

In Memoriam

Our Friend and Colleague, Dr. Robert M. Hughes



It is with profound sadness that we mark the passing of Dr. Robert M. Hughes on June 23, 2025. Dr. Hughes was a distinguished and influential figure whose work fundamentally shaped the field of aquatic science and conservation over the course of five decades. A tireless researcher, a dedicated mentor, and a respected leader, Dr. Hughes's legacy has benefited the health of rivers and streams worldwide.

Dr. Hughes earned an A.B. in Psychology and Biology from the University of Michigan in 1967, an M.Sc. in Resource Planning & Conservation in 1973 and a Ph.D. in Fisheries from Oregon

State University in 1979. His dissertation on juvenile salmonids laid the groundwork for many future contributions.

His career was a testament to his expertise and versatility. He held significant positions at key organizations, including the U.S. Environmental Protection Agency (USEPA) and Oregon State University, where he returned as a Courtesy Associate Professor and later a Senior Research Professor. His international influence was highlighted by his time as a Visiting Senior Professor at the Federal Universities of Lavras and Minas Gerais in Brazil, a role he earned through three prestigious Fulbright Scholar awards. His work at research institutions like ManTech and Dynamac, solidified his reputation as a leading aquatic ecologist.

Dr. Hughes was a pivotal force in the American Fisheries Society (AFS), serving in a multitude of leadership roles that had a lasting impact on the organization. He rose through the ranks of the Oregon Chapter AFS, serving as President from 1994 to 1995, and was instrumental in its financial stabilization and the development of its code of ethics. His leadership extended to the Western Division, where he was President from 2006 to 2007, and to the parent society, where he served as President in 2013-2014. He also served as president of the Water Quality Section and International Fisheries Section and was an active AFS past-president and stalwart of the policy committee. He was a champion of professional ethics, financial sustainability, and the modernization of the Society's communications, pioneering the use of electronic communication and webcasts to broaden the reach of scientific knowledge.

Among his most significant scientific accomplishments was his role in advancing bioassessment methods and the Index of Biological Integrity (IBI), which uses fish and other taxonomic communities to evaluate the health of aquatic ecosystems. He was a key figure in the USEPA's Environmental Monitoring and Assessment Program (EMAP) Field Surveys and was instrumental in the development of sound quantitative approaches in assessing aquatic habitat and ecological integrity. His work with the Oregon Department of Environmental Quality and the USEPA helped shape policy and criteria for water quality in the region and ultimately internationally. Dr. Hughes was a prolific author, with over 180 peer-reviewed publications and 6 edited books. He was a highly sought-after speaker, giving over 90 invited presentations at national and international conferences across the globe. In 2025 alone he had 14 papers in review by the time of his passing.

Dr. Hughes was honored with the Oregon Chapter AFS Fisheries Worker of the Year Award in 2011, the AFS Distinguished Service Award in 2013, the 2017 Oregon Chapter AFS Lifetime Achievement Award and was named an AFS Fellow in 2016. The Society for Freshwater Science

(SFS) honored him with the Environmental Stewardship Award in 2006 and he was a member of the inaugural class of SFS fellows in 2017. He was the recipient of two Fulbright Scholarships (2007, 2010) and he received numerous scientific and technological achievement awards from the USEPA throughout his career.

Dr. Hughes will be remembered as a giant in his field—a mentor who inspired countless students and colleagues, a scientist whose work provided a blueprint for environmental protection, and a leader who strengthened the professional community. His profound impact will continue to be felt by those who strive to understand and protect our planet's vital freshwater resources.

For many of us who worked with Bob as a colleague and friend, he was a beacon of principle, was measuredly optimistic for the future, and he was always willing to provide encouragement and advice when sought. Bob took pride in skiing Grand Targhee powder in the winter; kayak fishing in Canada's Georgian Bay and whitewater boating Oregon rivers; being a world traveler; and a loving husband, father, and grandparent. He was a respected soccer referee on the pitches of Corvallis and he always chose bike over car. Dr. Hughes was an institution in many ways, he will be missed by many, and will continue to influence and inspire work in fisheries.

The following remembrances were provided by colleagues and former students of Bob's:

Chris O. Yoder (Columbus, OH)

I first met Bob when I was with the Ohio EPA in 1983. Ohio was invited to participate in the Stream Regionalization Project (SRP) which was focused on Jim Omernik's early work on ecoregions and the parallel development led by Bob of using biological measures of the aquatic life goals of the Clean Water Act. Besides getting to work with Bob and his colleagues, Phil Larsen and Thom Whittier of the Western Ecology Lab at Corvallis, OR on the SRP, a lifelong friendship developed that endured until his recent passing. I was always impressed with Bob's ability to translate complex scientific principles so that others who were not ecologists could understand the promise of what was the nascent emergence of aquatic biology in CWA standards and policy that was at that time based solely on water chemistry. He was a rarity in being able to translate science to policy, something that the EPA of that day actually discouraged.

The SRP project in Ohio laid the foundation for the eventual adoption of numerical biological criteria in the Ohio water quality standards in 1990 that have endured to the present day. Bob's

original concepts about regional reference conditions first published in 1986 and his embrace of Jim Karr's Index of Biotic Integrity were the principal ingredients that are essential for developing regionally relevant biological criteria. Through the 1990s and 2000s, as Bob's attention was increasingly focused on the U.S. EPA EMAP and later NARS programs, he still managed to participate in the implementation of biological criteria and the underlying Biological Condition Gradient (BCG) first put forth by Susan Jackson and Susan Davies in 1996. As the BCG was being presented to the states by EPA, Bob was a voice of reason and wisdom in a process that was at times awash in competing and even contradictory ideas. Bob also introduced me to raft electrofishing in 1999 in Oregon, which inspired our own project to survey the non-wadeable rivers of Maine and New England. We emulated the concepts of the fish IBI for the species depauperate, cold water rivers of the Pacific Northwest that was published by Bob and his colleagues in 2003. Bob's ingenuity and rare talents were on full display with this effort as he overcame what many others had concluded was not feasible or even possible.

More recently, Bob was a trusted confidant when the first attempts to undermine CWA implementation emerged at the state level beginning in 2010 and which is still gaining momentum yet today, much of it going virtually unnoticed. We had frequent policy discussions, some of which made it into various publications during the past few years. I was always amazed at his ability to generate quality publications while achieving a high level of collaboration with his co-authors both nationally and internationally. Simply put, Bob's passing leaves a vacuum that will not be easy to fill and he will certainly be missed. While we have lost one of the truly great people in our science, we also lost a dear friend. I take comfort in knowing that we will always have his legacy and example to follow.

Rafaela Schinegger (Vienna, Austria):

I first met Bob in 2006 as a young PhD student, and his mentorship has stayed with me ever since. From him I learned not only the essentials of fish ecology and scientific rigor, but also what it means to make science matter — to root it in relevance, humility, and human connection. Bob embodied international collaboration and generosity of spirit; he guided so many of us, from all corners of the world, with wisdom, clarity, and deep kindness. His influence shaped my thinking and my path, and I carry his lessons with me in my professional but also private life. Bob's legacy lives far beyond his publications — in the people and perspectives he helped shape. I am deeply grateful to have known him.

Hossein Mostafavi (From Shahid Beheshti University, Tehran, Iran)

I met Bob when I was doing my PhD at the University of BOKU in Vienna, Austria. In addition to learning a lot of scientific issues in his class, the comments he made on my PhD thesis were very informative for me as a referee. After that, my scientific collaborations with him continued and I have published some joint articles about Iran with him. I extremely respect him as my mentor like Prof. Dr. Stefan Schmutz. In my opinion, one of his masterpieces was to bring together researchers and scientists from all over the world so that with this network he could serve in relation to protecting and saving the planet. I have learned a lot of moral and scientific things from Bob and God willing, I hope I can be worthy for the planet like him and continue his path. I wish that God blesses him and may his soul rest in eternal peace. Such people will never be forgotten and will always be in our minds and memories. Getting to know him has been one of the unforgettable honors of my life.

Mahdi BadriFariman (From Birjand University, Birjand, Iran)

I have known Dr. Prof. Robert (Bob) since 2021 through my doctoral advisor, Dr. Hossein Mostafavi. From the beginning, I found Bob to be both inspiring and compassionate. He was deeply committed to supporting and mentoring those in pursuit of knowledge and growth. His generosity and kindness transcended geographical borders and the political world. What struck me most was how someone of such high academic and social standing would willingly dedicate his time and energy to assist a student in Iran whom he had never met. It has truly been an honor to know him. In the brief time I had the privilege of interacting with him, I saw that he genuinely believed researchers across the globe are part of one unified community. I have lost a highly respected individual in Bob, and I believe the world—especially in our time—needs more people like him. I am profoundly thankful for the chance to have known him, and I wish him eternal peace

Robert L. Vadas, Jr. (WDFAS collaborator)

Here are six online products that I collaborated with Bob Hughes for, 1st joining his special sessions at the Portland and Reno meetings for AFS (afs.confex.com/afs/2015/webprogram/Session3503.html & <https://afs.confex.com/afs/2019/meetingapp.cgi/Session/7980>), then joining his RPECC work in late 2020 (<https://wdaafs.org/about-us/committees/resource-policy-and-environmental-concerns-committee>), then successfully nominating Bob for this AFS award

(<https://fisheries.org/2022/09/robert-hughes-receives-the-award-of-excellence-from-the-american-fisheries-society>), then both of us winning this WDAFS award for our Snake River dam work (<https://unitslargefs.s3.us-west-2.amazonaws.com/virtualllearn/wp-content/uploads/filebase/archive/newsletters/2023/Vol47No2.pdf>), and finally inviting him to join me as guest editor for this special issue on aquatic biomonitoring (https://www.mdpi.com/journal/fishes/special_issues/NP2H4ZZFBF), for which he solicited many of the papers. So I've known Bob for a decade. He "discovered" me as a good, but under-recognized and neurodivergent, scientist to advance my career. I'll miss him greatly, as he was also my good friend.

Lizhu Wang (Michigan, USA)

Bob is a prominent figure in the field of aquatic landscape ecology and environmental assessment, known for his pioneering work in river ecology, biomonitoring, and the development of rigorous ecological indicators for freshwater systems. His career has been marked by a dedication to improving the scientific basis for water resource management, with particular emphasis on the condition and integrity of aquatic ecosystems. The most obvious contribution of Bob on the topics is the two symposium volumes that I have worked with him – "Landscape Influences on Stream Habitats and Biological Assemblages" (2006) and "Advances in Understanding Landscape Influences on Freshwater Habitats and Biological Assemblages" (2019). These two volumes provided timely needs to facilitate communication and knowledge sharing among researchers, resource managers, and policy makers. Additionally, Bob has written many articles that have advanced the understanding of how land use/cover influences the structure and function of aquatic ecosystems, particularly streams and rivers. Bob has played a central role in developing and refining biological indicators used to assess water quality and ecosystem health. Bob has mentored many students and professionals in the field and served on numerous scientific panels and advisory boards, contributing to environmental policy and conservation efforts globally. Overall, Bob's work has significantly shaped how scientists and environmental managers understand, assess, and protect freshwater ecosystems at multiple spatial scales. His passing away is a significant loss to the scientist community in this field and he will be deeply missed.

Kai Chen (Nanjing, China)

Bob was more than just an advisor to me — he was a life mentor and a dear friend. I first met Bob in 2010 when I was a master student. I often felt uncertain as I began my scientific career,

but Bob constantly encouraged me to think big and act boldly. He helped bring me as a visiting student to the United States, supported me throughout my academic journey, and shared so much wisdom from his life experiences. Over the past decade and a half, we worked closely together on manuscripts and projects focused on riverine bioassessment and stream ecology in China. Bob also collaborated extensively with colleagues across China and made significant contributions to the fields of aquatic bioassessment, freshwater ecology, and the conservation of aquatic ecosystems in the country. He was full of enthusiasm for life, fish, rivers, and nature. Bob was a remarkable person who brought out the best in everyone around him, and I feel incredibly fortunate to have had his friendship and mentorship. I will always remember his wisdom, his humor, and his unwavering commitment to both people and the planet.

Dana Infante (East Lansing, MI)

I met Bob in person when I was a PhD student presenting at an American Fisheries Society (AFS) meeting in Madison, Wisconsin. I knew who Bob was from the beginning of my graduate program, reading and learning from his many papers describing landscape influences on stream fish, aquatic insects, and habitat. I was excited to have a conversation with Bob after my presentation. He offered thoughtful criticisms, but he was supportive of my project. That meant so much at the time, and Bob continued his encouragement and mentorship through my career. He linked me into networks of colleagues studying impacts of mining, reduced protection for headwater streams, and different approaches for bioassessment, enriching my own research but also benefitting post docs, graduate students, and researchers working in my lab. Bob was a brilliant thinker, a prolific writer, and an advocate (especially in recent years), but his skill as a connector served to amplify the impact of his science while also benefiting me and so many others. I think that to work like Bob – building teams of colleagues from around the world with different backgrounds and skill levels – requires an appreciation for people and friendships as well as a genuine sense of caring for others. That was a strength of Bob's that I'll miss most.

Christine Moffitt, AFS Past President 1999-2000.

I had the privilege to work with Bob over many years, particularly in the past 2 decades, most of which within the American Fisheries Society at the leadership level, and in the water quality and international sections through policy work. In the past decade I actively engaged with Bob in the Oregon Chapter policy work. I learned of the incredible influence Bob had on science generated in Oregon and transmitted across the globe. His contributions are many, and each with focus on relevant metrics that can be used to measure and understand aquatic systems, the biota and physical attributes of water quality. His partnership with others stands as a key attribute of his legacy. He authored more than 150 publications, with most if not all of these

with coauthors. These scientific interactions and efforts in collaborative learning and analysis stand as the outstanding contribution and are key to his recognizing his influence.

His personal depth of understanding of freshwater ecosystems was extraordinary, and through partnerships with key scientists Bob drafting key guidance documents for EPA survey work of non-fish bearing and fish bearing systems. These standardized guidance documents are incredibly thorough and important to standardize metrics, and data collection. These were efforts not only across the country but extended into impressive collaborations with international partners. Data were incredibly important to Bob. Not only in his science but in interactions with our professional society. He asked for economic data, and helped others understand the challenges to the economic viability of American Fisheries Society. He asked questions, and often was considered abrasive in his asks, but the genuine care and concern for data driven analysis was key to his understanding all systems, biological or economics of professional society organizations.

Bob's passion for science and sharing science was unstoppable. He worked with his national and international colleagues to help them in many ways through mentoring individual scientists and students and helped connect them to key partners internationally. He was unique, a great leader and a close friend and colleague.

Submitted by –

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