Scott A. Wells, P.E., Ph.D.

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Overview: He has a Ph.D. from Cornell University in Civil and Environmental Engineering, and graduate and undergraduate degrees from MIT and Tennessee Technological University. Since 1987 he has been at Portland State University and is currently Professor of Civil and Environmental Engineering after serving for 12 years as Department Chair. His research areas are in modeling of environmental fluid mechanics: surface water quality and hydrodynamics and solid-liquid separation processes. He has written over 100 technical publications.

He has received 2 Fulbright scholar awards, one to the Ukraine and the other to Israel where he taught and did research at the Earth Institute at Hebrew University and at the Israeli Geologic Survey in Jerusalem, Israel. During that time he worked on the environmental impacts of the proposed Peace Conduit between the Gulf of Aqaba and the Dead Sea.

He is the co-author of the water quality and hydrodynamic model, CE-QUAL-W2, used throughout the world for temperature and water quality modeling studies or rivers, lakes and reservoir systems. He and his research team are active as peer-reviewers for the US EPA and other clients.

He regularly teaches classes in water quality and hydrodynamic modeling at Portland State University, as well as workshops on modeling CE-QUAL-W2. He has presented an EPA sponsored webinar to a national audience on the Impact of Sediments on Water Quality, was an invited participant to EPA Region 6 workshop on water quality modeling, and was selected by EPA to serve on the Cayuga Lake Technical TMDL Review Team.

He has been a frequent invited seminar speaker and keynote speaker at conferences in the US and abroad (China, Netherlands, Brazil) and is currently a Principal Investigator for the Collaborative Center for Geo-hazards and Eco-Environment in Three Gorges Area, Hubei Province, Three Gorges University, Yichang, China.

Expertise: Environmental fluid mechanics: surface water quality and hydrodynamics and solid-liquid separation processes.

Experience in surface water quality and hydrodynamic studies: He has been involved in over 100 water body studies. In Oregon, he has been involved in hydrodynamic/water quality modeling on the Tualatin River, Hagg Lake, the Columbia Slough system (Lower Columbia Slough, Upper Columbia Slough, Smith and Bybee Lakes, Peninsula Canal), Klamath River, Russel Creek (near Eugene), Coast Fork of the Willamette River, Bull Run Reservoir #2, Bull Run Reservoir #1, Bull Run Reservoir #3, Bull Run Lake, Upper and Lower Bull Run River, Willamette River (Oregon City Falls to Columbia River, including Multnomah Channel, Willamette River basin), Johnson Creek, Ashland Creek, Cooper Creek Reservoir, Skipanon River, Schooner Creek, Siletz Bay, South Santiam River, Middle Fork Willamette River, Bear Creek, Stone Creek below Timothy Lake, Laurance Lake, Waldo Lake, South Slough off Coos Bay, Yaquina Bay and Yaquina River, the Clackamas River Basin (Clackamas River, Timothy Lake, Lake Harriet, Frog Lake, North Fork Reservoir, Faraday Lake, Estacada Lake) and areas of Tillamook Bay and the Columbia River (Bonneville Dam to St. Helens). His experience also includes water quality and hydrodynamic studies in Hawaii (Wahiawa Reservoir), Virginia (N. Anna Reservoir), Tennessee (Center Hill Lake), Kentucky (Laurel River Reservoir), Idaho (Boise River, Lower Snake River from Brownlee Reservoir to C. J. Strike Reservoir, Brownlee Reservoir, C. J. Strike Reservoir, Spokane River, Oxbow Reservoir, Hells Canyon Reservoir, Coeur D'Alene Lake, Pend Oreille River and Lake), California (Klamath River, Philbrook Reservoir, DeSabla Reservoir, Butte Creek, Millerton Lake, Lake Spaulding, Bowman Lake, Rollins Reservoir, Fordyce Reservoir, Jackson Meadows Reservoir), Washington (Columbia River, Clear Lake, Spirit Lake, Spokane River, Long Lake, White and Puyallup Rivers, Snohomish River and Estuary, Green River, Lake Roosevelt, Chelan River, Pend Oreille River, Tolt Reservoir, Lake Chaplain, Budd Inlet/Capitol Lake/Deschutes River, Chester Morse Reservoir, Cedar River, Banks Lake), Colorado (Cherry Creek Reservoir), Wisconsin (Kinnickinnic River, Lake George), North Carolina (Jocassee and Keowee Reservoirs),

Oklahoma (Tenkiller Reservoir on the Illinois River), Texas (Lake Lavon, Lake Travis), Florida (Tampa Bay Water Supply Reservoir, Reservoir C-44), *China* (Three Gorges Reservoir), *Spain*, *Peru* (Chaglla Reservoir), *Brazil* (Tabajara Reservoir), *Guyana* (Amaila Reservoir), *Canada* (Lake Lagopede, Pit Lakes region lakes), *Israel* (Lake Kinneret or Sea of Galilee, Jordan River, Dead Sea, experimental ponds at Dead Sea Works), and in the *Ukraine* (Dnieper River-reservoir system and Kiev Sea).

Education: Ph.D. Cornell Univ.; S.M. MIT; BSCE Tennessee Technological Univ., P.E. in Civil Engineering and in Environmental Engineering

Reviewer: National Science Foundation Research Proposals, USGS Water Resource Research Institute Proposals, Fluid/Particle Separation Journal, Powder Technology, Separations Technology, Separation Science and Technology, Journal of Environmental Engineering ASCE, Journal of Geotechnical Engineering ASCE, Journal of Hydrologic Engineering ASCE, Journal of Hydraulic Engineering ASCE, Journal of Irrigation and Drainage ASCE, Environmental Science and Technology, Water Resources Research, International Journal of Heat and Mass Transfer, Estuarine, Coastal and Shelf Science, Journal of HydroInformatics, American Society of Agricultural and Biological Engineers.

Partial list of research and consulting clients: METRO (Portland); Rhone-Poulenc Chemical Company; State of Oregon; Scientific Resources, Inc.; OBEC Consulting Engineers; AMTRAK; EWEB; Woodward-Clyde Consulting Engineers; Fishman Environmental Services; Black/Veatch; Cornforth Consultants, Inc; HDR Engineering, Inc; CH2MHill; Carollo Engineers; SECOR; R. M. Towill Corporation; LimnoTech, Inc; City of Bremerton; EPA; City of Sutherlin, OR; Lincoln City, OR; Tulalip Indian Tribes; Portland General Electric; City of Portland; Washington Department of Ecology; Israeli Geologic Survey; Idaho Power Company, AVISTA Corporation; USBLM; US BurRec; PacifiCorp; Chelan Public Utility District; City of Kansas City; Pacific, Gas and Electric Company; Stormwater Management 360; City of Toledo; MWH Engineering; HyQual Engineering; Waterways Experiments Station (Corps of Engrs); Corps of Engrs (Portland District); Oregon DEQ; Idaho DEQ; Friends of Blue Lake; King County (WA); Clackamas County (OR), CRITFC, US Forest Service; CDS Inc.; Clackamas River Water Supply group; Middle Fork Irrigation District; USGS.

Selected publications: Dr. Wells' publications have appeared in the following Journals: Aquatic Ecology, Ecological Modeling, Water Resources Bulletin, ASCE Journal of Hydraulic Engineering, Research Journal of the Water Pollution Control Federation, Fluid/Particle Separation Journal, ASCE Journal of Environmental Engineering, Water Research, Water Environment Research and have appeared in Proceedings for the following conferences: ASCE World Water and Envir. Resources, Water Resources and Envir. Engr., WEF National TMDL Science and Policy, International Reservoir Limnology and Water Quality, Federal Interagency Hydrologic Modeling, IAHR Hydroinformatics, Ecohydraulics, American Filtration Society, and American Bar Association Water Law conferences. He also has written almost 100 technical reports. A full-list can be found at http://www.cee.pdx.edu/~scott.

Selected publications since 2005:

Annette B.G. Janssen, George B. Arhonditsis, Arthur Beusen, Karsten Bolding, Louise Bruce, Jorn Bruggeman, Raoul-Marie Couture, Andrea S. Downing, J. Alex Elliott, Marieke A. Frassl, Gideon Gal, Daan J. Gerla, Matthew R. Hipsey, Fenjuan Hu, Stephen C. Ives, Jan H. Janse, Erik Jeppesen, Klaus D. Jöhnk, David Kneis, Xiangzhen Kong, Jan J. Kuiper, Moritz K. Lehmann, Carsten Lemmen, Deniz Özkundak, Thomas Petzoldt, Karsten Rinke, Barbara J. Robson, René Sachs, Sebastiaan A. Schep, Martin Schmid, Huub Scholten, Sven Teurlincx, Dennis Trolle, Tineke A. Troost, Anne A. Van Dam, Luuk P.A. Van Gerven, Mariska Weijerman, Scott A. Wells, Wolf M. Mooij (2015) "Exploring, exploiting and evolving diversity of aquatic ecosystem models: a community perspective", Aquatic Ecology, Volume 49, Issue 4, 513-548, DOI 10.1007/s10452-015-9544-1.

Ma, Jun; Liu, Defu; Wells, Scott A.; Tanga, Hongwu; Jif, Daobin; Yang, Zhengjian (2015) "Modeling density currents in a typical tributary of the Three Gorges Reservoir, China", Ecological Modeling, Volume 296, 24 January 2015, Pages 113–125, doi:10.1016/j.ecolmodel.2014.10.030

Berger, C. J., Bigham, G., and Wells, S. A. (2014) “Prediction of GHG Emissions from a New Reservoir,” Proceedings World Environmental and Water Resources Congress, EWRI, ASCE, Portland, OR, pp. 1010-1019.

Martinez, V. I., Wells, S. A. and R. C. Addley (2014) “Meeting Temperature Requirements for Fisheries Downstream of Folsom Reservoir, California,” Proceedings World Environmental and Water Resources Congress, EWRI, ASCE, Portland, OR, pp. 1081-1092.

Shoajei, N. and Wells, S. A. (2014) “Automatic Calibration of Water Quality Models for Reservoirs and Lakes,” Proceedings World Environmental and Water Resources Congress, EWRI, ASCE, Portland, OR, pp. 1020-1029.

Wells, S. A. (2014) “Integrating Fish Bioenergetics and Volitional Movement in Water Quality and Hydrodynamic Models,” Proceedings Water Environment Federation Conference, New Orleans, September 2014.

Berger, C. J.; Wells, S. A..; and Wells, V. (2012) "Modeling of Water Quality and Greenhouse Emissions of Proposed South American Reservoirs," Proceedings of the 2012 World Environmental & Water Resources Congress, Albuquerque, New Mexico, May 20-24, 2012, pp. 911-923.

Wells, S. A..; Wells, V., and C. J. Berger (2012) " Impact of Phosphorus Loading from the Watershed on Water Quality Dynamics in Lake Tenkiller, Oklahoma, USA," Proceedings of the 2012 World Environmental & Water Resources Congress, Albuquerque, New Mexico, May 20-24, 2012, pp. 888-899.

Wells, V. I. and Wells, S. A. (2012) “CE-QUAL-W2 Water Quality and Fish-bioenergetics Model of Chester Morse Lake and the Cedar River,” Proceedings World Environmental and Water Resources Congress, EWRI, ASCE, Albuquerque, NM, pp. 2756-2767.

Mooij WM, Trolle D, Jeppesen E, Arhonditsis G, Belolipetsky PV, Chitamwebwa DBR, Degermendzhy AG, DeAngelis DL, De Senerpont Domis LN, Downing AS, Elliott JA, Fragoso Jr CR, Gaedke U, Genova SN, Gulati RD, Håkanson L, Hamilton DP, Hipsey MR, ‘t Hoen J, Hülsmann S, Los FJ, Makler-Pick V, Petzoldt T, Prokopkin IG, Rinke K, Schep SA, Tominaga K, Van Dam AA, Van Nes EH, Wells SA and Janse JH (2010) “Challenges and opportunities for integrating lake ecosystem modelling approaches,” Aquatic Ecology: DOI:10.1007/s10452-010-9339-3, 44(3): 633-667.

Cheslak, E; Berger, C; Annear, R., and Wells, S. (2009) “Protecting Spring-Run Chinook Salmon: The Use of a Two-dimensional Water Temperature Model to Evaluate Alternative Hydroelectric Operations,” WaterPower XVI Proceedings, Spokane, WA, July 27-30, 2009

Berger, C.; McKillip, M.; Annear, R.; Wells, V., and Wells, S. (2009) “Modeling the Spokane River-Lake Roosevelt System,” Proceedings IAHR 33rd Congress, Vancouver, BC, August 9-14, pp. 6223-6230.

Berger, C. and Wells, S. (2008) “A Macrophyte Water Quality and Hydrodynamic Model,” ASCE, Journal of Environmental Engineering, Volume 134, Issue 9, pp. 778-788 (September 2008).

Wells, S. A., J. R. Manson, and J. L. Martin (2007) “Numerical Hydrodynamic and Transport Models for Reservoirs,” Chapter 4 in Energy Production and Reservoir Water Quality, ASCE.

Annear, R. L., and S. A. Wells (2007), A comparison of five models for estimating clear-sky solar radiation, Water Resour. Res., 43, W10415, doi:10.1029/2006WR005055.

Berger, C. J. and Wells, S. A. (2007) "Development and Calibration of Lake Whatcom Water Quality Model," Proceedings of the Water Environment Federation TMDL Conference, Seattle, WA, June 24-27.

Berger, C. J. and Wells, S. A. (2007) "Modeling Effects of Channel Complexity and Hyporheic Flow on Stream Temperatures," Proceedings of the Water Environment Federation TMDL Conference, Seattle, WA, June 24-27.

McKillip, M. and Wells, S. (2006) “Hydrodynamic, water quality and fish bioenergetics modeling in Lake Roosevelt Washington USA using CE-QUAL-W2,” Proceedings, 5th International Conference on Reservoir Limnology and Water Quality, Brno, Czech Republic, August 27-September 2.

Harrison, J. R.; Wells, S. A.; Rychert, R. C.; Naymik, J. (2005) “Searching For A Practical Approach To Partition Biomass And Detritus For Ecological Models Applied To The Snake River And Its Reservoirs,” Proceedings ASLO Conference, Salt Lake City, UT, February 24-25.

Wells, S. A. (2005) “Use and Misuse of Computer Models in Water Disputes,” Proceedings American Bar Association 23rd Annual Water Law Conference, San Diego, CA.