

NATHAN MANTUA

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Education

- B.S., University of California at Davis, Atmospheric Sciences, 1984-1988
- Ph. D., University of Washington, Atmospheric Sciences, 1988-1994
Dissertation: *Numerical Modeling Studies of the El Niño-Southern Oscillation*
- Graduate Advisors: Professors David Battisti and Edward Sarachik

Academic Experience

- University of Washington, Research Assistant with Professors David Battisti and Edward Sarachik, 1988-1994
- TOGA-COARE field assistant for Dr. Mike Gregg, RV *Moana Wave* 1992
- Scripps Institute of Oceanography, International Research Institute for Climate Prediction (IRICP) Postdoctoral Fellow, 1994 – 1995; supervised by N. E. Graham
- University of Washington, Joint Institute for the Study of the Atmosphere and Oceans (JISAO), Postdoctoral Researcher, September 1995-June 1997
- University of Washington, JISAO/SMA Climate Impacts Group, Staff Research Scientist, July 1997 - present
- Affiliate Assistant Professor of Atmospheric Sciences, August 1998 - present
- Affiliate Assistant Professor, UW School of Marine Affairs, June 2000 – present
- Assistant Director, UW Center for Science in the Earth System, January 2004 - present

Research Interests

- Large scale climate variability and anthropogenic climate change
- Interannual to interdecadal modes of climate variability and predictability
- Climate system (atmosphere-ocean-land-ice-biosphere) interactions
- Societal impacts of climate variations
- Climate impacts on natural resources, especially marine ecosystems, forest ecosystems, and hydrology
- Applications of science to public policy

University of Washington Courses Taught

- ENVIR/ESS/SMA/ATMS 585: *Pacific Northwest Climate Impacts*, co-taught with Amy Snover (2001, 2002, 2003)
- H&AS 220A: *Pacific Northwest Climate Variability*, with David Battisti (1999, 2000)
- ENVIR 201: *American Environmentalism in Context*, with Sara Tjossem (1999)

Graduate Advising

- Casola, Joe. (current) Atmospheric Sciences
- Hamlet, Alan. (current) Department of Civil and Environmental Engineering
- Littell, Jeremy. (current) College of Forest Resources
- Haltuch, Melissa. (current) School of Aquatic and Fishery Sciences
- Gedalof, Ze'ev. Ph.D. 2003. Pacific Basin climate variability and natural systems in the Pacific Northwest. University of Washington College of Forest Resources
- Brown, Craig. M. Sc. 2003. The impact of daily changes in the Pacific North American pattern on the occurrence of extreme weather events. University of Washington, Department of Atmospheric Sciences
- Strom, Are. M.Sc. 2003. Climate and fisheries in the Pacific Northwest: historical perspectives from geoducks and early explorers. University of Washington, School of Aquatic and Fishery Sciences
- Maurer, Edward. Ph.D. 2002. Predictability of runoff in the Mississippi River Basin. University of Washington, Department of Civil and Environmental Engineering
- Pinnix, William. M.Sc. 1999. Climate and coho: a Puget Sound perspective. University of Washington School of Aquatic and Fishery Sciences

Service:

- US Global Oceans Ecosystems Dynamics (GLOBEC) Scientific Steering Committee 1997-2003
- National Research Council Committee on the Alaska Groundfish Fishery and Alaska Stellar sea lions 2001-2002

Honors:

- Session chair: *Climate Variability and Change and Marine Fish Populations*. 15th Annual Beckman Frontiers of Science Symposium, November, 2003; sponsored by the U.S. National Academy of Sciences
- University of Washington Program on Climate Change Public Lecture, May 27, 2003. *Global Change, Local Impacts: consequences of natural and human caused climate change for life in the Pacific Northwest*
- NOAA's Presidential Early Career Award for Scientists and Engineers, April 2000
- NASA Global Change Fellowship, University of Washington, Department of Atmospheric Sciences 1991-1994.

Selected Publications:

Mantua, N.J., and R.C. Francis. (in press): Natural climate insurance for Pacific northwest salmon and salmon fisheries: finding our way through the entangled bank. E.E. Knudsen and D. MacDonald (editors). *Fish in our Future? Perspectives on Fisheries Sustainability*. A special publication of the American Fisheries Society.

Mote, P.W., E.A. Parson, A.F. Hamlet, K.G. Ideker, W.S. Keeton, D.P. Lettenmaier, N.J. Mantua, E.L. Miles, D.W. Peterson, D.L. Peterson, R., Slaughter, and A.K. Snover. 2003. Preparing for climate change: the water, salmon, and forests of the Pacific Northwest. *Climatic Change*, 61: 45-88.

Francis, R.C., and N.J. Mantua. 2003: Climate and Extinction Risk for Salmon Populations of the Northeast Pacific. Eds. A. D. MacCall and T. C. Wainwright. *Assessing extinction risk for West Coast salmon: Proceedings of the workshop*, Nov 13-15, 1996, Seattle, WA. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-NWFSC-56: 37-76.

Logerwell, E.A., N.J. Mantua, P. Lawson, R.C. Francis, and V. Agostini. 2003: Tracking environmental processes in the coastal zone for understanding and predicting Oregon coho (*Oncorhynchus kisutch*) marine survival. *Fisheries Oceanography*, 12(3): 1-15.

Edmonds, R.L., R.C. Francis, N.J. Mantua, and D.L. Peterson. 2003. Chapter 2. Sources of climate variability in river ecosystems. In R.C. Wissmar and P.A. Bisson, editors. *Strategies for restoring river ecosystems: sources of variability and uncertainty in natural and managed systems*. American Fisheries Society, Bethesda, Maryland.

Mote, P.W. and N.J. Mantua. 2002. Coastal upwelling in a warming future. *Geophysical Research Letters*, doi: 10.1029/2002GL016086.

Gedalof, Z., N.J. Mantua, and D.L. Peterson. 2002: A multi-century perspective of variability in the Pacific Decadal Oscillation: new insights from tree rings and corals. *Geophysical Research Letters*, Vol 29., No. 24, doi: 10.1029/2002GL015824, 2002

Mantua, N.J., D. Haidvogal, Y. Kushnir, and N. Bond. 2002: Making the Climate connections: bridging scales of space and time in the US GLOBEC program. *Oceanography*. Vol 15, No 2, 75-86.

Mantua, N.J., and P. Mote. 2002: Uncertainty in scenarios of human-caused climate change. *American Fisheries Society*, 32:263-272.

Mantua, N.J. and S.R. Hare. 2002: The Pacific Decadal Oscillation. *Journal of Oceanography*, Vol. 58 (No. 1), pp. 35-44.

Mantua, N.J. 2002: La Niña impacts on the Pacific Northwest. Pages 102-114 in *La Niña and its impacts: facts and speculation*. Edited by Michael Glantz. United Nations University Press, Tokyo, Japan. 271pp.

Mantua, N.J. 2001: The Pacific Decadal Oscillation. Eds M.C. McCracken and J.S. Perry, in *The Encyclopedia of Global Environmental Change*, Vol 1, The Earth System: physical and chemical dimension of global environmental change: 592-594.

Hare, S.R. and N.J. Mantua. 2000: Empirical evidence for North Pacific regime shifts in 1977 and 1989. *Progress in Oceanography*. Vol 47: 103-145.

- Minobe, S., and N.J. Mantua. 1999. Interdecadal Modulation of Interannual Climate Variability. *Progress in Oceanography*, Vol 43: 163-192.
- Hare, S.R., N.J. Mantua, and R.C. Francis. 1999: Inverse production regimes: Alaskan and West Coast Pacific Salmon. *Fisheries*, Vol. 21, No. 1, 6-14.
- Mantua, N.J. and S.R. Hare, Y. Zhang, J.M. Wallace, and R.C. Francis. 1997: A Pacific interdecadal climate oscillation with impacts on salmon production. *Bulletin of the American Meteorological Society*, **78**, pp. 1069-1079.
- Mantua, N.J. and D.S. Battisti. 1995: Aperiodic variability in the Zebiak-Cane coupled ocean-atmosphere model: ocean-atmosphere interactions in the western equatorial Pacific. *Journal of Climate*, 8, 2897-2927.
- Mantua, N.J. and D.S. Battisti. 1994: Evidence for the Delayed-Oscillator Mechanism for ENSO: the "Observed" Oceanic Kelvin mode in the Far Western Pacific." *Journal of Physical Oceanography*, 24, 691-699.

Gray Literature

- Mantua, N.J., 2003: *We need to get out of the clouds on issue of warming*, an invited commentary for the Seattle Post-Intelligencer, Sunday, May 25, 2003: F1.
- Mantua, N.J., and S.R. Hare. 2002: Large scale climate variability and the carrying capacity of Alaska's oceans and watersheds. Chapter 8 in *The Status of Alaska's Ocean's and Watersheds 2002*. Exxon Valdez Oil Spill Trustee Council, 441 W. 5th Avenue, Suite 500, Anchorage, AK 99501.
- Mantua, N.J., 2002: Environmental prediction, changing ocean conditions and implications for fishery management. *The Osprey*, newsletter published by the Steelhead Committee of the Federation of Fly Fishers. No. 43, pp. 1, 5-9.
- Mantua, N.J. 2000: Ocean Conditions and Columbia River Salmon. Testimony provided for the U.S. House of Representatives Subcommittee on Power and Water, Pasco, Washington. April 27, 2000.
- Pearcy, W., and N.J. Mantua, 1999: Changing Ocean Conditions and their Effects on Steelhead. *The Osprey*, newsletter published by the Steelhead Committee of the Federation of Fly Fishers, No. 35, pp. 6-10, 24.

Statement of Research and Teaching Interests: Nathan Mantua

My research and teaching interests revolve around links between climate dynamics and integrating natural sciences with social sciences in order to address human-environmental problems. Working with the University of Washington's Climate Impacts Group (CIG) has offered a wealth of opportunities for collaborating with graduate students and faculty from a diverse suite of policy and environmental science programs. At the same time, my interest in better understanding the climate system remains at the core of my work, with climate dynamics and predictability being the ever-present threads running through all of my teaching, research, and outreach activities.

My philosophy in pursuing interdisciplinary work, passed along to me by senior faculty and supervisors over the past decade, is that quality and legitimacy in interdisciplinary studies comes from first demonstrating expertise in a more traditional disciplinary research program. My experience has been that the most successful interdisciplinary collaborations have come with scientists that have a history of excellence within their respective disciplines yet a high level of enthusiasm for breaking down disciplinary barriers. Collaborations between such dual-personality individuals have been instrumental in CIG efforts to advance the understanding for such things as causes for interdecadal changes in marine fish populations, understanding the relative importance of climate and forest management practices in the history of western wildfire, and the role of climate variability in present-day conflicts over water resources in the western U.S.

I have maintained a place in the climate research community by pursuing studies aimed at developing an improved understanding for climate dynamics across the continuum from local weather extremes to hemispheric scale interdecadal climate variations. While in graduate school, my work revolved around running and diagnosing the behavior of coupled tropical ocean-atmosphere models of intermediate complexity. My postdoctoral work with the International Research Institute for Climate Prediction involved analyzing outputs from global atmospheric general circulation model simulations. Recently, most of my climate research has been pursued with diagnostic studies of historical records, and using natural climate proxies in paleoclimate reconstructions. Currently, I am pursuing theoretical work with simple conceptual models to test a variety of theories about the possible links between tropical and extratropical interdecadal climate variations in the Pacific.

My teaching goals are focused on bridging disciplinary boundaries in order to expose and enlighten graduate and undergraduate students to the linked nature of human-environmental problems. Interdisciplinary bridging, I believe, is of great value both between different natural sciences as well as between natural and social sciences. To this end, CIG-colleague Amy Snover and I created an interdisciplinary graduate course that is based on the results and experience of the CIG's research. Since 2001 this course has served graduate students from the Evans School of Public Affairs, Oceanography, the School of Marine Affairs, Atmospheric Sciences, Civil and Environmental Engineering, Geophysics, the School of Aquatic and Fishery Sciences, and the College of Forest Resources. For undergraduates, David Battisti and I created a climate impacts course for the Honors Program in the College of Arts and Sciences. Both the graduate and

undergraduate courses have been designed to provide students with a solid understanding of the basics of the climate system, and then to engage students in research projects aimed at understanding and solving interdisciplinary human-environmental climate impacts problems.

Beyond the boundaries of the university I participate in numerous outreach and education activities. These activities include frequent media contacts, stakeholder workshops and educational forums, and briefing various resource management staffers for local, state, federal, and tribal agencies. Generally speaking, my task usually requires that I communicate the latest science in climate diagnostics and prediction, as well as extending knowledge of the climate system to provide a broader perspective on natural variations in highly valued water, fishery, and forest resources.

The dynamics of the climate system and the role of climate in human-environmental interactions lie at the foundation of all my job-related activities and they continue to serve as the roots of my research and teaching interests. My goals for the future are to continue pursuing basic climate dynamics and interdisciplinary climate impacts studies, to increase the level of integration in CIG's climate impacts studies on the human, water, forests, and aquatic ecosystems of the Pacific Northwest, and to continue teaching interdisciplinary courses for undergraduate and graduate students.

References

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