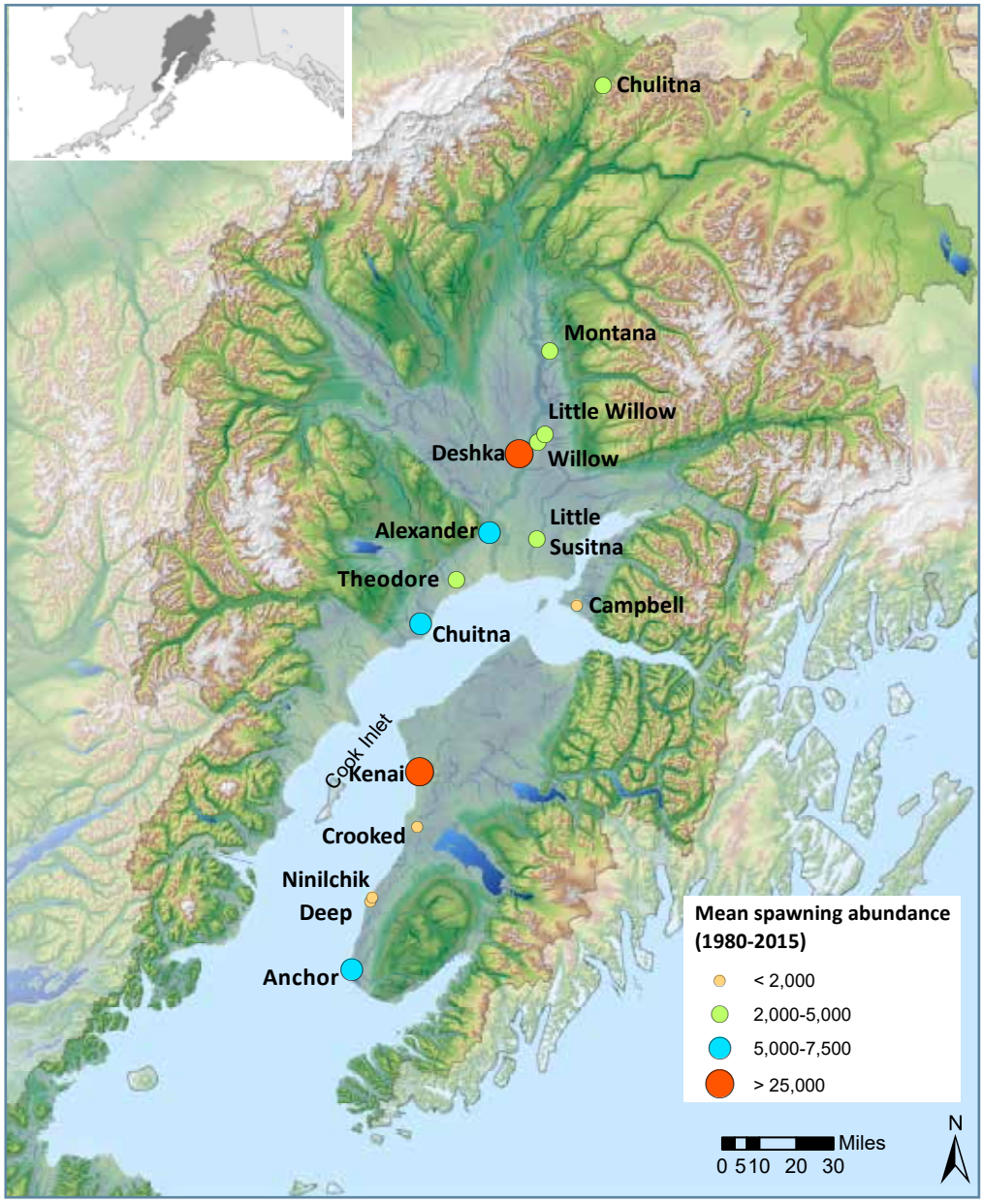
ONCORHYNCHUS

Newsletter of the Alaska Chapter, American Fisheries Society

Vol. XXXX Fall 2020 No. 3

In this issue:



Study populations included in the stock-recruitment model to investigate environmental drivers of Chinook Salmon productivity in the Cook Inlet basin. Dark shading on inset map shows the Cook Inlet basin in southcentral Alaska. Circle size represents mean spawning abundance for each population during 1980–2015. Figure by Leslie Jones.

The Importance of Freshwater Conditions for Cook Inlet Chinook Salmon

Sue Mauger and Rebecca Shaftel in collaboration with Leslie Jones, Erik Schoen, Curry Cunningham, Daniel Rinella, and Adam St. Saviour

Ecosystems supporting Alaskan salmon (*Oncorhynchus* spp.) populations are changing rapidly due to climate change and habitat alteration. Alaska is warming at more than twice the rate of the contiguous United States, leading to a myriad of habitat changes including increasing ocean, stream, and lake temperatures, altered hydrologic regimes, earlier ice breakup, and increased melting of glaciers. Salmon are an immensely valued resource for Alaskans, and the effects of these changes on salmon productivity have major

Continued on next page

The President's Corner

Stephanie Quinn-Davidson, AFS Alaska Chapter President.

Greetings, Alaska Chapter! Fall is here and I hope everyone is navigating this strange COVID-19 world well – or at least getting through it in whatever way you can. Travel bans, social distancing safety measures, and working/learning from home have certainly presented challenges to all of us and our work in fisheries research, management, and policy. The pause in research due to COVID-19 – from graduate student fieldwork to major long-term monitoring efforts in the Bering Sea – will undoubtedly have lasting impacts on our fisheries work moving forward. Thankfully, we are no stranger to unique challenges doing fisheries work in Alaska and I have faith that your collective ingenuity, persistence, and resilience will prevail.

As I write this update, the parent society is hosting their 150th annual meeting… virtually, of course. I have been able to participate when my schedule allows and have been impressed with the engagement from members and AFS leaders throughout the country. The society is using Slack, an online communication tool, to encourage and facilitate conversations you'd normally have at the coffee breaks or walking through the poster session. It's not the same as seeing an old colleague from grad school or meeting up with the speaker whose talk you just attended, but given the circumstances, it is a surprisingly nice alternative. I really appreciated the free access to some of the "theme" days, such as the Diversity, Equity, and Inclusion (DEI) Day. Registration for the meeting wasn't necessary for this particular

Continued on next page

Cook Inlet Chinook, continued

implications for jobs, food security, cultural well-being and identity, and the persistence of salmon-dependent communities.

In other parts of their range, salmon are strongly influenced by environmental conditions in the watersheds where the salmon spawn as adults and rear as juveniles. High temperatures and low flows are a lethal combination for migrating adult salmon, and increased peak flows reduce egg-to-fry survival through scouring of spawning redds and increased sedimentation. Alaska's salmon populations are at the northern extent of their range and climate-driven changes may reduce the productivity of some salmon populations while benefiting others.

Chinook Salmon (*O. tshawytscha*) populations across Alaska have suffered declines since the mid-2000s. The causes are not fully understood, but retrospective studies have linked regional-scale environmental indicators – like timing of river break up and winter sea temperatures – to the dynamics of particular populations. While regional trends in Chinook Salmon productivity are often associated with the North Pacific Gyre Oscillation (NPGO), an index of ocean conditions (*Ohlberger et al. 2016*; *Dorner et al. 2018*), much of the variability in productivity remains unexplained by regional-scale indicators. Few studies have attempted to link local climatic conditions to the dynamics of Alaskan Chinook Salmon populations due to a scarcity of environmental time-series data from watersheds where populations are monitored.

A recently published paper presents the first analysis of regional and watershed-specific climate drivers on the productivity of a diverse group of Alaskan Chinook Salmon populations (*https://onlinelibrary.wiley.com/doi/full/10.1111/gcb.15155*). The project was made possible by long-term monitoring efforts across organizations and included a stream temperature data collection program coordinated by Cook Inletkeeper over the last two decades, and salmon escapement and harvest data collected and shared by the Alaska Department of Fish and Game. Due to limited availability of streamflow data for the study streams, the research team utilized gridded and downscaled monthly precipitation data developed by the Scenarios

Continued on page 4

President's Corner, continued

theme day and I was able to watch several talks and a plenary related to the theme and join a live virtual "lunch", workshop, and "happy hour" with other participants. This format and platform being used by the parent society for such a large meeting (over 1,500 people were participating) gives me hope for a successful Alaska Chapter meeting in March 2021. Speaking of…

As you will see in this newsletter, the organizing committee for the March 2021 Chapter meeting has decided to move forward with a virtual meeting. I and the rest of the Executive Committee strongly support this decision, given the uncertainty we face in the coming months with COVID-19 and the time it takes to plan a successful meeting. Every other chapter in the Western Division has also opted to move forward with virtual meetings in the coming year, so we are not alone. And by the time our Alaska Chapter meeting comes along in March, we will have had numerous examples of successful virtual meetings we can follow.

I participate in a Western Division Executive Committee call each month. Much of our discussion the past couple of months has focused on how to support each chapter as they organize their virtual meetings for the upcoming year. Once the parent society has completed their annual meeting, we hope to have a better idea of what that support looks like – especially in terms of technological support. Our Western Division Executive Committee will be having their annual retreat virtually this year in October. Of course, I'm disappointed I won't be able to meet my Western Division colleagues in person, but I'm hopeful for a productive virtual discussion.

I was recently invited by the parent society to participate in a working group to evaluate adding a new membership level for Native American/Alaska Native/Indigenous members. As part of its DEI efforts, the society wanted to explore adding a specific membership level that would encourage broader participation and engagement with Native and Indigenous fisheries professionals and advocates. After much discussion, we determined that there are other ways to engage with our Native and Indigenous communities, and that starts with creating a more inclusive and welcoming environment – especially at our annual meetings. And that would likely be more effective than simply adding a membership level. I'm eager to continue this discussion within our Chapter, and am especially thankful for the efforts of our own DEI Committee.

AFS Alaska Chapter Annual Meeting Going Virtual in 2021

Our theme for the AFS Alaska Chapter meeting in 2021 will be "Coming Together for the Love of Fish!" Although we are disappointed to not be gathering in Homer next March, we are excited to create an engaging and meaningful experience as we re-envision our Chapter meeting in a virtual space. We hope to make this a more inclusive networking opportunity with active participation around the state…no travel restrictions or budget shortfalls to get in the way!

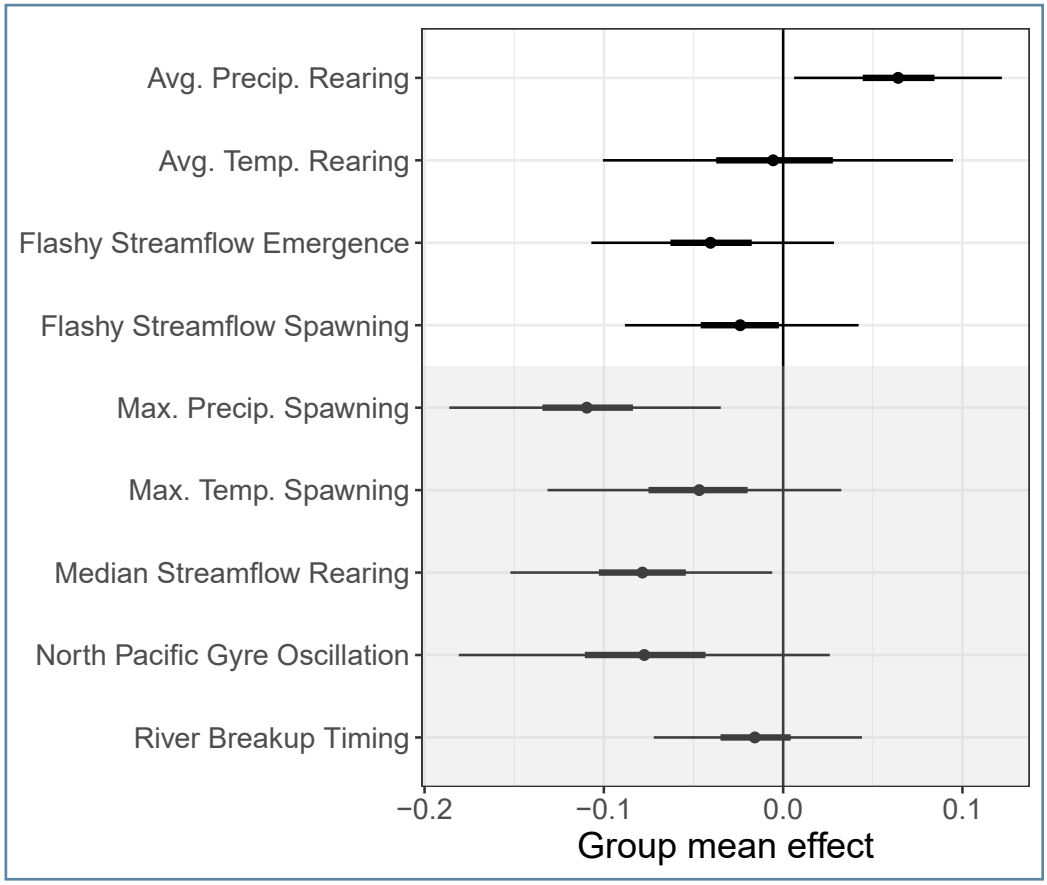
If you want to join our planning team or have program ideas, please contact meeting chair Sue Mauger (*presidentelect@afs-alaska.org*). More details and call for symposia will be posted this fall at *https://units.fisheries.org/ak-mtg/* and *https://www.facebook.com/AlaskaAFS/*.

Steven Berkeley Marine Conservation Student Fellowship

This fellowship was created by AFS in 2007 to honor the memory of Steven Berkeley, a dedicated fisheries scientist with a passionate interest in integrating the fields of marine ecology, conservation biology, and fisheries science to improve fisheries management. Berkeley was a long-time AFS member and on the first Board of Directors for the Fisheries Conservation Foundation. The fellowship comprises a competitively-based $10,000 award to a graduate student actively engaged in thesis research relevant to marine conservation. Research topics may address any aspect of conservation; a focus on fisheries issues is not required. Electronic applications and recommendations must be received by February 1, 2021. For more information see *http://mfs.fisheries.org/?page_id=155*.

Cook Inlet Chinook, continued

Network for Arctic + Alaska Planning (SNAP; https://uaf-snap.org/). Using these datasets, the team, led by the University of Alaska with state, federal, and non-profit partners, investigated the relationships between freshwater habitat conditions and variation in Cook Inlet Chinook Salmon productivity for 15 different populations over a three-decade period from 1980 to 2009.



Chinook Salmon population productivity (log recruits per spawner). Dots describe the median estimated effect of each covariate on productivity, while the thick and thin lines show uncertainty (50% and 95% credible intervals, respectively) in estimated effect sizes. The vertical line centered at zero represents a null effect on productivity. The background color shows watershed- (white) and regional-scale (shaded) indicators. Figure by Curry Cunningham.

In the Cook Inlet basin, Chinook Salmon adults typically spawn during July–August and die shortly thereafter. Their embryos incubate in the gravel streambed during the fall and winter, and juveniles emerge during the following spring. Juveniles typically rear in freshwater for one year before migrating to the ocean as smolts, spending one to five year in the marine environment before returning as mature adults to spawn in their natal streams. The Alaska Department of Fish and Game (ADF&G) monitors 24 Chinook Salmon spawning populations in the Cook Inlet basin. Stream temperature data were available for 15 of these populations, which together accounted for roughly 75% of the monitored spawning escapement. These 15 populations span a diverse range of stream and watershed characteristics, including low-elevation wetland streams, high-elevation snow-fed streams, and one glacial river.

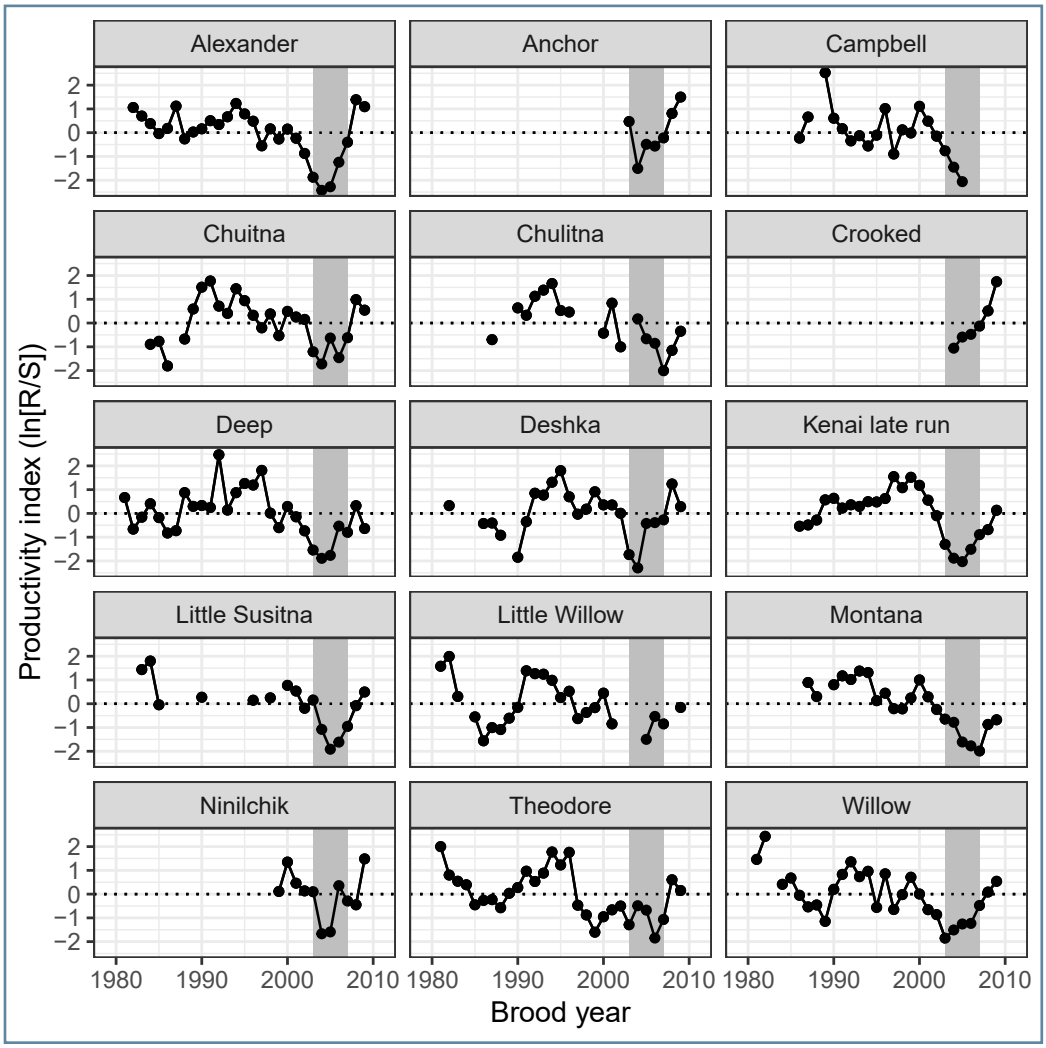
The research team used a hierarchical stock-recruitment approach to quantify environmental effects on Chinook Salmon productivity while accounting for density-dependence in survival. Stock-recruitment models relate the numbers of fish that escape ocean and freshwater fisheries to spawn in each brood year (spawning stock) to the numbers of their offspring (recruits) that return as adults and are harvested or spawn in subsequent years. Compiling spawning abundance, harvest, and age composition data collected by ADF&G, study researchers used a run reconstruction approach to estimate recruitment and productivity. The effects of environmental indicators on productivity of each Chinook Salmon population were then estimated. Chinook Salmon spawning abundances and harvests fluctuated by roughly an order of magnitude during the 1980–2015 return years. Spawning abundances declined during the early 1990s for many populations and during the mid-2000s for all populations. Spawning abundances partially recovered for some populations after 2010, but despite these gains,

Continued on next page

Cook Inlet Chinook, continued

overall harvests reached a 30-year low in 2012.

Analyses found that maximum monthly precipitation during spawning and early incubation periods negatively affected Chinook Salmon productivity, with a 10% reduction in recruits-per-spawner for each 1 standard deviation (SD) increase in precipitation. Flooding in late summer and fall may affect embryo survival through scouring or siltation of redds. Conversely, average monthly precipitation during juvenile rearing was positively related to Chinook Salmon productivity, with a 7% increase for each 1 SD increase in precipitation. Higher precipitation in the summer may increase the availability of off-channel habitats, where warmer temperatures and increased food resources may increase juvenile growth rates.



Standardized index of Chinook Salmon population productivity (natural log of recruits per spawner) by brood year. Dotted lines at zero represent the long-term mean productivity levels of each population. In all, 13 of 15 populations exhibited their single lowest productivity level during 2003–2007 (shaded vertical bands). Figure by Eric Schoen.

Stream temperatures had mixed effects across populations, depending upon the thermal regimes of each individual stream. Maximum weekly temperatures in fall above 18°C, and mean weekly temperatures in summer above 15°C, were negatively associated with Chinook Salmon productivity, but these conditions were only found in the warmest systems. In some of the coldest systems, maximum fall and mean summer stream temperatures were positively associated with productivity. The NPGO, an indicator of ocean conditions during the year of ocean entry, had variable effects across populations.

Our ability to understand the effects of freshwater conditions on salmon populations across the state requires a commitment to long-term datasets and the use of reliable monitoring tools, like this highly accurate and relatively inexpensive temperature data logger. Photo by Cook Inletkeeper.

These results suggest that cumulative effects from five years of adverse freshwater conditions, including high spawning abundance, heavy fall rains, and above-optimal spawning and rearing temperatures, reduced the productivity of the 2003–2007 broods and contributed to the diminished returns of Chinook

Continued on next page

Cook Inlet Chinook, continued

Salmon to Cook Inlet during the late 2000s and early 2010s. Spawning abundances were relatively high across the region during 2003–2005, but density-dependence explained only a small portion (10%) of the 57% average decline in recruitment suffered by the 2003–2007 broods across the 15 streams. In addition, these broods faced a combination of unusually high fall precipitation and warm summer stream temperatures.

A growing body of evidence now links the productivity of Alaskan Chinook Salmon populations to multiple drivers in both the freshwater and marine environments, including river discharge and temperature, precipitation, river ice breakup timing and the NPGO, winter sea surface temperature and competition with hatchery salmon in the ocean, and growth rates during the first year in the ocean. No single driver or life stage has been identified that can fully explain these declines, suggesting that multiple drivers are involved, individual populations are responding differently, or both.

In 2019, Alaska experienced a record heat wave with stream temperatures above 26°C in the warmest of Cook Inlet's Chinook Salmon systems. It will be increasingly important to understand stream-specific responses to climate change for better management of our valuable fisheries. Further research examining the relationships between climate and productivity at finer scales, leveraging advances in monitoring, remote sensing, and climate modeling, is necessary to provide valuable watershed-specific guidance for conserving habitats and managing fisheries. Co-located monitoring of stream temperature, streamflow, and adult salmon returns is an important data gap that should be addressed to help drive this research. Expanded stream temperature monitoring efforts across Alaska and the availability of new gridded climate datasets may allow for a better understanding of the effects of local, freshwater conditions on salmon populations across the state.

Sue Mauger is the Science & Executive Director of Cook Inletkeeper; Rebecca Shaftel is an Aquatic Ecologist with the Alaska Center for Conservation Science, UAA; Dr. Leslie Jones is the Geospatial Information Officer for the State of Alaska and an Affiliate Assistant Professor at UAA; Dr. Erik Schoen is a Research Scientist with the Institute of Arctic Biology, UAF; Dr. Curry Cunningham is an Assistant Professor at the College of Fisheries and Ocean Sciences, UAF; Dr. Daniel Rinella is a Fisheries Biologist in the Anchorage Fish and Wildlife Conservation Office, U.S. Fish and Wildlife Service; and Adam St. Saviour is a Fishery Biologist with the Alaska Department of Fish and Game.

NOAA 2021 Marine Debris Research Grant

This National Oceanographic and Atmospheric Administration (NOAA) grant provides funding for research directly related to marine debris through field, laboratory, and modeling experiments. The NOAA Marine Debris Program plans to fund selected research projects that investigate and identify the critical input pathways for marine debris introduction into the coastal zone (shoreline or nearshore), including evaluation of appropriate simultaneous pathways of riverine transport downstream, surface runoff, stormwater discharge, and wind-driven transport, as well as degradation and fragmentation of debris during transport. Projects should be original, hypothesis-driven projects that have not previously been addressed to scientific standards. The Letter of Intent (LOI) submission period for research projects will extend from September 15 to November 5, 2020. Applicants whose LOIs are selected will be invited to submit a full proposal following the LOI review period. For more information contact Peter Murphy (peter.murphy@noaa.gov).

AFS memberships
may be renewed online
https://fisheries.org

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

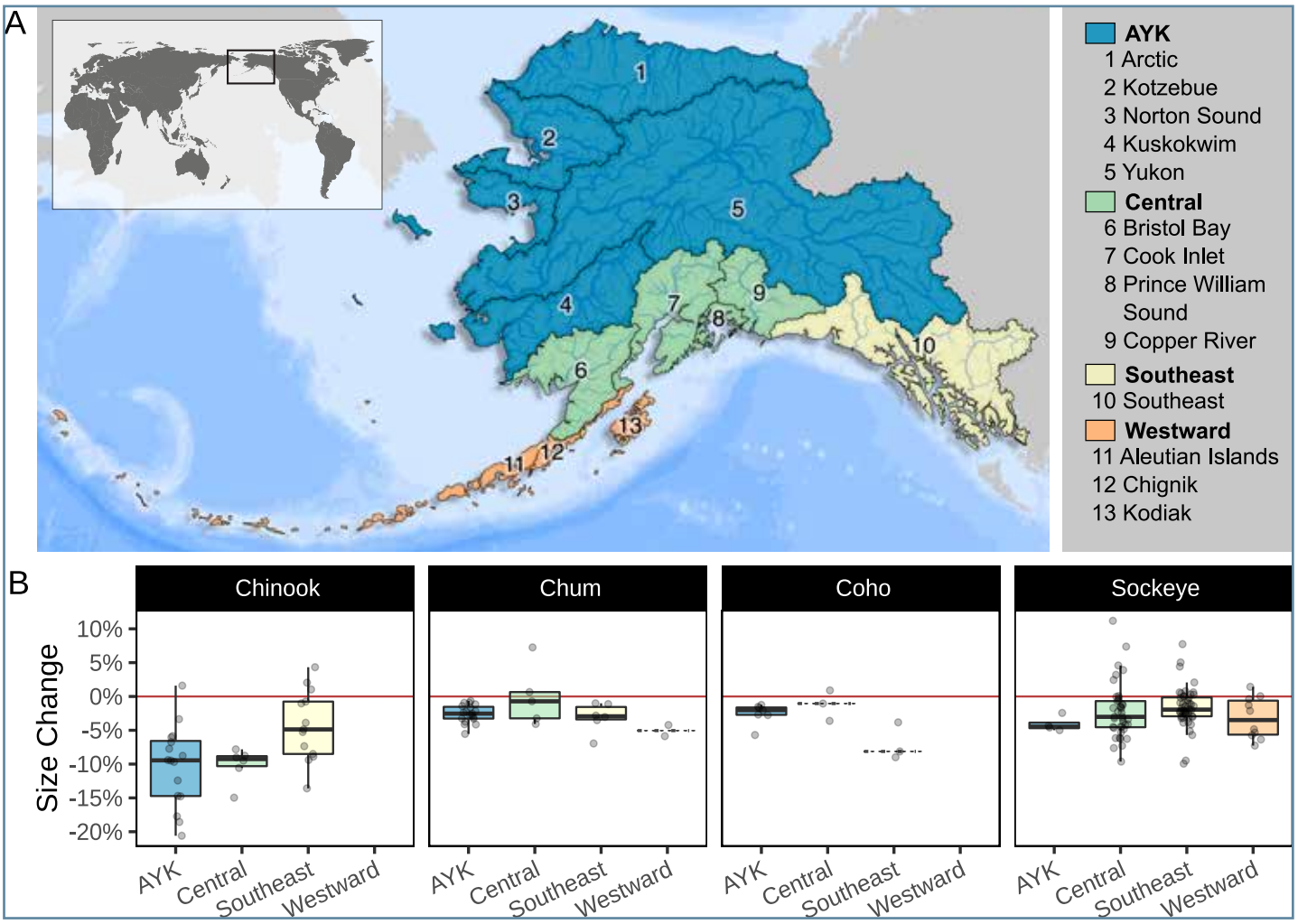
Alaska Salmon are Shrinking

Krista Oke and Bert Lewis

If you live in Alaska, you know that salmon play a critical role in Alaska's ecosystems, economies, and communities. You may also have heard that there is a general trend towards smaller body size in salmon, or that the very large, old Chinook Salmon (*Oncorhynchus tshawytscha*) once common in many parts of the state are becoming rare. Through a State of Alaska Salmon and People (SASAP) project working group sponsored by the National Center for Ecological Synthesis and Analysis (NCEAS), we conducted a synthesis of salmon size data from across the state to better document and understand the trend for smaller size seen in Chinook, Chum (*O. keta*), Coho (*O. kisutch*), and Sockeye (*O. nerka*) salmon. Using data collected over the past 60 years by the Alaska Department of Fish and Game on over 12.5 million individual salmon, we show broadscale declines in the body size of all four salmon species. We found that younger age at maturity was primarily responsible for decline in size.

In each species, fish maturing after 2010 were significantly smaller on average than fish that matured prior to 1990. Variation in the extent of body size change existed among species, with Chinook Salmon showing the greatest magnitude decline. Within species, the magnitude of decline also varied among regions and populations, but the overall pattern of body size decline was significant in all four species. Importantly, our study shows

Continued on next page

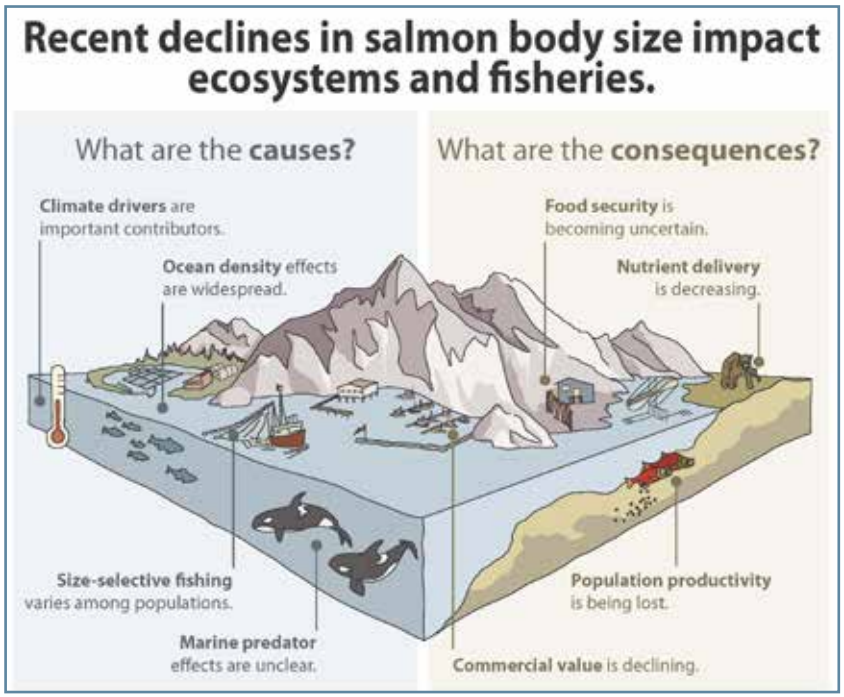


On average, salmon body size was smaller post-2010 compared with pre-1990 across all areas and species examined. A) Study area with regions numbered and colored according to Alaska Department of Fish and Game management areas. B) Percent change in mean length between data collected before 1990 and after 2010. Points show change in mean length for individual populations. Red line indicates no change. Adapted from Oke et al. (2020).

Alaska Salmon are Shrinking, continued

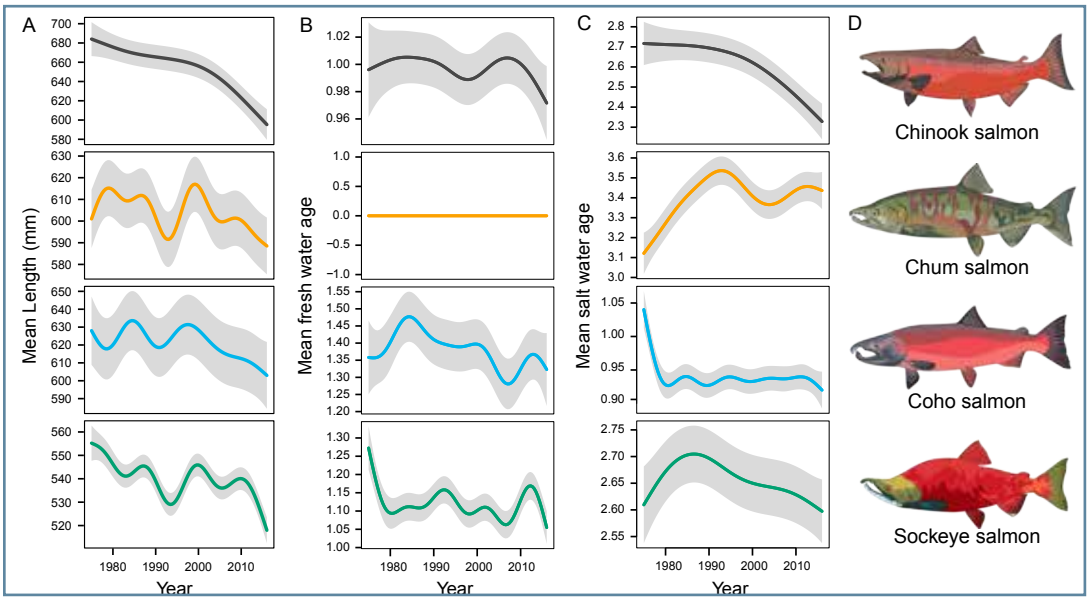
that changes in body size resulted primarily from changing age structure and to a much lesser extent from changing growth rates.

We also investigated potential causes of the declines including climate, competition, and size selective harvest. Our analysis found that no single factor could explain body size declines across all four species, which instead appear to result from complex and species-specific effects of several factors. However, both climate and competition at sea with highly abundant salmon species are clearly contributing to the observed body size declines. Our ability to test for an impact of size-selective fishing was limited to certain regions and species, where there was not an effect of fishing, but a role of size-selective fishing in other species or regions cannot be ruled out.



Potential causes and impacts of declines in salmon size in Alaska. Graphic from Krista Oke.

Given the importance of salmon for Alaska's ecosystems, economies, and culture, we investigated whether smaller body size could result in ecological or socio-economic consequences. Our calculations suggest that today, each salmon provides fewer meals for subsistence users and less profit for commercial users, while also transporting less marine-derived nutrients into freshwater ecosystems and leaving fewer eggs in redds, compared to the average salmon prior to 1990. These impacts will be most acutely felt when reduced body size is compounded by reduced salmon abundances, as is the case for many Chinook Salmon populations. Body size declines have been observed in many taxa, but the consequences of these changes are rarely quantified. Our results suggest that these consequences could be substantial.



A) Mean fish length has changed in a nonlinear pattern, as demonstrated by the nonlinear year effect from general additive models on mean population length with fixed effects of region and population. B) Mean freshwater age (in years) has generally declined, except for Chum Salmon, which leave freshwater shortly after emergence. C) Mean saltwater age (in years) has also generally declined, except in Chum Salmon, which increased in saltwater age until around 1990. Plots are conditioned on reference populations with the longest time series for each species, but the pattern plotted is the common pattern through time calculated for all populations. Adapted from Oke et al. (2020).

The paper is available as open access at https://rdcu.be/b6mc2.

Student Subunit Happenings

Elizabeth Hinkle, Student Subunit Representatives

I would like to first recognize recent AFS member and/or CFOS graduates: Matthew Callahan (M.S. Fisheries), Alyssa Frothingham (M.S. Fisheries), Bailey Fuller (B.S. Biological Sciences), Marcus Gho (Ph.D. Fisheries), Duncan Green (M.S. Fisheries), Kelly Ireland (M.S. Biological Sciences), Jenell Larsen Tempel (Ph.D. Fisheries), Ryan Lucas (M.S. Biological Sciences), Heidi Mendoza-Islas (M.S. Oceanography), Benjamin Meyer (M.S. Fisheries), Alexandra Poje (M.S. Oceanography), Justin Priest (M.S. Fisheries), Ann Raymond (M.S. Fisheries), Wendel Raymond (Ph.D. Fisheries), Danielle Siegert (M.S. Marine Biology), and Benjamin Weitzman (Ph.D. Marine Biology). Congratulation on your accomplishments and good luck in your future pursuits!

As this fall semester gets underway, I sit typing at my office desk. The normal buzz of students has vanished, the fluttering of jackets in the hallways has diminished, and the aggressive *click* of heels on linoleum is rare, but the fury of meeting deadline after deadline still exists. It is weird and I am sure students across the state are experiencing their own flavor of weird. Nonetheless, the AFS Student Subunit is surging forward and has already had its first virtual meeting! Leadership is accelerating with plans for semester events including hosting another R-based workshop, conducting a socially distanced research project, and volunteering in the community.

Speaking of which…students took to the streams in September—traveling in small roves or going solo—to clean up some popular streams in Interior Alaska. The Fairbanks student group paired up with Midnight Sun Fly Casters for a socially distanced stream clean-up on the Chena River and Badger Slough in Fairbanks and North Pole, respectively. The effort is part of a larger nationwide American Fisheries Society event in recognition of National Public Lands Day (NPLD). The NPLD is a single-day volunteer event that happens on the fourth Saturday of every September and began in 1994 by the National Environmental Education Foundation to encourage citizen volunteers to clean-up their local public lands. As eager as people are to help out, it is always a bit frustrating to know that our fellow nature lovers are the ones who created the messes in the first place. In short, we are trying to combat an age-old problem: the tragedy of the commons.

Alaska Chapter Student Subunit members (left) Molly Payne and (right) Carolyn Hammon participate in the Stream Cleanup event at the Chena River and Badger Slough. Photos from (left) Molly Payne and (right) Taylor Cubbage.

Human debris affects stream fauna, such as this Chum salmon in Southeast Alaska that became entangled in fishing line. Photo from Molly Payne.

The tragedy of the commons occurs when individuals in a shared-resource system act independently to deplete or ruin a communal resource through collective actions in fulfilling their own self-interest, which are contrary to the common good of all users. The "Tragedy of the Commons" (Hardin 1968) has become a concept to help understand and explain how

Continued on next page

Student Subunit Happenings, continued

our shared resources are treated. Some political philosophers believe that the one effective solution to the tragedy is grass roots social schemes (e.g., volunteer stream clean up), and that the best governmental solution is often no involvement at all.

In 2009, Elinor Ostrom was awarded the Nobel Memorial Prize in Economic Science for her analyses of Hardin's concerns. *Ostrom et al. (1999)* found that the tragedy was not as enigmatic as it seemed, and reported that locals do often create their own solutions. In the case of natural resources, such as fisheries, the research found a few particular factors that are useful in managing communal resources. Firstly, resources with definable boundaries are preserved more easily than those with less tangible perimeters. Second, a dependence on the resource is important, especially if the resource is difficult to substitute and is under threat. Another key factor is a supportive community that encourages and normalizes conservation. Finally, having clear community rules, procedures, incentives and punishments in place to enforce proper use of resources helps hold individuals responsible.

With events like a stream cleanup, our student leadership provides a supportive community that normalizes conservation. The event defines a clear location, from which many of us extract our valuable subsistence resources, and which we want to depend upon and protect from being under threat. In light of the chaos we are all experiencing, this event reminds me of the tenacity of the "helpers" in difficult times and I am proud of our student leadership for preventing the resources of the commons from becoming a tragedy. Perhaps next year we will not need a volunteer day, but for now, we carry on.

For more information regarding this semester's events keep an eye out for updates via Facebook (*AFSAlaskaStudentSubunit*) and Instagram (*uaf_afs_studentsubunit*) or contact Subunit President Carolyn Hamman (*chamman3@alaska.edu*). Lastly, speaking of caring about a shared resource and taking collective action for the common good, remember to vote, folks. You can check your voter registration at *https://vote.gov/*.

PWSAC Employees Study Fisheries at UAS while Working in Alaskan Hatcheries

Anna Laffrey

This salmon season, some Prince William Sound Aquaculture Corporation (PWSAC) employees are doubling down on the hatchery experience by taking the Introduction to Alaska Salmon Culture course through the Fisheries Technology program at the University of Alaska Southeast (UAS). In this introductory course offered through a new PWSAC-UAS partnership, students completed creative projects, like detailing the "egg take" fertilization process. At home, one student cuts open a brown sock, releasing red berries into a collection bucket, then mixing in a milky substance to simulate "fertilization."

Christopher Conrad, another student who is working at the Wally Noerenberg Hatchery on Esther Island in Prince William Sound, shoots video on an iPad while his co-worker gently pours salmon eggs into incubator trays, and vats are filled to the brim with millions of delicate pink ovoids. Conrad, a 27-year-old from Green Bay, Wisconsin, went to work for PWSAC knowing he'd also be accessing a formal fisheries education. Conrad is just one hatchery recruit sponsored by PWSAC to enroll in the three-credit course.

Angela Bowers is a fisheries professor at UAS and teaches for the Fisheries Technology program, a workforce training program based in Sitka and focused on aquaculture and fisheries management. Bowers instructs fisheries students across Alaska and the greater U.S. through distance-learning courses. This semester, Bowers sent 23 tablets to hotels in Cordova and Anchorage, where PWSAC hatchery workers were completing a two-week quarantine upon their in-state arrival. The iPads were pre-loaded with readings, lectures, and assignments, and equipped for video production projects.

Employee quarantines were just one hurdle that PWSAC cleared throughout an extraordinary Alaskan fishing season. In May, the famous Copper River Sockeye Salmon fishery was closed

Continued on next page

PWSAC Employees Study Fisheries at UAS, continued

due to poor returns, and a landslide-triggered tsunami alert threatened Prince William Sound. In June, Chum Salmon fell short of predictions at PWSAC's Wally Noerenberg Hatchery, and in July the aquaculture organization saw one of its worst Pink Salmon runs in history.

Meanwhile, UAS grappled with state budget reductions and reduced enrollment across campuses due to the COVID-19 pandemic. In keeping students safely off-campus, programs like the Fisheries Technology program in Sitka can't lead students in field work or cold-water scuba dives. Bowers and her colleagues cancelled Salmon Culture and Fish Pathology classes, as well as the Salmon Culture Semester held in Sitka each fall.

Then Tommy Sheridan, PWSAC CEO, called Bowers to offer a fresh crop of UAS students. Sheridan, a former UAS professor, imagined his employees studying the fundamentals of Alaskan hatcheries while settling into their new roles with PWSAC. Learning fish culture fundamentals shaped how students like Conrad, a newcomer with no background in fisheries, approached work each day. Through the introductory course, students understand the basics of species identification, anatomy, processes like "egg take," fish pathology, water quality, and get an in-depth look at the history and purpose of private non-profit hatcheries like PWSAC. For new fisheries workers like Conrad, the instruction becomes critical to increasing aquaculture understanding in a short time frame.

Since the pandemic hit, Sheridan has worked to maintain quality of life while prioritizing employee health and keeping hatchery operations afloat. He implemented wage increases for hourly employees, with additional increases for public-facing employees put at heightened risk. Fortunately, PSWAC had already contracted a new Safety Coordinator from Fairweather, LLC to begin with the corporation's hatcheries last March. Safety Coordinator John Stallone started his new role with the aquaculture organization just days before COVID-19 cases swept the U.S. This season, hatchery workers faced additional risks due to close, bunkhouse-style living quarters and necessary work-related travel. Fairweather and PWSAC prioritized health with twice-daily temperature checks, and maintained morale with amenities like coffee and meal delivery while employees quarantined in hotels.

The UAS course has been big for morale among participating employees and their colleagues. Stallone is optimistic that all PWSAC workers will walk away from the season having gained skills for work and life. Sheridan said PWSAC managers are hopeful that at least 75 percent of seasonal recruits will return for the 2021 spring season, making for the highest retention PWSAC has seen in "a long time."

Meanwhile, Bowers is eager to offer broader courses to more newcomers at aquaculture organizations like PWSAC. Her laboratory in fish pathology, for instance, would help workers identify illnesses in fish and keep their stock healthy. Either way, Sheridan said he wants to continue the partnership with UAS, offering all new recruits training that works for the organization and the employees.

Ginny Eckert appointed Alaska Sea Grant Director

Dr. Ginny Eckert was appointed director of the Alaska Sea Grant Program at the University of Alaska Fairbanks in July 2020. Eckert, based in Juneau, has served as acting, then interim, director since summer 2019, and has been Alaska Sea Grant's associate director for research since 2013. Concurrent with her Sea Grant role, Eckert will continue as a professor at the Juneau Center of the UAF College of Fisheries and Ocean Sciences, teaching and conducting research in marine ecology, mariculture, and fisheries. With a bachelor's degree from Dartmouth College, a master's degree from the University of Florida, and a doctorate from the University of California Santa Barbara, Dr. Eckert has authored over 50 scientific publications and is a scientific SCUBA diver and an avid boater. Eckert is the eighth director in the 50-year history of Alaska Sea Grant. Alaska Sea Grant is a partnership between the National Oceanic and Atmospheric Administration and UAF, and as one of 34 Sea Grant programs across the country, supports research, education, and extension activities that enhance the ability of Alaskans to understand, conserve and sustainably use Alaska's rich and diverse marine and coastal resources.

Meetings and Events

Alaska Marine Science Symposium

January 26–28, 2021: This is a virtual meeting with abstracts due October 16. For more information, visit https://alaskamarinescience.org/.

American Fisheries Society Western Division Annual Meeting

March 10–14, 2021. Virtual meeting originally scheduled for Ogden, Utah. More information will be posted at https://wdafs.org/.

American Fisheries Society Alaska Chapter Annual Meeting

March 22–25, 2021. The 47th annual meeting of the AFS Alaska Chapter will be a virtual meeting. More information will be posted at https://afs-alaska.org/.

13th International Conference on Climate Change

April 8–9, 2021. This meeting is scheduled for Vancouver, Canada. More information is at https://on-climate.com/.

AFS Alaska Chapter Mentorship Program ... coming soon!

The AFS AK Chapter Diversity, Equity, and Inclusion Committee (DEIC) has identified a need for greater representation and mentorship of underrepresented students and early career professionals in fisheries or a related discipline. We are seeking individuals who belong to an underrepresented or historically marginalized group (e.g., in terms of race, ethnicity, gender identity, sexual orientation, or socioeconomic background) in fisheries science and would like to be paired with others having shared identities and/or professional interests. The goal is to encourage support of membership diversity and reduce barriers to participation in our field. Mentors and mentees will be paired on an as-needed basis, with commitments ranging from a single conversation to long-term relationships with regular contact. The level of engagement will depend on individual interests and needs. Please fill out the survey at https://www.surveymonkey.com/r/G7MWDFD if you are interested in participating in the DEIC mentorship program as a mentor or mentee and would like to receive additional information. Submissions for the first round of placements must be submitted by COB on November 16, 2020. Questions and additional comments can also be sent to deic@afs-alaska.org.

ONCORHYNCHUS

Oncorhynchus is the quarterly newsletter of the Alaska Chapter of the American Fisheries Society. Material in this newsletter may be reprinted from other AFS websites.

Editor
Bill Bechtol
Bechtol Research
P.O. Box 3426, Homer 99603-3426
Phone 299-6146
bechtolresearch@hughes.net

Production
Connie Taylor
Fathom Graphics
P.O. Box 200448, Anchorage 99520-0448
Phone/Fax 272-3305
Connie@FathomGraphics.com

Deadline for materials for the next issue of *Oncorhynchus* is Dec. 10.

Alaska Chapter Officers

President Stephanie Quinn-Davidson, Yukon River Inter-Tribal Fish Commission; Ph: 328-8088; president@afs-alaska.org

President-Elect Sue Mauger, Cook InletKeeper; Ph: 399-2070; presidentelect@afs-alaska.org

Vice President Megan McPhee, University of Alaska Fairbanks; vicepresident@afs-alaska.org

Immediate Past-President Joel Markis, University of Alaska Southeast, 1332 Seward Ave., Sitka 99835; Ph: 747-7760; pastpresident@afs-alaska.org

Treasurer Lee Ann Gardner PO Box 670346, Chugiak 99567-0346; Wk: 688-1400, Fax: 688-1405; treasurer@afs-alaska.org

Secretary Scott Ayers, secretary@afs-alaska.org

Student Subunit Representative Elizabeth Hinkle, University of Alaska Fairbanks; student@afs-alaska.org

Feel free to contact the Executive Committee members.