

# October 1996

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## **National Wildlife Refuge Week Celebrated**

National Wildlife Refuge Week is the perfect opportunity to visit the refuge nearest you to learn how the U.S. Fish and Wildlife Service (USFWS) manages the National Wildlife Refuge System. The mission of the Refuge System is "to preserve a national network of lands and waters for the conservation and management of the fish, wildlife, and plants of the U.S. for the benefit of present and future generations." This mission sets the Refuge System apart from all other federal lands. The system was established in 1903 by Theodore Roosevelt.

National Wildlife Refuge Week is timed to coincide with the annual fall bird migration. The Western Oregon National Wildlife Refuge Complex consists of eleven refuges encompassing three different areas of Oregon: valley, coastal and metropolitan. There are three Refuges located in the lower Willamette Valley, six along the coast, and two in the Portland metro area. The HMSC nature trail and Yaquina Head Outstanding Natural Area are considered the third best birding spots in Oregon (following Malheur Refuge and Bandon).

On October 5, the Coastal Refuges Office here at the HMSC will sponsor an "Open House" at Coquille Point (part of Oregon Islands Refuge) in Bandon from 10 a.m. to 4 p.m. Coquille Point has a brand new handicapped accessible interpretive trail system with benches. The first year it has been opened has seen 500,000 visitors. The Shoreline Education for Awareness volunteers assist with the work there and are patterned after the Haystack Rock interpretive group. Bird watching has a tremendously positive impact on tourism, bringing in \$5-\$9 billion a year nationwide, on a par with other major sporting events. Roy Lowe and Dave Pitkin recommend the Oregon Birders On-Line web site at <<http://www-vms.uoregon.edu/~lbiggs/html>>. Range Bayer has a link there to his web page as well.

Refuge Operations Manager Nancy Morrissey is celebrating this event in a very special way. Her eighteen-year-old nephew has been granted a visit to see the California Condor Refuge through the Make-A-Wish Foundation. Normally, only the immediate family is permitted to accompany the recipient, but because of Nancy's position and the possibility of good publicity, she will go down to Hopper Mountain, California, and surprise her nephew. The condor is an endangered species and the Refuge is a release facility for birds bred in captivity at the San Diego Zoo. They will tour the rearing and hacking facilities and perhaps may get a chance to see the condors in the wild.

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## **Two New Faces in the RSF Building**

Welcome aboard to Paul Johnson! Paul is the new research assistant for Bob Embley at NOAA's Hydrothermal Vents group, taking the place of Julia Getsiv who went back for more graduate education. Paul earned his B.S. and his M.S. in Geology/Geophysics at the University of Hawaii.

Bruce Appelgate, formerly of the VENTS group now working there, suggested he try applying at the HMSC. A native of Massachusetts, Paul left that snowy country to go to school in Hawaii and he did his master's work on the East Pacific Rise, visiting Easter Island twice in the process. Paul enjoys SCUBA diving, mountain biking, camping, hiking and skiing.

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Bruce Mate's newest graduate student is Daniel Palacios, a native of Colombia. He has completed his Master's in Marine Biology from the University of Bogota and he is especially interested in the ecology and conservation of marine mammals. In the Caribbean there are humpback, sperm and tropical species of whales and marine mammals. He was a visiting scientist for a year at the NMFS lab in San Diego and he also spent a year in the United Kingdom while in high school. Daniel has an older sister, a twin sister and a younger sister. His father is an electronics engineer and an engineering professor at the University of Bogota, while his mother is a lawyer for the Ministry of Labor with special interest in protecting miners. Daniel enjoys all kinds of music, hiking and martial arts. His first impression of the United States was a sense of openness with our big roads and rivers of cars.

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### **Walt Frick Leaves for Georgia**

Walt Frick has taken a promotion and a new position with the EPA Center for Exposure Assessment Modeling in Athens, Georgia. Walt is the creator of a plume modeling program that is currently in use in over 30 countries around the world. This modeling program is used to determine effects of outfall pipes in bays and various offshore formations, and has been used in several court cases. In addition to continuing his work with this model, he will be taking on new duties. Walt said it was a difficult decision to leave the Newport EPA group, as he has been here eleven years, but the Athens Center was serious about his specialty, providing models for EPA policy. He will be working at the same center as Harvey Holmes, formerly the branch chief for the Newport EPA. He will take a 15-day leisurely trip across country, visiting friends and scenic spots along the way.

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### **What is a "Critical Tide Effect"?**

John Chapman, (OSU) Walter Frick, (EPA) and Patrick Clinton (previously HMSC but now Columbia River Estuary Study Taskforce, Astoria) completed the first draft of a paper on "Critical Tide Effects and Intertidal Zonation". The paper evolved out of their efforts to model the tides in Yaquina Bay. Vertical zonation of biological communities is apparent on nearly every marine intertidal shore. The complex biological interactions that determine the lower distributions of these zones have been studied intensely in recent years and clearly are not their ultimate cause since they form precisely level with the water.

The irregular rise and fall of the tides result in drastically different ranges and variations in exposure with depth. These variations in tide exposure and immersion with depth have long been considered to be biologically significant and the ultimate cause of intertidal zonation. They are

referred to collectively as "critical tide effects" but how they might occur has been largely unexplored because of the difficulty of either measuring or predicting them. Predictions are really important in this case since they indicate what to measure.

Methods for predicting tides and estimating critical tide effects have long been available but the required computations were too extensive to be practical without fast computers. The ultimate role of critical tide effects in the formation of intertidal species distributions was thus barely explored until Walter, John and Pat arrived at the scene.

Walter wrote the tide model. Pat pulled of these data together visually using GIS analyses. John brought the results to focus on critical tide effects and intertidal zonation. Together, they summarized tide patterns over broad spatial and temporal scales and reformulated predictions of critical tide effects assumed to control the upper limits of intertidal organisms. The tide model is very similar to the Wallner harmonic tide model available in the HMSC library computers. However EPATIDES has more adaptive data formats and is more accurate over long time periods due to a built in calendar. Walter is planning to post the model for free on the Internet.

What about Yaquina Bay? Intertidal zonation is a dominant feature of estuaries, including Yaquina Bay. We hope to use the tide model to analyze critical tide effects in Yaquina Bay and perhaps discover how the vertical distributions of many mud-flat plants and animals and high marsh plants in particular are controlled by the tides.

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### **From the Cold of Alaska to the Warmth of Newport**

Judy Mullen comes to us from the wilds of Alaska to serve as our new Library Technician. Most recently she lived in the very small village of Iliamna, on the largest lake in Alaska, Lake Iliamna, where she taught school for grades 4-12. Originally from Wisconsin, Judy earned her B.A. in Liberal Studies from the University of Hawaii (English as a Second Language) before moving to Alaska. There she earned her B.A. in English and a B. Ed. in Secondary Education so she could be certified to teach in Alaska. Her husband Ted was a commercial fisherman. She enjoys fishing, although here it doesn't measure up to throwing a net into Lake Iliamna and getting 100 salmon before the net was fully open. Once Ted retired, they decided to move to the Oregon coast. They enjoy hiking, the outdoors, opera, music, reading and travel.

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### **Terry Morse, General Naturalist and Master Sleuth**

Recently a letter came to the HMSC addressed to the "HMSC Dept. of Entomology" and Terry Morse laughs when he says it ended up in his mailbox. In addition to his identification work with insects, he also does skulls and mammal bones. He identified a bone found in a park as a human arm bone and notified police. Fortunately, it turned out to be part of dredge spoils from an earlier era and not the victim of a gruesome murder.

How does one become a naturalist? The answer is insatiable curiosity about everything and a wide variety of experiences and training. A native of Queens, New York, Terry has moved from cultural anthropology (B.A. SUNY Oswego) to primate behavior (M.S. University of Texas, Austin) to biology/botany (B.S., University of New Mexico, Albuquerque). He has worked on a landscape ecology project at the Sevilleta Wildlife Refuge in New Mexico, as a foreign fisheries observer aboard a Soviet ship in the Bering Sea, as a wildlife technician for COPE, as an interpreter in the HMSC public wing, as a biological technician on an ecotoxicity project in eastern Washington, as a biological aide for USFWS doing stream surveys in the Arctic National Wildlife Refuge, and finally as research assistant for Don Campbell.

Terry enjoys learning about what he doesn't know, being outdoors and doing nature observation. He has taken a number of field courses from Tom Brown, the famous tracker : the Basic Standard, Advanced Standard, Advanced Tracking and Observation, Advanced Awareness, and Winter Survival. These have enabled him to develop the skills of stalking, tracking and observation in the natural world.

These skills have come in handy with his newest interest in insects, particularly dragonflies and damselflies. Range Bayer alerted Terry to what seemed like a mass flight of dragonflies in the area, somehow correlated to an east wind. Terry started observing them and found that there is no comprehensive field guide to dragonflies. As part of his studies, Terry has been looking for ways to distinguish the dragonflies through binoculars or with live specimens in hand.

In pursuing this new interest, Terry gathered information about catching and preserving dragonflies and produced an on-line publication on frequently asked questions on these procedures. It can be found at <<http://www.afn.org/~iori/oinmorse.html>>. There are 15 different species in Lincoln County and many are nearly identical. One of Terry's interests now is to figure out why there are so many similar species. He is looking at habitat, phenology and other possible differences.

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New modifications to "elephant barn" in RSF

### **Shedding Light on Dark Behavior**

Cliff Ryer of NMFS Alaska Fisheries Science Center has been looking at fish behavior from a different perspective--the dark. The basic paradigms of fish behavior, such as finding food and avoiding predators, have only been studied in the light. There are two drawbacks to this research. First, it is not daylight all the time and second, many species of fish spend most of their time in dark or semi-dark conditions. Sablefish, for example, are active several hundred fathoms down and pollock, who live in the Arctic, are in the dark during the long winters.

Questions to be answered are: how much light do fish need to feed? How do they find their prey since they cannot use visual clues? Fish usually eat larger prey in the dark as well as in the light, but how are they able to distinguish between small and large prey without seeing it? Finally, can they avoid nets and utilize fish excluder devices in nets in the dark?

## A miniature ocean lies behind that locked door

To find the answers to these questions has required great ingenuity in constructing the equivalent of an ocean at night, yet with enough infrared light to videotape the behavior (fish cannot see infrared light). The miles of black plastic in the large wet lab are repeated in the smaller labs to eliminate the incoming light. Infrared lights are built into a platform on which sits a Plexiglas tank with a light diffusing panel at the bottom. Above the walls surrounding the tank are mounted regular lights to simulate daylight and small green diodes at all the same wavelength to simulate the light filtering down into the depths of the ocean. A computer can regulate the speed at which the lights chosen are increased in brightness, providing an exact reading of light intensity for each behavior observed. The video camera is mounted in the ceiling directly above the tank. This results in a round viewing field with the fish as silhouettes against a white background.

Videotape showing infrared-lit tank from above

Preliminary results have shown that fish do eat larger prey in the dark as well as in the light, but the mechanism by which they do this is not known. Do they simply prefer the larger individuals or are the larger individuals easier to find because they make a bigger "splash" when moving through the water? Research has shown that lakes without zooplankton-eating fish have higher proportions of large zooplankton than lakes with such fish.

Modifications in the RSF staging area (known as the elephant barn) have increased the tank space available for these and other fish behavior experiments. It is now possible to do both the control and experimental tanks at the same time, instead of one after the other.

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## **Dziak and Fox Visit Iceland**

Bob Dziak reports that he and Chris Fox recently returned from a meeting of the European Seismological Commission in Iceland, where they were invited speakers. This group was meeting to discuss mid-ocean ridge seismicity and they chose Iceland because it is actually the place where the mid-ocean ridge is above sea level. Researchers can simply walk to see active volcanoes, grabens (valleys) and black smokers (hot springs), instead of sending down a submersible. The meeting began with a three-day field trip around seismically active areas and ended with research presentations. Bob reports that Iceland is full of tall blondes, but everything is expensive (dinners run \$20-30 and a beer is \$8). The conference hotel was at the foot of the second largest volcano in Europe. His impression was of a harsh but beautiful place, with a climate like the coast.

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## **Imitation Crabmeat: It's the Wrong Name!**

Is it phony crabmeat or fake crabmeat? How about artificial crabmeat? All wrong--it's surimi seafood!

Surimi seafood has thrived in the American market over the 15 years with overall consumption increasing from less than 1 million pounds to over 160 million pounds in 1995. Surimi (raw material) is stabilized fish protein concentrates commonly from Alaska pollock and Pacific whiting and used for surimi seafood (finished products). Surimi seafood is a versatile product that is convenient, nutritious, fat free, and extremely low in cholesterol. It is also pasteurized. The FDA still requires that the word imitation be used in a surimi-based product because it purports to be or is represented as any specific-type of natural seafood, but is nutritionally inferior to that seafood.

A unique processing in surimi is washing and dewatering to remove fat, blood, enzymes, and etc. by concentrating functional myofibrillar proteins. It is true that water-soluble vitamins and minerals could be partially washed off during washing. Meantime, fat and cholesterol are almost completely removed. Does removing fat and cholesterol in the process of washing and dewatering create nutritional inferiority?

Recently, the US surimi seafood industry has petitioned the FDA for an approval for the use of surimi seafood as a common name. It sounds much better than imitation. One of recent approval for a common name is canola oil as opposed to rape seed oil. Soon the name of surimi seafood will be American, too.

In recent years the consumption of surimi seafood has reached a mature market condition with a low growth rate. One premise for the current stagnant market is the use of the term imitation for the surimi seafood. Jae Park and Deana Grobe recently surveyed general consumers with a question on their concerns toward the term "imitation." Over a third of the consumers surveyed had concerns about using a product labeled as imitation. The concern stated most frequently was the unknown ingredients in the imitation product. They suspected imitation was synthetic or chemically based. Since all ingredients used for surimi seafood are naturally occurring, it is obvious that the use of an inappropriate term leads general consumers to a misconception.

To help the surimi seafood industry to grow, Park's research covers several angles of surimi and surimi seafood. They are water-soluble myofibrillar proteins; gelation and gelation kinetics; cryoprotection and functionality; optimization of surimi seafood using mixture designs; and least-cost formulation. Park's efforts to standardize surimi in the international trade continued by attending the 22nd session of the Codex Committee on Fish and Fishery Products in Norway as a member of the US delegation in May. He also gave an on-site OSU Surimi Technology School in Nova Scotia, Canada in July. In mid December, the Surimi School moves to Bangkok, Thailand. The Thai National Science and Technology Development Agency and Khon Kaen University have invited Park, Dr. Michael Morrissey, and research associate Dr. Jirawat Yongsawatdigul for an on-site OSU Surimi Technology School.

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## Library Notes

Come see the new exhibit in honor of Banned Book Week in the library. Janet has prepared an exhibit of banned electronic material to provoke comment.

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The following unbound journal issues are missing and are needed immediately.

Geology. QE1 .G685

MISSING: August, 1995

Helgolander Meeresuntersuchungen.

MISSING: v.48, no.2/3; 1994

Marine fisheries review.

MISSING: v.55, no.1; 1993

New scientist.

MISSING: Sept.16, 1995

Oct.7, 1995

Oct.14, 1995

Jan.6, 1996

May 25, 1996

Oecologia.

MISSING: v.104, no.4; 1995

Oikos.

MISSING: v.73, no.3

Oregon geology.

MISSING: v.57, no.4; July, 1995

Scientific American.

MISSING: August, 1995

Nov., 1995

June, 1996

Tectonics.

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The annual binding process is coming to a close and volumes are coming in daily. Check on ones you have been waiting for.

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Michael Buchal began work at Bodega Farms, a pump-ashore abalone operation in Bodega Bay, California, the end of September. Michael recently completed his M.S. with Chris Langdon in molluscan aquaculture.

Hello and farewell to **Larissa Lubomudrov**! Larissa is a graduate student working with Dawn Wright in OSU for her M.S. in Marine Resource Management. After finishing her B.A. in Human Biology at Stanford, Larissa wanted to go deeper into environmental studies and marine science. She has been at the Center since June and will be leaving the end of October. While here, she has been working on metadata for the NOAA GIS system with Dawn and Chris Fox.

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Welcome to **Heather Stapleton**, an intern with Dave Young in EPA! Heather is a student at Long Island University at South Hampton, New York, and fulfilling her required internship for her degree in marine biology and marine chemistry. She will be working with PCH and PCB contaminants in estuarine invertebrates while she is here from September to January. She came here because Dave is Adjunct Faculty for Long Island University. She finds Newport to be different from the East Coast, although South Hampton is also a resort area. The resorts in South Hampton, however, are private rich people's estates with their own swimming pools and tennis courts. She really enjoys our public parks and beaches. She also finds the people here to be less sarcastic than those in New York of course, she **is** new here!

Congratulations to **Chris Fox** and his co-authors (Eddie Radford, Bob Dziak, Andy Lau, Haru Matsumoto and Tony Schreiner) for receiving a Best Paper Award from NOAA! Each year there are three Best Paper Awards given to researchers at NOAA's environmental research labs. This particular paper was on the detection of the Co-Axial Volcano eruptions in the Juan de Fuca Ridge. It was published in Geophysics Research Letters and comes with a cash award that Chris hopes will cover the cost of buying his co-authors a round of drinks.

**Kyla Ryan**, our library student worker, is the Grand Champion Poultry Showman in the entire state of Oregon. Congratulations, Kyla!

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