



Photos by Joel Donaldson

A Nevada fish story

Scientists probe reservoirs for answers to fish safety

Dark clouds form on the horizon, signaling the onset of another storm, as Melissa Markee drills a hole through ice to measure the pH of the frigid water beneath the surface. The air is cold and dry at the Wild Horse Reservoir and she can barely feel her hands and feet.

Alice Good '78 is an emerita communications specialist with Cooperative Extension.

Natural Resources. “Most of our reservoirs are desolate, off dirt roads, far from the cities. The

company I keep are bald eagles, antelope, deer, ducks and pelicans.”

Markee is in her second year of water sampling at five northern Nevada reservoirs (the others are Chimney Dam, Rye Patch, Ruby Marshes and South Fork) to test water quality parameters that may be a factor in the accumulation of toxic methyl mercury in reservoir fish.

Markee works with a team of University faculty—Mae Gustin, natural resources and environmental science associate professor, Susan Donaldson, Cooperative Extension water quality specialist, and Kerry Seymour, Cooperative Extension nutrition specialist—and scientists with the Nevada Department of Wildlife. Funded by the U.S. Department of Agriculture, the researchers are generating data on the factors responsible for high mercury concentrations in reservoir fish, and developing a public education program for consumers and reservoir managers.

Where does the mercury in fish come from?

In 2006, 80 percent of the national fish

TOP: Graduate student Melissa Markee, 26, measures the pH of the water at Wild Horse Reservoir during the winter. INSET: Markee collects water samples during the summer from Wild Horse Reservoir using a Van Doren sampler.

consumption advisories were for mercury, with 48 states issuing more than 3,000 warnings. NDOW indicates that mercury in fish from some of Nevada’s reservoirs and lakes exceeds the Environmental Protection Agency standard of 0.3 parts per million. A number of Nevada waterways were impacted by gold and silver mining in the late 1880s, which left residues of mercury used in extracting the precious metals.

In the reservoirs, some water quality



TOP: The Ruby Marshes have a desolate beauty all their own during the winter. LEFT: Markee turns the air flow on to bubble reservoir water samples onto traps to test for methyl mercury. RIGHT: Cooperative Extension faculty Sue Donaldson (left) and Kerry Seymour discuss the results of a survey of licensed fishermen to determine their fish-consumption habits.

parameters have been identified that may influence the production of methyl mercury, the neurotoxin taken up by living organisms that is dominant in fish tissue. Recent studies have suggested that the level of draw down and the timing of filling and release of water can impact this type of mercury production. And there is national debate as to whether mercury in the air might be the predominant source of mercury in fish.

“Currently we do not understand the primary drivers for production of methyl mercury in our reservoirs,” Gustin says. “There has been some work done for lakes but little for reservoirs.”

Donaldson adds, “We hope that data developed in this project will lead to understanding of how reservoir management affects methyl mercury production in reservoirs and concentrations in fish. We also hope to better manage human risk for mercury ingestion by studying fish consumption patterns and helping consumers make appropriate dietary choices.”

How much fish should we eat?

The American Heart Association recommends eating fish twice a week, especially those rich in Omega-3 fatty acids, as part of a diet that promotes cardiovascular health. On the other hand, the media has trumpeted the mercury-based fish advisories,

raising confusion and fear among the public. Mercury toxicity can affect the brain, nervous system, kidneys and the immune system. Babies and young children are at highest risk for mercury exposure.

To learn more about Nevadans’ fish-eating habits so that recommendations can be made about the role of fish as part of a healthy diet, Nevada researchers drafted two fish-consumption surveys. The first, distributed by NDOW to licensed fishermen, yielded nearly 1,900 responses.

“We were wondering if the fish-consuming habits of anglers might be different than others and possibly put them at risk for eating fish more often than recommended,” says Seymour. “However, we found that fewer than 6 percent eat fish twice a week. At the same time, the fish portions of more than half the fishermen surveyed are double the recommended deck-of-cards serving, indicating that about 12 percent are eating the recommended weekly amount of fish.”

Seymour and Truckee Meadows Community College dietetic interns Deanna Bradburn, Teresa Liebman and Anna Shepherd, prepared a similar survey of seafood consumption among the general public, randomly selected across northern Nevada. The results will be compared with national data and the data from the fishermen survey, and recommendations made about fish

selection and consumption guidelines in fact sheets and at workshops for water managers and the public.

The role of a graduate student

“Melissa’s doing a wonderful job,” says Donaldson. “She’s taken a very challenging project with a lot of facets, and is making the extra effort needed to understand the processes at work in determining mercury accumulation in fish.”

Markee, who graduates in May, is a native Nevadan who has had only one B in a nearly 4-point GPA during graduate school.

“The things that appeal to me on this project are the outreach and teaching aspects. I can spend all these hours in the lab, but I know I can share this knowledge and make an impact in the community,” Markee says.

“I’ve kind of grown up at the University,” Markee adds. “I like the small classes, and I feel like the faculty know me and know what I do. It’s comfortable but challenging at the same time.”

Gustin says, “Melissa is a careful scientist, and this project not only benefits the people of Nevada, but it advances our understanding of mercury in the environment.”

For more information on the Mercury in Fish project, contact Mae Gustin, (775) 784-4203, or mgustin@cabnr.unr.edu.

Photo by Melissa Markee

Photo by Alice Good

Youth take the first steps toward science careers

Christian Senda, 12, is eager to show people how they can conserve water in their potted plants through the use of superabsorbent polymers called hydrogels.

"I think the hydrogels would help my mom keep her plants alive," says the Carson City Mark Twain Elementary School student. "My friends and I are also excited to learn if the hydrogels could be used in disasters such as gasoline spills or maybe oil slicks."

Hydrogel polymers are long molecule chains that grab onto water molecules.

Senda, together with Mark Twain students Jose Sepulveda and Cindy Cardenas, celebrated the first 4-H National Youth Science Day, Oct. 8, by demonstrating water conservation experiments at the University of Nevada Cooperative Extension office in Carson City.

Alice Good '78 is an emerita communications specialist with Cooperative Extension.

The youth joined with more than 300 other students who conducted experiments in clubs and after-school programs throughout Nevada, as well as thousands of other sites around the country. This national science initiative hopes to inspire the six million 4-H members to explore scientific careers, and in turn, make a difference in their communities.

"The new campaign champions the national goal of attracting one million new youth to the 4-H science, engineering and technology programs in the next five years to help our country remain globally competitive," says Karen Hinton, Cooperative Extension dean and director.

How hydrogels can help conserve water

Members of the Pyramid Lake and Silver



Pyramid Lake 4-H Club members Cristal Rosales-Vega and Tyler James measure a drink mix in an experiment showing hydrogel's ability to retain water in soil in a demonstration on campus.

Paws 4-H Clubs showed that hydrogel polymers can absorb water and be used in environmental applications at the University's Mathewson-IGT Knowledge Center on Science Day.

Sabrina Nelson, 13, and Tenaya James, 12, collected a sample of hydrogel from the cotton and plastic lining of a clean, disposable diaper. The two then placed the stuffing material and plastic lining into a zipper-lock bag. After shaking the bag, they removed the powdery hydrogel polymer from the stuffing. When they mixed the powder with water, it became a gooey solid, showing it was able to absorb water from the diaper.

"It's fun to see how we can help the environment by saving water," says Nelson, an 8th-grader at Traner Middle School in Reno. "We need to start realizing that if we don't start, no one will."

Sarah Chvilicek, coordinator of 4-H youth development programs, says she is hopeful that more young women such as Nelson will consider careers in science, as they are underrepresented now.

In the second experiment, Tyler James, 17,

and Cristal Rosales-Vega, 10, poured potting soil into two clear plastic bottles. In one bottle, the pair mixed 1 tablespoon of hydrogel into the potting soil. Then they mixed a packet of unsweetened powdered drink mix into a cup of water, and poured a quarter-cup of solution into the two soil soakers. The bottle with hydrogel absorbed the liquid into the soil while it seeped through the soil in the other bottle.

"This experiment shows there's a potential for conserving water for indoor and outdoor plant use," says Mark Walker, who mentored the students. "The hydrogels change the infiltration rate in the soil, slowing down evaporation so we don't lose it."

Walker says the experiments open the door to a wide range of important questions, which is what science is all about. This kind of demonstration could be a starting point for these and other students, who might later conduct research that could change the way we use water.

Walker is environmental sciences graduate program director, state extension water quality specialist, and natural resources and environmental science associate professor.

How science programs expand 4-H offerings

4-H clubs in Las Vegas took advantage of the national science day to encourage youth and their parents to form more local clubs based on science, especially in urban areas.


“Kids in the city don’t always have room to raise swine or horses, but there are a lot of other sciences they can experiment with,” says Walter Barker, 4-H youth development specialist.

Barker says there are 12,000 youth participating in 4-H in southern Nevada. Science clubs experiment with Global Information Systems (GIS) and Global Positioning Systems (GPS) units, alternative energy, robotics and rocketry.

“These programs reach youth who otherwise don’t have the chance to build robots or launch rockets and give them a

relaxed environment away from school,” says Sandy Sanders, a community-based instructor. “It’s a fun environment with their friends and it gives youth more time to expand their interests.”

Silverado High School student Alyssa Barker, 16, says the 4-H space program gave her the chance to experience a flight simulator and meet an astronaut.

“In school, there’s a lot more paperwork,” she says. “In rocketry, we spoke to an astronaut and asked him questions. In class, we would have just read what he says.” 



Pyramid Lake 4-H Club member Tenaya James, a 7th-grader at Mendive Middle School in Sparks, shows the solid form the hydrogel powder turned into after absorbing water from a diaper.

For more information on 4-H programs in Nevada, contact Steve Schafer, (775) 784-6207, or schafers@unce.unr.edu, or your local Cooperative Extension office.

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Joe Bradley

Joe Bradley '78 (economics)

Throughout my life, I have learned the importance of an education—not only to acquire knowledge, but also because it is during your education that you develop lifelong relationships with people who serve as mentors and become friends. It is also important to help those who are less fortunate and continually strive to improve conditions within your community. This is something I do every day in my job as a senior partner at the law offices of Bradley, Drendel & Jeanney and in my philanthropic work as a trustee of the E.L. Cord Foundation, University of Nevada, Reno Foundation, and the Athletic Association of the University of Nevada.

I'm a native Nevadan born in Reno in 1955. I came through the Washoe County public schools, graduating from Reno High School. While I was at Reno High, I started my work career. I fueled airplanes and drove concrete trucks, and it was through those experiences that I truly learned the value of an education. My father, William O. "Bud" Bradley, had also been a lifelong resident of Nevada. He led a very interesting life in northern Nevada, first as a water rights and ranching lawyer, and then branching into injury litigation—which we carry on to this day and have done so in our very location at 401 Flint Street for 55 years.

While I was an undergraduate at Nevada, I met many people whom I still consider friends and who continue to be influential in my life: Mike Reed, former professor and dean of the College of Business, current vice chancellor of finance with the Nevada

System of Higher Education, was my faculty adviser; Nazir Ansari, emeritus professor of management, was my teacher; Ret. Air Force Major General Ron Bath '68 (business and agriculture), '71MBA, was a professor of mine and was instrumental in guiding me toward law school. As I look back on my life, I recognize how important it was for me to attend Nevada, particularly because at the time I didn't realize that I was going to continue practicing law in Reno for the next 25 years. I had a very rich and fulfilling experience at Nevada.

I attended the University of the Pacific McGeorge School of Law in Sacramento. It was there that I met many more interesting and influential people, including the late Dean Schaber, who was the former dean of McGeorge School of Law and former presiding judge of the Sacramento Superior Court.

Law school solidified my desire to continue on in the practice of law doing what my father and his partner, John Squire Drendel, had been doing: representing the rights of injured victims.

My father was an original trustee of the E.L. Cord Foundation, a Reno-based philanthropic organization. The Foundation was established for the purpose of improving the health, education and welfare of the residents of the Truckee Meadows and rural counties of northern Nevada. The work I do in this field is extremely rewarding because I have the opportunity to make changes in the quality of people's lives.

When the Mathewson-IGT Knowledge Center was nothing but a scribble on a piece of paper, President John Lilley approached the Foundation—I'm proud to say—as the first potential, major, private donor. The E.L. Cord Foundation became one of the first private commitments to the Knowledge Center. I like to think our pledge was the springboard for other donors to become involved, and that this magnificent facility exists today, is at least in some part due to our initial involvement.

If people haven't seen the Knowledge Center, the Joe Crowley Student Union or the E.L. Cord Academic and Athletic Complex, they really should take the time to come up and look because I doubt that there's a trio of buildings anywhere on the West Coast that would outshine these three facilities.

From a conversation with Senior Editor Melanie Robbins '06M.A. in October 2008. Bradley, 54, is the incoming chair of the University of Nevada, Reno Foundation Board of Trustees. He is a senior partner with the Reno law offices of Bradley, Drendel & Jeanney, where he has worked for the past 25 years. In 2005, he won a \$4 million jury verdict on behalf of a young, mentally disabled man seriously burned by a defective fryer machine. He graduated in 1978 with a degree in economics. He earned a juris doctorate in 1983 from the University of the Pacific McGeorge School of Law. His wife, Liza, graduated from Nevada in 1996 with a degree in accounting. The couple has two children, Gina and Sam.

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