



The Tributary

The Newsletter of the Western Division of the American Fisheries Association

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WDAFS Small Grant updates, page 3-6



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President's Hook

By Brian Missildine, WDAFS President

Hello Western Division

I don't know about you but for some reason work-load has really picked up over the holiday season. Budget analysis, modelling hatchery programs, and presenting information to our constituents has taken up a lot of time as of late. As one of my duties I get to go out and visit our hatcheries. It was amazing to see a stream so thick with chum salmon migrating to their spawning grounds and into the hatchery that you literally could walk across them and never touch the stream bed. I am sure the floods the following week left many carcasses high and dry...and stinky.

I also had the chance to visit a high school aquaculture program in Onalaska, Washington. This is a very small school district with a small budget and huge community support. The students rear and release 30,000 steelhead and 100,000 Coho salmon. They only have a few incubation trays, several large and small round tanks to rear the fish before moving them into the local lake's net pens. What was really fascinating was the effluent treatment system. The water from all of the tanks runs into a "moving bed biofilm reactor" (a what???). It is a fixed-film submerged biofilter using buoyant plastic media as the carrier element for nitrifying bacterial growth which is vigorously agitated via air injection. The water comes out clean enough that it is recycled back through the rearing tanks. Quite impressive, indeed. In fact, the students are now working with an aquaponics



system to see how well they can grow lettuce. Who knows, maybe they will eventually be able to generate enough greens to provide to the school and local food bank.

So how does this relate to AFS? Well, I took off my work hat and told them about AFS, the AFS Hutton Junior Fisheries Biologist program, and that Western Division has a small grant program because really, it is about the next generation of aquaculturists and biologists. The students in this program not only get high school credit but can also earn college credits for this program. The other fascinating aspect

of this program is the faculty also teaches wood and metal shop. So, not only are the students learning about aquaculture but can weave what they learn in wood and metal shop into the aquaculture program. In fact, the students were working on another water recycling system in metal shop for the aquaculture program. As any of us know who have worked in a hatchery, you really need to be a jack of all trades so that you can respond to repairs and emergencies.

Well, that's all for now. If you ever have any comments, suggestions, or just want to talk about AFS and/or the Western Division, drop me an email at brian.missildine@dfw.wa.gov.

I hope you all had a safe and wonderful holiday season!

Brian

Small Grant Update

Video highlights the importance of cold water refuges

By Greer Maier, Upper Columbia Salmon Recovery Board

In 2015 the Upper Columbia Region, like others across the West, experienced one of the hottest and driest summers in recent history. Rivers experienced record low flows and extreme fires swept through the region. Most salmon and steelhead returning to the region were lost before even reaching their natal tributaries, and those that did survive the 500+ mile journey up the Columbia River, were faced with extraordinary challenges. Those familiar with the challenges these fish faced went out to document their fight for survival. Local river snorkeler, Russ Ricketts of Colchuck Media, captured incredible footage of adult salmon, steelhead, and bull trout holding together in a small pocket of cool water (link to original footage taken in the Wenatchee River near USFS Tumwater Campground - <https://vimeo.com/143080727>). The footage and the accompanying story told by Russ was so compelling that the Upper Columbia Salmon Recovery Board decided to work with their local production company Voortex Productions to further develop Russ' video to tell the story of what was happening and describe how important these types of areas are to the survival of salmon and steelhead in the region. Funding from the WDAFS small grants fund made this project possible.

The video resulting from this collaborative effort can be found at the following link: <https://www.youtube.com/watch?v=Ff8kab4yHX0&feature=youtu.be>

The video shows fish use of thermal refuge in the summer of 2015 and explains the importance of



such refuges to the continued persistence of these species, especially in future warmer, drier climates.

It also promotes conservation and research of these important habitat types. The video was produced to have broad applicability and can be used by any entity trying to explain the uniqueness and importance of these habitat types. The short film medium can be an effective communication tool that can easily be shared and viewed, thereby facilitating a broad impact across a variety of audiences.

The conservation and sustainability of many species is highly dependent on understanding, protecting, and restoring thermal refuges. It is not hard to imagine a future in which the survival of species like the Upper Columbia endangered spring Chinook and others like it will be dependent on the persistence and quality of small pockets of cold water spread across an increasingly inhospitable landscape. As the video states, "it's not enough that water's wet, it also has to be cold. And there's not a lot of wiggle room here. A few degrees is a matter of life and death."

Small Grant Update

The secret life of larval fish: A geocaching adventure

By Katherine Dale, University of California, Santa Cruz

Did you know that you probably pass by several hidden treasure chests during your daily commute? It's true! They are part of a sport called "geocaching" – a free, real-life scavenger hunt where players use GPS technology to find secretly hidden containers called "caches". There are over 3 million official caches registered on Geocaching.com, and more are placed every day. Caches vary hugely in size, shape, and what they have in them, ranging from ones as small as a fingernail that just contain a tiny scroll of paper for finders to sign, to large canisters which have toys, stickers, and other fun trinkets that players can trade.

about. Interestingly, it has also been shown to be an effective mode of informal, mobile learning that can be paired with other activities to encourage critical thinking, teamwork, and navigational skills (Ally, 2009). Additionally, well-maintained caches can remain in place for many years – the oldest geocache in California is 17 years old! This increases potential chances to engage people, and may reach a larger cumulative audience than a single outreach event.

Icthyoplankton (eggs and planktonic larvae of fish) are rarely focused on in educational exhibits or outreach programs. This important part of the plankton transports nutrients vertically and horizontally in marine and aquatic ecosystems, provides food to predators, consumes other plankton themselves, and acts to disperse fish species to new areas. Yet larval fish remain generally understudied, mainly due to their fragility and elusiveness, the considerable effort required to sample them, and the near impossibility of tagging/tracking individuals.

I have created a program focusing on the early life history of fish, in collaboration with the Seymour Marine Discovery Center (SMDC). SMDC is a nonprofit marine science education facility in Santa Cruz, CA that serves several hundred thousand people a year. It is associated with the University of California, Santa Cruz (UCSC) and is located on UCSC's Coastal Science Campus.

The caches in this series are each themed around one aspect of larval fish, with a special focus on California species and ecosystems. Cache topics cover the following:

[GEOCACHE *continued on page 5*]



Figure 1. Clockwise from top: Official geocache stickers that are attached to caches; commemorative wooden coins; rubber stamps that visitors use to stamp their "passports."

Geocaching gets people outside, exploring places they otherwise would not have known about. It's also just plain fun to find hidden objects that few others know

[GEOCACHE *continued from page 4*]

1. Adaptations of larval fish to prevent sinking. *Focus species:* ocean sunfishes (family Molidae)
2. Divergence in form between larvae and adults. *Focus species:* Deep sea fish found in Monterey Bay
3. Importance of parental care in determining larval quality. *Focus species:* Black rockfish (*Sebastes melanops*) and tidewater goby (*Eucyclogobius newberryi*)
4. Reproductive strategies. *Focus species:* Clownfish (*Amphiprion sp.*), jawfish (*Opistognathus aurifrons*), surfperch (*Hyperprosson anale*)
5. Mimicry in larval fish. *Focus species:* Eels (Order Anguilliformes)

Each cache has a unique question associated with it. Information needed to answer the question is inside the caches in the form of images, short paragraphs of text, or drawings. Visitors wishing to participate first pick up a geocaching “passport” from SMDC. They then head out to find the caches using their own smartphone or a GPS unit available for borrowing from SMDC. When visitors find each cache, they review the cache contents, answer the question, and stamp their passport with a fish-themed stamp inside the cache. For completing the series, they can return to the SMDC and receive a commemorative wooden coin.

Accessibility was one of my main priorities when designing caches. Caches are placed so that they are accessible to people in wheelchairs and small children, and do not require visitors to ever leave paths. Having a pre-loaded GPS unit available for patrons promotes inclusion of people who do not own smartphones.

In the future, we hope to link the geocaching portion of this project with an indoor museum exhibit, where we’ll feature larval fish specimens and more in-depth information. We hope that visitors come away with an understanding that larval fish are diverse and very different from their parents, and that they have unique adaptations to deal with being a small

organism in a big ocean. We also hope to inspire local California residents to learn more about the species that are found in their waters, from the endangered gobies living in the estuary next door to SMDC to the deep-dwelling denizens of Monterey Bay.

References:

Ally, M. (2009). *Mobile learning: Transforming the delivery of education and training*. Athabasca University Press.

The projects featured on pages 3-6 were made possible in part by small grants from the Western Division.

2018 Western Division AFS Small Project Grants

The deadline for applying for a 2018 WDAFS Small Project Grant is February 15, 2018

The WDAFS is currently accepting applications for funding of small fisheries-related projects in the western United States, US territories, Mexico, and Canadian provinces represented by the WDAFS. Grants are usually modest, averaging less than \$1,000, but can help get a project started or be used to supplement funding from other sources. This year, the WDAFS Executive Committee approved a budget of \$5,000 to fund as many small projects as possible. **Applications must be received by the Western Division Past President, Cleve Steward, no later than February 15, 2018.** Contact Cleve at cleve.steward@gmail.com or Tel. (206) 719-1260 if you have any questions.

For full information about Small Grants, go to: wdafs.org/awards/

2017 Student colloquium

By Zach Klein and Shannon Blackburn, Palouse Student Subunit

The Palouse Student Subunit Unit of the American Fisheries Society (PUAFS) recently teamed up with the Western Division of the American Fisheries Society (WDAFS) to host the annual WDAFS Student Colloquium. The colloquium was held in McCall, Idaho from November 14th – 17th at the Quaker Hill Camp and Conference Center. Over 30 graduate and undergraduate students attended the meeting and represented universities from Alaska, Colorado, Montana, Oregon, Idaho, Washington, and Wyoming. On the first day, Dr. Derek Ogle taught a day-long workshop focused on using his Fisheries Stock Assessment (FSA) package for R.



Photo: Dr. Ogle teaches attendees the intricacies of von Bertalanffy growth models.

On the following day, eleven students presented their research to the group. The presentations represented a diversity of topics varying from microplastics in Pacific bivalves to the population dynamics of White Sturgeon in California. A particularly note-worthy talk was given by an undergraduate at the University of Idaho, Mackenzie Miner. Mackenzie presented work on an ecosystem-wide response of a wilderness river to the recent solar eclipse. Even though this was Mackenzie's first professional talk, she did an excellent job and reminded everyone why engagement of undergraduate students is critical to

our organization! Following the presentations, attendees retired to the Gold Fork Hot Springs to relax, take in the sights of central Idaho, and connect with one another.



Photo: Student members discuss fish trivia questions

Overall, the 2017 WDAFS Student Colloquium was a resounding success. Student's learned valuable technical skills, presented their work in a friendly and supportive environment, and made lasting relationships with their peers. Although the colloquium only lasted two days, the event would not have been successful without generous donations and a large amount of work behind the scenes. The planning committee (Shannon Blackburn [PUAFS], Kat Gilles-Rector [PUAFS], Stacey Feekan [PUAFS], Zach Klein [WDAFS Student Representative]) was integral in the development and implementation of the colloquium. We greatly appreciate our sponsors who included the Alaska Chapter of AFS, California-Nevada Chapter of AFS, Colorado-Wyoming Chapter of AFS, Idaho Chapter of AFS, WDAFS, PUAFS, Education Section of AFS, College of Natural Resources at the University of Idaho, Trout Unlimited, Onset, Biomark, Smith-Root, and Frigid Units. In fact, we received so many generous

[COLLOQUIUM *continued on page 7*]

Palouse student subunit update

By Shannon Blackburn, Palouse Student Subunit



Student members of the Palouse Student Subunit of the American Fisheries Society (PUAFS) have been busy this autumn. Members gained hands-on experience with fisheries techniques, participated in mentoring with graduate students, attended relevant seminars, and engaged with the local community.

Despite inclement weather, members assisted the Idaho Department of Fish and Game (IDFG) with gill-net sampling in Lake Coeur d'Alene during mid-September. In November, members joined IDFG biologists from the Clearwater Region with hook-and-line sampling of White Sturgeon in Hells Canyon. Additionally, PUAFS has hosted several fisheries related lectures and workshops. Dr. Michael Quist spoke in detail about the process of applying to graduate school and expectations for graduate students. Later in the semester, PUAFS was lucky to have Dr. Steve McMullin, the current President of the American Fisheries Society (AFS), discuss how to prepare for a successful career in fisheries. On November 14th – 17th, PUAFS hosted the 2017 Western Division of AFS Student Colloquium in McCall, Idaho. The colloquium consisted of a workshop on the Fish Stock Assessment package in R taught by its author, Dr.

Derek Ogle, followed by a day of student presentations.

Members of PUAFS were also involved with outreach and educational activities. In October, members partook in the University of Idaho's homecoming parade and the bi-annual stream clean-up of Paradise Creek. Over Halloween, PUAFS volunteered with the Palouse-Clearwater Environmental Institute's Animals of the Night event to teach the community about fishes. Members displayed "spooky"

fish (e.g., lamprey, eels), explained fish anatomy with freeze-dried fish heads, and assisted with fish-related arts and crafts.

So far, 2017 has been a fulfilling year. We plan to maintain PUAFS's momentum of promoting AFS's mission by providing members with exceptional professional development opportunities through an upcoming resume building workshop and continuing with mentoring, guest speakers, field trips, and community outreach events.

[COLLOQUIUM continued from page 6]

donations that the entire event came in under budget with no cost to attendees! We believe student colloquia are incredibly beneficial for student members of WDAFS and have decided to donate the excess funds from the 2017 meeting to the 2018 WDAFS Student Colloquium. We hope that our donations (and other like it) will help facilitate another successful colloquium that benefits the personal and professional development of student members of the Western Division of AFS.

Montana State University student subunit update

By Lauren McGarvey, MSU student subunit president

This semester, the MSU student subunit organized several events including guest speakers and an otolith workshop. Our subunit hosted Brian Ertel, a fisheries biologist with the National Park Service in Yellowstone National Park. Brian presented his work in the park and gave students advice on applying for federal jobs. The subunit also had a graduate student with Utah State University, Niall Clancy, present his proposed study design. This was a great opportunity for students to collaborate and discuss. Additionally, the subunit had an

otolith workshop where we demonstrated how to section and age otoliths.

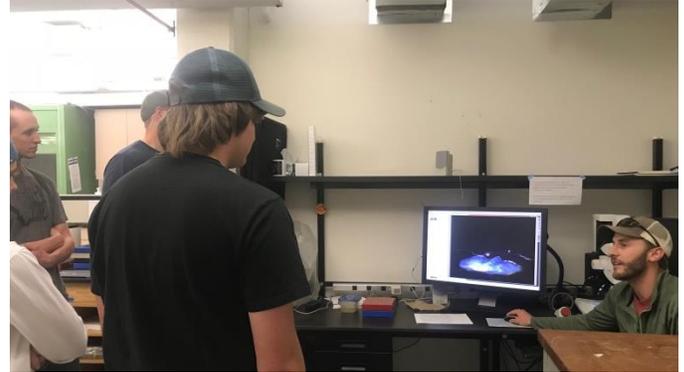


Photo: Dan Kaus, a graduate student at Montana State University, teaching students how to identify annuli.

Washington-British Columbia Chapter update

By Benjamin Cross, WA-BC Communications Director

The Washington-British Columbia Chapter of the American Fisheries Society has been busy planning our next Annual General Meeting to be held in Kelowna, British Columbia, Canada, March 19–22, 2018. The theme signifies the 40th anniversary of the Chapter in 2018: “40 Years of Fish and Fisheries in the Pacific Northwest.” A call for oral and poster presentation submissions will go out in mid-December, after symposia are finalized. Earlybird registration will also open up by early January. More information about the meeting can be found at: <https://wa-bc.fisheries.org/next-meeting/>. We hope to see you there!

The 2017–2018 Executive Committee (pictured below) met on November 11, 2017 at the University of Washington to conduct some annual housekeeping. Some of the main agenda items included updating Chapter Bylaws and the Chapter Procedures Manual, reviewing budgets, planning future meeting locations, the new website (<https://wa-bc.fisheries.org>), and continuing to improve student involvement.

We encourage students to check out their local subunits and get involved with the WA-BC Chapter.

Information on WA-BC student subunits can be found on our website. Also, students are encouraged to apply for scholarships and travel grants offered by WA-BC, such as the C. Jeff Cederholm Scholarship which will award three \$1,000 scholarships in 2018. The application deadline is February 16, 2018 and instructions can be found at: <https://wa-bc.fisheries.org/about-us/awards>.



From left to right: Gabriel Temple (President Elect), Sam Wilson (upper, BC Student Subunit President), Orlay Johnson (lower, Student Representative), Kirstin Gale (Secretary), Tamara Knudson (President), Alix Silver (Past President), Brittany Jenewein (Vice President), Benjamin Cross (Communications Director), and Ryan Klett (Treasurer).

Mexico Chapter AFS meeting recap

By Cleve Steward and Agustín Hernández

The recent meeting of the Mexico AFS Chapter was a success!

¡Saludos desde México!

The Mexican Fisheries Society of and the Mexico Chapter of the American Fisheries Society staged a joint meeting October 18-20, 2017 in the beautiful city of La Paz on the Baja peninsula, Mexico. The theme of the meeting was "**The Use and Conservation of Fishery Resources**". Hosted by the Centro Interdisciplinario de Ciencias Marinas (CICIMAR) of the Instituto Politécnico Nacional, and co-sponsored by the Instituto Nacional de Pesca y Acuicultura and Centro de Investigaciones Biológicas del Noroeste, S.C. the three-day meeting was attended by over 120 fisheries researchers, managers, students, and others from 7 different countries and 13 states of the Mexican Republic. Attendees from Mexico represented 17 different institutions; 6 civil society organizations, and 11 universities and research centers.

The meeting comprised 133 presentations organized around 8 session topics: 1) Changes in fisheries associated with oceanographic factors; 2) The importance of public education in fisheries conservation; 3) Stock dynamics and evaluation of fishery resources; 4) Fishing in the context of the marine ecosystem; 5) Efficiency of fishing systems; 6) Fisheries administration; 7) Marine Protected Areas; and 8) Potential resources.

In addition to the outstanding quality of the technical program and the comradery of meeting attendees, the meeting was distinguished by vigorous and free-ranging discussion among its participants. Students, in particular, were front and center, giving talks, handling registration,



moderating sessions, and interacting with their peers and career professionals. They also organized a well-attended poster session and informal gatherings where friendships were renewed and new relationships were forged. It was an enriching experience for all.

[MEXICO AFS continued on page 10]

[MEXICO AFS *continued from page 9*]

The Mexico Chapter of AFS held its business meeting on the second day of the event. Addressing the large crowd, the president of the Mexico Chapter, Dr. Agustín Hernández-Herrera, described the Chapter's recent accomplishments and his vision for its future. A slate of Chapter officers was proposed and by majority vote the following officers were approved by the membership for the 2017 - 2019 term: Dr. Veronica Morales- Zarate (Past- President); Dr. Agustín Hernández-Herrera (President); Dr. Cesar Augusto Salinas-Zavala (President-elect) and Dr. José Alberto Zepeda-Domínguez (Secretary-Treasurer). After the election, the assembly was addressed by Cleve

Steward, Past-President of the Western Division of the American Fisheries Society (WDAFS), who talked about WDAFS activities and the benefits of being an AFS member. To encourage people to join AFS, WDAFS and the Mexico Chapter paid annual membership fees for 6 people that were randomly drawn during the following evening's poster social. As the meeting demonstrated, there are a large number of talented and dedicated fisheries biologists and managers who work to conserve Mexico's fisheries resources. Mexico's fisheries professionals and students are proud to be members of the American Fisheries Society.

¡Te invitamos a que nos visites en el bello México!

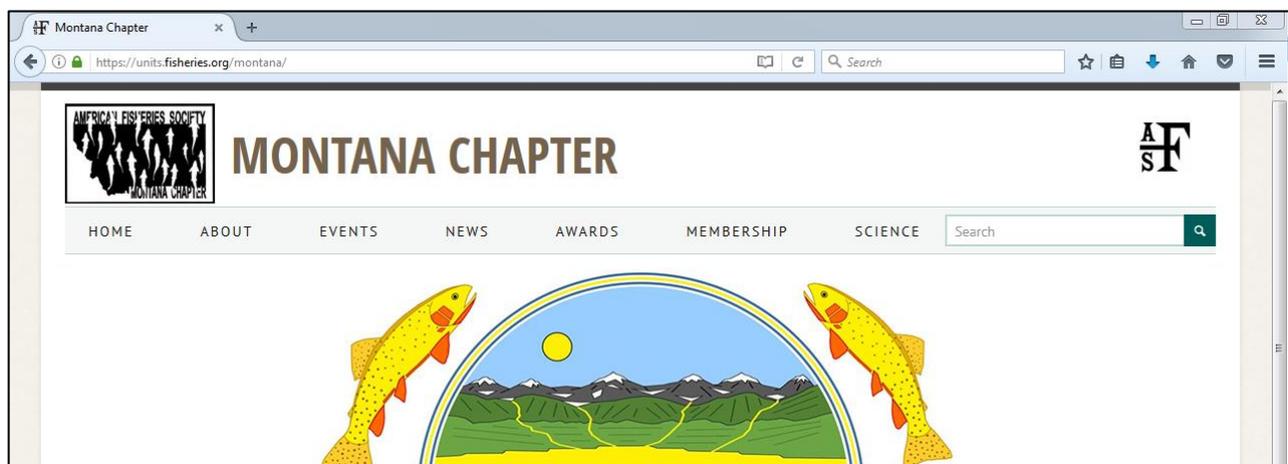
The Montana Chapter has a new website

The Montana Chapter of AFS is happy to announce the launch of our new website. You can find the new website at <https://units.fisheries.org/montana>. The new site has much of the same content and functionality of our old site, but with a new look. The structure and theme of the new site is consistent with the Parent Society and several other AFS chapters.

Some of the things you can do on the new website are:

- Post MTAFS chapter events and view an event calendar.
- View fish related job opportunities and post job announcements.
- Keep up on chapter, local, and national news and see past editions of The Outlet newsletter.
- Apply for awards and scholarships.
- Find information about the annual meeting.

If you have any suggestions for news stories, favorite photos, or other content you would like to see added to the site, please send them to nathan.cook.mt.fwp@gmail.com. Photos will periodically be added to the rotating banner on the homepage. MTAFS members, please consider this to be *your* website! This site will be as engaging and up to date as our members make it.



Invitation to attend the 2018 WDAFS meeting in Anchorage, Alaska



Kenai River near Sterling, AK. Photo: M. Buntjer

Greetings AFS members,

You are heartily invited to the Greatland for the 2018 WDAFS meeting to be held 21-25 May in Anchorage, AK! The meeting theme is “Change, Challenge, and Opportunity in Fisheries: Fishing for Solutions”.

If you’ve never been to Anchorage or Alaska this is the ultimate opportunity to expand your professional knowledge while experiencing America’s Last Frontier!

Fodor’s Travel Guide says, “By far Alaska’s largest and most sophisticated city, Anchorage is situated in a truly spectacular location. The permanently snow-covered peaks and volcanoes of the Alaska Range lie to the west of the city while part of the craggy Chugach Range is within the eastern edge of the municipality; the Talkeetna and Kenai ranges are visible to the north and south. Two arms of Cook Inlet embrace the town’s western and southern borders, and on clear days Denali looms on the northern horizon.”

Weather in late May in Anchorage is typically shifting to highs in the 60s with lows in the 40s and a 50/50 chance of sunshine. These conditions are great for hiking above the city in the Chugach Range, biking the paved Coastal or many singletrack trails,

or walking to enjoy nearby restaurants, breweries, and diverse cultural attractions. If you’re staying longer (Memorial Day weekend follows the meeting!) you may want to rent a car or take the train to Denali National Park or down the Kenai Peninsula for a glacier cruise or fishing charter; be sure to keep an eye out for Beluga Whales along your way! For more info see: <https://www.anchorage.net/things-to-do/>

See you in Alaska!

Jeff Falke and Brian Missildine, Meeting Co-Chairs



Poster and contributed paper abstract submission opens mid-January 2018 and due by mid- March 2018

Please consider being part of our meeting. The call for contributed papers and submission instructions can be found at <http://wdmtg.fisheries.org>.

2018 WDAFS call for awards and scholarships

WDAFS INDIVIDUAL AND ORGANIZATION AWARDS

Due: February 15, 2018
Contact: Cleve Steward
Cleve.steward@gmail.com
Website: wdafs.org/awards/information-deadlines-applications

Each year, the Western Division bestows awards on members, organizations, Chapters, and Subunits that have distinguished themselves through their contributions to the Division, our members, and fisheries and aquatic resources. We all know individuals or entities that are worthy of recognition. Please take the time to nominate them for a 2018 WDAFS award:

- Award of Excellence
- Award of Merit
- Award of Special Recognition
- Robert Borovicka Conservation Achievement Award
- Conservation Achievement Award (for organization)

Winners of 2018 WDAFS awards will be selected and nominees will be notified of the decision by Tuesday, February 27. All nominees are encouraged to attend the WDAFS annual meeting in Anchorage, AK May 21 – 25th.

WDAFS EUGENE MAUGHAN GRADUATE STUDENT SCHOLARSHIP

Due: April 1, 2018
Contact: Bob Gresswell
bgresswell@usgs.gov
Website: wdafs.org/students/scholarship-travel-award-information/

The Western Division is pleased to announce that applications for its graduate-level student scholarships are now being solicited. This Eugene Maughan Graduate Student Scholarship provides up to \$5,000 annually 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. This fund provides up to \$600 annually to a graduate-level student conducting studies on fisheries sustainability. Applications for the Western Division scholarship program will automatically be considered for the Sustainable Fisheries Foundation scholarship program as well. ***The 2018 scholarships will be awarded at the annual meeting of WDAFS in Anchorage, Alaska May 21-25, 2018.***

2018 Riparian Challenge Award

The purpose of the Riparian Challenge Award is to:

Encourage the Bureau of Land Management, Forest Service, and other conservation agencies or private industry to strive for excellence in riparian and watershed habitat management; encourage agencies to progress in on-the-ground accomplishments which when added together throughout the West, will significantly improve riparian systems; and, recognize managers and resource specialists for their efforts in maintaining, restoring, and improving riparian and watershed ecosystems.

The application period for the 2018 WDAFS Riparian Challenge Award is open now through February 15, 2018.

Winners will be announced at the WDAFS meeting in Anchorage, AK May 21-24. Winners will receive \$750 travel reimbursement from WDAFS to attend the meeting and will be awarded a plaque of acknowledgment at the Business Luncheon.

The application for the Riparian Challenge can be found at wdafs.org/awards/information-deadlines-applications/riparian-challenge-award.

2018 WDAFS travel grants

Application deadline is February 20, 2018

The Western Division of the American Fisheries Society is pleased to offer funding in the form of travel grants for the annual meeting in Anchorage Alaska, to be held May 21-24, 2018. These travel grants are for Students, Early Career Professionals (graduated after May 2013), Professionals, and International attendees. Please review criteria before applying. Applications will be only eligible for one travel grant, please do not apply to multiple categories or multiple times.

More information about travel grants, including the link to the applications, can be found at wdafs.org/travel-grants/.

If you have questions regarding the application and funding opportunities, please contact Dan Dauwalter at ddauwalter@tu.org using the subject line: WDAFS Travel Grant.

Backpack Electrofishing Course

Northwest Environmental Training Center (NWETC), a Washington-State-based, non-profit organization dedicated to environmental education, is pleased to announce a course in Backpack Electrofishing in **Anchorage, Alaska, May 19-21, 2018**, in conjunction with the annual meetings of the Western Division and Alaska Chapter. The course consists of classroom work on the first and third days and field exercises on the second day. A certificate is awarded for course completion that documents formal training.

For additional course information and registration, visit nwetc.org, select Courses > Chronological Course Offerings, and scroll down to the date of the course.

Individuals with administrative questions, such as tuition details, should contact Ralph Fontaine (rfontaine@nwetc.org) at NWETC. Technical questions about course content should be directed to Jim Reynolds, Instructor, at jbreyndolds@alaska.edu,

2018 AFS International Fisheries Section Fellow Award

Applications due by March 6, 2018

Attention Students and Young Professionals:
The International Fisheries Section (IFS) of the American Fisheries Society (AFS) is excited to announce the 2018 International Fisheries Section Fellow Award. The Fellow will represent IFS/AFS by presenting a poster or oral presentation at the 2018 Fisheries Society of the British Isles (FSBI) Annual Symposium, July 9-13, at the University of East Anglia, in Norwich, United Kingdom. The theme of the 2018 FSBI Annual Symposium is "The Sustainable Use and Exploitation of Fishes."

<http://www.fsbi.org.uk/conference-2018/symposium-theme-2/>

2018 Annual Symposium of the Fisheries Society of the British Isles

University of East Anglia, Norwich, UK

9-13 July 2018

The Sustainable Use & Exploitation of Fishes

Benefits:

- FSBI presentation (a presentation slot has been reserved for the recipient of this award)
- Up to \$2,100 (USD) of reimbursable travel expenses associated with attending the FSBI Annual Symposium
- Meeting registration, dormitory accommodations, and meal stipend while at the symposium

[INTERNATIONAL *continued on page 14*]

[INTERNATIONAL *continued from page 13*]

- 1 year of membership to FSBI
- 2 years of leadership in the International Fisheries Section

Eligibility:

This award is open to all Student Members and Young Professional Members (within 2 years of graduation) of the American Fisheries Society, especially those working on topics of international interest or those associated with the symposium theme. However, we encourage all interested Student and Young Professional Members to apply. Current membership with the American Fisheries Society is mandatory to apply for and receive this award.

Application:

To apply, please submit the following information as a single PDF document to the Committee Chair for the IFS Fellow Program, Charlie Waters (cwaters8@uw.edu), and the Deputy Committee Chair, Jane Sullivan (jane.sullivan1@alaska.gov) by 11:59pm (PST) on **March 6, 2018**:

- Letter of interest (please include information about your involvement in AFS and how you will benefit from attending the FSBI Annual Symposium)
- Proposed FSBI presentation title and abstract
- Concise resume
- Proposed travel budget (i.e. airfare, ground transportation, etc.); please specify availability of supporting funds you may have from other sources if budget exceeds allowance

The award recipient will be notified by April 6, 2018.

Obligations:

The awarded Fellow is expected to fulfill the following obligations:

- Attend the 2018 FSBI Annual Symposium and present an oral or poster presentation.
- Submit to the Committee Chair a travel report and photographs for print publication by August 12, 2018.
- Submit travel receipts to the Committee Chair by August 12, 2018 for expense reimbursement.

- Attend the AFS annual meeting and IFS committee meeting in Atlantic City, NJ, USA, August 19-23, 2018.
- Act as a site host at the Atlantic City AFS meeting for the FSBI Fellow.

Serve as the Deputy Committee Chair of the IFS Fellow Award in 2019 and the Committee Chair in 2020.

Planning & executing successful rotenone & antimycin projects

For biologists who manage the planning and execution of rotenone or antimycin projects

May 14 – 18, 2018

Utah State University, Logan UT

5 days

Tuition: \$1,200 (\$1,100 AFS Members)

This course stresses public involvement, safety, planning and new application restrictions and techniques and safety from the new 2nd edition AFS Rotenone SOP Manual and is taught by manual's two senior authors. The course was developed to meet the U.S. Environmental Protection Agency's labeling requirements that include the AFS Rotenone SOP Manual. For more information, go to fisheries.org/membership/continuing-education/



Voices and Vices

Turning a Page

By Bill Stewart



Have you ever considered taking a new job only to back out or not even apply because you're not sure you would take it in the first place? Maybe you recently took a new job and are wondering what in the world did I just do? In some form or fashion what we do as professionals defines a large part of who we are. Many of us take pride in our work and build relationships that go beyond our 9-5 jobs (I know, none of us work 9-5 jobs). Disrupting your routine, comfort level, and way of life can be a scary thing and is often times why it is difficult to make that leap into the unknown. A little over a year and a half ago I decided to take that leap and it is a decision for which I am grateful.

After spending 12 plus years with one agency, I had the opportunity to work with some of the

most hardworking professionals I know and formed many lifelong relationships. However, there was also this routine of commonplace tasks that became less appealing over time. As I became seasoned I found myself saying things like well that's not how we used to do it or even shutting ideas down before I had the chance to hear them out. For me these were signs that a change would probably do me some good.

The decision about leaving a great organization and wonderful group of people behind to pursue the unknown was very difficult, but I kept coming back to something a good friend told me about keeping it fresh and having new

perspectives. The new job at its core was doing similar things for conservation, but the idea of a new network of people, new challenges, and more importantly a new perspective were ultimately what tipped my decision. While the transition has been difficult at times, my energy and passion for conservation has been renewed. I find menial tasks more exciting, the new challenges and opportunities seem endless, and most importantly I have a new audience of people who think my fish jokes are funny. For anyone considering a change do it for the right reasons. Make sure you are not running away from something rather trying to challenge yourself in ways you might not even understand. I took a leap and landed just fine.

James Dominguez – you're on the hook for the next "Voice and Vices"!

INSTREAM FLOW COUNCIL
FLOW 2018
SCIENCE • LAW • POLICY • PUBLIC DIALOGUE

SAVE the DATE!

**Managing Rivers, Reservoirs, and Lakes in the
Face of Drought**

Practical Tools and Strategies for Sustaining and
Protecting Ecological Values of Water
Fort Collins, Colorado April 24-26, 2018

A workshop where:

- Participants will learn proven tools and strategies to help effectively balance traditionally recognized water needs with the ecological vitality of river systems that they can put to practice in their own jurisdiction.
- Tools and strategies will integrate legal and policy elements with scientific understanding and public involvement strategies to effectively manage flowing and standing water ecosystems when faced with drought.
- Problem-solving presentations will go beyond descriptions and projections of anticipated consequences and focus on proven practices for dealing with drought and extreme flow variability.

Find out More

at <http://www.instreamflowcouncil.org/conferences-flow-2018/> and be on the lookout for updates on registration, program, and sponsorship/exhibitor opportunities!



Endowment Brief History

Jeff Cederholm dedicated his career to conservation of salmon and aquatic species and their habitats. Jeff passed away in 2006 leaving a legacy of education, pioneering contributions to scientific literature and periodicals and instilling of passion for wild salmon conservation in many people for decades. After a successful American Fisheries Society Meeting hosted by the WA-BC Chapter in Seattle 2011, the Chapter resolved in 2013 to apply raised funds and subsequent contributions to the endowment to create a permanent source of financial support for educational expenses. The Scholarship is administered by the WA-BC Chapter Endowment Committee.

The Scholarship

The SEF will provide three equal value scholarships each school year, one each to an **undergraduate** student (pursuing a bachelor's or associate's degree), a student pursuing a **master's degree**, and a student pursuing a **doctorate**.

The following scholarship criteria apply:

Scholarships are intended for defrayment of educational expenses such as tuition, student fees, lab fees, books, supplies, room and board.

Scholarships will be awarded to students pursuing degrees in fisheries, aquatic sciences, or related fields at an accredited college or university.

Master's and PhD applicants must be Washington-British Columbia Chapter members at the time that their application is submitted.

Undergraduate applicants need not be Chapter members.

Scholarships for each given year will be equal amounts and will depend on the performance of the Endowment year to year. In 2018, **three \$1000 scholarships will be awarded.**

How to Apply

Provide a brief cover letter addressed to the C. Jeff Cederholm Scholarship Committee, fill out the attached application form, acquire two letters of recommendation and e-mail a merged pdf electronic version containing all elements to WA-BC AFS past president, Alix Silver (Blake), alix.blake@spokanetribe.com or mail to WA-BC chapter American Fisheries Society, P.O. Box 9322, Spokane, WA 99209. E-mail submissions are preferred.

Applications will be accepted through February 16th, 2018.

Important WDAFS Dates

January 29 – 31, 2018

Montana Chapter Annual Meeting
Butte, MT

<https://units.fisheries.org/montana>

February 28 – March 2, 2018

Cal-Neva Chapter Annual Meeting
San Luis Obispo, CA

www.afs-calneva.org

April 26 – 28, 2018

Instream Floc Council FLOW 2018
Fort Collins, CO

www.instreamflowcouncil.org

February 27 – March 1, 2017

CO/WY Chapter Annual Meeting
Laramie, WY

www.cowyafs.org

March 13 – 16, 2018

Oregon Chapter Annual Meeting
Eugene, OR

www.orafs.org

May 21 – 24, 2018

WDAFS Annual Meeting
Anchorage, AK

www.afs-alaska.org

February 28 – March 2, 2018

Idaho Chapter Annual Meeting
Idaho Falls, ID

www.idahoafs.org/2018

March 19 – 22, 2018

WA/BC Chapter 40th Anniversary
Annual Meeting
Kelowna, BC

wabc-afs.org

August 19 – 23, 2018

AFS Annual Meeting
Atlantic City, NJ

afsannualmeeting.fisheries.org

Thank you from the NorWeST Team

Hi Everyone,

Just writing to thank the hundreds of professionals from more than 100 natural resource agencies in the western U.S. that contributed their river and stream temperature datasets collected over the last 20 years to help us constitute the NorWeST database. The paper describing outcomes from the 6 years of work it took to accomplish that task was just published in Water Resources Research and is available at the NorWeST project website (<https://www.fs.fed.us/rm/boise/AWAE/projects/NorWeST.html>), along with the temperature data from ~23,000 stream sites and high-resolution summer temperature scenarios that were interpolated among those sites. When the project began in 2011, the goal was simple—get everyone's data organized and accessible in a comprehensive database to facilitate data sharing & recycling, decrease redundancy of monitoring efforts, stimulate collaboration among agencies, and enable new research on thermal ecology and stream temperature dynamics that would facilitate better conservation and management. That goal & the associated benefits seem to have been achieved as evidenced by the grass-roots user-community that has grown around NorWeST and the large amount of traffic through the website, which receives ~12,000 annual visits and services the downloads of hundreds of digital data products each year.

We'd be remiss not to also thank the grant funding agencies that made NorWeST possible. First and foremost are the [Great Northern LCC](#) and [North Pacific LCC](#) that started our small snowball rolling in the northwest before it gathered steam & grew organically thereafter to encompass the remainder of the western U.S. with additional funding from NFWF, California FPF, USFWS, NASA, TU, and EPA. Organizing thousands of data records would have been impossible without the consistent geospatial framework provided by the National Hydrography Dataset (<http://www.horizon-systems.com/NHDPlus/index.php>), so our thanks too to the joint EPA-USGS NHD development team led by Al Rea & Tommy DeWald.

A few fun facts about the stream thermalscape associated with the 2,500,000 km² western U.S. There are 1,600,000 km of channels draining the area as represented by NHD bluelines, of which approximately 343,000 km are perennial rivers and

streams. The average August temperature during the period of 1993–2011 in those perennial streams was 14.2°C (SD = 4.0°C) but with climate change related air temperature increases and summer flow decreases, streams have been warming at the rate of 0.17°C/decade since the mid 1970s and are now ~0.7°C warmer than they were. To facilitate conservation planning efforts as that warming trend continues for the foreseeable future, 36 scenarios representing historical and possible future stream climates at 1-km resolution are available as ArcGIS shapefiles at the NorWeST website. Additional scenarios are under development by our group and others to represent different seasonal periods, which is a straightforward task now that a robust database and statistical codesets have been developed.

The NorWeST notion was ultimately inspired by the community of aquatic professionals across the western U.S. that cares intensely about streams, rivers, and the cool critters they harbor. We hope our partnership with that community inspires similar efforts elsewhere to develop comprehensive databases, efficient monitoring networks, & models that yield ever-improving information for decision makers this century.

Best regards, The NorWeST Team (D. Isaak, S. Wenger, E. Peterson, J. Ver Hoef, D. Nagel, C. Luce, S. Hostetler, J. Dunham, B. Roper, S. Wollrab, G. Chandler, S. Parkes, D. Horan)

p.s. We'll be replicating this crowd-sourced, open-access database business again soon for aquatic biodiversity in the western U.S. with eDNA datasets collected by many agencies. More on that this winter when the NFWF funded Aquatic eDNA Atlas website & dataportal are launched (preliminary details here: <https://www.researchgate.net/project/The-Aquatic-eDNAAtlas-for-the-western-US>)...



United States Department of Agriculture
Forest Service

Rocky Mountain Research Station

Air, Water, and Aquatic
Environments Program

Science Briefing

*Providing scientific knowledge and technology to sustain
our nation's forests, rangelands, and grasslands*

THE NORWEST INTERAGENCY STREAM TEMPERATURE DATABASE AND CLIMATE SCENARIOS

Funded by:



Lead agencies:

ISSUE

Climate change is warming aquatic ecosystems and will have profound consequences this century. Effective conservation and management of aquatic resources will require unprecedented levels of interagency coordination. Development of shared databases and common sets of high-resolution climate scenarios are a cost-effective means of developing interagency partnerships and the information required to understand local climate effects so that conservation efforts can be prioritized accordingly.

INFORMATION CREATION

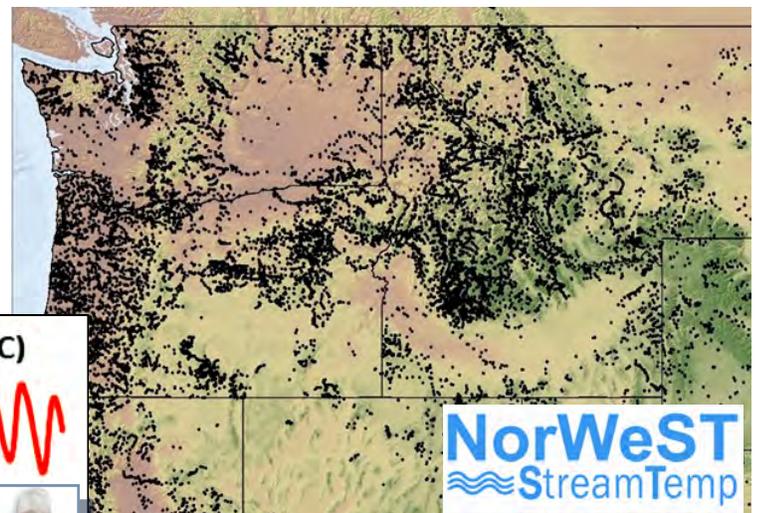
The NorWeST science and database team has developed a comprehensive, interagency stream temperature database over the last five years. Those data were used to develop accurate models and high-resolution (1 kilometer) temperature scenarios for all rivers and streams (1,000,000 kilometers) throughout the American West. The temperature data and scenarios are available in user-friendly digital formats through the project website.



KEY POINTS

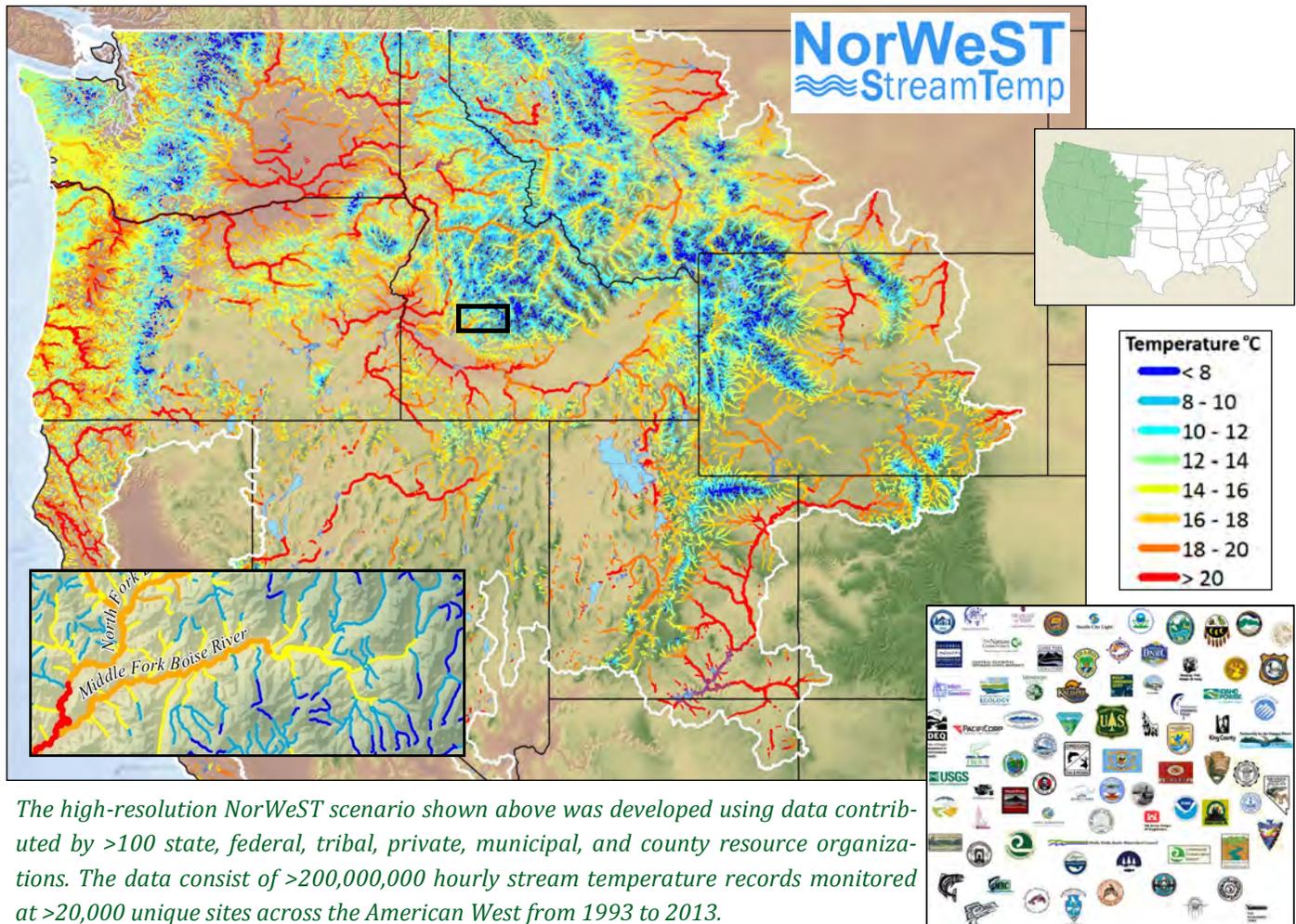


- The NorWeST stream temperature database is the world's largest and was developed by contributions from >100 state, federal, tribal, private, municipal, and county resource agencies across the American West.
- The data contained in NorWeST would require \$10,000,000 to replicate, but the information these data yield for decision making and prioritizing future investments has much greater value.
- Stream temperature data and high-resolution climate scenarios are available in user-friendly digital formats through the [NorWeST](#) website.



Locations of stream temperature data contributed to the NorWeST database for a portion of the American West.

THE NORWEST INTERAGENCY STREAM TEMPERATURE DATABASE AND CLIMATE SCENARIOS



The high-resolution NorWeST scenario shown above was developed using data contributed by >100 state, federal, tribal, private, municipal, and county resource organizations. The data consist of >200,000,000 hourly stream temperature records monitored at >20,000 unique sites across the American West from 1993 to 2013.

SIGNIFICANCE

The NorWeST project has transformed stream temperature monitoring and research across the western U.S. by providing access to a comprehensive set of high-quality data products. Monitoring efforts are now efficiently coordinated among all agencies, new research on the thermal ecology of stream organisms is accelerating, and management and regulatory agencies routinely use NorWeST information for species conservation, management, and policy development. Because the data to develop NorWeST were collected by working professionals, the information is also rapidly adopted by those same professionals at the grassroots level.

KEY REFERENCES

Original Grant Proposal

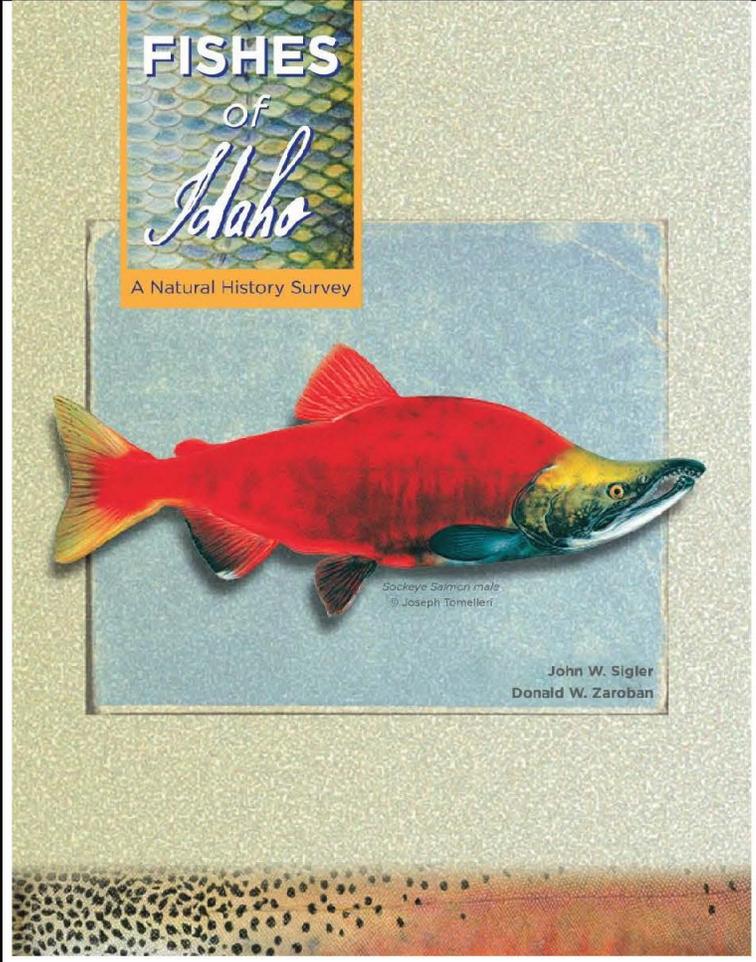
- Isaak, D.J., S.J. Wenger, E.E. Peterson, J. M. Ver Hoef, S. Hostetler, C.H. Luce, J.B. Dunham, J. Kershner, B.B. Roper, D. Nagel, D. Horan, G. Chandler, S. Parkes, and S. Wollrab. 2011. NorWeST: An interagency stream temperature database and model for the Northwest United States. U.S. Fish and Wildlife Service, Great Northern and North Pacific Landscape Conservation Cooperative grants.

Stream Temperature Model

- Isaak, D.J., C.H. Luce, B.E. Rieman, D.E. Nagel, E.E. Peterson, D.L. Horan, S. Parkes, G. Chandler. 2010. Effects of climate change and wildfire on stream temperatures and salmonid thermal habitat in a mountain river network. *Ecological Applications* **20**: 1350-1371.

MORE INFORMATION

Temperature data and stream climate scenarios are available for download at the NorWeST website (www.fs.fed.us/rm/boise/AWAE/projects/NorWeST.html). For more information, please contact **Dan Isaak**, USFS Fish Research Scientist, (208) 373-4385 or disaak@fs.fed.us.

	<p style="text-align: center;">Contents</p> <p>FOREWORD – Cecil Andrus ACKNOWLEDGEMENTS INTRODUCTION CHAPTER 1 An Overview-Idaho Fisheries Management CHAPTER 2 Ichthyology 101—A Guide to the Study of Fish In Idaho CHAPTER 3 Biogeography of the Native Fish Fauna of Idaho CHAPTER 4 IDAHO’S AQUATIC GEMS CHAPTER 5 Illustrated Key - Gerald R. Smith CHAPTER 6 PETROMYZONIFORMES CHAPTER 7 ACIPENSERIFORMES CHAPTER 8 CLUPEIFORMES CHAPTER 9 CYPRINIFORMES CHAPTER 10 SILURIFORMES CHAPTER 11 OSMERIFORMES CHAPTER 12 SALMONIFORMES CHAPTER 13 ESCOPIFORMES CHAPTER 14 PERCOPSIFORMES CHAPTER 15 GADIFORMES CHAPTER 16 CYPRINODONTIFORMES CHAPTER 17 SCORPAENIFORMES CHAPTER 18 PERCIFORMES GLOSSARY LITERATURE CITED SUPPLEMENTAL REFERENCES INDEX</p>
<p>John W. Sigler received his Bachelor of Science and Master of Science from Utah State University in 1969 and 1972, respectively, from what was then the Wildlife Resources Department. He received his Ph.D. in Fisheries Biology and Management from the University of Idaho in 1980. From 1980 until 2006 John worked for a variety of consulting firms in the western United States and retired from the City of Pocatello, Idaho as the Senior Environmental Coordinator in 2012.</p> <p>Donald W. Zaroban received his Bachelor of Science and Master of Science from the University of Nebraska-Lincoln in 1974 and 1987 respectively. He received his Ph.D. from the University of Idaho in 2011. He is currently the Curator of Fishes at the Orma J. Smith Museum of Natural History located at The College of Idaho and is a fish biologist with the Idaho Department of Environmental Quality in Boise.</p>	<p style="text-align: center;">105 Full Color Illustrations by Joe Tomelleri and 65 Scientific Drawings by Emily Damstra</p>
<p><i>Fishes of Idaho: A Natural History Survey</i> will be available for purchase in Spring 2018. By the end of January, 2018 there will be a web link available from caxtonpress.com. This link will include prepublication ordering information and a discount for preorders. The authors thank all of the contributors, both technical and financial, who facilitated the completion of this project.</p>	

C. Jeff Cederholm Scholarship Application

I, _____ have read and understand the conditions of the C. Jeff Cederholm Scholarship explained in the Application Description. I affirm that I plan to apply this award to a degree pursuit in fisheries, aquatic sciences, or related fields at an accredited college or university. I give permission to officials of my institution to release transcripts of my academic record and other information requested for consideration. I understand that this application will be available only to qualified people who need to see it in the course of their duties. I waive the right to access letters of recommendation written on my behalf. If selected as a scholarship recipient, I agree to attend a Chapter, Division, or Parent Society meeting of the American Fisheries Society to accept the award or present the progress or finding of the studies. I affirm that all of this application is my own work and the information contained herein is true and accurate to the best of my knowledge and belief.

Date

Signature

Legal name in full

(Print/Type)

Last Name

First Name

M.I.

Permanent residence

Number, Street, and Apartment Number

City

State

ZIP

Your address at school

(if different)

Number, Street, and Apartment Number

City (if studying abroad, add country)

State

ZIP

Home telephone ()

School telephone ()

(if different)

E-mail address

(Check one) I am a U.S. citizen U.S. national Resident alien expecting citizenship by the date of award

Canadian citizen

Name of institution attending

Current cumulative GPA

Your undergraduate major(s)

Number of college credits earned to date

Total number of credits required for graduation

Expected date to receive the degree

Degree you will receive

Graduate degree(s) sought

Concentration(s)

Graduate Student Awards General Scoring Criteria:

The scholarship application scoring system uses a 9-point scale for overall impact scores and scores for individual review criteria. Rating categories include: Significance, Investigator Profile, Innovation, Approach, Application to Environment. General narratives provide below should attempt to reflect these categories.

Research project or course of study should have a sustained, powerful influence on the research field(s) involved, but may be defined differently for different types of applications. An application does not need to be strong in all categories to be judged likely to have major impact, e.g., a projected course of study that by its nature is not innovative may be essential to advance a field.

5. List publications or special recognitions you have received. List in descending order of significance.

6. What do you hope to do and what position do you hope to have upon completing your studies?

7. What additional personal information do you wish to share with the Scholarship Committee?

Include 2 letters of recommendation, one from Academia and the other from a professional, personal, or community entity. E-mail a pdf version of the scholarship application to: WA-BC chapter AFS, past president, Alix Silver (Blake) alix.blake@spokanetribe.com, or mail to WA-BC AFS, P.O. Box 9322, Spokane, WA 99209. Email submission preferred.