



ONCORHYNCHUS

Newsletter of the Alaska Chapter, American Fisheries Society
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Sampling a salmon for bioelectrical impedance analysis. Photo from Keith Cox.

A Fish Biologist and his Dream: Taking Bioelectrical Impedance to the Market

Keith Cox

This is a story about the technological development of bioelectrical impedance analysis (BIA) in fisheries, its applications, and its future. In 1998, I was working on my Ph.D. in bioenergetics with Kyle Hartman (current American Fisheries Society President Joe Margraf was also his advisor) at West Virginia University. We were trying to ask the question, "Where is energy allocated during compensatory growth?" During compensatory growth, feeding is curtailed, followed by subsequent ad lib feeding. So is energy apportioned into fat, protein, growth, reproduction, or activity? While it seemed like growth did occur despite reduced feeding, could the growth measurement (weight) be through a non-energetic gain such as water? After doing some experiments, we developed some results followed by a presentation titled "Compensatory Growth, is it all Wet?" Although the sample sizes were pretty small, there was some indication that compensatory growth could represent non-energetic water weight gain. For people that have done this kind of work, the direct

measures of water, fat, protein, and energy content in a fish can be time consuming, challenging, and sometimes problematic, thus making small sample sizes a norm. For these direct measures (methods of course may vary), one must sacrifice the fish, freeze it, crystallize it in liquid nitrogen, powder the fish using a frozen blender, and then measure each parameter in triplicate, with each parameter having its own specific analysis. I was starting to feel like my graduate studies should be in chemistry instead of fisheries. I went to Hartman and suggested there had to be another indirect method to measuring body composition, to which he replied, "You figure that out!"

And so it began. After researching several different methods, BIA kept ending up at the top of the list as a means to indirectly measure body composition. The BIA approach had historical applications to assess body composition in human medicine, and was used by the U.S. Navy to monitor hydration status of high altitude pilots. The only paper I could find for BIA use in fish

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The President's Corner



Aaron Martin,
AFS Alaska Chapter President.

Hey crew. Welcome to Spring 2017! Wow, there is always so much to do this time of year. Field work to prep for, crews to be hired and coordinated, proposals and papers to write, fishing gear and boats to clean up, camping trips, and barbeques to attend. There is so much for us to be excited about, even in these uncertain times.

We are experiencing change at a rapid rate and, as professionals, we are being asked to address what seems at times to be an endless list of new conservation and management challenges. People are questioning the validity of science, state and federal budgets are being severely constrained, and we are observing shifts in environmental conditions never experienced before. These stressors put significant burdens on those of us who have chosen professions that aim to manage, conserve, and restore the aquatic worlds in and around Alaska. Unfortunately, it is not just us that carry the burden. Aquatic invasive species like Northern Pike and Elodea are spreading to new locations, harming subsistence, recreational, and commercial fisheries as well as water quality, while other invasive species expand their range west and north. Poor ocean productivity continues to impact the quality and quantity of many

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Bioelectrical Impedance, continued

was a gray literature report titled “Purrrfecting the Catfish” in which BIA was used to monitor body composition in catfish. One of the more important things we learned was to create a range of test conditions and develop body composition models across those conditions. Without a nice spread of data with pronounced contrast (e.g., fat fish to lean fish), regression models do not work well. Following a report showing the utility of BIA to measure body composition in fish, we started using BIA to measure fish body composition in both the field and the lab. It was nice that we could repeatedly measure the same tagged fish, over and over, all the time watching how body composition parameters changed. The work on body composition was then extended into research with the U.S. Department of Agriculture and the Oregon State University Seafood Laboratory to examine the effects of freezing on impedance measures in Albacore Tuna.

Creating models for body composition proved to be difficult because of the need for feeding trials and those tedious direct measures of body composition still had to be taken. As I was improving my skills in the BIA field, my research and study into BIA applications grew correspondingly. I soon learned that BIA use in the medical industry applied a parameter called “phase angle” that reflected cell health. Since BIA measures two things, cell membrane capacitance and interstitial water, using a combination of those two measures could tell you a lot about the health and condition of living organisms. Phase angle values as measures of cell condition usually range from 0 to 90 degrees. The specific value will depend on the species, environment, etc., but individuals of the same species and a similar cell condition should have similar phase angles. In the human health arena, phase angle was being touted as a prognostic tool with possibilities of becoming a global health index, and work was being completed to develop baseline thresholds.

By now, I had joined up with Margraf at the University of Alaska in Fairbanks. Along with Hartman, we started measuring salmon migrating up the Yukon river at three geographic locations (mouth, midpoint, and headwaters) with the intent

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President's Corner, continued

salmon fisheries statewide, hurting the state's economy and leaving many freezers empty. Budget cuts are resulting in less funding for critical research and assessment projects, leaving fisheries managers with less information on which to base decisions. Now more than ever we must look to build new partnerships and expand on existing ones.

Our recent annual Alaska Chapter meeting in Fairbanks was a great example of fisheries and aquatic scientists being adaptable and looking to less traditional partners for help in our work. The Alaska Chapter held its first spring meeting, co-hosted by the Alaska Section of the American Water Resources Association. The meeting was a huge success with nearly 230 registrants, 114 presentations, and 46 posters. Based on the feedback I have received, the joint meeting was an appreciated means of sharing innovative solutions to today's ecological challenges and building new partnerships.

The Chapter and I are grateful for the generous financial and auction item donations from all of our sponsors. Our silent and live auctions were a huge hit. The proceeds will assist us in continuing to support our student members in attending future Chapter meetings, Student Colloquials, and Western Division or Parent Society meetings. Thank you to Andy Sietz for stepping up to be our rock star auctioneer. A huge thank you also

goes out to everyone that helped develop the program, the sessions, and the events. I'd like to give an additional specific shout out to Cheryl Barnes, the Chapter's Student Representative to the Executive Committee, who was an incredible asset to the whole meeting – thank you for your patience and tireless commitment. For me, the week of the meeting went by too quickly and I am disappointed that I didn't get to interact with more of you that attended. However, I am excited to have the opportunity to work with you all in the coming months as our Chapter continues to help support students and professionals throughout the state, and as we work collectively to address issues affecting Alaska's marine and freshwater fisheries resources.

Jeff Falke is now the President-Elect and will be in charge of planning our next annual meeting which will be May 21-25, 2018, in Anchorage. We'll be hosting the Western Division meeting so it will be another great gathering. If you are interested in helping with coordination of the meeting or chairing a symposium, contact Jeff Falke, our President-Elect, at ak.afs.presidentelect@gmail.com. Lastly, I'd like to welcome Joel Markis to the Executive Committee as our new Vice-President. He will be planning our 2019 meeting which will be in southeast Alaska again—city to be determined.

All the best to everyone. 🐟



Collecting BIA measures from a salmon filet. Photo from Keith Cox.

Bioelectrical Impedance, continued

of developing energy content models and also using phase angle to measure condition of fish at the different locations (*Margraf et al. 2005*). Aside from the energy content, one of the most interesting findings was that phase angles for measures taken on the dorsal portion of the fish differed among the three geographic locations, but measures from the ventral portion of the fish did not differ. The discovery pointed to an important life history strategy of maintaining a high level of condition in the ventral portion to keep reproduction potential high, protected, and intact until spawning occurs. In fact, the muscle around the vent was so strong that it was difficult to insert the needle electrodes

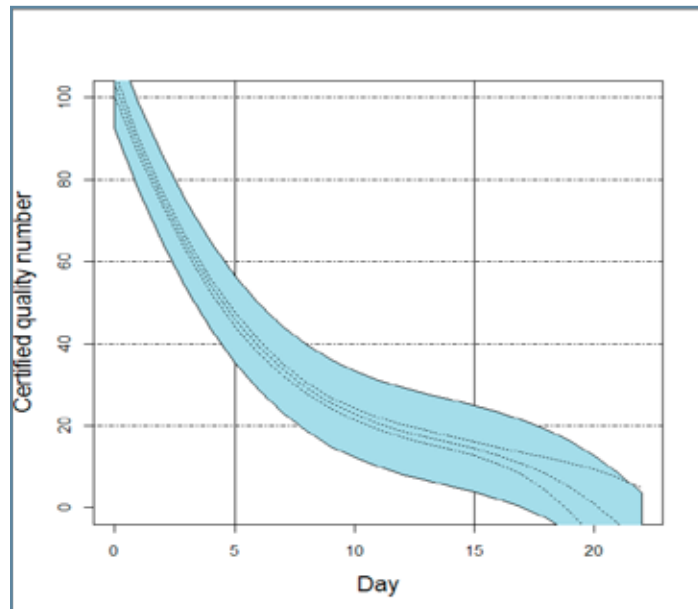
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Bioelectrical Impedance, continued

while the dorsal portion was literally falling apart in our hands. A new application was subsequently developed to use phase angle as a metric for fish cell condition – and there were no laborious laboratory methods to follow. Phase angle can immediately be used on any new species and results can be compared among situations where you might find conditional changes. Applications stemming from this have been used to compare different groups due to starvation, location (near shore versus off shore), season, sex, age, and other factors. As an example, while measuring Pacific Cod in Southeast Alaska we found phase angles consistently ranging from 50 to 60, over and over and over. Then one fish measured less than 30. A veterinarian working with me dissected the low phase angle fish to find a large cancerous mass in the abdomen.

By now I had a solid working relationship with a manufacturer of BIA devices for the medical industry. Although all of our measurement devices were purchased, our electrodes were all homemade and consisted of needles, wires, epoxy, tape measures, and modeling putty (imagine flying and explaining to TSA all aforementioned things attached to a circuit board – ask me over a beer sometime). Many other folks were using BIA and we were all presenting at the American Fisheries Society Chapter and Parent society meetings. New research also paralleled the different electrodes created by different people. Could these cause different incomparable results? I worked with others to write a paper discussing the assortment of methods and identifying potential sources of error. What was needed was a standard operating procedure manual, along with standardized electrodes.

In 2014, after about 15 years of research, I contemplated manufacturing a fish-specific BIA device. I knew that there was a pretty big gap between simplistic length-weight measures and the need for more specific measures, as well as the need to standardize electrode configurations. In proposed funding requests I also saw buzzwords that included electronic monitoring, meta-data, real-time data, and novel approaches for physiological parameters. After careful deliberation, the shell of a company was formed. My two MBA business



Example of degradation in fish quality over time. Figure from Keith Cox.

partners started dissecting the marketplaces of fisheries while I approached the field of seafood degradation. My thought was that if I could measure cell growth, I could also measure cell death, an arena where market applications are huge and much larger than research alone. After all, cell death is simply a rate function for the degradation process. After a fish is harvested, it starts down a one-way street of degradation. Options such as chilling can slow the process, but there is no reversal of the degradation. We started seeing good predictive models for analyzing freshness, time since harvest, and shelf life remaining, and correlated our findings with U.S. Food and Drug Association seafood scores of freshness. The company Seafood Analytics was born to fill this need. But there remains lots of work to be done.

The utility of this technology on different species under a wide range of ambient conditions was viewed as critical to the application's success. Because all species and their muscles differ slightly, the correlative relationships between BIA measurements and cell condition, as indicative of freshness, must be derived for each species. To date, we have analyzed and developed "degradation curves" for 14 fish species. Plus, technology continues to improve. The existing equipment represents a huge step up from the previous BIA approach that was a two-person

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Bioelectrical Impedance, continued

job requiring a clipboard and involving needles. Working with a team of business folks, engineers, and software gurus was a joy and resulted in the current device that has built in stainless compression electrodes, electronically stores up to 14,000 measurements, is Bluetooth capable, has built in modes and functions, and can be linked to a cloud-based dashboard system. The system allows for electronic monitoring of health and condition, real-time analysis, online storage, and the ability to acquire meta-data. It takes about a second to obtain a measure on a fish, about the same amount of time it would take to measure the weight and

length of a fish. As a next step, Seafood Analytics will soon be introducing the “FishBoard” which will allow length, weight, internal temperature, external temperature, latitude and longitude, and BIA measures to be taken at one station.

Dr. M. Keith Cox, co-founder of Seafood Analytics, was previously a Research Scientist for NOAA, a science chair at Sheldon Jackson College in Sitka, and chair of the board of the Sitka Sound Science Center. Dr. Cox is currently Assistant Professor of Marine Fisheries at the University of Alaska Southeast where he has also served three years as the Director for the Alaska Native Science and Engineering Program.

Your Help Needed:

Western Division Meeting of the American Fisheries Society

Your efforts are needed to help plan and carry out the 2018 Western Division American Fisheries Society Annual Meeting in Anchorage during May 21-25, 2018! A meeting of this magnitude doesn't happen without the collective efforts of numerous people, and your help is needed to bring things together to provide the awe and amazement

that people expect in visiting Alaska. Volunteers are being sought to help with the meeting arrangements. There are a variety of committees that need to be filled. If you are interested in serving, please contact AK Chapter President-Elect and meeting Program Chair Jeff Falke (afs.alaska.presidentelect@gmail.com; Ph: 474-6044).

Backpack Electrofishing Course: Principles and Practices

Northwest Environmental Training Center (NWETC), a non-profit organization dedicated to environmental education, will offer a backpack electrofishing course during May 31-June 2, 2017, in Anchorage, Alaska with instructor Dr. Jim Reynolds.

This 3-day course consists of classroom work on the first and third days and field exercises on the second day. The class will visit a stream/river/creek and each attendee will operate the equipment under the guidance of the instructor.

Electrofishing is an effective way to sample freshwater fish populations. However, it may cause injury or mortality to the fish if done incorrectly. Proper balance between efficient sampling and causing minimal harm is achieved through the knowledge of electrofishing principles and use of proper techniques.

To register, or for details, visit nwetc.org.

Understanding the North Pacific Fishery Management Council

Instructors Drs. Gordon Kruse (ghkruse@alaska.edu) and Keith Criddle (kcriddle@alaska.edu) are offering a course that immerses students into federal fisheries management in Alaska. Coursework will occur May 30-June 2, 2017, in Juneau or by videoconference, and June 5-9, in Juneau.

This 2-credit course immerses students into federal fisheries management in Alaska. Students receive four days of classroom instruction about federal laws, management plans, and briefing materials for pending fishery management decisions. Students will then witness first-hand how fishery management decisions are made during the June meeting of the North Pacific Fishery Management Council, in Juneau, Alaska. Experiential learning is enhanced by discussions with stakeholders, including fishery managers, industry representatives, fishers, processors, and NGOs. Field trips include tours of commercial fishing vessels and a seafood processing plant.

Changing Times, Changing Chapter

Bill Hauser

As a member of the gray beard club, but still at the edge of the business of fish biology and an AFS groupie, I am compelled to provide some insights into how much things have changed in our profession over time. My first job in the “fish business” was that of an assistant for a graduate student the summer of 1964. I became a graduate

student and member of AFS in 1965, just over 50 years ago. I moved to Alaska and became a member of the Alaska Chapter in 1980.

Here are some of the changes in our business I have observed. With this, one can only speculate and imagine how much things may change in another 30 or 50 years. 🐟

Item	Fifty Years Ago	1980	2017
AFS Parent	87 years old	110 years old	147 years old
Alaska Chapter	Didn't exist	Seven years old	44 years old
Chapter meeting registration	80 (first meeting, 1975, Juneau)	100+	231 registered
Female meeting attendees	Rare	Few	43%
Chapter Banquet	NA	Donated fish bake	Catered/sit-down
Chapter Social	NA	Donated keg of beer	Bar/finger food
AK Awards/WNA	NA	None	Ample
Member age	NA	Mid-late career	Student/early career
Participation	NA	Mostly State	State/Fed/Univ/NGO
Visual aids	Overhead projector	Slides/write on slides	Digital/laser pointer
Visual aid prep	Write-on transparencies	Photos/write on slides	Powerpoint
Fish marking	Early Floy/fin clip	Floy tag gun; CWT	Satellite/remote
Electroshocking	Used car generator	Boat/gas backpack	More precise
Telephone	Desktop, rotary dial	Desktop with buttons	In your pocket
Computer	In a building across campus	Commodore 64 (64KB); Apple I; IBM	In your pocket
Data storage	Paper files	5 ¼ inch floppy disk	Cloud
Camera	Bulky	Slide or print film	In your pocket
“Fish” themes (e.g., tie, shirt)	Never	Rare	Everywhere/anything
Word processing	Mechanical typewriter	Electric typewriter and typing “pool”	Personal computer
Calculator	Desk calculator	Battery calculator (hand)	In your pocket
Spreadsheet	What?	Hand drawn	Excel
Figures/graphs	Hand drawn	Drawn with templates	Computer
Fishery journals	2–3 Primary	4 or 5	On line; specialized
Math	Calculus/statistics	Statistics	Computer modeling
Genetics	Double helix	Scale analysis	DNA/Population analysis
Fish Biologist	Mostly generic	More specialists	Many more specialists
Water quality	Mercury thermometer; chemical titration	Hydrolab	Remote sensing
Fish length	Measuring board; Clip board	Same	Electronic board w/ computer
Communications	Phone/paper/memo	Email?	Email/Skype
Television	Small; B&W; snowy	Color; big tube	Big; flat; thin

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Awards Committee

Jon Gerken

The following Awards were presented at the March 2017 AFS Alaska Chapter meeting in Fairbanks. The best student presentation was from Thomas Farrugia (University of Alaska Fairbanks), "How Many Fish are in the Barrel? Sustainably Harvesting Two Easily Caught Skate Species." The best student poster was from Chase Jalbert (University of Alaska Fairbanks), titled "Landscape Genetic Diversity of Native and Invasive Northern Pike in Alaska."

Sonia Ibarra and Steve Moffitt were co-recipients of the Alaska Chapter Meritorious Service Award for outstanding contributions to Alaska fisheries. Sonia received this award for empowering Native leadership in fishery science by demonstrating a deep commitment to the concerns of tribal communities and subsistence users as an advocate, tutor, mentor, and scientist. She has promoted the development of fisheries professionals through the Sustainable Southeast Partnership, University of Alaska Southeast, and Rural Student Center. Steve received this award for contributions in the research and management of Prince William Sound salmon and herring fisheries. Recent contributions focus on understanding the interactions between hatchery and wild salmon, notably hatchery stray rates, hatchery and wild fish interbreeding genetics, and the effects of hatchery fish on the long-term productivity of wild salmon resources.

Continuing Education Workshops

Sara E. Miller and Katie J. Palof

There were three continuing education classes held in conjunction with the Alaska Chapter meeting in Fairbanks in March 2017. Of the three, the UAV-based Remote Sensing class and the Ice Jam Processes and Ice Discharge Measurements classes were sponsored by the Alaska Chapter of the American Water Resources Association. The UAV-Based Remote Sensing class had 16 registrants, the Electrofishing class had 9 registrants, and the Ice Jam Processes and Ice Discharge Measurements class had 12 registrants. An anonymous donor sponsored 3 students in the UAV class, two students in the Electrofishing class, and one student in the ice class. Due to low attendance, the Passive Integrated Transponder

(PIT) Tagging Field methods class and the Water Egress class were cancelled. The good news is that many of the people registered for the cancelled classes transferred to the UAV, Electrofishing, or ice classes. Also, thanks again to the students Chelsea Clawson, Ben Meyer, and Hugo Villavicencio who agreed to serve as instructor aids during the continuing education courses that they were enrolled in.

Cultural Diversity Committee

Sara Gilk-Baumer, Chair

The Cultural Diversity Travel Award helps fund entry-level applicants who are involved in the natural resource field to attend the annual conference of the Alaska Chapter of the American Fisheries Society (AFS). The main goal of this committee has been to help diversify our Chapter membership and get young up and coming people active with AFS.

This year's recipient of the Cultural Diversity Travel Award is Sarah O'Neal, a PhD student at the University of Washington. Currently Sarah is focusing on conservation of Alaska salmon and their habitat, particularly focusing on understanding more about mining and fisheries in Alaska. Sarah is working on evaluating both statistical modeling methods and environmental DNA (eDNA) methods to look for more affordable approaches to documenting salmon distribution in Alaska. Since 2008, Sarah has worked with tribes and non-profit groups in Alaska to study and interpret fisheries and other aquatic data in light of potential large-scale development, including the Pebble Mine, the Susitna-Watana Hydroelectric Project, and transboundary mining on the Canadian side of the border in Southeast Alaska. Her colleagues and mentors describe Sarah as extremely hard working, dedicated, passionate, and a team leader. She is also the recipient of an EPA "Science to Achieve Results" Fellowship. At the Alaska Chapter meeting, Sarah will be giving a presentation entitled "Documenting Habitat for Anadromous Species: Exploring Affordable Methods for Protecting Alaska's Salmon Streams."

In addition to the 2017 award, the committee is continuing to work on finding ways to both solidify the award process and to extend the role of the

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committee in diversifying chapter membership.

Electronic Communications Committee

Bert Lewis – Chair, Hamachan Hamazaki - Communications Lead, Audra Brase - Webmaster

The email server is fully functional and used primarily for seminar and meeting announcements, occasional job advertisements, and electronic distribution of the Chapter newsletter. The Alaska Chapter web page is also operating well.

Financial Assets Oversight Committee

Ray Hander (Chair), Milo Adkison, Lee Ann Gardner, Tim Joyce, Trey Simmons

Guidance to the Financial Assets Oversight Committee (FAOC) is provided in the AFS Alaska Chapter’s Procedure Manual under the Chapter Financial Plan within the Chapter Investments section. The purpose of the FAOC is to oversee, advise, and make recommendations for directing the financial assets of the Chapter by way of tracking the Chapter’s monetary holdings that are invested through financial or banking institutions.

In 2016 and 2017, the FAOC met quarterly with the Chapter’s Wells Fargo Advisors (WFA) representative, Todd Fletcher, to receive portfolio status updates, consider investment options, and conduct maintenance of accounts as needed to conduct Chapter business. Lee Ann Gardner, Chapter Treasurer, is in frequent contact with Mr. Fletcher as she conducts day-to-day Chapter business and informs FAOC members with information on an as-needed basis. The Chapter’s WFA portfolio is invested using a moderately conservative strategy with an investment horizon of 7 to 10 years as determined by the FAOC members in consultation with the WFA investment representative.

Endowments

All awards from each endowment may only be paid out of interest earned. All contributions to individual endowments were added to their respective principals. The FAOC made a general process decision to change the date when the

balance of a fund is calculated for disbursement purposes from July 31 to June 30 to match the end of a quarter. The following endowment fund balances are rounded to the nearest \$100.

The Wally Noerenberg Fund (WNF) principal amount is \$15,000, and the account balance was \$18,000 on June 30, 2016, and \$18,600 on February 28, 2017. A \$1,000 award was given in November 2015.

The Cultural Diversity Fund (CDF) principal amount is \$15,000, and the account balance was \$15,000 on June 30, 2016, and \$15,500 on February 28, 2017. The CDF is generally spent down to the principal amount each year to support CDF recipients and is often augmented by Chapter general funds (Fund A).

The Molly Ahlgren Scholarship Fund (MASF) principal amount is approximately \$129,000, and the account balance was \$132,800 on June 30, 2016, and \$135,800 on February 28, 2017. The Molly Ahlgren Scholarship fund principal may increase from additional contributions to the fund and also reinvestment of 10% of the earnings each year as calculated on June 30. The remaining earnings, rounded down to the nearest \$1,000, are disbursed as a scholarship(s). The remaining earnings balance, after rounding, will be added to the fund’s principal. Using these guidelines, a single scholarship amount for \$4,000 was available in 2017.

Approximate endowment fund total account values from the quarters ending June 2015 to June 2016 (rounded to the nearest \$100) and as of the end of February 2017 are shown below.

Chapter Investment Fund A

Chapter Investment Fund A (Fund A) was valued at \$41,000 in June 2015, \$25,900 in June 2016, and \$28,200 on February 28, 2017. Fund A balance was stagnant during the period because of flat investment returns and low income from the 2015 annual meeting. Generally, annual income is from payments made from general funds such

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Fund	Begin Quarter	Value (\$)	End Quarter	Value (\$)	Feb. 28, 2017 Value (\$)
Wally Noerenberg	June 2015	19,000	June 2016	18,000	18,600
Cultural Diversity	June 2015	15,000	June 2016	15,000	15,500
Molly Ahlgren Scholarship	June 2015	127,500	June 2016	132,800	135,800

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as earnings from the annual meeting, continuing education events, membership dues, and interest. Interest earned from Fund A may be used for expenditures such as travel and scholarship awards and special projects. Unexpended annual earnings from Fund A are reinvested into the Fund A principal.

General Funds

The interest bearing money market checking (MMC) and 1st National Bank Alaska cash accounts (CA) have fluctuated annually during January through July due to annual meeting and continuing education expenses and income. The CA houses petty cash and online income such as meeting registration and continuing education fees. Following the annual meeting, online sales from the CA are transferred to Fund A or the MMC while leaving a balance of approximately \$500 for petty cash during August to December.

The FAOC has been investigating the potential of self-management of the Chapter's investment portfolio. A pilot program approach is being considered to measure the outcome of a professionally managed (WFA) account (CDF) versus self-management. The main potential advantage to self-management is the reduction of professional investment management fees and subsequent increase in funds available to earn interest, thus increasing the ability to disburse more funds to awards and scholarships. A pilot program evaluation after a trial period will be necessary to determine the efficacy of considering management of the Chapter's entire portfolio. The Chapter Officers currently bear the fiduciary and management responsibilities for its portfolio and the same responsibility would apply to any self-management scenario.

In summary, the Chapter's portfolio experienced flat investment returns during June 2015 to June 2016, while maintaining a moderately conservative investment strategy. The market began improving around November 2016 and investment returns through the present reflect increases for all accounts. Our investment strategy asset allocation, approximately 2/3 bonds and 1/3 equities, lessens the volatility impact relative to greater equity exposure. During the recent sluggish market, our

investments performed rather flatly but we remain positioned to take advantage of improving market conditions when possible.

Fisheries Communication and Education Committee

Katrina Liebich (Mueller), Chair

Jimmy Fox and Katrina Liebich had proposed an outreach- and communication-focused session for the AFS Alaska Chapter annual meeting, but that option was dropped due to insufficient interest. The committee helped promote the film festival and a variety of films featured at the Chapter meeting.

Molly Ahlgren Scholarship Committee

Ray Hander (Chair), Lee Ann Gardner, Hal Geiger, Tim Joyce, Carol Kerkoliet, and Brenda Norcross

In 2016 the AFS Alaska Chapter, on recommendation from the Molly Ahlgren Scholarship Committee (Committee), offered one \$4,000.00 Scholarship. The application was distributed August 11, 2016, to various outlets such as the Alaska Native Science and Engineering Program, financial aid offices, scholarship coordinators, undergraduate student listserves, and professors at the University of Alaska and Alaska Pacific University, the Alaska Chapter web site, and Student Unit representatives. The application deadline was October 31, 2016. The applicant selection process by the Committee was completed November 11 with Executive Committee approval on November 30. The 2017 Molly Ahlgren Scholarship recipient was Kelly Ireland. Ms. Ireland attends the University of Alaska Anchorage where she double majors in Biological Sciences and Journalism. The scholarship funds disbursement and confirmation took place in December 2016 for use in the spring 2017 semester. After the ceremonial certificate is presented a letter will be sent to the Ahlgren family from the Alaska Chapter reporting on the 2017 scholarship.

Oncorhynchus Newsletter

Bill Bechtol, Editor

The *Oncorhynchus* serves as a medium to distribute information to AFS Alaska Chapter members and other interested individuals. The newsletter is produced by editor, Bill Bechtol, who

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compiles articles submitted by Chapter members, then sends the articles to Connie Taylor of Fathom Publishing for layout and mailing of hard copies. Electronic copies are posted to the Chapter listserv. The AFS style conventions described at <https://fisheries.org/books-journals/writing-tools/style-guide/> are generally followed. Prior to finalizing the newsletter, draft issues are sent to the Alaska Chapter Executive Committee and various article contributors for review.

Submissions of articles for inclusion in the newsletter are solicited quarterly via the Alaska Chapter listserv; high-resolution photos are encouraged. Newsletter submission deadlines are the 10th of March, June, September, and December. Each issue includes a front-page feature article and efforts are made to distribute feature article authorship among organizations. Feature articles by issue in 2016 were: Winter (Vol. 36 No. 1) "NSSEDC — Supporting Community Fisheries in Western Alaska" – Laureli Ivanof; Spring (Vol. 36 No. 2) "Digging into a Dilemma – Cook Inlet Razor Clams" – Carol Kerkvliet and Michael Booz; Summer (Vol. 36 No. 3) "Early Warning Signals for Sudden Change in Alaskan Fisheries" – Mike Litzow; and Fall (Vol. 36 No. 4) "Fall Chum - A Balancing Act for Management" – Jeff Estensen.

The issues were published near the beginning of the calendar quarter. All issues were largely distributed electronically through the Chapter listserv and being made available for download from the Chapter website. Approximately 65 paper copies of each issue were printed and retained for Chapter archival or mailed to subscribing libraries, AFS Parent Society officers, Alaska congressional delegation members, and individuals requesting hard copies. Total newsletter publication and distribution costs for 2016 were \$1,246.86. If you have a newsletter contribution, contact Bill Bechtol (299-6146; afs.alaska.newsletter@gmail.com).

Resolution and Bylaws Committee

*Toshihide "Hamachan" Hamazaki (Chair),
Lisa Stuby, and Bill Bechtol*

The major functions of the Resolution and Bylaws Committee for the AFS Alaska Chapter are: (1) provide technical review of any bylaws changes proposed by the Chapter Executive

Committee; (2) draft resolutions proposed by the Executive Committee; and (3) assist the Chapter Past President in updating the Chapter Procedure Manual.

For the past reporting year, the committee: (1) provided clarification regarding terms of the Executive Committee and committee chairs (i.e., from one annual meeting to the next annual meeting regardless of length between meetings); and (2) provided guidance regarding student unit bylaws. No resolutions were proposed, and no Procedure Manual revisions were proposed by the Past President. [Editor's note – Substantial updates to the Procedure Manual were identified by outgoing Past President Jennifer Stahl and will be transferred to this committee in the coming year.]

For the coming year, the committee strongly urges the Executive Committee to tackle the following issues: (1) update the Procedure Manual (last updated in 2010); and (2) expansion of Section 11: Alaska Student Unit. Section 11 of the Chapter Bylaws states only, "The Alaska Student Unit is a statewide organization of Alaska Chapter members who are AFS student members. The Alaska Student Unit provides representation for and attention toward issues concerning students of fisheries and aquatic sciences."

Neither the Bylaws nor the Procedure Manual specify: (1) terms and procedures of electing Student Unit presidents, or (2) functions of the Student Unit representing interests of student members across campuses. Currently, student members reside across campuses throughout Alaska, such as UAF (Fairbanks, Juneau), UAA (Anchorage), APU (Anchorage), and UAS (Juneau, Sitka). For the student unit to grow and flourish, it is imperative that the unit not simply represent the campus where the unit president resides, but instead represent and provide support to members in all campuses. Updating the bylaws and procedure manual are essential first steps.

Wally Noerenberg Award Committee

Kenneth Gates, Chair

The Wally Noerenberg Award (WNA) for Fishery Excellence is the highest award bestowed by the AFS Alaska Chapter. It honors an individual's

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life-long achievements in a career focused on Alaska's fisheries. Contributions may include, but are not limited to: fisheries research; technology development; species and habitat management; innovations in harvesting, processing or marketing; academics or fisheries education; and involvement

in national and international affairs affecting Alaska fisheries. The award was created in 1981, and in 1982 was awarded posthumously to its namesake, Wally Noerenberg. Since then, there have been 17 other recipients. There were no nominations for the WNA in this past year. 🗨️

The Streetlight Effect

Jim Reynolds

In his book *Wrong*, David Freeman discusses the "Streetlight Effect" in scientific research, illustrated by this popular, oft-told story of a police officer spotting a man on his hands and knees after dark beneath a street lamp: The man relays that he has lost something (maybe his keys). When asked if this was where the item was lost, the man replies he actually lost the item down the street, but he is looking here because it is easier to see under the streetlight.

The Streetlight Effect creates a difficult challenge for scientists because it traps us into looking for answers in the wrong places. It is human nature to take the easier path when the correct answers may be hiding from the questions we are asking. Two examples follow.

Catch-per-unit-effort (CPUE) is one of the most basic statistics in fisheries management. Typically, the number of fish caught is divided by the effort expended to catch them to obtain CPUE. Because we often cannot know absolute abundance, we rely on CPUE as a measure of relative abundance. That is, we assume a linear relationship between catch and effort; for example, if CPUE doubles, we assume that absolute abundance has doubled. If CPUE declines, we may conclude that absolute abundance has declined. However, ratios can be highly variable and unpredictable. For instance, catch efficiency tends to fall off with increasing effort, nullifying the basic assumption. It is easier to simply accept the assumption than to test it but doing so may lead us astray.

In retirement, I'm doing research into electrofishing theory. One of the questions I've recently asked was, "Do scales protect fish from electroshock?" I examined the electrical thresholds of Koi (*Cyprinus carpio*) with complete and partial scalation (the thickness and coverage of scales). The preliminary answer seems to be yes,

scales do afford some protection. But a colleague recently challenged me with a contrary example: salmonids have lighter scalation and should be less protected than coregonids with heavier scalation but the reverse seems true: coregonids have lower thresholds (more vulnerability) to electroshock. What is the message? It is that I've been pursuing the easier question that is in my comfort zone (under the streetlight) rather than trying to explain the exceptions (looking into the darkness). Perhaps the answer lies in the area of neurophysiology, one that requires me to leave my comfort zone.

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Jim Reynolds served as Unit Leader of the Alaska Cooperative Research Unit during 1978–1999 and is now Professor Emeritus with the University of Alaska Fairbanks. He was President of the Alaska Chapter during 1981–1982, and is an active member of the Alaska, Idaho, and Arizona-New Mexico chapters. Jim spends winters in Arizona, summers in Idaho, and he continues to teach courses and conduct research in electrofishing. 🗨️

Back issues of *Oncorhynchus*
can be found online
<http://www.afs-alaska.org/newsletter>

AFS Alaska Chapter at the Alaska Science and Engineering Fair

Doug Molyneaux

Hamachan Hamazaki represented the Alaska Chapter of the American Fisheries Society as a special category judge at the Alaska Science and Engineering Fair held in Anchorage March 25 and 26, 2017. Hamachan was specifically focused on projects associated with fish. Six science fair posters with fish-related investigations were on display from Aniak students. Miranda Petersen (10th grade) compared lengths and weights of juvenile Chinook and Coho salmon from among three habitat types in the George River (Kuskokwim drainage): mainstem, beaver complex, and spring brooks. Miranda and other students collected the data under the guidance of Dan Gillikin, a biologist with Native Village of Napaimute.

Emma Morgan (7th grade) estimated age of juvenile Dolly Varden based on length frequency distribution of fish sampled by fellow students during a float trip down the Salmon and Aniak rivers with mentors Dave Cannon of the Kuskokwim Watershed Council and AFS member and Partners Biologist Janessa Esquible of Orutsararmiut Native Council.

Eight other students from 5th and 6th grade worked in pairs to apply the scientific method to investigate various “facts” about juvenile salmon and Dolly Varden life history and ecology by way of a three part classroom simulation drawing on data collected by the older students during their annual float trip. Some of those “facts” were the number of years juvenile Coho and Chinook spend in freshwater and the stream reach juvenile Chinook Salmon preferred for rearing. One pair of students also investigated the influence of a cold versus a mild winter on the size and abundance of juvenile fish.

Hamachan beamed with enthusiasm and enjoyment throughout the Saturday judging, and it was reflected back at him by the students who relished the interest this professional biologist had in their work. During the Sunday award ceremony Hamachan presented each of the 10 participating students with a certificate, AK AFS Dolly Varden pin, and a \$20 cash prize on behalf of the AFS Alaska Chapter. Many thanks to Hamachan for the encouragement and positive experience he gave these young biologists! 🐟



Hamachan Hamazaki discusses poster presented at the Alaska Science and Engineering Fair. Photo from Doug Molyneaux.

Student Subunit Happenings

Cheryl Barnes, Student Subunit Representative

The AK-AFS Student Subunit would like to recognize the following University of Alaska students for recently defending their theses or dissertation:

Matt Catterson (M.S., UAF) – “Growth and abundance patterns of Situk River Steelhead (*Oncorhynchus mykiss*);” Chelsea Clawson (M.S., UAF) – “Using remote sensing, occupancy estimation, and fine-scale habitat characterization to evaluate fall Chum Salmon (*Oncorhynchus keta*) spawning habitat usage in Arctic Alaska;” John Hagan (M.S., APU) – “Assessing the accuracy of Landsat-derived stream temperature for use in juvenile salmonid habitat assessments on the Anchor River, Alaska;” Sarah Laske (Ph.D., UAF) – “Surface water connectivity of Arctic lakes drives patterns of fish species richness and composition, and food web structure;” Jared Siegel (M.S., UAF) – “Determinants of life history variability in the Chinook Salmon (*Oncorhynchus tshawytscha*) of Western Alaska;” Eric Torvinen (M.S., UAF) – “Lake Trout (*Salvelinus namaycush*) otoliths as indicators of past climate patterns and growth in Arctic lakes.”



Ben Meyer, Kristin Neuneker, and Leah Sloan, some of the winners at the AFS Student Symposium in March 2017. Photo from Stephanie Berkman.

The 21st annual AK-AFS Student Symposium was held on Friday, March 3, 2017. A total of 26 students from the UAF College of Fisheries and Ocean Sciences (CFOS) gave oral presentations about their graduate research focused in freshwater, estuarine, and marine ecosystems across the state.

Winners in the Long Talk category included Leah Sloan (1st place – Ph.D., Fairbanks), Chelsea Clawson (2nd place – M.S., Fairbanks), and Kristin Neuneker (3rd place – M.S., Fairbanks). Alicia Schuler (M.S., Juneau) was awarded Best Short Talk, and Benjamin Meyer (M.S., Fairbanks) was presented the St. Hubert Research Group award for Best Introduction. The CFOS students would like to



Cheryl Barnes, AFS Alaska Chapter Student Subunit Representative. Photo from Cheryl Barnes.

thank the many volunteer judges who took time out of their day to provide valuable feedback on presentations. We would also like to thank to all AK-AFS Student Symposium sponsors for making this event possible: the Alaska Chapter of the American Fisheries Society, St. Hubert Research Group, and the UAF School of Fisheries and Ocean Sciences. The AFS Alaska Chapter awarded a \$50 cash prize to best talk winners (Leah Sloan, Chelsea Clawson, Kristin Neuneker and Ali Schuler and St. Hubert Research Group provided a \$100 cash prize for best introduction (Ben Meyer).

A total of 59 students presented results from their graduate research during the 2017 AFS/AWRA meeting at Fairbanks in March. Four Juneau students and two Anchorage students received travel funds to attend the meeting. An additional 33 students received registration waivers in exchange for volunteering to help with registration, merchandise sales, session timing, and the various social events. The award for Best Oral Presentation was given to Thomas Farrugia, who spoke about “How many fish are in the barrel? Sustainably harvesting two easily caught skate species.” The Best Student Poster was awarded to Chase Jalbert for his presentation “Landscape genetic diversity of native and invasive Northern Pike in Alaska.” In addition, a new student subunit t-shirt was sold at the meeting to help raise funds for student travel to the 2018 AFS Western Division meeting in Anchorage. 🐟

Member Spotlight: Denny Lassuy

Dona Eidam

Denny Lassuy is a 36-year member of The American Fisheries Society, active in the AFS Alaska Chapter, and served as AFS Oregon Chapter President in 2000. He was Science Editor for Fisheries Magazine for nine years. Denny earned a B.S. in Biology and Intertidal Ecology from the University of Arizona, an M.S. in Biology and Coral Reef Ecology from the University of Guam, and a Ph.D. in Fisheries from Oregon State University.

Denny's career included working for the U.S. Fish and Wildlife Service (USFWS) as Invasive Species Program Manager for the Alaska Region. He helped formulate Alaska's first statewide Aquatic Nuisance Species Management Plan to establish an invasive weed eradication project while working as Regional Refuge Biologist. He also served as the USFWS Representative on the North Pacific Fisheries Management Council. Prior to coming to Alaska, Denny also served as Congressional Liaison for Fisheries and Environmental Affairs in Washington, D.C., and was Fisheries Student Career Experience Program (SCEP) Supervisor to help recruit, hire, and place diverse and promising students in USFWS offices.

Denny has had a special knack for helping fisheries students succeed, evident not only from his work as a successful SCEP Supervisor for USFWS, but also through involvement as adjunct Faculty at the University of Alaska Anchorage, Alaska Pacific University, and Portland State University. He is particularly proud to have been on the team that received the USFWS Alaska Region's first ever Regional Director's Diversity Champion Award.

In 2015, the AFS President's Fishery Conservation Award was bestowed on Denny and fellow "Oregon Chub Teammates" for the successful protection, recovery, and delisting of the Oregon Chub (*Oregonichthys crameri*) as an endangered species, the first-ever full recovery of an ESA-listed fish. While working as a USFWS Endangered Species Biologist, Denny helped write the initial ESA proposed rule to list Oregon Chub and formed the crucially important partnership with the State of Oregon to kick-start the species' recovery. Prior to retiring in fall 2016, Denny was appointed Acting



Denny Lassuy and daughter Mila share a moment with a big rainbow on the Kenai. Photo from Denny Lassuy.

Director of the North Slope Science Initiative, a uniquely Alaskan forum serving over a dozen federal, state, local, and Alaska Native organizations to identify shared priority science needs.

We asked Denny to answer a few questions reflecting back on his career.

How did you end up in the fisheries profession?
"Probably the same way many of us did — I got hooked on fishing with my dad when I was a kid. I became curious about the fish and their habitats... often because I couldn't figure out how Dad always caught more than I did. I figured if I understood the fish and its biology, I'd be better at catching them. Unfortunately, that never came to be - even after I became 'a PhD in fish,' he still out-fished me! The scary thing is, I almost didn't continue. In about the 5th grade I actually sat down and planned out how I'd become that PhD in fish. I stuck with that plan until I took Ichthyology and had my first run in with the fluidity of binomial nomenclature. The prof was such a good taxonomist that virtually every week he'd tell us that species X that we learned last week was now species Y and, by the way, that entire genus is being revised. At the time it almost overwhelmed me, but the next term I took a class in marine ecology in which the T.A. got so excited about estuarine critters that he'd get down on his hands and knees to replicate *Uca* mating behavior — who knew fiddler crabs were so cool!"

Continued on next page

Member Spotlight: Denny Lassuy, continued

What is a favorite memory from your field work? “One of my better memories came during a fish survey transect on the reef flats in Yap while doing my M.S. at the University of Guam Marine Lab in Micronesia. I couldn’t believe the diversity of fish I was seeing — something like over 140 species in an 800-m transect! I distinctly remember thinking this was like a magnificent aquarium with too many colorful species to be real, but it was, and just at that moment under a bit of coral rubble I spotted an adult Psychedelic Mandarin (*Synchiropus splendidus*; yes, aquarium buffs know this as a real fish!) — I was in fish heaven!

Though I’m a fish head, it was actually some non-fish field work that has perhaps been the most memorable among my Alaska experiences. I became concerned about invasive species early in my career and eventually ended up working on all invasives, aquatic or terrestrial, plant, or animal, including rats! As part of the successful eradication of rats from Rat Island, I was involved in preliminary field studies on smaller islands off Adak. Each day we donned our mustang suits and took Zodiacs from Adak to these smaller islands. That daily commute alone was stunningly beautiful and memorable, but the most prominent memory was trapping and anesthetizing the rats

2017 Alaska Tsunami Bowl

Sixteen high school teams from across Alaska met in Seward on February 16 to compete in an ocean-based academic Tsunami Bowl. The regional competition, part of the National Ocean Sciences Bowl engaging students in ocean sciences, prepares students for ocean-related and other STEM (science-technology-engineering-math) careers and becoming knowledgeable stewards of the marine environment. Alaska is the only region requiring students to write a research paper and give an oral presentation before competing in the buzzer-style quiz bowl.

The 2017 theme was “Resource Management in a Warming Pacific.” This year’s Alaska winners, the “Mat-Tsunamis” from the Mat-Su Career and Technical High School, competed in the 20th National Ocean Sciences Bowl in Corvallis, Oregon, on April 20–23, 2017. 🐟

and then using tiny little jeweler’s tools to attach equally tiny little radio collars to these rats to track their movements. The whole scene was nothing I could have ever imagined as a kid from a small farm town in Illinois with a penchant for bluegills!”

What advice would you give to young fisheries professionals just getting started?

“Take your English Comp and other basic classes seriously and get as much out of them as you can. The ability to construct a cogent argument (honed in that Philosophy class) and convey that argument in a clear and understandable way (from that English class) will serve you well in ways, including, but beyond, things like getting published, developing clear regulations, and writing that cover letter for your first job! For those who already are young fisheries professionals, you have started to learn the importance of things like being self-motivated but able to work on a team and keeping credibility in all your work (keep good notes!). Perhaps most important is finding ways (on the job or off) to keep the joy that sparked your interest in the first place — get your face in the water, geek out on policy, get mud on your boots, or just go fish’n!” 🐟

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<http://fisheries.org>

Meetings and Events

WRFC8

World Recreational Fishing Conference

July 15–16, 2017: This meeting will be held in Victoria, Canada. For more information, see <http://wrfc8.com/>.

147th Annual Meeting of the American Fisheries Society

August 20–24, 2017: This meeting will be held in Tampa, FL. For more information, see <http://afsannualmeeting.fisheries.org/>.



Oceans 17



September 18–21, 2017: This meeting will be held in Anchorage. For more information, see <http://www.oceans17mstsieeanchorage.org/>.

Planning and Facilitating Collaborative Meetings

September 20–21, 2017: This workshop to design meetings that enhance problem solving and minimize conflict will be held in Anchorage. For more information, see <https://seagrant.uaf.edu/events/2017/planning-collaborative-meetings/>.



Smoked Seafood School

October 12–13, 2017: This workshop for home or commercial applications will be held in Kodiak. For more information, see <https://seagrant.uaf.edu/map/workshops/2017/smoked-seafood-school/>.



2017 Alaska Young Fishermen's Summit

December 6–8, 2017: This summit provides training, information and networking opportunities for commercial fishermen early in their careers will be held in Anchorage. For more information, see <https://seagrant.uaf.edu/map/workshops/2017/ayfs/>.

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