

**Christopher John Berger**

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**Education:**

Phd. in Environmental Sciences and Resources: Civil Engineering, 2000, Portland State University. Dissertation topic: "Modeling Macrophytes of the Columbia Slough"

Master of Science in Civil Engineering, Portland State University, 1994. Thesis topic: "Water Quality Modeling of the Tualatin River"

Bachelor of Science in Civil Engineering, Portland State University, 1991

Bachelor of Science in Physics, Oregon State University, 1987

**Professional Registration:**

Professional Engineer, P. E., Oregon #48590, Civil Engineering

**Expertise:**

- Water Quality and Hydrodynamic Modeling
- Development and application of CE-QUAL-W2 water quality model
- Ground Water Modeling
- Computer Programming
- Water Quality Sampling
- Environmental Data Analysis

**Work Experience:**

Research Associate (2001 to present) and Research Assistant (1997 to 2001), Portland State University. Currently participating in the development of CE-QUAL-W2 water quality models. Responsibilities include computer programming, model calibration, water quality sampling, analysis of management scenarios, and the development of specialized macrophyte and culvert simulation algorithms. Contributed to the development of water quality models of the Tualatin River, Oregon; Columbia Slough, Oregon; Willamette River, Oregon; Lake Whatcom, Washington; Cooper Creek Reservoir, Oregon; Spokane River, Washington; Lake Whatcom, Washington; Laurance Lake, Oregon; and the Snake River, Idaho.

Consultant, Snake River Project (1997 to present). Participating in the development of a water quality and hydrodynamic model of the lower Snake River, Brownlee Reservoir, Hells Canyon Reservoir, and Oxbow Reservoir. Responsibilities include model development, calibration and alternative analysis.

Consultant, Wahiawa Reservoir Project (1996-1997). Helped develop a CE-QUAL-W2 water quality and hydrodynamic model of Wahiawa Reservoir, Hawaii. The model was used to evaluate alternatives designed to alleviate water quality problems caused by eutrophic conditions.

Contract Student Worker. U. S. Army Corps of Engineers Waterways Experiment Station, Vicksburg, Mississippi (October, 1996 to December, 1996). Conducted literature review of biological and chemical rate coefficients used in water quality modeling.

Graduate Research Assistant for Shuguang Li, St. Johns Landfill Project, Portland State University. (December, 1993 to January, 1995). Developed groundwater flow model of Portland's St. Johns Landfill.

Graduate Research Assistant to Scott Wells, Tualatin River Project, Portland State University. (January, 1992 to December, 1995). Participated in the development, calibration, and implementation of CE-QUAL-W2 Tualatin River water quality and hydrodynamic model. Responsibilities included: preparation of channel geometry, inflow, and withdrawal information; development of a diversion dam algorithm; surveying of the river channel and gaging sites; model calibration and verification; analysis of management alternatives.

Junior Engineer. Mackenzie Engineering Incorporated, Portland (June, 1991 to December, 1991). Site development work including the design of storm sewers, sanitary sewers, roads, parking lots, and water utilities.

Assistant Watermaster. Tualatin River District, Washington County. Oregon (June, 1990 to September, 1990). Measured stream flows, maintained stream gaging stations, helped regulate water rights, surveyed stream gaging sites, and inspected wells in the Tualatin River basin.

**Reviewer:**

Reviewer for Hydrobiologia

Reviewer for Journal of the North American Benthological Society

**Publications:**

Berger, C. and Wells, S. (in-print) "A Macrophyte Compartment for the Hydrodynamic and Water Quality Model CE-QUAL-W2," Corps of Engineers, Technical Notes Series, Waterways Experiments Station, Vicksburg, MS.

Wells, S. A., Annear, R. L., Berger, C. J., and McKillip, M. (in-print) "River modeling using CE-QUAL-W2," Corps of Engineers, Technical Notes Series, Waterways Experiments Station, Vicksburg, MS.

Wells, S. A., Berger, C. J., Annear, R. L., McKillip, M. and Jamal, S. (2003) "Willamette River Basin Temperature TMDL Modeling Study," Proceedings National TMDL Science and Policy Conference, Chicago, IL, November 16-19, 2003.

Berger, C.; Annear, R. and Wells, S. (2002) "TMDL Development of the Spokane River-Long Lake System using CE-QUAL-W2," Proceedings, Water Environment Federation National TMDL Science and Policy Conference, Phoenix, Nov 13-16, 2002.

Berger, C.; Annear, R. and Wells, S. (2002) "Willamette and Columbia River Waste Allocation Model," Proceedings, 2nd Federal InterAgency Hydrologic Modeling Conference, Las Vegas, July 28-Aug 1, 2002.

Berger, C. and Wells, S. (1999) "Macrophyte Modeling of the Columbia Slough," Proceedings International Water Resources Engineering Conference, ASCE, Seattle, Wa, Aug.8-11.

Wells, S. and Berger, C. (1998) "Water Quality Impacts of Urban Stormwater Runoff from the Portland International Airport on the Columbia Slough," [in Polish], Proceedings Gdanska Fundacja Wody, Podczyszczanie Wod Opadowych Wymagania Formalnopravne I Mozliwosci Techniczne, Gdansk, Poland.

Wells, S. A.; Berger, C. J., Abrams, M. (1996) "Winter Storm Event Impacts on Dissolved Oxygen Levels in the Columbia Slough System," The Pacific Northwest Floods of February 6-11, 1996, Proceedings of the Pacific Northwest Water Issues Conference, ed. by A. Laenen, American Institute of Hydrology, pp.107-126.

Berger, C. and Wells, S. A. (1995) "Effects of Management Strategies to Improve Water Quality in the Tualatin River, Oregon," in *Water Resources Engineering*, Vol. 2, ed. by W. Espey Jr. and P. Combs, ASCE, 1360-1364.

#### **Technical Presentations:**

Berger, C. J. and S. A. Wells (2006) "Columbia Slough Water Quality Model," 4<sup>th</sup> Annual Urban Ecology and Conservation Symposium, Portland, Oregon, January 27.

Berger, C. J. and S. A. Wells (2005) "Lake Whatcom Water Quality Model," Pacific Northwest Clean Water Association Conference, Tacoma, Washington, September 25-28.

Berger, C. J. and S. A. Wells (2005) "Laurance Lake Temperature Study, and Alternate Methods for Controlling Temperatures Downstream for Fish," Hood River Watershed Group, Parkdale, Oregon, June 28.

Berger, C.; Annear, R. and Wells, S. (2003) "Willamette River System Temperature Waste Allocation Model," Pacific Northwest Clean Water Association Conference, Boise, Idaho, September 14-17.

Berger, C. J., R. L. Annear and S. A. Wells (2002) "A Water Quality Model for the Spokane River-Long Lake System Using CE-QUAL-W2," National TMDL Science and Policy Conference, Water Environment Federation, Phoenix, Arizona, November 13-16.

Berger, C.; Annear, R. and Wells, S. (2002) "Water Quality Modeling of the Lower Willamette River," Pacific Northwest Clean Water Association 69<sup>th</sup> Annual Conference, Yakima, Washington, October 20-23.

Berger, C.; Annear, R. and Wells, S. (2002) "Willamette and Columbia River Waste Allocation Model," 2nd Federal InterAgency Hydrologic Modeling Conference, Las Vegas, July 28-Aug 1, 2002.

Berger, C. (2001) "Modeling Macrophytes of the Columbia Slough," (2001) Oregon Lakes and Reservoirs Symposium, Portland, Oregon, September 21.

Berger, C. and S. Wells (2000) "Investigation of Alternatives to Managing Macrophyte Growth in the Columbia Slough, Oregon," Pacific Northwest Pollution Control Association 67<sup>th</sup> Annual Conference, Coeur d'Alene, Idaho, October 29-November 1.

Berger, C. and S. Wells (1999) "Modeling Macrophytes of the Columbia Slough, Oregon," International Water Resource Engineering Conference, ASCE, Seattle, Washington, August 8-12.

Wells, S. and C. Berger (1998) "River Basin Modeling with CE-QUAL-W2 Version 3.0," Pacific Northwest Pollution Control Association 65<sup>th</sup> Annual Conference, Portland, Oregon, October 25-28.

Berger, C. and S. Wells (1997) "Water Quality Effects of Hydraulic Changes to the Columbia Slough," American Water Resources Association Annual Conference on Water Resources, Long Beach, California, October 19-23.

Berger, C. and Wells, S. A. (1995) "Effects of Management Strategies to Improve Water Quality in the Tualatin River, Oregon," The First International Conference on Water Resources Engineering, American Society of Engineers, San Antonio, Texas, August 14-18, 1995.

#### **Technical Reports:**

Wells, S. A., Berger, C., and Knutson, M. (1992) "Modeling the Tualatin River System including Scoggins Creek and Hagg Lake: Model Description, Geometry, and Forcing Data," Technical Report EWR-012-92, Department of Civil Engineering, Portland State University, Portland, Oregon, 90 pages.

Wells, S. A., Berger, C., and Staats, M. E. (1993) "Hydraulic and Water Quality Modeling of the Upper Columbia Slough: Model Description, Geometry, and Forcing Data," prepared for HDR Engineering and City of Portland, Portland, Oregon, 119 pages.

Wells, S. A., Berger, C. (1993) "Hydraulic and Water Quality Modeling of the Upper Columbia Slough: Model Calibration, Verification, and Management Alternatives Report," prepared for HDR Engineering and City of Portland, Portland, Oregon, 202 pages.

Berger, C. (1994) "Water Quality Modeling of the Tualatin River," Master's Thesis, Technical Report EWR-2-94, Department of Civil Engineering, Portland State University, Portland, Oregon, 152 pages.

Wells, S. A. and Berger, C. (1994) "Upper and Lower Columbia Slough Water Level Test: September 1 through October 29, 1993," Technical Report EWR-2-94, Department of Civil Engineering, Portland State University, Portland, Oregon, 69 pages.

Wells, S. A. and Berger, C. J. (1995) "Hydraulic and Water Quality Modeling of the Upper and Lower Columbia Slough: Model Calibration, Verification, and Management Alternatives Report for 1992-1995," Technical Report EWR-2-95, Department of Civil Engineering, Portland State University, Portland, Oregon, 258 pages.

Wells, S. A. and Berger, C. J. (1995) "Upper and Lower Columbia Slough Water Level Test and Winter Sampling Results for June 1994 through March 1995," Technical Report EWR-3-95, Department of Civil Engineering, Portland State University, Portland, Oregon, 82 pages.

Wells, S. A., Berger, C., and Eberle, M. (1996) "Modeling and Monitoring the Columbia Slough System: 1995/1996", Technical Report EWR-1-96, Department of Civil Engineering, Portland State University, Portland, Oregon, 74 pages.

Wells, S. and Berger, C. (1996) "Hydraulic and Water Quality Modeling of Wahiawa Reservoir Volume 1: Model Description, Geometry, and Forcing Data," prepared for R. M. Towill Corporation, Honolulu, Hawaii, 88 pages.

Wells, S. and Berger, C. (1997) "Hydraulic and Water Quality Modeling of Wahiawa Reservoir Volume 2: Model Calibration and Alternatives Analysis," prepared for R. M. Towill Corporation, Honolulu, Hawaii, 155 pages.

Berger, C. B. and Wells, S. A. (1997) "User's Manual for the Columbia Slough System Model," Technical Report EWR-3-97, Department of Civil Engineering, Portland State University, Portland, Oregon, 48 pages.

Berger, C. B. and Wells, S. A. (1997) "Culvert Replacements on the Southern Arm of the Upper Columbia Slough," Technical Report EWR-4-97, Department of Civil Engineering, Portland State University, Portland, Oregon, 65 pages.

Wells, S., Annear, R. and Berger, C. (1997) "Feasibility of Wetland Benches in the Lower Columbia Slough," Technical Report EWR-8-97, Department of Civil Engineering, Portland State University, Portland, Oregon, 70 pages.

Harrison, J.; Wells, S.; Berger, C.; and Kasch, M. (1998) "Lower Snake River Model Development," report prepared for the Idaho Power Company, Boise, Idaho.

Wells, S., Annear, R. and Berger, C. (1998) "Wetland Benches in the Lower Columbia Slough," Technical Report EWR-1-98, Department of Civil Engineering, Portland State University, Portland, Oregon, 187 pages.

Berger, C. and Wells, S. (1999) "Hydraulic and Water Quality Modeling of the Columbia Slough, Volume 1," Technical Report EWR-2-99, Department of Civil Engineering, Portland State University, Portland, Oregon, 67 pages.

Rodriguez, H.; Annear, R.; Berger, C.; and Wells, S. (2000) "Lower Willamette River Model: Boundary Conditions and Model Setup," Technical Report EWR-03-00, Department of Civil Engineering, Portland State University, Portland, Oregon.

Berger, C.; Annear, R.; and Wells, S. (2001) "Lower Willamette River Model: Model Calibration," Technical Report EWR-02-01, Department of Civil Engineering, Portland State University, Portland, Oregon.

Berger, C.; Annear, R.; and Wells, S. (2001) "Lower Willamette River Model: Management Scenarios," Technical Report EWR-03-01, Department of Civil Engineering, Portland State University, Portland, Oregon.

Annear, R. L.; Berger, C. J.; and Wells, S. A. (2001) "CE-QUAL-W2 Version 3.1 Shading Algorithm," Technical Report EWR-05-01, Department of Civil Engineering, Portland State University, Portland, Oregon.

Berger, C.; Annear, R.; Wells, S.; Cole, T. (2002) "Upper Spokane River Model: Model Calibration," Technical Report EWR-01-02, Department of Civil Engineering, Portland State University, Portland, Oregon and U.S. Army Corps of Engineers, Waterways Experiment Station, Vicksburg, Mississippi.

Rodriguez, H.; Annear, R.; Berger, C.; and Wells, S. (2000) "Lower Willamette River Model: Boundary Conditions and Model Setup," Technical Report EWR-03-00, Department of Civil Engineering, Portland State University, Portland, Oregon.

Wells, S.; Annear, R.; and Berger, C. (2002) "Clackamas River System Model: Boundary Conditions and Model Setup," (In Progress) prepared on behalf of Duke Engineering for Portland General Electric, Portland, Oregon.

Wells, S.; Berger, C.; and Annear, R. (2002) "Clackamas River System Model: Model Calibration," (In Progress) prepared on behalf of Duke Engineering for Portland General Electric, Portland, Oregon

Annear, R. L.; Wells, S. A.; and Berger, C. J. (2002) "Mid-Willamette River: Boundary Conditions and Model Setup," prepared for Portland General Electric, Portland, Oregon.

Berger, C. J.; Wells, S. A.; and Annear, R. L. (2002) "Mid-Willamette River: Model Calibration," prepared for Portland General Electric, Portland, Oregon.

Berger, C. J.; Wells, S. A.; and Annear, R. L. (2003) "Middle Willamette River: Management Scenarios," prepared for Portland General Electric, Portland, Oregon.

Slominski, S.; Annear, R. L.; Berger, C. J.; Wells, S. A.; and Cole, T. (2002) "Upper Spokane River Model: Boundary Conditions and Model Setup, 2001" Technical Report EWR-04-02, Department of Civil and Environmental Engineering, Portland State University, Portland, Oregon and U.S. Army Corps of Engineers, Waterways Experiment Station, Vicksburg, Mississippi.

Berger, C. J.; Annear, R. L.; and Wells, S. A. (2003) "Upper Spokane River Model: Model Calibration, 2001," Technical Report EWR-01-03, Department of Civil and Environmental Engineering, Portland State University, Portland, Oregon.

Wells, S. A., Annear, R. L., and Berger, C. J. (2003) "Upper Spokane River Model in Idaho: Boundary Conditions and Model Setup for 2001" Technical Report EWR-02-03, Department of Civil and Environmental Engineering, Portland State University, Portland, Oregon.

Annear, R. L., McKillip, M. L.; Khan, Sher Jamal; Berger, C. J.; and Wells, S. A. (2004a) "Willamette River Basin Temperature TMDL Model: Boundary Conditions and Model Setup," Technical Report EWR-01-04, Department of Civil and Environmental Engineering, Portland State University, Portland, OR.

Annear, R. L., McKillip, M. L.; Khan, Sher Jamal; Berger, C. J.; and Wells, S. A. (2004b) "Willamette River Basin Temperature TMDL Model: Model Scenarios," Technical Report EWR-03-04, Department of Civil and Environmental Engineering, Portland State University, Portland, OR.

Berger, C. J.; McKillip, M. L.; Annear, R. L.; Khan, Sher Jamal; and Wells, S. A. (2004) "Willamette River Basin Temperature TMDL Model: Model Calibration," Technical Report EWR-02-04, Department of Civil and Environmental Engineering, Portland State University, Portland, OR.

Kraft, T.; Annear, R. L.; Berger, C. J.; and Wells, S. A. (2004) "A Hydrodynamic and Water Quality Study of the Green River, King County, Washington," Department of Civil and Environmental Engineering, Portland State University, Portland, OR.

Berger, C. J., Wells, S. A., and Annear, R. L. (2005) "Laurance Lake Temperature Model," Technical Report EWR-04-04, Department of Civil and Environmental Engineering, Portland State University, Portland, Oregon.

Berger, C. J. and Wells, S. A. (2005) "Lake Whatcom Water Quality Model," Technical Report EWR-03-05, Department of Civil and Environmental Engineering, Portland State University, Portland, Oregon.

Berger, C. J. and Wells, S. A. (2006) "Columbia Slough Hydrodynamic and Water Quality Model Version 3.2," Technical Report EWR-04-05, Department of Civil and Environmental Engineering, Portland State University, Portland, Oregon.