

STATEMENT OF INTEREST

G Mathias 'Matt' Kondolf

I am keenly interested in the work of the TAG for the Napa GSA and the scientific issues that arise as the agency moves towards implementation of the GSP. While I have no direct experience with SGMA in the Napa context, I believe my expertise and experience could prove relevant to the NCGSA efforts. Over the years, I have had some exposure to natural resource and hydrologic issues in Napa County, and I have always found the hydrologic interactions, as well as their ecological and social implications, to be of scientific interest, but especially of socio-economic importance given the pre-eminence of the agriculture based in the county. Of the topic areas listed in the RFQ, I could support the TAG's work related to geomorphology, understanding of surface-groundwater interactions, and implications for aquatic habitat (especially spawning and rearing habitat for salmonids), all topics on which I have published extensively. My 'home' discipline is fluvial geomorphology, the domain of many of my publications, including a premier reference work in the field, *Tools in Fluvial Geomorphology* (second edition 2016, Wiley). For my dissertation, I took a geomorphic and sedimentological perspective on salmonid spawning gravels, and this research led me to work more broadly in interactions between stream flow/geomorphology and salmonid habitat, topics on which I actively published and consulted in the 1990s and early 2000s.

I have a long-standing interest in the interactions of surface and groundwater, and their ecological and management implications. Among my first research topics were the effects of well pumping on the alluvial water table and base flow of the Carmel River, in coastal Monterey County, and the role of a pumping-induced lowering of the water table in causing a dieoff of the river's riparian vegetation, in turn causing massive bank erosion. I also conducted multiple studies on surface-groundwater interactions on streams of the eastern Sierra Nevada, such as Rush Creek, the largest tributary to Mono Lake, which has evinced pronounced changes in surface and groundwater patterns since 1940. While at Oak Ridge National Laboratory in graduate school, I briefly served as staff to the Federal Energy Regulatory Commission and conducted synoptic flow measurements to detect groundwater losses and gains on six eastern Sierran streams on which small hydroelectric projects were proposed. My results identified proposed projects that were unrealistic in terms of flow available for diversion because they had not taken groundwater exchanges into account.

The most relevant experience is probably my work on the Russian River Independent Science Review Panel (ISRP), which was active 2012-2016. I lobbied for the panel's creation, led the recruitment process, and chaired the panel through to its final report. The aim of the ISRP was to compile and interpret data including surface flows and ground water levels, fish and other ecological data, to produce a conceptual model of surface-groundwater interactions in diverse geomorphic settings, resulting streamflow in streams, and implications for habitats in salmon-bearing streams. The ISRP was an interdisciplinary group, with expertise in fluvial geomorphology, hydrology, aquatic ecology, fish biology, and agricultural economics. We consulted with experts and resource managers from across the basin on a range of topics, and conducted independent analyses of some data sets. The resulting document '*Conceptual*

Model of Watershed Hydrology, Surface Water and Groundwater Interactions and Stream Ecology for the Russian River Watershed' (available [here](#)) provides insights into the fundamental geomorphic and hydrogeologic controls that determine spatial and temporal patterns of surface flow. I see many parallels to issues confronting the Napa County GSA.

As reflected in the title of my position, Professor of Environmental Planning at UC Berkeley, my work has always been applied, motivated less by advancing science in the abstract and more by solving real problems faced by land and water managers. Thus, communicating scientific results to members of the public and decision makers has always been a strong interest of mine. This has been at both at local and regional scales, such as my work on the Russian River Independent Science Review Panel, and at the large river basin scale, such as my work in the Mekong River basin (from which a publication, '*Save the Mekong Delta from drowning,*' will appear shortly in *Science*).

In addition to my potentially relevant work elsewhere, I have participated in research projects in the Napa River basin with the California Land Stewardship Institute, including a pilot project to remove gravel from sites of excess accumulation on Napa River tributaries and to insert it in incised reaches of the mainstem, and restoring wider riparian corridors along the river downstream of the Rutherford Reach. I worked with my graduate student on her thesis research on Carneros Creek, where we developed the concept of 'anticipatory management': predicting where along the deeply incised stream bank erosion is most likely, and thereby identifying areas where farmers can pull back agriculture from these banks and to replant with native riparian species in anticipation of erosion. This approach would create fewer conflicts when banks (inevitably) erode, while displacing far less agricultural land than a uniform width setback as previously proposed by a federal agency. Going back two decades ago, I served a member of a scientific advisory committee to the Napa County Watershed Task Force, and I provided technical review of Napa County Conservation Ordinance. I have given presentations to public meetings in Napa over the years, including a talk, *Watershed change and channel response: Some perspectives for planning*, presented to the Resource Conservation District Workshop on Watershed Management (1993) and a talk, *Why setbacks are essential to the health of the Napa River environment*, presented to the Napa Valley Vintners Association, St. Helena (2002). And I have used the Napa River and tributaries to illustrate points in various publications. However, if I am selected to serve on the TAG, it will be my first full-fledged involvement in science and policy in Napa County.

I am motivated to serve on the TAG to address the water management challenges that present themselves in Napa County. These challenges echo similar issues that I have previously studied elsewhere, but we will analyze them under an entirely new policy framework - SGMA. This is an exciting opportunity in a very compelling setting. I feel that I can bring my strong research background with a global reach (with publications on relevant topics having garnered over 19,000 citations) and my familiarity with the distinctive attributes of our Mediterranean climate to bear on the issues confronting Napa.

CURRICULUM VITAE

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EDUCATION

The Johns Hopkins University. PhD, Geography and Environmental Engineering 1988.

Dissertation: *Salmonid spawning gravels: A geomorphic perspective on their distribution, size modification by spawning fish, and application of criteria for gravel quality.*

University of California at Santa Cruz. MS, Earth Sciences 1982. Thesis: *Recent channel instability and historic channel changes of the Carmel River, Monterey County, California.*

Princeton University. AB cum laude, Geology 1978. Thesis: *Genesis and development of Sandy Hook, New Jersey*

EMPLOYMENT HISTORY

University of California at Berkeley

Professor of Environmental Planning and Geography: July 2007 to present

Associate Professor of Environmental Planning: 1994 to 2006

Associate Professor of Geography: 1996-2006

Assistant Professor of Environmental Planning: 1988-1994

Affiliated faculty Energy and Resources Group: 1992-present

Co-Director, Global Metropolitan Studies: 2018-present

Director, Sustainable Environmental Design Major: 2015-2017

Chair, Faculty of College of Environmental Design: 2015-2017

Chair, Department of Landscape Architecture and Environmental Planning: Jan 2011-Dec 2013

Chair, Portuguese Studies Program 2001-2018.

Co-Director, Environmental Sciences Program: 2008-2011

HONORS AND AWARDS

2021 Aspen Italia Institute Award for collaborative research US-Italy, awarded to Rafael Schmitt, Matt Kondolf, Simone Bizzi and Andrea Castelletti for joint research on *Improved trade-offs of hydropower and sand connectivity by strategic dam planning in the Mekong*, recognized as reducing impacts of the global clean energy transition on rivers and livelihoods.

EURIAS Fellowship Programme and the European Commission (Marie-Sklodowska-Curie Actions - COFUND Programme - FP7), Senior Research Fellow, Institute for Advanced Studies, Lyon, 2017-2018, for research on social and ecological restoration of urban rivers.

Landscape Architecture Foundation, Washington DC, appointed Fellow, 2013

Institute for Water Resources, US Army Corps of Engineers, Washington DC, appointed Clarke Scholar, 2011.

Council of Educators in Landscape Architecture. Award of Distinction, 2007.

Fulbright Commission, Washington DC. Senior scholar award for research on environmental river management in Portugal, University of Lisbon, Mar-May 2001.

Fulbright Commission, Washington DC. Senior scholar award for research on the Eygues River, France, University of Lyon, 1997-1998.

ACADEMIC, PROFESSIONAL SOCIETY, AND OTHER SERVICE

Member of Editorial Board of *Anthropocene, Water, Journal of Neotropical Diversity, Water Resources Research, Environmental Management*

National Research Council Committee on Strategic Research for Integrated Water Resources Management. member: 2013.

SERVICE ON GOVERNMENT ADVISORY BOARDS

Redwood Creek Floodplain and Groundwater Recharge Project Technical Advisory Committee, California Department of Parks and Recreation, member 2021-present.

Upper Truckee Marsh Technical Resource Committee, advisory to the California Tahoe Conservancy, member 2016-present.

Independent Science Review Panel for the Russian River, Sonoma County Water Agency and Mendocino County Water Agency. Chair 2012-2016.

Platte River Recovery Implementation Program Peer Review Panel, member 2014-2015.

Independent External Peer Review Committee for the Agency Technical Review, Greater Mississippi Basin Post-Flood Assessment, US Army Corps of Engineers. member 2012-2015

External Independent Peer Review of the Biological Opinion on the Klamath Hydroelectric Settlement Agreement and accompanying EIS. National Marine Fisheries Service, 2011-2012.

San Clemente Dam Removal Project Technical Review Team, California Coastal Conservancy, 2010-2011.

Federal Interagency Flood Risk Management Committee. member 2005-2007

National Research Council Committee on Hydrology, Ecology, and Fishes of the Klamath River Basin. member 2006-2007

Environmental Advisory Board to the Chief of the US Army Corps of Engineers. member 2002-2007

CALFED Bay-Delta Program Ecosystem Restoration Program Science Board. member 1999-2005

County of Napa, California. Member of scientific advisory committee to the Watershed Task Force. Provided technical review of Napa County Conservation Ordinance. 1999-2000.

EXPERT TESTIMONY

2016. Provided written and oral expert testimony regarding channel change on the Apalachicola River, Florida, before the US Supreme Court, Washington DC.

2013. Provided written expert regarding environmental flow requirements of the Kishenganga River, India-Pakistan before the Permanent Court of Arbitration, the Hague.

2012-2017. Provided written and oral expert testimony regarding environmental impacts of road construction along the Rio San Juan and historical changes in channels in the delta of the Rio San Juan, Nicaragua and Costa Rica, before the International Court of Justice, the Hague.

2010. Testified regarding water diversions and measurements of streamflow in Napa and Sonoma counties before the California State Water Resources Control Board.

2005. Provided written expert testimony regarding the feasibility of restoring salmon in the San Joaquin River below Friant Dam. (Natural Resources Defense Council et al. vs US Bureau of Reclamation and Friant Water Users)

2002. Testified regarding cause of channel change and flooding immediately downstream of a gravel mining site on the Applegate River, Emmons et al v. State of Oregon, et al., Josephine County Oregon.

1996. Testified on effects of land use change in watersheds on downstream channels and sedimentation before the California State Senate Natural Resources Committee, Subcommittee on River Protection and Restoration, Fairfield, California, December 1996.

1994. Testified on effects of instream gravel mining and channel capture by floodplain pits before the Sonoma County Board of Supervisors, Santa Rosa, California, March 1994.

1994. Testified on cumulative watershed effects in the Sequoia National Forest before the US House of Representatives, Committee on Agriculture, Subcommittee on Specialty Crops and Natural Resources, Washington DC, March 1994.

1993-1994. Testified on recommendations for flushing flows in Rush Creek, Mono Basin, before the State Water Resources Control Board, Sacramento.

1993. Provided written expert testimony concerning assessment of cumulative watershed impacts on the Sequoia National Forest filed with US District Court, San Francisco.

1992. Testified on probable geomorphic effects of enlarged reservoir on Carmel River before the State Water Resources Control Board, Sacramento.

1991. Testified on assessment of cumulative watershed impacts in the Sequoia National Forest before the U.S. House of Representatives, Committee on Interior and Insular Affairs, Subcommittee on General Oversight and Desert Lands.

1991. Testified on assessment of cumulative watershed impacts in the Sequoia National Forest, on behalf of Sequoia Forest Alliance, US District Court, San Francisco.

1990. Testified on cause of shoreline accretion along southern shore of Lake Tahoe, on behalf of California Office of the Attorney General.

1989. Testified on probable impact of instream gravel mining on Cottonwood Creek, Tehama County, on behalf of the California Office of the Attorney General.

1983. Testified on cause of channel erosion along the Carmel River, Monterey County Superior Court, Salinas.

LANGUAGES & COUNTRY EXPERIENCE

Languages: English (native), French (fluent), Spanish (basic).

Experience: Cambodia, China, Ecuador, Egypt, France, Laos, Morocco, Nicaragua, Nigeria, Portugal, Spain, Switzerland, UK, US, Vietnam.

PEER-REVIEWED PUBLICATIONS

Selected papers drawn from over 200 publications, which have collectively received over 19,000 citations, according to Google Scholar (as of March 2022).

Kondolf, GM. et al. 2022. Save the Mekong Delta from drowning. *Science*. (in press)

Serra-Llobet A, Jähnig SC, Geist J, Kondolf GM, Damm C, Scholz M, Lund J, Opperman JJ, Yarnell SM, Pawley A, Shader E, Cain J, Zingraff-Hamed A, Grantham TE, Eisenstein W and Schmitt R (2022) Restoring Rivers and Floodplains for Habitat and Flood Risk Reduction: Experiences in Multi-Benefit Floodplain Management From California and Germany. *Front. Environ. Sci.* 9:778568. doi: 10.3389/fenvs.2021.778568

Keeley, Annika T H; Fremier, Alexander K; Goertler, Pascale A L; Huber, Patrick R; Sturrock, Anna M; Bashevkin, Samuel M; Barbaree, Blake A; Grenier, J Letitia; Dilts, Thomas E; Gogol-Prokurat, Melanie; Colombano, Denise D; Bush, Eva E; Laws, Angela; Gallo, John A; Kondolf, Mathias; Stahl, Amanda T. 2022. Governing Ecological Connectivity in Cross-Scale Dependent Systems. *Bioscience* ISSN: 0006-3568 , 1525-3244; DOI: 10.1093/biosci/biab140

Serra-Llobet, A, GM Kondolf, F Magdaleno, D Keenan-Jones. 2022. Flood diversions and bypasses: benefits and challenges. *WIREs Water* 2022;9:e1562, <https://doi.org/10.1002/wat2.1562>

Kondolf, GM, G Descombes, A Zingraff-Hamed. 2021. Restoring dynamic fluvial processes in urban rivers: learning from the Aire and Isar Rivers. *Landscape Architecture Frontiers* 9(4): 10-27. <https://journal.hep.com.cn/laf/EN/10.15302/J-LAF-1-020051>

Ciotti, DC, J McKee, KL Pope, GM Kondolf, MM Pollock. 2021. Process-based design criteria for restoring fluvial systems. *Bioscience* 7 (1): 831-845. <https://doi.org/10.1093/biosci/biab065>

Parrinello, G, GM Kondolf. 2021. The social life of sediment. *Water History* <https://doi.org/10.1007/s12685-021-00280-w>

Schmitt, RJP, N Kittner, GM Kondolf, DM Kamman. 2021. Joint strategic energy and river basin planning to reduce dam impacts on rivers in Myanmar. *Environmental Research Letters*. Online at <https://iopscience.iop.org/article/10.1088/1748-9326/abe329>

Loire, R, H Piégay, J-R Malavoi, GM Kondolf, and LA Bêche. 2021. From flushing flows to (eco)morphogenic releases: evolving terminology, practice, and integration into river management. *Earth Science Reviews* 213: 103475

Wilson, K, SL Baker, and GM Kondolf. 2020. The ideal meander: exploring freshwater scientist drawings of river restoration. *Freshwater Science* DOI: 10.1086/709012

Pinto, JP, and GM Kondolf. 2020. The fit of urban waterfront interventions: matters of size, money and function. *Sustainability* 12: 4079; doi:10.3390/su12104079

Staentzel, C, GM Kondolf, L Schmitt, I Combroux, A Barillier, J-N Beisel. 2020. Restoring fluvial forms and processes by gravel augmentation or bank erosion below dams: A systematic review of ecological responses. *Science of the Total Environment* 706: 135743. <https://doi.org/10.1016/j.scitotenv.2019.135743>

Schmitt, R, S Bizzi, AF Castelletti, J Opperman, GM Kondolf. 2019. Planning dam portfolios for low sediment trapping shows limits on sustainable hydropower in the Mekong. *Science Advances* 5: eaaw2175.

Schmitt RJP, N Kittner, GM Kondolf, D Kammen. 2019. Deploy diverse renewables to save tropical rivers. *Nature* 569, 330-332 (2019) doi: 10.1038/d41586-019-01498-8

Oeurng, C, TA Cochrane, S Chung, GM Kondolf, T Piman, ME Arias. 2019. Assessing climate change impacts on river flows in the Tonle Sap Lake basin, Cambodia. *Water* 11, 618; doi:10.3390/w11030618

Shi, S, GM Kondolf, and D Li. 2018. Urban river transformation and the landscape garden city movement in China. *Sustainability* 10(11), 4103; <https://doi.org/10.3390/su10114103>

Pinto, PJ, GM Kondolf, and PL Wong. 2018. Adapting to sea-level rise: emerging governance issues in the San Francisco Bay region. *Environmental Science and Policy* 90: 27-38. <https://doi.org/10.1016/j.envsci.2018.09.015>

Wang, H-W, GM Kondolf, D Tullos, and W-C Kuo. 2018. Sediment management in Taiwan's reservoirs and barriers to implementation. *Water* 10(8), 1034; doi:[10.3390/w10081034](https://doi.org/10.3390/w10081034)

Kondolf GM, and P Lopez-Llompant. 2018. National-local land-use conflicts in floodways of the Mississippi River system. *AIMS Environmental Science* 5(1): 47-63. DOI: 10.3934/environsci.2018.1.47

Schmitt, RJP, S Bizzi, A Castelletti, & GM Kondolf. 2018. Improved trade-offs of hydropower and sand connectivity by strategic dam planning in the Mekong. *Nature Sustainability* 1: 96–104 doi:10.1038/s41893-018-0022-3

Kondolf, GM, RJP Schmitt, P Carling, S Darby, M Arias, S Bizzi, A Castelletti, T Cochrane, S Gibson, M Kummu, C Oeurng, Z Rubin, and T Wild. 2018. Changing sediment budget of the Mekong: Cumulative threats and management strategies for a large river basin. *Science of the Total Environment* 625: 114-134. <https://doi.org/10.1016/j.scitotenv.2017.11.361>

Rubin, Z, GM Kondolf, B Rios-Touma. 2017. Evaluating Stream Restoration Projects: What Do We Learn from Monitoring? *Water* 9, 174; doi:10.3390/w9030174. Online at <http://www.mdpi.com/2073-4441/9/3/174>

Beagle, J.R., G.M. Kondolf, L. Marcus, and R.M. Adams. 2015. Anticipatory management for instream habitat: application to Carneros Creek, California. *River Research and Applications*. DOI: 10.1002/rra.2863

Kondolf, G.M., Z.K. Rubin, J.T. Minear. 2014. Dams on the Mekong: Cumulative sediment starvation. *Water Resources Research* 50, doi:10.1002/2013WR014651.

Kondolf, G.M., Y. Gao, G.W. Annandale, G.L. Morris, E. Jiang, R. Hotchkiss, P. Carling, B. Wu, J. Zhang, C. Peteuil, H-W. Wang, C. Yongtao, K. Fu, Q. Guo, T. Sumi, Z. Wang, Z. Wei, C. Wu, C.T. Yang. 2014. Sustainable sediment management in reservoirs and regulated rivers: experiences from five continents. *Earth's Future*. 2: 256–280 doi: 10.1002/ef2 2013EF000184 Online at <http://onlinelibrary.wiley.com/doi/10.1002/2013EF000184/pdf>

Deitch, M.J., and G. M. Kondolf. 2012. Consequences of variations in magnitude and duration of an instream environmental flow threshold across a longitudinal gradient. *Journal of Hydrology* 420–421: 17–24. DOI:10.1016/j.jhydrol.2011.11.003

Ludy, J. and G.M. Kondolf. 2012. Flood risk perception in lands 'protected' by 100-year levees. *Natural Hazards* 61(2):829-842. DOI: 10.1007/s11069-011-0072-6

Kondolf, G.M. 2011. Setting goals in river restoration: when and where can the river 'heal itself'? in Simon, A. et al (eds) *Stream Restoration in Dynamic Fluvial Systems: Scientific*

Approaches, Analyses, and Tools. Geophysical Monograph Series Vol.194 pp.29-43. American Geophysical Union, Washington DC. DOI: 10.1029/2010GM001020.

Lassette, N.S. and G.M. Kondolf. 2011. Large woody debris in urban stream channels: re-defining the problem. *River Research and Applications*. DOI: 10.1002/rra.1538

Minear, T. and G.M. Kondolf. 2009. Estimating reservoir sedimentation rates at large spatial- and temporal-scales: a case study of California. *Water Resources Research* 45, W12502, doi:10.1029/2007WR006703 online at: <http://ca.water.usgs.gov/pubs/2009/MinearKondolf.pdf>

Deitch, M.,J., G.M. Kondolf, and A.M. Merenlender. 2009. Hydrologic impacts of small-scale instream diversions for frost and heat protection in the California wine country. *River Research and Applications* 25: 118-134.

Deitch, M.J., G.M. Kondolf, and A.M. Merenlender. 2009. Surface water balance to evaluate the hydrological impacts of small instream diversions and application to the Russian River basin, California, USA. *Aquatic Sciences: Marine and Freshwater Ecosystems* 19: 274-284.

Kondolf, G.M., P. Angermeier, K. Cummins, T. Dunne, M. Healey, W. Kimmerer, P.B. Moyle, D. Murphy, D. Patten, S. Railsback, D. Reed, R. Spies, and R. Twiss. 2008. Prioritizing river restoration: Projecting cumulative benefits of multiple projects: an example from the Sacramento-San Joaquin River system in California. *Environmental Management* 42:933-945 (DOI: 10.1007/s00267-008-9162-y)

Tompkins, M.R., and G.M. Kondolf. 2007. Systematic post-project appraisals to maximize lessons learned from river restoration projects: Case study of compound channel construction projects in Northern California. *Restoration Ecology* 15(3):524-537.

Kondolf, G.M., S. Anderson, R. Lave, L. Pagano, A. Merenlender, and E. Bernhardt. 2007. Two decades of river restoration in California: What can we learn? *Restoration Ecology* 15(3):516-523.

Kondolf, G.M. River restoration and meanders. 2006. *Ecology and Society*. [online] URL: <http://www.ecologyandsociety.org/vol11/iss2/art42/>

Kondolf, G.M., A. Boulton, S. O'Daniel, G. Poole, F. Rahel, E. Stanley, E. Wohl, A. Bang, J. Carlstrom, C. Cristoni, H. Huber, S. Koljonen, P. Louhi, and K. Nakamura. 2006. Process-based ecological river restoration: Visualising three-dimensional connectivity and dynamic vectors to recover lost linkages. *Ecology and Society* 11 (2): 5. [online] URL: <http://www.ecologyandsociety.org/vol11/iss2/art5/>

Kondolf, G.M. 2000. Assessing salmonid spawning gravel quality. *Transactions of the American Fisheries Society* 129:262-281.

Kondolf, G.M., and A. Adhikari. 2000. Weibull vs. lognormal distributions for fluvial gravels. *Journal of Sedimentary Research* 70(3):456-460.

Kondolf, G.M., R. Kattelman, M. Embury, and D.C. Erman. 1996. Status of riparian habitat. Chapter 36 in *Sierra Nevada Ecosystem Project: Final Report to Congress*, Vol. II, *Assessments and scientific basis for management options*. Report No. 88, Centers for Water and Wildland Resources, University of California, Davis, p.36-1 - 36-22.

Kondolf, G.M., and P.R. Wilcock. 1996. The flushing flow problem: Defining and evaluating objectives. *Water Resources Research* 32(8):2589-2599.

Castleberry, D.T., J.J. Czech, D.C. Erman, D. Hankin, M. Healey, G.M. Kondolf, M. Mangel, M. Mohr, P.B. Moyle, J. Nielsen, T.P. Speed, and J.G. Williams. 1996. Uncertainty and instream flow standards. *Fisheries* 21(8):20-21.

Kondolf, G.M. 1995. Five elements for effective evaluation of stream restoration. *Restoration Ecology* 3(2):133-136.

Kondolf, G.M., and E.M. Micheli. 1995. Evaluating stream restoration projects. *Environmental Management* 19:1-15.

Kondolf, G.M. 1994. Environmental planning in the regulation and management of instream gravel mining in California. *Landscape and Urban Planning* 29:185-199.

Kondolf, G.M., and P. Vorster. 1993. Changing water balance over time in Rush Creek, eastern California, 1860-1992. *Water Resources Bulletin* 29:823-832.

Kondolf, G.M., and M.G. Wolman. 1993. The sizes of salmonid spawning gravels. *Water Resources Research* 29:2275-2285.

Keller, E.A., and G.M. Kondolf. 1990. Groundwater and fluvial processes: Selected observations. *Geological Society of America Special Paper* 252:319-340.

Kondolf, G.M., J.W. Webb, M.J. Sale, and T. Felando. 1987. Basic hydrologic studies for assessing impacts of flow diversions on riparian vegetation: Examples from streams of the eastern Sierra Nevada, California. *Environmental Management* 11:757-769.

Kondolf, G.M., L.M. Maloney, and J.G. Williams. 1987. Effect of bank storage, and well pumping on base flow, Carmel River, California. *Journal of Hydrology* 91:351-369.

OTHER PUBLICATIONS

Williams, JG, PB Moyle, A Webb, and GM Kondolf. 2019. *Environmental flow assessment: methods and applications*. John Wiley & Sons, Chichester UK. 240 pp.

Serra-Llobet A, Kondolf GM, Schaefer K, Nicholson S. (eds) 2018. *Managing flood risk: innovative approaches from big floodplain rivers and urban streams*. Palgrave Macmillan, London, 162 pp. <https://www.palgrave.com/us/book/9783319716725>

Kondolf, GM, L Marcus, R Adams, J Bredehoeft, J Constantz, M Cover, C Farrar, M Marchetti, V Resh, and FD Shields. 2016. Conceptual model of watershed hydrology, surface water and groundwater interactions and stream ecology for the Russian River watershed. Report of the Russian River Independent Science Review Panel. Available online at: www.russianriverisrp.org

Kondolf, G.M., and H. Piégay, eds. 2016. *Tools in fluvial geomorphology, second edition*. John Wiley & Sons, Chichester UK, 560 pp.

Kondolf, GM, and S Bizzi. 2022. Stream geomorphology. in *Encyclopedia of Inland Waters 2nd Edition*, Elsevier. <https://doi.org/10.1016/B978-0-12-819166-8.00186-9>

Deitch, MJ, and GM Kondolf. 2015. The incendiary mix of salmon and water in Mediterranean-climate California, Chapter 12 in *Sustainable Water: Challenges and Solutions from California*, pp.269-291, A Lassiter, ed, University of California Press, Berkeley.

Bouleau, G. and G.M. Kondolf. 2011. Rivers of diversity: evolving water regulation in California and the European Union. in *Transatlantic Regulatory Cooperation: The Shifting Roles of the EU, the US and California*. D. Vogel and J. Swinnen, eds. Edward Elgar, Cheltenham, UK. pp. 83-101.

Kondolf, G.M., and R.J. Batalla. 2005. Hydrological effects of dams and water diversions on rivers of Mediterranean-climate regions: Examples from California. In C. Garcia and R.J. Batalla (eds.) *Catchment dynamics and river processes: Mediterranean and other climate regions*. Elsevier, London. pp.197-211.

SCIENCE/TECHNOLOGY ADVISING FOR NATURAL RESOURCE POLICY MAKING

Russian River Independent Science Review Panel, an interdisciplinary panel convened by the Sonoma County Water Agency, Mendocino County Water Agency, various growers, and NGOs, to compile and interpret data including surface flows and ground water levels, fish and other ecological data, to produce a conceptual model of surface-groundwater interactions in diverse geomorphic settings, resulting streamflow in streams, and implications for habitats in salmon-bearing streams. I lobbied for the panel, recruited the members, and chaired the panel through the preparation of the final report in 2016. The ISRP served to improve the dialogue amongst growers, agencies, NGOs, and other members of the public, which previously had been plagued by mistrust of agency science, and other disputes. The ISRP was widely viewed as a neutral, objective, scientifically credible ‘broker’ and thereby helped to tone down some of the disputes over scientific issues, and I hope ultimately improved the atmosphere in the basin. (2012-2016)

Environmental Advisory Board to the Chief of the US Army Corps of Engineers. This panel provides advice to leadership of the US Army Corps on all matters environmental related to the Civil Works program. I served two terms, from 2002-2007. The specific outcomes of these consultations are perhaps less clear-cut than was the case with some other science and technical advising, as in this case we were trying to influence the leadership of the Corps, which is highly constrained by political and institutional limitations. Nonetheless, depending on the priorities of

the Chief, the EAB can have a influence on policy implementation, although the translation of these policies into concrete changes in the landscape may lag behind.

Redwood Creek Floodplain and Groundwater Recharge Project Technical Advisory Committee. I currently serve on this committee, convened by the California Department of Parks and Recreation, in which context I provide comments on sequential iterations of restoration planning documents. So far, one of my suggestions regarding managing streamflow on Redwood Creek has triggered followup action by GGNRA, who have now hired a consultant to analyze some potential interactions between shallow groundwater, pumping, and streamflow along the lines of my suggestion (2021-present)

Upper Truckee Marsh Technical Resource Committee. This committee advises the California Tahoe Conservancy on restoration of the Upper Truckee Marsh, which formed at the delta of the Truckee River into the south end of Lake Tahoe. The committee has been set up so that scientific insights provided by the committee can be directly integrated into planning decisions. The Conservancy is trying a bold new approach: rather than sending channelized flow into Lake Tahoe, flood flows will be spread out over the marsh plain to maximize absorption of floodwaters, with the excess waters draining out into the lake (2016-present)

Mekong River Commission. Shortly after making a presentation at a conference of the Mekong River Commission, MRC (Vientiane, Laos) concerning the need to take sediment into account in basin planning, I served as a consultant to the MRC. In this capacity, I wrote the sediment sections of the MRC guidelines for mainstem dams, which have been applied to the three dams built/under construction in the Lower Mekong River basin, and require low-level outlets that are capable of passing large flows and their sediment loads. (2008-2010).

National Research Council Committee on Strategic Research for Integrated Water Resources Management. This committee addressed IWRM in North America and considered application of the concepts to the Mississippi Delta, specifically in the form of guidance for the newly-formed Gulf Institute. The Gulf Institute received the committee's recommendations favorably, but I have not tracked closely enough to see how the Institute actually implemented specific recommendations. (2013)

Platte River Recovery Implementation Program Peer Review Panel. The Platte River formerly supported large areas of habitat for birds dependent on open sand and gravel bars. With regulation by dams, these areas are no longer maintained by frequent scouring floods, and formerly open channels have become invaded by woody vegetation. To maintain minimum areas of habitat for listed bird species, areas of the channel floor are mechanically cleared, raising a host of issues. I served on the Peer Review Panel advising the Recovery Program on how best to accomplish program goals. Specific outcomes of the Peer Review panel were minor modifications in monitoring and metrics used in the program. (2013-2015)

April 1, 2022

Jamison Crosby – Natural Resources Conservation Manager
Napa County Department of Planning, Building and Environmental Services
1195 Third Street – Second Floor
Napa, CA 94559

Letter of support for: G 'Matt' Kondolf for Napa GSA Technical Advisory Group

To Whom It May Concern:

I have known and worked with Matt Kondolf for over 30 years on the faculty of UC Berkeley. We have taught and conducted research together on applied problems in resource management and environmental planning, from the San Francisco Bay region to coast of the Red Sea in Egypt. My main comment that I would share is that Matt is able to apply his (sometimes seemingly esoteric) science to real-world problems for which managers need answers right away, and to translate his science in ways that decision makers and members of the public can understand. Some of this science translation has resulted in policy actions, such as Senator Pavley's introduction of a bill in the California legislature in 2014 to require DWR to systematically measure sedimentation rates in California reservoirs, which was based on research published by Matt and his PhD student in 2009. Unfortunately that bill was killed in committee – and we still have no idea how much water storage capacity we have lost to sedimentation statewide. In addition, Matt's research for the Contra Costa County Flood Control District provided insights into the social dynamics of homeless camps along flood control channels, and more recently initiated a planning process for long-term transformation of the County's deteriorating concrete flood control channels to natural channels (the so-called '50-Year Plan').

In recent years, I have joined Matt in teaching the Environmental Planning Studio, in which students tackle environmental planning challenges for about a month, doing rapid research on the topic and developing spatially-explicit solutions in the form of land-use plans, management plans, policy changes, restoration approaches, public education campaigns, etc. For the last few years, we have studied the 2018 Montecito debris flows: not only the physical processes that led to the actual flows, but perhaps more instructive, mapping how land use has been virtually unregulated, resulting in new structures being rebuilt on the footprint of houses destroyed in 2018. In most cases these structures have also been destroyed by previous debris flows in the 20th century. This research has been conducted using large digital data sets, but to interpret them correctly, we have had multiple calls with staff of the county planning and public works agencies, US Forest Service, and California Geological Survey. This project has provided students with a compelling real-world case study, but also provides the agencies with objective feedback and recommendations on how to reduce risk for the next such debris flows. We are about to begin a project for Caltrans in which we will predict how much runoff from burned areas is 'bulked' by

sediment, ie how much larger the total flow will be because of the addition of high sediment loads.

In my view, Matt is ideally suited for the role of serving on the Napa GSA TAG. He is very strong scientifically, but also is oriented towards communicating the science to the stakeholders who can benefit from the scientific insights. He is also very effective communicating and supporting decision makers, for whom digestible scientific information can make an enormous difference on how they manage a given resource.

If you have any questions concerning my remarks, please feel free to contact me.

Sincerely yours,

A handwritten signature in black ink, appearing to read 'JR', with a long horizontal line extending to the right.

John Radke, Ph.D.

Associate Professor Departments:

Landscape Architecture & Environmental Planning, and City & Regional Planning

Center for Catastrophic Risk Management,

University of California Berkeley



**Sonoma
Water**

April 1, 2022

Napa Valley Groundwater Sustainability Agency
1195 Third Street
Napa, CA 94559

RE: Letter of Support for the Application of Prof Matt Kondolf to the Napa County Groundwater Sustainability TAG

Dear Napa Valley GSA Directors:

It is a pleasure to write in reference to Prof Matt Kondolf's nomination to serve on the Napa County Groundwater Sustainability Technical Advisory Group. I was acquainted with Dr Kondolf's work when he served on the Calfed Ecosystem Restoration Program Science Board 20 years ago, at which time he provided a geomorphological perspective to the Science Board's efforts. My comments now focus on Dr Kondolf's leadership of the Russian River Independent Science Review Panel (ISRP), a multi-year effort (2012-2016) to compile, assess, and interpret a vast array of data including surface and ground water data, fish and other ecological data. Dr Kondolf led an interdisciplinary group including aquatic ecologists, fish biologists, hydrologists, geomorphologists, and an economist, to develop the ISRP's report. The ISRP was funded by Sonoma Water, the Mendocino County Water Agency, and private landowners, and it followed a period in which scientific interpretations of the hydrology of the Russian River, notably stream-groundwater interactions, were poorly understood and disputed. One objective of the ISRP was to create a common scientific understanding of the hydrology of the river, its alluvial aquifer, and tributaries. The ISRP arranged for presentations by a wide range of experts on different aspects of the Russian River system, made field visits, obtained relevant data sets, and conducted analyses to resolve some outstanding questions. The result was a 'conceptual model' of how surface water and groundwater interact to produce stream flow in creek and river channels and how this interaction varies spatially in fish-bearing tributary streams.

For example, Dr Kondolf worked with his graduate student to develop a geomorphic/hydrologic typology of channels for the Russian River watershed based on variations in surface and groundwater interactions. The typology serves as a tool with which managers can better understand the controls on surface and groundwater, and can support initial predictions of the system's response to various interventions. The conceptual model provides a framework for future monitoring and analysis, and development of numerical models with which to test alternative management approaches designed to protect native fish and aquatic ecosystems.

One of the key aspects of the ISRP was communicating with decision makers and the public. Dr Kondolf's presentations were effective in reaching non-scientists through use of clear graphics, metaphors, etc. Even after the ISRP's report was submitted, Dr Kondolf continued to make himself available for presentations to the public, explaining the ISRP's findings and their implications, such as his 2018

presentation on causes and implications of channel incision in the Russian River to a public meeting in Cloverdale.

Lessons from the Russian River experience may bear on the Napa River. Both are deeply incised, with pronounced stream-groundwater interactions, and both support extremely valuable agriculture. Both face scientific uncertainties as they take steps toward more sustainable resource management.

Based on his experience leading the ISRP for the Russian River, I strongly recommend Dr Kondolf to serve on the Napa County GSA TAG.

Sincerely,

A handwritten signature in blue ink, appearing to read "Grant Davis". The signature is fluid and cursive, with a large initial "G" and "D".

Grant Davis
General Manager, Sonoma Water

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CANDIDATE INFORMATION

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