



# ONCORHYNCHUS

Newsletter of the Alaska Chapter, American Fisheries Society  
Vol. XXXIX Winter 2019 No. 1

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"Buttercup," the remotely operated vehicle used in a study of potential Yelloweye Rockfish habitat along the Northern Gulf of Alaska. Picture from Joshua Mumm.

## A Bathymetric-Based Habitat Model for Yelloweye Rockfish on Alaska's Outer Kenai Peninsula

Joshua Mumm, Bradley Harris, Roman Dial, and William Bechtol

Several life history characteristics predispose demersal rockfish such as Yelloweye Rockfish (*Sebastes ruberimus*) to overexploitation. Chief among these characteristics are their profoundly k-selected traits of low productivity, episodic recruitment, late maturation, and low dispersion. Additionally, demersal rockfish are difficult to survey using traditional methods because their rocky habitat precludes trawl surveys, and closed swim bladders embolize when brought to the surface, thereby inhibiting extractive mark recapture surveys.

Despite the susceptibility to overfishing, and the value to both recreational and commercial fisheries, formal stock assessments and districtwide abundance estimates have been lacking for Yelloweye in Southcentral Alaska. Instead, existing

catch limits were static based on historical catch averages (*Bechtol 1998*). Preferably, catch limits are set relative to biologically significant reference points, such as an estimate of abundance or biomass. Habitat-based abundance estimates are effective for heterogeneously distributed species closely associated with specific habitats, as is the case for Yelloweye, in which densities observed in habitat strata are expanded by the total extent of habitat in a management unit (e.g., *Nasby-Lucas et al. 2002*; *Yoklavich et al. 2007*). In contrast to Southcentral Alaska, Yelloweye catch limits in Southeast Alaska are tied to this type of habitat-based abundance estimate (*Olson et al. 2018*). This approach has also been demonstrated for juvenile groundfish in the greater Gulf of Alaska (*Pirtle et al. 2017*).The

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## The President's Corner



Jeff Falke, AFS Alaska Chapter President.

Greetings Alaska Chapter American Fisheries Society!

My hope was to use this space to report on the annual Alaska Chapter Executive Committee (ExComm) retreat, scheduled to be held in Anchorage during mid-December 2018. But, as you all know, nature had other plans and “shook up” that schedule! Jokes aside, myself and the rest of the ExComm hope that all of you and your families made it through the earthquake unscathed.

Did you know our Chapter has an annual meeting quickly approaching? In lieu of a retreat report, I'll use this space to highlight plans for our upcoming 2019 Alaska Chapter of the American Fisheries Society annual meeting.

**General meeting information:** Our annual meeting will take place the week of March 18–22, 2019, in Sitka, Alaska. The theme for this year's meeting is “Headwaters to Oceans, connecting Alaska's fisheries.” Joel Markis, Alaska Chapter AFS President-Elect ([jamarkis@alask.edu](mailto:jamarkis@alask.edu)) is the meeting chair. General meeting information and links to registration and abstract submission can be found on the meeting website (<https://www.afs-alaska.org/2019-2>).

**Accommodations:** Room blocks have been set aside at [Aspen Suites Hotel Sitka](#) (907-747-3477), the [Longliner Lodge & Suites](#) (907-747-

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## Yelloweye Rockfish, continued

Alaska Department of Fish and Game (ADF&G) recently used a remotely operated vehicle (ROV) to estimate Yelloweye density within habitat strata at several index sites along the outer coast of the Kenai Peninsula ([Byerly et al. 2007, 2015](#)). However, to calculate districtwide abundance, an estimate of the total area of suitable habitat in the district is required. The recent project aimed at this knowledge gap by producing a model for predicting suitable Yelloweye Rockfish habitat from high-resolution bathymetry in Southcentral Alaska.

[Young et al. \(2010\)](#) successfully modeled the distribution of three rockfish species, Rosy (*S. rosaceus*), Yellowtail (*S. flavidus*), and Greenstriped (*S. elongatus*), off California using a combination of submersible observations and high resolution multibeam echosounder (MBES) bathymetry data. For each species, the authors incorporated several depth derived terrain variables into a generalized linear model (GLM) to predict the probability of presence for a species. Our study used previously acquired high resolution bathymetry and ROV data to explore the feasibility of modeling Yelloweye Rockfish habitat in the Chiswell Island and Nuka Island study areas on the outer coast of the Alaska Kenai Peninsula using an approach similar to that developed in California ([Iampietro et al. 2005, 2008](#); Young et al. idem). The model was parameterized and evaluated in the Chiswell Island area using a reserved set of presence/absence points. To further test portability and robustness, the model was then applied to the independent Nuka Island area.

Four types of terrain variables were derived from depth rasters for use as predictor variables: bathymetric position index (BPI), rugosity, slope, and distance-to-rock (DTR). The bathymetry was surveyed using multibeam echosounder data for the Chiswell area and analyzed using a 3-m cell size. A variety of scales, corresponding to different neighborhood sizes, were considered for each type of terrain variable, because fish associate with the seafloor at a variety of scales ([Anderson and Yoklavich 2007](#); [Wilson et al. 2007](#); [Monk et al. 2011](#)). Rugosity was calculated as the vector rugosity metric (VRM) and is a measure of the variance in three-dimensional orientation of vectors orthogonal

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## President's Corner, continued

7910), and *Westmark Sitka* (907-747-6241). All are walking distances to the meeting venue and close to restaurants and entertainment. Room rates vary slightly but range from \$100 to roughly \$130 per night. Mention AFS to receive promotional pricing.

**Registration:** Registration will be conducted through EventBrite. Early bird registration will be open from January 28 to February 22, after which fees increase. Meeting attendees can also register (at the late rate) on-site during the meeting. A registration reminder email will be sent once registration opens.

**Program:** We will offer a high-quality and diverse set of symposia that reflect the meeting theme and address current and future issues in the conservation and management of fisheries resources. These sessions will address our mission to improve conservation and sustainability of fishery resources and aquatic ecosystems by advancing fisheries and aquatic science and promoting development of fisheries professionals. We would like to thank all of the session organizers for their contributions thus far. The call for papers and posters is currently open (through February 18). Instructions for presenters and abstract submission can be found at: [https://www.surveymonkey.com/r/AFS\\_Abstract](https://www.surveymonkey.com/r/AFS_Abstract). Questions? Contact Joel Markis ([jamarkis@alask.edu](mailto:jamarkis@alask.edu)) or Peter Westley ([pwestley@alaska.edu](mailto:pwestley@alaska.edu)) for more information.

**Continuing Education:** We plan to offer several continuing education courses on Monday,

March 18. Specific topics are still being evaluated and a list of options is forthcoming. Please contact Sara Miller ([sara.miller@alaska.gov](mailto:sara.miller@alaska.gov)) for course topic suggestions or more information.

**Socials:** We will host a number of engaging socials that not only allow our diverse membership to network and interact, but will also showcase a variety of beautiful Sitka venues. There will be a Welcome Social March 18, a Poster Session and Film Fest March 19, and a catered banquet Thursday evening, March 21.

**Field trips:** Make the most of your trip to beautiful Sitka! Meeting-sponsored field trips will occur on Friday, March 22, and will include a scenic wildlife cruise and production hatchery tour to name a couple. Please make sure and account for this extra day in your travel plans. Check the meeting website for options.

Interested in helping out with the meeting? Please contact Joel Markis ([jamarkis@alask.edu](mailto:jamarkis@alask.edu)) to volunteer!

As I mentioned in my last President's Corner, we will hold another Environmental Concerns issues and policy dialogue at the Sitka meeting. This discussion will follow a special session on this topic. More information on the discussion will follow, but in the meantime please contact me directly ([afs.alaska.president@gmail.com](mailto:afs.alaska.president@gmail.com)) with questions or for more information.

I hope to see each and every one of you this March at our annual meeting! Until then....

Best regards,  
Jeff Falke 🐻

## New Invasive Species Identified in Southeast Alaska Marine Waters

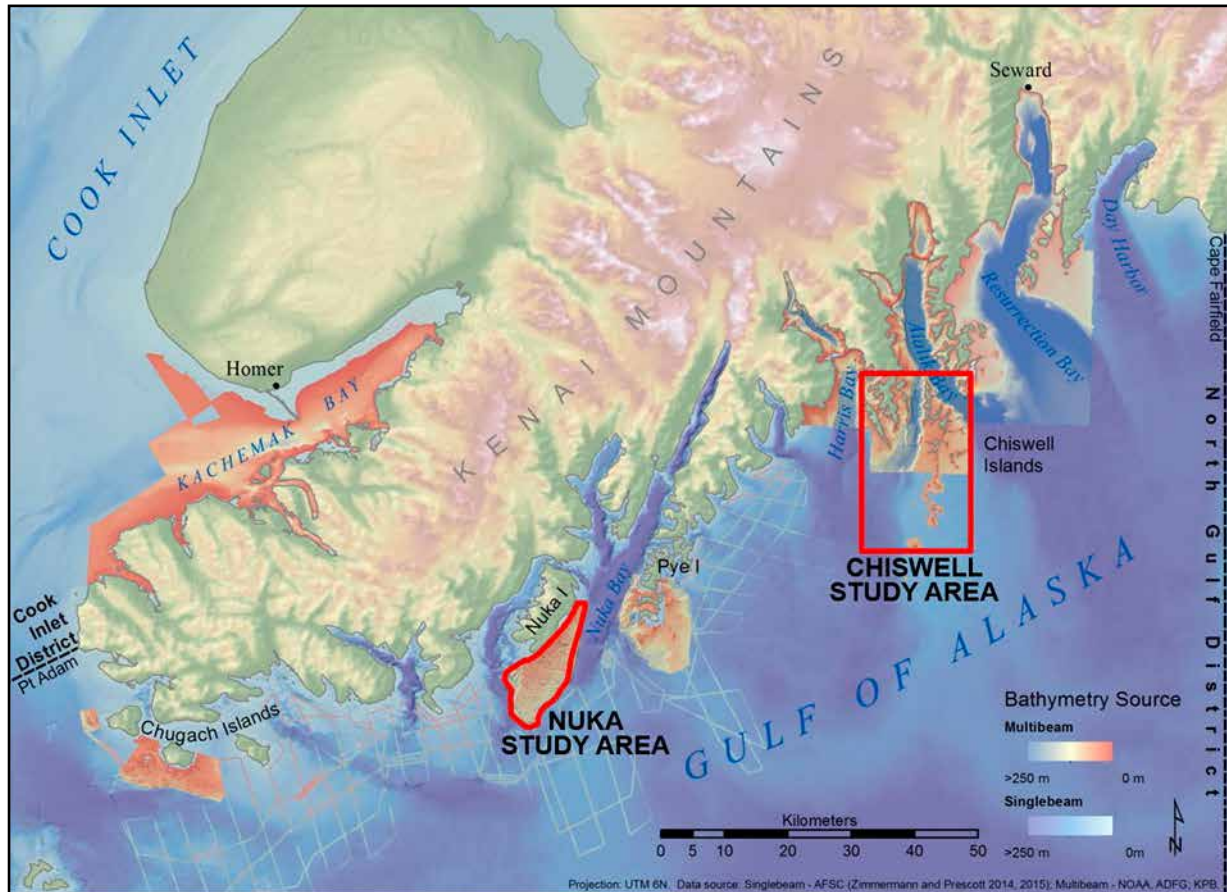
A team of scientists and local volunteers have identified *Bugula neritina*, an invertebrate filter feeder, in the Ketchikan area. These tiny organisms, sometimes called moss animals or sea lace, are a branching bryozoan that forms colonies that can grow on anything, resulting in fouling of ships, docks, or other structures. Besides *B. neritina*, the team documented a continued spread of three other non-native species in the Ketchikan region. The other invaders are tunicates, invertebrates often called sea squirts. The invasive species are believed to have arrived in Alaska by vessel

traffic. Ketchikan is the first stop in Alaska for large, foreign-flagged cruise ships as well as other marine vessels, such as barges and fishing vessels, heading north.

For more information, contact Alaska Sea Grant Marine Advisory agent Gary Freitag ([gary.freitag@alaska.edu](mailto:gary.freitag@alaska.edu)). 🐻

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

## Yelloweye Rockfish, continued



Location of the two study areas within the ADF&G North Gulf District of the Cook Inlet Management Area.

Figure from Joshua Mumm.

to the surface of the cells (*Sappington et al. 2007*), effectively capturing variability in both slope and aspect. The BPI is the difference in depth between a given cell and the mean depth of the cells in the surrounding neighborhood (*Weiss 2001*). Ridgetops have positive BPI values whereas valley bottoms have a negative BPI. The DTR was calculated as the Euclidean distance (m) to the nearest cell with a VRM value greater than a threshold value of 0.001.

The response variable for the habitat model was probability of suitable habitat with data consisting of presence and absence observations from ROV transect surveys conducted in each study area. Yelloweye Rockfish were observed at 164 points along 69 long transects, 500-m long, in the Chiswell area. In the Nuka area, Yelloweye were observed at 169 points along 82 long transects, 300-m long.

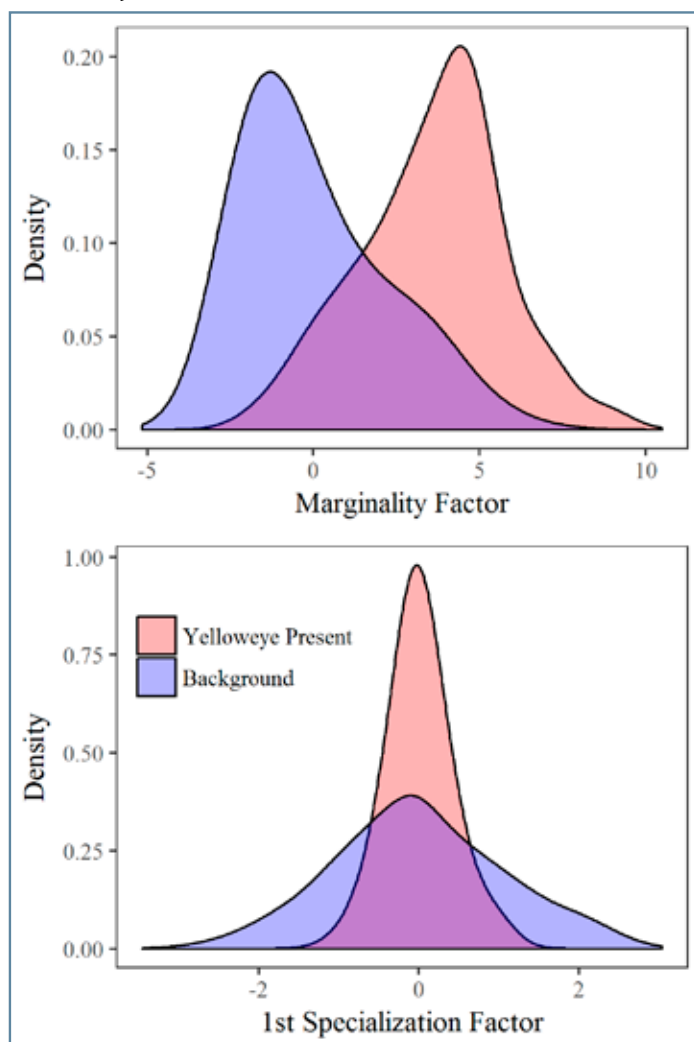
Selecting absence points was more complex than presence points owing to imperfect detectability and false absences. A common problem in habitat distribution modeling is the unreliability of absence

points. While observation of a species guarantees both presence and suitable habitat at that location, the inverse is not true; lack of detection at a point does not necessarily indicate that a point is unsuitable habitat. Habitat modelers have termed these lacking locations *false absences* (*Hirzel et al. 2002*). False absences arise from two situations: (1) the species was at that location but not detected; or (2) the species really was not at that location, despite seemingly suitable habitat. To reduce the false absences in our analysis, absence points were only selected from areas along transects that were identified by a preliminary Ecological-Niche Factor Analysis (ENFA) as poor habitat, following the Young et al. (idem) adaptation of the *Engler et al. (2004)* method of selecting pseudo-absences.

Ecological-niche factor analysis is a method of modeling habitat distributions that does not require absence points (*Hirzel et al. idem*). The method compares the n-dimensional space occupied by the species along n-environmental

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## Yelloweye Rockfish, continued



Distribution of Yelloweye Rockfish occurrences across the first two factors of the Ecological-Niche Factor Analysis. Pink indicates Yelloweye presence, while blue is distribution across the greater study area. The marginality factor identifies differences in the occupied niche from total available environmental conditions. The first specialization factor identifies the environmental tolerance or breadth of the species niche. Figure from Joshua Mumm.

gradients to the multidimensional characteristics of the background or greater study area. This approach is similar to other multidimensional variable reduction techniques, such as principle component analysis (PCA), in combining multiple collinear predictor variables into a few ‘super’ variables, or factors that account for the majority of the variation in the environmental data based on eigenvectors of predictor variable covariance matrices. However, unlike PCA where the factors are oriented orthogonal to one another, in ENFA the factors are constructed to give easily

interpreted ecological meaning. In ENFA, the first factor is termed the *marginality factor* which captures how different the occupied niche is from our perception of the totality of available environmental conditions. Subsequent factors are *specialization factors* which describe the breadth of the occupied niche.

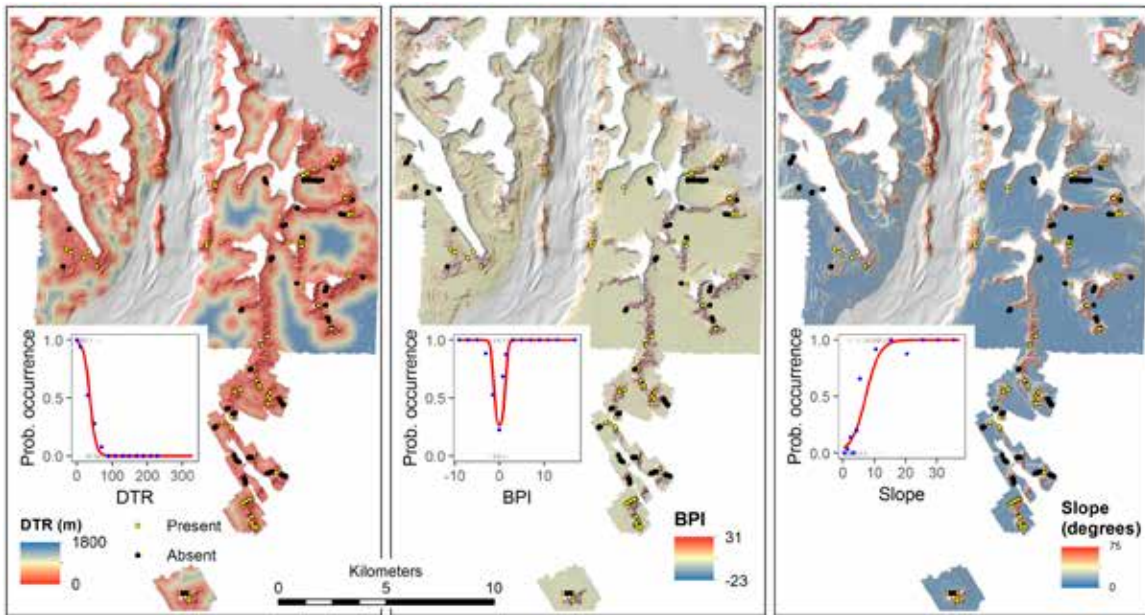
The final habitat model took the form of a binomial logistic GLM which predicted the probability of suitable Yelloweye Rockfish habitat in a given cell based on the values of multiple terrain variables for that cell. The most parsimonious model for suitable Yelloweye habitat in the Chiswell area included VRM with a 9-m radius, BPI with a 240-m radius, DTR, and slope; the model was parameterized as a maximum likelihood estimate. Univariate analysis indicated that Yelloweye were observed more: in (VRM) and near (DTR) rugose areas; steep areas; shallow areas; areas with positive large scale BPI; and areas of either positive or negative, but not neutral, small scale BPI (i.e., small depth differences compared to nearby habitat).

When evaluated for the Chiswell Island training area, the model correctly classified 96.0% ( $n = 100$ ) of a reserved set of presence/absence validation points (Cohen’s Kappa = 0.92; Receiver Operator Characteristics AUC = 0.98). When evaluated for the independent Nuka Island study area, the overall accuracy in predicting Yelloweye occurrence was 82.5% ( $n = 332$ ; Kappa = 0.65; AUC = 0.95). This study suggested suitable Yelloweye Rockfish habitat can be identified with reasonable accuracy using high resolution multibeam bathymetry, and this model has reasonable portability among sites along the outer coast of the Kenai Peninsula. For specifics of model derivation and evaluation see [Mumm \(2015\)](#).

In 2016, the model was applied to Prince William Sound to create strata surveyed with an ROV to produce the first management area wide abundance estimates of Yelloweye Rockfish and Lingcod in Southcentral Alaska. Similar methods may be used to revise demersal shelf rockfish survey strata in Southeast Alaska, as well as for other species. However, widespread application is limited by the availability of the high-resolution

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## Yelloweye Rockfish, continued



*Yelloweye Rockfish presence and absence observations for three bathymetric-based terrain variables in the Chiswell Island study area with univariate response curves showing probability of presence to the terrain variables. The DTR is distance to rock and BPI is bathymetric position index. Figure from Joshua Mumm.*

bathymetry the model relies on. In areas where only coarser single-beam based bathymetry is available, a much coarser scale of analysis is needed, likely in conjunction with incorporating additional environmental variables such as sediment type.

*Joshua Mumm works in Homer, Alaska as a GIS analyst for the ADF&G Division of Commercial Fisheries. Dr. Brad Harris is the Director of the*

*Fisheries, Aquatic Science & Technology (FAST) Laboratory at Alaska Pacific University. Roman Dial is a professor at Alaska Pacific University where he uses mathematics and biology to better understand Alaskan landscapes and their organisms. After a 25-year career with ADF&G working on salmon, herring, shellfish, and groundfish, William Bechtol obtained his Ph.D. while forming Bechtol Research.*

## Scholarship and Grant Funding Opportunities

### Hutton Junior Fisheries Biology Program

The Hutton Junior Fisheries Biology Program is a paid summer internship and mentoring program for high school juniors and seniors interested in pursuing the disciplines of fisheries science, marine biology, and STEM related fields. The principal goal of the Hutton Program is to stimulate interest in careers in fisheries science and management among groups underrepresented in the fisheries professions, including minorities and women. Selected students known as “Hutton Scholars,” are matched and mentored by a fisheries professional to enjoy an 8-week hands-on fisheries science summer experience in a marine and/or freshwater setting. Scholars receive a \$4,000 scholarship award. Mentors and their organizations not only have the opportunity to impart a positive effect on the life of a high school student, but also receive assistance with important summer projects and may even discover a potential future employee! The American Fisheries Society simplifies the mentor’s involvement by

providing guidance and administrative support. For more information on how students apply for an internship, or information on serving as a mentor, please visit <http://hutton.fisheries.org>. The application deadline for this summer scholarship or to serve as a mentor is February 15, 2019.

### Eugene Maughan Graduate Student Scholarship

The AFS Western Division is offering up to \$5,000 annually in scholarships to masters or doctoral students in the general area of fisheries science with one to three awards to individual students. Beginning in 2002, the Sustainable Fisheries Foundation established the William Trachtenberg Memorial Scholarship Fund, which augments the Western Division scholarship program by providing up to \$600 annually to a graduate-level student conducting studies on fisheries sustainability. Applications for the Western Division scholarship program are automatically considered for the Sustainable Fisheries Foundation

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**Scholarship and Grant Funding Opportunities**, continued

scholarship program. The application deadline is April 1, 2019. For more information, contact Bob Gresswell at [bgresswell@usgs.gov](mailto:bgresswell@usgs.gov).

**NPRB Graduate Student Funding**

The North Pacific Research Board announced graduate student awards to support 2019 scientific and scholarly research that informs effective management and sustainable use of marine resources in North Pacific waters. Awards will be \$25,000 each, with at least six students selected in May 2019. Funds may be used for graduate student stipends and standard benefits, tuitions or required university fees, research-related travel, supplies, and laboratory analyses. Students must be enrolled in a graduate degree program at an accredited university or college at the time of submission in order to be eligible. Proposals will be accepted from now through February 8, 2019. For more details visit <https://www.nprb.org/graduate-research-award-program/apply/>.

**Alaska Sea Grant State Fellowship**

This state fellowship program provides professional opportunities and on-the-job experience for recently or nearly finished graduate students interested in Alaska’s marine resources and policy decision-making. The paid 12-month fellowships are matched with host state or federal agencies in Alaska. The application deadline is February 21, 2019, for fellowships that begin in July 2019 or later contingent on position. More information is at <https://alaskaseagrant.org/education/awards-fellowships/>.

**John A. Knauss Marine Policy Fellowship**

This fellowship is designed for graduate students with an interest in ocean, coastal, or Great Lakes resources and in national policy decisions affecting those resources. Eligible graduate students from any discipline receive a year of paid experience in Washington, D.C., working on ocean issues with U.S. Congressional offices or with an executive branch, such as the National Oceanic and Atmospheric Administration or National Science Foundation. The application deadline is February 22, 2019, for fellowships that begin in February 2020. For more information visit <https://seagrant.uaf.edu/research/knauss.html>.

**NPRB 2019 Photo Contest**

The North Pacific Research Board conducts a photo contest featuring beautiful images of sea life, seascapes, coastal scenes, and marine research within the waters of the North Pacific Ocean including the Gulf of Alaska, Prince William Sound, Bering Sea/Aleutian Islands, and Bering Strait or Chukchi/Beaufort Seas. The submission deadline is March 11, 2019. Professionals, amateurs, adult, and youth are all encouraged to apply. The NPRB awards total up to \$3,300 in cash prizes to the top finalists in adult and youth categories. For details, go to <https://www.nprb.org/nprb/annual-photo-contest>. 📷

**Mourning Mary Ciuniq Pete**



Photo from Mary Sattler Peltola.

Alaskans are mourning the loss of Mary Ciuniq Pete who died November 17 at Providence Alaska Medical Center in Anchorage after a battle with cancer. Pete, born in Stebbins, Alaska, in April 1957, was raised practicing Yup’ik values, which informed every part of her life and career, including as an educator. Pete went on to earn both a bachelor’s and a master’s degree in anthropology from the University of Alaska Fairbanks. Always an advocate for indigenous people and subsistence uses, Pete’s substantial knowledge about subsistence resulted in her being appointed as Director of the Subsistence Division at the Alaska Department of Fish and Game during 1996–2005; Pete was the first Alaska Native woman to serve in that position. Pete also worked to support some subsistence fishing during a failure of the king salmon run on the Yukon River, and was later part of the Alaska delegation negotiating development of the Pacific Salmon Treaty with

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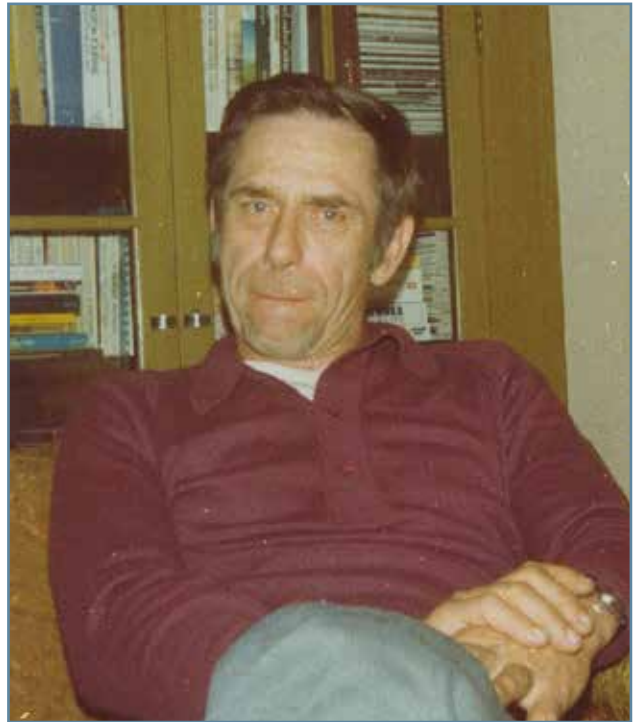
## Remember When — Alaska Chapter Meetings in Sitka and Wally Noerenberg

The annual meeting of the AFS Alaska Chapter is returning to Sitka in March 2019. The annual Alaska Chapter meeting typically rotates among Southcentral, Interior, and Southeast Alaska with rotation changes modified as needed to host AFS Western Division or Parent Society meetings, which occur in Anchorage to accommodate larger number of participants. March 2019 will be the sixth Chapter meeting held in Sitka, following previous meetings in 1978, 1982, 1994, 2001, and 2004. While the first official Chapter meeting (1974) occurred in May, the next five, including a Sitka meeting, were held in February. However, beginning in November 1980, Chapter meetings occurred in the fall, mainly in November. In 1980 the Chapter held two meetings, February 5–7 in Kodiak and November 18–21 in Girdwood, which is notable both for having two “annual” meetings in a calendar year and also for having two sequential meetings in what would now be considered Southcentral Alaska.

But back to Sitka – the Sitka meeting in November 1982 had several notable events. First, it included the first presentation of the Wally Noerenberg Award (WNA), the Alaska Chapter’s most prestigious award (<https://www.afs-alaska.org/awards-scholarships>). The WNA was established in 1981 by resolution of the Chapter membership to honor individuals who have made great and outstanding contributions to Alaska fisheries. Contributions may include scientific research; technological development; species and habitat

### **Mary Ciuniq Pete, continued**

Canada. But, Pete was science-based, communicated well with the communities, and received the understanding and support of subsistence users, which is difficult during tough times. In particular, this initial treaty moved forward on providing for conservation of the resources while recognizing a subsistence priority for salmon harvests. In 2010, President Barack Obama named Pete to the U.S. Arctic Research Commission. Throughout her life, Pete maintained a strong voice against domestic violence and sexual abuse, serving on the Tundra Women’s Coalition and the state Council on Domestic Violence and Sexual Assault. But Pete also promoted development and education of youth, serving as the University of Alaska Fairbanks, Kuskokwim Campus Director from 2005 until her death. 🐾



*Wally Noerenberg, namesake of the AFS Alaska Chapter’s most prestigious award. Photo from Bill Hauser.*

management; innovations in harvesting, processing, or marketing; academic and fishery education; or involvement in national and international affairs affecting Alaska fisheries. The first WNA went posthumously to Wally Noerenberg, presented by then Chapter President Jim Reynolds to Wally’s widow, Betty Noerenberg.

As a University of Washington fisheries technician, Alaska Department of Fish and Game (ADF&G) employee (including ADF&G Commissioner), and Prince William Sound Aquaculture Corporation Executive Director, Wally Noerenberg made a huge influence on Alaska fisheries and a future newsletter article will provide more information on Noerenberg’s history.

Another aspect of the 1982 Sitka meeting was a Chapter resolution to urge the State of Alaska to enforce a law passed by the state legislature two years previously to reserve water for stream habitats instead of being withdrawn for communities and businesses; a vote on the resolution was postponed until additional information could be gathered. 🐾



## Faith and Reason: The Dynamic Duo

Jim Reynolds

*Author's note: This is the eighth in a series of essays on uncertainty written for Oncorhynchus. I hope Alaska Chapter members have enjoyed reading them as much as I've enjoyed writing them.*

In a professional setting, we scientists can be a bit uncomfortable using the word faith. We prefer the word assumption. Yet, I know many fish biologists who are religious; in fact, some are ecclesiastical leaders. But this little essay is not only about the science-versus-religion debate. I'm writing about something larger that includes that debate: faith and reason — and their role in seeking truth.

Despite his scientific genius, Albert Einstein made room in his life for faith and his kind of religion. He said, "The most beautiful emotion we can experience is the mysterious. It is the fundamental emotion that stands at the cradle of all true art and science. He to whom this emotion is a stranger, who can no longer wonder and stand rapt in awe, is as good as dead, a snuffed-out candle. To sense that behind anything that can be experienced there is something that our minds cannot grasp, whose beauty and sublimity reaches us only indirectly: this is religiousness. In this sense, and in this sense only, I am a devoutly religious man." Einstein embraced the uncertainty in life and the importance of being humbled by it.

Ever run out of gas on a lonely highway with no service station in sight? I must admit I have. What do we do? We accept our situation and start hitchhiking to an uncertain destination. Faith and reason are both at work but at different points in our travel. While behind the wheel, the fuel gauge tells us that we can make progress. But when the gauge says empty and we are forced to stop, we are faced with solving a problem of unknown proportion.

The out-of-gas scenario is, to me, a classic example of the faith-reason dynamic. My mental picture of this dynamic, admittedly unsophisticated, is



Graphic by Blair Reynolds, Mesa, AZ.

a circle that cycles back and forth between faith and reason. We reason that progress is possible by evidence from the fuel gauge; the needle on empty forces us to exercise some faith by making some assumptions. We repeat this process every day in many ways. Buying a car? Do the research, gather evidence, and exercise reason — until a decision is necessary and then rely on faith, hoping the decision is a good one. Designing an experiment? Read the literature, talk to colleagues, and rely on personal experience; then do the design and hope that the right questions have been asked and the right methods are being used.

In our science, whether research or management, it is important to embrace uncertainty and understand that it is an integral part of our work. The same may be said for our lives. Faith and reason are companions working together to bring us closer to truth, perhaps never quite reaching it. In this time of distrust for science and reliance only on opinion, we should heed the words of the English poet Alfred, Lord Tennyson:

Nothing worthy proving can be proven,  
Nor yet disproven: wherefore thou be wise,  
Cleave ever to the sunnier side of doubt.

*Jim Reynolds (jbreyndolds@alaska.edu) was AFS Alaska Chapter President during 1981–1982. 🐟*

## 2019 AFS Alaska Chapter Annual Meeting

The annual meeting of the AFS Alaska Chapter is rapidly approaching. This meeting will occur March 19-21 in Sitka, AK, with the theme "Headwaters to Oceans: Connecting Alaska's Fisheries." Abstracts for oral or poster presentations are due February 8, 2019. [https://www.surveymonkey.com/r/AFS\\_Abstract](https://www.surveymonkey.com/r/AFS_Abstract)

If you have suggestions or questions on sessions or continuing education opportunities, contact program chair Joel Markis at [afs.alaska.presidentelect@gmail.com](mailto:afs.alaska.presidentelect@gmail.com). 🐟

## Student Subunit Happenings

*Justin Priest, Student Subunit Representative*

It's been a busy time of year for fisheries students across Alaska! The start of a new school year welcomed a new group of students, as well as new AFS Alaska Chapter student subunit officers kicking off their program. The Fairbanks student group has been active this semester pursuing a Burbot research project after having been approved for ADF&G fish handling permits and passing IACUC protocol review. This project looks to analyze Burbot tissue samples for mercury and per- / polyfluoroalkyl substances (PFAS) concentrations. These substances are commonly used in fire retardants, especially around airfields or military bases, and are extremely persistent in the environment. This project will have implications in fish toxicology and ecology research, as well as human health impact. The group hopes to gain experience for all members in collaboration, study design, data analysis, and writing. The end goal is to produce publications as a group and present our work at a conference. First, though, has been going out as a club to ice fish for samples using Burbot set lines. Recently, the group captured their first Burbot together and will continue to set lines until they obtain adequate sample sizes. In addition to this project, the Fairbanks subunit has been planning many events for the upcoming months including an ageing workshop in February, an overnight fishing trip to collect Burbot samples, a fly-tying night in March, and an education and outreach opportunity with Science,

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*Donnie Arthur, Fairbanks student group President, holds up a Burbot sampled as part of the subunit's ongoing research project. Photo from Justin Priest.*



*AFS Alaska students (l-r) Jesse Gordon, Justin Priest, and Donnie Arthur attend the 2018 WDAFS Student Colloquium in Corbett, OR. Photo from Justin Priest.*

### Student Subunit Happenings, continued

Technology, Engineering, and Math (STEM) high school students visiting the College of Fisheries and Ocean Sciences.

Juneau fisheries students have been active in outreach this semester. Several students participated in the 2nd annual Southeast Education Exchange STEM networking event. The UAF students coordinated with Juneau K–12 teachers to learn about curriculum and connect with younger students to hopefully inspire the next generation regarding STEM possibilities in their backyard. For Halloween, students celebrated with the 5th Annual Spooktacular Dive and Underwater Pumpkin Carving Competition. There were 11 scuba divers this year carving their pumpkins underwater with prizes for the best one!

In November, three Alaska AFS students attended the Western Division AFS Student Colloquium in Corbett, Oregon. This is a great opportunity to connect with students from across the Northwest and learn about unique projects occurring across the region. Not to mention, a lot of the work being done is very applicable to student research in Alaska and it was helpful for students to connect in informal ways to become updated on concurrent work and recent advances in the field. There was also an infographic workshop hosted by two NOAA graphic designers that was particularly useful. This workshop not only taught best design practices, but the graphic designers took requests to create icons and logos for student presentations!

I highly encourage Alaska students to participate in this student colloquium next year as it was fun and very useful.

The AFS Alaska Chapter student subunit congratulates the following students for defending or graduating recently: Jennifer Marsh (Ph.D., UAF) – Diets, distribution and population dynamics of Arctic Cod (*Boreogadus saida*) in Arctic shelf ecosystems; Caitlin Forster (M.S., UAF) – Spatial patterns and environmental correlates of Arctic Cod (*Boreogadus saida*) in Arctic shelf ecosystems; Jessica Pretty (M.S., UAF) – Particles in the Pacific: How productivity and zooplankton relate to particles in the deep sea; Casey Clark (Ph.D., UAF) – Biogeochemical tracers of change in Pacific Walrus past and present; Jodi Neil (M.S., UAF) – Growth of juvenile Chilkat Lake Sockeye Salmon in response to density-dependent and environmental factors; Tanja Schollmeier (M.S., UAF) – Tracing sea ice algae into various benthic feeding types on the Chukchi Sea shelf; Chase Jalbert (M.S., UAF) – Landscape genetics, connectivity, and vulnerability: predicting impacts of a top predator (*Esox lucius*) on salmonids in Southcentral Alaska; Kaitlyn Manishin (M.S., UAF) – Potential effects of marine predation on Chinook Salmon populations; Aaron Bland (M.S., UAF) – Spatial trends and environmental drivers of epibenthic shelf community structure across the Aleutian Islands. Great job to all and hopefully we'll cross paths soon! 🐟

### Revisions to Pacific Salmon Treaty

The Alaska Department of Fish and Game (ADF&G) recently released three chapters of new Pacific Salmon Treaty language. These three chapters, which went into effect January 1, 2019, will impact Alaska and Alaskans with a focus on southeast Alaska and British Columbia. The previous chapters of the Pacific Salmon Treaty that affected southeast Alaska expired December 31, 2018.

Over the past several years a team of 58 Alaskans, including ADF&G staff and affected users, have worked towards negotiating a new agreement. In June 2018 the Pacific Salmon Commission completed negotiations regarding a

new conservation and harvest sharing agreement between the U.S. and Canada. The release of the new language allows stakeholders the opportunity to become familiar with the stipulations as management strategies are developed for the upcoming season. The Pacific Salmon Treaty provides for the conservation and management of salmon that span the international borders between the U.S. and Canada. Since being ratified in 1985, the Treaty has been instrumental in reducing interceptions, preventing overfishing, and improving salmon management. Additional information on the new treaty components may be found on the [ADF&G website](#). 🐟

## Amazon Smile

The AFS Alaska Chapter is enrolled as a charitable organization in AmazonSmile. Anyone who shops online at Amazon can now support the Chapter financially, at no additional cost! Simply shop through [AmazonSmile](https://www.amazon.com/amazonsmile). The shopping experience is identical to Amazon.com with the benefit that the AmazonSmile Foundation donates

0.5% of the purchase price of eligible purchases to the Alaska Chapter. The contribution is not large, but it has increased from the initial donations in 2016 and represents a supplemental income that can be used to support Chapter projects. There is no additional expense to the customer, no price add-on, and no cost to the Alaska Chapter.

## Meetings and Events



### Alaska Marine Science Symposium

January 28–February 1, 2019: This symposium will be held in Anchorage, AK. For more information, go to <https://www.alaskamarinescience.org/>.

### Alaska Forum on the Environment

February 11–15, 2019: This meeting will be held in Anchorage, AK. For more information, visit <http://www.akforum.com/>.



### AFS Alaska Chapter Annual Meeting

March 19–21, 2019: This meeting will be held in Sitka, AK. For more information, contact Joel Markis at [jamarkis@alaska.edu](mailto:jamarkis@alaska.edu).



### Eleventh International Conference on Climate Change: Impacts & Responses

April 16–17, 2019: This meeting will be held in Washington, D.C. For more information, go to <http://on-climate.com/2019-conference>.



### Collaborative Fisheries Research

May 7–10, 2019: This symposium in the Lowell Wakefield Fisheries Symposium series will be held in Anchorage, AK. More information is at <https://alaskaseagrant.org/event/wakefield-fisheries-symposium-2019/>.

### PICES 2019

October 16–29, 2019: This meeting with the theme “Connecting Science and Communities in a Changing North Pacific” will be held in Victoria, BC. More information is at <https://meetings.pices.int/meetings/annual/2019/PICES/scope>.



## 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.

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

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