Honorary Degree Nomination for Mr. David Marmorek

It is with great pleasure that I nominate Mr. David Marmorek for an honorary degree from Simon Fraser University. Dave is an accomplished applied environmental scientist with a worldwide reputation as a leader in designing programs to address complex environmental problems. He has made important contributions in areas as diverse as the science and policy of acid deposition, river flow management and restoration, fisheries science and stock restoration, and environmental assessment and planning in relation to industrial pollution. He has had a lifelong commitment to supporting post-secondary education and was an active Adjunct Professor at SFU for 31 years.

Dave has spent most of his career working for ESSA Technologies, where he has been Director, President, Lead Scientist, and Senior Partner. ESSA was formed in 1979 to take ideas about Adaptive Management (AM) out of the academic world into the practice of environmental assessment. Dave's work has been seminal in transforming fundamental academic concepts into practical tools for change in resource management and policy. ESSA has applied these approaches to diverse environmental problems around the world, becoming, under Dave's leadership, a global leader in this area. According to Randall Peterman (Professor Emeritus, former CRC in Fisheries Risk Assessment and Management at SFU: "*It [ESSA] was (and I believe still is) regarded as Canada's premiere environmental consulting company.*"

Dave is an expert in Adaptive Management and related approaches. AM arises from the idea that, since environmental and social systems are complex, interacting, and dynamic, we often have too little information and too much uncertainty about their behavior to make good choices about what management actions will be most effective. AM provides a structured process for using management actions as a way to learn about complex systems, to reduce uncertainty, and for learning which management actions will best meet management objectives. This typically involves first facilitating the engagement of policy makers, scientists and diverse (and often conflicting) stakeholders in a collaborative *hypothesis building* process and then undertaking complex data analysis and modeling in order to craft those ideas into a formal program of *hypothesis evaluation*. Doing so requires combining outstanding facilitation and conflict resolution ability with consummate analytical and modelling skills—a rare combination. Says Mike Jones (Peter A Larkin Professor of Quantitative Fisheries (Emeritus) at Michigan State University) of Dave: "*He is a superb technical facilitator, which means he combines outstanding listening skills with an ability to process and synthesize ideas "on his feet". As someone with expertise in this area, I can honestly say I have never met anyone who is better at this than Dave.*" In contrast to the norm in environmental consulting, Dave has had an ongoing commitment to peer-reviewed publication, with 27 papers in refereed journals and book chapters plus 23 refereed technical reports and conference proceedings.

Contributions to science, application, and policy.

Acid Rain. Dave's early career focused on the problem of acid rain. He was one of Canada's science representatives in a bi-national science and policy process with the US, where he played a major role in the joint development of regional scale modeling and monitoring to address the aquatic effects of acidic deposition in Canada and the United States (1981-1990). This provided the technical foundation for Canada-U.S. negotiations on emission reductions and Dave coordinated the watershed scientists and biologists working on the National Acid Precipitation Assessment Program (NAPAP) and developing the 1990 NAPAP Report to the US Congress. These bi-national achievements in addressing the acid rain problem are widely considered an important case study of success in international environmental regulation. For his contributions to these programs, he was awarded the Bronze Medal for Commendable Service by the U.S. Environmental Protection Agency. This is a rare recognition, especially for non-Americans. Dave subsequently led the design and implementation of monitoring programs and modeling to evaluate acidification risks in Northern Thailand (1990-1992) and Kitimat, BC (2012-2022).

River regulation/restoration and fish stock rehabilitation. Another major theme in Dave's work has been applying decision analysis and AM to the collaborative design of strategies for flow management, ecosystem restoration, and fish species recovery in rivers. He has worked on this type of project in the

Columbia Basin (U.S. and Canadian portions), British Columbia (Cheakamus and Okanagan Rivers), the Platte River (Nebraska and Colorado), Northern California (Clear Creek, Trinity River, Sacramento River, Russian River), Puget Sound, the Middle Rio Grande, and the Missouri River Basin.

The PATH project (Plan for Analyzing and Testing Hypotheses; 1995-2000) in the Columbia River basin of the western US is exemplary of these projects. The Columbia was home to endangered Chinook salmon populations, with years of conflicts about responsibility for the dire status of these stocks and for their recovery. ESSA's task was to bring the parties together to craft a solution by the year 2000, as mandated by a federal court. These parties included the Bonneville Power Administration, the U.S. Army Corp of Engineers, the U.S. National Oceanographic Administration, Oregon and Washington state agencies, and various First Nations, tribes, and other stakeholders. Dave facilitated dozens of challenging workshops with these diverse groups over five years, ultimately achieving broad agreement on a model to evaluate numerous options for rebuilding the salmon populations. This synthesis of all the participants' hypotheses about how the uncertain parts of the system worked clearly showed that the most promising way to restore the endangered Snake River Chinook salmon populations was to remove the four Lower Snake River dams. Though the politicians chose not to follow this advice, based on this Columbia River experience, Dave was asked to help develop programs elsewhere for restoration of fish habitat (e.g., the Klamath, Platte, and Missouri Rivers). Since this time, dam removal has become normalized as a strategy for the recovery of river ecosystems and the fisheries dependent on them

Subsequent to PATH, Dave has served on eight peer review panels dealing with ecosystem restoration, species recovery and AM: Oregon forest management (2006), Platte River species recovery (2005-2006, 2009-2022), Florida Everglades restoration (2008, 2010), Puget Sound ecosystem restoration (2008-12), Fraser River sockeye (2010-2012), Southern Resident Killer Whales (2011-12), Southern BC Chinook (2013), and restoration and protection of coastal Louisiana (2013). Dave's experience in teasing out hypotheses and assessing the evidence for and against them led to him being asked by BC's Cohen Commission in 2009 to undertake the cumulative assessment of risks to Fraser River sockeye salmon as a core part of their examination of the poor returns of sockeye salmon in the Fraser River (https://www.youtube.com/watch?v=N5T-s-8U4vM).

Contributions to SFU

As an active Adjunct Professor in the School of Resource and Environmental Management (REM) from 1991-2022, Dave has made a sustained contribution to the SFU community for three decades. As an Adjunct, he provided guest lectures every year, often in several courses. He is an engaging and inspiring lecturer and many grad students have noted that he was influential in their ability to be optimistic about making a contribution in their own careers to the interface between research, policy, and decision-making. Says Karen Kohfeld (Professor, REM and Professor and Director, ENVSC): "*Dave has been a steadfast, enthusiastic, and thoughtful contributor to REM 631…Dave provides a rare combination of creativity and practicality in his approaches. Students respond to his ability to call upon his life's experiences of using ecological restoration, which made him a powerful contributor to our program.*" Dave has also been a research collaborator with faculty from various departments at SFU (REM, BioSciences, Statistics). Under Dave's leadership, ESSA has been source of employment for 19 SFU graduate students.

People like Dave are the glue that hold together the sometimes tenuous connection between academic research and its effective application. Dave is able to comfortably, and with authority, walk between the worlds of science and policy as well as seamlessly meld the social and natural science dimensions of environmental practice. In many ways, this ability to move respectfully and effectively between disciplines, between communities, and among disputing stakeholders is the currency of engagement. SFU justifiably takes pride in our commitment to these diverse dimensions of engagement. I most heartily propose we confer an Honorary Degree on Dave Marmorek in recognition of his achievements across these dimensions and his commitment to sharing his experience with generations of SFU students.