WILLIAM KLEINDL, PH.D., PWS

Montana State University, Land Resources and Environmental Studies
401 S. 8th Avenue 406-599-7721
Bozeman, MT 59715 Bill@Naiadllc.com

EDUCATION

Ph.D. (December 2014), Systems Ecology, University of Montana, Missoula, Montana.

M.S. (1995), Aquatic Ecology, University of Washington, Seattle, Washington.

Certification in Secondary Education, (1990), Biology, University of Wisconsin, Madison, Wisconsin.

B.S. (1987), Botany, University of Wisconsin, Madison, Wisconsin.

PROFESSIONAL EXPERIENCE

President (2006 – Current), Naiad Aquatic Consultants, LLC, Bozeman, Montana.

Assistant Research Professor (2016 - Current), Montana State University, Bozeman, MT.

Postdoctoral Researcher (2016), NSF Macrosystems, Montana State University, Bozeman, MT.

Postdoctoral Scholar (2015 - Current), Flathead Biological Research Station, University of Montana, Missoula, MT.

Research Assistant (2009 – 2014), Institute of the Environment, University of Montana, Missoula, MT.

Aquatic Ecologist (1997 – 2006), Parametrix, Inc., Bellevue, Washington.

Associate Scientist (1995 – 1997), L. C. Lee & Associates, Inc., Seattle, Washington.

Associate Scientist (1995 – 1997), National Wetland Science Training Cooperative, Seattle, Washington.

Research Assistant (1993 – 1995), Institute of Environmental Studies, University of Washington, Seattle, Washington.

Research Assistant (1992 – 1993), Department of Forestry, University Of Washington, Seattle, Washington.

TEACHING EXPERIENCE

Adjunct Professor (2014 – Current), Wetland Ecology, Freshwater, Ecological Management, and Honor Seminars, Wetland Science Certification Program, Montana State University, Bozeman, Montana.

Lead instructor (2001 – 2006), Wetland Ecology and Application, Wetland Science Certification Program, University of Washington Extension, Seattle, Washington.

Short Course Instructor (Spring 2004), Hawaiian Process-Based Stream Restoration, Northwest Environmental Training Center, Honolulu, Hawaii.

Teaching Assistant (1992 - 1993), Wetland Ecology and Fisheries Management, University of Washington, Seattle, Washington.

High School Biology Teacher (1990 – 1992), Petrolia High School, Petrolia, California.

Guest Lecturer - Wetland Soils (2010 - 2014), Storm Water Management (Spring 2013), Storm Water Management (Fall 2010), Montana State University and Flathead Biological Research Station, Polson, MT

MEMBERSHIP AND CERTIFICATIONS

Society of Wetland Scientists

Professional Wetland Scientist (Certification Number 1695).

MODELING AND PROGRAMMING PLATFORMS

R system for statistical computing (extensive experience in the raster)

Matlab

ArcGIS

PUBLICATIONS: PEER REVIEWED AND CONFERENCE PROCEEDINGS

Kleindl, W. J., P. C. Stoy, J. M. Becknell, A. R. Desai, M. Dietze, P. A. Duffy, M. W. Binford, M. P. Marsik, C. A. Schultz, G. Starr, and C. Staudhammer. *In Prep*. Toward Forest Macrosystem Ecological Theory. Frontiers in Ecology and the Environment.

Marsik, M., **W. J. Kleindl**, C. G. Staub, M. W. Binford, C.-S. Fu, D. Yang, J. Hall, C. Staudhammer, and G. Starr. *In Prep*. Working Forests under Pressure: Applications of Regional-Scale Forest Management Maps for the Continental United States. Remote Sensing of Environment.

Kleindl, W.J., Rains, M.C., Marshall, L.A. and Hauer, F.R., (2015). Fire and flood expand the floodplain shifting habitat mosaic concept. Freshwater Science, 34(4), p.1366.

Kleindl, W.J., S. L. Powell, and F. R. Hauer. (2015). Effect of thematic map misclassification on landscape multi-metric assessment. Ecological Monitoring and Assessment. 187-321. DOI 10.1007/s10661-015-4546-y

Kleindl, W.J., (2014). Assessing ecological condition of large landscapes with limited human impacts. Dissertation, University of Montana, Missoula, Montana.

Kleindl, W.J., M.C. Rains, and F.R. Hauer. (2010). HGM is a rapid assessment: Clearing the confusion. Wetland Science and Practice 27:17–22.

Stein, E.D., M. Brinson, M.C. Rains, **W.J. Kleindl,** and F.R. Hauer. (2010). A response to Tom Hruby. (Response to "A reply by Tom Hruby" to "Wetland assessment alphabet soup: How to choose (or not choose) the right assessment method", Wetland Science & Practice 26:20–24.) Wetland Science and Practice 27:8–9.

Stein, E.D., M. Brinson, M.C. Rains, **W.J. Kleindl,** and F.R. Hauer. (2009). Wetland assessment alphabet soup: How to choose (or not choose) the right assessment method. Wetland Science and Practice 26:20–24.

Kleindl, W.J., L. Tear, R. Maney, P. Lawson, and W. LaVoie. (2004). Modeling Ecosystem Integrity: Decision Tools for Prioritizing Stream Restoration in the 2003 Georgia Basin/Puget Sound Research Conference Proceedings, February 2004. Puget Sound Action Team. Seattle, Washington

Madsen, J.D., M.S. Adams, and **W.J. Kleindl.** (1987). The Aquatic Macrophyte Community of Black Earth Creek, Wisconsin: 1981-1986. Wisconsin Academy of Arts Letters and Science.

Madsen, J.D., M.S. Adams, and **W.J. Kleindl.** (1987). Aquatic Macrophytes in Hydrology, Aquatic Macrophytes, and Water Quality in Black Earth Creek and its Tributaries, Dane Co. Wisconsin. 85-86. (eds.) S.J. Fields and D. Graczyk. USGS Water-resources investigation.

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PUBLICATIONS: NON-PEER-REVIEWED TECHNICAL REPORTS

Kleindl, W. J., F. R. Hauer, B. Ellis, S. Kimball, K. Kunkel, P. Matson, C. Muhlfeld, J. Oyler, E. Porter, C. Servheen, and K. Smucker. 2015. A multi-metric watershed condition model for Glacier National Park. Natural Resource Report NPS/GLAC/NRR—2015/944. National Park Service, Fort Collins, Colorado. DOI: 10.13140/RG.2.1.3107.6965

Rains, M.C., K.C. Rains, **W.J. Kleindl,** S. Landry, T.L. Crisman, A. Brown, and L. van Maurik. (2011). Wetland Inventory and Evaluation, St. Lucie County, Florida. Prepared for St. Lucie County, Fort Pierce, Florida.

Kleindl, W.J., M. C. Rains, F. R. Hauer, J. Doskocil, and J. White. (2009). Jicarilla Rapid Assessment of Functions (JRAF): A Protocol for the Rapid Assessment of Functions on Riverine Floodplains in the San Juan River System. Jicarilla Apache Nation. Natural Resources Department. Dulce, New Mexico. DOI: 10.13140/RG.2.1.3218.8005

Kleindl, W.J. and D. Smith. (2004). Habitat Surveys, Data Analysis, and Results: Drainage Needs Report Protocols. Snohomish County Public Works Department Surface Water management Division.

Kleindl, W.J. and D. Smith. (2002). Habitat Assessment and Analysis Protocols: Drainage Needs Report Protocols. Snohomish County Public Works Department Surface Water management Division.

Lee, L.C., M. Brinson, **W.J. Kleindl**, M. Whited, M. Gilbert, W.L. Nutter, M.C. Rains, D. Whigham, D. Dewald. (1997). Operational draft Guidebook to HGM Functional Assessments in Temporary and Seasonal Depressional Waters/Wetlands in the Prairie Pothole Region of North America. Prepared for the Natural Resources Conservation Service, Washington, D.C.

Rains, M.C. M.M. Brinson, M. Clark, K.A. Coshow, J. Hall, G. Hollands, **W.J. Kleindl,** D. LaPlant, L. C. Lee, W. L. Nutter, R. Post, J. Powell, T. Rockwell, D. Whighan. (1997). Draft Guidebook for the Application of Hydrogeomorphic Functional Assessments in Precipitation-Driven Wetlands in Interior Alaska. Prepared for the State of Alaska Department of Environmental Conservation.

Lee, L.C., M.C. Rains, J.A. Mason and **W.J. Kleindl.** (1997). Draft Guidebook to HGM Functional Assessments in Riverine Waters/Wetlands of the Santa Margarita Watershed. Prepared for the U.S. Environmental Protection Agency (Region IX), San Francisco, California.

Lee, L.C., M.C. Rains, J.A. Mason and **W.J. Kleindl.** (1996). Draft Guidebook to HGM Functional Assessments in 3rd and 4th Order Riverine Waters/Wetlands of the Central California Coast.. Prepared for the U.S. Environmental Protection Agency (Region IX), San Francisco, California.

Kleindl, W.J. (1995). A Benthic Index of Biotic Integrity for Puget Sound Lowland Streams, Washington, USA. M.S. Thesis, University of Washington. Seattle, Washington.

WORKSHOPS ATTENDED BY INVITATION

Hydrogeomorphic Approach to Assessing Wetland Function (2009), Jicarilla Apache Natural Resource Department, Durango, Colorado

Hydrogeomorphic Approach to Assessing Wetland Function (2005), Jicarilla Apache Natural Resource Department, Durango, Colorado

Workshop on the Hydrogeomorphic Approach to Assessment of Functions of Waters of the U.S., Including Wetlands, in the Santa Margarita Watershed (1997), National Wetland Science Training Cooperative, Fallbrook, California.

Workshop on the Hydrogeomorphic Approach to Assessment of Functions of Precipitation-Driven Wetlands on Discontinuous Permafrost in Interior Alaska (1997), National Wetland Science Training Cooperative, Fairbanks, Alaska.

National Workshop and Symposium on the Future of Wetland Assessment: Applying Science Through the Hydrogeomorphic Assessment Approach and Other Approaches (1997), Association of State Wetland Managers, Annapolis, Maryland.

Workshop on the Hydrogeomorphic Approach to Assessment of Functions of Waters of the U.S., Including Wetlands, in the Northern Prairie Region (1995), National Wetland Science Training Cooperative, Jamestown, North Dakota.

SELECTED CONFERENCES AND PRESENTATIONS

Staudhammer, C.L., M. Binford, L. Boring, A. Desai, M. Dietze, P. Duffy, J. Franklin, G. Starr, P. Stoy, **W. Kleindl**, M. Marski. 2016. Building forest management into Earth system modeling: Scaling from stand to continent. National Science Foundation - Macrosystems Biology Annual PI Meeting. September 29-30, Arlington, VA Effect of thematic map misclassification on landscape multi-metric assessment. (2015). Paper Presentation. Society of Wetland Science. Providence, RI.

Riverine Shifting Mosaic: State and Transition Approach. (2014). Paper Presentation. Joint Aquatic Science Meeting. Portland, OR.

Watershed Scale Ecological Conditional Assessment in Areas with Limited Disturbance (2012). Paper Presentation. Society of Wetland Scientist. Boise, MT.

Comparing Ecosystem Conditional Assessment across Multiple Scales. (2011). Paper Presentation. Montana American Water Resources Association, Great Falls, Montana.

Hydrogeomorphic Approach to Functional Assessments in Riverine Wetlands of Colorado and Rio Grande Headwater Rivers. (2006). Paper Presentation. Western Division of the American Fisheries Society, Bozeman, Montana.

Modeling Ecosystem Integrity: Decision Tools for Prioritizing Stream Restoration. Paper Presentation. (2003) Georgia Basin/Puget Sound Research Conference Proceedings. Vancouver British Columbia.

Development of a Draft Guidebook for the Application of Hydrogeomorphic Functional Assessments in Precipitation-Driven Wetlands in Interior Alaska, USA. (1997). Paper Presentation. Society of Wetland Scientists Conference, Bozeman, Montana.

A Benthic Index of Biotic Integrity for Puget Sound Lowland Streams, Washington, USA. (1996). Paper Presentation. North American Benthological Society Conference. Kalispell, Montana.

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National Wildlife Symposium on Urban Wildlife. (1995). Poster under the title of Biotic Integrity of Urban Streams.

REPRESENTATIVE CONSULTING PROJECTS

Ecosystem Modeling

I have developed ecosystem assessment tools for state, tribal, and federal agencies in Alaska, Washington, California, New Mexico, Montana, The Midwest, and Massachusetts. Assessed ecosystem integrity, function and condition of aquatic invertebrates, instream habitat, and vegetation, soil, and hydrology of multiple wetland classes across multiple assessment scales. A few samples are provided below.

Ecosystem Conditional Assessment – Glacier National Park, Montana (2012). Developed methodology that assesses ecosystem condition with low levels of anthropogenic impacts and over a diverse physiography.

Wetland Ecosystem Functional Assessment Tools – Confidential Clients, Alaska (2009). Develop two functional assessment models to rapidly assess wetland and stream functions in undisturbed wetland conditions. The first model is for predominately tundra wetlands in the Bristol Bay watershed and the second in for predominately forested wetlands in the foothills adjacent to the Yukon Delta. The outcome of this model will support two confidential clients with permitting, mitigation design and monitoring.

Jicarilla Rapid Assessment of Functions (JRAF) - Jicarilla Apache Nation, New Mexico (2009). Led the development of an ecosystem assessment approach for the Jicarilla Apache Nation to assist with prioritization, design, and monitoring of stream restoration on their reservation with broader application throughout portions of Colorado and New Mexico.

Index of Habitat Integrity (IHI) – Snohomish County, Washington (2004). Multi-metric model to assess physical integrity of a stream basin relative to reference conditions for multiple watersheds in seven urban growth areas in Snohomish County, Washington.

Hydrogeomorphic Approach to Functional Assessments (HGM) Models for multiple state and federal agencies (1995-1997). 1) Rivers on the Central Coast of California, 2) Vernal Pools, Slope Wetlands, and Rivers in Sacramento and San Joaquin Counties, California, 3) Semi-Arid Santa Margarita Watershed California, 4) Northern Prairie Pot Holes, 5) Precipitation-Driven Wetlands on Discontinuous Permafrost in Interior Alaska, and 6) Riverine Wetlands Cook Inlet Basin

Benthic Index of Biotic Integrity (B-IBI) (1995). Puget Sound Lowlands, Washington. The BIBI uses aquatic macroinvertebrates to rapidly and economically assess the biotic integrity of regional streams by comparing site conditions to reference-based conditions.

REPRESENTATIVE CONSULTING PROJECTS

Stream Ecology

I collected and analyzed physical and biotic data on over 300 miles of wadeable streams (about forth order and smaller) and 150 miles of large rivers (about fifth to sixth order streams) throughout the U.S. A few samples are provided below.

Tropical Stream Assessment (2016). University of Guam. Provided training to UoG researchers on monitoring and assessment of the instream habitat, fluvial process, valley bottom geomorphic features and watershed condition.

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Drainage Needs Assessment (2004). Snohomish County, WA. Project Technical Lead: directed a multi-consultant team in an aquatic habitat assessment of multiple watersheds in seven urban growth areas (UGAs) in Snohomish County, Washington The assessment included the survey, analysis, and evaluation of wetlands, riparian areas, fish passage barriers, and 150 miles of instream habitat within these watersheds to development and prioritization of multiple infrastructure projects within these drainages.

Stream Ecosystem Assessment (2000-2005). Port of Seattle, WA. Project Technical Lead: directed the assessment and monitoring of three urban streams as part of the Clean Water Act Section 404 permit conditions for the Seattle-Tacoma International Airport third runway expansion.

Tribal Water Rights (Early 2000's) Confederated Tribes of the Umatilla Indian Reservation, Oregon Biotic Assessment Lead: assisted the Confederated Tribes of the Umatilla Indian Reservation (in quantifying its tribal instream water rights for culturally important fish species.

Stream Impact Assessment Following a Large Forest Fire (Early 2000's) Taos Pueblo, New Mexico. Assisted the Taos Pueblo with the geomorphic and riparian integrity assessment of riparian and instream conditions following an extensive forest fire in the adjacent uplands.

REPRESENTATIVE CONSULTING PROJECTS

Wetland Delineation, Mitigation, and Monitoring

I performed regulatory wetland delineation or determination on over 1,200 square miles of land in Alaska, Washington, California, New York, and Florida. A few samples of this work are provided below.

Wetland Inventory and Evaluation (2011). St. Lucie County, Florida. Through remote sensing and GIS, mapped estuarine and palustrine wetlands, their buffers and determined their condition on 600+ miles of land within the political boundaries of St. Lucie County, Florida.

Delineation and Determination of 600+ Square Mile Area (2006 – 2009). Bristol Bay and Alaska Range, Alaska. Provided assistance to an Alaska wetland company to complete the determination / delineation, permitting, and mitigation design of an approximately 600+ square mile assessment area for two confidential clients. Duties included assisting in the determination of jurisdictional waters of the U.S., including wetlands, as well as the functional assessment and the GIS delineation of these waters throughout the assessment area.

Port of Seattle Master Plan Development (1997 – 2005). Port of Seattle, Washington. Directed the delineation of jurisdictional waters on a 4-square mile section within the Cities of SeaTac and Des Moines, Washington. Delineation included meeting Clean Water Act Section 404 requirements for a permit for the Seattle-Tacoma International Airport third runway expansion.

Low-Income Housing Redevelopment Master Plan (1997 - 1999). Tacoma, Washington. Directed the delineation of jurisdictional waters within a 200-acre urban area to determine potential impacts from the redevelopment of the Salishan Public Housing Project. Additionally, assistance was provided

to develop a conceptual mitigation plan and acquire permits for unavoidable impacts resulting from the low-income development.

REPRESENTATIVE CONSULTING PROJECTS

I developed a benthic index of biotic integrity for the Puget Sound Lowlands (the second in the US), conducted on-going assessment of invertebrate response to urban development across 17 years and surveyed endangered invertebrates in several vernal pool systems. A few samples of this work are provided below.

Invertebrate Analysis

Seattle-Tacoma International Airport (1997 – 2014). Port of Seattle, Washington. Project Technical Lead: led the multi-year benthic assessment of the project area by sampling several stream to determine if the project was affecting stream health.

Normative Flow Studies (2002). King County Washington. Provided assistance to the consultant team working to develop of a reliable method for assessing and evaluating the effects of anthropogenic alterations of flow regimes on salmonid persistence and recovery in King County rivers and streams.

City of Medford Water District (2000 – 2002) Medford, Oregon. Project Technical Lead: led a two-year assessment and reporting project within the Agate Dessert Vernal Pool system for the presence of endangered vernal pool fairy shrimp.

BOARDS

City of Bozeman Wetland Review Board (2006-2008). Assists the City of Bozeman with Wetland Permitting Issues.

Montana Outdoor Science School: (2008-2011). Vice President of the board. Providing science education support to rural schools.

Green Drinks, Gallatin Valley, (2013-Current). Organize monthly business socials for conservations community.

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