KF2 CONSULTING
water - science - engineering
P.O. Box 1484, Helena, MT 59624

Dr. Kyle F. Flynn, P.E., P.H.

Curriculum vitae

Education

Ph.D. Civil & Environmental Engineering
Tufts University, 2014

M.S. Environmental Science & Water Resources
University of Idaho, 2007

B.A. Environmental Science
University of Montana Western, 1999

Registrations & Affiliations

MT Professional Engineer # 38373
AIH Professional Hydrologist # 1683
American Society of Civil Engineers
American Water Resources Assoc.

Leadership

TSU Structured Mentoring Program
Assistant Professor

Awards

2021 –ASCE Samuel Greeley Award
2015–ASCE Horner Award
2014–Earle F. Littleton Award
2013–Reviewer of the Year, JEQ
2010–Governor's Award

Areas of Expertise

- Surface water-quality
- Hydrology and hydraulics
- Watershed modeling
- Eutrophication/toxics
- Sediment
- GIS/Remote Sensing
- Limnology

Software/Models

QUAL2K, SWMM, SWAT, GWLF, CE-QUAL-W2, HEC-HMS, HEC-RAS, HEC-SSP, R, VBA, Python, ArcGIS, LOADEST, HydroCAD, PeakFQ, SWSTAT

Years of Experience

23

Professional & Academic Experience

My primary experience involves the application and development of numerical modeling tools to help solve complex water resource issues. I am an expert in surface water-quality modeling, hydrologic and hydraulic model development, water resources engineering, nutrient and algal interactions, toxics, and experimental methods to improve the underlying process science of water-quality models. I have worked extensively in both the private and public sector providing science-based, and engineering-oriented, water resource solutions.

2015 – current	KF2 Consulting, Helena, MT: Principal Engineer/Scientist providing expert water science and engineering opinions for civil and criminal litigation.
2018 – 2022	CDM Smith, Helena, MT: Senior Water Resources Engineer, responsible for supervision, oversight, and mentoring of 3 to 6 junior staff for hydrologic and hydraulic engineering projects.
2019 – 2020	Carroll College, Helena, MT: Assistant Professor, lecturer of groundwater and civil and environmental engineering courses.
2004 – 2018	Department of Environmental Quality (DEQ), Helena, MT: Lead Scientist/Engineer, responsible for statewide water-quality modeling program development and management.
2011 – 2014	Tufts University, Medford, MA: Research Engineer and Teaching Assistant, responsible for water-quality modeling, field and laboratory experimentation, and remote sensing.
1999 – 2004	Clear Creek Hydrology, Inc., Bozeman, MT: successively, Engineering Technician, Hydrologist, and Project Manager, responsible for hydrologic and hydraulic analysis.
1996	Montana Conservation Corps (AmeriCorps), Townsend, MT: Assistant Crew Leader/Supervisor, responsible for land stewardship activities in various locations of Montana.

Representative Professional Experience

Testimony and Expert Panels

Testimony, Depositions, or Expert Opinions: Expert testimony for Montana Department of Fish, Wildlife & Parks (FWP) about Vollenweider flushing flow requirements to maintain oligotrophy to secure water rights for five lakes in the Clearwater River chain (letter of commendation from Jeff Hagener, FWP Director). Expert report and deposition testimony regarding flooding on Big Sandy Creek, MT (HEC-RAS analysis). HEC-RAS and HydroCAD modeling in support of the Billings International Airport flood litigation (opinion/report).

HEC-HMS and HEC-RAS (2D) unsteady flow/dam breach review for Arroyo Doble Subdivision flooding litigation (opinion). HEC-HMS model development (including PMP) for dam spillway design and potential litigation at Echo Lake, TX. Water balance and conveyance analysis for water rights objection for Racetrack Creek, MT (opinion). HEC-RAS (2D) analysis of East Gallatin River for flooding lawsuit (opinion). Independent evaluation of hydrologic/hydraulic analysis for Red Fox Meadow Subdivision (opinion). Construction of water and arsenic mass balance for the Yellowstone River to evaluate the importance of naturally occurring arsenic from the Yellowstone Caldera (opinion). Model development of proposed closed system Gordon Butte hydropower project to evaluate salinity and total dissolved solids water-quality concerns (opinion). Expert report regarding water temperature scald investigation for criminal litigation including dye investigation of burn patterns (opinion/report).

Expert Panels/Advisory Boards: Delegate for bi-national Elk Valley Area-Based Management Plan Technical Advisory Committee regarding selenium pollution in Lake Koocanusa resulting from mountain top coal mining in British Columbia. Co-chair of Geological Society of America (GSA) session for selenium, uranium, and radionuclides: geology, biogeochemistry, and ecosystem impacts from mining and other activities in the western U.S. and Canada. Technical expert for Consent Decree negotiations in Butte Priority Soils Operable Unit Superfund site. Technical expert/scientist for the Successor Coeur d' Alene Custodial Trust for remedial activity on the bed and banks of the Lower Coeur d' Alene River Superfund site. Collaborator on Water Environment & Reuse Foundation (WE&RF) team for developing modeling guidance for developing site-specific nutrient goals (LINK1T11). Advisory Scientist for LINK2T14, modeling guidance for developing site-specific nutrient goals – demonstration, Boulder Creek Colorado. Technical advisor to WE&RF to create modeling guidance for developing site-specific nutrient goals and screening level application (LINK4T17). Collaborator on WE&RF LINK3R16, evaluation of data needs for nutrient target-setting using the Nutrient Modeling Toolbox, including developing practical methods for assessing model uncertainty. External Review (letter) on the Literature Review on Nutrient-Related report on Rates, Constants, and Kinetics Formulations in Surface Water Quality Modeling for U.S. Environmental Protection Agency.

Environmental Engineering

Receiving-Water Modeling: Calibration and confirmation of steady-state 1-D QUAL2K and AT2K nutrient and dissolved oxygen models for 145 mi of the lower Yellowstone River to assess the feasibility of deriving numeric nutrient criteria using mechanistic water-quality models. Analysis of 219 mi of upper Yellowstone River for nutrient criteria development using the above approach. QUAL2K model development for 41 miles of the Missouri River from Three Forks to Canyon Ferry Reservoir for nutrient criteria development. Regulatory review of QUAL2Kw model of East Gallatin River for site-specific nutrient variance. Analytical model development of the Gallatin River to evaluate transport of nutrients from point- and non-point sources (first-order kinetics). Analysis of 66 mi reach of the Beaverhead River in QUAL2K to evaluate stream temperature improvement scenarios. Oversight of modeling of 82.3 mi of the Bitterroot River in QUAL2K to assess management options for improving instream water temperature. Oversight or project design on an additional 100 mi of temperature studies for streams and rivers across the state including the Boulder River, Jefferson River, Dearborn River, and Ashley Creek (QUAL2K models). Dynamic streamflow/temperature modeling for 95 mi of the Big Hole River for the purpose of evaluating streamflow and improvement scenarios and their influence on in-stream water temperature. TMDL temperature modeling of 17 mi of Divide Creek. Development of CE-QUAL-W2 hydrodynamic and water-quality model of Canyon Ferry Reservoir for nutrient management purposes. Development of EFDC dissolved oxygen model for Upper Red Rock Lake for engineering analysis. Compilation of rates and kinetics information related to algal growth (periphyton) and nutrient exchange (unpublished). Design of dye tracer investigation and drone mapping procedures to assess effluent dispersion characteristics in mixing zones. Co-developer of AT2K model.

Watershed Modeling: GWLF and SWAT model development for simulation of sediment and nutrients on the Big Hole River (2,790 mi^2) and Blackfoot River (2,290 mi^2) to estimate TMDL pollutant loading allocation. Scenario analysis (not model development) of various agricultural sediment BMPs in SWAT for the Clark Fork and Bitterroot River watersheds for TMDL

source assessment. Senior oversight of LSPC modeling for the Flathead Lake Watershed TMDL whose endpoint is Flathead Lake, one of the largest freshwater lakes in the United States. Development of a spatially distributed ArcGIS USLE sediment model of the Ruby River watershed (965 mi^2) to assist in TMDL load allocations using modified National Engineering Handbook procedures. Compilation of calibration coefficients for SWAT in mountainous headwater regions (unpublished).

Limnological Studies: Principal investigator of benthic nepheloid layer turbidity and lake stability/mixing phenomenon in Clark Canyon Reservoir. 2-D CE-QUAL-W2 model development for eutrophication and nutrient loading studies on Canyon Ferry Reservoir. EFDC dissolved oxygen model development for Upper Red Rock Lake (URRL) to assess engineering alternatives to improve wintertime habitat for arctic grayling. LOADEST and Vollenweider model application to estimate minimum annual flushing flows and flow-through volumes needed to minimize changes in trophic state from phosphorus loadings (i.e., from oligotrophic to mesotrophic or eutrophic). Development of 2-D finite difference (Laplace equation) dissolved oxygen model to improve overwinter habitat in URRL for arctic grayling.

Hydrology, Hydraulics, and Sediment Transport

Idaho National Engineering and Environmental Laboratory (INEEL): Successive flood studies at various facilities including the Idaho Nuclear Technology and Engineering Center (INTEC) and Radioactive Waste Management Complex (RWMC). Responsible for hydrograph development (HEC-1) and modeling of associated hydraulic infrastructure for rainfall, snowmelt, rain-on-snow, and rain-on-frozen-ground events (25-, 100-, 500-yr). Hydrographs were proportioned into the stormwater drainage system and evaluated within SWMM to perform analysis of subsurface piping to identify surface flooding/ponding and make drainage improvement recommendations.

Hydrology, Hydraulics, and Permitting Various Locations. Oversight of hydraulic analysis on dozens of bridges and culverts in Kansas, Texas, Oklahoma, Oregon, and Utah for sizing openings, including LOMR, CLOMR, and no-rise certifications at sites in Oregon, Texas, and Montana. Review of location drainage study for IDOT I-155 Auxiliary Lane project. CLOMR support for SB-317 realignment project for Tennessee DOT. HEC-RAS model review for subsidence investigation on San Juaquin River, CA. Review of hydraulic and sediment transport analysis for Bouquet Canyon Creek, CA. Review of probable maximum flood in HEC-HMS and HEC-RAS 2D modeling to assess dam upgrades or decommissioning in Zoo Lake #2, Big Sandy, and Yarboro Lakes and Lake Deverina (all in Texas).

FEMA Flood Insurance Studies (FIS), Region V and Region VIII: Developed flood frequency curves and drainage area regressions using Bulletin 17B (PeakFQ) for flood analysis of Butler and Lavalle Creeks near Missoula, MT. Completed HEC-GeoRAS mapping, and flood drawing preparation for restudy of an eight mile section of the Yellowstone River near Livingston, MT. Initiated surveys and preliminary HEC-RAS model creation for Big and Little Cottonwood Creek, and Willow Creek in Salt Lake City, UT. Hydraulic model setup and floodplain mapping for Turtle Creek FIS in Todd County, MN. Co-review of White Lick Creek FIS in Hendricks County, IN. Review of Grove Gulch and Silver Bow Creek, MT floodplain restudy (for Superfund). FEMA Compass JV review of hydraulic studies in Montana, North Dakota, and Utah. FEMA hydrology lead for Compass JV probabilistic flood risk analysis (PFRA) project.

Stormwater Modeling: SWMM hydraulic analysis of approximately 10 miles of subsurface piping to identify surface flooding and mitigate flooding hazards at Travis Air Force Base (both on the airfield, hospital, and residential districts). HEC-1 design storms and synthetic hydrographs were used to evaluate piping capacities and prioritize drainage improvements on the base. Modeling and design of the topography and subsurface piping system to convey the 10-yr rainfall event for the 300 Ramp Aircraft parking area. SWMM modeling of hydrology, sediment, and metals, and retention and detention basin performance (e.g., Stoke's law and first-order passive treatment) for storm drains in the Butte Priority Soils Operable Unit. Detention basin design numerous locations.

Tongue River Hydraulics: Developed and calibrated a HEC-RAS hydraulic model for approximately 200 miles of the Tongue River to determine reach volumes and flow parameters for a HSPF water quality study of the reservoir and river system. Integrated USGS WSPRO model geometry into the effort and calibrated the model to known water surface elevations. Field chief tasks included cross-section layout, GPS RTK survey, and model setup & calibration.

Applied Watershed Studies and Ecological Restoration

Geomorphology: Project Manager and technical lead for geomorphic surveys and HEC-RAS model development to support a bank stabilization project on Dry Creek in Broadwater County, MT. Deformable bank concept and bioengineering design were used to mediate sedimentation from eroding stream terraces. Technical lead for geomorphic investigation of Newsome Creek in Northern Idaho (tributary to the South Fork of the Clearwater River) for the United States Forest Service (USFS) to develop alternatives to improve salmon spawning at the historically mined site. Applied USFS Basin Methodology and constructed HEC-RAS models to determine flow parameters and feasibility of channel reconstruction/improvement. Cross-section and topographic surveys, and Rosgen stream inventories for channel relocation for a private developer in Big Sky, MT. Lead scientist/engineer for sediment transport and hydraulic analysis for capping and bank stabilization on the Lower Coeur d'Alene River Superfund site (MIKE 21C and HEC-RAS 2-D evaluations).

Surface and Groundwater Studies: Surface water monitoring program development for the Flathead Lake Basin modeling, which included seven major tributaries (North, Middle, and South Fork of the Flathead River; Stillwater River; Whitefish River; Swan River; and Ashley Creek), and three large lakes or reservoirs (Hungry Horse Reservoir, Whitefish Lake, and Swan Lake). Groundwater monitoring program at Travis and Beale Air Forces Bases, CA to assess groundwater contamination and characterize plume geometry (500 wells). Characterization of hydrogeology of Landfill (LF-19) at Malmstrom Air Force Base near Great Falls, MT including aquifer characterization, soil and gas vapor sampling, drilling oversight, well development, and slug testing. Water yield and consumption analysis for the Green Hills Ranch Development near Bozeman, MT considering current water rights, proposed crop consumption, and irrigation application efficiency. Technical reviewer for Butte Priority Soils Operable Unit stormwater investigation and associated Technical Impracticability analysis to minimize metals contamination to Silver Bow Creek. Upper White River, CO nutrient assessment.

Surveying (Hydrographic and Topographic). Ground crew chief for hydrographic survey of over 100 miles of the Yellowstone River for Chris Ransome & Associates. Crew chief for bathymetric surveys (RTK) for approximately 200 miles of the Tongue River for a HSPF water quality study of the river. Cross-section surveys for Ashley Creek, MT and San Joaquin River, CA (legal defense). Topographic surveys to calculate cut and fill volumes for Middle Butte and Weston Road (Gillette, WY), and Green Mountain Road (Jeffrey City, WY) for the Bureau of Land Management. Acoustic Doppler Current profiler (ADCP) application on several rivers including the Yellowstone, Missouri, and Clark Fork rivers to generate underwater topography and/or velocity data. Boat initiated sediment survey of Clark Canyon Reservoir. RTK topographic and bathymetric survey of Shambow Creek and Grayling Creek in Centennial Valley for pipeline design project.

REFEREED JOURNAL ARTICLES

Chapra, S.C., **Flynn, K.F**., and J.C. Rutherford. 2014. Parsimonious model for assessing nutrient impacts in periphyton-dominated streams. Journal of Environmental Engineering. 140(6): 04014014.

Chudyk, W.C and **K.F. Flynn**. 2015. Fiber optic light sensor. Environmental Monitoring and Assessment. 187(6): 1-7.

Flynn, K.F. and S.C. Chapra. 2014. Remote sensing of submerged aquatic vegetation in a shallow non-turbid river using an unmanned aerial vehicle. Remote Sensing. 6(12): 12815-12836.

Flynn, K.F. and S.C. Chapra. 2020. Evaluating hydraulic habitat suitability of filamentous algae using an unmanned aerial vehicle and acoustic Doppler current profiler. Journal of Environmental Engineering. 146(3): 04019126.

Flynn, K.F., Chapra, S.C., Auer, M.T., Ramsburg, C.A., and V. Watson. *In preparation*. River *Cladophora* model.

Flynn, K.F., Chapra, S.C., and M.W. Suplee. 2013. Modeling the lateral variation of bottom-attached algae in rivers. Ecological Modelling. 267 (2013): 11-25.

Flynn, K.F., and M.W. Van Liew. 2011. Evaluation of SWAT for sediment prediction in a mountainous snowmelt-dominated catchment. Transactions of the ASABE. 51(1): 113-122.

Flynn, K.F., Chudyk, W.C., Chapra, S.C., and V. Watson. 2018. Influence of biomass and water velocity on light attenuation of *Cladophora glomerata* L. (Kuetzing) in rivers. Aquatic Botany. 151: 62-70.

Flynn, K.F., Suplee, M.W., Chapra, S.C., and H. Tao. 2015. Model-based nitrogen and phosphorus (nutrient) criteria for large temperate rivers: 1. Model development and application. J. Am. Water Res. As. 51(2): 421-446.

Flynn, K.F., and W. Xu. *In preparation.* Open-source bathymetry pre-processor for CE-QUAL-W2.

Flynn, K.F., Cutting, K., Jaeger, M., Warren, J., and T. Johnson. 2022. *In press.* Using a solar circulator to restore dissolved oxygen in a shallow ice-covered hypoxic lake. PLOS Water.

Jeong, J., Santhi, C., Arnold, J.G., Srinivasan, R., Pradhan S., and **K. Flynn**. 2011. Development of algorithms for modeling onsite wastewater systems within SWAT. Transactions of the ASABE. 54(5): 1693-1704.

Nagisetty, R., **Flynn, K.F.**, and D. Uecker. 2018. Dissolved oxygen and pH modeling of effluent-dominated macrophyte-rich upper Silver Bow Creek. Ecological Modelling 393(2019) 85-97.

Suplee, M.W., **Flynn, K.F.**, and S.C. Chapra. 2015. Model-based nitrogen and phosphorus (nutrient) criteria for large temperate rivers: 2. Criteria derivation. J. Am. Water Res. As. 51(2): 447-470.

CONFERENCE PROCEEDINGS OR WEBCASTS

Dilks, D.W., DePinto, J.V., Chapra, S.C., Bell, C., Bierman, V.J., **Flynn, K.**, Slawecki, T.A.D., and P. Moskus. Application of load-response models for establishing site-specific nutrient goals based on water quality and biological response variables. At: *Electric Power Research Institute (EPRI) Environment Sector Winter Advisory Meeting, P53 Water Quality and Watershed Protection*. February 24, 2014. Savannah, GA.

DePinto, J.V., Dilks, D.W., Bierman, V.J., Chapra, S.C., and **K. Flynn**. 2013. Challenges and advances in complex nutrient TMDL modeling. At: *EPA Region 6 Water Quality Modeling Conference*. November 18-21, 2013. Dallas, TX.

DePinto, J.V., Chapra, S.C. Bell, C., Dilks, D.W., **Flynn, K.**, Bierman, V.J., Slawecki, T.A.D., and P. Moskus. 2013. Load-response models for establishing site-specific nutrient goals based on water quality and biological response indicators. In: *Proceedings for WEFTEC 2013*. Chicago, IL.

Farnes, P. and **K. Flynn**. 2009. Statewide Precipitation Map. In: *Proceedings of the 2009 AWRA Montana Section Annual Conference: Waters that Cross Divides*, September 30-October 2, 2009. Missoula, MT.

Flynn, K.F., Kron, D., Nixon, A., Selch, T., Jaeger, M., Horn, M. and D. DeoCampo. 2017. Clear as mud?: Evaluating turbidity in the Beaverhead River and Clark Canyon Reservoir. In: *Science, Policy and Communication: The role of science in a changing world, American Water Resources Association Montana Section 2017 Conference*. October 18-20, 2017. Helena, MT.

Flynn, K.F., Dolan, L., Dalby, C. and R. Nagisetty. 2016. Evaluating climate change impacts on water quality using mechanistic receiving-water models. In: *Water Quality & Quantity in a Changing Climate, American Water Resources Association Montana Section 33rd Annual Meeting*. October 12-14, 2016. Fairmont Hot Springs, MT.

Flynn, K.F. 2015. It's a drag: Understanding current and *Cladophora*. In: *Clark Fork Symposium-30 Years of Conservation Progress*. University of Montana. April 23-24, 2015. Missoula, MT.

Flynn, K.F. 2014. Co-chair Session No. 30, Selenium, uranium, and radionuclides: Geology, biogeochemistry, and ecosystem impacts from mining and other activities in the western United States and southwestern Canada. At: *Geological Society of America, Rocky Mountain (66th Annual) and Cordilleran (110th Annual) Joint Meeting*. May 19-21, 2014. Bozeman, MT.

Flynn, K.F. 2012. Sediment calibration in SWAT: Differentiating between landscape- and channel-based source contributions. For: *Water Quality Calibration of SWAT/APEX. Heartland Regional Water Coordination Initiative*. September 27, 2012.

Flynn, K.F. 2010. River and Stream Water Quality Model QUAL2K and QUAL2E. For: *Watershed, In-Stream, and Lake/Reservoir Water Quality Models for Planning and Assessment. Heartland Regional Water Coordination Initiative*. April 22, 2010.

Flynn, K.F. 2007. Modeling Streamflow and water temperature in the Big Hole River: 2006. In: *Proceedings for Irrigation Management in Transforming Western Landscapes, American Water Resources Association Montana Section 24th Annual Meeting*. October 11-12, 2007. Lewistown, MT.

Flynn, K.F., Steg, R.F., Bond, J.I., Van Liew, M.W., and M.J. Pipp. 2007. Identification of a management framework for TMDL source allocations in the Flathead Lake Basin, Montana. In: *Proceedings of the 4th Annual Conference on Watershed Management to Meet Water Quality Standards and TMDLs*. March 10-14, 2007. San Antonio, TX.

George, W., Nagisetty, R. and **K.F. Flynn**. 2017. Climate change impacts on the hydrological processes of Silver Bow Creek, MT. In: *Science, Policy and Communication: The role of science in a changing world, American Water Resources Association Montana Section 2017 Conference*. October 18-20, 2017. Helena, MT.

Hays, J., **Flynn, K.**, and R. Hoerner. 2000. Phosphorus cycling in Clark Canyon Reservoir and adjoining tributaries. In: *219th American Chemical Society National Meeting*. March 2000. San Francisco, CA.

Mitchell, J.S., **Flynn, K.F.**, and T.S. Mitchell, 2003. Floodway dumbbells–cause, effect, and mitigation. In: *Proceedings of the Montana Association of Floodplain Managers Annual Conference*. Lewistown, MT.

Naftz, D., Easthouse, K., Gildea, J., **Flynn, K.**, Presser, T. and C. Muhlfeld. 2015. Populating an ecosystem-scale model to support the development of a selenium water quality criterion for Lake Koocanusa that is protective of fish species. In: *Proceedings for Linking Water Research to Policy and Water Management, Montana Section AWRA*. October 2015. Missoula, MT.

Nagisetty, R. and **K. Flynn**. 2016. Modeling dissolved oxygen in effluent and macrophyte rich Upper Silver Bow Creek. In: *Water Quality & Quantity in a Changing Climate, American Water Resources Association Montana Section 33rd Annual Meeting*. October 12-14, 2016. Fairmont Hot Springs, MT.

Suplee, M.W. and **K.F. Flynn**. 2014. Process by which Montana DEQ derived a low-flow design flow for permitting nutrient discharges. *EPA Region VIII RTAG and Numeric Nutrient Criteria Technical Workshop*. May 8th, 2014. Denver, CO.

Uecker, D., Nagisetty, R., and **K. Flynn**. 2015. Application of QUAL2K to a macrophyte rich effluent dominated stream. In: Annual AWMA/PNWIS conference (student paper – first place). November 2015. Stevenson, WA.

Van Liew, M.W., **Flynn, K.F.**, and D.T. Marshall. 2007. Simulation of streamflow, sediment, and nutrients on the Blackfoot Watershed in western Montana using SWAT. In: *Proceedings of the 4th Annual Conference on Watershed Management to Meet Water Quality Standards and TMDLs*. March 10-14, 2007. San Antonio, TX.

REPRESENTATIVE PROFESSIONAL/AGENCY PUBLICATIONS

Bierman, V.J., DePinto, J.V, Dilks, D.W., Penelope, M., Slawecki, T.A.D., Bell, C.F., Chapra, S.C., and **K.F. Flynn**. 2013. Modeling guidance for developing site-specific nutrient goals. LINK1T11. Water Environment Research Foundation. Alexandria, VA.

Flynn, K.F., Suplee, M.W., R. Sada. 2016. Using a computer water-quality model to derive numeric nutrient criteria. Upper and middle Yellowstone River. Part 1. Model Enhancements. June 2016.

Flynn, K.F. 2015. Continuous simulation of priority BMPs (detention and retention) in BPSOU Watersheds. Montana DEQ. Water Quality Planning Bureau. Helena, MT.

Flynn, K.F. 2014. Methods and mathematical approaches for modeling *Cladophora glomerata* and river periphyton. Ph.D. Thesis. Tufts University. Medford, MA.

Flynn, K.F. and M. Suplee. 2013. Using a computer-water quality model to derive numeric nutrient criteria. Lower Yellowstone River. Montana DEQ. Water Quality Planning Bureau. Helena, MT.

Flynn, K.F., Granger, M., and E. Regensburger. 2010. Water quality data summary for major tributaries, lakes, and reservoirs in the Flathead Lake Watershed, 2007-2008. Montana DEQ. Water Quality Planning Bureau. Helena, MT.

Flynn, K.F. and D. Kron, 2008. Big Hole River watershed nutrient TMDL GWLF modeling documentation. Montana DEQ. Water Quality Planning Bureau. Helena, MT.

Flynn, K.F., Kron, D. and J. Smith. 2005. Ruby River Watershed soil erosion modeling. Montana DEQ. Water Quality Planning Bureau. Helena, MT.

Sada, R., Suplee, M.W., and **K. Flynn**. 2014. Results from the deployment of nutrient-diffusing substrates in the Upper Missouri River. Montana DEQ. Water Quality Planning Bureau. Helena, MT.

TRAINING

Water -Quality Analysis Simulation Program (WASP) short course (2017); CE-QUAL-W2 Modeling Workshop (2015); RSTAT400 (statistics) (2013); River Water Quality Modeling with QUAL2K (2007); Introduction to Relational Database Design (2005); Geoprocessing and Scripting in ArcGIS 9 (2005); RUSLE2 Training (2005); SWAT Short Course (2005); USDA Hydrology for Engineers I (2003); BASINS (2002); USGS Surface Water Methods Training SW4230 (2002); USEPA Watershed Management Training Certificate (2002); OSHA HAZWOPER (2002); GSA Applied Inverse Ground Water Modeling (1999). Management & Leadership Skills for First-time Supervisors and Managers (2017).

RELEVANT GRADUATE COURSEWORK

CEE 212–Chemical Principles of Environment & Water; CEE 213–Transport Principles Environment & Water; CEE 214–Water Resource Systems; CEE 294–Environmental Systems Modeling; BAE 404–Environmental Hydrology; BREN 432–Advanced Engineering Hydrology; FOR 462–Watershed Science/Management; CEE 502–Watershed Modeling; CEE 503–Open Channel Hydraulics; ; GEOG 504–Hydrologic Applications of GIS/Remote Sensing; AGEC 504–West US Water Resource Policy/Equity; CEE 528–Stochastic Hydrology; ENVS 541–Sampling/Analysis Environmental Contaminants; GEOL 568–Geochemistry of Natural Waters.

SERVICE OR INVITED PEER-REVIEW

Reviewer: Journal of Environmental Engineering, Journal of Environmental Quality; Journal of Water Resources Planning and Management; Journal of the American Water Resources Association; Transactions of the ASABE; Desalination and Water Treatment.

Invited reviews: External Review (Letter) on the Literature Review on Nutrient-Related report on Rates, Constants, and Kinetics Formulations in Surface Water Quality Modeling (U.S. Environmental Protection Agency). NUTR1R06aa–Nutrient Speciation and Refractory Compounds in Water Quality Models (Water Environment Research Foundation).

ADVISING/TEACHING

Assistant Professor – Carroll College, courses taught: Groundwater Modeling, Engineering graphics/CAD applications

Teaching Assistant – Tufts University, courses taught: Probability and Statistics, R lab for statistical computing.

Guest Lecturer – Montana State University, Carroll College, Montana Technological University.

Committee member Montana Tech - (1) Dylan Uecker 2015–2016; Environmental Engineering Graduate Student. Thesis: "*Application of QUAL2K to Macrophyte Rich Silver Bow Creek*". (2) William George 2016–2017; Environmental Engineering Graduate Student. Thesis: "*Climate change impacts on hydrological processes in Silver Bow Creek Watershed*".

INTERESTS

I am part of a fourth-generation Montana ranching family. My love for Montana and its amenity keeps me close to home and has given me a strong interest in water and environment. I am married, have two growing children, a poorly trained Labrador retriever, and a handful of other animals. I enjoy all aspects of life including spending time outdoors with family and friends exploring the mountains, snow, and rivers of the Rocky Mountains.