

## CURRICULUM VITAE

### STEVEN M. WONDZELL

Research Riparian Ecologist  
Corvallis Forestry Sciences Laboratory  
Pacific Northwest Research Station  
3200 SW Jefferson Way  
Corvallis OR 97331

Tel: (541) 758-8753  
FAX: (541) 750-7234  
e-mail: [steve.wondzell@usda.gov](mailto:steve.wondzell@usda.gov)

### EDUCATION:

Ph.D., Forest Ecology, 1994. Department of Forest Science, Oregon State University, Corvallis OR.  
Thesis Title: *Flux of ground water and nitrogen through the floodplain of a fourth-order stream.*

M.S., Biology, 1984. Department of Biology, New Mexico State University, Las Cruces NM 88003.  
Thesis Title: *Recovery of Desert Grasslands in Big Bend National Park Following 36 Years of Protection from Grazing of Domestic Livestock.*

B.S., Range Science, 1981. Department of Animal and Range Science, New Mexico State University, Las Cruces NM 88003.

### EMPLOYMENT HISTORY:

Research Riparian Ecologist, Jan 2012 to present. Corvallis Forestry Sciences Laboratory, Pacific Northwest Research Station, USDA Forest Service, Corvallis, OR.

Research Riparian Ecologist, April 2000 to Dec 2011. Olympia Forestry Sciences Laboratory, Pacific Northwest Research Station, USDA Forest Service, Olympia WA.

Assistant Professor (Research), June 1996 to March 2000. Dept. Forest Science, Oregon State University, Corvallis OR.

Temporary Assistant Professor of Water Resources Management, Aug 1995 to May 1996. Dept. Natural Resources, University of New Hampshire, Durham NH.

NSF-NATO Post Doctoral Fellow, March 1994 to March 1995. Centre d'Écologie des Systèmes Fluviaux, 29 rue Jeanne Marvig, Toulouse, France.

### JOURNAL and BOOK EDITORSHIPS

Associate Editor for Water Resources Research, a journal of the American Geophysical Union. January 2013 to December 2014.

Guest-Editor for a Special issue of the journal Freshwater Science titled "*Groundwater and Surface-Groundwater Interactions*". Larned, S. (lead guest-editor) and four guest co-editors including Wondzell, S. M. (20 Manuscripts).

Guest-Editor for a Special issue of the journal Landscape and Urban Planning titled "*Landscape Analysis: Projecting the effects of management and natural disturbances on forest and watershed resources of the Blue Mountains, Oregon, USA*". Wondzell, S. M., Burnett, K. M., and Kline, J. D. (Guest Editors). Landscape and Urban Planning 80(3): 193-344. (13 Manuscripts).

## **PUBLICATIONS:**

### **Manuscripts Submitted or in Preparation:**

Hinshaw, S., E. Wohl, J. Burnett, and S. Wondzell. (*under revision after review by the Journal*). Monitoring Strategy for Stage 0 Restoration in the South Fork McKenzie River, Oregon. Submitted to Earth Surface Processes and Landforms.

Wondzell, S. M., and A. S. Ward. (*submitted*). The channel source hypothesis: empirical evidence for in-channel sourcing of solutes to explain hysteresis in a headwater mountain stream. Submitted to Hydrological Processes.

### **Invited Commentary:**

Larned, S. T., Gooseff, M. N., Packman, A. I., Rugel, K., and Wondzell, S. M. 2015. (*Introduction to the Special Issue*) Groundwater—surface-water interactions: current research directions. *Freshwater Science* 34(1): 92-98.

Wondzell, S. M. 2015. Groundwater–surface-water interactions: perspectives on the development of the science over the last 20 years. *Freshwater Science* 34(1): 368-376.

Wondzell, S. M. 2010. Water and Sustainability: Reflections from the western United States. *Northwest Science* 84(3): 310-312.

Wondzell, S. M., Burnett, K. M., and Kline, J. D. 2007. (*Introduction to the Special Issue*) Landscape analysis: Projecting the effects of management and natural disturbances on forest and watershed resources of the Blue Mountains, OR, USA. *Landscape and Urban Planning* 80:193-197.

### **Peer-reviewed Manuscripts:**

Johnson, S. L., D. Henshaw, G. Downing, M. Schulze, A. Kennedy, G. Cohn, S. A. Schmidt, S. Wondzell, and J. A. Jones. 2021. Long-term hydrology and aquatic biogeochemistry data from H.J. Andrews Experimental Forest, Cascade Mountains, Oregon. *Hydrological Processes*, 35: e14187, <https://doi.org/10.1002/hyp.14187>

Jarecke, K. M., K. D. Bladon, and S. M. Wondzell. 2021. The influence of local and nonlocal factors on soil water content in a steep forested catchment. *Water Resources Research*, 57, e2020WR028343. <https://doi.org/10.1029/2020WR028343>

Ward AS, Wondzell SM, Schmadel NM and Herzog SP. 2020. Climate Change Causes River Network Contraction and Disconnection in the H.J. Andrews Experimental Forest, Oregon, USA. *Front. Water* 2:7. <https://doi:10.3389/frwa.2020.00007>

Herzog, S., A. S. Ward, S. M. Wondzell. 2019. Multi-scale feature-feature interactions control patterns of hyporheic exchange in a simulated headwater mountain stream. *Water Resources Research*. 55(12):10976-10992. <https://doi.org/10.1029/2019WR025763>

Ward, A. S., M. J. Kurz, N. M. Schmadel, J. L.A. Knapp, P. J. Blaen, C. J. Harman, J. D. Drummond and 12 other authors listed alphabetically. 2019. Solute Transport and Transformation in an Intermittent, Headwater Mountain Stream with Diurnal Discharge Fluctuations. *Water* 11, 2208; doi:10.3390/w11112208. Associated dataset: <https://www.hydroshare.org/resource/d353ce4a7dc643c8a566504bfd578a57/>

Ward, A.S., S.M. Wondzell, N.M. Schmadel, S. Herzog, J.P. Zarnetske, and 32 other authors listed alphabetically. 2019. Spatial and temporal variation in river corridor exchange across a 5th order

mountain stream network. *Hydrology and Earth System Science*, <https://doi.org/10.5194/hess-2019-108>

- Ward, A. S., J. P. Zarnetske, and 35 additional authors listed alphabetically. 2019. Co-located contemporaneous mapping of morphological, hydrological, chemical, and biological conditions in a 5th-order mountain stream network, Oregon, USA. *Earth Syst. Sci. Data*, 11, 1567–1581. <https://doi.org/10.5194/essd-11-1567-2019>
- Adelfio, L. A., S. M. Wondzell, N. J. Mantua, and G. H. Reeves. 2019. Warm winters reduce landscape-scale variability in the duration of egg incubation for coho salmon (*Oncorhynchus kisutch*) on the Copper River Delta, Alaska. *Canadian Journal of Fisheries and Aquatic Science* 76: 1362–1375. <https://doi.org/10.1139/cjfas-2018-0152>.
- Campbell, E. Y., J. B. Dunham, G. H. Reeves, and S. M. Wondzell. 2019. Phenology of hatching, emergence, and end-of-season body size in young-of-year coho salmon in thermally contrasting streams draining the Copper River Delta, Alaska. *Canadian Journal of Fisheries and Aquatic Science* 76: 185–191. <https://doi.org/10.1139/cjfas-2018-0003>
- Nash, C. S., G. E. Grant, J. S. Selker and S. M. Wondzell. 2019. DISCUSSION: “Meadow Restoration Increases Baseflow and Groundwater Storage in the Sierra Nevada Mountains of California” by Luke J.H. Hunt, Julie Fair, and Maxwell Odland. *Journal of the American Water Resources Association* 1–4. <https://doi.org/10.1111/1752-1688.12796>
- Wondzell, S.M., M. Diabat, and R. Haggerty. 2019. “What Matters Most: Are Future Stream Temperatures More Sensitive to Changing Air Temperatures, Discharge, or Riparian Vegetation?” *Journal of the American Water Resources Association* 55(1):116–132.
- Houlahan, J. E., D. J. Currie, K. Cottenie, G. S. Cumming, C. S. Findlay, S. D. Fuhlendorf, P. Legendre, E. H. Muldavin, D. Noble, R. Russell, R. D. Stevens, T. J. Willis, and S. M. Wondzell. 2018. Negative relationships between species richness and temporal variability are common but weak in natural systems. *Ecology*, 99(11), 2018, pp. 2592–2604. (All but 1<sup>st</sup> author listed alphabetically).
- Ward, A. S., N. M. Schmadel, and S. M. Wondzell. 2018. Simulation of dynamic expansion, contraction, and connectivity in a mountain stream network. *Advances in Water Resources* 114: 64–82.
- Ward, A. S., N. M. Schmadel, and S. M. Wondzell. 2018. Time-variable transit time distributions in the hyporheic zone of a headwater mountain stream. *Water Resources Research*, 54, 2017–2036.
- Ludwig, J. A., S. M. Wondzell, E. H. Muldavin, K. R. Blanche, and Y. Chauvin. 2017. Native desert grassland plant species declines and accelerated erosion in the Paint Gap Hills of southwest Texas. *The Southwestern Naturalist* 62(1): 53–61.
- Schmadel, N. M., A. S. Ward, and S. M. Wondzell. 2017. Hydrologic controls on hyporheic exchange in a headwater mountain stream. *Water Resources Research*, 53, 6260–6278, [doi:10.1002/2017WR020576](https://doi.org/10.1002/2017WR020576).
- Ward, A. S., N. M. Schmadel, S. M. Wondzell, M. N. Gooseff, and K. Singha. 2017. Dynamic hyporheic and riparian flow path geometry through base flow recession in two headwater mountain stream corridors. *Water Resources Research*, 53, 3988–4003, [doi:10.1002/2016WR019875](https://doi.org/10.1002/2016WR019875).
- Ward, A. S., N. M. Schmadel, S. M. Wondzell, C. Harman, M. N. Gooseff, and K. Singha. 2016. Hydrogeomorphic controls on hyporheic and riparian transport in two headwater mountain streams during base flow recession. *Water Resources Research* 52:1479–1497. DOI:10.1002/2015WR018225.

- Penaluna, B. E., D. H. Olson, R. L. Flitcroft, M. Weber, J. R. Bellmore, S. M. Wondzell, J. B. Dunham, S. L. Johnson, and G. H. Reeves. 2016. Aquatic biodiversity in forests: A weak link in ecological and ecosystem resilience. *Biodiversity and Conservation*.
- Argerich, A., R. Haggerty, S. L. Johnson, S. M. Wondzell, N. Dosch, H. Corson-Rikert, L. R. Ashkenas, R. Pennington, and C. K. Thomas. 2016. Comprehensive multiyear carbon budget of a temperate headwater stream, *Journal of Geophysical Research Biogeosciences*, 121, doi:10.1002/2015JG003050.
- Corson-Rikert, H. A., S. M. Wondzell, R. Haggerty, M. Santelmann. 2016. Carbon dynamics in the hyporheic zone of a headwater mountain stream in the Cascade Mountains, Oregon. *Water Resources Research*, 52, 7556–7576, doi:10.1002/2016WR019303
- Zarnetske, J. P., Haggerty, R., and Wondzell, S. M. 2015. Coupling multiscale observations to evaluate hyporheic nitrate removal at the reach scale. *Freshwater Science* 34(1):172-186.
- Ward, A. S., R. A. Payn, M. N. Gooseff, B. L. McGlynn, K. E. Bencala, C. A. Kelleher, S. M. Wondzell, and T. Wagener. 2013. Variations in surface water-ground water interactions along a headwater mountain stream: Comparisons between transient storage and water balance analyses *Water Resources Research* 49, 3359–3374, doi:10.1002/wrcr.20148.
- Diabat, M., Haggerty, R., and Wondzell, S. M. 2012. Diurnal timing of warmer air under climate change affects magnitude, timing and duration of stream temperature change. *Hydrological Processes* DOI: 10.1002/hyp.9533.
- Payn, R. A., Gooseff, M. N., McGlynn, B. L., Bencala, K. E., and Wondzell, S. M. 2012. Exploring changes in the spatial distribution of stream baseflow generation during a seasonal recession. *Water Resources Research* 48, W04519, doi:10.1029/2011WR011552
- Zarnetske, J. P., Haggerty, R., Wondzell, S. M., Bokil, V. A., and González-Pinzón, R. 2012. Coupled transport and reaction kinetics control the nitrate source-sink function of hyporheic zones. *Water Resources Research* 48, W11508, doi:10.1029/2012WR011894
- Janisch, J. E., S. M. Wondzell, and W. J. Ehinger. 2012. Headwater stream temperature: Interpreting response after logging, with and without riparian buffers, Washington, USA. *Forest Ecology and Management*, doi:10.1016/j.foreco.2011.12.035
- Wondzell, S. M. 2011. The role of the hyporheic zone across stream networks. *Hydrological Processes* 25: 3525-3532 (doi: 10.1002/hyp.8119)
- Zarnetske, J. P., R. Haggerty, S. M. Wondzell, and M. A. Baker. 2011. Labile dissolved organic carbon supply limits hyporheic denitrification, *J. Geophys. Res.*, 116, G04036, doi:10.1029/2011JG001730.
- Zarnetske, J. P., Haggerty, R., Wondzell, S. M., and Baker, M. A. 2011. Dynamics of nitrate production and removal as a function of residence time in the hyporheic zone. *Journal of Geophysical Research - Biogeosciences* 116, G01025, doi:10.1029/2010JG001356.
- Jencso, K.J., B.L. McGlynn, M.N. Gooseff, K.E. Bencala. and S.M. Wondzell. 2010. Hillslope hydrologic connectivity controls riparian groundwater turnover: Implications of catchment structure for riparian buffering and stream water sources. *Water Resources Research* 46, W10524, doi:10.1029/2009WR008818, 2010
- Wondzell, S. M., M. N. Gooseff and B. L. McGlynn. 2010. An analysis of alternative conceptual models relating hyporheic exchange flow to diel fluctuations in discharge during baseflow recession. *Hydrological Processes* 24: 686-694.

- Jencso, K. J., B. L. McGlynn, M. N. Gooseff, S. M. Wondzell, and K. E. Bencala. 2009. Hydrologic Connectivity between landscapes and streams: Transferring reach and plot scale understanding to the catchment scale, *Water Resources Research* 45: W04428, doi:10.1029/2008WR007225.
- Payn, R. A., M. N. Gooseff, B. L. McGlynn, K. E. Bencala, and S. M. Wondzell. 2009. Channel water balance and exchange with subsurface flow along a mountain headwater stream in Montana, USA. *Water Resources Research* 45: W11427, doi:10.1029/2008WR007644.
- Wondzell, S. M., J. LaNier, and R. Haggerty. 2009. Evaluation of alternative groundwater flow models for simulating hyporheic exchange in a small mountain stream. *Journal of Hydrology* 364:142-151, doi: 10.1016/j.jhydrol.2008.10.011.
- Wondzell, S. M., J. LaNier, R. Haggerty, R. D. Woodsmith, and R. T. Edwards. 2009. Changes in hyporheic exchange flow following experimental wood removal in a small low gradient stream. *Water Resources Research* 45, W05406, doi:10.1029/2008WR007214.
- Houlahan, J.E., K. Cottenie, G. S. Cumming, D. J. Currie, C. S. Findlay, U. Gaedke, P. Legendre, J. J. Magnuson, B. H. McArdle, R. D. Stevens, I. P. Woiwod, S. M. Wondzell. 2008. The utility of covariances: A response to Ranta et al. *Oikos* 117(12): 1912-1913. DOI: 10.1111/j.1600-0706.2008.17078.x.
- Houlahan, J. E., Cottenie, K., Cumming G.S., Currie, D. J., Ernest, S. K. M., Findlay, C. S., Fuhlendorf, S. D., Gaedke, U., Legendre, P., Magnuson, J. J., McArdle, B. H., Muldavin, E. H., Noble, D., Russell, R., Stevens, R. D., Willis, T. J., Woiwod, I. P., and Wondzell, S. M. 2007. Compensatory dynamics are rare in natural ecological communities. *Proceedings of the National Academy of Sciences* 104:3273-3277.
- Wondzell, S. M., Gooseff, M. N., and McGlynn, B. L. 2007. Flow velocity and the hydrologic behavior of streams during baseflow. *Geophysical Research Letters* 34, L24404, doi:10.1029/2007GL031256.
- Wondzell, S. M., Hemstrom, M. A., and Bisson, P. A. 2007. Simulating riparian vegetation and aquatic habitat dynamics in response to natural and anthropogenic disturbance regimes in the Upper Grande Ronde River, Oregon, USA. *Landscape and Urban Planning* 80:249-267.
- Gooseff, M. N., Anderson, J. K., Wondzell, S. M., LaNier, J., and Haggerty, R. 2006. A modeling study of hyporheic exchange pattern and sequence, size, and spacing of stream bedforms in mountain stream networks. *Hydrological Processes* 19:2915-2929.
- Wondzell, S. M. 2006. Effect of morphology and discharge on hyporheic exchange flows in two small streams in the Cascade Mountains of Oregon, USA. *Hydrological Processes* 20:267-287.
- Anderson, J. K., Wondzell, S. M., Gooseff, M. N., and Haggerty, R. 2005. Patterns in stream longitudinal profiles and implications for hyporheic exchange flow at the H.J. Andrews Experimental Forest, Oregon, USA. *Hydrological Processes* 19:2931-2949.
- Moore, R. D. and Wondzell, S. M. 2005. Physical hydrology and the effects of forest harvesting in the Pacific Northwest: A Review. *Journal of the American Water Resources Association* 41:763-784.
- Shibata, H., Sugawara, O., Toyoshima, H., Wondzell, S.M., Nakamura, F., Kasahara, T., Swanson, F.J., and Sasa, K. 2004. Nitrogen dynamics in the hyporheic zone of a forested stream during a small storm, Hokkaido, Japan. *Biogeochemistry* 69:83-104.
- Gooseff, M.N., Wondzell, S.M., Haggerty, R., and Anderson, J. 2003. Comparing Transient Storage Modeling and Residence Time Distribution (RTD) Analysis in Geomorphically Varied Reaches in the Lookout Creek Basin, Oregon, USA. *Advances in Water Resources* 26:925-937.

- Kasahara, T., and Wondzell, S.M. 2003. Geomorphic Controls on Hyporheic Exchange Flows in Mountain Streams. *Water Resources Research* 39(1), 1005, doi=10.1029/2002WR001386.
- Wondzell, S.M., and King, J. G. 2003. Post-fire Erosional Processes: Comparing the Pacific Northwest Region to the Interior Northwest and Northern Rocky Mountain Region. *Forest Ecology and Management* 178:75-87.
- Haggerty, R., Wondzell, S.M., and Johnson, M.A. 2002. Power-law residence time distribution in the hyporheic zone of a 2nd-order mountain stream. *Geophysical Research Letters* 29:18-1 - 18-4.
- Wondzell, S. M. 2001. The Influence of Forest Health and Protection Treatments on Erosion and Stream Sedimentation in Forested Watersheds of Eastern Oregon and Washington. *Northwest Science* 75:128-140.
- Johnson, S. L., F. J. Swanson, G. E. Grant, and S. M. Wondzell. 2000. Riparian forest disturbances by a mountain flood – the influence of floated wood. *Hydrological Processes* 14:3031-3050.
- Nakamura, F., Swanson, F. J., and S. M. Wondzell. 2000. Disturbance regimes of stream and riparian systems – a disturbance-cascade perspective. *Hydrological Processes* 14:2849-2860.
- Wondzell, S. M. and F. J. Swanson. 1999. Floods, Channel Change and the Hyporheic Zone. *Water Resources Research* 35:355-368.
- Pinay, G., C. Ruffinoni, S. M. Wondzell, and F. Gazelle. 1998. Change in groundwater nitrate concentration in a large river floodplain: Denitrification, uptake, or mixing? *The Journal of the North American Benthological Society* 17:179-189.
- Wondzell, S. M., G. L. Cunningham, and D. Bachelet. 1996. Relationships between Landforms, Geomorphic Processes, and Vegetative Communities on a Watershed in the Northern Chihuahuan Desert. *Landscape Ecology* 11:351-362.
- Wondzell, S., and F. J. Swanson. 1996. Seasonal and storm dynamics of the hyporheic zone of a 4th-order mountain stream. II: Nitrogen cycling. *The Journal of the North American Benthological Society* 15:20-34.
- Wondzell, S. M. and F. J. Swanson. 1996. Seasonal and storm dynamics of the hyporheic zone of a 4th-order mountain stream. I: Hydrologic processes. *The Journal of the North American Benthological Society* 15:3-19.
- Wondzell, S., and J. A. Ludwig. 1995. Community Dynamics of Desert Grasslands: Influences of Climate, Landforms, and Soils. *Journal of Vegetation Science* 6:377-390.
- Wondzell, S. M., G. L. Cunningham, and J. M. Cornelius. 1990. Vegetation patterns, microtopography, and soils on a Chihuahuan desert playa. *Journal of Vegetation Science* 1:403-410.

#### **Book Chapters:**

- Wondzell, S. M., Herzog, S. P., Gooseff, M. N., Ward, A. S., and Schmadel, N. M. 2019. Geomorphic Controls on Hyporheic Exchange across Scales - Watersheds to Particles. *Treatise on Geomorphology*, 2nd-Edition, published on-line, December 2019. <https://doi.org/10.1016/B978-0-12-409548-9.12135-9>
- Reeves, G. H., D. H. Olson, S. M. Wondzell, P. A. Bisson, S. Gordon, S. A. Miller, J. W. Long, and M. J. Furniss. 2018. Chapter 7: The Aquatic Conservation Strategy of the Northwest Forest Plan—A Review of the Relevant Science After 23 Years. Pgs. 461-624. In: T. A. Spies, P. A. Stine, R. Gravenmier, J. W. Long, M. J. Reilly. (Tech. Coords.) *Synthesis of science to inform land*

management within the Northwest Forest Plan area. Gen. Tech. Rep. PNW-GTR-966. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station.

Wondzell, S. M. and Gooseff, M. N. 2013. Geomorphic Controls on Hyporheic Exchange Across Scales - Watersheds to Particles. pgs. 203-218. In: Shroder, J. (Editor in Chief), Wohl, E. (Ed.), *Treatise on Geomorphology*, Vol. 9, Fluvial Geomorphology. Academic Press, San Diego, CA.

Gooseff, M. N., K. E. Bencala, and S. M. Wondzell. 2008. Chapter 18 – Solute Transport Along Stream and River Network. Pgs. 395-417, *in*: S. Rice, A. Roy, and B. Rhoads (Eds.) *River Confluences, Tributaries and the Fluvial Network*. John Wiley and Sons, Chichester, U.K. 457 pp.

Bisson, P.A., Wondzell, S.M., Gregory, S.V., and Reeves, G.H. 2003. Trends in Using Wood to Restore Aquatic Habitats and Fish Communities in Western North American Rivers. Pgs. 391–406 *In*: S. V. Gregory, K. L. Boyer, and A. M. Gurnell (eds). *The ecology and management of wood in world rivers*. American Fisheries Society, Symposium 37, Bethesda, Maryland.

Wondzell, S. M. and P.A. Bisson. 2003. Influence of Wood on Aquatic Biodiversity. Pgs. 249–264 *In*: S. V. Gregory, K. L. Boyer, and A. M. Gurnell, editors. *The ecology and management of wood in world rivers*. American Fisheries Society, Symposium 37, Bethesda, Maryland.

Swanson, F. J., S. M. Wondzell, and G. E. Grant. 1992. Landforms, Disturbance, and Ecotones. pgs. 304-323 *In*: F. diCasteri and A.J. Hansen (eds.) *Landscape boundaries: Consequences for biotic diversity and ecological flows*. Ecological Studies, Vol. #92. Springer-Verlag.

Bachelet, D., S. M. Wondzell, and J. F. Reynolds. 1988. A Simulation Model Using Environmental Cues to Predict Phenologies of Winter and Summer Annuals in the Northern Chihuahuan Desert. Pgs. 235-260. *In*: Marani, A. (Ed.) *Advances in Environmental Modelling*. Elsevier.

#### **Agency Published Reports and Published Proceedings:**

Jaeger, K.L., Burnett, J., Heaston, E.D., Wondzell, S.M., Chelgren, N., Dunham, J.B., Johnson, S., and Brown, M., 2020, FLOWPER user guide—For collection of FLOW PERmanence field observations: U.S. Geological Survey Open-File Report 2020–1075, 40 p., <https://doi.org/10.3133/ofr20201075>.

Bisson, P. A., Claeson, S. M., Wondzell, S. M., Foster, A. D., and Steel, A. 2013. Evaluating Headwater Stream Buffers: Lessons Learned from Watershed- scale Experiments in Southwest Washington. Pgs. 165-184 *In*: Anderson, P. D. and Ronnenberg, K. L. (eds.). *Density Management in the 21<sup>st</sup>-Century: West Side Story*. General Technical Report, PNW-GTR-880. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station.

Wondzell, S. M., Przeszlowska, A., Pflugmacher, D., Hemstrom, M. A., and Bisson, P. A. 2012. Modeling the Dynamic Responses of Riparian Vegetation and Salmon Habitat in the Oregon Coast Range With State and Transition Models. Pgs. 173-196. *In*: Kerns, B. K., Shlisky, A. J., and Daniel, C. J. (Eds.). *Proceedings of the First Landscape State-and-Transition Simulation Modeling Conference*, June 14-16, 2011. United States Department of Agriculture, Forest Service, Pacific Northwest Research Station General Technical Report PNW-GTR-869.

Gooseff, M. N., Wondzell, S. M., and McGlynn, B. L. 2008. On the Relationships Among Temporal Patterns of Evapotranspiration, Stream Flow and Riparian Water Levels in Headwater Catchments During Baseflow. International Association of HydroGeologists Congress, Toyama, Japan . Oct. 26 – Nov. 1, 2008.

Harris, R.M., C. Clifton, and S.M. Wondzell. 2007. Hillslope Erosion Rates in Areas with Volcanic Parent Materials and the Effects of Prescribed Fires in the Blue Mountains of Eastern Oregon and Washington, USA. *In*: M. Furniss, C. Clifton, and K. Ronnenberg (Eds.). *Advancing the Fundamental Sciences: Proceedings of the Forest Service National Earth Sciences Conference*, San Diego, CA,

18-22 October 2004. PNW-GTR-689, Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station.

Wondzell, S. M., and Howell, P. J. 2004. Chapter 6: Developing a decision support model for assessing condition and prioritizing the restoration of aquatic habitat in the interior Columbia Basin. Pgs. 73-81. *in* J. L. Hayes, A. A. Ager, and R. J. Barbour, Technical Editors. Methods for integrating modeling of landscape change: Interior Northwest Landscape Analysis System. PNW-GTR-610. USDA Forest Service, Pacific Northwest Research Station, General Technical Report 610.

Wondzell, S. M., G. L. Cunningham, and D. Bachelet. 1987. A Hierarchical Classification of Landforms: Some Implications for Understanding Local and Regional Vegetation Dynamics. pp. 15-23. In: Strategies for Classification and Management of Native Vegetation for Food Production in Arid Zones. United States Forest Service, Rocky Mountain Forest and Range Experiment Station, General Technical Report RM-150.

Ludwig, J. A., and S. M. Wondzell. 1986. Vegetation Dynamics Following Establishment of Big Bend National Park U.S.A. pp 13-15. In: P.J. Joss, P.W. Lynch, and O.B. Williams (eds.) Rangelands: A Resource Under Siege - Proceedings of the Second International Rangeland Congress, Canberra, Australia.

#### **Scientific Briefs and short communications:**

Adelfio, L. A., S. M. Wondzell, N. J. Mantua, and G. H. Reeves. 2020. Groundwater upwelling provided a thermally stable incubation environment for Coho Salmon during warm winters on the Copper River Delta, Alaska. BASEFLOWS: The Groundwater Newsletter of the U. S. Forest Service, 7:9-10.

Kirkland, J. and S. Wondzell. 2020. Shading out climate change: Planting streamside forests to keep salmon cool, based on science by Mousa Diabat, Steven Wondzell, and Roy Haggerty. Science Findings 228. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 5 p.

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## **ELECTRONIC and AUDIOVISUAL OUTPUTS**

Wondzell, S. M. 2000. Delineating the Extent of the Hyporheic Zone in Mountain Streams. Presentation #2. *in*: A. Wald (editor) *The Delineation of Hyporheic Zones in Western Alluvial Rivers* – a videotaped seminar and panel discussion moderated by Susan Bolton, Center for Streamside Studies, University of Washington. Washington Department of Transportation, Environmental Affairs Office. Olympia, WA. July 2001.

## **GRANTS FUNDED:**

### **Competitive Research Grants:**

Advancing predictive understanding of hydrologic exchange in the river corridor. PI: A. S. Ward; Co-PI: S. M. Wondzell. 8/1/2018 to 7/31/2021. Funding: \$200,000 (\$188,040 to Indiana University; \$11,960 to USFS PNW) from US Department of Energy.

Collaborative Research: How do hydrology and biogeochemistry control carbon flux from headwater streams to the atmosphere? NSF – Hydrologic Sciences Program. PIs: R. Haggerty and S. M. Wondzell. Collaborators: D. Tonina and K. Feris. July 2014 – June 2017. \$444,943.

An assessment of the vulnerability of watersheds in Prince William Sound, Alaska to climate change. Proposal funded by the National Fish and Wildlife Foundation. Lead PI: G. H. Reeves; Co-PIs: S. M. Wondzell and N. Mantua. January 2013 – December 2015. \$300,000.

A decision support system for assessing the impact of fire management on threatened and endangered species. Proposal funded by the Joint Fire Sciences Program. Lead PI: G. H. Reeves; Co-PIs: L.E. Benda, W. Elliot, R. Flitcroft, P. Bisson, and S. Wondzell. May 2009 – September 2010. \$300,000.

Integrated Dynamic Landscape and Coho Salmon Model. Proposal funded by the Oregon Watershed Enhancement Board. Lead PI: P. Lawson. Co-PIs: D. Miller, K. Burnett, E. A. Steel, and S. M. Wondzell. 2007 – 2009. \$324,000.

Mapping current conditions and modeling the dynamic responses of riparian vegetation and salmon habitat in Oregon. Proposal funded by the Oregon Watershed Enhancement Board. Lead PI: S. M. Wondzell; Co-PIs: P. Bisson, K. Burnett, W. Cohen, M. Hemstrom, J. Kagan, J. Ohmann. Sept. 2007 – April 2010. \$640,000.

Collaborative Research: Hydrological linkages between landscapes and streams: transferring reach and plot scale understanding to the network and catchment scales. NSF – Hydrologic Sciences Program. PIs: B.L. McGlynn and M.N. Gooseff. Collaborators: J. Seibert, K.E. Bencala and S. M. Wondzell. April 2004 – March 2007. \$377,060.

Collaborative Research: Controls on hyporheic nitrate retention - discriminating among transport, reaction-rate, and substrate limitation. NSF Hydrologic Sciences Program. Co-PIs: R. D. Haggerty, S. M. Wondzell, and M. N. Gooseff. June 2004 - May 2007. \$450,000.

Evaluating the effects of prescribed fire and fuels treatments on water quality and aquatic habitat. Joint Fire Sciences Program October 2001-September 2004. Co-PIs: C. Clifton and S.M. Wondzell. \$299,151.

Interactions between streams and groundwater along the river continuum: Scaling up to a stream network. NSF - Hydrologic Sciences Program. PI: Wondzell. Co-PI: F. J. Swanson. February 2000 - January 2003, \$300,000.

Influence of natural processes and human modifications of river channels on stream-ground water interactions in the hyporheic zone of mountain streams. NSF - Japan Program (Joint project with Japanese Society for Promotion of Science). PI: Wondzell. Co-PI: F. J. Swanson. June 1998 - June 2001, \$23,000. (also with F. Nakamura and H. Shibata)

Interactions between streams and ground water along the river continuum: Influence of stream size, geomorphology, and catchment wetness. NSF - Hydrologic Sciences Program. PI: Wondzell. Co-PI: F. J. Swanson. November 1995 - November 1998, \$183,500.

Influence of human modifications of river channels on ground-water processes and surface-water quality. NSF-NATO Postdoctoral Fellowship in Science and Engineering. PI: Wondzell. March 1994 - March 1995, \$42,800. (To work at the Centre d'Écologie des Systèmes Fluviaux, Toulouse France).

The role of riparian forests in regulating nitrogen flux between ground water and surface water in third order stream valleys of Oregon. 1990 - 1992, \$16,410. Doctoral Dissertation Improvement Award, National Science Foundation.

### **Non-Competitive Grants and Contracts:**

Predicting flow permanence and late summer low flows in western Oregon. Co-PIs: S. L. Johnson and S. M. Wondzell. 8/19/2018 to 1/1/2022. Funding: \$500,000. Interagency Agreement from the Bureau of Land Management to the Pacific Northwest Research Station.

Climate Regime Shifts and Extreme Events: Impacts on Tree Establishment, Growth, and Mortality in Southwestern Piñon-Juniper Savannas. Co-PIs: S. M. Wondzell and E. H. Muldavin. 7/1/2018 to 6/30/2020. Funding: \$29,997 from Western Wildland Environmental Threat Assessment Center.

Mechanisms of Impacts and Trends over Time: Exploring Potential Climate Change Influences on Stream Water Temperature. Funded through the USGS-USFS Joint Climate Change Research Project on Pacific Northwestern Freshwater Ecosystems. Co-PIs (alphabetic): P. Conolly, J. Dunham, S. Johnson, S. Wondzell. July 2010 – April 2012. \$500,000.

Knotweed Control Efficacy and Riparian Restoration. Lead PI: S. M. Claeson. Co-PIs: P. A. Bission and S. M. Wondzell US Fish and Wildlife Service, Chehalis Fisheries Restoration Program, FY2009. \$20,915.

Monitoring Long-Term Vegetation Dynamics In Big Bend National Park: Factors Controlling Woody And Grass Species Demographics With Implications For Restoration And Management. Proposal funded by the National Park Service, Chihuahuan Desert Network. Lead PI: E. Muldavin; Co-PIs: S. M. Wondzell & J. A. Ludwig. July 2007 – Dec. 2008. \$69,928.

The hyporheic zone: It's role in forest-stream interactions. USDA Pacific Northwest Experiment Station. PI: Wondzell. May 1999 - May 2000. \$15,078.

Influence of groundwater inputs and hyporheic exchange flow on low-baseflow discharge. HJA - LTER program. Co-PIs: Wondzell, S. M. and S. L. Johnson. June 1999 - Dec 1999, \$10,674.

Forty years of vegetation change in the desert grasslands of Big Bend National Park. PI: E. Muldavin. Co-PIs: S. M. Wondzell and J. A. Ludwig. 1995-96, \$5,500. National Park Service.