Marcos Robles

Lead Scientist Arizona

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EDUCATION

Master of Science, Ecology, 1995, Colorado State University, Fort Collins, CO
Bachelor of Arts, Environmental Science, 1993, University of California at Berkeley, Berkeley, CA

EXPERIENCE

Oct 2020 – present: Lead Scientist, The Nature Conservancy (TNC), Tucson AZ

As lead scientist for the Arizona chapter, Marcos leads a team of scientists that demonstrates the impact of TNC's conservation strategies on Arizona's forests, rivers, and grasslands and set priorities for future conservation strategies that address emerging threats and leverage opportunities. He leads the development and communication of novel partnerships with leading scientists from universities, government agencies, and NGOs using the Arizona Science Innovation Fund. Beyond Arizona, he led a team of scientists from TNC, universities and federal agencies to develop a set of foundational science tools for the Western Dry Forest & Fire Program, an initiative to increase the pace of scale of forest restoration with key partners and stakeholders across the western US.

Aug 2006 – Oct 2020: Conservation Scientist, TNC, Tucson AZ

He developed scientific knowledge to help sustain Arizona and western US ecosystem resilience in a changing environment. Projects included a series of studies that evaluated how forest restoration in Northern Arizona could reduce impacts of climate change, wildfire, and drought on streamflow, forest mortality & regeneration, and forest carbon. Other projects included grassland and desert program strategic planning; conservation priorities to guide transportation and renewable energy planning and mitigation; drought effects on grassland resilience; forest restoration and human water demand effects on river flow; Southwest Climate Change Assessment; ecoregional conservation geodatabase and map for the western United States and northwestern Mexico.

Nov 2000 – Jul 2006: Project Manager & Conservation Database Specialist, NatureServe, Fort Collins CO

As project manager, he developed conservation planning framework, facilitated stakeholder workshops and completed a Seamless Network of Protected Areas report to initiate landscape-scale partnerships between the National Park Service (NPS) and management agencies in neighboring jurisdictions in the southeastern United States. As a conservation database specialist, he completed scientific analyses using comprehensive information of North American species biodiversity. Projects included: natural resource assessments of several National Parks; an analysis of at-risk species on private forest lands; provision of federally listed species data to the pesticide industry.

Sept 1995 – Feb 1999: Conservation Volunteer, United States Peace Corps, Guatemala

Promoted agroforestry and soil conservation practices to subsistence farmers and completed a preliminary inventory of tree, shrub, epiphyte and vine species in a sub-montane cloud forest threatened by slash and burn agriculture.

July 1994 – Feb 1995: Graduate Research Assistant, Colorado State University, Fort Collins CO

Completed analyses and published scientific articles quantifying changes in soil organic matter resulting from conservation management of former wheat agriculture fields in southeastern Wyoming.

PUBLICATIONS

Davis, K.T., J. Peeler, J. Fargione, R.D. Haugo, K.M. Metlen, M.D. Robles, T. Woolley. Tamm Review: A meta-analysis of thinning, prescribed fire, and wildfire effects on subsequent wildfire severity in conifer dominated forests of the Western US. ***Forest Ecology and Management 2024*** 561, https://doi.org/10.1016/j.foreco.2024.121885.

Dwivedi, R., J.A. Biederman, P.D. Broxton, J.K. Pearl, K. Lee, B.M. Svoma, W.J.D van Leeuwen, M.D. Robles. How three-dimensional forest structure regulates the amount and timing of snowmelt across a climatic gradient of snow persistence. ***Frontiers in Water 2024*** 6, https://doi.org/10.3389/frwa.2024.1374961.

Peeler, J.L., L. McCauley, K.L. Metlen, T. Woolley, K.T. Davis, M.D. Robles, R.D. Haugo, and co-authors. Identifying opportunity hotspots for reducing the risk of wildfire-caused carbon loss in western US conifer forests. ***Environmental Research Letters 2023*** 18 094040, https://doi.org/10.1088/1748-9326/acf05a.

Davis, K.T.; M.D. Robles, K.B. Kemp, P.E. Higuera, T. Chapman, K.L. Metlen, J.L. Peeler, and co-authors. Reduced fire severity offers near-term buffer to climate-driven declines in conifer resilience across the western United States. ***Proceedings of the National Academy of Sciences 2023*** 120(11), e2208120120, https://doi.org/10.1073/pnas.2208120120.

Biederman, J.A.; M.D. Robles, R.L. Scott, J.F. Knowles. Streamflow response to wildfire differs with season and elevation in adjacent headwaters of the Lower Colorado River Basin. ***Water Resources Research 2022*** 58(3), https://doi.org/10.1029/2021WR030687.

McCauley, L.A., J.B. Bradford, M.D. Robles, R.K. Shriver, T. Woolley, C.A. Andrews. Landscape-scale forest restoration decreases drought mortality under climate change in Southwest USA ponderosa forest. ***Forest Ecology and Management 2022*** 509, 120088, https://doi.org/10.1016/j.foreco.2022.120088.

Bradford, J.B.; R.K. Shriver, M.D. Robles, L.A. McCauley, T.J. Woolley, M. Crimmins, D.M. Bell. Tree mortality response to drought-density interactions suggests opportunities to enhance drought resistance. ***Journal of Applied Ecology 2021*** 59(2), 549-559, https://doi.org/10.1111/1365-2664.14073.

Robles, M.D., J.C. Hammond, S.K. Kampf, J.A. Biederman, E.M.C. Demaria. Winter Inputs Buffer Streamflow Sensitivity to Snowpack Losses in the Salt River Watershed in the Lower Colorado River Basin. ***Water 2021***, 13, 3, https://dx.doi.org/10.3390/w13010003.

Bradford, J.B., C.A. Andrews, M.D. Robles, L.A. McCauley, T.J. Woolley, R.M. Marshall Landscape-scale restoration minimizes tree growth vulnerability to 20th century drought in a dry forest. **Ecological Applications 2020**, 31(2), e2238, https://doi.org/10.1002/eap.2238.

Hunter, M.E., M.D. Robles. Tamm review: The effects of prescribed fire on wildfire regimes and impacts: A framework for comparison. ***Forest Ecology and Management 2020***, 475, 118435, https://doi.org/10.1016/j.foreco.2020.118435.

McCauley, L.A., M.D. Robles, T.J. Woolley, R.M. Marshall, A. Kretchun, D.F. Gori. 2019. Large-scale forest restoration stabilizes carbon under climate change in the Southwest United States. ***Ecological Applications 2019*** 29(8), e01979, https://doi.org/10.1002/eap.1979.

Robles, M.D., D.S. Turner, J.A. Haney. A century of changing flows: Forest management changed flow magnitudes and warming advanced the timing of flow in a southwestern US river. ***PLoS ONE 2017***, 12(11), e0187875. https://doi.org/10.1371/journal.pone.0187875.

Demaria, E.M.C., F. Dominguez, H. Hu, G. von Glinski, M.D. Robles, J. Skindlov, and J. Walter Observed hydrologic impacts of landfalling atmospheric rivers in the Salt and Verde river basins of Arizona, United States. ***Water Resources Research 2017***, 53(12), 10025-10042, https://doi.org/10.1002/2017WR020778.

Bodner, G.S., M.D. Robles. Enduring a decade of drought: Patterns and drivers of vegetation change in a semi-arid grassland. ***Journal of Arid Environments 2017***, 136, 1-14, https://doi.org/10.1016/j.jaridenv.2016.09.002.

Robles, M.D., R.M. Marshall, F. O'Donnell, E.B. Smith, J.A. Haney, D.F. Gori. Effects of Climate Variability and Accelerated Forest Thinning on Watershed-Scale Runoff in Southwestern USA Ponderosa Pine Forests. ***PLoS ONE 2014***, 9(10), e111092, https://doi.org/10.1371/journal.pone.0111092.

Marshall, R.M., M.D. Robles, D.R. Majka, J.A. Haney. Sustainable Water Management in the Southwestern United States: Reality or Rhetoric? ***PLoS ONE 2010***, 5(7): e11687. https://doi.org/10.1371/journal.pone.0011687.

Robles, M.D., C.H. Flather, S.M. Stein, M.D. Nelson, A. Cutko. The geography of private forests that support at-risk species in the conterminous United States. ***Frontiers in Ecology and the Environment 2008***, 6(6), 301-307, https://doi.org/10.1890/070106.

Robles, M.D., I.C. Burke. Soil organic matter recovery on Conservation Reserve Program fields in Southeastern Wyoming. ***Soil Science Society of America Journal 1998***, 62(3), 725-730, https://doi.org/10.2136/sssaj1998.03615995006200030026x.

Robles, M.D., I.C. Burke. Legume, grass, and Conservation Reserve Program effects on soil organic matter recovery. ***Ecological Applications 1997*** 7(2), 345-357, https://doi.org/10.1890/1051-0761(1997)007[0345:LGACRP]2.0.CO;2.

Burke I.C., W.K. Lauenroth, M.A. Vinton, R.H. Kelly, H.E. Epstein, M.D. Robles, K.L. Murphy, R.A. Gill. Plant-Soil interactions in grasslands. ***Biogeochemistry 1997***, 42, 121-143, https://doi.org/10.1007/978-94-017-2691-7_7.

Robles, M., F.S. Chapin III. Comparison of the influence of two exotic species on ecosystem processes in the Berkeley Hills. ***Madroño 1995***, 42(3), 349-357, https://www.jstor.org/stable/41425082.

SCIENTIFIC REPORTS

Payton, E., J. Biederman, M. Robles. Snowtography: Snowpack & Soil Moisture Monitoring Handbook. ***Western Water Assessment 2021***. University of Colorado Boulder, Boulder, Colorado, 58 pp, https://doi.org/10.25810/r9s7-4t28.

Guarinello, M.L., M.D. Robles, D.S. Turner, R.M. Marshall, M.C. Wilson. A place for human modificaition and intactness data in regional mitigation. ***The Nature Conservancy 2017***. Tucson, Arizona. 21 pp, https://azconservation.org/wp-content/uploads/2021/08/Arizona_Landscape_Intactness_TNC_2017.pdf.

Robles, M.D., C. Enquist. Managing changing landscapes in the Southwestern United States. ***The Nature Conservancy 2010***. Tucson, Arizona. 26 pp, https://azconservation.org/wp-content/uploads/2021/08/TNC_Managing_Changing_Landscapes_SW.pdf.

Robles, M.D., G.E. Ecker, L. Mehrhoff. Seamless network of protected areas in the southeastern United States: Opportunities for partnerships in biodiversity conservation, invasive species control, and recreation. ***NatureServe 2007***, Arlington, Virginia.

Robles, M.D., C.J. Madden, M.R. Lara, D.L. Jones, M.J. Butler. Condition of the natural resources of Florida Bay, Everglades National Park: A state of the parks technical report. ***National Parks Conservation Association 2005***, Washington, D.C.

Robles, M.D., R.D. White, J.W. Petranka, R.K. Smith, N.A. Capuano. Condition of the natural resources of Great Smoky Mountains National Park: A state of the parks technical report. ***National Parks Conservation Association 2003***, Washington, D.C.