DAVID P. BRAUN, Ph.D.

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SUMMARY OF QUALIFICATIONS

Extensive experience integrating ecological, hydrologic, watershed and socioeconomic science to conserve freshwater ecosystems to meet both societal and ecological needs, including in context of ecosystem services and climate change; watershed planning and management in mixed-use and agricultural watersheds; hydrologic alteration analysis and environmental flow assessment; design and implementation of ecological adaptive management projects including development of threshold-based management goals and performance metrics; watershed-based water quality and hydrologic research design, monitoring and data analysis; application of watershed modeling to land-use planning and evaluation of climate change and governmental policy impacts; public-private partnerships in watershed management. Extensive experience in program leadership and staff supervision; in grants administration and project management; and in developing guidance materials and training programs in socially sustainable ecological conservation with particular emphasis on watershed-based freshwater conservation. Well-experienced with Microsoft Office software and productivity tools such as MindManager, Evernote, statistical software.

EDUCATION

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

PROFESSIONAL APPOINTMENTS

Sound Science, LLC **2009--**

- Senior Associate
  Leading the freshwater science components of a small consulting firm focused on helping organizations develop plans, goals and objectives, mobilize sound scientific information, measure success, and take actions that contribute to effective decision making in land and watershed management practice, conservation action, and environmental policy (www.sound-science.org).

Cary Institute of Ecosystem Studies **2009--**
Adjunct Scientist

The Nature Conservancy **1993-2009**

- Director of Conservation Science, Eastern New York, 2006-2009
  Guided planning and data acquisition, ensured scientific soundness, and directed implementation of performance metrics for partnership-based river, estuary and forest conservation projects in Hudson River Valley and Catskill Mountains; supervised team of 2-3 employees and 1-3 external contractors; developed recommendations on climate change adaptation at local, state and regional scales; initiated research on climate change impacts to Karner blue butterfly habitat in New York, and on biogeography and policy 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" Hudson River valley climate change adaptation project; developed guidance materials on biodiversity conservation planning and adaptive management for the Conservancy's global Conservation Action Planning team and for the U.S. National Park Service; served as member of global conservation planning coaches network; and served for two years as part-time state-wide science advisor to New York State Deputy Director, while the formal state-wide science position was vacant.
- Watershed Initiative Director, Upper Mississippi River Program, 2003-2006
  Launched a multi-watershed, public-private program with funding from the USEPA and Altria, Inc. to demonstrate ways to sustain freshwater ecosystems in three 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 of Iowa RC&D to launch the Boone River Watershed project (*reports available on request*); managed one employee and one external contractor; co-established an international (US, Brazil) agricultural basin conservation program in the Conservancy's new Great Rivers Program; developed recommendations for an organization-wide approach to promoting ecologically sustainable agriculture in sensitive ecoregions; co-established and co-directed a collaborative "learning network" workgroup on hydrologic alteration

and its mitigation in agricultural watersheds; served on program review panels Altria, Inc., environmental grants program, Trout Unlimited watershed grants program, and Wetland Initiative, Inc. "Nitrogen Farming" program.

- Biohydrology Advisor, Southeast Region, 2003-2005
  Launched investigations with Dauphin Island Sea Lab, Mobile Bay Keeper, and Alabama Power Company to assess impacts of upstream dam operations and a local causeway on water chemistry and ecological dynamics of Mobile-Tensaw River Delta estuary; managed one employee; 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 (*reports available on request*).
- Senior Biohydrologist, Freshwater Initiative, 1998-2003
  Provided guidance to and training for, supervised a team of three 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, socially and ecologically sustainable watershed management, 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 ("Indicators of Hydrologic Alteration") for assessing ecologically important types of hydrologic alteration using long-term river gage data (see list of publications); supervised one employee and multiple interns and volunteers; 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. Supervised five employees.

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.

Transition from Prior Academic Career, 1988-1990

- Career change prompted by long-term desire for an active role in environmental policy, protection, and restoration with emphasis on ecologically sustainable water resource management. Readily transferable skills in computing and statistical methods; interdisciplinary research and grant administration; writing and technical editing; oral presentation; strong background in social sciences, small-scale societies 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; 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 from National Science Foundation) and contracts with agencies and private corporations, approx. $1M total; 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, $110K.

- "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, $80K.
- "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, $400K.
- "Collaborative Agricultural Watershed Conservation–Upper Mississippi River Basin," Altria Group, Environment Program, 2003-2004, $40K.
- "Hydrolab Corporation Equipment Grants Program," Hydrolab, Inc., 2000-2003, in-kind donation of equipment and training, $115K value.
- "Natural Resources Stewardship and the Protection of Freshwater Ecosystems", U.S. Environmental Protection Agency, Office of Water, 1999-2003, $300K.

- Presenter and panel member, WWF-TNC online "Freshwater Virtual Conference" symposium on Climate Change Adaptation, January 2009.
- 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-organizer and one of two presenters, Workshop on Climate Change Adaptation, TNC Eastern US Conservation Region Conference, April 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, Symposia Facilitated, Media Appearances:
  - New York State Climate Change Adaptation Assessment (NYSERDA ClimAID project) peer review panel, 2009.
  - 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, 2001-2006.
  - U.S. Environmental Protection Agency, Regional Vulnerability Assessment 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, Internal Organization-Wide Support Activities:
  - Eastern US Regional "Resilience Network" workgroup, 2008-2009.
  - 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.
  - Global Freshwater Habitat Goals Strategy Team-Water Quality Workgroup, 2005-2006.
  - Global Conservation Approaches Team, Conservation Measures Group, 2004-2006; included serving as liaison to NatureServe-Ecological Integrity Assessment Work Group, 2004-2006.
  - Co-Organizer, Nature Conservancy-Conservation International Science Meeting, 2003, Duluth, MN.
  - Ecological Systems Viability Workgroup, 2000-2002.
  - Ecoregional Planning Workgroup, 1996-1997.