

APPLIED RESEARCH

Applied research seeks to answer real-world questions and solve real-life challenges.

Engaging coastal communities in wave energy development

About 40 percent of the U.S. population currently lives in a coastal county. Harnessing wave energy has the potential to supply these millions of Americans with electricity, and create jobs in the process. But it also has the potential to disrupt the livelihood of other ocean users, put marine ecosystems at risk, and diminish the beauty of Oregon's coastal communities.

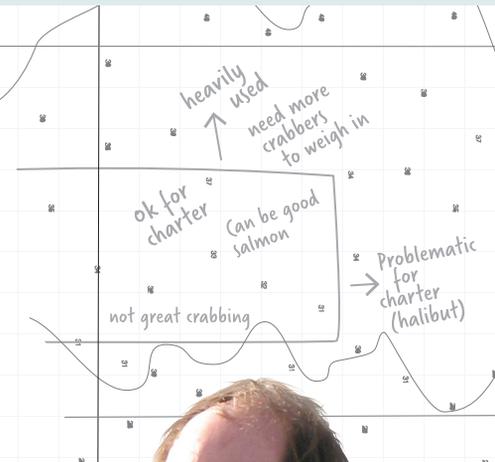
The complexity of the issues has caused wave energy discussions to take decades as the state seeks to balance economic diversity, rural vitality, and energy independence, and also build trust between constituents.

Commissioners in Lincoln County, the site of the Northwest National Marine Renewable Energy Center* (NNMREC), were not opposed to wave energy research, but they also wanted to acknowledge and address community concerns. To find a workable balance, the Fishermen Involved in Natural Energy (FINE) advisory committee was created in 2007.

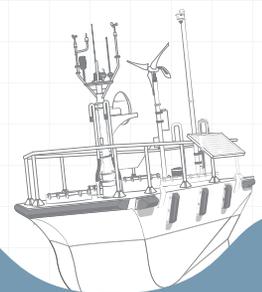
Oregon Sea Grant Extension played a critical role as liaison between the community, FINE, and wave energy researchers and developers. "Community collaboration does work," observed Kaety Jacobson, Oregon Sea Grant Extension. "It makes it possible for off-shore energy, fishing, and marine habitat to coexist."

FINE members were the voice of the fisheries and were essential to finding workable solutions to wave energy site placement by applying their knowledge of marine fisheries and the coastal environment. **They became partners in collaborative research, picking up buoys that strayed, monitoring devices, and deploying equipment.**

Continued on back page ▶



*Bob Eder, original member of Fishermen Involved in Natural Energy (FINE).
 Photo by Kaety Jacobson*



Better-fed honey bees **fight off harmful effects of parasite**

Many Oregon beekeepers worry that preventive antibiotic treatments—the conventional way to combat two serious parasites—might be doing their bees more harm than good.

At high levels, *Nosema ceranae* and a related parasite disrupt protein metabolism, weaken immune systems, and cause malnourishment in the next generation of bees. A severe infestation can deplete the population of bees within a colony and may eventually cause it to collapse.

A study of European honey bees by Ramesh Sagili, a professor and honey bee Extension specialist, and Cameron Jack, a doctoral student in horticulture, found that well-nourished honey bees are better at fighting off the parasite.

The finding suggests that **giving honey bees access to a greater quantity and variety of pollen—their only source of protein—could make them more resilient** against parasites and other pests, and help to stem worrisome declines in bee populations.

Bee experts have worried for some time that “working” honey bees with access only to monocultural crops are not getting enough nourishment to thrive. Some are giving their bees a few weeks’ break from work and letting them forage in uncultivated areas.

“It’s a limited menu for them,” Sagili said. “It’s as if you or I were to eat nothing but chicken for two months. We think a polyfloral diet can definitely enhance bee nutrition by providing a variety of amino acids and other nutritional elements.”

Many beekeepers already feed their bees extra rations of protein in early spring when they’re rearing new brood, and in the fall when they’re preparing to overwinter. Sagili cautions that too much protein can also be harmful to bees. “It appears that there is an optimal balance of nutrients needed for best survival,” he said. “We now need to do some trials in the field to determine how much protein is optimal.”



*Honey Bee Extension Specialist Ramesh Sagili.
Photo by Lynn Ketchum*



30-day lifestyle intervention **lowers risk factors for chronic disease**

Heart disease, stroke, cancer, diabetes, obesity and arthritis are all preventable forms of chronic disease. Diet and lifestyle contribute to—or prevent—these conditions.

LEAP (Lifestyle Eating Activity Progress) is a 30-day, community lifestyle management program created and delivered by OSU Extension Family & Community Health faculty and volunteers for residents in Coos and Curry Counties, two counties at the bottom of Oregon’s health rankings.

The gold standard of lifestyle management programs—referred to as CHIP—was developed and tested by Dr. Hans Diehl of Loma Linda Lifestyle Medicine Institute beginning in 1986. LEAP achieved similar results as CHIP at a greatly reduced cost—46 percent less—making it more affordable for lower resourced individuals.

After two pilots programs, LEAP was offered in Bandon, Ore., in June 2015, to 19 participants.

Continues on page 3 ▶



The LEAP immersion lifestyle management program provides participants with the knowledge and skills to purchase, store, prepare and consume the types of foods that can prevent, or reverse, chronic diseases over their lifetime.

LEAP is built around plant-based meals, science-based nutrition education sessions, and includes pre-and post-health screenings. In just 30 days, participants saw the results of their actions, which encouraged them to continue on the path of healthy eating for optimal health.

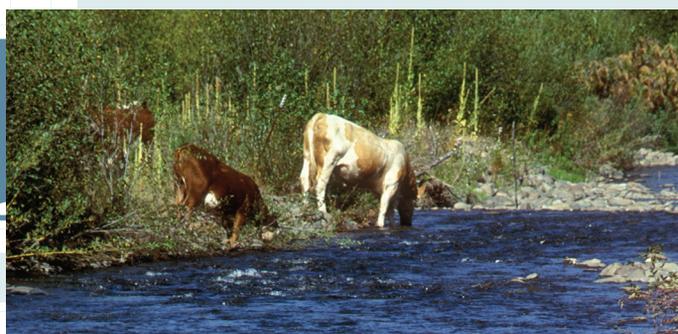


Photo by Stephanie Polizzi



All participants showed significant improvement in at least one health risk factor, with most reducing four or more. The greatest results were seen in those with the highest risk, including three that decreased or eliminated medications for blood sugars, blood pressure and/or cholesterol. One

participant even boasted about a sprained elbow caused while playing basketball, a sport he thought he would never enjoy again after the heart attack he suffered before attending LEAP.



**The research was supported by the U.S. Department of Agriculture's National Institute of Food and Agriculture; Agricultural Research Service; the Oregon Beef Council; the Oregon Agricultural Experiment Station; the University of Idaho; and the International Center for Agricultural Research in the Dry Areas.*



Cattle spend **limited time in streams**

Using precise tracking technology, a five-year study by OSU Extension Service found that cattle spend less time in streams than most people think—the average is between 1 and 2.5 percent of their time on the range.

John Williams, an Extension rangeland expert based in Wallowa County, Ore., and his colleagues used affordable GPS collars on beef cows allowing the researchers to map their positions over the paths of rangeland streams across five spring-to-fall grazing seasons. They discovered that the cows went down to the water when they needed to drink or cross, but did not typically linger there. They spent most of their time grazing on higher ground or resting on dry areas away from the stream.

The collars recorded the cows' locations about every five minutes, yielding more than 3.7 million data points over the five-year study. "With this GPS technology, **we can get a body of data we can really analyze, and we can start answering controversial questions with confidence,**" Williams said.

Cattle grazing, especially on public lands, has been controversial at least since the 1980s, when ecological studies started to document the environmental damage done to rangelands from a 150-year history of livestock grazing. These findings and public pressure led to the adoption of grazing management practices aimed at protecting streams while still allowing livestock use.

The cows only used about 10 to 25 percent of the stream area, avoiding steep and slippery banks and inaccessible areas. Williams noted that all the study areas also contain non-stream sources of water, such as developed springs and ponds. In some months, cattle drank exclusively from these man-made sources, suggesting that they are useful range management tools that encourage decreased use of streams and riparian areas.

◀ Coastal Communities *Continued from front*

Strong community stakeholder support and engagement distinguished a successful NNMREC grant proposal—worth up to \$40 million—from competitor sites. The Department of Energy grant, announced in December 2016, is for the design, permit, and construction of an open-water, grid-connected national wave energy testing facility.

“I’ll never forget watching the FINE committee draw on a National Oceanic & Atmospheric Administration chart with a Sharpie pen,” Jacobson said. “The space would eventually become NNMREC’s open ocean test berth.”

**NNMREC was established in 2008 by the U.S. Department of Energy to facilitate the development of marine renewable energy technologies via research, education, and outreach. University partners include Oregon State University, University of Washington, and University of Alaska Fairbanks.*



Hi, I'm Kaety!

I work with many different people who care about the ocean and coastal communities.

Bringing these people together helps OSU make decisions about where and how to test devices with little displacement of others.



Grant funding for outreach and engagement work **grew significantly in 2016**, building OSU's capacity to respond to social, economic and environmental challenges.

\$44,223,292

Total Grants Received in 2016 for Outreach and Engagement Work.



Download the Free Book

Coping with Caregiving: How to Manage Stress When Caring for the Elderly

catalog.extension.oregonstate.edu/pnw315

*“Community-engaged research starts with identifying a social, economic or environmental challenge. Then OSU faculty, staff, students and community members go to work—bringing expertise and existing knowledge together to add value and fill gaps through collaborative discovery of solutions. **Applied research makes an immediate difference and builds a pool of useful information for other communities to tap.**”*

— Dr. Scott Reed, Vice Provost, University Outreach and Engagement



The Division of University Outreach and Engagement connects Oregon State University to the rest of the world by making its educational programs accessible wherever and whenever people need to learn. The Division provides leadership across campus for the outreach and engagement mission.

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