



# ONCORHYNCHUS

Newsletter of the Alaska Chapter, American Fisheries Society  
Vol. XXXII Spring 2012 No. 2

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## Sharks in Alaska – Really?

Kenneth J. Goldman

Alaska and sharks are not often thought of together. During the 14 years I have studied sharks in Alaska, I have found many people were unaware that sharks even swim off Alaska's coastline. In fact, 12 shark species occur in Alaska waters: basking (*Cetorhinus maximus*), six gill (*Haxanchus griseus*), blue (*Prionace glauca*), Pacific angel (*Squatina californica*), soupfin (*Galeorhinus glaeus*), brown catshark (*Apristurus brunneus*), white (*Carcharodon carcharias*), common thresher (*Alopias*



*Spiny Dogfish caught while sport fishing. Photo by Bob Romanko.*

*vulpinus*), spiny dogfish (*Squalus suckleyi*), Pacific sleeper (*Somnoisus pacificus*), and salmon (*Lamna ditropis*), with the last three species being the most abundant or common. The other nine species are not commonly encountered. The size of sharks in Alaska waters ranges from the large filter feeding basking shark, which can exceed 9.1 m in total length, to the small brown cat shark, which reaches only about 0.5 m in total length.

The spiny dogfish, likely the most abundant shark in Alaska waters, was taxonomically reclassified from *Squalus acanthias* to *Squalus suckleyi* in 2010. This species ranges throughout the North Pacific and is the

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## The President's Corner

*Trent Sutton*

With winter losing its grip, albeit slowly, and spring just around the corner, many of us are thinking longingly about summer field projects, fishing outings, vacation trips, and (wait for it!) fall hunting expeditions. Yes, it is that time of year when we all start to develop selective amnesia as



*Trent Sutton,  
AFS Alaska Chapter President.*

we transition from winter (“Why do I want to live where it gets this cold or the snow gets this deep?”) to summer (“Now I remember why I live here.”). So this is always an exciting time of year and optimism abounds with increasing day length and warming air temperatures. And it is also an exciting time in our Chapter, with a lot on the go, especially the potential opportunity that has befallen us for hosting a future World Fisheries Congress.

In January, our Chapter was contacted by Helen Thomas of Visit Anchorage to gauge our interest in submitting a bid to host the 7th World Fisheries Congress (to be held in 2016) in Anchorage. I am pleased to report that two of our members (Karen Gillis and Malcolm McEwen) have agreed to co-chair a steering committee to develop that bid in cooperation with Visit Anchorage. In addition, there are ten members of our Chapter that have agreed to serve on that steering committee. Bids will be due later in the spring and will be presented at the 6th World Fisheries Congress to be held in Edinburgh, Scotland in May. This is a great opportunity and exposure for our Chapter and I want to thank everyone that has agreed to participate on the steering committee.

As President-Elect Mark Wipfli reports in this newsletter, our annual Chapter meeting will be held in October in Kodiak. It has been several years since we have had a Chapter meeting

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## Sharks, continued

shark most frequently observed in fisheries surveys and in non-target catches of both commercial and sport fisheries. Spiny dogfish can be found from the surface to over 1,200 m, reach a maximum length of around 1.3 m, and live over 100 years. Males and females do not mature until around 21 and 36 years of age, respectively, and this species has one of the longest gestation periods of any animal, let alone any cartilaginous fish; between 22 and 24 months, which is longer than that of the African elephant! An average of nine pups is born on this biennial cycle and females do not appear to undergo a resting period prior to their next pregnancy.

While Pacific sleeper sharks occur as non-target catch in both commercial and sport fisheries, little is known about the life history or general biology of this species. Attempts to age this species (including by myself) have been unsuccessful, so longevity and age-at-maturity are unknown. We also have virtually no information on when they mature, how frequently they give birth, or how many pups are born at one time. This species can get quite large, exceeding 7.6 m in length, with sexual maturity occurring around 4.3 m in length for both males and females.

The most charismatic shark in Alaska waters is the salmon shark, which is in the same taxonomic family as the more publicly well-known white shark. Salmon sharks, grow to a maximum length of 2.7 m and can weigh over 200 kg. They occur only in North Pacific waters at depths ranging from the surface to over 1,000 m. As Alaska’s “big game fish,” they have been targeted for many years by sport fishermen, mainly in Prince

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*Pacific sleeper shark caught during sablefish longline survey in Prince William Sound. Photo from ADF&G.*

### The President's Corner, continued

in Kodiak and I know that many folks are very excited about the prospects of returning. Mark has a lot of great ideas for the meeting and I look forward to seeing how meeting planning shakes out over the next few months.

In the last newsletter, I reported on the pending Bristol Bay resolution from the Western Division of AFS (WD-AFS). The resolution recommends a formal, independent scientific review and survey of potential environmental and socioeconomic consequences of large-scale mineral extraction in the Bristol Bay watershed of Alaska. This resolution was discussed within the Alaska Chapter of AFS Executive Committee, and I have also discussed this with Dennis Riecke,

the Resolutions Committee Chair for the AFS Parent Society. It appears that the Parent Society Resolutions Committee will vote to advance the resolution, or a modification of it, to the Society Governing Board (which will probably have happened by the time this newsletter is published). The comment that I received from the Society Resolutions Committee is that if good science is done on the environmental review end (as endorsed in the resolution), then no one should object to another peer review of the science that was completed.

That is all for now until the summer newsletter. In the meantime, may the rest of your winter be mild and your spring be warm. ☺

### Sharks, continued

William Sound and adjacent waters, but also occur regularly as non-target catch in commercial salmon and pollock fisheries. Salmon sharks are believed to live around 40 years, and have between three and five pups at a time on a biennial cycle with gestation estimated at around nine months and a resting year between pupping events. The reproductive mode of salmon sharks is aplacental viviparity and includes an oophagous stage. During gestation, the mother continues to produce unfertilized eggs (ova), which proceed from the ovary to the nidamental gland, where they are filled with yolk. These nutritive ova then pass into the uterus, where they are consumed by the growing embryos. Salmon shark pups are around 65 cm precaudal length (PCL) at birth. The reproductive cycle is currently being investigated via reproductive hormones in the blood of female sharks. Mating is believed to occur during the late summer and early fall with parturition occurring in the spring. Length-at-maturity has been estimated at between 125 and 145 cm PCL at an age of three to five years for males, and between 160 and 180 cm PCL at an age between six and 10 years for females in the eastern North Pacific (ENP). Salmon sharks in the ENP have a faster growth rate, reach sexual maturity earlier, and attain greater weight-



*Salmon shark being sampled and tagged before release in Prince William Sound. Photo by Ken Goldman.*

at-length than their same-sex counterparts living in the western North Pacific (WNP). Salmon sharks are opportunistic feeders, sharing the highest trophic level of the food web in subarctic waters. They feed on a wide variety of prey, including salmon, rockfishes, sablefish, lancetfish, daggerteeth, lumpfishes, sculpins, Atka mackerel, mackerel, pollock, tomcod, herring, spiny dogfish, Tanner crab, squid, and shrimp.

Perhaps the most fascinating aspect of salmon shark biology is that they are warm-blooded or endothermic. They belong to a small group of sharks that possess vascular counter-current heat exchangers called *retia mirabilia*, allowing retention

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## Sharks, continued

of metabolically generated heat to elevate their body temperature. Salmon sharks have *retia* in the cranium near the eyes, in the locomotor muscles, and in the viscera (liver and kidney *retia*). They also



*Spiny dogfish in situ. Photo by Greg Calliet.*

have vascular shunts that allow them to alter the route of blood flow, further regulating the rate of heat gain or loss. Not only is their body temperature warmer than that of the surrounding water, but adults appear to maintain and physiologically defend their body core temperature, analogous to birds and mammals. The maximum observed elevation of body core temperature over ambient was 21.2°C. While some other fish species, including several other shark species and a suite of tuna species, are endothermic, only the salmon shark and its immediate relatives (mako, white, and porbeagle sharks) can be classified as homeothermic or “same temperature” as they maintain an elevated constant body temperature regardless of surrounding ambient temperature—an amazing thing for a fish! The thermal buffer to the environment is what likely allows salmon sharks to pursue and capture highly active prey like salmon in the cold, high latitude waters of the North Pacific. It is an incredible thing to see a salmon shark in pursuit of a salmon. Even if unsuccessful in an attempt when both shark and salmon become airborne, upon crashing back into the water the shark is agile and flexible enough to resume pursuit and frequently capture its prey; a sight that has always amazed me.

While sexual segregation is relatively common in sharks; an extremely large sex ratio difference exists in salmon sharks across the North Pacific basin. The WNP is male dominated and the ENP female dominated, with the dominance increasing at higher latitudes. Larger sharks also range farther north than smaller individuals, and southern catches generally occur in deeper waters. In Alaska, females are caught more than 10 times as frequently as males, with the opposite

ratio occurring off Honshu, Japan. The high degree of sexual segregation across the Pacific Basin and age- and length-dependent latitudinal distribution are important factors in pursuing responsible management and conservation of the salmon shark. Although latitudinal migrations and movements in the ENP are becoming well documented in this species due to satellite tagging of salmon sharks in Prince William Sound, Alaska, trans-Pacific movements have only been inferred from fisheries bycatch data as there has yet to be documentation of tagged individuals moving across the North Pacific. However, the large degree of sexual segregation by itself (in regard to finding a mate) would seem to indicate that movements across the Pacific are likely.



*Salmon shark pursuing salmon. Photo by Ken Goldmann*

Another critical element for successful management of salmon sharks is stock structure, which is not well understood at this time. However, a study of population genetics is currently underway. Stock structure may be an important factor in the differential growth rates between ENP and WNP salmon sharks. However, ecological differences between the ENP and WNP may also play a role in observed differences. Young salmon sharks appear to move from temperate waters of the U.S. west coast into the Alaska Gyre and the Gulf of Alaska as they approach adulthood, a time when the ENP growth rate begins to exceed that of the WNP counterparts. These waters are extremely productive and abundant food resources may be the key factor in the differences in growth rate, age-at-maturity, and weight-at-length observed

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## **Sharks**, continued

between ENP and WNP salmon sharks. Stock structure data, along with additional information on movements and migration, will be critical for determining whether regional or international conservation and management plans are needed for this species.

*Ken Goldman was born and raised in Denver Colorado before obtaining B.S. and M.A. degrees from San Francisco State University, and a Ph.D.*

*in fisheries ecology from the College of William and Mary, School of Marine Science, Virginia Institute of Marine Science. Dr. Goldman spent time as a postdoctoral scholar and lecturer at California State University, Long Beach and as an assistant professor at Jackson State University in Mississippi before joining the Alaska Department of Fish and Game as a groundfish/shellfish research biologist for the Division of Commercial Fisheries.*

## **Alaska Chapter Annual Conference, Call for Sessions/Chairs**

*Mark Wipfli*

The 39th annual meeting of the Alaska Chapter of the American Fisheries Society is scheduled for October 22–26, 2012 in Kodiak, Alaska. The theme of the meeting is “Ecosystem, Fishery, and Food Sustainability in a Changing World.” Continuing education courses will be offered at the beginning of the week, with the plenary, special, contributed oral, and poster sessions taking place mid and late week. We are planning lots of social activities and community events. There are loads of great local attractions in Kodiak including the local brewery, canneries and seafood processors, windmill farm,

waterfront and harbor, local artisans, Alaska Fisheries Science Center, and much more. As those of you that have been to Kodiak know, there are a lot of great outdoor activities that time of year, including hiking, wildlife viewing, silver salmon and halibut fishing, and hunting. Start planning now to take full advantage of what Kodiak and this meeting have to offer! If you’re interested in organizing or chairing a session, or helping with meeting planning, social activities, or local arrangements, please contact Chapter President-Elect and Program Chair Mark Wipfli (phone: 907-474-6654; [mwipfli@alaska.edu](mailto:mwipfli@alaska.edu)).

## **Southeast Alaska Candidate Fish Habitat Partnership Coordinator**

Trout Unlimited is seeking an individual to provide coordination and support services to the Southeast Alaska Candidate Fish Habitat Partnership (SEAKFHP), a regional initiative approved by the National Fish Habitat Board (<http://fishhabitat.org/>) in August 2011. Partners in this effort currently include Trout Unlimited, US Fish and Wildlife Service, US Forest Service, Alaska Department of Fish and Game, National Marine Fisheries Service, Alaska Department of Environmental Conservation, Southeast Alaska Watershed Coalition, and The Nature Conservancy. Each organization has contributed one or more staff to serve as the interim Steering Committee. This recruited position is located in Juneau and will coordinate continued organizational development of the SEAKFHP into a productive and dynamic partnership. The ideal candidate would have skills in leading small groups, generating outreach, development, and marketing strategies; developing budget and work plans to cover current and out-year budgetary needs of the

partnership; and provide coordination as needed to habitat restoration projects throughout SE Alaska. Experience in watershed conservation, restoration, assessment, or planning and an understanding of salmonid ecology is preferred. Some travel within Alaska and the lower 48 may be required, but the majority of coordination with partners shall be conducted through teleconference, webinar, and video conference to the extent possible to encourage region-wide participation and reduce travel costs. This position is funded for two years starting on or about April 16, 2012. This contract allows work hours to vary from 24-40 hours per week with compensation Not-to-Exceed \$35,000-\$45,000 annually depending on experience. Office space, furniture, computer resources, phone, internet, and supplies are provided as part of this contract. This recruitment notice will be open until filled. For additional information, or to apply via a cover letter, resume, and references, please respond electronically to: Mark Kaelke ([tuinbox@gmail.com](mailto:tuinbox@gmail.com)) or Neil Stichert ([Neil\\_Stichert@fws.gov](mailto:Neil_Stichert@fws.gov)).

## Student Subunit Happenings

*Thomas Farrugia, Student Subunit Representative*

The students of the AFS Alaska Chapter Student Subunit continue to be active and are working to strengthen ties among various campuses across the state. In January, ten AFS students attended the Alaska Marine Science Symposium in Anchorage and presented their research through posters or oral presentations. Charlotte Regula-Whitefield won Best Student Poster Presentation at the Ph.D. level.



*Dona Eidam and Mary Sherbick present "Fishes of Palmer Hayflats" to STEM students at Machetanz Elementary School in Wasilla. Photo provided by Dona Eidam.*

and Bill Templin from the Alaska Department of Fish and Game, and began hosting biweekly pub nights in midtown. People interested in attending can find dates/locations on the website or contact Emily Lescak ([elescak@alaska.edu](mailto:elescak@alaska.edu)). Emily was also one of two recipients of the Western Division Eugene Maughan Scholarship. Dona Eidam is serving a 3-year term on the Alaska SeaLife Center (ASLC) Board of Directors, representing students and fisheries. Kyle Shedd won the Anchorage Fisheries Club drawing for a free ticket to the Alaska SeaLife Center Marine Gala! The gala is an annual ASLC fundraiser and was held at the Denaina Center in Anchorage on February 18 with Jeff Corwin as the guest speaker. On March 2, Dona Eidam and Mary Sherbick presented a hands-on talk "Fishes of Palmer Hayflats" to a group of 21 Science, Technology, Engineering, and Math (STEM) 4th/5th grade students at Machetanz Elementary School in Wasilla; the talk included measuring and drawing preserved threespine stickleback and holding a live Alaska blackfish. An upcoming Education Day on May 18, hosted by Alaskans for Palmer Hay Flats ([www.palmerhayflats.org](http://www.palmerhayflats.org)), will include hands-on fish presentations by Emily Lescak, Mary Sherbick, and Dona Eidam.

In Juneau, Gretchen Geiger presented a public defense for her M.S. in Marine Biology; her talk was titled "Evaluation of Prey Composition and Nutritional Value of Diets of Free-ranging Harbor Seals (*Phoca vitulina*) from Tugidak Island, Alaska." The Fairbanks students have continued to hold monthly meetings with engaging speakers. Darcy Etcheverry from the Fairbanks Soil and Water Conservation District presented work on the biology, potential impacts, and control plans for *Elodea Canadensis*, an invasive plant recently found in the Chena River. Travis Hyer, Assistant Hatchery Manager at the newly operational Ruth Burnett Fish Hatchery in Fairbanks, gave students an overview of the importance, potential, and challenges of getting the hatchery up and going. Fairbanks students organized an ice fishing trip on March 10, and hold weekly meetings at the UAF pub; for anybody wanting to join in all the fun, check out the website (<https://sites.google.com/a/alaska.edu/studentafs/>) or contact Parker Bradley ([ptbradley@alaska.edu](mailto:ptbradley@alaska.edu)). 🐟

The AFS Student Symposium is taking place on April 13, 2012 and offers a great opportunity for students to improve their public speaking and presentation skills. Students from Juneau, Fairbanks, Anchorage, and Kodiak will present their research through video conference to the other campuses. The symposium also allows students to stay current on research being conducted by their peers and increases the cohesion among students at different campuses. The AFS Alaska Chapter is sponsoring the event. For more information, contact Rachael Blevins ([rachael.blevins@gmail.com](mailto:rachael.blevins@gmail.com)).

In addition, the Anchorage student campus group has a new website (<http://uaa-afs.blogspot.com/>) and Facebook page (<http://www.facebook.com/pages/UAA-AFS-Student-Subunit/246338502081936?sk=info>)! The Anchorage campus group had two guest speakers this semester, Bert Lewis

## Alaska Chapter Seeks Listserve Manager

The AFS Alaska Chapter is seeking one or more individuals to manage the Chapter membership database and to oversee the listserve for distribution of information to Chapter members. This is a great opportunity to serve the Alaska Chapter and the professional society supporting Alaska's fisheries. This position is currently occupied by Allen Bingham who has offered to work with interested individuals during 2012 to provide a transition period.

The Electronics Communication Committee for the Alaska Chapter maintains an email distribution list for most Chapter members with email addresses in the Chapter's membership database. The distribution list is used to inform subscribers of Chapter activities such as announcements for the Chapter Annual Conference, chapter elections, the chapter newsletter, and other items of interest. The parent Society hosts our Chapter's email listserver, and all Chapter members with an email address (who have chosen to participate) can be members of that list. Chapter members that are subscribed may post emails to the list at the address *akchap@lists.fisheries.org*. To reduce SPAM messages and to control for mistaken "Reply-to-All" responses, the listserve manager filters submissions before allowing transmission to subscribed participants. In recent years, approximately 100 email messages per year were sent participants.

Related to this duty, the chair for the Electronics Communication Committee also maintains the distribution list for the Chapter's email list, this essential method of information exchange for our Chapter. The current approach uses a combination of MS Excel and some SAS code to manage the database. It would be optimal for the individual interested in this position to either be conversant in SAS and with access to a SAS license, or be someone with good skills in some other database package (e.g., MS SQL, MS ACCESS, etc.) who can re-write the code in the language of their choice.

Anyone potentially interested in fulfilling these responsibilities can direct questions to Allen Bingham (*allen.bingham@alaska.gov*) or Chapter President Trent Sutton (*tmsutton@alaska.edu*).

## Do We Have Your Email?

*Allen Bingham*

This newsletter is distributed via email to all Chapter members who have provided either the AFS parent office or the Chapter with their email address and have not opted out of subscribing to our Chapter's email listserve. Each issue is also mailed to a few Chapter members who have requested a hard-copy of the newsletter, as well as a number of non-members (e.g., libraries). The listserve email distribution list also serves as a communication tool to "get the word out" for other items of interest to our membership. I maintain the distribution list for the newsletter and for the listserve subscription list. I update this distribution list with information provided by our members, and I periodically reconcile our contact information for members with information provided by AFS. Unfortunately, not all emails provided by AFS are functional; and periodically a member's email ceases to function for such reasons as changing jobs, changing personal networks, etc.

If you received this newsletter via email through our listserve, then we have your email. If you received the newsletter as a hard-copy but not by email, you have either chosen to receive a hard-copy only, or perhaps we do not have a valid email address.

Following are individuals for which I currently have no valid email addresses: Sean Brennan, Jack DiMarchi, Robert J. Ellis, Donald E. Kramer, Sarah Laske. Additionally, I do not have an email address or a valid mailing address for the following member: Elizabeth Kandror.

If you see yourself in this list, please contact me with revised contact information so I can update our Chapter's records. If you know individuals in this list and have their contact information, please pass along this request to them. I can be reached at *allen.bingham@alaska.gov*.

### ONCORHYNCHUS

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## Biologist turned Musher – DeeDee Jonrowe

*Hamachan Hamazaki*

By the time you receive this newsletter, the Iditarod is over and most mushing races have ended. Many of you who follow mushers know DeeDee Jonrowe, a member of the Iditarod Hall of Fame, a princess on the runners, and a breast cancer survivor. During the mushing season, I cheer her not only because of her mushing fame, but also because of her contribution to Alaska's fisheries.



Former fisheries biologist DeeDee Jonrowe is now a world famous dog musher. Photo source <http://www.deedeejonrowe.com>.

In her website, <http://www.deedeejonrowe.com>, her biography says, "DeeDee enrolled in the University of Alaska, Fairbanks, where she earned a B.S. degree in Biological Sciences & Renewable Resources. She worked as a biologist for the State of Alaska for 10 years." In fact, she worked for the Alaska Department of Fish and Game (ADF&G) Division of Subsistence as a resource specialist and for the Commercial Fisheries Division as a fisheries biologist and then as an area management biologist in Bethel. During her tenure, she conducted subsistence food surveys in the middle Kuskokwim

River villages and test fished at Kwegooyuk on the mouth of Kuskokwim River. She also submitted reports to the Alaska Board of Fisheries in 1982 when the board adopted regulations creating a rural subsistence priority. This regulation was overturned by the Alaska Supreme Court in 1989, resulting in our current State-Federal dual fisheries management. By the way, DeeDee started racing the Iditarod in 1980, while she worked for the ADF&G. She didn't run in 1982 due to a Board of Fisheries meeting, showing her dedication to Alaska's fisheries. DeeDee appears in many public events. Why not thank her for her contribution to Alaska's fisheries, and ask for an autograph on one of her reports? Some of DeeDee's publications are:

Jonrowe, D.D. 1979. Middle Kuskokwim food survey, December 1979. ADF&G, Division of Subsistence, Technical Paper No. 51, Bethel.

Jonrowe, D.D.A.S. 1980. Kwegooyuk test fishing study, 1980. ADF&G, Division of Commercial Fisheries, Kuskokwim Test Fishing Report Number 11, Bethel.

Jonrowe, D.D.A.S. 1981. Kwegooyuk test fishing study, 1981. ADF&G, Division of Commercial Fisheries, Kuskokwim Test Fishing Report Number 12, Bethel.

Jonrowe, D.D.S., K. Schultz, R. Baxter, D. Schneiderhan, and S. Allen. 1982. Kuskokwim Area salmon report to the Alaska Board of Fisheries, December 1982. ADF&G Division of Commercial Fisheries, Salmon Board of Fisheries Report No. 21, Bethel.

Jonrowe, D.D.A.S., R. Baxter, K. Schultz, and D. Schneiderhan. 1983. Annual Management Report, 1982, Kuskokwim Area. ADF&G, Divisions of Commercial Fisheries, Anchorage.

## Fish Wheel Operator Expertise Sought

The Cowlitz River is a large, regulated tributary of the lower Columbia River with an average annual Q of ~6,000 cfs. The lower river (< RM 50) has populations of hatchery-origin spring and hatchery-origin and natural-origin fall Chinook. Tacoma Power and the Washington Department of Fish and Wildlife would like to talk with experienced fish wheel operators from Alaska to investigate the feasibility of using this gear to live catch Chinook in the lower Cowlitz River. Please contact Mark LaRiviere, Tacoma Power at p: (253) 502-8767; [mlarivie@cityoftacoma.org](mailto:mlarivie@cityoftacoma.org), [www.tacomapower.com](http://www.tacomapower.com).

## Japan Tsunami Marine Debris – Updates and Information

In March 2011, a massive earthquake struck Japan. This earthquake caused a tsunami that took nearly 16,000 lives, injured 6,000 people and destroyed or damaged hundreds of thousands of buildings. The tsunami receded from land, washing material from the inundation zone into the ocean. Heavy materials sank near shore, while buoyant materials became debris fields seen in satellite imagery and aerial photos of waters around Japan. In the weeks after the tsunami, winds and ocean currents dispersed the debris across the North Pacific, making the fields no longer visible in the low resolution satellite imagery accessed at the time. Efforts to assess the debris and possible impacts to our natural resources and coasts are being led by NOAA and other federal and non-federal partners. The NOAA Marine Debris Program (NOAA) maintains a website with updated information at <http://marinedebris.noaa.gov/info/japanfaqs.html>. A few quick general questions and answers below are derived from information provided by Peter Murphy (Alaska Coordinator – NOAA MDP):

### **(1) How much debris is there?**

The Japanese government estimated the tsunami created 25 million tons of debris, but there is no confirmed estimate of how much went into the water. Of the amount washed to sea, much of the heavier debris likely sank in the nearshore area. The remaining debris dispersed with ocean currents and weather, generally moving east. Right after the event, tsunami debris concentrations or bands could be seen by satellite sensors, but by a few weeks after the event the debris had dispersed to the point that most remote sensors could no longer discriminate the debris fields. The NOAA MDP is working to access higher resolution satellite data and also opportunistic overflights to search for debris at sea.

### **(2) What type of debris is out there?**

The tsunami impacted an area with varied infrastructure, so materials washed to sea included a wide range of items—household and consumer goods, construction and industrial materials, fishing and maritime equipment, etc. The exact composition is unknown, and likely to vary over time and distance as the debris weathers or breaks down. This makes it difficult to differentiate “tsunami debris” from the debris that already hits Alaskan (and other) shorelines all the time.

### **(3) Is the debris radioactive?**

Consensus of scientists across the agencies consulted by NOAA is that debris contamination is HIGHLY unlikely. This is based on several reasons, primarily that most debris would have been too far from the Fukushima reactor to have been in contact with radiation, both because the radiation leaks began after debris would have begun moving off the coast, and because the tsunami impact area included areas far from the reactor site. Furthermore, testing of ocean waters 30 km offshore from the Fukushima reactor site has found radiation levels below drinking-water standards.

### **(4) What to do if I see potential tsunami-related debris?**

People are asked to use the email address [disasterdebris@noaa.gov](mailto:disasterdebris@noaa.gov) to report significant sightings of debris that could be linked to the Japanese tsunami. Include as accurate a description as possible of what you saw, and where you saw it, as well as the potential linkage to the tsunami. We are also working with partners to put together a set of general guidances for handling of potential tsunami debris. For updated information, go to the Marine Debris Program website ([marinedebris.noaa.gov](http://marinedebris.noaa.gov)) or contact Peter Murphy ([peter.murphy@noaa.gov](mailto:peter.murphy@noaa.gov)). 

## Electrofishing Courses Available

The Northwest Environmental Training Center (NWETC), a Washington-based, non-profit organization dedicated to environmental education, is seeking U.S. venues for its 2012 electrofishing courses. Two 3-day courses are available: backpack electrofishing and boat electrofishing. Both courses consist of classroom work on the first and third days and field exercises on the second day. A 4-day course covering both backpack and boat systems, including two days of fieldwork, is also available.

To schedule a venue, NWETC seeks to (1) identify a local fisheries biologist willing to serve as field trip coordinator and (2) achieve an enrollment of at least 12 participants. (Those serving as coordinator earn a course tuition waiver.)

Individuals interested in scheduling a course in their locale should contact Ingrid Kimball, [ikimball@nwetc.org](mailto:ikimball@nwetc.org), at NWETC. Contact Jim Reynolds, [jbreynolds@alaska.edu](mailto:jbreynolds@alaska.edu) with technical questions about course content. 

Completed ecosystem entry at UAF Juneau. Photo by Michael Kohan.



## SFOS Ecosystem Entry

Michael Kohan

The School of Fisheries and Ocean Sciences (SFOS) recently installed an “ecosystem entry” to welcome students and faculty into the building at the Juneau campus.

In early 2010, the University of Alaska Fairbanks (UAF) created a committee to select an art piece for the SFOS Juneau facility; the state’s Percent for Art in Public Places statute requires that one percent of the capital construction costs of public buildings be applied to the acquisition and permanent installation of artwork. The winning proposal was from Ray Troll, a Southeast Alaskan with a repertoire of fisheries related art. Working with Gary Staab, a sculptor from Missouri, Ray envisioned an “ecosystem entry” for the UAF facility, a 3D mural of marine species found in Southeast Alaska. In the summer of 2010, the artists began collecting their models. Long, diligent, hours of fishing off Prince of Whales Island, and some help from fellow anglers, provided enough species diversity for Gary to begin sculpting.



Gary Staab and Ray Troll rockfishin’ out for the UAF mural. Photo by Keith Criddle.

From rubber molds to wax casts to ceramic shells and finally to bronze casts, Gary worked every fish specimen into a detailed bronze art piece. Individual fish scales were ground into the casts and color was added by fusing multiple metals together. As a personal touch, a replica of the largest fish Gary has ever caught, a lingcod, is now prominently displayed in the center of the mural. After completing the installation in September 2011, Ray proudly carried around an extra art piece, a bronze cast of a spiny lump sucker. When asked if he was a fan of the curious-looking species, he ripped off his coat to reveal a spiny lump sucker tattoo on his bicep. If you look closely, you can find Ray’s spiny fish hidden in the rock garden overlooking the mural.



Spiny lump sucker created for the ecosystem entry. Photo from Keith Criddle.

Not only does the mural, aptly titled “Into the Flow,” serve as an aesthetic addition to the relatively new UAF facility, but the Director of Fisheries, Dr. Keith Criddle, jokes that the art piece could be used as a rite of passage. He suggests adding a section to graduating students’ comprehensive exams, identification of all species in the mural, making the entry to the graduate school also the exit. 🐟

## Copper River Knowledge System

*Erica McCall Valentine, Ecotrust Alaska Program*

In an effort to help local citizens and resource managers better understand the watershed in which they live and work, Ecotrust created the Copper River Knowledge System (CRKS). A hub of information, CRKS fosters a broader understanding of the natural and human-influenced processes affecting the Copper River watershed, facilitates data transparency and information exchange, and promotes more resilient communities and ecosystems.

CRKS is a dynamic website that brings together a wealth of information including scientific research and management reports, fisheries data, local perspectives and traditional stories, along with a web-based mapping feature that brings to life

publicly available datasets and allows users to directly download GIS datasets.

The CRKS provides critical information about the natural and human resources of the Copper River watershed in southcentral Alaska, with a special focus on Copper River salmon fisheries. A growing base of knowledge, CRKS offers salmon distribution data, information on mineral development, climate, human impacts, water resources, and land management, links to management reports, and audio recordings featuring local stories and traditional knowledge.

To learn more, visit [www.CRKS.org](http://www.CRKS.org). If you would like to share other information or stories about the Copper River watershed on CRKS, please contact Gabriel McMahan at [gmcghan@ecotrust.org](mailto:gmcghan@ecotrust.org).

### New Books

*Fishes of the Last Frontier, Life Histories, Biology, Ecology, and Management of Alaska Fishes* by Bill Hauser. Publication Consultants, ISBN 978-1-59433-255-5.

*Fishes of the Last Frontier* answers many of your questions, and others you haven't even thought of yet, in a nontechnical, plain talk voice. Learn about the fishes that are of value or special interest to Alaskans: how fish are able to survive and grow, how they get along with each other—or not—and what they eat, where and how our Alaskan fishes spawn, the difference between a red and a redd, and the difference between anadromous and catadromous and why that is important. The author, a fishery scientist with nearly 50 years of training and experience, including more than 30 years in Alaska, describes the life history characteristics of 43 species of fishes valuable or important in some way to Alaskans. He delves into various aspects of biology and ecology of fish

and provides insight into how humans and fish interact. The processes of fishery management in Alaska are described. *Fishes of the Last Frontier* includes fishes from throughout Alaska in fresh, brackish, and marine waters and sport, commercial, and subsistence fisheries. Learn not just how anadromous fish find their way home but also how scientists were able to learn the details. Nontechnical readers have declared the information as enjoyable, readable, understandable, and informative.

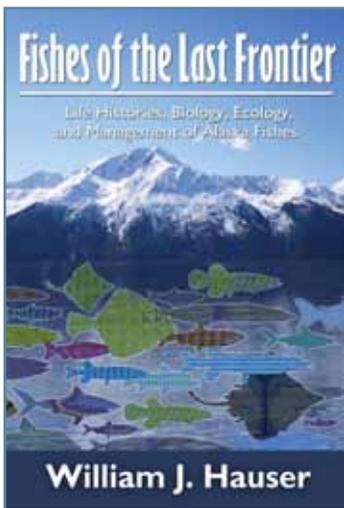
"Never again will I look at fishes the same way—as generic finned, silvery inhabitants of rivers and oceans that occasionally end up on dinner plates. Hauser explains clearly and simply the facts of fish identity and peculiarities, and the ecological implications of fish management. *Fishes of the Last Frontier* makes informative reading for all those who live in a world that is increasingly dependent on oceanic resources, and need to understand their management."

*Marthy W. Johnson, Copyeditor*

"Alaskans appreciate their fish and fisheries. But many Alaskans have only a superficial knowledge about the lives of fishes. Through *Fishes of the Last Frontier* readers will discover facts that are not only interesting, but useful as well, because the health of fishes and the aquatic world are essential to human health and prosperity."

*Dr. James Reynolds, Professor of Fisheries, Emeritus, University of Alaska Fairbanks*

Bill is also the author of the book, *Letters from Alaska, The Inside to the Outside*.



## Meetings and Events



### 6th World Fisheries Congress

May 7–11, 2012: This meeting, “Sustainable Fisheries in a Changing World,” will be held in Edinburgh, Scotland. For more information, please visit <http://www.6thwffc2012.com/>.

### Alaska Chapter Meeting of the American Statistical Association

August 15-17, 2012: This meeting will be held in Anchorage. Contact Kanapathi Thiru ([afkt@uaa.alaska.edu](mailto:afkt@uaa.alaska.edu)).



### American Society of Ichthyologists and Herpetologists and the American Elasmobranch Society 2012, Annual Meeting

August 8–14, 2012: This meeting will be held in Vancouver, British Columbia, Canada. Visit <http://wch2012vancouver.com/>.



### 142nd Annual Meeting of the American Fisheries Society Symposium

August 19–23, 2012: This meeting will be held in Minneapolis and Saint Paul, Minnesota with the theme “Fisheries Networks: Building Ecological, Social, and Professional Relationships.” Please visit <http://www.afs2012.org>.



### 39th Annual Meeting of the American Fisheries Society Alaska Chapter

October 22–26, 2012: This meeting will be held in Kodiak, AK with the theme “Ecosystem, Fishery, and Food Sustainability in a Changing World.” The meeting chair and program contact is Mark Wipfli ([mwipfli@alaska.edu](mailto:mwipfli@alaska.edu)).



### Responses of Arctic Marine Ecosystems to Climate Change

March 26–29, 2013: This meeting will be held in Anchorage, Alaska. For more information, please visit <http://seagrant.uaf.edu/conferences/2013/wakefield-arctic-ecosystems/index.php>.



### 7th International Fisheries Observer and Monitoring Conference

April 8–12, 2013: This meeting will be held in the city of Viña del Mar, Chile. For more information, please visit [www.ifomc.com](http://www.ifomc.com).



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