



PRESIDENT'S NOTES:

Steve Nelson, RH2, AWRA-WA Section President

November for me is Fall, as in leaf fall. I have spent the last month raking, pruning and cleaning gutters from the trees that surround my house. Wet, cool, and dark, are the weather forecasts for the next...several months. So that means it's time to reflect on the events of 2017 and consider 2018, just a few weeks away. I have had the privilege of working with the AWRA-WA as the Board president and with my time in the yard, found myself appreciating the work of our organization and members. We have repeated our program of activities this year, much as we have in previous years relying upon our members, committees, volunteers and Board to participate and organize around a shared interest in water resources. I will go through some of the themes and memories for 2017.

Our Annual State Conference, The 100 Year Anniversary of the Washington Water Code: Where We Came From and Where We're Going, held at the Mountaineers in Seattle, was a reflection on the past 100 years and more of Washington Water Law, and a forecast of potential conditions and challenges the Washington Water Law will likely address. The conference program and coordination benefited from participation with Washington State Department of Ecology staff and from a strong committee led by John Chandler and Tyson Carlson. The conference had nearly 200 attendees, a continuation of the trend from previous conferences.

We hosted seven dinner meetings this year with plans for one more in December, and two student mixer and networking events. These meetings are the heart of our organization to draw members, students and the public together for presentations and discussions of diverse topics of interest in water resources. Terry Smith and Patrick Vandenberg led the planning duties to bring speakers related to the Nooksack River restoration, Kittitas County water resource management, water infrastructure, and stormwater management.

You are reading the final newsletter for the year, which focusses on the highlights from the annual conference and presents candidates for the 2018 Board. Previous issues complemented our dinner meetings with summaries and presented additional topics of interest from our members. Thanks to Erin Thatcher, Jenny Saltonstall, and Allison MacEwan for sharing the newsletter editor

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duties. We look forward to some new submissions for next year. Share your experience and insights with the members in a newsletter article in 2018.

The AWRA-WA honors good work by professional and students in the water resource community. At the annual conference, we celebrated and awarded our recognition for outstanding service to Rachel Pachal Osborne for her work in environmental policy and protection in Washington State. Read more about Rachel later in this newsletter. We awarded two \$2,000 fellowships to UW graduate students, Justin Pflug and Shahryar Ahmed. Applications for student fellowships in 2018 are due in February. See the AWRA-WA website for details.

Student participation is a core function of AWRA-WA. Sponsorship funds and member dues subsidize student attendance at our dinner meetings and annual conference, supports student mixer and networking events, and student fellowships. We are resuming a mentorship program for professionals and students in 2018. All this to encourage and support the next generation of professionals to improve and protect Washington water.

We are ready for a new slate of Board members in 2018, and AWRA-WA members will receive an email containing a secure link to cast a vote for the new Board. Find details on the Board elections later in this newsletter. We have biographies and photos of nominated candidates for the 2018 Board in this newsletter and on our website.

It has been my honor to serve as AWRA-WA President in 2017. I look forward to working with you all as AWRA-WA's Past President in 2018 as we continue to support the mission of this organization: promoting the advancement of water resources management in Washington and the PNW.

SAVE THE DATE: WA-AWRA DECEMBER 19TH DINNER MEETING AND ANNUAL CHAPTER MEETING

Join us December 19th for the last dinner meeting of the year, to be held at held at the Naked City Brewery in Seattle. We will have interesting speakers and the 2018 Board election results will be announced. Additional details will be posted at <http://waawra.org> soon.

*December 19, 2017, 5:30 to 8:00 pm
Naked City Brewery and TapHouse
8564 Greenwood Ave North
Seattle, WA*

SUMMARY OF AWRA-WA'S ANNUAL CONFERENCE: 100 YEAR ANNIVERSARY OF THE WASHINGTON WATER CODE: WHERE WE CAME FROM & WHERE WE'RE GOING

By Jason McCormick, Tom Ring, Tom FitzHugh, Dave Christensen, Kathleen Moore and Patrick Vandenberg

AWRA-WA's Annual Conference, 100 Year Anniversary of the Washington Water Code: Where We Came From & Where We're Going, was held on October 3 at The Mountaineers in Seattle. The conference was co-chaired by John Chandler and Tyson Carlson, and had record attendance with 190 attendees. This summary is an overview of the topics covered at the conference. Links to the conference program can be found at: <https://waawra.wildapricot.org/event-2504575>

Keynote Address

This year our conference featured a distinguished keynote address from Professor Charles Wilkinson. Some of you might recognize Professor Wilkinson from his books, titled *The Eagle Bird: Mapping a New West*, *Crossing the Next Meridian: Land, Water, and the Future of the West*, and *Blood Struggle: The Rise of Modern Indian Nation*. When Professor Wilkinson isn't offering keynote addresses or writing books and scholarly articles, he teaches law classes at the University of Colorado Boulder School of Law.

Professor Wilkinson's keynote address took attendees on a journey through local, regional, and national historical events from the Homestead Act in 1862 to Present. Most notably, Professor Wilkinson drew connections



between significant water resources law and policy changes and major population booms in the west. He also discussed case law that was in his view "radical", that is, cases that were decided in their time and context as radical departures from the law. These radical cases, including *Postema*, *Swinomish*, *Foster*, and *Hirst*, in his view are setting a different course for water law in the state.

He correctly noted that Washington State population has swelled from 1.2 million in 1917 to 7.2 million in 2017, a 600% population increase. Under this population increase, the state and its people have formed water law and policy to protect prior appropriation while meeting new demands and protecting environmental values. He felt at ease with the fact that Washington has sufficient amounts of water to meet future demands both out of stream and instream.

Prof. Wilkinson left the audience on an optimistic note, remarking that "the law doesn't come from the top down, it

comes from the bottom up." He further clarified that in his view, "the law is dynamic," and it is meant to adapt to change. Lastly, he quoted Billy Frank, Jr., Nisqually Tribal Leader, stating "today is a good day, see the mountains." To view a complete list of Prof. Wilkinson's work, go to: <https://lawweb.colorado.edu/profiles/profile.jsp?id=65>

SESSION 1: Early Water Code History

The first session provided a historical overview before and after the adoption of the Washington State Water Code. The session was moderated by Andy Dunn, RH2 Engineering. Tom Ring, hydrogeologist for the Yakama Nation gave a talk titled "Time Immemorial to 1917" describing the history of water use predating the water code. He described early irrigation in central Washington beginning with Yakama people followed by early settlers. By 1900, the Yakima River had been dewatered, after which the Bureau of Reclamation developed the Yakima Reclamation Project, which developed reservoirs and new acreage and fully appropriated the basin for the second time, all before the state adopted a comprehensive water code. The talk also described the depletion and in some cases local extinctions of the once great salmon runs in the Yakima Basin.

Tom MacDonald, former Assistant Attorney General and member of the Pollution Control Hearings Board spoke on "The Codification of Water Law in Washington." He began by filling in the blanks in the legal framework of the early development described in the previous talk. There was water law in Washington before the 1917 water code, some of which predates statehood. Tom detailed the evolution from common law and riparian doctrine to the adoption of prior appropriation, and eventually the codification into the comprehensive water code of 1917 and subsequent modifications.

SESSION 2: Contemporary Water Code History

Session 2 focused on the contemporary water code, with three former and current Washington State Department of Ecology presenters: Ken Slattery, retired former Program Manager; Jim Pacheco, instream flow biologist; and Bob Barwin, retired former Central Office Regional Manager. The session was moderated by Dave Christensen, Department of Ecology Program Development Section Manager.

Ken Slattery was first to present, as he started his talk by discussing the importance of the Minimum Flow Act of 1969 and Water Resources Act of 1971. These statutes were adopted at a time that environmental protection was front and center in the legislature's thinking. These laws ensured that instream flow protection would have equal footing as other appropriations of water through the adoption of rules for each water resource inventory area

Conference Review Continued...

(WRIA) in the state. The Water Resources Act also included provisions for planning that included public engagement. Mr. Slattery discussed how in implementing the Water Resources Act of 1971 began with the adoption of the Sammamish-Cedar WRIA 8 rule in 1971. A total of 19 rules were adopted prior to 1986 before a moratorium on new rulemaking ensued up to the year 2000. During that time, the legislature created a joint select committee and the state signed the Chelan Agreement.

Mr. Slattery discussed other key laws that affected water resource management, including the Growth Management Act, Watershed Planning Act, Water Conservancy Boards, Municipal Water Law, Trust Water and Columbia Basin Water Supply. Mr. Slattery touched on some key court cases and summarized recent water laws as providing flexibility, protecting instream flows and authorizing more local involvement and input into decision making.

Jim Pacheco presented next, with a focus on the technical methodology for how instream flow protection occurs in Washington. Mr. Pacheco started with the methods used for the instream flow rules used in the 1970s. In those early rules, flows were based primarily on exceedance curves. Beginning in the late 1970s, Ecology began using other methods including the Toe Width Method, PHABSIM and Instream Flow Incremental Methodology (IFIM). The Toe Width Method is a fast way to estimate preferred flows based on the flows needed to fill the stream channel to the toe of the channel. IFIM is a five-part process that relies on a computer model, such as PHABSIM, to evaluate the preferred flows for different fish species at different life stages, modified based on the occurrence of the modeled flows. Mr. Pacheco then talked about where things stood today and what scientific challenges and areas he saw to focus on going forward, which included improvements to Toe Width and statistical validation of preference curves.

The last speaker in this session was Bob Barwin. Mr. Barwin's

focus for his talk was managing water over the past 40 years in the era focused on water reallocation instead of allocating new water



supplies. He started by discussing adjudications in the state. The most notable adjudications include the Yakima, Walla Walla and Dungeness River basins. He discussed the role in the water right claims registration process that changed water users' perceptions about water supplies, and also that conditions on water rights to protect instream flows were enforced as GIS tools were developed and enhanced. With the remainder of his talk, Mr. Barwin focused on acquisition and Trust Water. Un-

der the Trust Water Right Program, the department leases, contracts or purchases water rights. To date, Washington has acquired over 100,000 acre feet of water to boost stream flows. The Trust program is also the foundation for water banking, which has been used to offset new impacts to protect senior water rights, including instream flows, and is a key element of the Columbia River water supply program, established in 2006.

SESSION 3: Defining Future Risks

For Session 3, moderated by Steve Hirschey of King County, three speakers provided their perspectives on some of the technical, legal, and social issues that will affect future water management and the need for collaboration and adaptability.

First, Jennifer Adam, Associate Professor at Washington State University and Associate Director at the State of Washington Water Research Center, presented results from the Columbia River Basin 2016 Long-Term Water Supply and Demand Forecast. The purpose of the forecast is to improve understanding of where additional water supply is most critically needed, now and in the future. The modeling approach to construct the forecasts consisted of (1) biophysical modeling of water supply and irrigation demand, (2) economic modeling of the future crop mix, and (3) estimates of municipal and hydropower demand. Climate change was incorporated by simulating five future climate scenarios for two levels of future greenhouse gas increase. Results projecting to the 2030s were that annual water supply will increase by 10% but with a significant shift in seasonality, with decreasing supply in the summer and increasing supply throughout the rest of the year. The shift is due to reduction in snowpack due to the effects of climate change. Irrigation water demands were projected to decrease by <10%, also with a shift in seasonality (decrease in summer and increase through the rest of the year). The overall decrease is due to shorter irrigation seasons, higher water-use efficiencies for plants due to more CO₂, and an economic shift towards more water-efficient crops. Looking at the balance between supply and total water needs, with includes both water demands and instream flow requirements, there is lack of water in the summer. In the Columbia River basin curtailments are projected throughout the summer based on both historical and climate change hydrology. In the Yakima River basin the proration ratio (percent of the water right allowed for irrigation season) is projected to decline through 2075, declining to as low as 50% depending on the climate scenario. The take-away message from the presentation is that climate change will have significant effects on water supply availability, which has implications for water rights and management across the Columbia basin.

Peter Dykstra, attorney with Plauche & Carr LLP, spoke next and discussed how the legal perspective on water availability and reliability has evolved in Washington. Over the years there has been an expansion of responsibility for evaluating availability, and changes in the information that must be reviewed to establish availability. Prior to 1917, legal availability decisions were made by the courts based on priority date, beneficial use, and effects on other

Conference Review Continued...

users. But by 1917 this became untenable, as most streams were over-appropriated, so a system was established that gave Ecology and its predecessor agencies the responsibility to evaluate availability for surface water. In 1945 the same was done for groundwater (except for permit-exempt wells). The recent Hirst decision gave counties additional responsibility to assessing groundwater availability. There has also been an increasing emphasis on instream flows over the last 30-40 years, which has changed how availability is analyzed. Peter then discussed the Trust Water Rights program and the role of water markets. The Trust Water Rights program has allowed for transfer of existing water rights to instream flows, which achieves greater legal certainty for flow rules by keeping the more senior priority date of the original water right. The program has also led to development of water banks, which brings the market into the equation and allows for transfer of water from irrigation to domestic or urban water use. Peter concluded by emphasizing that using markets in this way creates a pathway to address the question of legal availability, but there are challenges that need to be addressed to make this method more effective. There is a need to streamline the adjudication process and the priority system so that transfers can be accomplished more efficiently. In addition, limited budgets affect the ability of Ecology and the counties to process the water rights and acquire rights for instream flows.

Finally, Rachael Paschal Osborn, attorney at law, discussed the public interest and the future of water law in Washington State. She began by describing the basis for the concept of public interest in Washington water law. Public interest was first mentioned in the state constitution, which asserted state ownership of water and established the public trust doctrine. The 1917 surface water code states in several places that all waters in the state belong to the public. The public interest and its importance are also discussed in the state groundwater code, the Minimum Flows and Water Levels Act of 1967, the Water Resources Act of 1971, and Watershed Planning Act of 1998. The meaning of the public interest and what constitute detriments to the public interest have also been established in numerous court cases throughout the years. In emphasizing the importance of the public interest, she described how many recent water rights decisions have been issued in the public interest, including rights for instream flows and hatcheries. Rachael concluded by recommending that we re-evaluate the use of public interest as a basis to rethink how we are managing water resources in Washington. We need to consider



how circumstances have changed from the time when the water code was established. The most serious problem confronting us now is climate change, so the water law must adapt to these changing conditions. Rachael argued that in the face of this challenge, it is the public interest that will cause us to rethink whether priority and “use it or lose it” are necessarily absolute standards by which we must judge allocation of water in the state. She also recommended that because of the junior nature of instream flow rules and the fact that one half of the state does not have such rules, public interest and the public trust doctrine should be used as a basis to revisit protection and restoration of instream flows. Finally, she emphasized the need to elevate the priority of tribal water rights because these are an essential part of the public interest.

SESSION 4: Identifying Possible Solutions

Session 4 explored an array of potential solutions to the water resource challenges identified in session 3. The session was moderated by Tyson Carlson, Aspect Consulting. The first three presentations examined alternate approaches for overcoming water management issues, while the fourth presentation provided a relevant case study. Although each speaker highlighted a strategy, a key conclusion from the session was the complementarity of methods and the value of a multi-faceted approach.

The first presentation was given by Lynette de Silva, the director of the Program in Water Conflict Management and Transformation at Oregon State University. Ms. de Silva discussed the use of dispute resolution practices to foster sustainable and efficient water resources management. This approach focuses on improving relationships among stakeholders and includes creative tools to build trust, skills, consensus, and capacity, while balancing physical, emotional, intellectual, and spiritual needs. The tools presented by Ms. de Silva include the use of stories to promote empathy, the practice of active listening, the use of “situation maps” to elucidate stakeholder perspectives and interactions, and the use of games to switch roles among stakeholders.

The second speaker was Alan Reichman, the Senior Counsel in the Ecology Division of the Washington State Attorney General’s Office. Mr. Reichman spoke about the importance of having legal certainty on the validity and extent of water rights for finding solutions to water resources management issues. Mr. Reichman discussed the Acquavella adjudication of surface water rights in the Yakima River Basin. While this adjudication was costly, it benefitted the basin by providing clarity for water delivery expectations during times of shortage, establishing water banks, and facilitating a market for water rights. Mr. Reichman concluded his talk with a discussion of other methods for resolving water rights disputes in Washington. These included increasing the efficiency of the adjudications process, expanding the role of mediation, creating a state water court system, and creating a “compact commission” charged with negotiating settlements on claims for federal and tribal reserved water rights.

The third presenter was Ryan Brownlee, an Associate Water Resources Engineer with Aspect Consulting.

Conference Review Continued...

Mr. Brownlee discussed the use of water storage projects to address water supply challenges that result from a seasonal mismatch between peak water supply and demand. As Ms. Adam presented in session 3, this seasonal mismatch may worsen as peak streamflow shifts earlier in the water year with climate change. Mr. Brownlee presented a variety of storage solutions ranging in size from small (<10 acre-feet) to large (>10,000 acre-feet). These included on-farm facilities, mitigation reservoirs (both new and re-operated reservoirs), aquifer storage and recovery projects, and storage retrofit projects.

The final presentation was given by Lisa Pelly, the Director of Trout Unlimited's Washington Water Project. Ms. Pelly provided an overview of the Methow Valley Irrigation District (MVID) Project. The MVID has a long history of water dispute. The MVID canal system was constructed in 1905. The first adjudication in the valley occurred in the early 1920's. By 2002 litigation related to endangered fish species and waste orders issued by Ecology had reduced diversion rates to 8% of the original water right claims. The reduction in diversion rates coupled with high seepage losses resulted in MVID being unable to deliver water to all shareholders. The MVID Project brought together key stakeholders, including the Department of Ecology's Columbia River Program, Bureau of Reclamation, MVID, and Trout Unlimited to resolve the water issues. The successful collaboration resulted in an agreement which will upgrade district infrastructure, increase water use efficiency, provide water for the City of Twisp, and enhance instream flows for endangered fish. Ms. Pelly noted the importance of mediation in achieving this resolution.

SESSION 5: Future Direction and Legislative Change

Session 5, the final session of the day, was structured as a question-and-answer session for a panel of experts. This panel had four esteemed guests: Jaime A. Pinkham, a citizen of the Nez Perce tribe and Executive Director of the Columbia River Inter-Tribal Fish Commission; Scott Revell, manager of the Roza Irrigation District in the Yakima Valley; Derek Stanford, Washington State Representative and statistical consultant; and Charles Wilkinson, Distinguished Professor and Moses Laskey Professor of Law at the University of Colorado School of Law and conference keynote speaker. The session was moderated by Adam Gravely, who practices water law and policy at Van Ness Feldman.

The first question, posed by Mr. Gravely, asked what is and is not working about the water code and what are some notable examples. Rep. Stanford responded first, alleging that efforts to protect senior water rights, implementation of existing laws, and updating the rules are all categories in which the code is currently falling behind. Mr. Pinkham cited the Snake River Basin adjudication, which had forced prioritization and compromise and resulted in giving up some important priorities to find a negotiable solution. He added that shifting environments at all levels of government made negotiations a more dynamic and difficult process. Mr. Revell's response focused on the flexible approach strategy needed to respond to drought years. He also brought up that the Ya-

kima Basin Integrated Plan should include more reservoir storage to increase resiliency to the effects of climate change, and expressed optimism that the system of water transfers are beginning to gain traction in his district. Prof. Wilkinson gave some prescriptive insight, saying that the code will need to adjust to confront climate change, seek to incentivize and increase conservancy, and introduce a fee structure to account for inherited water rights.



The second question asked the panelist what changes should be made to the code to adequately prepare for the future. Rep. Stanford gave a number of suggestions: mount a challenge to the Hirst decision, empower local planning and encourage grassroots solutions, seek to be more proactive when issuing drought declarations, and use state-level policy and planning to push the market toward resiliency to climate change. Mr. Pinkham noted that resiliency to climate change and other variables is needed in our energy portfolio and emphasized the power of a financial bottom-line that accurately considers the benefits realized by preserving and bolstering positive ecosystem functions. Mr. Revell agreed with the previous two panelists, adding that increased conservancy is still an underused source of potential water savings. Prof. Wilkinson talked about our own responsibility as water resource professionals to leverage our community's cohesion to provide an example to the public and drive positive change. He reminded us to remain hopeful and ambitious in the face of adversity.

Next, Mr. Gravely asked whether the state legislature should focus more on substance or process. Mr. Revell insisted that substance is significantly more important. Rep. Stanford and Dr. Wilkinson rebutted that both are important. Rep. Stanford emphasized that respect for all stakeholders is truly the most important consideration, and Prof. Wilkinson reminded us that the situation will generally dictate what percentage of each should take precedent. Mr. Gravely also asked whether we can minimize risk through legislation, or if that is unreasonable. Rep. Stanford was optimistic that risk can be minimized, and that more preparedness is the best course of action in the face of higher uncertainty. He also talked of the importance of trust in the legislature to coordinate preparedness efforts. Mr. Pinkham added that trust goes both ways, and that the legislature must also trust its constituents to design a preparedness plan that best suits their specific needs.

Conference Review Continued...

The first question from the audience asked whether there is a legislative solution to the Hirst decision. Rep. Stanford said that the response should stem from regional solutions. He advocated for allowing development while still mitigating the effects of decreased water availability. Prof. Wilkinson added that permit wells specifically are not an effective long-term solution to the decrease in water availability.

The last question from the audience sought to gain insight on how the market for water can improve. Mr. Revell insisted that it should be more adaptable to local needs. Rep. Stanford emphasized that the state government should work with the market and seek to provide the best information to it to help it succeed and better serve its users.

Section Business

Steve Nelson, State Section President, summarized Section accomplishments during the year. Stan Miller and Tom Ring then presented the Section’s annual Award for Outstanding Contribution to Washington’s Water Resources to Rachael Pascal Osborn in recognition of her long career promoting and defending the public interest in the state’s water resources. Rachael Osborn is a public interest water lawyer and has provided representation to Indian tribes, environmental organizations, labor unions, and small communities since 1992. It is appropriate to give Rachael the award in this year, the centennial of the Water Code, given her life’s work in bringing meaning to the public interest prong of the code.



Photo: Full house at the Seattle Mountaineer’s Conference Room



Photo: John Chandler, PSE, and Chair of the 2017 Annual Conference

THANK YOU TO OUR 2017 BASIN SPONSORS!



AWRA – WASHINGTON SECTION ANNUAL MEETING

The AWRA Washington Section will convene its annual meeting and conduct elections for the 2018 Board of Directors. Our elections process will be electronically administered. Each AWRA-WA member in good standing will be sent a link to a secure ballot and can vote for up to 15 individuals for the 2018 Board, with the option to add write-in candidate(s). Biographies of those nominated for the 2018 Board Candidate Slate are presented on the following pages for review. Election results will be announced at the December 19th, 2017 Chapter meeting to be held at the Naked City Brewery in Seattle, 8564 Greenwood Ave North.

The Board of Directors consists of up to fifteen directors, plus the past president. All members are welcome to attend the annual meeting and to nominate other candidates. Board members are expected to actively participate and support the following activities: attending monthly board meetings, refining section policies, running dinner meetings, organizing the annual conference, securing articles for newsletters, supporting the student chapter and establishing new student chapters, and other activities.

The 2017 Board of Directors presents the below candidates for the 2018 Board:

Rabia Ahmed	Amanda Cronin	Jason McCormick	Jennifer Saltonstall
Tyson Carlson	Tom FitzHugh	Stan Miller	Terry Smith
John Chandler	Felix Kristanovich	Steve Nelson	Stephen Thomas
Dave Christensen	Greg McLaughlin	Tom Ring	Patrick Vandenberg

CANDIDATE BIO'S



Rabia Ahmed - Rabia is an economist currently working with Maul Foster & Alongi in Seattle, and is a Board Member of the AWRA-Washington Section. She has over 14 years of experience in water and natural resource economics, policy and regulatory economics, litigation support, and international development. Prior to joining Maul Foster & Alongi in 2017, she worked with Ram-boll Environ and Cardno ENTRIX for about 11 years. Rabia's primary expertise in the water sector includes studying water laws and water markets, assessing and valuing surface and ground-water rights in that context, conducting assessment of water rights, carrying out water supply security analyses, supporting the water rights applications process, and conducting cost-benefit and feasibility analyses of water projects. She has carried out a number of water management projects in more than twenty-five US States and internationally. She also has many years of experience in the international development sector, and worked directly with communities in some of the remotest areas of Pakistan and Bangladesh. Rabia has an MS degree in Economics from Portland State University. She lives in Lynnwood, Washington, with her husband, two children, and a beautiful cockatoo. In her spare time, she likes hiking and sailing with her family.



Tyson Carlson - Tyson is an Associate Hydrogeologist with Aspect Consulting, with over 17 years of experience specializing in water resource development and water rights. Serving private and public sector clients, Tyson's water rights experience includes both new appropriations – municipal, agriculture, fish propagation, and commercial/industrial purposes – and transfer/change of existing rights, including use of the State's Trust Water Right Program for purposes of instream flow, habitat, and mitigation through water banking. Tyson's strong background in analytical and numerical groundwater modeling is often used in the development of site-specific conceptual models describing groundwater-surface water interaction, saline intrusion, well hydraulics, and aquifer sustainability. These skills are also used in Tyson's work in large-scale hydrogeologic characterization – such as regional tunnel alignments, contaminant fate and transport modeling, and construction dewatering design. Tyson has a BS in Soil, Water, and Environmental Science and a MS in Hydrology from The University of Arizona. Outside of the office, he can be found skiing the deepest of Cascade powder, on his bike, or fly fishing his favorite waters.



John Chandler - John is a licensed professional engineer who currently serves as the water resources technical lead at Puget Sound Energy. He is the water manager of the Baker Project, a two reservoir system with three powerhouses, and combined capacity of 200 MW. John also supports operational compliance, dam safety, FERC license implantation, and marketing. He received an M.S. focused in water resources and environmental engineering from the University of Maine at Orono in 2008. When he's not working John enjoys multiple types of partner dances, ultimate frisbee, and playing card games.

Bio's Continued...

Dave Christensen - Dave Christensen has over 20 years of experience working in water resource management, environmental health and environmental protection. He has worked as a consultant, for local and state governmental agencies, and non-profit organizations. For the last three years, Dave has been the Program Development Section Manager for the Washington State Department of Ecology Water Resources Program. He leads a team that develops State rules and policies, evaluates legislative proposals, and collaborates with water resources interests to address current conflicts and challenges. Dave holds a B.S. degree from the University of Washington in Fisheries Biology and an M.S. in Limnology and Oceanography from the University of Wisconsin. When not working, he tries to spend most of his time outdoors, mostly chasing salmon and halibut out in the ocean or on the Salish Sea, but also enjoys wandering through the woods with his wife and two teenage girls.



Amanda Cronin, is a Manager at AMP Insights. Amanda is a Washington State native with over thirteen years of professional experience in water rights, water transactions, stream restoration and conservation program design and implementation. At AMP Insights, Amanda specializes in water resource policy and planning, water transactions and water banking and works in WA, CA, AZ and WY. Before joining AMP Insights, Amanda was a Project Manager at the Washington Water Trust for 11 years and a Watershed Program Coordinator at the Idaho-based Palouse-Clearwater Environmental Institute for 2 years. At the Washington Water Trust, Amanda worked across Washington State to develop and implement water right acquisitions for environmental flow restoration and groundwater mitigation and she also led the development of the Walla Walla and the Dungeness Water Exchanges for the Water Trust. Amanda holds a B.A. from Whitman College and an M.S. in Environmental Science and Policy from Northern Arizona University. Amanda lives in Seattle, WA with her husband and two children. Amanda enjoys spending time outside; backpacking, mountaineering, cross country skiing, gardening and playing ultimate frisbee.



Tom FitzHugh - Tom FitzHugh is a Water Resources Scientist with Stantec Consulting, in Bellevue, Washington. He specializes in hydrologic modeling of surface water systems, including reservoir and water supply system operations, riverine and reservoir temperatures, and rainfall-runoff processes. His current work is primarily in California, analyzing water supply operations for water agencies and other clients in the Central Valley. Prior to joining Stantec in 2015, he worked for the Bureau of Reclamation in Sacramento, California for 5 years, where he conducted modeling for long-term planning studies such as the Shasta Lake Enlargement study and analysis of new environmental flow standards in the San Joaquin River Basin. From 1999-2009 he worked for The Nature Conservancy in Chicago and Olympia, where his responsibilities were regional conservation planning, analysis of environmental flows, scientific software development and training, and GIS. He has an M.S. in GIS and Remote Sensing from the University of Wisconsin-Madison, and a B.A. in Political Science from Lawrence University. In his spare time he enjoys hiking, learning and practicing his Spanish, and following the Seattle professional soccer teams, the Sounders and the Reign.



Felix Kristanovich - Felix is a senior water resources manager with Ramboll in Seattle, Washington. He has 25 years of professional experience in the United States and abroad where he has worked on numerous watershed analysis and streamflow restoration projects, water quality monitoring programs, environmental impact studies, hydrologic field investigations, floodplain analysis, and design and modeling of storm water systems. Felix has been actively involved in several professional societies, including AWRA, where he has served on the Board for the last five years as Secretary, Treasurer, and 2010 Board President. Felix organized technical field trips during the 2005 and 2009 AWRA National Conference in Seattle, and was the co-organizer of several National AWRA conferences. Felix volunteers his time on Whidbey Island where he spearheaded numerous watershed restoration projects. Felix and his wife June enjoy backpacking, hiking, and telemark skiing with their two fantastic dogs Storm and Bear here in the Washington Mountains, and sea kayaking around Puget Sound and in Alaska. Felix and June also enjoy landscape photography and are season ticket holders to the Seattle Opera.

Bio's Continued...

Greg McLaughlin - Greg is a project manager with Washington Water Trust, where he has worked since 2006, opening the Ellensburg Field Office in 2008. His instream flow and water resource management projects have culminated in 65 cfs and 9,000 acre-feet of annual flow to fish-critical tributaries throughout Washington State. His work includes water right reviews, connecting project benefits to salmon recovery plan, and shepherding those projects through the Ecology review process. He is a frequent presenter statewide on water rights valuation and transactions, trust water, and water law. Greg has worked since 1997 on collaborative resource management projects from his hometown in rural Missouri to the Mekong River in Thailand. He has academic degrees in Environmental Science (BA - Colorado College 1995) and Social Ecology and Community Development (MA - Yale University 2002). Greg currently lives in Lynnwood, WA, and spends his free time as a youth pastor, traveling and doing community service with his wife and four sons, enjoying the occasional craft beer, and not doing nearly enough hiking, camping, and telemark skiing.



Jason McCormick – Jason is the founder of McCormick Water Strategies (MWS) with ten years of water resources experience. Jason is recognized regionally as a water rights and water transactional expert. In 2015, Jason formed MWS after working in the private, public, and non-profit water resources sectors. His experience includes six years at Washington Water Trust (WWT) in Central Washington, specializing in water transactions, trust water, mitigation banking, representing conservation buyers, geospatial water rights evaluation, permitting, and water rights instruction. Prior to WWT, Jason worked as a permit writer for the newly formed Washington State Department of Ecology, Office of Columbia River (OCR) where he worked in water rights permitting, project planning, geospatial water resource mapping, program outreach, and coordinated initial grant solicitations. From his experience in the private sector, WWT and OCR, he excels at water rights permitting, water transactions, water rights evaluations, water resources problem solving, and water rights instruction. In addition, he draws a strong appreciation for the communities and unique local values of Eastern Washington from his local roots.



Stan Miller - Stan is semi-retired, and currently doing water resources consulting as Inland Northwest Water Resources. Prior to venturing into retirement, Stan held the position of Program Manager for Spokane County's Water Resources Section in the County Utilities Division of the Public Works Department for over 20 years. The prime focus of Water Resources is the regional aquifer protection program. In that capacity he worked toward integrating the groundwater protection efforts of all municipalities and water purveyors using the Spokane Valley-Rathdrum Prairie Aquifer. In addition to working on this program at the administrative level, Stan has developed technical information and conducted local studies on the potential impacts of storm water infiltration on ground water quality and the interaction of the Spokane River and the Spokane Valley Aquifer. Stan is a long-time member of the AWRA Board and a past president of the Chapter. Away from work, Stan enjoys canoeing, backpacking, running, and working on the restoration of a turn-of-the-century home.



Steve Nelson - Steve is a licensed hydrogeologist and engineering geologist with 25 years of experience involving water resource assessment, development, management, remediation, and protection. Steve's project experience includes characterization of groundwater systems for groundwater supply; water reuse; water rights evaluation; aquifer testing and modeling of groundwater flow, contaminant fate and transport. Steve conducts geologic investigations to evaluate foundations for water infrastructure, geologic hazards and slope stability; and designs infiltration and construction dewatering systems. Depending on the season, find Steve trail running, skiing, climbing in the Cascades or Sierra, and/or fly fishing.

Bio's Continued...

Tom Ring - Tom is a hydrogeologist with the Water Resources Program of the Yakama Nation. He has held this position since 1990 and, in that role, has worked on a variety of projects involving groundwater and surface water quantity and quality, water rights, irrigation and fisheries issues and planning for future water needs. Previously he worked for the Water Resources Program at the Washington Department of Ecology. Tom has Bachelors and Masters of Science degrees in geology from Central Washington University and Northern Arizona University respectively. He has taught geology and hydrogeology classes at Central Washington University and is a licensed geologist and hydrogeologist in Washington State. When not working, he enjoys hiking, climbing, and skiing in the mountains of the west.



Jennifer Saltonstall - Jenny is a licensed Hydrogeologist in Washington State, a Senior Associate at Associated Earth Sciences, Inc., and has consulted on Puget Sound area hydrogeology, geology, and geologic hazards assessments for both private and public sector clients since 1998. She is a leader in stormwater infiltration feasibility and practical stormwater infiltration site investigation and design, both for shallow conventional systems and deep stormwater recharge Class V UIC wells. Jenny is an expert in complex Puget Sound stratigraphy and has a fundamental understanding of subsurface "plumbing" system in our area from managing hundreds of infiltration projects from design through construction. Jenny provides senior review for geologic and hydrogeologic studies, and is a regular contributor at technical conferences and has been an invited speaker on infiltration components for "green" storm water management seminars. Outside of work, now that her kids are getting older, Jenny and family have begun backpacking again, spending time on the Olympic Coast and looking forward to the Cascades.



Terry Smith – Terry is a licensed and retired attorney with a background in environmental law. She has worked for King County's Wastewater Treatment Division for twelve years, where she was responsible for permit applications and negotiations with federal and state regulatory agencies. She is also well versed in water quality regulations and legislation. Prior to working with the County, Terry worked in private practice representing clients as both plaintiffs and defendants on environmental issues. Working in both the private and public sectors has given her insight into the needs and issues of regulators, businesses, and the public. She has served on the board of AWRA/WA since 2015.



Stephen Thomas - Stephen is a hydrogeologist in the Seattle office of Shannon & Wilson, Inc. He has 22 years experience as a consultant in the areas of geologic and water resources. He manages and performs technical aspects of hydrogeological investigations for groundwater resources development, wellhead protection and groundwater management, groundwater contamination and waste disposal, dewatering, and environmental projects. A native of the United Kingdom, Stephen moved to Seattle in 2001, having previously lived in Los Angeles since 1992. He holds a BSc in Geology from the University of Cardiff (Wales) and a MSc in Hydrogeology from the University of Birmingham (England), and is a licensed hydrogeologist in the states of Washington and California. Stephen has been on the Board since 2009, and has held positions of vice president and treasurer, and has chaired the dinner and sponsorship committees. Stephen enjoys many outdoors activities, particularly rugby football, cycling and open-water swimming, and annoying his neighbors with his guitar playing.



Patrick Vandenberg - Patrick, a native of Southern California, has called Seattle home for about three years now. He received his Bachelors of Science from UCLA and his Masters of Science at UW, both in Civil Engineering. He was formerly the University of Washington Student Chapter Representative to the AWRA-WA Board. Patrick currently works for King County as a hydraulic modeling engineer in the Wastewater Treatment Division. Before moving to Seattle, he worked as an environmental engineer for AECOM in Long Beach, CA. He enjoys playing ultimate Frisbee and volleyball.

REVIEW OF SEPTEMBER DINNER MEETING:

TEN YEARS OF CLEAN WATER: THE EFFECTS OF STORMWATER SOURCE CONTROLS ON SEDIMENT QUALITY IN THEA FOSS WATERWAY, TACOMA, WASHINGTON

By Patrick Vandenberg, King County WTD

The September dinner meeting for AWRA was held at Pyramid Brewery in Seattle on September 26th. The speakers, Dana de Leon and Mary Henley, gave the presentation "Ten Years of Clean Water: The Effects of Stormwater Source Controls on Sediment Quality in Thea Foss Waterway, Tacoma, Washington". The speakers are both engineers for the City of Tacoma, Environmental Services/ Science & Engineering Division and have worked extensively on this waterway rehabilitation project. The following abstract gives an overview of the project:

Under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), also referred to as Superfund, contaminated bottom sediments were remediated in the Thea Foss and Wheeler-Osgood Waterways in Tacoma, Washington under the oversight of the Environmental Protection Agency (EPA) at a cost of \$105M. Sources of Contaminants of Concern (COCs) continue to exist in the drainage basins and are conveyed to the waterways via stormwater (municipal and private), aerial deposition, marinas, and groundwater discharges.

Since stormwater is one of the potential sources, the City of Tacoma is implementing a stormwater source control program (started in 2001) to protect the quality of waterway sediments and the integrity of the cleanup. The program is supported by post-construction sediment quality monitoring; stormwater, base flow, and storm sediment monitoring; and a validated contaminant transport model of the waterway (EPA WASP model). Contaminants of concern in waterway sediments include polycyclic aromatic hydrocarbons (PAHs) and bis(2-ethylhexyl)phthalate (DEHP). These contaminants are associated with various ongoing sources including municipal stormwater, marinas, atmospheric deposition, and groundwater discharges, many of which are common or ubiquitous in modern urban environments. The WASP model predictions in Thea Foss Waterway show excellent agreement with seven years of observed post-construction sediment quality data, validating the ability of the model to link pollutant loads to sediment concentrations, and predict the effects of source control actions on waterway sediment quality.

The City's multi-pronged stormwater source control program consists of best management practices, business inspections, public education, source tracing investigations, and stormwater treatment. Over the 15 year period (August 2001-September 2016), these efforts have resulted in statistically significant reductions in suspended sediments, lead, zinc, PAHs, and DEHP, in spite of the inherently high variability of stormwater data. In recent years, the City performed basin-wide street sweeping and system-wide storm sewer cleaning in selected drainages to remove residual contaminated sediments that may continue to degrade stormwater quality. Street Sweeping and system-wide sewer cleaning resulted in statistically significant reductions in PAHs and metals. Finally, the City developed a GIS-based pollutant loading model of its urban drainages (HSPF model) to evaluate the cost-effectiveness of various treatment technologies and management practices for reducing pollutant loads in stormwater; including in-line treatment vaults, street sweeping, and low-impact development (LID). The model results identify areas and land uses that contribute disproportionately to stormwater pollution, where source control efforts are best focused, and recommendations for cost-effective source control investments.

Their presentation focused on all the technical expertise used to approach this problem, as well as the community coordination and political maneuvering needed to make it a true success.

Many thanks to Ms. de Leon and Ms. Henley for an informative and captivating presentation!

The Board of AWRA-WA seeks to provide through this newsletter a full range of views on water resource issues. Opinions expressed in this newsletter do not necessarily reflect the views of individual Board members, the section membership, or their employers.

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