

DAVID P. BRAUN, Ph.D.

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SUMMARY OF QUALIFICATIONS

Extensive research and project development and management experience in the integration of ecological, hydrologic, and watershed science to conserve freshwater ecosystems to meet both societal and ecological needs in both mixed-use and agricultural watersheds, including in context of climate change; design and implementation of ecological adaptive management projects – both in general and for watershed-based freshwater projects in particular – including development of ecological threshold-based management goals and performance metrics; water quality and hydrologic research design, monitoring and data analysis; hydrologic alteration analysis with particular application to agricultural watersheds and freshwater inflows to estuaries; application of watershed modeling to land-use planning and evaluation of governmental policy impacts; public-private partnerships in watershed management. Extensive experience developing guidance materials and providing training in biodiversity conservation with particular emphasis on watershed-based freshwater conservation. Increasing experience in the causes, impacts and policy implications of methyl-mercury terrestrial and freshwater bioaccumulation “hotspots.”

EDUCATION

M.S., 1992, Water Resources Administration, University of Arizona, Tucson, AZ
Ph.D., 1977, Anthropology, University of Michigan, Ann Arbor, MI
B.A., Magna Cum Laude, 1972, Anthropology, Harvard University, Cambridge, MA

PROFESSIONAL APPOINTMENTS

The Nature Conservancy

1993-2009

- Director of Conservation Science, Eastern New York, 2006-2009
Guided planning, ensured scientific soundness, and directed implementation of performance metrics for freshwater and terrestrial ecological conservation projects in Hudson River Valley and Catskill Mountains; developed research project on biogeography and implications of methyl-mercury bioaccumulation hotspots in the Northeastern US; served on federal Lake Champlain Sea Lamprey Control Alternatives Workgroup; served on Scenarios Team for Rising Waters climate change adaptation project, Hudson River Estuary Watershed; developed guidance materials on biodiversity conservation planning and adaptive management for the Conservancy’s global Conservation Action Planning team.
- Watershed Initiative Director, Upper Mississippi River Program, 2003-2006
With grant funding from the USEPA and Altria, Inc., launched a multi-watershed, public-private program to demonstrate ways to sustain and restore freshwater ecosystems in agricultural watersheds while sustaining and improving farm productivity; built a partnership with the Iowa Soybean Association, Iowa State University-Center for Agriculture and Rural Development (CARD), and Prairie Rivers RC&D to launch the Boone River Watershed project; co-established an international (US, Brazil) agricultural basin conservation program in the Conservancy’s new Great Rivers Program; and co-established a workshop series and collaborative workgroup on hydrologic alteration in agricultural watersheds across the Conservancy’s Central US Region.
- Biohydrology Advisor, Southeast Region, 2003-2005
Assisted in launch of multi-institutional investigations with Dauphin Island Sea Lab, Mobile Bay Keeper, and Alabama Power Company to assess impacts of upstream dam operations and a cross-delta causeway on water chemistry and ecological dynamics of Mobile-Tensaw River Delta estuary; conducted extensive data mining and analysis of short- and long-term salinity/salt-front dynamics in the estuary, leading to the identification of specific upstream dam operations responsible for alterations to critical low-inflow conditions.
- Senior Biohydrologist, Freshwater Initiative, 1998-2003
Provided guidance to and training for, directed a team of advisors for, and directed funding and equipment grants to 40+ watershed-based freshwater conservation projects from Alaska to Brazil to teach them how to become effective in freshwater biodiversity conservation, program funding, monitoring and adaptive management; obtained and managed grants from the USEPA, Philip Morris Companies and Hydrolab, Inc. to support these efforts, with the USEPA funds also supporting development of formal guidance materials (see list of publications); coordinated freshwater “Agricultural Strategies” learning network; tested and co-authored

recommendations for significant improvements to ecological adaptive management methods for ecological conservation projects in general (see list of publications); conducted training workshops with regional and state offices from USEPA Regions 4, 5, 6 and 7 on integration of freshwater biodiversity conservation with nonpoint-source TMDL programs; served on New York City, Department of Environmental Protection, Stream Management Science Advisory Panel.

- Biohydrologist-Water Quality Specialist, National Stewardship Program, 1993-1998
As the second freshwater conservation specialist ever hired by the Conservancy, provided on-site and general guidance to numerous freshwater (watershed, river, wetland) ecological conservation projects throughout the US on conservation planning, threat assessment and abatement, and both surface and groundwater hydrologic and water quality monitoring; provided project-specific analyses including, for example, water-budget modeling in support of water-rights adjudication in the Upper Klamath River Basin, OR; co-conducted national assessment of threats to freshwater biodiversity and co-developed a methodology for assessing ecologically important types of hydrologic alteration using long-term gauge data (see list of publications); and co-directed training workshops in freshwater ecology, hydrology, and conservation to practitioners throughout the organization. Served on USGS National Water Quality Assessment (NAWQA) advisory panel.

Pima County, Arizona, Department of Environmental Quality **1992-1993**

- Principal Hydrologist
Responsible for the direction of all Department planning and monitoring programs concerning ground and surface water quality and natural stream flows, including: (1) development and direction of the NPDES Stormwater Discharge water quality monitoring program and coordination of the associated EPA discharge permit application and compliance program; (2) direction of a ground water sampling program in and around the Tucson International Airport Superfund Site; and (3) direction of GIS and database development for a comprehensive land use, hazardous materials and waste distribution, and hydrology data management system, to allow assessment and monitoring of soil and water contamination risks from hazardous material use and waste disposal in the Tucson Basin.

University of Arizona, Department of Hydrology and Water Resources **1990-1992**

- Research Associate
Developed water-budget model and groundwater model (MODFLOW) as part of team advising state and county agencies and conservation groups on water management for the San Pedro River Basin, where groundwater pumping for municipal and agricultural consumption threatens ecologically crucial perennial river flows.

[Career Change, 1988-1990]

- Career change prompted by long-term desire for an active role in environmental policy, protection, and restoration with emphasis on water. Readily transferable skills in computing and statistical methods; interdisciplinary research administration; writing and technical editing; oral presentation; strong background in social sciences and ecology.]

Northern Arizona University, Department of Anthropology **1988-1990**

- Adjunct Professor and Research Associate
As a temporary appointee (during career change), taught classes in archaeology and served as principal investigator on archaeology field projects while taking courses in preparation for MS studies in water resources.

Southern Illinois University, Department of Anthropology **1977-1987**

- Assistant Professor 1977-1981, and Associate Professor, tenured, 1981-87
Research emphases in ecosystem-society interactions; pre-colonial North American ecosystems and the place of native cultures in these ecosystems; structure of scientific inquiry; quantitative and statistical research methods; and environmental impact studies; taught courses in scientific research design, use of ecological concepts and data to understand human social systems, and prehistory of North America in its paleo-ecological context; conducted field and laboratory investigations of prehistoric land use and social change in the Midwestern US; served as General Editor and Director of Publications for technical publications (SIU Center for Archaeological Investigations) and a joint series with Southern Illinois University Press; obtained numerous grants (including National Science Foundation) and contracts with agencies and private corporations; produced numerous peer-reviewed publications and one book; directed numerous theses and dissertations, served as Director of Graduate

Studies and occasionally as acting Departmental Chair, and served as member or chair of several university administrative committees.

PUBLICATIONS IN CONSERVATION & HYDROLOGY

- D.P. Braun. 2006. Freshwater Fundamentals (Chapter 2, co-author), Focusing Freshwater Conservation Efforts (Chapter 3, co-author), Understanding Threats to Freshwater Biodiversity (Chapter 4, co-author) and Measuring Freshwater Biodiversity Conservation Success (Chapter 5, author) and Indicators of Freshwater Ecological Integrity (Appendix B, author), In N. Silk and K. Ciruna, editors, *A Practitioner's Guide to Freshwater Biodiversity Conservation*, Island Press and The Nature Conservancy (original edition © The Nature Conservancy, 2004).
- J.D. Parrish, D.P. Braun, R.S. Unnasch. 2003. Are We Conserving What We Say We Are? Measuring Ecological Integrity within Protected Areas. *BioScience* 53(9): 851-860.
- D.P. Braun, L.J. Clemens, P.C. West. 2003. Challenges to Conserving Native Freshwater Biodiversity in Agricultural Watersheds. *Proceedings of the 2003 AWRA Spring Specialty Conference, Agricultural Hydrology and Water Quality*, Kansas City, MO.
- D.P. Braun, L.B. Bach, K.A. Ciruna, and A.T. Warner. 2000. Watershed-Scale Abatement of Threats to Freshwater Biodiversity: The Nature Conservancy's Freshwater Initiative. In *Proceedings, Watershed-2000 Conference*, Water Environment Federation, Alexandria, VA.
- B.D. Richter, J.V. Baumgartner, D.P. Braun, and J. Powell. 1998. A Spatial Assessment of Hydrologic Alteration within a River Network. *Regulated Rivers Research and Management* 14(4):329-340.
- B.D. Richter, J.V. Baumgartner, R. Wigington, and D.P. Braun. 1997. How Much Water Does a River Need? *Freshwater Biology* 37:231-249.
- B.D. Richter, D.P. Braun, M. Mendelson, and L. Master. 1997. Threats to Imperiled Freshwater Fauna. *Conservation Biology* 11(5):1-14.
- B.D. Richter, J.V. Baumgartner, J. Powell, and D.P. Braun. 1996. A Method for Assessing Hydrologic Alteration within Ecosystems. *Conservation Biology* 10(4):1163-1174.
- D.P. Braun. 1995. Ecological Dynamics and Hydrologic Integrity. In *Proceedings of the 4th Annual National Conference, U.S. EPA, Water Quality Criteria and Standards for the 21st Century*, Washington, D.C., September 1994. U.S. Environmental Protection Agency, Office of Water. Washington, D.C.
- D.P. Braun, T. Maddock III, W.J. Lord. 1992. WATERBUD: A Spreadsheet-Based Model of the Water Budget and Water Management Systems of the Upper San Pedro River Basin, Arizona. *University of Arizona, Department of Hydrology and Water Resources, HWR Series No. 92*. Tucson.
- [1974-1992, publications from prior career in anthropology/archaeology: Co-author of one book and author of eight peer-reviewed journal articles, fourteen book chapters, five research monographs, and twenty-four papers presented at national/international conferences. List available on request].

GRANTS, OUTREACH, MEDIA APPEARANCES AND COLLABORATIVE ACTIVITIES

- Principal Investigator, 1993-2009:
 - "Disentangling Mercury Pollution from Other Ecoregional Threats," The Nature Conservancy, RJKOSE Endowment Grant Program, in partnership with Dr. David Evers (BRI) and Dr. Michael Bank (Harvard), 2007-2009.
 - "Karner Blue Butterfly Conservation-Habitat Monitoring and Assessment," U.S. Fish and Wildlife Service and New York State Department of Environmental Conservation, State Wildlife Grants Program, 2006-2009.
 - "Incorporating Freshwater Biodiversity Conservation into Watershed Planning in Impaired Agricultural Watersheds, Upper Mississippi River Basin," U.S. Environmental Protection Agency, Assessment and Watershed Protection Program, 2003-2007.
 - "Collaborative Agricultural Watershed Conservation—Upper Mississippi River Basin," Altria Group, Environment Program, 2003-2004.
 - "Hydrolab Corporation Equipment Grants Program," Hydrolab, Inc., 2000-2003.
 - "Natural Resources Stewardship and the Protection of Freshwater Ecosystems", U.S. Environmental Protection Agency, Office of Water, 1999-2003.

- Co-Author (Robert S. Unnasch, David P. Braun, Patrick J. Comer, Gregory E. Eckert), “*The Ecological Integrity Assessment Framework: A Framework for Assessing the Ecological Integrity of Biological and Ecological Resources of the National Park System*,” Report to the National Park Service, December 2008.
- Co-Developer and Project Member, “Biogeography of Mercury Contamination in New York State: Risk to Species of Greatest Conservation Need,” New York State Department of Environmental Conservation, State Wildlife Grant, under Principal Investigator Dr. Nina Schoch, Wildlife Conservation Society, 2007-2010.
- Co-Founder (with Larry Clemens), “TNC Agriculture and Hydrology Learning Network,” launched for the Central and Eastern Conservation Regions, 2005.
- Co-Developer: “Indicators of Hydrologic Alteration” desktop method for assessing the hydrologic integrity of freshwater ecosystems, 1993-1997; training curricula in freshwater biodiversity conservation, 1994-2003.
- Presentations: Numerous presentations to EPA conferences and American Society of Wetland Managers, 1994-2006.
- Advisory Boards, External Review Panels, Media Appearances:
 - Lake Champlain Sea Lamprey Control Alternatives Workgroup (for USFWS), 2006-2009.
 - Trout Unlimited, Watershed Program Peer Review Panel, 2005.
 - American Museum of Natural History, International Symposium, “New Currents in Conserving Freshwater Systems,” Steering Committee Member and Session Moderator, 2004-2005.
 - Altria Group, Environmental Initiative Grants Program, External Review Panel, 2004-2005.
 - USEPA and The Weather Channel, co-producers, “After the Storm” video/Storm Story, TNC spokesperson in multiple segments, 2004.
 - New York City-Department of Environmental Protection, Stream Management Program Advisory Board, 2002-2004.
 - World Watershed Summit, Holistic Monitoring Session Chair, 2002.
 - U.S. Environmental Protection Agency, Tiered Aquatic Life Use Criteria Program participant, 2001-current.
 - U.S. Environmental Protection Agency, Regional Vulnerability Assessment Program Peer Review Panel, 2001.
 - National Research Council, Water Science and Technology Board, Committee on Hydrologic Science, Peer Review Panel, “Towards Integration of Hydrologic and Ecological Sciences”, 2000.
 - U.S. Geological Survey, National Water Quality Assessment Program, Advisory Panel, 1994-1996.
- The Nature Conservancy, Organization-Wide Support Activities:
 - 2015 Goal-Eastern US Regional Implementation Plan freshwater team, 2006-2009.
 - Great Rivers Biodiversity and Agriculture Initiative proposal development team (a joint External Affairs, Corporate Partnerships, and Great Rivers Partnership effort), 2005-2006.
 - Freshwater Habitat Goals Strategy Team-Water Quality Workgroup, 2005-2006.
 - Global Conservation Approaches Team, Conservation Measures Group, 2004-2006; includes serving as liaison to NatureServe-Ecological Integrity Assessment Work Group, 2004-2006.
 - Co-Organizer (with Jim Herkert and Jenny Brown), TNC-Conservation International All Science Meeting, 2003, Duluth, MN.
 - Ecological Systems Viability Workgroup, 2000-2002.
 - Ecoregional Planning Workgroup, 1996-1997.