



UNIVERSITY OF ALASKA FAIRBANKS BRISTOL BAY CAMPUS

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BRISTOL BAY ENVIRONMENTAL SCIENCE NEWS

BRISTOL BAY ENVIRONMENTAL SCIENCE LABORATORY

VOLUME 4 , ISSUE 1 WINTER 2011

GROW WITH THE BRISTOL BAY ENVIRONMENTAL SCIENCE LAB

The Bristol Bay Environmental Science Lab is growing and is anxiously awaiting the move across the street



in 2012 to the soon to be remodeled Napa building. The new lab will contain aquariums with local species, a renewable energy lab and more space to run experiments and demonstration projects.

Dan Dunaway has been busy in the lab this winter calculating caloric energy of the organisms that were collected during our summers trawling season. The results were surprising! Did you know a ninespine stickleback has the same caloric energy as Ruffles potato chips? More on page 3.

Gardening season is right

around the corner and it is time to start planning. BBC just held it's second gardening symposium titled Seeds and Sprouts. Check out gardening on page 2.



In 2009 a seed was planted and a renewable energy program began at BBC, now that seed has grown in to a new Occupational Endorsement in Sustainable Energy. Learn more about this new program on page 2.



Arctic AAAS Division is coming to Dillingham!

Sept 21 -Sept 24 2011

Ecosystems:

Understanding the Cycles

As the Arctic witnesses climate change at an alarming rate, its ecosystems are also rapidly transforming. Science based management and conservation is needed to help determine how our society will adapt to keep nature resilient and healthy. Please join and add to our understanding of the issues that surround maintaining ecosystems and human health.

Visit arcticaaas.org

READING LIST:

- Small Town Sustainability: Economic, Social, and Environmental Innovation
By: Heike Mayer
- The Omnivore's Dilemma: a Natural History of Four Meals
By: Michael Pollan



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FIELD NOTES



Platichthys stellatus
Starry flounder

The starry flounder is a common flatfish found in Bristol Bay, the northern Pacific, Japan and Korea. The starry floun-

der is identified by the presence of both eyes on the same side of the head, a rough feeling body, and orange and white bars marking the anal and dorsal fins.

The Starry flounders found along the coasts of WA, OR, and CA are 50% right-eyed and 50% left-eyed, in Alaska 70%

are right-eyed, 30% left-eyed, and in Japan 100% are left-eyed.

Starry Flounder are found in shallow waters and estuaries during the summer and move to deeper water in the winter. Often outdone by salmon, starry flounder are delicious and can be fried, grilled or baked—just ask Dan.

OCCUPATIONAL ENDORSEMENT IN SUSTAINABLE ENERGY



High School students learn about energy efficiency

In 2009, the Sustainable Energy Initiative was created to help reduce fossil fuel consumption and energy costs throughout the region.

The team has been hard at work creating and offering courses, engaging in community outreach activities and starting research projects. One exciting project is the development of an Occupational Endorse-

ment in Sustainable Energy that the Campus hopes to offer in the near future.

This new degree program will require 13 credits and will be able to be completed in 1 year. Curriculum will be broad-based with a focus on energy efficiency and renewable energy. Some of the courses to be included in the endorsement are Introduction to Sustainable Energy, Home Energy Basics, and Construction Technology Core.

One of the goals is to provide students with the ba-

sic skills necessary to obtain entry level employment in sustainable energy-related industries. There is currently a shortage of qualified, professionals needed to keep up with the increase in energy efficiency and renewable energy projects throughout the state, many of which are in rural areas. This endorsement will be a stepping stone towards more advanced degree programs and vocational training.

The proposal for the Occupational Endorsement was recently submitted to the

UAF governing body for approval. Although the approval process can be lengthy, the Sustainable Energy team is hopeful that the program will become a permanent fixture at the Bristol Bay Campus. -Chet Chambers



Construction Trades Technology student Jacob Nelson cutting a header.

PRACTICAL GARDENING: GET YOUR HANDS DIRTY AND READY FOR SPRINGTIME



Making the right compost mix can be a tricky thing.

Years ago, Hazel Koppenberg told Rae Belle Whitcomb about her dream: host a Southwest Alaska gardening conference

in the Bristol Bay Region and not in Anchorage or Fairbanks. Fast forward to September 2010 where 40 participants from 11 communities in the Bristol Bay Region came together for three days to learn about gardening successes in Southwest Alaska. With help from UAF BBC's Michele Masley and Jodie Anderson, Hazel and Rae Belle's dreams had come true, but the story really just begins here because garden dreams had just begun for many of the participants. In a huge collaborative effort between the Marston Foundation, Bristol

Bay Native Association Workforce Development Program, Bristol Bay Campus, SeaGrant, Bristol Bay Area Health Corporation's Diabetes Prevention Program, American Seafoods, and the School of Natural Resources and Agricultural Science, a practical gardening class was held 04-06 March at the Bristol Bay Campus where 35 students from 8 communities participated. The students began by drawing their dream gardens. This was an eye-opening experience as many of their dream gardens were very manageable and practical for small gardens at their homes or in their communities.

Funding from the collaborators allowed the students to travel to Dillingham and stay for the weekend while the class was held. There was a group of students and their teachers from Manokotak who plan to work with other community members on a garden at

the school. Another group from Manokotak plan to put a community garden in the old village site. New Stuyahok's greenhouse manager was at the conference as well as others planning to plant individual gardens there. Togiak, Twin Hills, Perryville, Newhalen, Manokotak, and Dillingham students plan to plant individual gardens whether they are traditional gardens or container gardens.

Students learned how to plot a garden and decide what vegetables to plant, seed starting, transplanting, tuber planning, lighting/heat improvement, and composting basics. Soil improvement was another important topic, along with how to research vegetable information and seed varieties with seed catalogs and on the Internet. At the end of the weekend, everyone took home seeds and supplies to start a garden as well as having met with a local gardener who



Students plant seeds and take home starts to start their own gardens in southwest Alaska.

will serve as their mentor as the students continue forward as the gardening season advances.

This was one of the largest classes taught at the Bristol Bay Campus and, based on the course evaluation responses, it will hopefully not be the last on gardening. If you would like to participate in a gardening course, please let the Bristol Bay Campus know. There are tentative plans to come together in the fall-time for a celebration of gardening success weekend with presentations, harvest show-n-tell, and question and answer time.

-Jodie Anderson

NEED ENERGY? SMELT OR SNICKERS? SEA STAR OR BIG MAC?

Ever wonder how many calories are in a rainbow smelt or a sea star? It is hard to know without the FDA nutrition label, but here at BBESL we are busy figuring that out. Since 2007 we have been conducting a biodiversity food-web study of Nushagak Bay by using a 3 meter trawl net to collect samples of fish and invertebrates from different locations throughout the bay. Fish species collected include rainbow smelt, black-line pricklebacks, sticklebacks, starry flounder, salmon, sculpins. Invertebrate species include bay shrimp, isopods, amphipods, mussels, clams, sea stars, anemones and many more.

To calculate the calories the specimens are dehydrated, ground to powder, made into pellets, then 'blown-up' using

a bomb calorimeter to determine their gross heat of combustion (GHOC). The GHOC is the caloric energy that the specimen holds. Results range from a low of 2886.926 cal/g for a sea star to a high of 5869.26 cal/g for ninespine stickleback.

So how does this compare to our food? It turns out that a sea star has similar caloric energy to a Big Mac, a rainbow smelt to a Snickers and a ninespine stickleback to a serving of Ruffles potato chips. However, just because two foods have the same caloric energy does not mean that they have the same nutritional value. If your hungry instead of grabbing for a Snickers next time go grab a rainbow



Species	cal/g	Food	cal/g
Sea star	2886	Big Mac	2689
Rainbow Smelt	4899	Snickers	4754
Ninespine Stickleback	5869	Ruffles Potato Chips	5714

smelt and enjoy a high energy snack without the high-fructose corn syrup and other ingredients that are difficult to pronounce. BBESL will continue its study this summer to gain a better understanding of Nushagak Bay's food web.

MEET THE NEW BBESL STAFF



Lilly Capell joined BBESL the summer of 2010 as a Research Aide, and has now been hired on as Microbiology Lab Manager and Research Technician. Lilly earned her Biology degree from UAF in December 2010

and is eager to begin a new career in environmental science. Lilly comes originally from the Mojave Desert in California and moved to Alaska to attend UAF. She has lived all over Alaska from Juneau to Coldfoot and now calls Dillingham her home. Lilly loves to go trawling and see what the net will bring up next. As a result, to her surprise, she has a profound fondness for the isopod and the extreme sport of isopod racing.

Lilly can't wait until break-up so she can begin fishing, beach combing, and berry picking. She is not looking forward to the mosquitoes though. Lilly is also an avid container gardener and loves having home grown tomatoes and lettuce year round.



My name is Kimberly Seybert, I just graduated from Dillingham High school class of 2010. I am attending University of Alaska Fairbanks Bristol Bay Campus, taking a total of 14 credits this semester. I have re-

cently enrolled in the Environmental Studies Certificate after applying for a BBNA internship. I didn't think I was going to be ready for college out of high school this fast but after working with the Bristol Bay Environmental Science Lab it helped step my way back into school. I am looking forward to furthering my education, and have learned that I can do anything if I really wanted to.

When I'm not studying or at work I am usually with my family hanging out with my nieces, mom or hunting fishing or snow machining.



BRISTOL BAY ENVIRONMENTAL SCIENCE LABORATORY

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WE'RE ON THE WEB

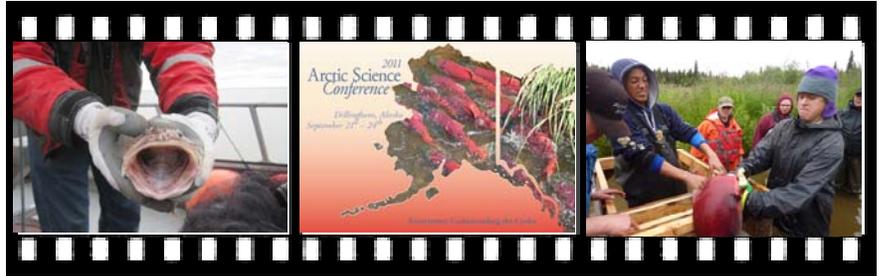
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Bristol Bay Environmental Science Laboratory was established in 2007 to serve the biology and environmental science needs for the Bristol Bay region. Our mission is to increase science literacy and to provide the knowledge and skills necessary for individuals to take an active role in the management of the natural resources in and around Bristol Bay. We are your neighborhood science lab!

NEXT TIME

- Results of 2011 Field Season
- AAAS Arctic Science Division Conference in Dillingham
- Salmon Camp 2011



What will the summer trawls bring up?

Visit arcticaaas.org for more information

High school students struggle to hold on to a salmon at Salmon Camp

LETTERS FROM THE PROFESSORS



Dr. Tomas Marsik
Assistant Professor
Sustainable Energy

A lot of exciting projects are happening at the Bristol Bay Environmental Science Lab. Even though our sustainable energy team has been working hard on developing the occupational endorsement described earlier in this newsletter, we have been active also in other areas. Our distance-delivered Intro to Sustainable Energy class that is taught throughout the spring semester is a part of what is keeping us busy. We are dealing with an unexpectedly high enrollment, but it is certainly a good thing. It is nice to see students from all across Alaska and also from out of state join us. We are continuing with our Passive Office project. Due to many delays, partly because of faulty or wrong equipment delivered to us several times by our suppliers, we were not able to start collecting data on

the energy usage of this super efficient structure until recently, but preliminary results look promising. Other projects, we have also continuing in class are technical assistance to small businesses and facilitating the energy audit process to identify high priority improvement options.

A lot has been done, but even more still needs to happen. For this summer, we are planning to offer a large series of classes on energy efficient construction, teach renewable energy at the Salmon Camp, update our website, continue data collection for our photovoltaic system, and lot more. If you want to get involved in our activities, let us know. Don't forget that even by taking small actions in your own life to reduce the consumption of fossil fuels, you are helping advance the cause of our program!



Dr. Todd Radenbaugh
Assistant Professor
Environmental Science

The Bristol Bay Environmental Science Lab has a high class problem – we are using all our space available and still need more. Between our expanding sustainable energy and ecosystem health programs we are using every nook and cranny available to us. To find equipment seems we are constantly packing and unpacking containers. If we buy one more piece of equipment or hire one more essential employee I feel that our building will burst. That will make for a logistically complicated summer as activities will be a lesson in space management. Already Tom and I need to use shop space at the same time with doing activities that are non-compatible. However help is on the way. With the purchase of NAPA's Dillingham building across the street we will be able to expand. but that is

still two or three years away as the building needs extensive renovation. So we will continue our classes and projects while bumping elbow with our neighbors. As they say in Jamaica when getting on the bus – "small up yourself." It is time for BBESL to follow that advice.

Western Alaska Science Interdisciplinary Conference

March 22nd-March 25th

Bethel, Alaska

Hosted by the Alaska Sea Grant Marine Advisory Program and UAF this 4th WAISC will be the first of its kind to be held in Bethel, Alaska. The intent of this program is to bring together scientists, educators, rural leaders, community members and subsistence hunters to discuss science and issues relevant to western Alaska.

Call 907-842-5109 for information