

Tessa B. Francis
Curriculum Vitae

Tessa B. Francis

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Current position

Lead Ecosystem Ecologist, University of Washington Tacoma, Puget Sound Institute (2012-present)

Education

Ph.D. in Zoology, University of Washington (2002-2009). Dissertation title: "Effects of shoreline urbanization on aquatic-terrestrial links in lakes." Advisor: Daniel Schindler

B.S. in Wildlife Science with Honors and a Minor in Quantitative Science, University of Washington (1999-2002)

B.A. in Political Science with Honors and a Minor in English, University of California, Berkeley (1989-1992)

Recent Positions

National Research Council Postdoctoral Researcher, Northwest Fisheries Science Center, NOAA, Seattle, WA (2009-2012). Advisor: Phil Levin

Publications

Francis TB, Wolkovich EM, Scheuerell MD, Katz SL, Holmes EE, Hampton SE. 2014. Shifting Regimes and Changing Interactions in the Lake Washington, U.S.A., Plankton Community from 1962-1994. PLoS ONE 9(10): e110363. doi:10.1371/journal.pone.0110363.

Carey, M.P, Levin, P.S., Townsend, H.T., Minello, T.J., Sutton, G.R., Francis, T.B., Harvey, C.J, Toft, J.E., Arkema, K.K, Burke, J.L., Kim, C., Guerry, A., Plummer, M., Spiridonov, G. and M. Ruckelshaus. 2013. Characterizing coastal food webs with qualitative links to bridge the gap between the theory and practice of ecosystem based management. *ICES J. of Mar. Sci.* doi:10.1093/icesjms/fst012.

Francis, T.B., M.D. Scheuerell, R.D. Brodeur, P.S. Levin, J.J., Ruzicka, N. Tolimieri and W.T. Peterson. 2012. Climate shifts the interaction web of a marine plankton community. *Global Change Biology* 18: 2498-2508. doi: 10.1111/j.1365-2486.2012.02702.x.

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Schindler, D.E., J.L. Carter, T.B. Francis, et al. 2012. Mysis in the Okanagan Lake food web: a time-series analysis of interaction strengths in an invaded plankton community. *Aquatic Ecology* 46: 215-227.

Francis, T.B., D.E. Schindler, G.W. Holtgrieve, E.R. Larson, M.D. Scheuerell, B.X. Semmens and E.J. Ward. 2011. Habitat structure determines resource use by zooplankton in temperate lakes. *Ecology Letters* 14(4): 364-372.

Francis, T.B., C.J. Harvey and P.S. Levin. 2011. The perils and promise of futures analysis in marine ecosystem-based management. *Marine Policy* 35:675-681.

Francis, T.B., contributor in Levin, P. S., F. B. Schwing. (Eds.) 2011. Technical background for an integrated ecosystem assessment of the California Current: Groundfish, salmon, green sturgeon, and ecosystem health. U.S. Dept. of Commerce, NOAA Tech. Memo. NMFS-NWFSC-109, 330 p.

Harvey, C. J., K.K. Bartz, J. Davies, T.B. Francis, T.P. Good, A.D. Guerry, B. Hanson, K.K. Holsman, J. Miller, M.L. Plummer, J.C.P. Reum, L.D. Rhodes, C.A. Rice, J.F. Samhuri, G.D. Williams, N. Yoder, P.S. Levin and M.H. Ruckelshaus. 2010. A mass-balance model for evaluating food web structure and community-scale indicators in the Central Basin of Puget Sound. NOAA Technical Memorandum NMFS-NWFSC-106.

Levin, P.S., T.B. Francis, et al. 2010. Understanding future and desired system states, Chapter 1A in Puget Sound Science Update, Puget Sound Partnership, 144 p.

Francis, T.B. and D.E. Schindler. 2009. Shoreline urbanization reduces terrestrial insect subsidies to fishes in North American lakes. *Oikos* 118(12): 1872-1882.

Mills, A., T.B. Francis, V. Shandas, K. Whittaker, and J.K. Graybill. 2008. Using best available science to protect critical areas in Washington state: challenges and barriers to planners. *Urban Ecosystems* 11(4).

Francis, T.B., D.E. Schindler, J.M. Fox, E. Seminet-Reneau. 2007. Effects of urbanization on the dynamics of organic sediments in temperate lakes. *Ecosystems* 10: 1057-1068.

Francis, T.B. and D.E. Schindler. 2006. Degradation of littoral habitats by residential development: woody debris in lakes of the Pacific Northwest and Midwest, United States. *Ambio* 35: 274-280

Francis, T.B., D.E. Schindler and J.W. Moore. 2006. Aquatic insects play a minor role in dispersing salmon-derived nutrients into riparian forests in southwestern Alaska. *Canadian Journal of Fisheries and Aquatic Sciences* 63: 2543-2552.

Francis, T.B. "Eurasian watermilfoil" in Boersma, P. D., S. E. Reichard, and A. N. Van Buren (eds.). *Invasive Species in the Pacific Northwest*. Seattle and London: University of Washington Press, 2006.

Francis, T.B., K.A. Whittaker, V. Shandas, A. Mills and J.K. Graybill. 2005. Incorporating science into the environmental policy process: A case study from Washington State. *Ecology and Society* 10(1): 35.

Schindler, D.E., M.D. Scheuerell, J.W. Moore, S.M. Gende, T.B. Francis and W.J. Palen. 2003. Pacific salmon and the ecology of coastal ecosystems. *Frontiers in Ecology and*

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the Environment 1(1): 31-37.

In Review

Francis, T.B., Wolkovich, L., Scheuerell, M.D., Katz, S., Holmes, E. and Hampton, S.E. Shifting regimes and changing interactions in the Lake Washington, U.S.A., plankton community from 1962-1992. *Canadian J of Fisheries and Aquatic Sciences*.

In Prep

Francis, T.B., M.P. Carey, C. Harvey and P.S. Levin. Linking habitat to forage fish in Puget Sound: a qualitative food-web analysis. *Estuaries and Coasts*

Francis, T.B., D.E. Schindler and J.E. Baker. Asynchronous population dynamics of Pacific herring in Puget Sound, Washington. *Canadian J of Fisheries and Aquatic Sciences*.

Francis, T.B. and P.S. Levin. Key prey and predators of California Current fish groundfish: a qualitative food web analysis. *MEPS*

Francis, T.B., W.T. Peterson, E. Wolkovich and P.S. Levin. Zooplankton community stability is a leading indicator of regime shift in the Northern California Current. *Limnology & Oceanography*

Presentations

Big problems, little data: Qualitative modeling of the forage fish food web in Puget Sound, USA. 2012. ICES/PICES FACT Forage Fish Conference, Nantes, France.
Forage fish of Puget Sound. 2012. University of Washington Water Seminar (*invited*), Seattle, WA.

Population Diversity in Puget Sound Herring: Is there a 'Portfolio Effect'? 2012. Conservation and Ecology of Marine Forage Fishes Symposium, Friday Harbor, Washington.

Qualitative food-web modeling to support ecosystem-based fisheries management: A case study of California Current groundfish. 2012. Ecological Society of America, Portland, OR.

Qualitative modeling of groundfish food-webs. Western Society of Naturalists meeting, Vancouver, WA. November 2011.

Analysis of OR coast zooplankton interactions and stability using multivariate autoregressive (MAR) models with a moving window. 2010. American Society of Limnology and Oceanography Aquatic Sciences meeting, Santa Fe, NM.

Analysis of Oregon coast zooplankton interactions using multivariate autoregressive (MAR) models. 2010. American Society of Limnology and Oceanography Ocean Sciences meeting, Portland, OR.

Shoreline urbanization reduces terrestrial insect subsidies to fishes in North American lakes. 2009. Ecological Society of America, Albuquerque, NM.

Modeling community interactions in the California Current. 2009. NOAA Northwest Fisheries Science Center. Newport, OR. (*invited*)

Effects of shoreline urbanization on aquatic-terrestrial coupling in lakes. 2009. National

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- Lakes Management Conference. Chicago, IL. (*invited*)
- Lakes on the edge: Consequences of shoreline urbanization in the Pacific Northwest. 2008. University of Washington Water Center's 18th Annual Review of Research. Seattle, WA. (*invited*)
- Terrestrial insect subsidies to fish populations weakened with lakeshore development in the Pacific Northwest. 2007. American Society of Limnology and Oceanography, Santa Fe, NM.
- Terrestrial insect subsidies to fish populations weakened with lakeshore development in the Pacific Northwest. North American Benthological Society. 2006. Anchorage, AK.
- Alteration of benthic habitats in the Pacific Northwest: Effects of lakeshore development and consequences for invertebrate production. 2005. Washington Lake Protection Associate. Spokane, WA (*invited*).
- Alteration of benthic habitats in the Pacific Northwest: Effects of lakeshore development and consequences for invertebrate production. 2005. American Society of Limnology and Oceanography, Salt Lake City, UT.
- Emerging aquatic insects transport salmon nutrients to riparian forests. 2004. Alaska Salmon Program Research Symposium. Seattle, WA.
- Consequences of lakeshore development for littoral habitats in the Pacific Northwest: The role of large wood in lakes. 2004. Ecological Society of America, Portland, OR.
- Distribution and function of coarse woody debris in Pacific Northwest lakes. 2003. Littoral Habitat Workshop, Trout Lake Research Station, Wisconsin. (*invited*)
- Consequences of lakeshore development for littoral habitats in the Pacific Northwest. 2003. Ecological Society of America, Savannah, GA.
- The role of coarse woody debris in lakeshore dynamics. 2003. Urban Ecology Conference, Berlin, Germany.
- Consequences of lakeshore development for littoral habitats in the Pacific Northwest. 2003. Washington Lake Protection Association annual meeting. (*invited*)
- Consequences of lakeshore development for littoral habitats in the Pacific Northwest. 2003. American Society of Limnology and Oceanography, Salt Lake City, UT. (*invited*)
- Flying insects disperse salmon nutrients into streamside forests. 2002. Mary Gates Undergraduate Research Symposium.

Grants and Fellowships

Puget Sound Institute Research Grant: Habitat limitation of Puget Sound forage fish (2012-2013). Lead PI. Collaboration with NOAA NWFSC.	\$120,000
National Research Council Postdoctoral Research Fellow/CAMEO (2009-2012).	\$177,000
U.S. Environmental Protection Agency – STAR Graduate Fellow (2006-2009)	\$111,000
U.S. National Science Foundation – Graduate Research Fellow (2004-2006)	\$75,000

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U.S. National Science Foundation – Integrative Graduate Education & Research Training Fellow (2002–2004) \$75,000

Awards

ICES/PICES Early Career Conference Invitee (2012)

Eco-DAS (former DIALOG) awardee (2009)

Budweiser/National Fish & Wildlife Foundation Conservation Scholarship
– \$10,000 (2001)

Marsha Landolt and Robert Busch Award in Aquatic and Fishery Sciences (2006)

University of Washington Ingrith Deyrup-Olsen Outstanding Teaching Award (2005)

Washington Lake Protection Association Research Scholarship (2004)

University of Washington Robert T. Paine Field Ecology Award (2004)

Synergistic Activities

Salish Sea Ecosystem Conference (2014) Steering Committee member

Puget Sound Institute Study Panel: Ecosystem-based Management of Puget Sound Forage Fish. Friday Harbor, San Juan Island, WA. August 2013. (Organizer)

Puget Sound Institute/Puget Sound Partnership State of the Science Panel: “Ocean Health Index Downscaling to Puget Sound,” Tacoma, WA. March 2013. (Organizer)

Northwest Straits Commission, Conservation and Ecology of Marine Forage Fishes Symposium, Friday Harbor, WA. 2012. (Participant)

King County Water and Land Resources Division. 2007. Shoreline Technical Appendix. (Reviewer)

Scholarly and Professional Activities

Manuscript Referee for:

Canadian J of Fisheries and Aquatic Sciences
Global Change Biology
Ecological Applications
Ecology
Ecology Letters
Conservation Letters

Ecology of Freshwater Fish
Ecosystems
Hydrobiologia
J of Applied Ecology
Oikos

Referee for Granting Agencies:

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New York Sea Grant

Society Memberships

Secretary, Aquatic Section of the Ecological Society of America, 2011-2013

American Society of Limnology and Oceanography, 2002-present

Ecological Society of America, 2002-present Washington

Lake Protection Association, 2003-present North

American Benthological Society, 2005-present

Teaching and Mentoring Experience

PhD Committee Member, Megsie Siple, Univ. Washington School of Fisheries

Water Seminar (ESRM 429, Undergraduate), Univ. Washington, Guest lecture

Urban Ecology (Enviro 220, Undergraduate), Univ. Washington (2004)

Limnology (FISH 473, Undergraduate), Univ. Washington (2002, 2004), Teaching
Assistant

Limnology Lab (FISH 475, Undergraduate), Univ. Washington (2002, 2004), Teaching
Assistant

Limnology (FISH 473, Undergraduate), Univ. Washington, Guest lecture

Graduate Student Advisory Committees

Margaret Siple, UW School of Aquatic and Fishery Sciences (Ph.D degree; Advisor: Dave
Beauchamp)

Non-scientific Professional Activities

Producer and Staff Member, Annex Theater, Seattle, WA (1996-1999)

Founder and Board Member, Westside Original Works, Los Angeles, CA (1992-1994)

Assistant to the Producers, *Robin Hood: Men in Tights*, Hollywood, CA (1992-1994)