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EDUCATIONAL HISTORY:

Ph.D. 1991 CIVIL ENGINEERING, UNIVERSITY OF TEXAS, AUSTIN, TEXAS.

Doctor of Philosophy Degree in Civil Engineering within the Department of Environmental and Water Resources Engineering ... Dissertation topic in the area of Surface Water Quality Modeling with emphasis on prediction of macrophyte growth, epiphytic algae populations, and nutrient concentrations as a result of wastewater discharges and nonpoint source loadings ... Dissertation: "Modeling Water Quality and Biota in the Colorado River Below Austin, Texas."

MSCE 1983 PURDUE UNIVERSITY, WEST LAFAYETTE, INDIANA.

Master of Science Degree in Civil Engineering specializing in Hydrology/Hydraulics received in May, 1983 ... Thesis research involved developing two computer programs to automate widely accepted design procedures ... Thesis: "Computer Programs for the Design of Pressure Sanitary Sewers and for Determining the Structural Design of Buried Rigid Pipes."

BSCE 1981 UNIVERSITY OF NEW HAMPSHIRE, DURHAM, NEW HAMPSHIRE.

Bachelor of Science Degree in Civil Engineering specializing in Constructed Systems (Structures) received in May, 1981.

EMPLOYMENT HISTORY:

From 8/13 UNIVERSITY OF UTAH, SALT LAKE CITY, UTAH.
To Present

- ◆ Chair, Civil and Environmental Engineering, August 2013 to Present
- ◆ Professor of Civil and Environmental Engineering, August 2013 to Present
- ◆ Interim Director, Nuclear Engineering Program, January 2017 to 2020

Currently serving as Chair of Civil and Environmental Engineering in an administrative position responsible for facilitating operations involving teaching, research, and service activities within the Department and participating in leadership meetings within the College of Engineering.

Also, as a Professor in the Department of Civil and Environmental Engineering my responsibilities include teaching undergraduate and graduate classes, developing externally funded research proposals and budgets, advising and supervising undergraduate and graduate students, publishing and reviewing technical papers, and serving on graduate committees.

Established a new Bachelor of Science Degree in Construction Engineering effective 8/16. Included writing a proposal to Utah Technology Council for three new faculty positions and one additional administrative professional.

Courses Taught

Undergraduate:

Junior/Senior Seminar
 Statistics/Engineering Economics
 Intro to Environmental Engineering

Graduate:

Flood Modeling
 Water Quality Modeling

Graduate Students Supervised

Student Name	Degree & Year	University	Thesis Title
Mohammad Hasan	MS/15	UU	Post-Harvesting Woody Biomass Harvesting Impacts on Erosion and Runoff
Zubayed Rakib	MS/16	UU	Predicting Nutrient and Dissolved Oxygen Concentrations in the Spokane River Under Future Development and Climate Conditions
Taylor Smith	MS/17	UU	Evaluating the Hydrological Impact of Removing Woody Biomass for Biofuel Production through Unsaturated Zone Modeling
Sulochan Dhungel	PhD/19	UU	Predicting Watershed-scale Agricultural Water Consumption using Statistical and Cropping Systems Models with Satellite-based Remote Sensing
Juhn-Yuan Su	PhD/21	UU	Water Quality Trading: A Conceptual Framework for Addressing Water Quality Goals with Pollutant Reduction Performance Subject to Climate Change
Mohammad Hasan	PhD/21	UU	An Integrated Approach to Determine the Changes in Responses of Mountainous Watersheds as a Source of Water Supply Under Future Climate Change Scenarios
Nicholas von Stackleberg	PhD/23	UU	Modeling Sediment Resuspension in Shallow Lakes (in progress)

Rajendra Khanal	PhD/23	UU	Remote Sensing of Crop Water Use Requirements (in progress)
Ry Weber	MS/23	UU	Hydropower and Climate Change (in progress)
Bibek Acharya	PhD/24	UU	Remote Sensing in Water Resources (in progress)

From 8/94 WASHINGTON STATE UNIVERSITY, PULLMAN, WASHINGTON.

To 7/13

- ◆ Director, State of Washington Water Research Center, December 2001 to July 2013
- ◆ Professor of Civil and Environmental Engineering, August 2008 to July 2013
- ◆ Director, Center for Environmental, Sediment and Aquatic Research, May 2008 to May 2009
- ◆ Associate Professor of Civil and Environmental Engineering, August 1999 to August 2008
- ◆ Assistant Professor of Civil and Environmental Engineering, August 1994 to August 1999

Served as Director of the State of Washington Water Research Center (SWWRC), a 50% administrative position responsible for facilitating research activities and promoting water issues throughout the State. The SWWRC is part of the National Institutes for Water Resources (NIWR), receives and distributes federal funding from the US Geological Survey. The Director is responsible for implementing the SWWRC's threefold mission to: i) oversee and conduct applied water-related research, ii) foster the education and training of our Nation's future water professionals, and iii) transfer research results to those who manage or use the Nation's water resources. This includes conducting and evaluating an annual call for proposals, submitting USGS annual reports, promoting water-related activities throughout the university, interfacing with WSU Extension specialist, and building an international reputation for WSU in the water resources arena. In addition, I currently serve on the NIWR Board of Directors which carries the added responsibilities of being active in monthly conference calls, developing a Strategic Plan, debating performance metrics, attending three Board meetings annually, and keeping track of legislation impacting the Institutes program. Furthermore, I was elected Secretary in 2004, so I am responsible for taking meeting minutes and distributing them to the other Board members.

Also, a tenured faculty member in the Department of Civil and Environmental Engineering. Responsibilities include teaching undergraduate and graduate classes, developing externally funded research proposals and budgets, advising and supervising undergraduate and graduate students, publishing and reviewing technical papers, and serving on graduate committees.

- ◆ Water Research Center Program Director for Water Resources and Biotic Systems, October 1999 to November 2001
 - ◆ Served as Secretary of the National Institute for Water Resources, March 2004- June 2009
 - ◆ Elected to University Council on Water Resources Board of Directors, July 2004-July 2009
- Served as Past President July 2010-July 2011.
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- Served as President July 2009-July 2010.

- ◆ University Representative for Consortium of Universities for the Advancement of Hydrologic Science (CUAHSI), May 2002-Present
- ◆ Sabbatical Leave at w|Delft Hydraulics, The Netherlands, August 2000-2001

Courses Taught

Undergraduate:

Water Resources Engineering
Open Channel Flow
Hydraulic Design

Graduate:

Open Channel Flow
Surface Water Hydrology
Surface Water Contaminant Transport
Ecological Concepts and Modeling
Sediment Transport
Hydraulics Seminar

Graduate Students Supervised

Student Name	Degree & Year	University	Thesis Title
Steve Lundgren	MSCE/93	Tulane	Enhanced Runoff Quality and Quantity Modeling
Chuck Harrell	MSCE/93	Tulane	Underground Storage Tank Management using a KBES
Peikang Jin	MSCE/94	Tulane	Numerical Simulation of Variable Density Deep-Well Injections
Sonya Agnasi	MSCE/94	Tulane	Modflow Analysis of Deep-Well Injection near Geismar, LA
S Chunduru	PhD/96	Tulane	Material Performance and Numerical Modeling of HDPE Liners
Tonja Koob	MSCE/96	Tulane	A Decision Support System for Constructed Wetland Design
Randall Downs	MS/95	WSU	Investigation of Culvert Hydraulics Related to Juvenile Fish Passage
Steve King	MS/97	WSU	Environmental Compliance of Roadway Runoff
Arn Coombs	MS/98	WSU	Analysis of Mixing in Wet Ponds Through Physical Modeling
Ted Perkins	MS/00	WSU	Stream Channel Restoration After Dam Removal
Kevin Timmins	MS/00	WSU	Continuous Simulation Versus Return Period Design of Wetponds and Constructed Wetlands
Eric Rowland	MS/01	WSU	Predicting Fish Passage Design Flows at Ungaged Streams in

			Eastern Washington
Mo'ayyad Shawaqfah	PhD/02	WSU	Migration Pathways of Pesticides into Streams
Teresa Hauser	MS/03	WSU	Effects of Nutrient Applications on Primary Productivity and Lake Species Fractions in Oligotrophic Alpine Lakes of the Sawtooth Valley, Idaho
Janet Snedecor	MS/04	WSU	Recycling Jordan's Water: Identification of Monitoring Program Requirements
Gregg Teasdale	PhD/05	WSU	Satellite and Aerial Imaging in Characterization, Hydrologic Analysis, and Modeling of Inland Watersheds and Streams
Elizabeth Milburn	MS/07	WSU	The Effects of Dredging on Dissolved Oxygen in Agricultural Waterways in King County, Washington
Erik Pruneda	MS/07	WSU	Use of Stream Response Functions and STELLA Software to Determine Impacts of Replacing Surface Water Diversions with Groundwater Pumping Withdrawals on Instream Flows within the Bertrand Creek and Fishtrap Creek Watersheds
Zain Al-Houri	PhD/08	WSU	Modifications of the Existing Design Parameters to Improve the Performance of Infiltration Treatment BMPs in Cold Climates
Katie Mozes	MS/08	WSU	Evaluating the Cost Implications of Fish Passage Culvert Replacement in Washington State
Laura Garcia	MS/10	WSU	Estimating Groundwater Recharge via Surface Infiltration in Cold Semi-Arid Regions
Travis Lopes	MS/10	WSU	Spatial and Temporal Precipitation and Their Effects on Queets Watershed Runoff in the Olympic Experimental State Forest
SM Helalur Rashid	MS/10	WSU	Effectiveness of Widely Used Critical Velocity and Bed Shear Stress Equations for Different Types of Sediment Beds
Colt Shelton	MS/11	WSU	An Analytical and Numerical Investigation of Stream/Aquifer Interaction Methodologies
Matt McDonald	MS/13	WSU	Climate Change Impacts on Reservoir Operations in the Columbia River Basin
Lai Tran	MS/15	WSU	Lake Water Quality Management of Lake Osoyoos
Lisa Dilly	PhD/16	WSU	The Economic Feasibility of Pumped Storage Hydropower

From 8/91 ASSISTANT PROFESSOR, TULANE UNIVERSITY, NEW ORLEANS, LOUISIANA.
To 8/94

Worked as an assistant professor in a tenure track position within the Department of Civil and Environmental Engineering at Tulane University. Responsibilities include teaching undergraduate and graduate classes, developing an undergraduate specialization in environmental engineering, advising and supervising undergraduate and graduate students, developing research proposals and budgets, publishing and reviewing technical papers, and serving on graduate committees.

Spent summer of 1993 working for U.S. Environmental Protection Agency in area of wetlands hydrologist reviewing plans and specifications associated with Louisiana wetlands restoration and protection plan.

Spent summer of 1992 at the U.S. Army Corps of Engineer's Waterways Experiment Station in Vicksburg, Mississippi conducting research on expert systems and groundwater contaminant transport and flow model evaluations.

Courses Taught

Undergraduate:

Hydraulic Engineering
Hydraulics Laboratory
Physical Principles in
Environmental Engr.

Graduate:

Surface Water Quality Modeling
Ground Water Quality Modeling
Physical Principles in Environmental Engineering
Surface Water Hydrology

From 9/88 RESEARCH ASSISTANT, UNIVERSITY OF TEXAS, AUSTIN, TEXAS.
To 8/91

Worked on modifying existing USEPA Water Quality Analysis Program (WASP4) to include the effects of ground water inflow, suspended sediment, unsteady flow, and point and nonpoint source pollutant loads on water quality and macrophyte growth rates in the Colorado River basin downstream of Austin, Texas. Also spent one semester teaching hydraulics lab. Instructed and corrected junior level introductory hydraulics laboratory on a half time basis. Assisted in the development of two additional lab assignments involving pipe network analysis and storm water drainage design.

From 6/83 PROJECT ENGINEER, KKBNA INC., WHEAT RIDGE, COLORADO.
To 7/88

Consulting engineer in the areas of water right investigations, computer simulations of water right operations in river basins, reservoir firm yield analyses, water resources planning, floodplain and floodplain reduction studies, drainage studies, and various other water resource projects ... Project manager for several surface water and ground water field monitoring networks, including coordination of data collection, implementation of data into computer databases, and analysis and dissemination of data to clients ... Programming and operation skills in both Fortran and Basic, including surface water operation models, water quality and

stream flow plotting programs ... Use and operation of simulation models such as HEC-1, HEC-2, and DAMBRK (Dam Break Simulator).

From 9/81 TEACHING ASSISTANT, PURDUE UNIVERSITY, WEST LAFAYETTE, INDIANA.
To 12/82

Instructed and corrected junior level introductory hydraulics laboratory on a half time basis (concurrent with being a full-time student). Proctored and graded exams. Conducted help sessions for homework problems. Selected as lab coordinator during final semester.

Summers CIVIL ENGINEER, US COLD REGIONS RESEARCH AND ENGINEERING
'80, '81 LABORATORY (CRREL), HANOVER, NEW HAMPSHIRE.

Performed computer-based research to test theoretical models involving frost heave and ice lens formation. Experimented with computer model to develop correct soil parameters. Simulated long-term performance of airport runway due to freeze/thaw cycles and wrote report on conclusions and results.

RESEARCH ACTIVITIES:

University of Utah:

“University Partnership Countering Climate Change in Sindh and Balochistan,” PI Michael Barber, U.S. Department of State, \$499,651. (September 30, 2022 – September 30, 2025).

“Higher Education System Strengthening Activity (HESSA),” PI Michael Barber, Co-PI Cheri Daily, US Agency for International Development, Washington, DC, \$18,999,710. (August 2021 - August 2026).

“Irrigation Technologies,” PI Michael Barber, Utah Department of Natural Resources, Salt Lake City, UT, \$137,827. (December 2019 - June 2020).

“NRC Fellowships,” PI Michael Barber, Co-PI Luther McDonald, Tara Mastren, Ed Cazalas, U.S. Nuclear Regulatory Commission, \$462,154. (September 2019-August 2023).

“National Summer Transportation Institute Program,” PI Michael Barber, Federal Highways Administration, Las Vegas, Nevada, \$20,000. (June 2019 - August 2019).

“Technology for Trade: New Tools and New Rules for Water Use Efficiency in Agriculture and Beyond,” PI Michael Barber, US Department of Agriculture (subcontract from WSU), Washington, DC, \$247,041. (July 2018 - June 2022).

“National Summer Transportation Institute Program,” PI Michael Barber, Co-PI Amanda Bordelon, Richard Porter, Pedro Romero, and Milan Zlatkovic, Federal Highways Administration, Las Vegas, Nevada, \$20,000. (June 2016 - September 2016).

“Prediction of Nonlinear Climate Variations Impacts on Eutrophication and Ecosystem Processes and Evaluation of Adaptation Measures in Urban and Urbanizing Watersheds,” PI Michael Barber, Co-PI Steve Burian, Ramesh Goel, Sarah Hinnners, Brent Clark, US Environmental Protection Agency, Washington, DC, \$1,250,000. (September 2015-August 2020).

“USAID Funded Partner Center for Advanced Studies in Water (PCASW),” PI Steven Burian, Co-PI Tariq Banuri, Michael Barber, US Agency for International Development, Washington, DC, \$9,853,708. (January 2015 - December 2019).

“Utah Transportation and Public Safety - Crash Data Initiative (UTAPS-CDI),” PI Richard Porter, Co-PI Michael Barber, Utah Department of Public Safety and Utah Department of Transportation, Salt Lake City, Utah, \$357,860. (January 2015 - March 2016).

“Remote Sensing of Evapotranspiration - 2016 Columbia River Forecast,” PI Michael Barber, subcontract from WSU for Washington State Department of Ecology Project, \$236,277. (September 2014 - June 2017).

“National Summer Transportation Institute Program,” PI Michael Barber, Co-PI Amanda Bordelon, Richard Porter, Pedro Romero, and Milan Zlatkovic, Federal Highways Administration, Las Vegas, Nevada, \$20,000. (June 2014 - September 2014).

“Northwest Advanced Renewables Alliance (NARA): A New Vista for Green Fuels, Chemicals, and Environmentally Preferred Products (EPPs),” PI Michael Barber, subcontract from WSU NARA Project led by Michael Wolcott, U.S. Department of Agriculture, Washington, DC. \$47,471. (August 2013 - July 2014).

Washington State University:

“USGS Base Grant for National Institute of Water Resources,” PI Michael Barber, United States Geological Survey, Washington, D.C., \$55,400 total, \$1,400 for operating budget, \$54,000 for base grants. (March 2013 - February 2014).

“Watershed Integrated System Dynamics Modeling (WISDM): Feedbacks among Biogeochemical Simulations, Stakeholder Perceptions, and Behaviors,” PI Cailin Orr, Co-PIs Jennifer Adam, Michael Barber, Allyson Beall, Michael Brady, Cary Gazis, John Harrison, Kent Keller, Chad Kruger, Brian Lamb, Claudio Stockle, and Jonathan Yoder, National Institute of Food and Agriculture, U.S. Department of Agriculture, Washington, DC. \$1,495,640. (August 2012 - August 2017).

“USGS Base Grant for National Institute of Water Resources,” PI Michael Barber, United States Geological Survey, Washington, D.C., \$92,335 total, \$8,335 for operating budget, \$84,000 for base grants. (March 2011 - February 2012).

“Northwest Advanced Renewables Alliance (NARA): A New Vista for Green Fuels, Chemicals, and Environmentally Preferred Products (EPPs),” PI Michael Wolcott and Norman Lewis, Co-PIs Michael Barber and Brian Lamb, U.S. Department of Agriculture, Washington, DC. \$369,725. (August 2011 - July 2013).

“Pacific Northwest Regional Water Quality Coordination,” PI Michael Barber, USDA Cooperative State Research, Education, and Extension System, Washington, D.C., subcontracted through University of Idaho, Moscow, Idaho, \$239,500. (October 2010 - September 2013).

“Collaborative Research: WSC-Category 1. Sustainability Dynamics for Water Resources in a Rapidly Urbanizing and Climatically Sensitive Region,” PI Todd Norton, Co-PIs Allyson Beall, Brian Lamb, Eugene Rosa, and Michael Barber, National Science Foundation, Washington, DC. \$74,729. (September 2010-August 2012).

“USGS Base Grant for National Institute of Water Resources,” PI Michael Barber, United States Geological Survey, Washington, D.C., \$92,335 total, \$8,335 for operating budget, \$84,000 for base grants. (March 2010 - February 2011).

“Evaluation of Sediment Yield Reduction Potential for Agricultural Lands Contributing to Lower Granite Reservoir,” PI Michael Barber, Co-PIs Jeff Ullman and Jan Boll, US Army Corps of Engineers, Walla Walla, Washington. \$264,100. (February 2010 - January 2011).

“Columbia River Basin Water Supply Investment Plan: A Strategy to Develop Water Supply to Meet Water Demand needs through 2030,” PI Jennifer Adam, Co-PIs Michael Barber, Claudio Stockle, Michael Brady, Chad Kruger, Troy Peters, Jonathan Yoder, David Granatstein and Thomas Marsh, Washington State Department of Ecology, Olympia, Washington. \$974,500. (October 2009 - December 2011).

“Lake Osoyoos Drought Studies,” PI Michael Barber, Co-PIs Marc Beutel, Cailin Orr, and Barry Moore, Washington State Department of Ecology, Olympia, Washington. \$149,996. (September 2009 - June 2011).

“INRA Spatial Recharge in the Spokane Valley-Rathdrum Prairie (SVRP) Watershed under Climate Change Scenarios,” PI Michael Barber, Co-PIs Jenny Adam and Jonathan Yoder, Inland Northwest Research Alliance, Idaho Falls, Idaho, \$80,000. (July 2009 - December 2010).

“Investigating Hydraulic Performance Characteristics of Pulsating, Submerged Jets using Flume Testing in Relationship to the M3 Test Platform,” PI Michael Barber, Co-PIs Cara Poor, Bill Cofer, Balasingam Muhunthan, David Stock, and Shelley Pressley, Energy Solutions (US Department of Energy), Richland, Washington, \$859,231. (May 1, 2009 - June 31, 2010).

“Planning and Mobilization for Hanford Tank Waste Treatment - M3 Flume Testing,” PI Michael Barber, Co-PI Bill Cofer, Energy Solutions (US Department of Energy), Richland, Washington, \$16,865. (April 1, 2009 - May 1, 2009).

“USGS Base Grant for National Institute of Water Resources,” PI Michael Barber, United States Geological Survey, Washington, D.C., \$92,335 total, \$20,335 for operating budget, \$72,000 for base grants. (March 2009 - February 2010).

“Spokane Valley-Rathdrum Prairie Aquifer Storage and Recovery for Summer Flow Augmentation of the Columbia River,” PI Michael Barber, Co-PIs Akram Hossain and Cara Poor, Washington Department of Ecology, Spokane, Washington, \$250,000. (January 2009 - June 2011).

“INRA Constellation of Experimental Watersheds (ICEWATER),” PI Michael Barber, Co-PI Jonathan Yoder, Inland Northwest Research Alliance, Idaho Falls, Idaho, \$51,000. (January 2009 - December 2010).

“INRA Water Research Consortium - Phase 3,” PI Michael Barber, Co-PI Jonathan Yoder, Inland Northwest Research Alliance, Idaho Falls, Idaho, \$25,000. (January 2009 - December 2009).

“Water Resources Programs in the Pacific Northwest,” PI Michael Barber, USDA Cooperative State Research, Education, and Extension System, Washington, D.C., subcontracted through University of Idaho, Moscow, Idaho, \$68,750. (October 2008 - August 2009).

“Enhancing Summer Instream Flow and Reducing Temperature in Agricultural Watersheds,” PI Shulin Chen, Co-PIs Michael Barber and Joan Wu, Bonneville Power Authority (Northwest Power Planning Council), Portland, Oregon \$224,766 (October 2008 - March 2010).

“Middle Snake-WRIA 35 Stream Habitat Assessments,” PI Jeff Ullman, Co-PI Michael Barber, Asotin County Public Utility District, Clarkston, Washington \$35,063. (August 2008-June 2009).

“USGS Base Grant for National Institute of Water Resources,” PI Michael Barber, United States Geological Survey, Washington, D.C., \$92,335 total, \$23,370 for operating budget, \$68,965 for base grants. (March 2008 - February 2009).

“Skagit County Water Quality Monitoring Program Review,” PI Michael Barber, Skagit County, Mount Vernon, Washington \$20,000. (December 2007-March 2008).

“Investigation of Spatial Recharge in the Spokane Valley Rathdrum Prairie Aquifer,” PI Michael Barber, Co-PI Akram Hossain, Washington Department of Ecology, Spokane, Washington, \$134,845. (July 2007 - June 2008).

“Snow Redistribution and Water Storage at a Watershed Scale: Field Investigation and WEPP

Simulation,” PI Joan Wu, Co-PIs Michael Barber and David Huggins, Inland Northwest Research Alliance, Idaho Falls, Idaho, \$62,500. (June 2007 - May 2009).

“Investigating Primary Productivity of Dworshak Reservoir after Nutrient Addition,” PI Michael Barber, TerraGraphics, Moscow, Idaho, \$13,492. (April 2007 - October 2007).

“USGS Base Grant for National Institute of Water Resources,” PI Michael Barber, United States Geological Survey, Washington, D.C., \$92,335 total, \$23,370 for operating budget, \$68,965 for base grants. (March 2007 - February 2008).

“EXACT Needs Assessment for Israeli, Palestinian and Jordanian Water and Agriculture Sectors,” PI Michael Barber, United States Department of Agriculture - Foreign Agricultural Service, Washington, D.C., \$9,185. (February 2007 - June 2007).

“INRA Water Research Consortium - Phase 2,” PI Michael Barber, Co-PI Phil Wandschneider, Inland Northwest Research Alliance, Idaho Falls, Idaho, \$39,586. (January 2007-September 2007).

“INRA Water Research Consortium Needs Assessment,” PI Phil Wandschneider, Co-PI Michael Barber, Inland Northwest Research Alliance, Idaho Falls, Idaho, \$12,482. (August 2006-December 2006).

“USGS Base Grant for National Institute of Water Resources,” PI Michael Barber, United States Geological Survey, Washington, D.C., \$92,335 total, \$23,370 for operating budget, \$68,965 for base grants. (March 2006 - February 2007).

“INRA Water Research Consortium,” PI Michael Barber, Co-PI Phil Wandschneider, Inland Northwest Research Alliance, Idaho Falls, Idaho, \$29,838. (January 2006-September 2006).

“Environmental Investigation of Heavy Metals in Highway Runoff,” PI Michael Barber, Co-PI David Yonge, Washington State Department of Transportation, Olympia, Washington, \$39,586. (January 2006- December 2006).

“Bertrand and Tenmile Studies and Ground Water Modeling,” PI Michael Barber, Co-PI Joan Wu, Whatcom County Public Works, Bellingham, Washington, \$154,971. (November 2005 - May 2007).

“Transient and Steady State Groundwater Flow Modeling of the Spokane Valley-Rathdrum Prairie Aquifer,” PI Michael Barber, Co-PI Akram Hossain, Washington Department of Ecology, Spokane, Washington, \$136,240. (October 2005 - June 2008).

“A Preliminary Numerical Flow Model Development for the Spokane Valley-Rathdrum Prairie Aquifer,” PI Akram Hossain, Co-PI Michael Barber, United States Geologic Survey, Tacoma, Washington, \$43,861. (July 2005 - November 2005).

“USGS Base Grant for National Institute of Water Resources,” PI Michael Barber, United States Geological Survey, Washington, D.C., \$92,524 total, \$11,524 for operating budget, \$81,000 for base grants. (March 2005 - February 2006).

“Improving Groundwater Management in Jordan,” PI Michael Barber, US Geological Survey, Reston, Virginia, \$204,572. (January 2005 – December 2007).

“Runoff Treatment BMP Design for Highway Runoff in Cold Climates,” PI Michael Barber, Co-PIs Marc Beutel, David Yonge, Federal Highways Administration, Washington, DC. \$200,000. (January 2005 - December 2006).

“Water Quality Coordination Grant,” PI Michael Barber, USDA Cooperative State Research, Education, and Extension System, Washington, D.C., subcontracted through University of Idaho, Moscow, Idaho, \$196,000. (September 2004 - September 2008).

“Spokane Valley Rathdrum Prairie Groundwater Model Evaluation,” PI Michael Barber, Co-PI Akram Hossain, Washington Department of Ecology, Spokane, Washington, \$20,000. (August 2004 - May 2005).

“Little Spokane Total Maximum Daily Load Project - Phase II,” PI Michael Barber, Co-PI Shulin Chen, Washington Department of Ecology, Olympia, Washington, \$212,602. (July 2004 - June 2006).

“Walla Walla River Temperature Study,” PI Michael Barber, Economic and Engineering Services, Portland, Oregon, \$28,438. (June 2004-December 2004).

“Determining Primary Productivity in Alturas Lake, Pettit Lake, Redfish Lake, and Stanley Lake, Idaho during 2004,” PI Michael Barber, Biolines Environmental Consulting, Stanley, Idaho, \$29,181. (June 2004 - December 2004).

“USGS Base Grant for National Institute of Water Resources,” PI Michael Barber, United States Geological Survey, Washington, D.C., \$92,524 total, \$22,524 for operating budget, \$70,000 for base grants. (March 2004 - February 2005).

“TMDL Sediment Data Collection,” PI Michael Barber, Co-PI Rollin Hotchkiss, Idaho Department of Environmental Quality, Lewiston, Idaho, \$29,999. (January 2004 - May 2005).

“Little Spokane Total Maximum Daily Load Project - Phase I,” PI Shulin Chen, Co-PI Michael Barber, Washington Department of Ecology, Olympia, Washington, \$15,672. (January 2004 - June 2004).

“Water Quality Coordination Grant,” PI Michael Barber, USDA Cooperative State Research, Education, and Extension System, Washington, D.C., subcontracted through University of Idaho, Moscow, Idaho, \$50,000 (September 2003 - September 2004).

“Determining Primary Productivity in Alturas Lake, Pettit Lake, Redfish Lake, and Stanley Lake, Idaho,” PI Michael Barber, Biolines Environmental Consulting, Stanley, Idaho, \$29,182. (June 2003 - December 2003).

“Tucannon River Instream Flow Study,” PI Michael Barber, Economic and Engineering Services, Portland, Oregon, \$6,000. (May 2003-June 2003).

“Walla Walla Basin Instream Flow Studies,” PI Michael Barber, Economic and Engineering Services, Portland, Oregon, \$25,500 (March 2003 - September 2003).

“USGS Base Grant for National Institute of Water Resources,” PI Michael Barber, United States Geological Survey, Washington, D.C., \$84,234 total, \$34,234 for operating budget, \$50,000 for base grants. (March 2003 - February 2004).

“Water Quality Coordination Grant,” PI Michael Barber, USDA Cooperative State Research, Education, and Extension System, Washington, D.C., subcontracted through University of Idaho, Moscow, Idaho, \$62,000 (September 2002 - September 2003).

“Jordan Skills Enhancement Project,” PI Jan Noel, Co-PI Michael Barber, US Agency for International Development, Washington, D.C., \$850,000. (July 2002 - June 2004).

“Determining Primary Productivity in Alturas Lake, Pettit Lake, Redfish Lake, and Stanley Lake, Idaho,” PI Michael Barber, Biolines Environmental Consulting, Stanley, Idaho, \$26,782. (June 2002 - December 2002).

“Research Study to Determine Optimal Maintenance Practices for Agricultural Drainage Watercourses in Lowland Agricultural Areas in King County,” PI Chris Feise, Co-PIs Shulin Chen and Michael Barber, King County Department of Natural Resources, Seattle, Washington, \$810,000 (includes \$140,000 subcontract to UW). (April 2002-December 2006).

“USGS Base Grant for National Institute of Water Resources,” PI Michael Barber, United States Geological Survey, Washington, D.C., \$84,234 total, \$34,234 for operating budget, \$50,000 for base grants. (March 2002 - February 2003).

“Design of Bank Barbs in the State of Washington,” PI Thanos Papanicolaou, Co-PIs Rollin Hotchkiss and Michael Barber, Washington State Department of Transportation, Olympia, Washington, \$69,000. (June 2001 - June 2003).

“Instream Flow Incremental Methodology Analysis and Streamflow Data Collection of the Touchet River System within Columbia County,” PI Darin Saul, Co-PI Michael Barber, Columbia Conservation District, Dayton, Washington, \$42,500. (May 2000 - October 2001).

“Modeling Dworshak Reservoir Operations for Biological Enhancement,” PI Michael E. Barber, Co-PI Steve Juul, Nez Perce Tribe, Orofino, Idaho, \$24,923. (February 2000-September 2000).

“Development of Design Flows and Runoff Characteristic Equations for Small Ungaged Watersheds in Critical Fish Habitat Areas,” PI Rollin H. Hotchkiss, Co-PIs Michael E. Barber and Thanos N. Papanicolaou, Washington State Department of Transportation, Olympia, Washington, \$90,000. (November 1999-December 2001).

“Surface and Subsurface Transport Pathways of Non-point Agricultural Pollutants: Analysis of the Problem over Four Decades of Basin Scale,” PI Richelle Allen-King, Co-PIs Kent Keller, Michael Barber, and Marcus Flury, United States Geological Survey, Washington, DC, \$155,000. (September 1999-May 2002).

“Deicer Effects on Salmon Spawning Streams,” PI David Yonge, Co-PIs Michael Barber and Richard Watts, Washington State Department of Transportation, Olympia, Washington, \$100,607. (July 1999 - December 2000).

“Water Quality Sampling of Dworshak Reservoir and Chain Thermistor Deployment/Data Collection,” PI Steve Juul, Co-PI Michael Barber, Normandeau Associates, subcontract for US Army Corps of Engineers Project, WSU’s share \$26,939. (August 1999 - October 1999).

“Streambed Simulation in Road Culvert Designs for Culverts Used for Fish Passage,” PI Thanos Papanicolaou, Co-PIs Michael Barber and Rollin Hotchkiss, Washington State Department of Transportation, Olympia, Washington, \$72,300. (January 1999 - September 1999).

“Hemlock Dam Fish Passage Evaluation and Restoration Development,” PI Michael Barber, US Department of Agriculture, Forest Service, \$28,000 (December 1998 - July 1999).

“Watershed Assessment,” PI Shulin Chen, Co-PI Michael Barber, Pacific Watershed Institute, subcontract for US Environmental Protection Agency, WSU’s share \$31,000 (June 1998 - Dec 1998).

“Completion of the Limnological Assessment of the Lower Snake River as it Relates to Primary Productivity Modeling,” PI Steve Juul, CoPIs Michael Barber and William Funk, Normandeau Associates, subcontract for US Army Corps of Engineers Project, WSU’s share \$133,314, (June 1998 - September 1998).

“Evaluation and Modeling of Planktonic Productivity and Associated Limnological Parameters on the Lower Snake and Columbia Rivers,” PI Steve Juul, Co-PIs William Funk and Michael Barber, Normandeau Associates, subcontract for US Army Corps of Engineers Project, WSU’s share \$321,944, (April 1997 - March 1998).

“Discovering Hydrology: Development of Interdisciplinary Labs for All Academic Levels,” PI Richelle Allen-King, Co-PIs Michael Barber, Kent Keller, Larry Davis, and Wade Hathhorn, NSF-ILI, \$36,521. (May 1997 - April 1999).

“Wet Detention Pond Design for Highway Runoff Pollutant Control,” PI David Yonge, Co-PIs

Michael Barber and Shulin Chen, NCHRP, Washington, D.C., \$600,000. (February 1996 - December 1999).

“Best Management Practices for Stormwater Runoff in Confined Spaces,” PI Michael Barber, Washington State Department of Transportation, Olympia, Washington, \$75,000. (December 1995 - December 1997).

“Stormwater Runoff - Cost/Benefit Analyses,” PI Michael Barber, Washington State Department of Transportation, Olympia, Washington, \$45,059. (January 1995 - May 1996).

Tulane University:

"Evaluation of U-Liner Technology for Trenchless Sewer Rehabilitation" Louisiana Education Quality Support Fund (LEQSF), Subprogram B (Industrial Ties), Tulane No. 5-32023, Baton Rouge, Louisiana, PI Reda Bakeer, Co-PI Michael Barber, \$377,500. (June 1993 - June 1996).

"Pore Pressure Response of Shallow Marine Sediments to Wave and Current Loadings," Naval Research Laboratory, Stennis, Mississippi, PI Glen Andersen, Co-PIs Michael Barber and Reda Bakeer, \$100,160. (August 1993 - August 1995).

"Expert Geographical Information Systems for Assessing Hazardous Wastes in Aquatic Environments" U.S. Department of Energy (DOE), DE-FG01-93EW53023, Tulane No. 5-33958, Washington, D.C., Co-PI's R. Bakeer, B. Belkhouche, CBR, and School of Public Health, \$377,554. (April 1993-December 1993).

"Expert System and Model Evaluation for Groundwater Remediation," PI Michael Barber, U.S. Army Research Office, Battelle, Research Triangle Park, North Carolina, \$25,000. (May 1993 -May 1994).

"Knowledge-Based Expert Systems for Ballistic Analyses," PI Michael Barber, U.S. Army Research Office, Waterways Experiment Station, Vicksburg, Mississippi, \$24,910. (March-December 1993).

"Subsurface Investigation of the Geismar, Louisiana Area," Louisiana Department of Environmental Quality, Baton Rouge, Louisiana, PI Michael Barber, Co-PIs Reda Bakeer, Robert Reimers and George Flowers, \$48,840. (February-December 1993).

"Evaluation of Models and Development of an Expert System for Groundwater Remediation," PI Michael Barber, Interpersonnel Agreement, U.S. Army Corps of Engineers, Waterways Experiment Station, Vicksburg, Mississippi, \$13,158. (May-August 1992).

Software Grant. Landmark Graphics Corporation, Houston, Texas, PI George Flowers, Co-PI Michael Barber, \$230,350. (March 1993).

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J.Y. Su, R.Goel, S. Burian, S.J. Hinnners, A. Kochanski, C. Strong, and M.E. Barber, (2021). “Water Quality Trading Framework with Uncertainty for River Systems Due to Climate and Population Characteristics.” *Water*, 13(13), 1738; <https://doi.org/10.3390/w13131738>

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PROFESSIONAL:

Registered Professional Engineer in State of Colorado - No. 24415
Member of American Society of Civil Engineers
Member Committee on Potable Groundwater Quality 1993-1996
Faculty Advisor for Tulane Student Chapter 1992-1994
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GRADUATE COURSEWORK:

Classes taken at The University of Texas:

Stream & Estuary Analysis	Water Quality Modeling
Statistics in Water Resources	Engr Hydrology: Surface Water
Water Resources Plan and Mgmt	Water Pollution Ecology
Groundwater Pollut and Transport	Numerical Methods
Stochastic Process in Water Res	Surface Phenomena
Hydraulic Transport of Pollutants	Fourier and Laplace Transforms
Finite Elements	

Classes taken at Purdue University:

Hydrology	Environmental Fluids II
Open Channel Flow	Design of Hydraulic Structures
Environmental Fluids I	Small Dam Design
Stochastic Concepts	Pressure Sewer Design
Subsurface Hydrology	

