



Getches-Wilkinson Center
for Natural Resources, Energy,
and the Environment

2016 Martz Summer Conference



Coping with Water Scarcity in River Basins Worldwide: Lessons Learned from Shared Experiences

2016 Clyde Martz Summer Conference

University of Colorado School of Law

Wolf Law Building, Wittemyer Courtroom

Thursday, June 9th and Friday, June 10th, 2016

***Presented by the Getches-Wilkinson Center for Natural Resources,
Energy, and the Environment***



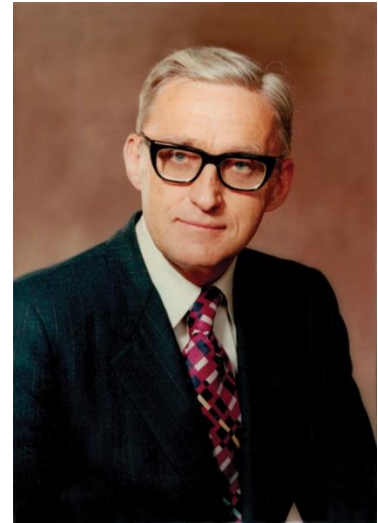
COLORADOLAW
UNIVERSITY OF COLORADO **BOULDER**

37th Annual Martz Summer Conference

Clyde O. Martz was a father of natural resource law in the United States. He was an exemplary teacher, mentor, counselor, advocate, and a professor of natural resources law for 15 years at the Colorado Law. Professor Martz was one of the founders of the Rocky Mountain Mineral Law Foundation and of the Law School's Natural Resources Law Center, which later became the Getches-Wilkinson Center for Natural Resources, Energy, and the Environment. In 1951, he assembled and published the first natural resources law casebook, combining the previously discrete subjects of water law, mining law, and oil and gas law.

In 1962, Professor Martz joined the law firm of Davis Graham & Stubbs. During his tenure at Davis, Graham & Stubbs, he took periodic leaves of absence to serve as the Assistant Attorney General of the Lands and Natural Resources Division of the U.S. Department of Justice (1967-69), a Colorado Special Assistant Attorney General (1971-75), and as the Solicitor of the Department of the Interior (1980-81). He retired from the firm in the late 1990s and passed away in 2010 at the age of 89.

The Getches-Wilkinson Center's annual summer conference hosts outstanding faculty, scholars, public officials, and students who gather to discuss the complex and fascinating issues that dominate the field of natural resources law and policy. The GWC will administer the summer program in a way that honors Clyde's singular contributions to the profession.



Conference Introduction

Water scarcity is increasingly dominating headlines throughout the world. In the southwestern USA, the looming water shortages on the Colorado River system and the unprecedented drought in California are garnering the greatest attention. Similar stories of scarcity and crisis can be found across the globe, suggesting an opportunity for sharing lessons and innovations. For example, the Colorado River and Australia's Murray-Darling Basin likely can share many lessons, as both systems were over-allocated, feature multiple jurisdictions, face similar climatic risks and drought stresses, and struggle to balance human demands with environmental needs. In this conference we cast our net broadly, exploring several salient topics including: trans-boundary cooperation, water marketing, Indigenous water rights, environmental and social water needs, and drought coping.

This public event will be informed by three invitation-only meetings held immediately before the conference: an "Indigenous Water Justice" symposium; a "Social Dimensions of Environmental Water Management" workshop; and a "Drought Crises in Federations" symposium.

Agenda Day One: Thursday, June 9th

7:30-8:00 Welcome and Registration

8:00-8:10 Welcoming Remarks

Session One: *The Challenge of Water Scarcity in Basins Around the World: An Introduction*
Session Chair: Doug Kenney (Getches-Wilkinson Center)

Cases from North America

8:10 to 8:30 Columbia River Basin (Canada and US)

Barb Cosens (University of Idaho)

8:30 to 8:50 British Columbia (Canada)

Oliver M. Brandes (University of Victoria)

8:50 to 9:10 Colorado River Basin (US and Mexico)

Larry MacDonnell (University of Colorado)

9:10 to 9:30 Arizona (US)

Amy McCoy (University of Arizona)

9:30 to 9:50 Rio Grande (US and Mexico)

Adrian Oglesby (University of New Mexico)

9:50-10:20 Morning Networking Break
(Refreshments provided in Boettcher Hall)

Some Other Cases From Around the World

10:20 to 10:40 Murray-Darling River Basin (Australia)

Tony McLeod (MDBA)

10:40 to 11:00 Spain

Teodoro Estrela (Jucar River Basin Authority)

11:00 to 11:20 Sao Francisco River Basin (Brazil)

Vanessa Empinotti (Federal University of ABC)

11:20 to 11:40 South Africa

Mike Muller (University of Witwatersrand)

11:40 to 12:00 India

Srinivas Chokkakula (Centre for Policy Research)

12:00-1:00 Lunch
(Lunch provided in Schaden Commons, 2 floor-West End)

Session 2: Rivers and People: Improving Environmental Water Management by Integrating Social and Eco-hydrological Sciences
Session Chair: Sue Jackson (Griffith University)

1:00 to 1:15 Environmental Flows in the Era of River Anthropology
Rebecca Tharme (Riverfutures Ltd)

1:15 to 2:45 Environmental Flow Case Studies

Case 1. Three tropical north Australian basins (the Fitzroy River, Daly River and the Mitchell)

Michael Douglas (University of Western Australia) and Sue Jackson (Griffith University)

Case 2. The Patuca (Honduras) and Marañon (Ecuador-Peru) basins

Elizabeth Anderson (Florida International University)

Case 3. Southern and Eastern African River basins (Rufiji and Mara basins)

Rebecca Tharme (Riverfutures Ltd)

Case 4. USA Case Studies

Joe Flotemersch (US Environmental Protection Agency)

2:45-3:15 Afternoon Networking Break
(Refreshments provided in Boettcher Hall)

Session 3: *Indigenous Water Justice*

Session Chair: Jason Robison (University of Wyoming)

3:15 to 3:45 Synthesis of the Indigenous Water Justice Symposium

Moderator: Jason Robison (University of Wyoming)

Panelists:

- Barb Cosens (University of Idaho)
- Sue Jackson (Griffith University)
- Dan McCool (University of Utah)

3:45 to 5:00 Indigenous Voices: Commentary and Open Dialogue with Audience

Moderator: Jason Robison (University of Wyoming)

Panelists: Indigenous attendees from Australia, Canada, and the U.S.

- Amy Cordalis (Yurok Tribe)
- Daniel Cordalis (Navajo Tribe)
- Forrest Cuch (Northern Ute Tribe)
- Howard Dennis (Hopi Tribe)
- Phil Duncan (Gomerioi Nation, New South Wales Aboriginal Land Council)
- Fred Hooper (Murrawarri Nation, Northern Basin Aboriginal Nations)
- Paul Lumley (Yakama Tribe, Columbia River Intertribal Fishing Commission)
- Nora McDowell (Fort Mojave Indian Tribe)
- D.R. Michel (Confederate Tribes of the Colville Reservation, Upper Columbia United Tribes)
- John Sirois (Confederate Tribes of Colville Res., Upper Columbia United Tribes)
- Rene Woods (Nari Nari Nation, Murray-Lower Darling Rivers Indigenous Nations)

Agenda Day Two: Friday, June 10th

8:00 Conference Reconvenes

Session 4: *Adapting to Water Scarcity and Droughts in Federations*

Session Chairs: Dustin Garrick (McMaster University/University of Oxford)
and Lucia De Stefano (Complutense Univ. of Madrid)

8:15 to 8:50 *Learning from Drought Crisis in Federations: Tools and Institutions for Dealing with Water Scarcity and Sustained Droughts*

Dustin Garrick (McMaster University/University of Oxford)

Lucia De Stefano (Complutense Univ. of Madrid)

8:50 to 10:15 Panel: *The Colorado and the Murray-Darling*

Moderator: Lucia De Stefano (Complutense Univ. of Madrid)

Panelists:

- Daniel Connell (Australia National University). *Drought Provisions*
- Dustin Garrick (McMaster University/University of Oxford). *Water Markets and Basin Governance*
- Tony McLeod (MDBA). *River Basin Planning*
- Brad Udall (University of Colorado). *Dealing with Climate Change*

**10:15-10:45 Morning Networking Break
(Refreshments provided in Boettcher Hall)**

10:45 to 12:20 Panel: *International Innovations to Address Water Scarcity and Drought: Lessons Learned*

Moderator: Daniel Connell (Australian National University)

Panelists:

- Reed Benson (University of New Mexico). *Infrastructure and climate change*
- Nuria Hernández Mora (University of Seville). *Reallocation and water markets*
- Michele Lee Moore (University of Victoria). *Innovation in transboundary governance*
- Kevin Wheeler (University of Oxford). *Data sharing and river basin modelling*

12:20-1:20 Lunch
(Lunch provided in Schaden Commons, 2 floor-West End)

Session 5: *Wrap-Up: Themes, Cross-Cutting Issues, and Transferable Lessons*
Session Chair: Doug Kenney (Getches-Wilkinson Center)

1:20 to 2:30 Panelists (*for a facilitated audience Q&A session*)

- Teodoro Estrela (Jucar River Basin Authority)
- John Fleck (University of New Mexico)
- Kathy Jacobs (University of Arizona)
- Kelsey Leonard (McMaster University)
- Tony McLeod (MDBA)
- Rebecca Tharme (Riverfutures Ltd)

2:30-3:30 Conference Concludes
(Post-conference socializing until 3:30)

Speaker Biographies (alphabetical by last name)

Elizabeth P. Anderson



Elizabeth Anderson is a freshwater conservation ecologist based at Florida International University (FIU) in Miami, FL. Her research explores the natural history of tropical freshwaters of Central America, the Andean Amazon, and East Africa, and the effects of human activities on these ecosystems. Her work has a strong conservation focus and involves collaborations with other scientists and those in key water resource management roles. Dr. Anderson received both undergraduate and PhD (Ecology) degrees from the Odum School of Ecology at the University of Georgia (UGA) in Athens, GA, USA. She has since worked for the Organization for Tropical Studies as coordinator of an international research program for U.S. and Costa Rican students at La Selva Biological Station; as Conservation Sustainability Director at The Field Museum of Natural History; and currently is a member of the faculty and Director of

International Research Programs in the School of Environment, Arts and Society at Florida International University.

Reed Benson



Reed D. Benson is a Professor at the University of New Mexico School of Law, where he teaches courses relating to water law, natural resources, and administrative law, and chairs the school's Natural Resources and Environmental Law Program. Prof. Benson has published nearly thirty articles on western water law and policy, focusing largely on environmental issues and federal water project operations, and he is a co-author of the *Water Resource Management* casebook from Foundation Press. He spent four months in 2015 as a Fulbright Scholar, serving as Visiting Chair in Water and the Environment at the University of Lethbridge in Alberta, Canada, where he did research on dam operations in southern Alberta. He served from 2002-08 on the University of Wyoming law faculty. Before he began teaching, Prof. Benson worked in Oregon for the nonprofit conservation group WaterWatch, including five years as executive director. He has also worked as an attorney for a

Boulder, Colorado law firm, and for the U.S. Environmental Protection Agency in Washington, DC, and for the Land and Water Fund of the Rockies (now Western Resource Advocates). He earned a B.S. with honors in economics and environmental studies from Iowa State, and a J.D. *magna cum laude* from Michigan.

Oliver M. Brandes



Oliver M Brandes is an economist and lawyer by training and a trans-disciplinarian by design. He serves as Co-Director of the Centre for Global Studies' POLIS Project on Ecological Governance at the University of Victoria and leads the Water Sustainability Project where his work focuses on water sustainability, sound resource management, public policy development and ecologically based legal and institutional reform.

Oliver is an Adjunct Professor at the University of Victoria in both the Faculty of Law and in the School of Public Administration. He is a founding member of the national expert group the Forum for Leadership on Water (FLOW), which he currently co-chairs, and serves as an advisor to numerous other national, provincial and more local water organizations and funders. He has affiliations at a number of Universities including the University of Waterloo, University of Manitoba, and Brock University. At the University of Victoria, he is a Senior Research Associate at the Centre for Global Studies and is a Fellow of the Environmental Law Centre. He has recently co-developed and delivered BC's first water law course at the University of Victoria's law school.

He is a formal advisor to a variety of local, provincial and national governments providing strategic water law and policy advice and is currently a technical advisor to the BC Ministry of Environment supporting the ongoing development of the *Water Sustainability Act* and was a member of the Water Advisory Committee to the Council of the Federation.

Srinivas Chokkakula



Dr. Srinivas Chokkakula is based at the Centre for Policy Research, a public policy research think tank in New Delhi, India. He is a Research Fellow with the Department of Anthropology and Sociology, School of Oriental and African Studies, University of London, London, UK.

Srinivas is a political geographer with a Ph D from the University of Washington, Seattle; and has earlier degrees in environmental planning and civil engineering. His work experience extends for over 20 years in academia, professional and voluntary sectors – covering wide-ranging topics: water conflicts; natural resources management; urban and regional planning, governance in India; disaster response and reconstruction; and, ICT4D (Information and Communication Technologies for Development). His current research interests focus on transboundary water conflicts, development studies, and state-society relations in South Asia.

Amy Cordalis



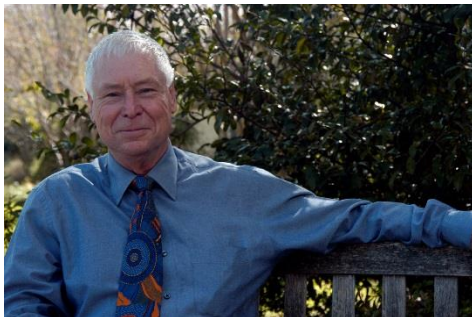
Amy Cordalis is a member of, and attorney for, the Yurok Tribe. Her family is from the Yurok village of Requa, located on the mouth of the Klamath River in Northern California. As traditional regalia holders and leaders, several generations of her family have fought for Yurok legal rights. Her connection to Yurok culture, particularly fishing, brought her into the field of law. She worked for the Native American Rights Fund and Berkey Williams LLP prior to joining the Tribe. Her practice is dedicated to the preservation of tribal sovereignty, cultural and natural resources, and tribal economic self-determination.

Daniel Cordalis



Daniel Cordalis is an attorney with the Denver Earthjustice office. Daniel is a Navajo tribal member and the proud parent to two wonderful little boys, and the lucky husband to a wonderful Yurok woman. Daniel and his wife look forward to raising Yurok fishermen who will continue the fight for justice for tribal people and the land. Before Earthjustice, Daniel worked with the National Congress of American Indians, the Native American Rights Fund, the Colorado Supreme Court, and the Yurok Tribe.

Daniel Connell



Dr. Daniel Connell works in the Crawford School of Public Policy at the Australian National University focusing on governance issues relating to trans-boundary hydrological systems. His main ongoing project is a comparison of the governance arrangements for rivers in multi-layered governance systems focusing on Australia, South Africa, United States, Mexico, European Union (Spain), India, China and Brazil. Subjects of particular interest include water reform, conflict between stakeholders, environmental justice, public participation, cultural change, institutional design, displaced and indigenous peoples, water transfers between catchments and across borders, water markets, and the distribution of costs, benefits and risk between different levels of government. At the Crawford School Daniel supervises PhD students working on environmental and water issues in Australia, south-east Asia and South Asia and teaches two postgraduate courses, one on water governance issues and the other on issues related to sustainable development.

Barb Cosens



Barbara Cosens is a Professor with the University of Idaho College of Law and the Waters of the West Graduate Program. She teaches Water Law, Water Policy, Law Science and the Environment, and leads a team taught graduate course in Interdisciplinary Methods in Water Resources. Barbara coordinates the Natural Resources and Environmental Law Program at UI. Her research interests include the integration of law and science in education, water governance, and dispute resolution; adaptive water governance and resilience; and the recognition and settlement of Native American water rights. She is a collaborator with the Utton Center and Earth Data Analysis Center at University of New Mexico and the American Indian Law Center on

development of the Native American Water Right Settlement Electronic Repository and has served as a negotiator and mediator of Native American Water Right settlements.

Barbara is a member of the Universities Consortium on Columbia River Governance and has worked with Nigel Bankes, University of Calgary Faculty of Law, on two projects funded by the Program on Water Issues at the Munk School of Global Affairs: one on mechanisms for flexibility and adaptability in international water agreements, and the other on U.S. and Canada domestic law in international law. She is co-chair of a project made possible through support from the NSF funded National Socio-Environmental Synthesis Center, SESYNC: Adaptive Governance in Regional Water Systems to Manage Resilience in an era of Changing Climate. She spent spring 2015 as the Goyder Institute Visiting Professor in Public Sector Policy and Management at Flinders University researching adaptive water governance and water law in South Australia and the Lake Eyre Basin.

Forrest Cuch



Forrest S. Cuch is an enrolled member of the Ute Indian Tribe. He was born in 1951 and raised on the Uintah and Ouray Ute Indian Reservation in northeastern Utah. In 1973, he graduated from Westminster College with a Bachelor of Arts Degree in the Behavioral Sciences. During his 38 year career, Forrest has held many challenging jobs, beginning as education director for the Ute Indian Tribe. He has also served as tribal planner/administrator for an eastern tribe and social studies department head and teacher for his alma mater, Wasatch Academy, Mt. Pleasant, Utah. Forrest was executive director, Utah Division of Indian Affairs. During this time, he published *A History of Utah's American Indians*, Utah State University Press, 2000. He has

served on numerous boards, including as a trustee representing American Indians on the Salt Lake Organizing Committee for the 2002 Winter Olympic Games; trustee for Swaner Preserve; and Salt Lake City based Pax Natura. Forrest played a key role in the PBS/KUED sponsored curriculum project entitled "We Shall Remain," which features a video series of the histories of the Utah tribes with accompanying materials. Forrest is Co-Founder of Rising American Indian Nations (RAIN), an Indian operated non-profit organization established to empower American Indian people. Throughout his career, he has worked to call attention to the ancient presence of American Indian people in the intermountain west, and he has worked with other American Indian leaders in and out of state to address many critical issues facing all American Indians. He currently is engaged in working with spiritual leaders through the Western Hemisphere to usher in the new shift in feminine conscious known as the New Earth and calling attention to Climate Change and Harm to Mother Earth.

Lucia De Stefano



Lucia De Stefano is Associate Professor at Complutense University of Madrid (Spain), where she teaches hydrology and water resources management. She is also an international consultant, having worked for USAID, The World Bank, University of Oxford and Oregon State University. Her previous position was as a senior research fellow at the Water Observatory of the Botín Foundation, a Spanish think-tank working on water policy in Spain and Latin America. In 2008-09 she was a postdoctoral researcher at Oregon State University, USA, working on global studies on water conflicts and resilience to climate-change-induced water variability, and regional water governance benchmarking in the Middle East and Northern Africa. Previously she worked as a policy officer for World Wide Fund for Nature (WWF), and as a water management specialist in the private sector. A hydrogeologist by training, she obtained her advanced degree in Geological Sciences from the University of Pavia (Italy), and holds a PhD on evaluation of water policy from Complutense University of Madrid, Spain.

She received formal training in water conflict management and negotiation at Oregon State University, USA, and UNESCO-IHE in Delft, the Netherlands. Her main fields of interest are public policy evaluation, multilevel water planning, drought management, groundwater governance, transboundary waters, and the assessment of good governance attributes from different disciplinary perspectives.

Michael Douglas



Michael Douglas is a Professor of Environmental Science at the University of Western Australia and a University Professorial Fellow at Charles Darwin University. He is Hub Leader of the Northern Australian Environmental Resources Hub: a 6 year research initiative focused on supporting the sustainable development in northern Australia, funded by the Australian Government's National Environmental Science Program. He also leads the Tropical Rivers and Coastal Knowledge Research consortium and has been doing research on northern Australia's water resources and the ecology of aquatic ecosystems for the past 25 years.

Phil Duncan



Phil Duncan is a member of the Gomeroi Nation from Moree New South Wales (NSW) Australia; his homelands are Moree and Terry Hie Hie. Phil has over 37 years' experience working with Aboriginal people and government to improve the lives of my people through recognition of our rich cultural history, the return of our lands, the improvement of our living conditions and the education of our next generation both through my employment and volunteer community work. Phil provides high level policy and strategic advice to the NSW Aboriginal Land Council

Board and Executive, as well as external key stakeholder groups including key Government agencies. This strategic advice regards issues of cultural and heritage significance, community engagement in on ground projects, the design, delivery and implementation of programs in partnership with government, regarding the range of issues as required, particularly natural resource management and water rights and allocations.

Vanessa Empinotti



Vanessa L. Empinotti is Assistant Professor in Rural Policy and Planning in the Spatial Planning Program at Federal University of ABC - UFABC - in Brazil. An agronomist by training, she completed her Ph.D in Geography at the University of Colorado, Boulder. She studied participatory practices and water governance at the São Francisco River Basin in the northeastern region of Brazil. Her research employs critical political ecology to analyze institutional arrangements, environmental governance, and power relations.

She has been studying drought and its influence over water governance in megacities, the dynamics of water governance in agricultural frontier regions, and transparency in water resources management. She is also Associate Editor of *Ambiente e Sociedade* Journal. She co-edited books, including, *Water Governance in the Iberian context: innovation in process* (2015, Annablume).

Teodoro Estrela



Dr. Teodoro Estrela is Head of the Water Planning Office of Júcar River Basin Authority in Valencia (Spain) since 2012. He was Deputy Director of Júcar River Basin Authority (2009-2012) and Deputy Water Director on Water Planning of the Spanish Ministry of Environment and Rural and Marine Affairs (2005-2009), being in charge of the implementation of the European Union Water Framework Directive (WFD) in Spain. As Head of Water Planning Office of Júcar RBA from 2002 to 2005, he was in charge of the WFD implementation of the Júcar River Basin, which was a pilot river basin within the European Union. Dr. Estrela held different positions during 16 years at the Centre for Hydrographic Studies of CEDEX in

Madrid, including the one of Technical and Scientific Coordinator of the Hydrology Department. During his work at CEDEX, he was member of the European Topic Centre on Inland Waters of the European Environment Agency. He is Permanent Secretary of the Mediterranean Network of Basin Organisations since 2002, and Vice-President and Chairman of Standing Committee on Water of World Council of Civil Engineers since 2015. With a PhD in Civil Engineering, he is also a lecturer at Technical University of Valencia (2003-present).

John Fleck



John Fleck is writer-in-residence at the University of New Mexico's Water Resources Program, where he co-teaches classes in contemporary water policy issues, modeling, and technical communication for water managers. A science journalist with 30 years of newspaper experience, he first wrote about water in the 1980s as a beat reporter covering the Metropolitan Water District of Southern California. He spent 25 years at the Albuquerque Journal covering a variety of topics, including nuclear weapons and waste policy, climate, and especially New Mexico water, before taking up

his current post at UNM in 2015. He is the author of the forthcoming book *Water is for Fighting Over and Other Myths About Water in the West*, an exploration of solutions to the Colorado River Basin's water problems, to be published in September by Island Press.

Joe Flotemersch



Dr. Joseph Flotemersch is a Senior Environmental Scientist with the United States Environmental Protection Agency. His primary responsibility is serving as the Program Coordinator for the U.S. Report on the Environment. He also has multiple ongoing research activities, all focused on understanding and supporting the successful management of watersheds as social-ecological systems.

Dustin Garrick



Dr. Dustin Garrick is a Lecturer in Environmental Management at the Smith School of Enterprise and the Environment at the University of Oxford. His work examines policies, institutions and incentives addressing water scarcity and climate variability in stressed river basins. His recent book, *Water Allocation in Rivers under Pressure*, compares the evolution and performance of water markets and river basin governance in the Colorado, Columbia and Murray-Darling Rivers – three closed rivers at the forefront of water challenges globally. In this work, he seeks to advance theory and evidence on property rights and resource allocation, working across multiple research traditions, including the commons, political economy, and risk science. His current work is anchored in ongoing projects examining: the political economy and performance of water markets; disaster risk governance and drought resilience in federal rivers; and the development and use of institutional indicators by water managers and development practitioners. He has a special interest in networks and partnerships that connect water research and institutional innovations in water allocation and basin governance, working with partners in the US Bureau of Reclamation, Columbia Basin Water Transactions Program (USA), OECD, Forum of Federations, and the World Bank. He recently served on the Global Water Partnership / OECD task force on Water Security and Sustainable Growth and is active on a number of international and comparative water policy and economic projects. Prior to joining Oxford (from July 2016), Dr Garrick was Philomathia Chair of Water Policy at McMaster University and a Fulbright Scholar (2010-11) in Australia, where he remains a Research Associate of the Centre for Water Economics, Environment and Policy at Australian National University.

Nuria Hernandez-Mora



Nuria Hernández-Mora is a specialist in water governance and water policy analysis. She holds a BS in Economics and Business Administration from the Universidad Pontificia de Comillas in Madrid (1990), and MS degrees in Natural Resources Policy from Cornell University (1995) and in Water Resources Management from the University of Wisconsin-Madison (2001). She has worked for non-profit organizations dedicated to land use and water resources policy both in the US and Spain, and as a consultant for non-profit and governmental organizations, including the Spanish Ministry of the Environment and the World Bank. She has participated in research projects focusing on water governance, risk management and vulnerability to extreme climatic events. She actively participates in Spanish water policy evaluation and analysis. She is the author or co-author of more than 60 publications in the fields of water governance, water policy analysis, water risk management, public participation and transparency. She is currently a collaborating researcher at the Department of Human Geography at the University of Seville where she is completing her PhD. She serves on the Board of Directors of the Foundation for a New Water Culture (*Fundación Nueva Cultura del Agua*), which she presided between 2010 and 2013. Since 2015 she is a member of the Technical Advisory Committee of the *Pacto de Toledo por el Tajo* of the Municipality of Toledo (Spain). She is also a member of the Editorial Board of the *Agua y Territorio* Scientific Journal.

Fred Hooper



Fred Hooper is a Murrawarri man from the Murrawarri Nation which straddles what is now called northwest New South Wales and southwest Queensland, Australia. He is the chairman of the Murrawarri Provisional Council of State and the chair of the Northern Basin Aboriginal Nations. He served in the Australian Defence Forces and the Commonwealth Public Service and in various community organisations. He is passionate about his people's ownership and rights to their lands and waters.

Sue Jackson



Sue Jackson is an Associate Professor at the Australian Rivers Institute at Griffith University in Queensland. She is a geographer with over 20 years' experience researching the social dimensions of natural resource management in Australia, particularly those issues relating to the rights and interests of Indigenous communities. She has a strong research interest in systems of water resource governance, including customary Indigenous resource rights and values, and methods for addressing Indigenous values in environmental flow assessments and water allocation planning. Sue is currently a member of the Research Executive of the TRaCK (Tropical Rivers and Coastal Knowledge) Research Hub and a research participant in the Northern Australian Environmental Resources Hub: an initiative focused on supporting the sustainable

development in northern Australia, funded by the Australian Government's National Environmental Science Program. In 2014 Sue was awarded a prestigious Australian Research Council Future Fellowship to conduct research in the Murray Darling Basin.

Kathy Jacobs



Kathy Jacobs is the director of the Center for Climate Adaptation Science and Solutions and a professor at the University of Arizona. From 2010 to 2013, Jacobs worked in the White House, leading the National Climate Assessment and advising on water science and climate adaptation. Prior to her work in DC, Jacobs was the executive director of the Arizona Water Institute from 2006-2009, and she has more than 20 years of experience as a water manager for the Arizona's Department of Water Resources. Her research interests include water policy, connecting science and decision making, stakeholder engagement and climate change adaptation.

Douglas Kenney



Doug Kenney is Director of the Western Water Policy Program and its Colorado River Governance Initiative, located within the University of Colorado Law School in the Getches-Wilkinson Center for Natural Resources, Energy and the Environment. He is also founder and current chair of the Colorado River Research Group. He has written extensively on several water-related issues, including law and policy reform, river basin and watershed-level planning, climate change adaptation, and water resource economics. Dr. Kenney has served as a consultant to a variety of local, state, multi-state, and federal agencies, including several Interior Department agencies, EPA, and the US Forest Service; and national governments and NGOs in Asia and Africa. Additionally, he has made presentations in 20 states (and the District of Columbia), 7 nations, and 4 continents. He has a B.A. in biology from the University of Colorado, a M.S. in Natural Resources Policy and Administration from the University of Michigan, and a Ph.D. in Renewable Natural Resource Studies from the University of Arizona.

Kelsey Leonard



Kelsey Leonard is a PhD student in Comparative Public Policy in the Department of Political Science at McMaster University where she focuses on Indigenous water security and its climatic, territorial, and governance underpinnings. She is McMaster University's Philomathia Trillium Scholar in Water Policy and currently works as a Research Assistant for the Water Economics, Policy and Governance Network (WEPGN). Kelsey has previously worked for the National Congress of American Indians (NCAI) as a legislative associate on tribal climate change adaptation. She holds an A.B. in Sociology and Anthropology from Harvard University, an MSc in Water Science, Policy and Management from the University of Oxford, and a J.D. from Duquesne University. Kelsey is an enrolled citizen of the Shinnecock Indian Nation.

Paul Lumley



Paul Lumley is the Executive Director for the Columbia River Inter-Tribal Fish Commission (CRITFC) and a citizen of the Yakama Nation, which is located in central Washington State. Mr. Lumley worked at CRITFC from 1987-2004 under several capacities. He returned to CRITFC after 5 years in Washington DC to begin his tenure as executive director on July 1, 2009. Mr. Lumley has an extensive history working with Northwest Tribes on salmon issues, particularly in the Columbia River Basin. Paul Lumley received his Bachelor of Science degree in Mathematics from Western Washington University in 1986.

Larry MacDonnell



Lawrence J. MacDonnell is an attorney and consultant in Boulder who retired in 2013 as a professor of law at the University of Wyoming College of Law where he taught water law, public land law, and natural resources law. He is also a senior fellow at the Getches-Wilkinson Center and a member of the adjunct faculty at the University of Colorado School of Law. He was the first director of the Natural Resources Law Center at the University of Colorado School of Law, a position he held between 1983 and 1994. Between 1995 and 2009 he worked as an attorney and consultant in Boulder, Colorado. His work focused primarily on water resources and on ways to make natural resource development more environmentally compatible. His publications include numerous books, law review articles, other journal articles, and research reports. He has given over 250 invited presentations. He is married, with three daughters.

Daniel McCool



Daniel McCool is a Professor of Political Science at the University of Utah. Professor McCool's research focuses on water resources, Indian voting and water rights, and public lands policy. His recent books include: *River Republic: The Fall and Rise of America's Rivers* (Columbia University Press 2012); *The Most Fundamental Right: Contrasting Perspectives on the Voting Rights Act* (Indiana University Press 2012, edited); *Native Vote: American Indians, the Voting Rights Act, and Indian Voting* (Cambridge University Press 2007, co-authored); and *Native*

Waters: Contemporary Indian Water Settlements and the Second Treaty Era (University of Arizona Press 2002). He has served as an expert witness in seven Voting Rights Act cases.

Amy McCoy



Amy McCoy has twelve years of professional experience in ecohydrology, strategic planning, and monitoring and evaluation. Amy's recent portfolio includes the development of flow monitoring and evaluation programs, including assessment tools to link stream restoration actions with ecological improvements in the Colorado River, Columbia River and Great Basins. Amy has worked with a number of non-profit organizations in Arizona to promote the use of water rights transactions for environmental purposes. Previously, at the Sonoran Institute, Amy helped create the first aquatic health assessment for the Santa Cruz River Watershed in southeastern Arizona and northern Mexico. Amy has a PhD in Arid Lands Resource

Science from the University of Arizona, a MA from University of Southern California and a BS from Yale University. She lives in Tucson, Arizona.

Nora McDowell



An enrolled member of the Fort Mojave Indian Tribe, Nora McDowell was born and raised on the Fort Mojave Indian reservation located in Needles, CA. Ms. McDowell has committed over 38 years to tribal government, starting her career as a clerk for the Manpower program in 1975, eventually working her way up to Tribal Council Secretary in 1980. Her interest in tribal politics began with her first tribal council campaign and election in 1981, when she began her first four-year term. She is proud to have served the Council and the Fort Mojave Tribal community for over 38 years. As Fort Mojave Tribal Council Chairperson, Ms. McDowell's leadership has been instrumental in forging many economic projects for the tribe. Ms. McDowell felt it necessary for the tribe to achieve total tribal self-sufficiency and to exercise its sovereign rights. Her belief and that of the standing council was that it was incumbent of the tribal government to take over all of its operations and infrastructure services on reservation. Thus began a long process of numerous legal workings and administrative duties to accomplish that goal. The tribe currently provides all utility services on the reservation in three states, California, Arizona and Nevada. The Fort Mojave Indian Tribe maintains one of only eight tribally owned and operated telecommunications companies in the United States. Ms. McDowell has been recognized by many Native American organizations for her leadership and service as President and Board Member of such organizations as the Inter-Tribal Council of Arizona, Arizona Indian Gaming Association, Fort Mojave Telecommunications, National Tribal Telecommunications Association, National Congress of American Indians, 10 Tribes Partnership of the Lower Colorado River, Fort Mojave Tribal Utilities Authority, Council of Energy Resources, Native American Rights Fund and Founding Member of the WEWIN organization "Women Empowering Women for Indian Nations."

Currently, Ms. McDowell serves as Project Manager within the AhaMakav Cultural Society department and oversees a hazardous waste cleanup located at the Pacific Gas & Electric Topock Compressor Station, which is within a known Mojave sacred site area and traditional homeland of the Fort Mojave Indian Tribe. Nora is the proud mother of 3 children and Grandmother to 10 grandchildren. Nora resides on the Fort Mojave Indian Reservation, which is located in the States of California, Arizona and Nevada.

Tony McLeod



Dr. Tony McLeod is the General Manager of the Water Management Branch at the Murray-Darling Basin Authority in Canberra, Australia. Prior to joining the MDBA in 2008, he was involved in the development of the Australian Federal *Water Act 2007* with the Australian Government Department of the Environment.

From 1998 to 2006 he worked for the Murray-Darling Basin Commission including on The Living Murray, river operations and on the cap on diversions. He has also worked with the New South Wales Government and in 1993 he completed a PhD in water resource management at the University of Melbourne. In 2014 he spent 4 months based at the Getches-Wilkinson Center for Natural Resources, Energy and the Environment at the University of Colorado Boulder on a Fulbright Fellowship researching water management issues in the western United States with particular reference to the comparisons with the Murray-Darling Basin.

D.R. Michel



D.R. Michel has been the Executive Director for the Upper Columbia United Tribes for eight years. He is a member of the Confederated Tribes of the Colville Reservation, and served eight years on the Tribal Business Council, and as Chairman of the Natural Resources Committee. His background is primarily in forestry – including many years managing forest fire suppression. The Upper Columbia United Tribes is a coalition of five Tribes: the Coeur d’Alene Tribe, the Colville Confederated Tribes, the Kalispel Tribe, the Kootenai Tribe of Idaho, and the Spokane Tribe of Indians. As Executive Director, D.R. applies his broad experience and knowledge to advise policy matters and decisions for the protection, preservation, and enhancement of Tribal Rights, Sovereignty, Culture, Fish, Water, Wildlife, Habitat and other interests of common concern for the benefit of all people in the Columbia River Basin. He provides justification and validation on a myriad of issues – including forestry, water quality and water supply, cultural and natural resources, river and reservoir management, developing and maintaining regional partnerships, and administrative functions. D.R. served as the Sovereign Review Team delegate for the UCUT on the 2014/2024 Columbia River Treaty Review; and is an active and effective member of the Coalition of Columbia Basin Tribes.

Michele Lee Moore



Michele Lee Moore is Assistant Professor at the Department of Geography at University of Victoria. She led the Water, Innovation, and Global Governance Lab (WIGGLab) housed at the University of Victoria’s Centre for Global Studies. The WIGGLab is a group of graduate student researchers fascinated by the seemingly insurmountable social-ecological challenges being faced in watersheds throughout Canada and the world. Michele is interested in issues that are specific to water, but also use water as a lens to explore a broader range of social, political, economic, and environmental problems.

Cutting across all of her research is an interest in social innovation and the potential role that processes for transformative change may have for addressing complex ecological and governance challenges.

Mike Muller



Mike Muller has been a Visiting Adjunct Professor in the University of the Witwatersrand Graduate School of Governance since 2006 and was a Commissioner of South Africa's first National Planning Commission (2010-2015). A registered professional engineer with extensive experience in strategic public and development management, he advises a variety of organisations on water and development issues from local to global level and chaired the World Economic Forum's Global Agenda Council on Water Security (2012/14). He has a particular interest in Southern African integration and development including cooperative approaches to achieving regional food and water security in the face of climate challenges.

As Director-General of South Africa's Department of Water Affairs and Forestry from 1997-2005, Mike led development of new policy and legislation; investment programmes that gave millions of people access to safe water and sanitation; and water-sharing negotiations with Mozambique, Swaziland and Lesotho that unlocked major water and agricultural investments. He also chaired the water programme at the 2002 World Summit on Sustainable Development. From 1988 to 1994, he worked for the Development Bank of Southern Africa; between 1979 and 1988 he managed water programmes for the Mozambique Government. His earlier writing on nutrition, health and development was widely commended and had significant impact on global public policy.

Adrian Oglesby



Adrian Oglesby is a graduate of the University of New Mexico School of Law and has worked as a water attorney for the last thirteen years. He has focused on river and riparian restoration, agricultural preservation, efficient water management, governmental accountability, and fish and wildlife conservation. He has advised irrigation districts, acequias, pueblo and tribal governments, the New Mexico Interstate Stream Commission, farmers, environmental organizations and local water providers. He is currently Vice-Chairman of the Board of Directors of the Middle Rio Grande Conservancy District. He became director of the Utton Center on July 1.

Jason Robison



Jason Anthony Robison is an Assistant Professor at the University of Wyoming (UW) College of Law. He teaches courses in water law and policy, international environmental and natural resources law, and federal courts. Professor Robison joined the UW faculty in fall 2014 after completing his S.J.D. at Harvard Law School. His scholarship focuses mainly on intersovereign relations over water resources, particularly relations among federal, state, and tribal sovereigns within the American West. Most of Professor Robison's recent writing, including his S.J.D. dissertation, addresses the elaborate legal framework governing the Colorado River system (the "Law of the River"). Professor Robison chaired the organizing committee for the *Big Horn* General Stream Adjudication Symposium held in September 2014 on the Wind River Indian Reservation. He also served as lead organizer for the Indigenous Water Justice Symposium this year. Before joining the UW faculty, Professor Robison held various law and policy positions with the Oregon

Department of Justice, Oregon Supreme Court, Harvard Emmett Environmental Law and Policy Clinic, Harvard Water Security Initiative, Harvard Kennedy School of Government, and Colorado River Governance Initiative at CU Law School.

John Sirois



John Sirois is an enrolled member of the Okanagan and Wenatchi Bands of the Colville Confederated Tribes. Mr. Sirois served a majority of his professional career working within the Colville Tribes' government in cultural revitalization, economic development, renewable energy project development, policy development, and governance as former Council Chairman and Council Member. Mr. Sirois now serves Upper Columbia United Tribes as the Committee Coordinator to facilitate issues through an intertribal committee process to respond to many fish, wildlife and natural resources issues. Key committees' efforts are to

investigate and spearhead the reintroduction of salmon above Chief Joseph and Grand Coulee Dams on the Columbia River and climate change affects to all of the committees' efforts. Mr. Sirois approaches the betterment of our natural resources and committee work through the lens of cultural teachings and applied science. Mr. Sirois seeks to build a better future for the lands animals and all people for generations to come.

Rebecca Elizabeth Tharme



Dr. Rebecca Tharme is the Director of Riverfutures, a company she founded in 2015 to help develop policy appropriate solutions and technical capacity for environmental water management. She has 25 years of experience as a lead and member of interdisciplinary, multi-cultural teams on projects in 40 developing countries of Africa, Latin America and Asia. Rebecca holds a Ph.D. in Zoology (Aquatic Ecology) and is an Adjunct Principal Research Fellow of the Australian Rivers Institute. She is a jury member for Swiss Re Foundation's International ReSource Award for resilience in water management, and served on the Ramsar Convention on Wetlands' Scientific and Technical Review Panel from 2002 to 2008. She has held the positions of Director of Partnerships for Great Rivers and Senior Freshwater Scientist in The Nature Conservancy's Global Water team, Theme Leader for Water and Environment at the International Water Management Institute, and began her career at the Freshwater Research Unit, Cape Town University. Rebecca has contributed to several initiatives on water and sustainability, including on international water quality guidelines for freshwater ecosystems, the Comprehensive Assessment of Water Management in Agriculture, and Millennium Ecosystem Assessment. She has co-authored over 90 publications on environmental flow policy and practice, river ecohydrology, and human water, food and energy security. She has given some 40 invited conference presentations and numerous trainings. English is her native tongue and she has a basic working proficiency in French, Spanish and Afrikaans.

Brad Udall



Brad Udall serves as senior water and climate research scientist at the Colorado Water Institute to provide additional expertise in the field of water resources and climate change. He has extensive experience in water and climate policy issues, most recently as the director of the Getches-Wilkinson Center for Natural Resources, Energy and the Environment and the Western Water Assessment at the University of Colorado, Boulder. He has authored numerous peer-reviewed publications on water management and climate change which have been published by the federal government and major journals. He has researched water problems on all major Southwestern US rivers including the Rio Grande, Colorado, Sacramento-San Joaquin and Klamath, and has spent six months in Australia studying their recent water reforms.

Kevin Wheeler



Kevin Wheeler is a PhD candidate in the Environmental Change Institute at the University of Oxford in the U.K., but with roots in Colorado with a BSc and MSc from the University of Colorado, Boulder. As a professional engineer, consultant and now an academic researcher, Mr. Wheeler has worked for over 15 years on a wide variety of water issues ranging from community-level water development as a Peace Corps volunteer in the Dominican Republic and Haiti to trans-boundary negotiations over contested international rivers. His current research focuses on increasing water security through trans-boundary cooperation, specifically through the development of risk-based modelling tools for seeking negotiated arrangements and the resulting coordinated management of infrastructure. With 10 years of experience working on the Colorado River for numerous stakeholders such as the Bureau of Reclamation, State of Colorado and Environmental Defense Fund, he now focuses on the Nile River and the need and potential for cooperative arrangements between Ethiopia, Sudan and Egypt. His PhD work explores the science-policy interface of trans-boundary negotiations and developing cooperative management strategies for the Grand Ethiopian Renaissance Dam.

Rene Woods



Rene Woods hold several affiliations and positions including: Nari Nari Nation, South West NSW Low-bidgee Area; Deputy Chair, Murray Lower Darling Rivers Indigenous Nations; Deputy Chair, Nari Nari Tribal Council; Deputy Chair, Hay Local Aboriginal Land Council; Member of the National Cultural Flows Research Committee. Rene is a proud Nari Nari man from south west NSW. Rene has had a long involvement in water for Aboriginal people within NSW and now as deputy Chair of Murray Lower Darling Rivers Indigenous Nations (MLDRIN) for Aboriginal people within the Murray Darling Basin Area and nationally with the National

Cultural Flows Research Committee. Within Rene's own Nation Group Nari Nari he is a leader, working with his elders to make sure their views are incorporated into the new regime of Water Planning within the states and Basin. Rene was an integral member of the Nari Nari Tribal Council which was successful in securing Land and Water entailments for his Nation with the Indigenous Land Corporation purchasing property within his Nation Boundaries, with the property's becoming Indigenous Protected Areas, and with Nari Nari people working and caring on country.

Event Co-Sponsors



Australian Rivers Institute



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Living Rivers



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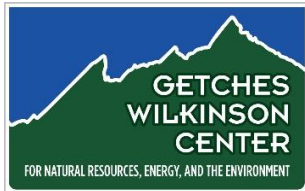
University of Wyoming High Plains American Indian Research Initiative

University of Colorado Law School



Established in 1892, the University of Colorado Law School is one of the top public law schools in the United States. Colorado Law School's diverse student body is selected from among the statistically best applicants from every corner of the nation representing over 100 undergraduate institutions, and its highly published faculty is dedicated to interacting with students both inside and outside the classroom. The school's state-of-the-art green building is located at the base of the Rocky Mountains in beautiful Boulder, Colorado. With about 500 students and a low student to faculty ratio, Colorado Law School is a thriving academic community where the study of law is embraced to create leaders who recognize the civic responsibilities essential to the legal profession.

Getches-Wilkinson Center for Natural Resources, Energy, and the Environment



The Getches-Wilkinson Center for Natural Resources, Energy and the Environment continues the long-standing work of Colorado Law's Natural Resources Law Center. The newly renamed Center endeavors to serve the people of the American West, the nation, and the world through creative, interdisciplinary research, bold, inclusive teaching and innovative problem solving in order to further true sustainability for our use of the lands, waters, and environment. Major programs and initiatives focus on natural resources, water and public lands issues in Colorado and the West; energy and environmental security in the developing world; electricity regulation and energy policy; climate change law and policy; and native communities and environmental justice. The name comes from the contributions of two iconic figures in the law school's environmental law history, David Getches and Charles Wilkinson.

Upcoming Events

9th Annual Schultz Lecture

***Featuring Paul Joskow, MIT Professor of Economics
President, Alfred P. Sloan Foundation***

Coming Thursday, September 22th

5:30 p.m.

University of Colorado, Boulder

Wolf Law Building, Wittemyer Courtroom

More information and registration coming soon to:

<http://www.colorado.edu/law/research/gwc/events>

40th Anniversary of the Federal Land Policy and Management Act of 1976

Coming Friday, October 21st

University of Colorado, Boulder

Wolf Law Building, Wittemyer Courtroom

More information and registration coming soon to:

<http://www.colorado.edu/law/research/gwc/events>

Serving the people of the American West, the nation, and the world through creative, interdisciplinary research, bold, inclusive teaching, and innovative problem solving in order to further true sustainability for our lands, waters, and environment.

<http://www.colorado.edu/law/research/gwc>

