Nature Trails

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Pacific Sea Nettle, *Chrysaora fuscescens*. Photo source: http://lbc9.net/animals/marine-life/jellyfish/wallpapers-10.html

Are Jellyfish Taking Over the Oceans?

Kelly Sutherland, Assistant Professor, Clark Honors College and Oregon Institute of Marine Biology, University of Oregon

Friday, 20 January 2017, 7:30pm,
Room 100 Willamette Hall, UO Campus

There are many ways to see the world. Join the Army. Board a tramp steamer. Fire up the RV. Start walking. You're familiar with these, but one way you (and I) would never think of is, take up marine biology. Exotic destinations were not what drew our January speaker to her chosen field, but Kelly Sutherland's journey from her southern California roots to her present position with the University of Oregon has been anything but straightforward. Along the way she has immersed herself in the Gulf of Mexico, the Adriatic Sea, the North Atlantic, the North Pacific, the South Pacific, and the Southern Oceans, and her career is yet young.

Sutherland grew up in Pasadena, California. A high school program on Catalina Island was her first exposure to marine science, and that was all it took. Before finishing high school she was a certified SCUBA diver, and hooked for life on things oceanic.

Sutherland went to Tufts University, in Medford, Massachusetts, for her undergraduate work. Tufts is a good school, but a major reason for her choice was she wanted to see a different part of the world. She finished her time at Tufts with a dual major in biology and child development. Following her graduation from Tufts Sutherland began working as an intern at the New England Aquarium (NEA), in Boston, Massachusetts, culturing jellies and lobsters. The person directing her work left and she was promoted. Her new job title: Jellyfish Culturing Aquarist. Jellies are not easy to culture, so her products were in high demand. Most went to the obvious places—aquaria all around the globe. But some went to more unusual locations. One batch of their little jellies was Fed Ex'd to Las Vegas and ended up in a huge fish tank in a sushi bar. I can just imagine customers losing track of time and consumption, mesmerized by the delicate dance of these exquisite animals. That purchase was a smart business decision by the bar owners.

By the end of her three years with the NEA Sutherland knew she wanted to become a jelly researcher. There are not many labs that have an interest in jellies, but one such is the Dauphin Island Sea Lab at the University of South Alabama. Sutherland went there to begin her graduate studies. Dauphin Island had been a military base and many of the military buildings have been made use of by the Sea Lab, including housing for students and researchers, so for the two years she spent getting her M.Sc. Sutherland lived in a barracks.

For her Ph.D. Sutherland returned to Massachusetts, to the Woods Hole Oceanographic Institution (WHOI). Her degree, in biological oceanography, was jointly administered by the Massachusetts Institute of Technology, in Cambridge, and WHOI, although almost all her work was carried out at WHOI; she took only a few courses at MIT.

Woods Hole is on the shore of the Atlantic Ocean, and jellies do exist in that body of water. Sutherland, however, did not take advantage of this fact. No, for her Ph.D. research she went to Panama, to the Liquid Jungle Lab (LJL), where the WHOI has an extensive research presence. The LJL, formed in 2003, is on Canales de Tierra, a remote and beautiful island about 250 km west of Panama City. Sutherland made seven separate trips there over the course of her studies, spending a total of over 4 months in that tropical wonderland.

Alas, all good things come to an end, and her Ph.D. work was completed, except for that pesky task of writing the thesis. Sutherland took a post-doc at the California Institute of Technology in Pasadena, but for the first year of this two-year position she lived in Seattle, where her husband was doing a post-doc at the University of Washington, and where she finished writing her thesis while carrying out research at the Friday Harbor Lab in Puget Sound related to her own post-doc.

Sutherland then served one year as a research associate and adjunct instructor in the Institute of Ecology and Evolution at the University of Oregon, and in 2012 accepted her present position as assistant professor of biology in the Clark Honors College, with a joint appointment in the Oregon Institute of Marine Biology.

Sutherland's lab has an Oregon Sea Grant, and has received funding from NSF and the US-Israel Binational Science Foundation. She was recently honored with a Sloan Research Fellowship in Ocean Sciences, from the Alfred P. Sloan Foundation. The Sloan Fellowship is a big deal. There aren't many of these awarded each year, and they "seek to stimulate fundamental research by early-career scientists and scholars of outstanding promise."

In her words, the Sutherland lab "is at the intersection of biology and physics: our goal is to gain a mechanistic understanding of how marine organisms interact with one another and within their fluid environment. We use a variety of tools including in situ video, kinematic analysis, and flow visualization to understand how the environment is experienced at the organismal scale. These observations can be related to smaller-scale physiological problems or to larger-scale population patterns and food-web dynamics. We use novel technologies but much of our equipment is relatively inexpensive and portable, which enables us to work

locally, off the Pacific Northwest coast, as well as in remote locations. Students working in the lab use innovative techniques and a mechanistic approach to investigate how organisms function in the marine environment, and more broadly, to understand ecological roles and evolutionary relationships. Students work either in the Institute of Ecology and Evolution on the Eugene campus, or at the Oregon Institute of Marine Biology in Charleston." Some of Sutherland's current areas of interest include predator-prey interactions, biological propulsion, gelatinous zooplankton ecology, and particle capture by mucous-net feeders.

In her upcoming talk Sutherland will discuss some of her recent work on the ecology of jellies. Feeding ecology in the oceans is the result of an intricate interplay of behavior, morphology, kinematics, and fluid mechanics; understanding predation of these important marine predators requires an integrative approach. Sutherland will begin at the global scale and discuss a current paradigm predicting a 'rise of slime' in the oceans. Moving to the more familiar Oregon coast, Sutherland will describe the common jellies off of our coast that beachcombers have likely come across as well as some of the more rare species. She will finish at the scale of an individual tentacle where much of the important action governing predation occurs.

Please join us to hear Kelly Sutherland's presentation "Are jellyfish taking over the oceans?" on Friday, 20 January, at 7:30pm in room 100 Willamette Hall, U of O campus.

Boomers by Reida Kimmel

Recently I've been thinking a lot about a little rodent, *Aplodontia rufa*, better known as Mountain Beaver, or Boomer. Evolutionarily, it is quite a primitive and unspecialized rodent. It lives in burrows on land and is not closely related to beavers, though it can swim. It prefers moist habitat close to streambeds where the soil, often sandy, is ideal for digging its extensive burrows. In fact, due to its inability to concentrate urine, *Aplodontia* cannot live in arid environments. Like squirrels, from which group *Aplodontia* split in the Eocene, boomers can climb trees. I saw one in our yard once when we first moved here. The dogs chased it down the driveway and we never saw him again, but the memory remains. Boomers are considered plentiful, a species of no concern, even a pest, throughout their range, which extends from sea level to timberline in the western parts of British Columbia, Washington, and Oregon. Subspecies of Boomers in coastal California have small populations that are very vulnerable.

How does this 'pest' make a living? It eats a variety of fleshy herbs, especially ferns, but also salal, and deciduous woody plants like maples, alders, willows, blackberries, salmonberries and other brambles. In the winter, when more delectable forage is not available, Mountain Beavers eat young fir trees. Though they do inhabit coniferous forests, Boomers seem to prefer mixed forests where food is more varied and abundant. They are solitary creatures, though sometimes they loosely group in colonies. Each Mountain Beaver builds an amazing burrow with shallow tunnels extending long distances in several directions. The extent of the burrows has led casual observers, even wildlife professionals, to regard each burrow as evidence of an extensive colony, which is never true. They need those burrows. Bobcats, golden eagles, coyotes, cougars and owls all relish Boomers. Unfortunately, the cozy burrows are also inhabited by parasites such as *Hystrichopsylla schefferi*, the largest known flea. For a rodent, Boomers have a long lifespan—5 or 6, sometimes even 10 years—but they also have a low reproduction rate, producing small litters of two to four young that do not breed until they are two years old. Populations usually remain at 2 to 4 individuals per acre.

It is eating young fir trees in commercial forests that has earned Boomers the status of a hated pest. There's not much else to eat on a monoculture fir plantation, and massacring Boomers is easier than protecting trees or harassing the rodents off the land. Companies and individuals that plan to use pesticides or herbicides must notify the Forestry Department of their intentions. Issued in early November, NOAP ID 2016-78—12861 put forth a plan to poison *Aplodontia* on 183.6 acres of commercial timberland in the Coast Range, not far from Siltcoos Lake and Florence. Applicators would administer the chemical Rozol [chlorophacinone] by shoving a bag of the poison into every burrow they saw. Rozol kills by causing internal bleeding, is more potent than Warfarin, and persists in the dead animal. In their death agonies, victims seek water and move so unsteadily that they are easy prey, setting up the near certainty of a cascade of poisonings. The area to be "treated" has five creeks and two wetlands, one aquatic and the other in the shrub stage. The label on the pesticide Rozol clearly states that it is "extremely toxic to fish and other aquatic animals." It goes on to warn that dogs, predatory and scavenging mammals, and birds could be poisoned if they eat carcasses. All carcasses should be removed promptly. The product should be kept out of lakes, streams and ponds and not be applied when rain or drift could occur.

Given that it would be impossible to remove all the affected bodies from 183.6 acres of rough land and more importantly that threatened and sensitive species, like amphibians, raptors, and Coho salmon inhabit the Coast Range, Rozol should never have been considered. Keep in mind that only some of the burrows that applicators would find are actually in use by a Boomer. Burrows that they have abandoned are taken up as prime real estate by all sorts of animals. Just how many species could be affected by this mass poisoning? Debbie Schlenoff estimated that the following species could be affected: bobcats, fishers, coyotes, weasels, mink, spotted skunks, rabbits, Barred Owls, Short Eared Owls, Bald Eagles, Northern Harriers, Red–tailed Hawks, Red Shouldered Hawks, Osprey, and Turkey Vultures.

Led by Forestland Dwellers, a local group opposing herbicide use in forestry, a number of Eugene's environmental associations expressed their horror at the proposed killing. The ENHS Board were unanimous that we should send in a formal commentary on the notification, which we did. I e-mailed Lane County Audubon Society and Debbie Schlenoff, who writes on environmental issues for *The Quail*. Phillip Johnson of Coast Watch and Louise Schimmel of the Cascade Raptor Center heard from me. Beyond Toxics contributed this discouraging fact. Killing off Boomers is common practice. I asked the organizations to send commentaries on the notification, which they did, writing really insightful, informed letters. What more could be done? Notifications are just that. No amount of citizen protest can change them. The Oregon Forest Practices Act protects the interests of the timber industry, not of the earth. In fact, we were finally told by the forester that he only published notifications, nothing more, and that we needed to take up the matter with the Oregon Department of Agriculture if we had a complaint. That sounded like a long and hopeless hassle perhaps involving a lawyer. Louise had said early on that publicity was going to be more important than our comments on the notification. She suggested getting the news out, a letter signed by some of the big guns in Eugene's environmental community, and that the Northwest Coalition Against Pesticides should be invited to join in. Kim Leval was very happy to do so, and many of you may have read the brilliant Guest Opinion letter in the 27 December 2016 Register Guard that she and Debbie and Louise wrote.

In trying to learn about Boomers so that we could write intelligent, cogent comments on the notification we discovered that Boomers are utterly cool little animals. But we also learned something far more important that should stand us in good stead in these discouraging times. There are a lot of good people in our community, in our state, and even in our nation. If we can initiate conversations, work together, and really try to do the right thing, we can have a much greater voice in defense of our planet and its inhabitants.

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Spawned Out by Tom A. Titus

Before me lies a deep incision in the soaking wet Coast Range. The afternoon sky is finally tired of spitting rain. A sea of overcast ruptures into vaporous breakers crashing silently against conifer ridges. Occasionally an insipid sun peeks through, but it seems tired as well. A Hermit Thrush twitches its reddish tail from a bare hazel branch. I haven't been here for some time and normally visit in February. But spawning Coho have been calling to me, and I was compelled to come in December.

The stream draining this canyon is Coho spawning habitat. In my view the Coho is the iconic salmon of the Oregon Coast Range. Their cousins the Chinook are larger, more powerful, perhaps more charismatic. But Chinook lack the staying power of Coho, who continue in this world by spawning in the filamentous tributaries far up in coastal mountains. Coho seem uniquely adapted to use these small streams. They arrive later in the year than the Chinook, and their smaller size makes lower-order streams more accessible. Later spawning might be a behavioral adaptation to ensure consistent flows that aid their journey far upstream, with ample winter flow to keep the spawning gravels submerged until the eggs hatch.

I grab an orange-handled machete from behind the seat of the pickup, expecting the old roadbed in the bottom of the canyon to be swallowed by Armenian Blackberry brambles. But the trail is mostly clear. More years have passed than I realized. The Douglas-fir in the clearcut have grown tall enough to block the sunlight, and the blackberries are being excluded for lack of light, an outcome of the relentless replacement of plant communities inherent in uninterrupted seral succession.

At the end of the road, the Douglas-fir canopy is now completely closed. The ground is covered in dark duff, interrupted only by a variety of small mushrooms withering and rotting back into the nutrient cycle. From here, I walk into a newer clearcut, following a game trail across its lower end. The Douglas-fir have doubled in height since my last trip. The trees were planted by humans, but I wonder if the land might heal better if left to its own processes.

Beyond this clearcut lies a native forest two centuries old. Some Douglas-fir trunks are four feet in diameter, furrowed by bark canyons six inches deep. On one trunk is a six-inch orange oblong hole excavated by a Pileated Woodpecker.

Moving further inside the grove, the meager light dims. Soft creek music rises from my left. I descend to the bank and stand above a clear stream coursing along a shallow rill of blond sandstone cobbles. Very recently the flow was much higher. Small sandbars are scrubbed clean and devoid of tracks. I step into the shallow flow with impunity, thankful for knee-high rubber boots, and immediately begin looking for evidence of spawning Coho. A light-colored scrap undulates in a small milky blue pool just upstream. Focusing hard, I finally discern a piece of old man's beard lichen attached to a submerged fir limb, waving in the current like the scarred tail of a ravaged salmon.

Climbing out of the streambed, I negotiate the thick understory. This forest is perennially wet, lush with salal, sword fern, and old-growth vine maple. Large conifers have fallen haphazardly, lying in various stages of decay. My body reminds me of this flow of time—ducking under vine maple and crawling over down logs is more of a chore than I remember. But I persist and choose a route for keeping the stream in sight. The fish shouldn't be hard to find in the narrow creek, and churned gravel in the spawning redds would be easy to spot. The stream meanders along the flat canyon floor. On the inside of crooked elbows the water forms quiet pools, potential resting places for spent salmon. But there is only the liquid rattle of the stream, the swish of brush against my rain pants.

People have been here before me. Pieces of pink flagging along the creek mark summer snorkel surveys for smolts. An ugly orange sign, edges curling, is tacked to a large hemlock. In bold black letters it proclaims SALMON SPAWNING SURVEY, as though anyone or anything but me or the salmon spawning surveyors would care. Still, I appreciate that data are being recorded.

Continuing upstream, the sun breaks through briefly but only because the clouds have again relented, and the December sun is setting far to the south, shining into the south-facing canyon mouth. Diminishing light presses in. A warm cabin is waiting back up the road. I should turn back. But I can't.

Finally, the canyon relinquishes. On a freshly scrubbed sandbar perhaps six feet long rests a small litter of bones. The vertebrae remain attached by sinew and bleached-out muscle fibers, all bent into a shallow, upwardly bending arc. Thin ribs bend downward into the sand like curved gray needles. The core of the skull remains attached to the vertebrae, around which are scattered the toothed lower jaw and bony gill plates. High rainfall earlier in the fall provided the necessary water for spawning. The Coho had taken care of their reproductive business, the business prescribed by evolution, long before my arrival.

On the surface of things, all that remains are the remains. I cannot know if this salmon successfully spawned. The only certainty is that orange flesh has melted into the creek or been scavenged by raccoons, becoming part of a larger cycle in which ocean nutrients were tethered to the reproductive will of the Coho, transported into forest ecosystems far upstream. The continuation of this story, the one now ending in dusk and a scatter of cloudy bones, is an article of faith. I choose to believe that this salmon parented a clutch of fertile eggs nestled somewhere in the sandstone gravel. The embryos await their time to hatch, to renew the cycle of smolts growing and descending Smith River, to flash new nickel silver through the prodigious resources of the Pacific. I imagine nothing more or less, my hope tied to circles of ocean, rain, creek, and Coho.

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

Events of Interest in the Community

Lane Community College Natural History Courses of Interest (2017 winter term)

1. Native Bees of Oregon. Learn bee identification, bee diversity, and pollination ecology basics. Get ready for spotting the spring, summer and fall native bees of Oregon and the Pacific Northwest. Enhance bee-watching success. Expand your knowledge of the issues facing our native bee pollinators. Lecture, discussion, and hands on combination. Start date: 01/19/17. Downtown Campus room 303. Three sessions: Weekly - Thursdays 6-8pm (1/19/2017-2/2/2017). Cost: $39.00. Instructor: Brian Dykstra

2. The Intelligence of Plants. This 3-hour class will explore how plants learn, recall, strategize, share, cooperate, defend themselves, recognize family members, and make informed choices, summarizing contemporary scientific literature for the non-scientist. Downtown Campus room 303**.** One session. Thursday, 2 March, 6-9pm. Cost: $29.00. Instructor: Brian Dykstra
3. Bee Box Construction. Build a habitat for a variety of native solitary (not hive) bees. Work with a local expert to learn the nesting habits of multiple pollinator species, and then make structures to invite them to live in your yard, garden, or balcony. University of Oregon - Erb Memorial Union (EMU) Craft Center https://craftcenter.uoregon.edu/workshops/woodworking Two sessions. Sundays, 12, 19 February, 1-4pm. Instructor: Brian Dykstra

Lane County Audubon Society

Saturday, 21 January, 8am-noon. Site and leader will be determined by interesting bird sightings posted to OBOL and other pertinent information available before the day of the walk. Details will be posted on the LCAS Facebook page (facebook.com/pages/Lane-County-Audubon-Society/330177413824?ref=hl) and on the website (laneaudubon.org). All ages and skill levels are welcome. To carpool, meet at 8am at the South Eugene High School parking lot, corner of 19th and Patterson. We plan to return by noon. Remember that it's not a good idea to leave valuables or your vehicle registration in your car if you leave it at the lot. A $3 donation is appreciated to help support Lane County Audubon's activities. FMI: Jim Maloney at 541.968.9249 or jimgmal@comcast.net.
Tuesday, 24 January, 7:30pm. Malheur National Wildlife Refuge—An Inside Look at Its Natural Wonders, and Implications of the Occupation in 2016. Tim Blount, executive director of Friends of Malheur National Wildlife Refuge, will make a photo-rich presentation of wildlife at Malheur NWR and surrounding areas. Tim will also speak about the occupation by armed militants that occurred in January and February of 2016, and the implications to our public lands, such as Malheur, that have now become larger targets with the acquittal of the refuge occupiers. Known throughout the birding world as one of the top places to bird in North America, and cherished by many, the refuge was threatened by antigovernment protestors who staged an armed occupation lasting almost two months. In October 2016, all of the protestors on trial for conspiracy and weapons violations were acquitted in a Portland court. This should prove to be an entertaining, informative and timely presentation. 1645 High St., Eugene.

Mt. Pisgah Arboretum

Saturday, 21 January, 1-3pm. 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. Rain or shine. Meet at the Arboretum's Visitor Center. Don't forget your parking pass. Fee: $5, members free.
Saturday, 21 January, 10am-1pm. Trail Work Party. Join us as we get a little dirty cleaning out drainage ditches along our network of trails. Meet at the Arboretum Visitor Center. Tools, gloves, and a parking pass will be provided to volunteers (we suggest you bring along a water bottle). Please RSVP if you plan to attend.
Saturday, 28 January, 10am-2:30pm. Introduction to Cedar Bark Weaving Workshop. In this weaving workshop, local artist Donna Crispin will cover some of the basics of weaving with cedar bark. You will learn how to weave a 1/2" wide cedar bark cuff, while also preparing some bark from the raw form, splitting and cutting it into uniform strips. This will be a 4 1/2 hour workshop with a break for lunch. Workshop meets at the EPUD community room (33733 Seavey Loop Rd). $40 members, $45 non-members, plus $15 materials fee paid to instructor. All basketry materials included. Bring scissors, a tapestry needle, very small jewelry pliers (optional, but recommended), spray bottle, and a small, old towel. Pre-registration required. To register call 541-747-3817 or click here.
Saturday, 28 January, 10am-1pm. Trail Work Party. Join volunteers from the Eugene Emerald Empire Kiwanis as they work on their adopted Tom McCall Riverbank Trail. Meet at the Arboretum Visitor Center. Tools, gloves, and a parking pass will be provided to volunteers (we suggest you bring along a water bottle). Please RSVP if you plan to attend.

Friends of Buford Park and Mt. Pisgah

Monday Morning Regulars. 9am-noon. Contact volunteer@bufordpark.org for more information.
Tuesdays and Thursdays, 9am-noon. Nursery Work. 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.

WREN (Willamette Resources and Educational Network)

Go to http://wewwild.blogspot.com/ for upcoming events.

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

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

Native Plant Society of Oregon, Emerald Chapter

Thursday, 19 January, 7pm. Burning for Butterflies, Birds, and Blooms. Amanda Stamper, Oregon fire management officer for the Nature Conservancy, will discuss the history of fire in the Valley and how prescribed burns are being used to restore and conserve native habitats. Stamper has worked in fire management on the Deschutes and Ochoco National Forests and studied Natural Resources Fire Ecology at Oregon State University and the University of Idaho. Meeting Location: 150 Shelton-McMurphey Boulevard in Eugene just south of Skinner Butte.

North American Butterfly Association, Eugene-Springfield Chapter
Go to http://www.naba.org/chapters/nabaes/ for the next event.

Nearby Nature
Monday, 16 January, 8:30am-3:00pm. No School Day Adventure: Creepy Crawlers. Turn over logs, search under leaves, discover who is scurrying, wiggling, and crawling on the forest floor. Make a model insect, play bug bingo, and learn what it takes to survive on the forest floor. $40 members/$45 non-members. Ages 6-9, max 12 kids. Outdoors in Alton Baker Park and at our Yurt. To register, call 541-687-9699, ext. 2 or visit: http://www.nearbynature.org/registration-scholarship-forms/no-school-day.
Saturday, 21 January, 10am-1pm. Restoration Celebration. Join Nearby Nature for Alton Baker Park restoration and caretaking. Thanks to REI for helping to sponsor our caretaking work in Alton Baker Park. We focus on creating a park that is safe, clean, ecologically diverse, and functional. Please bring a water bottle and dress for the weather. Snacks, tools and gloves will be provided. Click here to let us know you're coming.
Thursday, 2 February, 10-11:30am. Green Start Play Day: Cozy Critters. Enjoy outside nature play in our Learnscape plus pre-school crafts and stories. Rain or shine! Indoor area available for wet weather. Kids 5 and under only, with an adult. Members free, non-members $5/family (adult and preschoolers). Meet by the Yurt in our Learnscape at Alton Baker Park. Pre-register: 541-687-9699.

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
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ANNUAL DUES:	Family	$25.00
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Annual dues for renewing members are payable in September. Memberships run from September to September. Generosity is encouraged and appreciated.

Deepwater Dive

Salp sampling in Ligurian Sea. Gitai Yahel (l)
K. Sutherland (r). Photo by Ayelet Pilosof

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Schedule of Speakers and Topics for 2016-2017

20 Jan. 2017	– Kelly Sutherland	– Are Jellyfish Taking Over the Oceans?
17 Feb.	– Terry Hunt	– Easter Island Archaeology
17 Mar.	– William Cresko	– Sea Horses and Sea Dragons
21 Apr.	–Svetlana Maslakova	– Pythons of the Sea: Natural History of the Nemertean Worm
19 May	– Ed Alverson	– Southern Willamette Valley Natural Areas Through the Seasons