University of Alaska Fairbanks
Bristol Bay Campus

Bristol Bay Environmental Science News

Bristol Bay Environmental Science Laboratory

Volume 2, Issue 3 **Fall 2009**

Sustainability

Sustainability can mean many different things. The simplest definition is: *capable of being sustained*. UAF BBC and Bristol Bay Environmental Science Lab are determined to increase the sustainability of Bristol Bay, as well as our education programs and community research projects.

Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. The sustainability of our communities and ecosystem depends on the integrity of its parts. Two parts, Lamprey and Isopods are local species we need to know more about. Global issues are affecting lamprey and isopods in Bristol Bay (see p.1 and p.2, respectively).

This summer we held what will be an annual field methods course in Bristol Bay region. Learn about the goals of the course and student projects on p. 2.

Small changes can make big differences. Some changes occurring at UAF BBC include, worm bins composting, aluminum can recycling, and wind turbine research. Learn more about Rural Alaska Energy Conservation on page 3.

Keep an eye out for upcoming courses in composting, home gardening and use of fish wastes. Izetta Chambers, MAP Agent, has big plans for increasing food sustainability in Dillingham (p.3).

Along these lines, Campus Climate Challenge is a movement sweeping the nation and mobilizing students to reduce energy usage at their universities. Read more about this grassroots movement on page 2.

Do you have a great idea for increasing sustainability in Bristol Bay Region? Tell us about it!

Field Notes

Lampetra tridentate

As adults, Pacific Lamprey live in the sea and are parasitic, feeding on a variety of large marine fish. After 1-3 years at sea they cease parasitic feeding and migrate to freshwater to spawn, similar to salmon. Upon hatching, larvae burrow into the substrate where they filter feed for 3-7 years! More needs to be known about their complex life history and ecology. USFWS reports that lampreys were once an important food source for many birds, fish, and mammals but overall numbers are decreasing. Like salmon, they have an ecological role moving nutrients from marine to freshwater ecosystems. In BBESL trawls in Nushagak Bay, lamprey have been observed so they may still be important in creeks and streams throughout Bristol Bay region.

Reading List:

- ***Being Caribou: Five Months on Foot with an Arctic Herd***
  by: Karsten Heuer
- ***Conserving Living Natural Resources in the context of a Changing World***
  by: Bertie Josephson Weddell
- ***On the Edge of Nowhere***
  by: James Huntington & Lawrence Elliot
- ***Always Getting Ready, Upterrlainarluta: Yup'ik Eskimo Subsistence in Southwest Alaska***
  by: James Barker & Robin Barker

Inside this issue:

Jaclyn and Jocelyn making observations and collecting data while on a research cruise in Meshik Bay.

Typical catch during scientific trawling in Meshik Bay during ENVI 260.

STUDENTS INVESTIGATE MESHIK BAY

In August 2009, six students participated in a 7-day intensive field course investigating estuarine habitats in Meshik Bay, near Port Heiden. During scientific trawls 21 species of fin fish were counted including juvenile halibut, Pacific cod, and Alaska Plaice. Twenty species of invertebrates were also caught, including many not found in Nushagak Bay .

Meshik Bay is an example of a classic saltwater estuary, which acts as a nursery for juvenile fish and invertebrates.

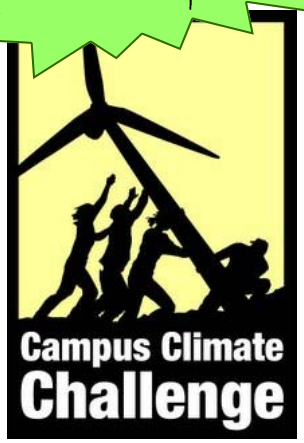
During this course students designed and conducted small research projects that ranged from investigations of hermit crab habitat preference to distribution of mussel beds. Two students followed up this Field Methods with a Reporting Methods where they start to analyze data and organize info into a scientific report.

Jaclyn Reamey-Christensen and Jocelyn Reamey are two students in this course. They are working on projects looking at mussel bed distribution and species diversity, respectively. They are analyzing their data to look for patterns and trends.

Field Methods (ENVI 260) is a course offered each summer at UAF BBC, and will investigate estuarine habitats and species diversity around Bristol Bay.

The course will be offered every year. If you are interested in participating in this course in 2010 please contact UAF BBC .

January 27th
5:00—6:00 pm



CAMPUS CLIMATE CHALLENGE

Are you interested in impacting energy and climate issues at UAF Bristol Bay Campus? Well, Campus Climate Challenge is a national movement uniting 42 organizations and over 631 local groups, and together they have worked to pass 100s of local and regional climate policies.

The Challenge uses the power of young people to organize on college campuses and win 100% Clean Energy policies at their schools.

Other campus groups have organized educational workshops and outreach events, and also evaluated energy-saving options and made recommendations adopted by their university.

If this sounds like a movement that you would like to participate in please contact UAF BBC or swing by the campus January 27th from 5-6pm for a casual informational session on this and other student clubs on campus.

If you would like to learn about Campus Climate Challenge, visit their website at: http://climatechallenge.org

Isopod during temperature preference

Mesidotea entomon habitat

ISOPODS AND TEMPERATURE

BBESL has large isopods and they may be telling us something! The species *Mesidotea entomon* is found across the Arctic, and in Bristol Bay. Temperature tolerance studies conducted at BBESL suggest they seem to prefer temperatures between 5-15°C and temps higher than 20°C can be lethal. Thus, this species of isopod might be used as an Indicator Species, a species that gives early warnings that a ecosystem is changing.

In Bristol Bay, this *Mesidotea* is found on the bottom of most water-bodies where temperatures can fluctuate greatly in the summer months. Often higher then 20°C .

Water temperatures measured in Nushagak Bay and its tributaries, show summer water temperatures can go above 15°C. Are these temperatures within the species tolerances or can they negatively influence populations? Since isopods fill an important role in Bristol Bay, as consumers and recyclers of organic materials (e.g. salmon carcasses) any change in their numbers could influence ecosystem health.

Are you interested in learning more about the effects of temperature on local isopods? Contact BBESL today!

RURAL ALASKA ENERGY CONSERVATION

UAF BBC and BBESL Professor Tom Marsik helped organize and participated in the Bristol Bay Energy Summit, which took place on October 8-10, 2009 in Dillingham. The theme of the Summit was "*Energy Efficiency: The First Step to Renewable Energy*."

On the first day of the Summit, UAF BBC held an "Efficient Car Show," during which, residents of Dillingham owning efficient vehicles displayed their cars and provided information to those residents who don't own efficient vehicles yet and are exploring options. UAF BBC also gave a tour of the now fully functioning 4 kW photovoltaic system installed on the campus building.

On the second day of the summit, UAF BBC presented an overview of our sustainable energy activities, and was also represented in a panel during a discussion of financial and technical assistance.

On the third day, Tom held a workshop on advanced lighting technologies. Dr. Marsik also organized a class associated with the Energy Summit. Students actively participated in the Energy Summit via networking and attending all events. Besides learning about the state and regional energy situations, participants of the Energy Summit obtained practical knowledge of how they can directly reduce their fossil fuel consumption. A summary of steps that yield the "highest bang for the buck" in a typical home is below:

- **Retrofit** lighting – replace incandescent lamps with compact fluorescent lamps and replace linear T12 fluorescent lamps with T8s.
- **Replace** old inefficient refrigerators with new Energy Star refrigerators.
- **Add** insulation to your attic. Consider blown-in cellulose.
- **Insulate** your crawl space.
- **Weatherize** windows using a window insulation kit (heat-shrink plastic film taped to window frames).

This gray box is a fancy electrical box, called an inverter that connects UAF BBC's solar panels to the electric grid.

MARINE ADVISORY PROGRAM AGENT

Izetta Chambers joined the UAF Marine Advisory Program (MAP) in August 2009. She is originally from Naknek, where she and her family own a small fish processing plant - Naknek Family Fisheries. Izetta recently graduated with her law degree from University of Arizona College of Law. In her new position as MAP Agent, she is committed to helping fishermen gain the skills and knowledge necessary to market their catch directly, in order to bring more quality and value to the Bristol Bay salmon harvest. Izetta is also passionate about sustainability, and even writes a blog on the topic (http://sustainabledillingham.blogspot.com). She is currently working on a project to produce fish-based fertilizers to increase soil fertility for small-scale agricultural operations in the region.

Alaska Permaculture Gaining Strides

A new social networking site has formed to bring individuals interested in permaculture in Alaska together. The website (http:/www.akpermaculture.ning.com) is an excellent forum for sharing information, informing members of events, and providing a forum on topics relating to permaculture, including: sustainability, gardening, and the local movement in Alaska. If interested in joining, simply sign up as a member. As of the end of November, there were 141 members, most of them from Anchorage. However, there are some excellent resources available on the site, and a lot of knowledge to be shared. Since we don't have a Cooperative Extension Agent here in the Bristol Bay region, Izetta aims to bring information relating to gardening and small-scale agriculture to the region. Because the Marine Advisory Program is an extension program (similar to Cooperative Extension Service), our local MAP Agent has access to information from CES and hopes to encourage sustainable agriculture in the region. If you are interested in putting in a garden or would like more information on gardening, call (907) 842-8323 for a free consultation.

Sea Grant Alaska

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WE'RE ON THE WEB

WWW.UAF.EDU/BBESL

Many of these projects are funded by

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 provided 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

- WAISC: Are you doing research in Western Alaska? Come to Unalaska.
- Winter Solar Power: How much energy can you produce?
- From Trash to Energy: Is biomass combustion an option in Bristol Bay?

In March 2010, WAISC will be held in Unalaska.

Solar panel installed on BBC will produce electricity year-round.

Solid Waste may be an alternative energy source in Bristol Bay.

LETTERS FROM THE PROFESSORS

Dr. Tomas Marsik
Assistant Professor
Sustainable Energy

The Bristol Bay Environmental Science Lab and its Sustainable Energy Initiative has had a successful start. Thanks to our faculty, staff, interns, and many others involved in our activities, a lot of things have been accomplished. We have taught a class on Bristol Bay energy, which was associated with the Bristol Bay Energy Summit. We have held a highly successful weatherization class, which was well attended and sparked a lot of enthusiasm. We have held lighting workshops and have installed a 4 kW grid-tied photovoltaic system, which now serves as an educational tool for the community, and reduces the amount of diesel generated electricity that our campus uses. A small windmill was also installed for class demonstrations of a battery-based renewable energy system. Many things have been accomplished, however, a lot more must be done. We are preparing new sustainable energy classes and are looking into possibilities for establishing an Occupational Endorsement in Sustainable Energy. We are working with several entities on the Wind for Schools program for the Dillingham, New Stuyahok, and Togiak high schools. With the USF&WS in Dillingham we are designing a solar hot water system for one of their residences, which will also serve as an educational model. We are starting a program for small businesses using a USDA Rural Business Enterprise Grant. We are starting to participate in updating the City of Dillingham's Comprehensive Plan.

Yes, there is a lot we are working on, but remember that we need everyone's help. Any small action in our everyday life matters. Only via cooperation we can make a sustainable Bristol Bay and beyond.

Dr. Todd Radenbaugh
Assistant Professor
Environmental Science

Bristol Bay Environmental Science Lab is involved in projects from Meshik Bay to Togiak, that teach us about our relationship with the environment. A common theme is that our communities may not be sustainable. Sustainable development is value-driven, and assumes that communities have a common future. That means all segments of society must work together for the good of the whole.

BBESL is committed to sustainable development by helping address regional environmental issues. We need to be good stewards of resources passed on to us and we need to be environmentally literate citizens. The concept of sustainability is difficult to define; it can only come when communities have an understanding of how local economy, nature, and society interact. Sustainable development requires knowledge and respect for:

- *values of diverse populations stewardship of the natural world*
- *vibrant economic activity that respects the rights of future generations*
- *commitments to social justice, and*
- *protection of Earth's diversity, from cells to ecosystems.*

Sustainable development also requires active citizens with common values. We must ask questions like, what is our generation doing to those that follow, and what services do ecosystems offer society for free. We need to enact sustainable practices in our businesses, education system, civic engagements, and community connections. Remember, the sum is greater than the whole and collective actions have economic, social, and environmental consequences.

I invite you to explore the concept of sustainability as it relates to yourself and community. You will discover that your actions will both promote and hinder local sustainable efforts. A sustainable community won't be built without your help – so please remember to learn and share knowledge, then assist in creating a sustainable future for everyone.