The Experiential Learning Coordinator has compiled a list of over 50 professional contacts (primarily within Alaska) that could lead to employment of UAF fisheries students. All employers we have contacted have given positive feedback regarding the process of student hiring and evaluation in coordination with the SFOS Fisheries Experiential Learning Program and have had no suggestions for improvement and alteration.

Quote from Shawna Karpovich, Alaska Department of Fish and Game

“You were easy to communicate with and the program was very easy to initiate (I’m used to tons of paperwork associated with government work). I am plased that Kelly [Walker] got this experience and I know that she made some connections there who would be more than happy to give her glowing recommendations.”

Students have even more glowing reports regarding their summer experiences (see Appendix I for student-authored summaries of their experiences).

Future Plans for Objective 1:
The School of Fisheries and Ocean Sciences will hire a new Assistant to the Experiential Learning Coordinator. The primary focus of the new position will be to contact potential employers and create “employer profiles” for students to peruse when considering their summer employment. Our particular focus will be to expand job opportunities for students in the private sector, particularly with employers in the Seafood and Seafood Science industries (e.g., Icicle Seafoods). Job announcements will continue to be posted on UAF’s Blackboard system.

For the spring semester, the Experiential Learning Coordinator and the Assistant will host two workshops: one on resume and C.V. writing, the other on cover letters and interview skills and on-the-job professional conduct. The coordinator will also develop an Experiential Learning Handbook for faculty, employers, and students and develop a small questionnaire for employers on their experience with the experiential learning program and continue to seek verbal feedback from student employers.

Accomplishments for Objective 2: providing research and mentoring opportunities for undergraduate students within UAF SFOS Oceanography and Marine Biology programs.

The support from PCCRC is allowing students to gain research experience in a laboratory environment during the academic year in fisheries and marine sciences within SFOS. With support from the PCCRC, we offered stipends to three students in Spring (09) semester, who participated in research in three laboratories under the supervision of SFOS faculty. Below is a summary of their projects:

Spring 09 student, Shelley Woods. Faculty Supervisor: Dr. Sarah Mincks. ANSEP (Alaska Native Science and Engineering Program) student. Project Title: Ecology of Antarctic Polychaete Worms.

Summary: Shelley assisted in a project examining the composition and reproductive status of adult polychaetes found in sediment samples from the West Antarctica Peninsula shelf. The work tests the hypothesis that warming-related spikes in productivity resulted in a change in the
reproductive strategies of polychaetes. Shelley assisted in the sorting of sediment samples by identifying, counting, and measuring target species. Subsequently, she conducted basic histology and analyze egg size-frequency in sections. Shelley’s work is a component of a larger research program on the decoupling between benthic and pelagic ecological process on the Antarctic continental shelf and the role of pulsed inputs of organic detritus on the benthic ecosystem. Shelley’s project will continue into the spring, and her data will contribute to a manuscript that she will co-author. As part of her Fish Ecology class this spring (professor: P.I., Amanda Rosenberger, Shelley conducted a comprehensive literature search on her subject to contribute to this manuscript.

Spring 09 student, Daniel Vaughn. Faculty Supervisor: Dr. Katrin Iken; Graduate student supervisor: Tania Spurkland. Project Title: Resource allocation in sugar kelp, *Saccharina latissima*, under varying environmental conditions in Kachemak Bay, Alaska.

Summary: Dan is assisted Dr. Iken and Ms. Spurkland on several experiments on sugar kelp to determine if high glacial melt is having a dramatic effect on coastal kelp beds through localized increases in sediment and decreases in salinity. In the lab, chemical defense levels in the kelp will be assessed using acute toxicity tests; Dan is assisting with those tests and conducting preliminary analyses; results from his work have potential to be publishable.

Spring 09 student, Seth Wietgrefe. Faculty Supervisor: Dr. Trent Sutton; Agency supervisor: Jim Fish, Alaska Department of Fish and Game. Seth is a non-traditional student, part-time father, and veteran. Project Title: Hatchery rearing of Arctic grayling

Summary: Seth assisted in an ongoing study examining post-hatch early rearing and feeding of Arctic grayling (*Thymallus arcticus*) at the Alaska Department of Fish and Game’s (ADF&G) Fairbanks Experimental Fish Hatchery (FEFH). Arctic grayling will be annually cultured in ADF&G’s new Ruth Burnett Sport Fish Hatchery (RBSFH) beginning 2010-11. However, the early rearing and feeding of Arctic grayling in captivity has historically been problematic in ADF&G facilities, where larval rearing survivals have typically averaged ~59% or less. This study will expand on work begun in 2008 at the FEFH to examine feed and rearing strategies for newly-hatched larval Arctic grayling. These strategies will eventually be implemented for annual fish production at the new hatchery once it becomes operational.

Future Plans for Objective 2:
I request continuance of funding from PCCRC to sponsor, as residual funding allows, for additional students to participate in UAF research for Summer and Fall of 2010. 2009 students did not take advantage of all of the funding available; evaluation of residual funding suggests that we can sponsor part time work for at least 2 students in Fall of 2010.

Accomplishments for Objective 3: Organize an undergraduate symposium that will highlight student research and hands-on learning experiences and provide opportunities for students to present their research results in professional settings (society meetings).

This spring, we held a PCCRC-funded experiential learning symposium, with one faculty speaker (Amanda Rosenberger) and three student speakers (Daniel Vaughn, Shelley Woods, and Kyle
Schumann) that highlighted the newly developed experiential learning curriculum and the particular lessons that can be learned from hands-on learning, in particular, their PCCRC sponsored in-school internships. Students summarized their occupational field experiences to an audience of students. The event was hosted by the student subunit of the American Fisheries Society (AFS) and was well attended. Catered food provided by PCCRC insured good attendance by both faculty and students.

Two of the student symposium speakers (Shelley Woods and Kyle Schumann) were selected to accompany me to the national AFS Meeting held in Nashville, Tennessee (funded by PCCRC). There, the students participated in a variety of activities that enhanced their professional development, such as a student-colloquium, -mentor luncheon, -section meetings, and -social. For both students, it was a life changing experience that gave them new focus and purpose in their careers.

Future Plans for Objective 3:
I request continuance of funding from PCCRC to sponsor another experiential learning symposium and student and faculty travel to the 2010 AFS meeting held in Pittsburg, PA.

Accomplishments for Objective 4: facilitate involvement and recruitment of rural Alaskan students in the program through participation in an NSF-sponsored field course for Alaska high school students that applies towards undergraduate credit at UAF (Nunivak Island Science Camp). In June of 2009, the School of Fisheries and Ocean Sciences supported an NSF-funded summer science camp on Nunivak Island supported by the Nunivak Island Mekoryuk Alaska (NIMA) Corporation and the Nunivak Island Cultural Education and Adventures (NICEA). The goal of this science camp was to encourage high school students from the Yukon-Kuskokwim Delta to consider a career in Science and Technology and to pave their way toward an academic education. SFOS faculty Dr. Amanda Rosenberger taught a 2-week long fisheries curriculum (see Appendix II for the syllabus) and exposed seven Yukon-Kuskokwim native students to fisheries field methods (Table 1). All of the students were fantastic participants in the class (all passed) and very much enjoyed the experience (Plates I-IV). The class included both laboratory and field exercises, and lectures covered a variety of topics, including basic descriptions of the fisheries field, fish anatomy, field methods, and fish ecology (Appendix II).

Plate I. Amanda Rosenberger, instructor, demonstrates seine methods and investigates the catch with Nunivak Island students (From left to right facing the camera, Amanda Rosenberger, Tiffany Andrew, Kira Wilkinson, Samantha Moses, and Cody Lewis; left to right with backs to the camera, Mitchell Forbes and Jalene Herron; Photo credit: Robert [Chip] Carpenter).
Plate II. Colin Atti, student, shows off part of the catch, a starry flounder (Photo by Amanda Rosenberger, P.I.).

Plate III. Students, Jalene Herron and Kira Wilkinson (background), work with Tiffany Andrew and Cody Lewis (foreground) to identify fish and take data on length and weight (Photo by Amanda Rosenberger, P.I.).

Future Plans for Objective 4:
It is anticipated that the fisheries curriculum will not only continue to be part of the science camp in the future but also grow to a larger component, ultimately allowing the participating students to acquire credits towards an undergraduate degree at UAF. The NSF funding for the class; however, is no longer available; however, Martin Leonard, program director, is working on having the program taken over by the Alaska Native Science and Engineering Program (ANSEP). UAF SFOS has been partners with the ANSEP program in its new undergraduate expansion and would gladly continue to work with them in this effort.

Conclusions
The Experiential Learning curriculum at UAF SFOS involves students from pre-college to upper-classman undergraduates in hands-on learning, providing continuing mentorship and guidance that can lead to a successful professional career in the fisheries industry, government agencies, non-governmental organizations, or academia. Support from the PCCRC has been instrumental for this
academic program, adding additional experiential learning opportunities for UAF undergraduate students interested in careers in fisheries. Practical research and field experience in academic or professional settings offer students inspiration, lasting lessons, and the foundation for future careers. Further, students also benefit greatly from additional attention and mentorship from SFOS faculty, some of which would otherwise have minimal contact with these students. This summer (2009), we will export these opportunities to Alaska Native students participating in the Nunivak Island Science camp with the intention of paving their way towards and enhancing their chances at an undergraduate education in fisheries at UAF SFOS.
Appendix I – Student Internship Summaries

The following are student-authored summaries of their Summer Internship experiences; it will give the reader an excellent idea the range of student experiences and their enthusiasm for the program. The papers below are scanned from hard copies turned in by the student. The Experiential Learning Coordinator, Amanda Rosenberger, wrote markings on Shelley Wood’s paper. Authorship and page number of the summary assignment is indicated at the bottom of each page of the Appendix.

Shelley Woods
2009 Internship Summary
Kvichak Smolt Sonar Project

My second year as a sonar technician working with the Bristol Bay Science and Research Institute (BBSRI) was exciting! The short time spent in Igiugig was spent facing technological challenges and fine tuning sampling techniques. The first week was slow, with ice still looming in Lake Iliamna, waiting for a storm to push it down toward the inlet of the Kvichak River. Our crew spent a few days setting up sonar stations, an incline plane trap, and an experimental fyke net. None of our equipment was deployed as soon as possible because of the threat of ice flow which would rip expensive equipment from the bottom and destroy nets and traps.

One sonar system was deployed, but removed the next day, due to ice flows. After that occurrence we thought the ice was finished. Both sonar sites were dragged into the water using cables and a chainsaw winch. The sonar transducers are mounted on aluminum sleds, and are situated in the sediment, and attached at both banks. The sonar beams upward and records the passage of smolt as they pass through the Kvichak River from the Lake Iliamna drainage with a goal of Bristol Bay, then the Bering Sea and Pacific Oceans.

The sonar stations create an abundance estimate by using EchoView, a computer program to edit the data for boat noise, programming glitches called noise spikes, and wind/rain/iceberg noises. EchoView is then used to gather the raw data and integrate the echograms to calculate abundance of smolt passing. Water velocity is also used in calculations of abundance. To determine the age composition of out-migrating smolt the Alaska Department of Fish and Game takes age-weight-length, scale samples, and length frequency of a goal of 600 fish per night. 6 separate samples of 100 fish each are taken, with a minimum of 5
minutes between samples, so that a distribution of the migration each night can be
determined.

Originally a large fyke net with a live-box on one end was brought out to be used. This
fyke net style was not suited for the deep swift Kvichak River. An Incline plane trap which was
designed in 2000 was towed to the sampling site and used in the main channel. This trap is
successful on dark evenings as the fish cannot avoid it in the thalweg were the velocity is
greatest. Sampling was successful using this method, and the greater number of age-2 fish
sampled is either due to a change in bias because a different sampling method was previously
used, or a change in the composition of the run. The biologists using the smolt data may never
know which of the two is true. **Need to pair methods**

Besides sampling every night, I was in charge of starting generators each evening,
checking the echograms of each transducer to make sure they were not over-turned, swapping
a storage device and editing the data from the swapped device, and transmitting water
temperature data to a fisheries manager. Each of these tasks went well every day except the
data editing. A processor and program were created to take the raw echograms and compress
them so they could be edited on a camp computer in the cabin. The editing would have
provided in-season estimates of smolt abundance and prevented a winter position of data
editing.

The processor and program responsible for creating compressed files stopped working
on 5/31 at site 1 and 6/2 at site 2. One possible explanation was that some of the echograms
contained too little or too much information, which could be from the transducers taking too
little or too much data. The program was unable to compress files beyond the points described
above, so I was only able to edit a few days worth of data for each site. We did, however, get
the data from the main run edited. My objective to plot run strength and calculate abundance
was not possible, as the data past a certain point was not edited. I did, however, learn a lot
about networking computers, transferring many gigabytes of data between two computers,
troubleshooting EchoView and the compression program, and editing echograms using
EchoView. Good learning experiences! were

Although we had issues with ice and computer programs, all the data was taken and
stored in 3 places for editing this winter. The scales and age-weight-length data taken were
analyzed and the work done will contribute to management decisions made by ADF&G

biologists. All-in-all, I enjoyed my second year as a smolt sonar technician, and useful data came
of cooperation between ADF&G technicians and.

Great!
Anna Deveraux

Summer Internship 2009 Summary

This Summer I did an internship with the Bureau of Land Management (BLM) as a Hydrologic Technician. Before I technically started working there I had to do a lot of training. I did ATV training, helicopter and small plane safety, bear safety, gun safety, a defensive driving class, CPR training, and wilderness first aid classes. Now I’m certified in wilderness First aid. Also one of the most important things I learned was backing up a trailer even though it wasn’t a class. It was definitely one of most difficult tasks to learn because it was difficult in doing the opposite of what you wanted to do. But when my supervisor, Ben, told me this different way it was a piece of cake. You just have to start off straight, put one hand at the bottom of the steering wheel and you just take that hand and turn it in the direction you want to go, so you don’t have to try to think opposite.

My schedule usually went like this; every day I worked from 8am-5pm unless we were out in the field then it would be as long as it needed to be until we were finished. Every Tuesday and Thursday we would go out in the field for a whole day and do water quality testing. When we were out in the field we would do certain tasks required for certain areas. We would do survey levels, YSI readings, discharge measurements, gather a 1 liter water sample, grab ISCO bottles from the ISCO sampler, and once in a while a 3 liter water sample along with a sediment sample. On Monday, Wednesday, and Friday, we would either enter data into Excel work books or we would get the water samples that we got on Tuesday and Tuesday and process them and send them off to labs. Once School started I went to part time working from 1-5pm Monday, Wednesday, and Thursday. I’ve been processing data from unattended sampling from the YSI and other equipment and putting it into excel books all organized with graphs for the 2009 season.

This internship really allowed me to learn so much more information about Alaska that I never really learned in Alaska Studies. Also in this internship I did so many things that I thought I would have never done such as riding in a helicopter, a float plane, or even going to Chicken, Alaska. This internship really helped me finalize my future career goals or at least narrowed it down; now I know for sure that for a future career I want to be outside helping the earth in any way I can even if it’s just for a little bit every once in awhile. I’m so glad that I got this opportunity at the Bureau of Land Management with Ben Kennedy this summer, I’ve learned so much and I’ll never forget this experience.
Summer with Fish and Game

Working for the Department of Fish and Game this summer was the best working summer I’ve had. I got to see parts of Alaska I would probably never get to see if I wasn’t employed with the Department. I also got to do some things for the first time, like fly in small planes (which was a little different than expected) and visit remote villages.

My summer started off with a trip to Volkmar Lake outside of Delta for a Northern Pike mark-recapture experiment. One thing that stuck out to me as being very cool were the numerous pike we caught from a previous project done in 2001. Next up for me was a trip to Summit Lake in Wrangell-St. Elias National Park where we were out stocking rainbow trout to reduce the population in the lake. We removed over 8,000 trout in 10 days, which was quite an experience handling that many fish. For the month of July I worked on the Chena River counting tower where I counted Chinook and Chum salmon on their way up river to spawn. After the counting was all done it was time to carcass, which was a little interesting this year due to the low water level on the Chena. To finish up my summer I went to the Kobuk River for a Sheefish radio telemetry project. For 2 ½ weeks I caught Sheefish with rod and reel and surgically implanted radio tags, which I thought was pretty cool. The boat trip down to Kotzebue after we had put out our tags was really neat because we got to stop at all of the villages along the way and I had never been to a remote village before.

The skills and knowledge that I have acquired over the past three months that can be applied towards a career in fisheries and more importantly everyday life are by far the best things I have brought away from this summer.
Mark Setzer

Dr. Amanda E. Rosenberger

Fish 290

22 August 2009

Fisheries Internship

The internship I was able to experience proved to be very beneficial in refining my career goals. I have learned much over the past three and a half months working at Murray Springs Fish Hatchery in Eureka, MT. Some broad topics that I learned more about are fish related work, dealing with the public and working under management.

One of the more interesting things I learned was how to work with fish. The fish hatchery is one that has their own brood stock so I was able to experience all stages of the fish’s life from egg to death in the hatchery system. We have an isolation building that houses the new brood stock. They are eggs that have not hatched yet. I was able to learn that white or clear eggs are dead and/or will not hatch. I was able to separate the living from dead eggs by looking to see if the eggs had an eye in them. After the fish hatched many were dying and needed to be disposed of. Only the alive and healthy were wanted. After some time these fish were moved to the outside raceways where they eventually were planted or where they eventually died. More planted than dead of course. I was then able to see what happened to the fish after their hatchery life when they were planted into various local lakes. This was in my opinion the best part of the job, planting fish and when addressed by the public answering questions while planting.

The public is always asking questions. Whether it is back at the hatchery as tourists or
out on a plant as recreational people, people are always asking questions about what we are doing and all about what kind of fish we are planting. I was never very good with people when I first started this job four summers ago, but I have noticeably progressed. I have given a few tours of the hatchery and I am always available to answer questions which happens a lot. This is probably one of the biggest aspects to furthering my career. Talking to people is a lesson that is all too important in a career. I need to work on it a lot more but I have much improved at this fish hatchery. Sometimes tourists and visitors can be difficult because they have formed opinions of Montana Fish Wildlife and Parks that aren't good but my boss has always told me to be cool and calm and to answer their questions to the best of my ability and if they are too unreasonable to send them to my supervisor.

I have learned a lot from my supervisor. He is very good with the public and is a role model for me. I know if I work at it I can give tours and talk to the public just as good as he does. There are also two other guys who can also tell me what to do. Sometimes I get three different opinions of how to do one job. I always try to make everybody happy but that is not always possible. So my reasoning has told me to always do what the manager (top boss) tells me to do. The manager is in charge and his opinion is what is most important to a certain extent. Getting the job done in my own way also is necessary sometimes. So doing something my own way is sometimes the only option after I have heard everyone else's opinions. So sometimes it is the final result that matters not how you get there. It is great to take the boss's advice but it is often necessary to go your own way to a certain extent.

I have gained a lot of necessary experience from this internship to forward my career a step further. This internship is a step up the employment learning pyramid. There is still a lot to learn about the world of fisheries, dealing with the public, and different types of management.
I worked at the National Marine Fisheries Service’s Alaska Fisheries Science Center in Seattle, Washington. My mentor was Kim Rand and my project involved determining the food habits of Arctic cod, *Boreogadus saida*. The Arctic cod were collected in August 2008 when scientists from the Alaska Fisheries Science Center conducted a bottom trawl survey of the Beaufort Sea.

I spent most of the time in the Food Habits Lab analyzing stomach contents. Five fish from each tow of the survey were sampled for stomach content analysis. Each fish was lengthed, weighed, and sexed. The stomach was cut out and its contents were weighed. The prey were sorted and then identified to the lowest taxonomic level. Diet composition from the midwater trawls was compared to diet composition from the bottom trawls. Major prey items by weight for the midwater trawls were euphausiids, larvaceans, amphipods, and copepods. Major prey items by weight for the bottom trawls were larval fish, amphipods, and copepods.

In addition to my time in the lab, I also had the opportunity to do field work for three weeks on the Gulf of Alaska Bottom Trawl Survey. Each day, four 15 minute tows were conducted. The average tow took about two hours to identify, weigh, sex, length, and collect biological samples. Nearing the end of the cruise, I was amazed at how my groundfish identification skills improved.

Overall, I enjoyed my internship experience at the Alaska Fisheries Science Center. It has given me some great ideas for future career possibilities in the fisheries field. I especially enjoyed my time in the lab and can definitely picture myself looking at fish stomachs as a career.
Glacier Bay National Park Summer 2009 Fisheries Internship

During this internship I learned many valuable fisheries techniques and became familiar with many fisheries issues that were new to me. I learned a great deal about marine ecosystems and fisheries, which I had little experience with prior to this internship.

My internship mentor and supervisor was Chad Soiseth, fisheries biologist for Glacier Bay National Park. I also worked closely with Craig Murdoch, a Glacier Bay fisheries crew member who holds a “term” position there.

I started work in Glacier Bay on May 11, and I immediately began working on data entry for charter halibut businesses that operate in the bay (under the guidance of Chad and Craig). I entered and requested clarifications from these businesses regarding trip dates, catch amount, and rod hours that Glacier Bay National Park tracks to quantify halibut charter effort and catch in the Park.

I worked on charter halibut data entry and issues throughout the summer. Many people in the area believe that allowing halibut charters in the Park violates the park mission statement and doctrine because charters operating in the park amounts to a commercial operation, and because more halibut were being harvested in area 2C (halibut management area including Glacier Bay) than the charter halibut quota recommended.

Others, mainly charter boat captains and charter business owners, are for allowing charter halibut harvest in the park because the fish in the Bay are on average larger than the fish outside, and argue that the catch is sustainable. Charter fishing in the “Bay Proper” of the park is currently allowed only in the “shoulder seasons” of the summer (May and September).

I also developed several posters at Chad’s request detailing fisheries research done in the park for visitor display. I put together three posters that are displayed at the Park’s Visitor Information Station (VIS). These posters showed methods, results, and figures from the Western Toad Chytrid Fungus research project, the Falls Creek Hydropower Dolly Varden Monitoring project, and the Bartlett River Headwater Lakes Annual Sockeye Count project.
I edited the Park’s sportfishing website (http://www.nps.gov/glba/planyourvisit/sport-fishing.htm), and added new text specific to different game fish. I also expanded the page’s sportfishing photo gallery using my own and others’ sportfishing images from the summer. Additionally, I researched and added useful links to ADF&G Sportfishing Emergency Orders and other pertinent websites to the Park’s sportfishing page.

I assisted in two fisheries projects in the field. One project was the Falls Creek Hydropower Dolly Varden Monitoring Project. The purpose of this project is to assess the movement patterns of Dolly Varden trout up and down Falls Creek before and after the installation of a hydropower dam (up and running as of this year, creating an impoundment that may attract fish and blocking up and downstream fish traffic). During sampling for this project I assisted Craig Murdoch in trapping Dolly Varden trout using wire minnow traps. These traps were either set for 2 or 24 hours. When Dolly Varden were caught in these traps we took total and fork lengths and weight from these fish. We also checked for old fin clips or PIT tags in each captured fish to determine if the fish was a recapture or not. If the fish was a new capture we implanted a PIT tag in the fish (if it was longer than 115 mm), and gave the fish identifying fin clips specific to each location where the fish were caught.

The other field project I helped out on was the Bartlett River Headwater Lakes Sockeye Salmon Counts. The purpose of this project is to estimate spawning runs of adult sockeye salmon each year, and thus determine long-term population trends. Several counts are undertaken by the fisheries staff each year. I was able to go along on two of these. I assisted Craig Murdoch in counting sockeye, dog, and pink salmon on their spawning grounds in the Bartlett River and Bartlett River Headwater Lakes. This was a lot of fun because we got to use small, inflatable pack rafts, and got to observe the spawning fish close up.

I helped Chad and Craig edit and finalize an Anadromous Fishes visitor brochure that can be found on Glacier Bay’s sportfishing webpage. I also oversaw and collected the data from the Visitor Information Station’s angler number surveys of the Bartlett River. Additionally, I worked intensively on editing, updating, and compiling data for a report monitoring fish abundance, habitat change, and stream restoration techniques in a small stream in Glacier Bay National Park that had been moved and affected during road
construction there in 2001. This project/report is not yet finalized, and I will continue to work on it next summer if I return to Glacier Bay national Park. It is now 29 pages long, and we are intending to condense the report and then possibly publish it in a scientific journal.

I had a lot of fun at Glacier Bay National Park this summer, and learned an immense amount about the management and operation of national parks, marine ecosystems and fisheries, and Alaska fisheries management. I also caught my first Pacific salmon (one of my lifelong dreams), and met some very interesting and engaging people. I hope to head back to Glacier Bay next summer!
Appendix II – Nunivak Island Science Camp Course Syllabus

**FISH 195**

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<tr>
<td>Instructor:</td>
<td>Amanda Rosenberger</td>
</tr>
<tr>
<td>Phone:</td>
<td>(907) 474-7458</td>
</tr>
<tr>
<td>Fax:</td>
<td>(907) 796-7204</td>
</tr>
<tr>
<td>Email:</td>
<td><a href="mailto:rosenberger@sfos.uaf.edu">rosenberger@sfos.uaf.edu</a></td>
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**Course Description:** This summer field course will provide the students with a first introduction to the biology and ecology of fishes and some basic fisheries techniques. During the lecture and lab sessions, the major external and internal anatomic features of fishes will be introduced. Students will gain insight into general life history patterns of fishes and learn how to collect fish and use keys to identify unknown species as part of this course.

**The Lecture:** The schedule for the lectures is attached to this syllabus. The instructor reserves the right to change the schedule if deemed necessary. Lectures will be based on PowerPoint presentation, which will be available to the students at the lecturer’s discretion.

**The Laboratory:** The laboratory sessions have been designed to complement the presented lecture material. As part of the laboratory, students will be required to write a laboratory journal. A complete laboratory journal will be a basic requirement for passing this course. In addition, each student will compile a summary and key to all local fish collected as part of the field sampling.

**Grading:** Your total course grade is calculated as shown below:

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<th>Attendance and participation</th>
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<tr>
<td>Guide to Local Fishes</td>
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<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
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**Course Policies:** Attendance and active participation during the lecture and laboratory sessions and during the field trips is expected, and attendance will be taken at the beginning of each session. Any work missed during laboratory sessions is the responsibility of the student. With written permission from the instructor (A. Rosenberger), you may make up the missed work outside of the laboratory sessions. After two unexcused absences, you will fail this course. Students are reminded to consult the Student Code of Conduct. Cheating, plagiarism, and other forms of academic dishonesty will not be tolerated in this class.
Disabilities Services: During the course, instructors will work with the Office of Disabilities Services to provide accommodations to students with disabilities. For questions, contact the UAF Office of Disabilities Services (phone: (907) 474-7043).

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