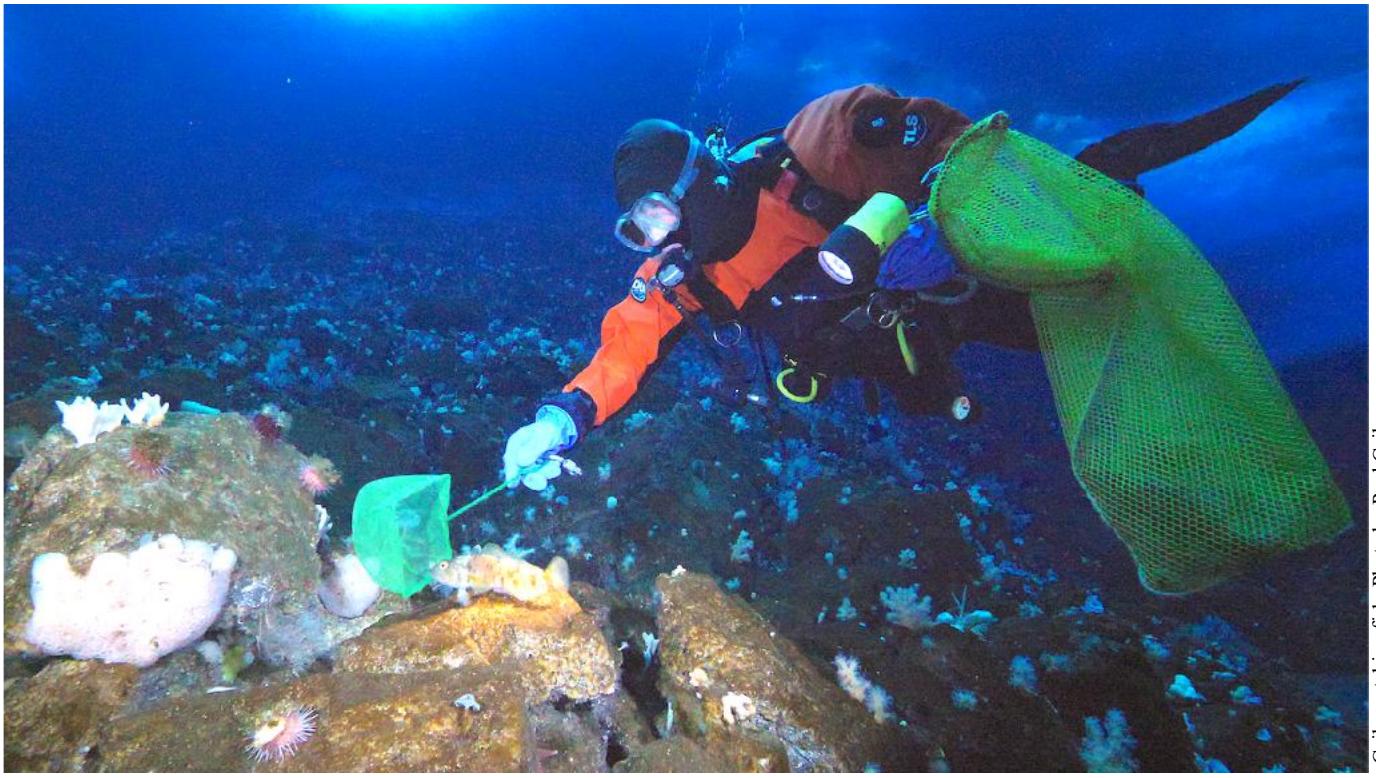
Annual dues for renewing members are payable in September. Memberships run from September to September. Generosity is encouraged and appreciated.

A good place to park for our meetings is the Physical Plant lot: turn north from Franklin onto Onyx, go about a block and you will be in the lot. After 6pm it's open to the public.

The Eugene Natural History Society meets on the third Friday of the month September through May except in December when the meeting is on the second Friday. Meeting time is 7:30 p.m. and our standard meeting location is room 100 Willamette Hall on the University of Oregon Campus. Any temporary changes will be noted in the newsletter for the current meeting and on our website: https://blogs.uoregon.edu/enhsuoregon/



Cziko catching fish. Photo by Paul Cziko

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2019-2020 Speakers and Topics

21 Feb.	**Paul Cziko**	**Opening a "Window" into Antarctica's Frozen Ocean**
20 Mar.	**John Helmer**	**Steens Mountain: A Tale of Beauty and Hard Work**
17 Apr	**John Bishop**	**The Weevil Empire: How Insects Rule Plant Succession at Mount St. Helens and Other Stories from the Pumice Plain**
15 May	**David Wagner**	**Mosses, Liverworts, and Hornworts**