

Dr. Raphael Mazor

Biologist

Biology Department

Southern California Coastal Water Research Project

Education

Ph.D., environmental science, policy, & management, University of California, Berkeley, 2006

B.A., neuroscience and behavior, Columbia University, 1999

Professional Experience

Principal Scientist, Southern California Coastal Water Research Project Authority. Costa Mesa, CA. 2017-present

Senior Scientist, Southern California Coastal Water Research Project Authority. Costa Mesa, CA. 2010-2017

Scientist, Southern California Coastal Water Research Project Authority. Costa Mesa, CA. 2006-2010

Graduate Student Researcher, University of California, Berkeley. Berkeley, CA. 2001-2006

Biomonitoring Specialist, NYC Parks and Recreation Natural Resources Group. New York, NY. 1999-2001

Professional Appointments

Society for Freshwater Science, Associate Editor. 2019-present.

Society for Freshwater Science-California Chapter. Secretary-Treasurer. 2015-2018.

Society for Freshwater Invertebrate Taxonomists. Treasurer. 2006-2012.

Honors and Awards

National Science Foundation GK12 Teaching Fellow (2006)

Magy Award for Excellence in Entomological Studies (2005)

Robert Usinger Memorial Award in Aquatic Entomology (2004)

Walker Award in Insect Systematics (2004-2005)
North American Benthological Society Award in Conservation Science (2002)
National Science Foundation Graduate Research Fellow - Honorable Mention (2002-2003)
University Fellowship-University of California, Berkeley (2001-2002)
Graduated Summa Cum Laude with departmental honors - Columbia University (1999)
Barry M. Goldwater Fellowship (1998)
Phi Beta Kappa (1998)
Summer Undergraduate Research Fellowship - Columbia University (1996)
Columbia College Dean's List (1995-1999)

Selected Presentations and Conference Proceedings

Mazor, R.D., M. Sutula, E. Stein, S. Theroux, K. Taniguichi-Quan, and M. Beck. 2019. Beyond bioassessment: Setting management goals to protect biological integrity in California's wadeable streams. Society for Freshwater Science. Salt Lake City, UT.

Mazor, R.D., E.D. Stein, R. Guill, A. Suter, A.E. Fetscher. 2016. What kind of conditions do engineered channels support? California Stormwater Quality Association. San Diego, CA.

Mazor, R.D., S. Osterman-Kelm, S. Johnson, C. Loflen, P. Pendleton, D. Bram, R. Maas, H. Boyd, A.E. Fetscher, and E.D. Stein. 2016. Integrating perennial and intermittent rivers into regional ambient assessments in dry climates: Case studies from Southern California. Society for Freshwater Science. Sacramento, CA

Mazor, R.D., P.R. Ode, M. Denton, and E.D. Stein. 2013. Technical obstacles and solutions for the management of temporary streams: What are western States doing, and how can researchers help? Joint Aquatic Sciences Meeting. Portland, OR.

Mazor, R.D., P.R. Ode, A. Rehn, E. Stein, and K. Schiff. 2013. Site-specific indices improve bioassessment in complex environments: An introduction to the California Stream Condition Index. California Stormwater Quality Association. Tahoe, CA.

Mazor, R.D., P.R. Ode, A. Rehn, D. Gillett, K. Schiff, and E. Stein. 2012. Representing the Perfect in an Imperfect World: California's Approach to Creating and Evaluating a Network of Reference Streams. Presented at the Society for Freshwater Science. Louisville, KY.

Mazor, R.D., V. Resh, E. Stein, K. Schiff, P. Ode, and A. Rehn. 2011. Bioassessment in Mediterranean Streams: Effects of Hydrologic Stability on Assessment Validity. Presentation at MEDECOS XII. Los Angeles, CA.

Mazor, R.D., E. Stein, K. Schiff, A. Rehn, and P. Ode. 2011. Bioassessment in Nonperennial Streams: Do Traditional Tools Work in Temporary Streams? Presentation at the Annual Meeting of the North American Benthological Society. Providence, RI.

Mazor, R.D., K. Ritter, K. Schiff, and B. Bernstein. 2008. Evaluating multiple indicators in Southern California streams. Presentation at the Headwaters 2 Oceans conference. Long Beach, CA.

Mazor, R.D., P. Ode, A. Rehn, and K. Schiff. 2008. Bioassessment in non-perennial streams. Presentation at the California Aquatic Bioassessment Workgroup. Davis, CA.

Journal Articles

Paul, M.J., B. Jessup, L.R. Brown, J.L. Carter, M. Cantonati, D.F. Charles, J. Gerritsen, D.B. Herbst, R. Stancheva, J. Howard, B. Isham, R. Lowe, R.D. Mazor, P.K. Mendex, P.R. Ode, A. O'Dowd, J. Olson, Y. Pan, A.C. Rehn, S. Spaulding, M. Sutula, S. Theroux. 2020. Characterizing benthic macroinvertebrate and algal biological condition gradient models for California wadeable Streams, USA. *Ecological Indicators* DOI:10.1016/j.ecolind.2020.106618.

Beck, M.W., C. O'Hara, J.S. Stewart-Lowndes, R.D. Mazor, S. Theroux, D.J. Gillett, B. Lane, G. Gearheart. 2020. The importance of open science for biological assessment of aquatic environments. *PeerJ* DOI:10.7717/peerj.9539.

Simons, A.L., R.D. Mazor, S. Theroux. 2019. Using Co-occurrence Network Topology in Assessing Ecological Stress in Benthic Macroinvertebrate Communities. *Ecology and Evolution* DOI:10.1002/ece3.5751.

Giraldo, M.A., S. Dark, P. Pendleton, E.D. Stein, R.D. Mazor, J. Andreas. 2019. Environmental predictors of stream flow in semi-arid watersheds for biological assessments. *Ecological Indicators* 104:429-438.

Beck, M., R.D. Mazor, S. Theroux, K.C. Schiff. 2019. The Stream Quality Index: A multi-indicator tool for enhancing environmental management. *Environmental and Sustainability Indicators* DOI:10.1016/j.indic.2019.100004.

Beck, M., R.D. Mazor, S. Johnson, K. Wisenbaker, J. Westfall, P.R. Ode, R. Hill, C. Loflen, M. Sutula, E.D. Stein. 2019. Prioritizing Management Goals for Stream Biological Integrity Within the Developed Landscape Context. *Freshwater Science* DOI:10.1086/705996.

Gillett, D.J., R.D. Mazor, S.B. Norton. 2019. Selecting comparator sites for ecological causal

assessment based on expected biological similarity. *Freshwater Science* 38:554-565.

Simons, A.L., R.D. Mazor, E.D. Stein, S. Nuzhdin. 2019. Using alpha, beta, and zeta diversity in describing the health of stream-based benthic macroinvertebrate communities. *Ecological Applications* DOI:10.1002/eap.1896.

Coates, J., K.C. Schiff, R.D. Mazor, D.J. Pondella II, R.A. Schaffner, E. Whiteman. 2018. Development of a biological condition assessment index for shallow, subtidal rocky reefs in Southern California, USA. *Marine Ecology* DOI:10.1111/maec.12471.

Howard, J.K., K.A. Fesenmyer, T.E. Grantham, J.H. Viers, P.R. Odes, P.B. Moyle, S.J. Kupferburg, J.L. Furnish, A. Rehn, J. Slusark, R.D. Mazor, N.R. Santos, R.A. Peek, A.N. Wright. 2018. A Freshwater Blueprint for California: Prioritizing freshwater habitat for conservation in California to maximize biodiversity and leverage existing protected areas. *Freshwater Science* DOI:10.1086/697996.

Mazor, R.D., J.T. May, A. Sengupta, K. McCune, B.P. Bledsoe, E.D. Stein. 2018. Tools for managing hydrologic alteration on a regional scale: Setting targets to protect stream health. *Freshwater Biology* DOI:10.1111/fwb.13062.

Sengupta, A., S.K. Adams, B.P. Bledsoe, E.D. Stein, K. McCune, R.D. Mazor. 2018. Tools for managing hydrologic alteration on a regional scale: Estimating changes in flow characteristics at ungauged sites. *Freshwater Biology* DOI:10.1111/fwb.13074.

Stein, E.D., A. Sengupta, R.D. Mazor, K. McCune, B.P. Bledsoe, K. McCune, S. Adams. 2017. Application of regional flow-ecology relationships to inform watershed management decisions: Application of the ELOHA framework in the San Diego River watershed, California, USA. *Ecohydrology* 10:1869.

Mehinto, A.C., D.R. VanDervort, W. Lao, G. He, M.S. Denison, S.M. Vliet, D.C. Volz, R.D. Mazor, K.A. Maruya. 2017. High throughput in vitro and in vivo screening of inland waters of Southern California. *Environmental Science: Processes and Impacts* 19:1142-1149.

Stein, E.D., J.S. Brown, R.D. Mazor. 2017. Transferability of bioassessment indices among water body types and ecoregions: A California experiment in wetland assessment. *Ecological Indicators* 81:65-73.

Ode, P.R., A.C. Rehn, R.D. Mazor, K.C. Schiff, E.D. Stein, J.T. May, L.R. Brown, D.B. Herbst, D.J. Gillett, K. Lunde, C.P. Hawkins. 2016. Evaluating the adequacy of a reference-site pool for ecological assessments in environmentally complex regions. *Freshwater Science* 35:237-248.

Mazor, R.D., A.C. Rehn, P.R. Ode, M. Engeln, K.C. Schiff, E.D. Stein, D.J. Gillett, D.B. Herbst, C.P. Hawkins. 2016. Bioassessment in complex environments: designing an index for consistent

meaning in different settings. *Freshwater Science* 35:249-271.

May, J.T., L.R. Brown, A.C. Rehn, I.R. Waite, P.R. Ode, R.D. Mazor, K.C. Schiff. 2015. Correspondence of biological condition models of California streams at statewide and regional scales. *Environmental Monitoring and Assessment* 187:4086.

White, B.P., E.M. Pilgrim, L.M. Boykin, E.D. Stein, R.D. Mazor. 2014. Comparison of four species-delimitation methods applied to a DNA barcode data set of insect larvae for use in routine bioassessment. *Freshwater Science* 33:338-348.

Mazor, R.D., E.D. Stein, P.R. Ode, K.C. Schiff. 2014. Integrating intermittent streams into watershed assessments: applicability of an index of biotic integrity. *Freshwater Science* 33:459-474.

Stein, E.D., B.P. White, R.D. Mazor, J.K. Jackson, J.M. Battle, P.E. Miller, E.M. Pilgrim, B.W. Sweeney. 2014. Does DNA barcoding improve performance of traditional stream bioassessment metrics?. *Freshwater Science* 33:302-311.

Fetscher, A.E., R. Stancheva, J.P. Kociolek, R.G. Sheath, E.D. Stein, R.D. Mazor, P.R. Ode, L.B. Busse. 2013. Development and comparison of stream indices of biotic integrity using diatoms vs. non-diatom algae vs. a combination. *Journal of Applied Phycology* 26:433-450.

Resh, V.H., L.A. Beche, J.E. Lawrence, R.D. Mazor, E.P. McElravy, A.P. O'Dowd, D. Rudnick, S.M. Carlson. 2013. Long-term population and community patterns of benthic macroinvertebrates and fishes in Northern California Mediterranean-climate streams. *Hydrobiologia* 719:93-118.

Stein, E.D., B.P. White, R.D. Mazor, P.E. Miller, E.M. Pilgrim. 2013. Evaluating ethanol-based sample preservation to facilitate use of DNA barcoding in routine freshwater biomonitoring programs using benthic macroinvertebrates. *PLoS ONE* 8:e51273.

Lunde, K.B., M.R. Cover, R.D. Mazor, C.A. Sommers, V.H. Resh. 2013. Identifying reference conditions and quantifying biological variability within benthic macroinvertebrate communities in perennial and non-perennial northern California streams. *Environmental Management* 51:1262-1273.

Mazor, R.D., K.C. Schiff, K. Ritter, A. Rehn, P. Ode. 2010. Bioassessment tools in novel habitats: An evaluation of indices and sampling methods in low-gradient streams in California. *Environmental Monitoring and Assessment* 167:91-104.

Mazor, R.D., A.H. Purcell, V.H. Resh. 2009. Long-term variability in bioassessments: A twenty-year study from two northern California streams. *Environmental Management* 43:1269-1286.

Ode, P.R., C.P. Hawkins, R.D. Mazor. 2008. Comparability of biological assessments derived from

predictive models and multimetric indices of increasing geographic scope. *Journal of the North American Benthological Society* 27:967-985.

Book Chapters

Mazor, R.D., V.H. Resh, D.M. Rosenberg. 2019. Use of Aquatic Insects in Bioassessment. in: R.W. Merritt, K.W. Cummins, M.B. Berg (eds.), *An Introduction to the Aquatic Insects of North America* pp. 141-164. Kendall Hunt Publishing Company. Dubuque, IA.

Chiu, M.C., C. Leigh, R.D. Mazor, N. Cid, V. Resh. 2017. Anthropogenic Threats to Intermittent Rivers and Ephemeral Streams. in: T. Datry, N. Bonada, A. Boulton (eds.), *Intermittent Rivers and Ephemeral Streams: Ecology and Management* pp. 433-454. Academic Press. London, UK.

Technical Reports

Taniguchi-Quan, K.T., R.D. Mazor, J.S. Brown, R. Guill, M. Yeager, A. Suter, J. Rudolph, W. Isham, S. Johnson. 2020. 2018-2019 Report on the SMC Stream Survey. Technical Report 1127. Southern California Coastal Water Research Project. Costa Mesa, CA.

Beck, M.W., R.D. Mazor. 2020. A decision framework for evaluating bioassessment samples and landscape models. Technical Report 1115. Southern California Coastal Water Research Project. Costa Mesa, CA.

Mazor, R.D., B. Topping, R. Kwok, T. Nadeau, R. Leidy, K. Fritz, R. Harrington, J. Kelso, A. Allen, J. Robb, G. David, S. Jensen. 2019. Validation of Two Streamflow-duration Assessment Methods (SDAMs) in the Arid Southwest of the United States. Technical Report 1100. Southern California Coastal Water Research Project. Costa Mesa, CA.

Mazor, R.D., J. Olson, M. Robison, A. Caudillo, J.S. Brown. 2019. Assessing the biological condition of dry ephemeral and intermittent streams. Technical Report 1089. Southern California Coastal Water Research Project. Costa Mesa, CA.

Beck, M., R.D. Mazor, S. Theroux, K.C. Schiff. 2019. The Stream Quality Index: A Multi-Indicator Tool for Enhancing Environmental Management Communication. Technical Report 1080. Southern California Coastal Water Research Project. Costa Mesa, CA.

McCune, K., R.D. Mazor. 2019. Review of Flow Duration Methods and Indicators of Flow Duration in the Scientific Literature: Arid Southwest. Technical Report 1063. Southern California Coastal Water Research Project. Costa Mesa, CA.

Rehn, A.C., R.D. Mazor, P.R. Ode. 2018. An Index to Measure the Quality of Physical Habitat in

California Wadeable Streams. Technical Report 1053. Surface Water Ambient Monitoring Program. Sacramento, CA.

Mazor, R.D., M. Beck, J.S. Brown. 2018. 2017 Report on the Southern California Stormwater Monitoring Coalition Regional Stream Survey. Technical Report 1029. Southern California Coastal Water Research Project. Costa Mesa, CA.

Beck, M., R.D. Mazor, E.D. Stein, R. Maas, D.D. Mello, D. Bram. 2017. Mapping of Non-Perennial and Ephemeral Streams in the Santa Ana Region. Technical Report 1012. Southern California Coastal Water Research Project. Costa Mesa, CA.

Stein, E.D., R.D. Mazor, A. Sengupta, K. McCune, B. Bledsoe, S. Adams, S. Eberhart, M. Pyne, P. Ode, A. Rehn. 2017. Development of Recommended Flow Targets to Support Biological Integrity Based on Regional Flow-ecology Relationships for Benthic Macroinvertebrates in Southern California Streams. Technical Report 974. Southern California Coastal Water Research Project. Costa Mesa, CA.

Mazor, R.D., E.D. Stein. 2017. 2015 Report on the Stormwater Monitoring Coalition Regional Stream Survey. Technical Report 963. Southern California Coastal Water Research Project. Costa Mesa, CA.

Mazor, R.D., P.R. Ode, A.C. Rehn, E.D. Stein. 2017. Spatial statistical network models to estimate the spatial representativeness of bioassessment samples. Technical Report 979. Southern California Coastal Water Research Project. Costa Mesa, CA.

Mazor, R.D., J.S. Brown, E.D. Stein, J.R. Olson, M.D. Robinson, T. Clark. 2017. Assessment of Episodic Streams in the San Diego Region. Technical Report 1011. Southern California Coastal Water Research Project. Costa Mesa, CA.

Stein, E.D., A. Sengupta, R.D. Mazor, K. McCune. 2016. Application of Regional Flow-ecology to Inform Management Decision in the San Diego River Watershed. Technical Report 948. Southern California Coastal Water Research Project Authority. Costa Mesa, CA.

Mazor, R.D. 2015. Bioassessment of Perennial Streams in Southern California: A Report on the First Five Years of the Stormwater Monitoring Coalition's Regional Stream Survey. Technical Report 844. Southern California Coastal Water Research Project Authority. Costa Mesa, CA.

Mazor, R.D. 2015. Bioassessment Survey of the Stormwater Monitoring Coalition: Workplan for Years 2015 through 2019 Version 1.0. Technical Report 849. Southern California Coastal Water Research Project Authority. Costa Mesa, CA.

Rehn, A.C., R.D. Mazor, P.R. Ode. 2015. The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams. Technical

Report 883. Southern California Coastal Water Research Project Authority. Costa Mesa, CA.

Mazor, R.D., K.C. Schiff, P. Ode, E.D. Stein. 2012. Final Report on Bioassessment in Nonperennial Streams - Report to the State Water Resources Control Board. Technical Report 695. Southern California Coastal Water Research Project. Costa Mesa, CA.

Mazor, R.D., D.J. Gillett, K.C. Schiff, K. Ritter, E.D. Stein. 2011. Ecological Condition of Watersheds in Coastal Southern California: Progress Report of the Stormwater Monitoring Coalition's Stream Monitoring Program First Year (2009). Technical Report 639. Southern California Coastal Water Research Project. Costa Mesa, CA.

Mazor, R.D., K.C. Schiff. 2008. Surface Water Ambient Monitoring Program (SWAMP) Report on the Carlsbad Hydrologic Unit. Technical Report 527.04. Southern California Coastal Water Research Project. Costa Mesa, CA.

Mazor, R.D., K.C. Schiff. 2008. Surface Water Ambient Monitoring Program (SWAMP) Report on the Los Penasquitos Hydrologic Unit. Technical Report 527.06. Southern California Coastal Water Research Project. Costa Mesa, CA.

Mazor, R.D., K.C. Schiff. 2008. Surface Water Ambient Monitoring Program (SWAMP) Report on the Otay Hydrologic Unit. Technical Report 527.1. Southern California Coastal Water Research Project. Costa Mesa, CA.

Mazor, R.D., K.C. Schiff. 2008. Surface Water Ambient Monitoring Program (SWAMP) Report on the Pueblo San Diego Hydrologic Unit. Technical Report 527.08. Southern California Coastal Water Research Project. Costa Mesa, CA.

Mazor, R.D., K.C. Schiff. 2008. Surface Water Ambient Monitoring Program (SWAMP) Report on the San Diego River Hydrologic Unit. Technical Report 527.07. Southern California Coastal Water Research Project. Costa Mesa, CA.

Mazor, R.D., K.C. Schiff. 2008. Surface Water Ambient Monitoring Program (SWAMP) Report on the San Dieguito Hydrologic Unit. Technical Report 527.05. Southern California Coastal Water Research Project. Costa Mesa, CA.

Mazor, R.D., K.C. Schiff. 2008. Surface Water Ambient Monitoring Program (SWAMP) Report on the San Juan Hydrologic Unit. Technical Report 527.01. Southern California Coastal Water Research Project. Costa Mesa, CA.

Mazor, R.D., K.C. Schiff. 2008. Surface Water Ambient Monitoring Program (SWAMP) Report on the San Luis Rey Hydrologic Unit. Technical Report 527.03. Southern California Coastal Water Research Project. Costa Mesa, CA.

Mazor, R.D., K.C. Schiff. 2008. Surface Water Ambient Monitoring Program (SWAMP) Report on the Santa Margarita Hydrologic Unit. Technical Report 527.02. Southern California Coastal Water Research Project. Costa Mesa, CA.

Mazor, R.D., K.C. Schiff. 2008. Surface Water Ambient Monitoring Program (SWAMP) Report on the Sweetwater Hydrologic Unit. Technical Report 527.09. Southern California Coastal Water Research Project. Costa Mesa, CA.

Mazor, R.D., K.C. Schiff. 2008. Surface Water Ambient Monitoring Program (SWAMP) Report on the Tijuana Hydrologic Unit. Technical Report 527.11. Southern California Coastal Water Research Project. Costa Mesa, CA.

Mazor, R.D., K.C. Schiff. 2008. Surface Water Ambient Monitoring Program (SWAMP) synthesis report on stream assessment in the San Diego Region. Technical Report 527. Southern California Coastal Water Research Project. Costa Mesa, CA.

Annual Report Articles

Fetscher, A.E., R. Stancheva, J.P. Kociolek, R.G. Sheath, E.D. Stein, R.D. Mazor, P.R. Ode, L.B. Busse. 2013. Development and comparison of stream indices of biotic integrity using diatoms vs. non-diatom algae vs. a combination.

Ode, P., A. Rehn, R.D. Mazor, K.C. Schiff, E.D. Stein, J. May, L. Brown, D. Herbst, D.J. Gillett, K. Lunde, C.P. Hawkins. 2013. Evaluating the adequacy of a reference-site pool for the ecological assessment of streams in environmentally complex regions.

White, B.P., E.M. Pilgrim, L.M. Boykin, E.D. Stein, R.D. Mazor. 2013. Comparison of four species-delimitation methods applied to a DNA barcode data set of insect larvae for use in routine bioassessment.

Mazor, R.D., E.D. Stein, P.R. Ode, K.C. Schiff. 2013. Integrating intermittent streams into watershed assessments: Applicability of an index of biotic integrity.

Stein, E.D., B.P. White, R.D. Mazor, J.K. Jackson, J.M. Battle, P.E. Miller, E.M. Pilgrim, B.W. Sweeney. 2013. Does DNA barcoding improve performance of traditional stream bioassessment metrics?.

Resh, V.H., L.A. Beche, J.E. Lawrence, R.D. Mazor, E.P. McElravy, A.P. O'Dowd, D. Rudnick, S.M. Carlson. 2012. Long-term population and community patterns of benthic macroinvertebrates and fishes in northern California Mediterranean-climate streams.

Stein, E.D., B.P. White, R.D. Mazor, P.E. Miller, E.M. Pilgrim. 2012. Optimizing ethanol-based

sample preservation to facilitate use of DNA barcoding in routine freshwater biomonitoring programs using benthic macroinvertebrates.

Lawrence, J.E., K.B. Lunde, R.D. Mazor, L.A. Beche, E.P. McElravy, V.H. Resh. 2010. Long-term macroinvertebrate responses to climate change: Implications for biological assessment in Mediterranean-climate streams.

Ode, P.R., C.P. Hawkins, R.D. Mazor. 2008. Comparability of biological assessments derived from predictive models and multimetric indices of increasing geographic scope.