

Gregory J. Pelletier, M.S.E., P.E.

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Environmental Engineer

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OBJECTIVE

To explain water quality changes in marine, estuarine, and freshwater aquatic environments by using data and numerical models.

NUMERICAL MODELING EXPERIENCE

- Technical expert and authority in numerical modeling of water quality for the Washington State Department of Ecology since 1988. Created numerical models of hydrodynamics and water quality for estuary, river, and lake water quality problems. Examples include: 3-dimensional modeling of hydrodynamics and eutrophication in southern Puget Sound and Budd Inlet, long-term fate and bioaccumulation of PCBs in Puget Sound, and many other projects.
- Created a generalized numerical modeling framework for stream water quality simulation called QUAL2Kw using VBA/Excel and FORTRAN (in collaboration with Dr. Steven Chapra of Tufts University). This program is being applied in numerous projects at the Washington State Department of Ecology and also is widely used around the world (e.g. Verones et al 2010, Turner et al 2009, Kannel et al 2007, etc.). Also collaborated with Dr. Chapra on the USEPA version of the framework called QUAL2K.

- Collaborated with USEPA to extend their WASP framework for numerical modeling of water quality to include simulation of the CO₂ system, alkalinity, and pH. Wrote a standalone Excel/VBA version of the CO₂SYS calculator for the CO₂ system in seawater that is widely used by oceanographers around the world, and also incorporated CO₂SYS into the WASP framework upgrade.
- Proficient in application of several other commonly used numerical modeling programs including EFDC, GEMSS, WASP, QUAL2E and other programs.

EDUCATION

M.S.E., 1985, Environmental Engineering, University of Washington, Seattle, WA

B.S., 1979, Environmental Studies, Springfield College, Springfield, MA

EMPLOYMENT

- 2/88 - present, Environmental Engineer, Washington State Department of Ecology, P.O. Box 47600, Olympia, WA 98504
- 4/84 - 2/88, Environmental Scientist, Harper-Owes, 1325 4th Ave, Suite 1800, Seattle, WA
- 4/82 - 4/84, Environmental Scientist Intern, Municipality of Metropolitan Seattle, 821 Second Ave, Seattle, WA
- 1/82 - 12/83, Environmental Scientist, Herrera Environmental Consultants, 1414 Dexter Ave N, Seattle, WA
- 9/79 - 9/81, Research Assistant, University of Washington, Department of Civil Engineering, Seattle, WA

COMPUTER SKILLS

- Proficient in programming in modern computer languages (FORTRAN and VBA) including translating JavaScript and C code to other languages
- Experienced in application of numerical data analysis packages (MATLAB)

- Expert in application of GIS (Arcview and Arcinfo)
- Experienced in UNIX, Windows, DOS, and Macintosh operating systems
- Proficient in HTML and JavaScript coding for Web publishing

SELECTED PUBLICATIONS

Hobson, A.J., B.T. Nielson, N. von Stackelberg, M Shupryt, J. Ostermiller, G. Pelletier, and S.C. Chapra. 2014. Development of a minimalistic data collection strategy for QUAL2Kw. ASCE J. Water Resour. Plann. Manage. DOI: 10.1061/(ASCE)WR.1943-5452.0000488

Ahmed, A. G. Pelletier, M.Roberts, and A. Kolosseus. 2014. South Puget Sound Dissolved Oxygen Study: Water Quality Model Calibration and Scenarios. Washington State Department of Ecology. Publication No. 14-03-004. Olympia, WA. (<https://fortress.wa.gov/ecy/publications/SummaryPages/1403004.html>)

Pelletier, G, Ahmed, A., Sackmann, B, Roberts, M., and Ambrose, R. 2011. Calibration of a three-dimensional model of water quality in South Puget Sound (poster). 2011 Salish Sea Ecosystem Conference, October 25-27, 2011, Vancouver, B.C., Canada. (<http://www.ecy.wa.gov/biblio/1103059.html>)

Pelletier, G, 2010. The long-term fate and bioaccumulation of polychlorinated biphenyls in Puget Sound (poster). Society of Environmental Toxicology and Chemistry (SETAC) National Conference, November 7-11, 2010, Portland OR. (<http://www.ecy.wa.gov/biblio/1003066.html>)

Verones, F., Hanafiah, M., Pfister, S, Huijbregts, M., Pelletier, G., Koehler, A. 2010. Characterization factors for thermal pollution in freshwater aquatic environments. *Environmental Science and Toxicology*. 44(24):9364-9369. (<http://pubs.acs.org/doi/abs/10.1021/es102260c>)

Pelletier, G, and Mohamedali, T. 2009. The long-term fate and bioaccumulation of polychlorinated biphenyls in Puget Sound. Publication 09-03-015, Washington State Department of Ecology, Olympia WA. (<http://www.ecy.wa.gov/biblio/0903015.html>)

Turner, D., Pelletier, G., and Kasper, B. 2009. Dissolved oxygen and pH modeling of a periphyton dominated, nutrient enriched river. *American Society of Civil Engineers, J. Environ. Eng.* 135:8(645) (http://ascelibrary.org/eeo/resource/1/joeedu/v135/i8/p645_s1?isAuthorized=no)

Kannel, P.R., S. Lee, Y.S. Lee, S.R. Kanel, and G.J. Pelletier. 2007. Application of automated QUAL2Kw for water quality modeling and management in the Bagmati River, Nepal, *Ecological Modelling* 202(2007):503-517. (<http://www.ecy.wa.gov/pubs/0703035.pdf>)

Pelletier, G.J., S.C. Chapra, and H. Tao. 2006. QUAL2Kw - A framework for modeling water quality in streams and rivers using a genetic algorithm for calibration. *Environmental Modelling and Software*, 21 (2006) 419-425. (<http://www.ecy.wa.gov/pubs/0503044.pdf>)

Roberts, M. and G. Pelletier. 2001. Estimating Loads of Nutrients, Bacteria, DO, and TSS from 71 Watersheds Tributary to South Puget Sound. Puget Sound Research 2001 Conference.

Matthews, R.A., M.A. Hilles, and G. Pelletier. 2002. Determining trophic state of Lake Whatcom, Washington (USA), a soft water lake exhibiting seasonal nitrogen limitation. *Hydrobiologia* 468:107-121, 2002.

Pelletier, G., M. Roberts, S. Albertson, and J. Newton. 2001. A three-dimensional water quality model of southern Puget Sound (poster). 2001 Puget Sound Research Conference.

Yake, B., D. Rogowski, L. Goldstein, and G. Pelletier, 2000. Dioxins in Washington State Soils. *Organohalogen Compounds- 20th International Symposium on Halogenated Environmental Organic Pollutants*, V. 46, pp. 342- 345.

Albertson, S.L., J. Newton, and G. Pelletier. 1999. Barotropic and baroclinic response of South Puget Sound in a 3-D hydrodynamic model. American Society of Civil Engineers. Proceeding of the Environmental Computer Models Conference, November 1999, New Orleans, LA.

Pelletier, G, and E.B. Welch. 1987. Phosphorus loading and diversion for Pine Lake, Washington. In: *Lake and Reservoir Management*. 3:38-47. North American Lake Management Society. Washington, D.C.

SELECTED PRESENTATIONS

Pelletier, G., and M. Roberts, A. Ahmed, B. Sackmann, and A. Kolosseus. 2014. Anthropogenic influence on dissolved oxygen in the Salish Sea, Central and South Puget Sound, and Budd Inlet. 2014 Puget Sound Georgia Basin Research Conference, April 30-May 2, 2014, Seattle, WA.

Pelletier, G., Mohamedali, T., and Norton, D. 2009. The long-term fate and bioaccumulation of polychlorinated biphenyls in Puget Sound. 2009 Puget Sound Georgia Basin Research Conference, Session 6D, February 8-11, 2009, Seattle, WA.

Use of genetic algorithms for automatic calibration of water quality models. February 28 & March 2, 2007, University of Washington, CEE 577 (Water Quality Management) guest speaker.

The EFDC Water Quality Model: Application to South Puget Sound. April 14, 1999, University of Washington, Ocean 506B guest speaker.

The South Puget Sound Model project: GIS methods for analysis of hydrology and nutrient loading. May 27, 1999, University of Washington, CEWA 599C guest speaker.

South Puget Sound Modeling Program. Washington State Lake Protection Association, 13th Annual Conference on Lakes, Reservoirs, and Watersheds, SeaTac, WA.

Modeling of hydrodynamics and fecal coliform bacteria in Grays Harbor. Water Environment Foundation, National TMDL Science and Policy Conference, June 2001, St Louis MO.