

## Vita

### Matthew H. Alford

Affiliate Associate Professor, School of Oceanography and  
Senior Oceanographer, Applied Physics Laboratory,  
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### Education

Swarthmore College, Astrophysics, B.A., May 1993  
Scripps Institution of Oceanography, Oceanography, Ph.D., August 1998  
University of Washington, Physical Oceanography, Postdoctoral, 1998-1999

### Appointments

2009 – present Affiliate Associate Professor, School of Oceanography, UW  
2007 – present Sr. Oceanographer, Applied Physics Laboratory, UW  
2001 - 2009 Affiliate Assistant Professor, School of Oceanography, University of Washington  
1999 – 2007 Oceanographer, Applied Physics Laboratory, University of Washington  
1998 - 1999 Research Associate, School of Oceanography, University of Washington  
1998 Chief Scientist, Postdoctoral Research Associate. Scripps Institution of Oceanography, R/P FLIP  
1998 Ph.D., Candidate, Research Assistant, Marine Physical Laboratory, Scripps Institution of Oceanography  
1992 Research Assistant, Department of Chemistry, Swarthmore College  
1992 Programmer, University of Virginia Medical Center, Charlottesville, VA  
1989 - 1992 Data Analyst, Swarthmore College, Department of Astronomy  
1991 Software Engineer, National Radio Astronomy Observatory

### Awards and Professional Service

Sigma Xi  
Member, APL K-12 Educational Outreach Program  
Guest Scientist, Salish Sea Expeditions, Bainbridge Island, WA  
Peer Reviews: Journal of Physical Oceanography, National Science Foundation, Continental Shelf Research,  
Geophysical Research Letters, Journal of Geophysical Research, Deep-Sea Research  
2002 Young Investigator Award, Office of Naval Research  
2004 Editor's Award, American Meteorological Society  
2009 College of Ocean and Fishery Sciences Distinguished Research Award  
Member, AGU

### Related Publications:

Alford, M. H. (2003). Energy available for ocean mixing redistributed through long-range propagation of internal waves, *Nature*, 423:159–163.  
Alford, M. H., M. C. Gregg, and M. A. Merrifield (2006). Structure, propagation and mixing of energetic baroclinic tides in Mamala Bay, Oahu, Hawaii, *J. Phys. Oceanogr.*, 36(6):997–1018.  
Alford, M. H., J. A. MacKinnon, Z. Zhao, R. Pinkel, J. Klymak, and T. Peacock (2007). Internal waves across the Pacific, *Geophys. Res. Lett.*, 34(L24601): doi:10.1029/2007GL031566.  
Alford, M. H. and Z. Zhao (2007). Global patterns of low-mode internal-wave propagation, Part I: Energy and energy flux, *J. Phys. Ocean.*, 37(7):1829–1848.  
Alford, M. H. and Z. Zhao (2007). Global patterns of low-mode internal-wave propagation, Part II: Group velocity, *J. Phys. Ocean.*, 37(7):1849–1858.

# Jonathan C. Allan.

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Mineral Industries, Coastal Field Office,  
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## 1. EDUCATION

- 1992 - 1998:** Degree of Doctor of Philosophy in Geography, thesis title: *Shoreline Development at Lake Dunstan, South Island, New Zealand*. Supervisor: Prof. R.M. Kirk. Degree of Doctor of Philosophy conferred in December 1998.
- 1990 - 1991:** Master of Science Degree, thesis title: *Storm-Induced Surf Zone Processes and Beach Profile Response at Lake Pukaki, South Island, New Zealand*. Supervisor: Prof. R.M. Kirk. Master of Science Degree (Honours) conferred June 1992.
- 1986 - 1989:** Bachelor of Science, Major subject Physical Geography. Bachelor of Science Degree conferred May 1990.

## 2. CURRENT POSITION

*Coastal Geomorphologist and Coastal Section Leader, Oregon Department of Geology and Mineral Industries. Courtesy Faculty Staff, Marine Resource Management Program, College of Oceanic & Atmospheric Sciences, Oregon State University.*

## 3. PREVIOUS POSITIONS

- Jul 1999 - Jan 2001** Post-Doctoral Research Associate working with Professor Paul Komar in the College of Oceanic & Atmospheric Sciences, Oregon State University.
- Apr 1998 - Jun 1999** Research Fellow in the Department of Geography, University of Canterbury, Christchurch, New Zealand.
- Apr 1998 - Jun 1999** Coastal consultant for Land and Water Studies (International) Ltd.

## 4. MEMBERSHIPS AND PROFESSIONAL SOCIETIES

Member of the American Geophysical Union (1999-present)  
Member of the American Shore & Beach Preservation Association (2000-present)

## 5. RESEARCH INTEREST

Major research interest in understanding the role of: Beach process dynamics in lake and oceanic environments, Equilibrium beach forms, Sediment dynamics, Nearshore processes, El Nino/La Nina Southern Oscillation, Wave climates, Shoreline management, Coastal Hazards.

## 6. PUBLICATIONS

### 6.1 Refereed Papers

- Komar, P.D., **Allan, J.C.**, and Ruggiero, P., *in press*. Sea Level Variations along the U.S. Pacific Northwest Coast: Tectonic and Climate Controls. *Journal of Coastal Research*.
- Ruggiero, P., **Allan, J.C.** and Komar, P.D., 2010, Increasing wave heights and extreme-value projections: the wave climate of the U.S. Pacific Northwest: *Coastal Engineering*.
- Allan, J.C.**, Witter, R.C., Ruggiero, P., and Hawkes, A.D., 2009. Coastal geomorphology, hazards, and management issues along the Pacific Northwest coast of Oregon and Washington. In: O'Connor, J.E.; Dorsey, R.J., and Madin, I.P. (ed.), *Volcanoes to vineyards: Geologic field trips through the dynamic landscape of the Pacific Northwest*: Geological Society of America Field Guide 15, The Geological Society of America, pp. 495-519.
- Komar, P.D., **Allan, J.C.** and Ruggiero, P., 2009, Ocean wave climates: trend and variations due to earth's changing climate: In: Young, K. C. (Editor), *Handbook of Coastal and Ocean Engineering*.
- Komar, P.D. and **Allan, J.C.**, 2008, Increasing hurricane-generated wave heights along the U.S. Atlantic Coast and their climate controls: *Journal of Coastal Research*, 24(2), p 479-488.
- Komar, P.D. and **Allan, J.C.**, 2007, Higher waves along U.S. East Coast linked to hurricanes: EOS, Transaction of the American Geophysical Union, 88(30), p 301.

- Dalon, M. M., Haller, M. and **Allan, J.C.**, 2007, Morphological characteristics of rip current embayments on the Oregon coast., Coastal Sediments' 07, Coastal Engineering and Science in Cascading Spatial and Temporal Scales, New Orleans, Louisiana.
- Allan, J.C.** and Hart, R., 2007, Profile dynamics and particle tracer mobility of a cobble berm constructed on the Oregon Coast, Coastal Sediments' 07, Coastal Engineering and Science in Cascading Spatial and Temporal Scales, New Orleans, Louisiana, pp. 449-462.
- Allan, J.C.**, Hart, R. and Tranquilli, V., 2006. The use of Passive Integrated Transponder tags (PIT-tags) to trace cobble transport in a mixed sand-and-gravel beach on the high-energy Oregon coast, USA. *Marine Geology*, 232(1-2), p 63-86.
- Allan, J.C.**, and P.D. Komar, 2006: Climate controls on US West Coast erosion processes. *Journal of Coastal Research*, 22(3): 511-529.
- Baptista A , Zhang Y , Turner P , Zulauf M , Kaminsky G , Grantham B , **Allan J** , Newton J , Devol A , MacCready P , Rumrill S , Haller M , Ozkan-Haller T , Gelfenbaum G , Ruggiero P. 2006. NANOOS-Pilot technologies: a national role?, Eos Trans. AGU, Ocean Sci. Meet. Suppl. Abstract OS14F-03, vol. 87, Honolulu, Hawaii.
- Allan, J.C.** and Komar, P.D. 2004. Environmentally compatible cobble berm and artificial dune for shore protection. *Shore & Beach*, 72(1): 9-18.
- Allan, J.C.**, Komar, P.D., and R. Hart, 2003. A dynamic revetment and reinforced dune as "natural" forms of shore protection in an Oregon state park. Coastal Structures 2003 Conference, Portland, Oregon, ASCE, pp. 1048-1060.
- Allan, J.C.**, P.D. Komar, G.R. Priest, 2003: Shoreline variability on the high-energy Oregon coast and its usefulness in erosion-hazard assessments. In: Byrnes, M.R.; Crowell, M. and Fowler, C., (eds.), Shoreline mapping and change analysis: Technical considerations and management implications. *Journal of Coastal Research Special Issue No. 38*, pp. 83-105.
- Komar, P.D., **J.C. Allan**, and R. Winz, 2003: Cobble beaches - The "design with nature" approach for shore protection. *Proc. 5th International Symposium on Coastal Engineering and Science of Coastal Sediment Processes, Clearwater Beach, Florida*.
- Allan, J.C.**, and P.D. Komar, 2002: A dynamic revetment and artificial dune for shore protection at Cape Lookout State Park, Oregon. *Proc. 28th International Conference on Coastal Engineering, Cardiff, Wales*.
- Komar, P.D., **J.C. Allan**, 2002: Assessments of nearshore-process climates related to their potential for producing beach and property erosion. *Shore and Beach, Vol. 70(3): 31-40*.
- Allan, J.C.**, P.D. Komar, 2002: Extreme Storms on the Pacific Northwest Coast during the 1997-98 El Niño and 1998-99 La Niña. *Journal of Coastal Research, Vol. 18(1), 175-193*.
- Allan, J.C.**, W.J. Stephenson, R.M. Kirk, A. Taylor, 2002: Lacustrine shore platforms, Lake Waikaremoana, New Zealand. *Earth Surfaces Processes and Landforms, Vol. 27(2): 207-220*.
- Komar, P.D., J.J. Marra, and **J.C. Allan**, 2002: Coastal-erosion processes and assessments of setback distances. *Proc. of Solutions to Coastal Disasters'02, San Diego, California, Amer. Soc. Civil Engrs, 808-822*.
- Allan, J.C.**, and P.D. Komar, 2001: Wave climate change and coastal erosion in the US Pacific Northwest. *Proc. 4th International Symposium on Ocean Wave Measurement and Analysis, WAVES 2001, San Francisco, California, Amer. Soc. Civ. Engrs., 680-690*.
- Allan, J.C.**, P.D. Komar, 2000: Are ocean wave heights increasing in the eastern North Pacific? *Eos, Transactions, American Geophysical Union, 47: 561-567*.
- Marra, J.J., P.D. Komar, G. Diaz-Mendez, **J.C. Allan**, and P. Ruggiero, 2000: El Nino versus La Nina along the Oregon coast. *Proc. 17th International Conference of the Coastal Society, Portland, Oregon, 776-787*.
- Komar, P.D., **J.C. Allan**, G. Diaz-Mendez, J.J. Marra, P. Ruggiero, 2000: El Nino and La Nina – Erosion processes and impacts. *Proc. 27th International Conference on Coastal Engineering, Sydney, Australia, 2414-2427*.

### 6.3 Published Technical Papers

- Allan, J. C.**, and P. Ruggiero (2010), Coastal Flood Insurance Study, Coos County, Oregon. Portland, Oregon, Oregon Department of Geology and Mineral Industries, 110 pp.
- Allan, J.C.** and Hart, R., 2009, Beach and shoreline response to an artificial 'Landslide' at Rocky Point, Port Orford, on the southern Oregon Coast: Open file report O-09-01: Portland, Oregon, Oregon Department of Geology and Mineral Industries, 56 p.
- Allan, J.C.** and Hart, R., 2008, Oregon beach and shoreline mapping and analysis program: 2007-2008 beach monitoring report: Open file report O-08-15: Portland, Oregon Department of Geology and Mineral Industries, 54 p.
- Allan, J.C.** and Hart, R., 2008, Beach and shoreline response due to dune lowering on the Elk River spit, Curry County, Oregon: Open file report O-08-02: Portland, Oregon Department of Geology and Mineral Industries, 20 p.
- Allan, J.C.** and Hart, R., 2007, Assessing the temporal and spatial variability of coastal change in the Neskowin littoral cell: Developing a comprehensive monitoring program for Oregon beaches Open-file-report O-07-01: Portland, Oregon, Oregon Department of Geology and Mineral Industries, 27 p.

## **António M. Baptista, Ph.D.**

### **NANOOS OHSU Lead**

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### **Professional Preparation**

1987 Ph.D., Civil Engineering, Massachusetts Institute of Technology, Cambridge MA

1986 Especialista em Hidráulica Marítima (Specialist in Maritime Hydraulics), Laboratório Nacional de Engenharia Civil (LNEC), Lisboa, Portugal

1984 M.S., Civil Engineering, Massachusetts Institute of Technology, Cambridge, MA

1978 Engenheiro Civil, Academia Militar, Lisboa, Portugal

### **Appointments**

2006 - present *Director*, NSF Science and Technology Center for Coastal Margin Observation & Prediction (CMOP)

2000-2006 *Head*, Department of Environmental & Biomolecular Systems, OGI/OHSU, Beaverton OR

1998 - present *Professor*, Division of Environmental & Biomolecular Systems, Oregon Health & Science University (OHSU), Beaverton OR

1993-1998 *Associate Professor*, Department of Environmental Science and Engineering, Oregon Graduate Institute (OGI), Beaverton OR

1987-1993 *Assistant Professor*, Department of Environmental Science and Engineering, Oregon Graduate Institute (OGI), Beaverton OR

1979-1987 *Researcher*, Estuaries Division, Laboratório Nacional de Engenharia Civil, Portugal

### **Relevant Recent Publications**

Burla, M., A.M. Baptista, E. Casillas, J.G. Williams and D.M. Marsh (in press). "The influence of the Columbia River plume on the survival of steelhead (*Oncorhynchus mykiss*) and Chinook salmon (*O. tshawytscha*): a numerical exploration." *Canadian Journal of Fisheries & Aquatic Sciences*.

Burla, M., A.M. Baptista, Y. Zhang and S. Frolov (2010). "Seasonal and inter-annual variability of the Columbia River plume: A perspective enabled by multi-year simulation databases." *Journal of Geophysical Research* doi:10.1029/2008JC004964 (2010).

Hickey, B. M., R. M. Kudela, J. D. Nash, K. W. Bruland, W. T. Peterson, P. MacCready, E. J. Lessard, D. A. Jay, N. S. Banas, A. M. Baptista, E. P. Dever, P. M. Kosro, L. K. Kilcher, A. R. Horner-Devine, E. D. Zaron, R. M. McCabe, J. O. Peterson, P. M. Orton, J. Pan and M. C. Lohan (2010) "River Influences on Shelf Ecosystems: Introduction and synthesis." *Journal of Geophysical Research - Oceans*, Vol. 115, C00B17, 26pp.

Frolov, S., A.M. Baptista, et al. (2009). Estimation of Ecologically Significant Circulation Features of the Columbia River Estuary and Plume Using a Reduced-Dimension Kalman Filter. *Continental Shelf Research* 29(2): 456-466.

Ghindilis, A.L., M.W. Smith, K.R. Schwarzkopf, C. Zhan, D.R. Evans, A.M. Baptista, H.M. Simon (2009). Sensor Array: Impedimetric Label-Free Sensing of DNA Hybridization in Real Time for Rapid, PCR-Based Detection of Microorganisms. *Electroanalysis* 21(13): 1459-1468.

Frolov, S., A.M. Baptista, et al. (2009). Fast data assimilation using a nonlinear Kalman filter and a model surrogate: an application to the Columbia River estuary. *Dynamics of Atmospheres and Oceans* 48(1-3): 16-45.

Baptista, A.M., B. Howe, et al. (2008). Scientific Exploration in the Era of Ocean Observatories. *Computing in Science and Engineering* 10(3): 53-58.

Bruland, K. W., M. C. Lohan, et al. (2008). Factors influencing the chemistry of the Columbia River Plume: Nitrate, silicic acid, dissolved Fe and dissolved Mn. *Journal of Geophysical Research - Oceans* 113, C00B02 (23 pp.).

Chawla, A., D. Jay, et al. (2008). Seasonal variability and estuary-shelf interactions in circulation dynamics of a river-dominated estuary. *Estuaries and Coasts* 31(2): 269-288.

Baptista, A.M., Y.L. Zhang, A. Chawla, M. Zulauf, C. Seaton, E.P. Myers, III, J. Kindle, M. Wilkin, M. Burla, and P.J. Turner (2005). A cross-scale model for 3D baroclinic circulation in estuary-plume-shelf systems: II. Application to the Columbia River. *Continental Shelf Research* 25: 935-972.

**ANDREW H. BARNARD**

Department of Research and Development

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Philomath, OR 97370

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**PROFESSIONAL PREPARATION:**

1997-2001 Ph.D. in Oceanography (biological), Oregon State University

1990-1993 M.S. in Oceanography (biological), Oregon State University

1986-1990 B.S. in Marine Science, University of South Carolina

**APPOINTMENTS:**

2003-present Vice President Research & Development, Research Scientist, WET Labs

2003-present Adjunct Research Scientist, Bigelow Laboratory for Ocean Sciences

2000-2003 Post-Doctoral Research Scientist, Bigelow Laboratory for Ocean Sciences

1996-2000 Faculty Research Assistant, Oceanography, Oregon State University

1996-1997 Consultant, WET Labs, Inc.

1993-1996 Marine Research Specialist, Oceanography, University of Rhode Island

1990-1993 Graduate Research Assistant, Oceanography, Oregon State University

**RELAVENT PUBLICATIONS:**

Moore, C., A. Barnard, P. Fietzek, M. R. Lewis, H. M. Sosik, S. White, and O. Zielinski.

Optical tools for ocean monitoring and research, *Ocean Sci. Discuss.*, 5, 659-717,

2008. <http://www.ocean-sci-discuss.net/5/659/2008/osd-5-659-2008.html>

Chang, G. C., A. H. Barnard, S. McLean, P. J. Egli, C. Moore, J. R. V. Zaneveld, T. D.

Dickey, and A. Hanson, In situ optical variability and relationships in the Santa

Barbara Channel: implications for remote sensing, *Applied Optics*, 45(15), 3593-

3604, 2006.

Zaneveld, J.R.V., M.J. Twardowski, A.H. Barnard, and M.R. Lewis. Introduction to

Radiative Transfer. In: *Remote Sensing of Coastal Aquatic Environments*, R.L.

Miller, C.E. Del Castillo, and B.A. McKee, eds., Ch. 1, Springer, 2005.

Twardowski, M.J., M.R. Lewis, A.H. Barnard, and J.R.V. Zaneveld. In-Water

Instrumentation and Platforms for Ocean Color Remote Sensing Applications. In:

*Remote Sensing of Coastal Aquatic Environments*, R.L. Miller, C.E. Del Castillo, and

B.A. McKee, eds., Ch. 4, Springer, 2005.

Barnard, A.H., W.S. Pegau, and J.R.V. Zaneveld. 1998. Global relationships in the

inherent optical properties of the oceans. *J. Geophys. Res.*, 103:24,955-24,968.

**OTHER PUBLICATIONS:**

McManus, M.A., A.L. Alldredge, A.H. Barnard, E. Boss, J.F. Case, T.J. Cowles, P.L.

Donaghay, L.B. Eisner, D.J. Gifford, C.F. Greenlaw, C.M. Herren, D.V. Holliday, D.

Johnson, S. MacIntyre, D.M. McGehee, T.R. Osborn, M.J. Perry, R.E. Pieper, J.E.B.

Rines, D.C. Smith, J.M. Sullivan, M.K. Talbot, M.S. Twardowski, A. Weidemann,

and J.R. Zaneveld. 2003. Characteristics, distribution and persistence of thin layers

over a 48 hour period. *Mar. Ecol. Prog. Ser.*, 261:1-19.

- Boss, E., W.S. Pegau, W.D. Gardner, J.R.V. Zaneveld, A.H. Barnard, M.S. Twardowski, G.C. Chang, and T.D. Dickey. 2001. Spectral particulate attenuation and particle size distribution in the bottom boundary layer of a continental shelf. *J. Geophys. Res.*, 106, 9509-9516.
- Boss, E., W.S. Pegau, A.H. Barnard, and J.R.V. Zaneveld. 2001. Spatial and temporal variability of absorption by dissolved material at a continental shelf. *J. Geophys. Res.*, 106, 9499-9507.
- Twardowski, M.S., E. Boss, J.B. Macdonald, W.S. Pegau, A.H. Barnard, and J.R.V. Zaneveld. 2001. A model for estimating bulk refractive index from the optical backscattering ratio and the implications for understanding particle composition in case I and case II waters. *J. Geophys. Res.*, 106, 14,129-14,142.
- Barnard, A.H., J.R.V. Zaneveld, and W.S. Pegau. 1999. Remotely sensed reflectance and the absorption coefficient: Closure and inversion. *Applied Optics*, 38, 5108-5117.

### **RECENT PRESENTATIONS**

- Monitoring the particulate and dissolved materials in the Penobscot Estuary, Ocean Optics XIX, Barga, Italy, October 2008 (Poster and extended abstract).
- Temporal and spatial scales of terrestrially derived particulate and dissolved materials in the Penobscot River system: Transport and transformations, Ocean Sciences Meeting, Orlando, FL, March 2008 (Presentation).
- Using temporal and spatial variability in optical signals measured from a network of moorings within the Penobscot Bay and river system to discern between coastal and riverine CDOM sources, Ocean Optics XVIII, Montreal, Canada, October 2006 (Poster).

### **COLLABORATORS & OTHER AFFILIATIONS:**

- (i) List of all collaborators during past 48 months (Last name, First, Affiliation):

Aiken, George, USGS; Balch, William, Bigelow Laboratory; Barth, John, Oregon State University; Boss, Emmanuel, University of Maine; Campbell, Robert, Prince William Sound Science Center; Case, James, University California, Santa Barbara; Chang, Grace, SEI; Dickey, Tommy, University California, Santa Barbara; Donaghay, Percy, University of Rhode Island; Hanson, Al, SubChem; Huntington, Tom, USGS; Ingle, James, Oregon State University; Jones, Burton, University of Southern California; Levine, Murray, Oregon State University; Lewis, Marlon, Satlantic Inc.; Moline, Mark, Cal. Poly. Tech. Inst.; Morrison, Ru, University of New Hampshire; Roesler, Collin, University of Maine; Sullivan, James, University of Rhode Island; Trees, Charles, San Diego State University; Twardowski, Michael, WET Labs; Voss, Ken, University of Miami; Wilson, Doug, NOAA Chesapeake Bay Office; Xue, Huijie, University of Maine.

- (ii) Graduate and Postdoctoral Advisors (affiliations):

*Dr. Dudley Chelton*, Oregon State Univ., Corvallis, OR; *Dr. Timothy Cowles*, Oregon State Univ., Corvallis, OR; *Dr. Collin Roelser*, Bigelow Laboratory, W. Boothbay Harbor, ME.

## BIOGRAPHICAL SKETCH

### **John (Jack) A. Barth**

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### A. PROFESSIONAL PREPARATION

University of Colorado, Physics (Cum Laude), B.A., 1982  
Massachusetts Institute of Technology Woods Hole Oceanographic Institution Joint Program,  
Oceanography, Ph.D., 1988

### B. APPOINTMENTS

Editor, Journal of Physical Oceanography (2007-present)  
Professor, COAS, OSU (2001-present)  
Associate Professor, COAS, OSU (1996-2001)  
Associate Professor (Senior Research), COAS, OSU (1995-1996)  
Assistant Professor (Senior Research), COAS, OSU (1989-1995)  
Research Associate (Postdoctoral), College of Oceanography, Oregon State University (1987-1989)

### C. PUBLICATIONS

#### *Most Closely Related to Proposed Project*

- Barth, J. A., S. D. Pierce and T. J. Cowles (2005) Mesoscale structure and its seasonal evolution in the northern California Current System, Deep-Sea Research II, 52:5-28.
- Kirincich, A. R., J. A. Barth, B. A. Grantham, B. A. Menge and J. Lubchenco (2005) Wind-driven inner-shelf circulation off central Oregon during summer. Journal of Geophysical Research, 110(C10), C10S03, doi:10.1029/2004JC002611.
- Barth, J. A., S. D. Pierce and R. M. Castelao (2005) Time-dependent, wind-driven flow over a shallow mid-shelf submarine bank. Journal of Geophysical Research, 110(C10), C10S05, doi:10.1029/2004JC002761.
- Barth, J. A., B. A. Menge, J. Lubchenco, F. Chan, J. M. Bane, A. R. Kirincich, M. A. McManus, K. J. Nielsen, S. D. Pierce and L. Washburn (2007) Delayed upwelling alters nearshore coastal ocean ecosystems in the Northern California Current. Proc. Natl. Acad. Sci., USA, 104:3719-3724.
- Chan, F., J. A. Barth, J. Lubchenco, A. Kirincich, H. Weeks, W. T. Peterson, and B. A. Menge (2008) Novel emergence of anoxia in the California Current System, Science, 319:920.

#### *Other Significant Publications*

- Barth, J. A., S. D. Pierce and R. L. Smith (2000) A separating coastal upwelling jet at Cape Blanco, Oregon and its connection to the California Current System, Deep-Sea Research II, 47:783-810.
- Castelao, R. M. and J. A. Barth (2005) Coastal ocean response in a region of alongshore bottom topography variations off Oregon during summer upwelling. Journal of Geophysical Research, 110(C10), C10S04, doi:10.1029/2004JC002409.
- Dale, A. C., J. A. Barth, M. D. Levine and J. A. Austin (2008) Observations of mixed-layer restratification by onshore surface transport following wind reversal in a coastal upwelling region. J. Geophys. Res., 113, C01010, doi:10.1029/2007JC004128.
- Kirincich, A. R. and J. A. Barth (2009a) Time-varying across-shelf Ekman transport and vertical eddy viscosity on the inner-shelf. J.Phys. Oceanogr., 39:602-620.

Kirincich, A. R., S. J. Lentz and J. A. Barth (2009b) Wave-driven inner-shelf motions on the Oregon coast. *J. Phys. Oceanogr.*, 39:2942-2956.

#### D. SYNERGISTIC ACTIVITIES

- Participant in science planning activities: Global Ocean Ecosystems Dynamics Eastern Boundary Current Program Implementation Team, 1993-1994; NSF Coastal Ocean Processes (CoOP) Wind-Driven Transport Experiment Planning, 1993; NSF Advances and Primary Research Opportunities in Physical Oceanography Studies Workshop Steering Committee, 1997-1998; Coastal Ocean Processes and Observations: Advancing Coastal Research, CoOP Observatory Science Workshop Organizing Committee, 2002; Coastal Observatory Research Arrays Meeting Organizing Committee, 2003.
- Public science lectures: Active participant in Operation Pathfinder Teacher Education Program, OSU Hatfield Marine Science Center, Newport, OR; Presentations at local elementary schools and mentoring of Boy Scouts on Oceanography Merit Badge; Led public tours of R/V Wecoma, R/V Thomas G. Thompson and R/V Roger Revelle as part of COAST and GLOBEC NEP (2001-2002).
- Input to ocean policy: Oregon Ocean Policy Advisory Council (OPAC) Dialogue With Experts, Newport, OR, February 2002; Coastal Processes and Ballast Water Workshop, Pacific States Marine Fisheries Commission, Gladstone, OR, March 2002; Review Panel Member for Huntington State Beach, CA, Shoreline Contamination Study, 2002-2003. OPAC Science and Technical Advisory Committee, 2006-present.
- Leadership of national programs: Global Ocean Ecosystems Dynamics Northeast Pacific Program Exec. Comm., 2000-present; NSF Coastal Ocean Processes (CoOP) Steering Comm., 2000-2004; Northwest Association of Networked Ocean Observing Systems (NANOOS) Steering Committee, 2003-present; Pacific Coast Ocean Observing System (PaCOOS) Board of Governors, 2003-present; NSF ORION Observatory Steering Committee, 2004-2007.
- Service to scientific community: National Center for Atmospheric Research Scientific Computing Division Advisory Panel, 1992-1994; Eastern Pacific Oceanic Conference, Secretary, 1992-1996, President, 1998-2001; NSF Physical Oceanography Panel, Nov. 1995. Gordon Research Conference on Coastal Ocean Circulation, Organizing Committee, 2007-2009, Vice Chair, 2009-present.

#### E. COLLABORATORS & OTHER AFFILIATIONS

##### *i) Collaborators*

J. Austin-UMinn  
J. Bane-UNC  
D. Hebert-URI

P. Oke-UNSW Australia  
S. Pegau-UAF  
W. Peterson-NOAA/NMFS

A. Thomas-UMaine

##### *ii) Advisors*

**Post-doctoral:** J. S. Allen, Oregon State University; **Doctoral:** K. H. Brink, WHOI

##### *(iii) Thesis Advisor (10) and Postgraduate-Scholar (6) Sponsor*

**Masters:** Bassirou Diaw (1997), Senegal Hydrographic Office; Glenn May (1997); Maria Jose Juan Jorda (2006), Ph.D. program in Spain; Jennifer Simeon (2000), NOAA GFDL; Ata Suanda (2009), OSU.

**Doctoral:** R. Kipp Shearman (1999), OSU; Renato Castelao (2006), Univ. Georgia; Anthony Kirincich (2007), WHOI; Ata Suanda; Kate Adams; Piero Mazzini.

**Postgraduate-Scholars:** Jay Austin (1998–2000), UMinn.; Darek Bogucki (1997–99), RSMAS; Andrew C. Dale (1997–99), Scottish Assoc. Mar. Sci.; Michael W. Ott (2001–04), Paul Smith's College; Stephen D. Pierce (1995–98), OSU; Sangil Kim (2009-present).



## **Rick Blair**

Associate Technical Fellow  
Boeing Research and Technology  
The Boeing Company  
PO Box 3707 ms 42-50  
Seattle, WA 98124  
[rick.blair@boeing.com](mailto:rick.blair@boeing.com)

### **Education:**

1985 East Texas State University, Commerce, TX. MS, Computer Science  
1979 Stephen F. Austin State University, Nacogdoches, TX, BS Forestry 2<sup>nd</sup> Major  
Biology

### **Professional Employment:**

2008-Present	Principle Investigator Information and Knowledge Management program, Boeing Research and Technology
2005-2008	Software Lead Real Time Simulation group, P8A program, The Boeing Company
2004-2005	Network Centric Operations Lead Software Architect, Boeing Phantom Works, The Boeing Company
2001-2004	Senior Contract Engineer, Distributed Software Architectures, Boeing Phantom Works, Volt Technical Services
1999-2002	Senior Software Engineer, E-Commerce, Photoaccess.com
1988-1999	Embedded Software Engineer, Boeing High Technology Center, The Boeing Company
19880-1988	System Software Engineer, Central Research Labs, Texas Instruments.

### **Selected Relevant Publications:**

Risien, C.M., J.C. Allan, R. Blair, A.V. Jaramillo, D. Jones, P.M. Kosro, D. Martin, E. Mayorga, J.A. Newton, T. Tanner and S.A. Uczekaj. 2009. The NANOOS Visualization System: Aggregating, displaying and serving data. *Proc. MTS/IEEE Oceans'09*.

Mayorga, E., T. Tanner, R. Blair, A.V. Jaramillo, N. Lederer, C.M. Risien and C. Seaton. 2010. The NANOOS Visualization System (NVS): Lessons learned in data aggregation, management and reuse, for a user application. *Proc. MTS/IEEE Oceans'10*.

### **Professional Accomplishments**

Rick Blair is an Associate Technical Fellow in the Boeing Research and Technology division of The Boeing Company in Seattle Washington. Rick has over 20 years experience in distributed software architectures where he holds several patents. He is also active in standards bodies and standards development including Posix Real-time Extensions, XML Schema, and Real-Time Java. Rick is active in advancing mobile platforms such as the iPhone into non-traditional environments.

Francis Chan  
Assistant Professor Senior Research  
Department of Zoology  
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## EDUCATION

Hampshire College, B.A. Ecology and Environmental Economics, 1993  
Cornell University, Ph.D. Department of Ecology and Evolutionary Biology, 2001

## APPOINTMENTS

2005 to present      Assistant Professor (Senior Research), Department of Zoology, Oregon State University  
2001 to 2004        Research Associate (Postdoctoral), Department of Zoology, Oregon State University (2001-2004)

## PUBLICATIONS RELATED TO THE PROPOSED WORK

In Press. Howarth, R.W., F. Chan, D. J. Conley, J. Garnier, S. C. Doney, R. Marino, and G. Billen. Coupled biogeochemical cycles: Eutrophication and hypoxia in temperate estuaries and coastal marine ecosystems. *Frontiers in Ecology and Environment*.

2010. Keller, A., V. Simon, F. Chan, W. W. Wakefield, M. E. Clarke, D. Kamikawa, E. L. Fruh, J. A. Barth. Demersal fish and invertebrate biomass in relation to an offshore hypoxic zone along the U.S. West Coast. *Fisheries Oceanography* 19:76-87.

2008. Chan, F., J. A. Barth, J. Lubchenco, A. Kirincich, H. Weeks, W. T. Peterson, B. A. Menge. Emergence of anoxia in the California Current large marine ecosystem. *Science* 319:920.

2007. Barth, J. A., B. A. Menge, J. Lubchenco, F. Chan, J. M. Bane, A. R. Kirincich, M. A. McManus, K. J. Nielsen, S. D. Pierce, L. Washburn. Delayed upwelling alters nearshore coastal ocean ecosystems in the Northern California Current. *Proceedings of the National Academy of Sciences*. 104: 3719-3724.

2004. Grantham, B. A., F. Chan, K. J. Nielsen, D. S. Fox, J. A. Barth, A. Huyer, J. Lubchenco, and B. A. Menge. Upwelling-driven nearshore hypoxia signals ecosystem and oceanographic changes in the northeast Pacific. *Nature* 429:749-754.

## OTHER REPRESENTATIVE PUBLICATIONS

2009. B. A. Menge, F. Chan, K. J. Nielsen, E. D. DiLorenzo, J. Lubchenco. Climatic variation

alters supply-side ecology: impact of climate patterns on phytoplankton and mussel recruitment. *Ecological Monographs* 79:379-395.

2008. Menge, B. A., F. Chan, and J. Lubchenco. Response of a community dominant to climate patterns in rocky intertidal ecosystems. *Ecology Letters* 11:151-162.

2006. Chan, F., R. M. Marino, R. W. Howarth, and M. L. Pace. Ecological limitations on estuarine planktonic nitrogen-fixation II: Mechanisms of trophic control. *Marine Ecology Progress Series* 309: 41-53.

2004. Chan, F., M. L. Pace, R. W. Howarth, R. M. Marino. Bloom formation in heterocystic nitrogen-fixing cyanobacteria: The dependence on colony size and zooplankton grazing. *Limnology and Oceanography*. 49: 2171-2178

2003. Menge, B. A., J. Lubchenco, M. E. Bracken, F. Chan, M. M. Foley, T. L. Freidenburg, S. D. Gaines, G. Hudson, C. Krenz, H. Leslie, D. N. Menge, R. Russell, and M. S. Webster. Coastal oceanography sets the pace of rocky intertidal community dynamics. *Proceedings of the National Academy of Science U. S. A.* 100: 12229-12234.

#### SYNERGISTIC ACTIVITIES

- Public understanding of science: Interviews with and hosted cruise observations on board the R/V Elakha by: National Public Radio, New York Times, Oregon Public Broadcasting Television, Associated Press, and others in 2002, 2004, 2006, 2007, 2008, 2009, 2010
- Community and policy outreach: Presentations and testimonies on hypoxia at: Scientists and Fishermen Exchange Meeting, Newport OR, 2004, 2005; Congressional field hearing, Newport, OR 2006; Oregon Coastal Zone Management Association Meeting 2006.
- Service to scientific community: reviewer for *Ecology*, *Limnology and Oceanography*, *Ecosystems*, *Ecological Applications*, *Geophysical Research Letters*; proposal reviewer for Coastal Ocean Program, NOAA, NSF, organizing committee member for Coastal and Estuarine Research Federation 2009 meeting, Ocean Research and Resources Advisory Panel (ORRAP) Ocean Acidification Task Force committee member.
- Internship advisor for undergraduate (17) and high school (1) students at OSU (2001-2009)

#### COLLABORATORS & OTHER AFFILIATIONS

*i) Collaborators in addition to those listed in above publications:* G. Billen (UMPC Paris), D. Conley (Lund Univ.), S. Doney (WHOI), L. Farías (Universidad de Concepción), S. Giovannoni (OSU), S. Hacker (OSU), G. Hoffman (UCSB), D. Ianson (Fisheries and Oceans Canada), C. Lange (Universidad de Concepción), R. Letelier (OSU), A. Mix (OSU), S. Pantoja (Universidad de Concepción), O. Pizarro (Universidad de Concepción), S. Pierce (OSU) S. Place (Univ. S. Carolina), O. Ulloa (Universidad de Concepción), C. Deutsch (UCLA).

*ii) Co-Advisors:* **Post-doctoral:** B. A. Menge, J. Lubchenco, Oregon State University  
**Doctoral:** R. W. Howarth, Cornell University, M. L. Pace, Institute of Ecosystem Studies

**Allan H. Devol**

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**Professional Preparation**

B.S., 1967, Knox College, Galesburg, Illinois (Chemistry)  
Ph.D., 1975, University of Washington, Seattle, Washington (Oceanography)  
Post Doc, University of Washington, Seattle, Washington. (Ocean/Fisheries)

**Appointments**

'88-present Professor, University of Washington, Oceanography  
'85-'88 Research Associate Professor, University of Washington,  
Oceanography  
'80-'85 Research Associate Professor, University of Washington, Fisheries  
'75-'80 Research Assistant Professor, University of Washington, Fisheries

**Publications:**5 recent.

Chang, B.X., A.H. Devol, and S.E. Emerson. (in Press) The nitrogen gas excess in the Eastern Tropical South Pacific oxygen deficient zone. *Deep-Sea Res.*  
Engstrom, P.E., Devol, A.H., and Penton, R.C. Anaerobic ammonium oxidation in deep-sea sediments off the Washington margin. *Limnol. Oceanogr.* 54:1643-1652 (2009)  
Ward, B.B., Devol, A.H., Rich, J.J., Chang, B.X., Bulow, S.E., Naik, H, Pratihary, A. and Jayakumar A. (2009) Denitrification as the dominant nitrogen loss process in the Arabian Sea. *Nature* 461: 78-82  
Chang, B.X. and A.H. Devol, (2009) Seasonal and spatial patterns of sedimentary denitrification in shelf and slope sediments of the Chukchi Sea. *Deep-Sea Res II.* 56:1339-1350  
Devol, A.H. (2008) Denitrification. Pp. 263-302, In Capone, D.G., D.A. Bronk, M.R. Mulholland and E.J. Carpenter. *Nitrogen in the Marine Environment.* Elsevier,

5 others

Brandes, J.A., Devol, A.H. and Deutsch, C. 2007. New developments in the marine nitrogen cycle. *Chem. Rev.* 107:577-589.  
Devol AH, Uhlenhopp AG, Naqvi SWA, Brandes JA, Jayakumar DA, Naik H, Gaurin S, Codispoti LA, Yoshinari T (2006) Denitrification rates and excess nitrogen gas concentrations in the Arabian Sea oxygen deficient zone. *Deep-Sea Research* 53:1533-1547  
Van Mooy, B.A.S. and A.H. Devol (2008) Assessing nutrient limitation of *Prochlorococcus* at ALOHA by using an RNA capture method. *Limnol. Oceanogr.* 53:78-88.  
Devol, A.H., L.A. Codispoti and S.W.A. Naqvi. (2006) Nitrogen cycling in the suboxic waters of the Arabian Sea. Pp 283-310, In, Neretin, L. Jorgensen, B.B. and Murray, J.W. [eds.] *Past and Present Marine Water Column Anoxia.* Kluwer Academic.

Van Mooy, B.A.S., Evans, C.T., Rocap, G., Devol, A.H. and Fredrichs, H.. (2006) Sulfolipids dramatically decrease phosphorus demand by picocyanobacteria in oligotrophic marine environments. PNAS:103(23)8067-8012

**Synergistic Activities:**

Developed and taught 2 courses (one lecture, one cruise-lab) on marine sedimentary biogeochemistry and interfaced with an NSF grant.

Development of in situ benthic chamber techniques.

Development of new sedimentary diagenesis models.

**Collaborators :** (other than included in publication list)

J. Brandes (Univeristy of Texas), J. P. Christensen, (NSF-OPP), L. Codispoti (Horn Point, University of Maryland), S. Emerson (University of Washington), M. Kawasi (University of Washington), L.A. Martinelli (U. Sao Paulo, Brazil), W.Naqvi (NIO, Goa, India), Igor Semeletov (University of Alaska), J. Richey (University of Washington) J.Tiedje (Michigan State University), T. Yoshinari (State University of New York, Albany), J. Zhou (Oak Ridge Natnl Laboratory), B. Ward (Princeton), Burk Hales (Oregon State), Zanna Chase (Oregon State), Clare Reimers (Oregon State), David Shull (Western Washington U), Amul Jayakumar (Princeton), Sonia Tiquia (Michigan State)

**Graduate Students Advised:**

Past: John P. Christensen (Bigelow Lab), Mervin Coover (CH2M Hill consultants, Seattle), Jay A. Brandies (Skidaway Institute of Oceanography), Hilairy H. Hartnett(Arizona State University), Amy Uhlenhopp (Portland, OR.), Ben Van Mooy (WHOI), Brook Holcombe (University of Washington) , Kelly Balster (U of Washington)

Current:, Bonnie Chang, Heather Whitney

**Recent Post Docs**

Stephen Colbert (Observatorie Oceanographique de Villefranche, France

Pia Engstrom (Universtiy of Gothenburg, Sweden)

**Graduate Advisor:**

Francis A. Richards

**Post Doctoral Advisor:**

Theodore T. Packard

**ROBERT M. EMANUEL**  
**Abbreviated Curriculum Vitae**

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**EDUCATION**

Ph.D., 2006    University of Arizona, Tucson, Arizona  
Major: Environmental Anthropology | Minor: Latin American Studies  
M.A., 1998    University of Arizona, Tucson, Arizona  
Major: Latin American Studies | Minor: Agricultural and Resource Economics  
B.S., 1995    Humboldt State University, Arcata, California  
Major: Botany | Minor: Biology

**RELEVANT PROFESSIONAL EXPERIENCE**

**Assistant Professor and Extension Agent, Oregon State University Extension Sea Grant & Department of Geosciences**

*Jan. 2007 – present, Corvallis & Tillamook, OR*

**Senior Program Coordinator, University of Arizona Cooperative Extension**

*Nov. 2003 – Dec. 2006, Tucson, AZ*

**Research Associate, Arizona-Sonora Desert Museum**

*Sep. 2003 – Jun. 2006, Tucson, AZ*

**Research Associate, Water Resources Research Center**

*Jan. 2001 – Oct. 2003, Tucson, AZ*

**Researcher and Technical Writer, Sonoran Institute**

*Aug. 1999 – Aug. 2000, Tucson, AZ*

**Biological, Forestry, and Fuels Technician, United States Forest Service, Winema National Forest**

*Jun. 1992 – Aug. 1995, Chemult, OR*

**Botanical Intern, Huntington Botanical Garden**

*Fall 1989, Summer 1990, San Marino, CA*

**Field Botanist, Reynolds Engineering and Environmental Corporation, U.S. Department of Energy Nevada Test Site**

*May 1989 – Aug. 1989, Mercury, NV*

**PEER-REVIEWED PUBLICATIONS**

**Emanuel R.** 2010. Privately Unsustainable: Ecological Resiliency and Watershed Resources in an Arid-Land Ejido. *In: The Impact of Neoliberalism on Commodity Production in Mexico.* Thomas Weaver, James B. Greenberg, Anne Browning-Aiken, and William L. Alexander, editors. University of Arizona Press, Tucson, Arizona.

**Emanuel, R.,** D. Godwin and C. Stoughton. 2010. Oregon Rain Gardens: Landscaping for Clean Water and Healthy Streams. Oregon Sea Grant: Corvallis, Oregon.

- Emanuel, R.** 2008. Maintenance Tips for Healthy Septic Systems. 2 pp. 50 distributed.
- Emanuel, R.** 2008. Suppliers of Water Testing Kits & Equipment. 1 pp. 50 distributed.
- Emanuel, R.** 2008. Shock Chlorinating a Spring. 2 pp. 50 distributed.
- Emanuel, R.** and G. Andrews. 2007. Testing of Potable Water Sources for North Coast Residents. 2 pp. 240 distributed.
- Emanuel, R.** 2007. After the Flood: Inspecting and Testing Your Private Well Water System. 2 pp. 100 distributed.
- García, Jesús M. and **R. Emanuel.** 2007. Tasting History: The Kino Heritage Fruit Trees Project. *Sonorensis Vol. 27(1)*. Arizona-Sonora Desert Museum, Tucson, Arizona.
- Emanuel, R.** 2006. *Parting the Watershed: Ecological Resiliency and Political Ecology in the Santa Cruz River Watershed, Sonora, Mexico*. [Doctoral Dissertation] UMI: Ann Arbor, Michigan.
- Emanuel, R.** 2006. (Ed.) *Arizona Watershed Stewardship Guide*. University of Arizona, Tucson, Arizona.
- Sprouse, T., **R. Emanuel** and S. Storrer. 2003. Water Quality Monitoring Program for High-Priority Water Bodies in the Sonoran Desert Network. Water Resources Research Center, Tucson, Arizona.
- Sprouse, T., **R. Emanuel** and B. Tellman. 2002. Surface Water Quality Monitoring Overview and Assessment, Sonoran Desert Network National Park Service. Water Resources Research Center, Tucson, Arizona.
- Emanuel, R.** 2000. Human Dimensions of the Sonoran Desert Ecoregion: A Summary Report. Sonoran Institute, Tucson, Arizona.
- Emanuel, R.** and J. Greenberg. 2000. "Lluvia Enojada: The Political Ecology of Forest Extraction in the Sierra Chatina of Oaxaca, Mexico." *Journal of Political Ecology*. Vol. 7.
- Emanuel, R.** 1995. *A Field Guide to Ethnobotanical Plants of the Winema National Forest, Oregon*. Government Printing Office: USDA Forest Service.

## PROFESSIONAL AFFILIATIONS & MEMBERSHIPS

- Sea Grant Sustainable Coastal Community Development Network (since 2007)
- National NEMO Network (since 2007)
- Alliance of Natural Resource Outreach and Service Programs (since 2004)
- Association for Natural Resources Extension Professionals (since 2005)
- Oregon Native Plant Society (since 2007)
- Arizona Native Plant Society (2003 – 2006)
- Society for Applied Anthropology (since 1996)
- Political Ecology Society (since 1995)

## Biographical Sketch – Burke Hales

### EDUCATION

- Ph.D. Chemical Oceanography, 1995  
University of Washington School of Oceanography  
(Thesis Advisor: Dr. Steve Emerson)
- M.S. Chemical Oceanography, 1992  
University of Washington School of Oceanography, Seattle, WA
- B.S. Chemical Engineering, 1988  
University of Washington College of Engineering, Seattle, WA

### PROFESSIONAL EXPERIENCE

- Associate Professor, 2004-Present: College of Oceanographic and Atmospheric Sciences, Oregon State University
- Assistant Professor, 1998-Present: College of Oceanographic and Atmospheric Sciences, Oregon State University
- Postdoctoral Research Fellow, 1995-1997: Lamont-Doherty Earth Observatory of Columbia University (Postdoctoral Advisor: Dr. Taro Takahashi)

### FIVE RECENT PUBLICATIONS MOST CLOSELY RELATED TO THE PROPOSED WORK

- Evans, W., B. Hales, and P. Strutton, (2010). The seasonal cycle of surface ocean pCO<sub>2</sub> on the Oregon shelf. *J. of Geophys. Res.—Oceans* (submitted).
- Juranek, L.W., Feely, R.A., Peterson, W.T., Alin, S.R., Hales, B., Peterson, J., Lee, K., and Sabine, C.L., (2009). A novel method for determination of aragonite saturation state on the continental shelf of central Oregon using multi-parameter relationships with hydrographic data. *Geophys. Res. Lett.*, 37, L01601, doi:10.1029/2009GL040423
- Takahashi, T., et al., (Hales is 7<sup>th</sup> of 31 co-authors), 2009. Climatological mean and decadal change in surface ocean pCO<sub>2</sub>, and net sea-air CO<sub>2</sub> flux over the global oceans. *Deep-Sea Res.*, doi:10.1016/j.dsr2.2008.12.009.
- Feely, R. A., C. L. Sabine, J. M. Hernandez-Ayon, D. Ianson, and B. Hales, 2008. Evidence for upwelling of corrosive ‘acidified’ water onto the continental shelf. *Science* 320, 1490-1492.
- Bandstra, L., B. Hales, and T. Takahashi, 2006. High-frequency measurement of seawater total carbon dioxide. *Mar. Chem.* doi:10.1016/j.marchem.2005.10.009.

### FIVE OTHER SIGNIFICANT PUBLICATIONS

- Hales, B., D. Hebert, and J. Marra, 2009. Turbulent supply of nutrients to phytoplankton at the New England Shelfbreak Front. *Jour. Geophys. Res.*, doi:10.1029/2008JC005011.
- Hales, B., D. Chipman and T. Takahashi, 2004. High-frequency measurement of partial pressure and total concentration of carbon dioxide in seawater using microporous hydrophobic membrane contactors. *Limnology and Oceanography: Methods* 2, 356-364.
- Hales, B., Wei-Jun Cai, B. Greg Mitchell, Christopher L. Sabine, and Oscar Schofield [eds.] (2008). North American Continental Margins: a synthesis and planning workshop. Report of the North American Continental Margins Working Group for the U.S. Carbon Cycle Scientific Group and Interagency Working Group. Washington, DC: U.S. Carbon Cycles Science Program.
- Hales, B., L. Karp-Boss, A. Perlin, and P. Wheeler, 2006. Oxygen production and carbon sequestration in an upwelling coastal margin. *Global Biogeochemical Cycles*, 20, GB3001, doi:10.1029/2005GB002517.



Hales, B., T. Takahashi and L. Bandstra, 2005. Atmospheric CO<sub>2</sub> uptake by a coastal upwelling system *Global Biogeochem. Cycles* 19, doi:10.1029/2004GB002295

### **ADVISORS**

Doctoral: Steven Emerson, University of Washington School of Oceanography, Seattle, WA.  
Post-Doctoral: Taro Takahashi, LDEO, Columbia University, Palisades, NY.

### **STUDENTS ADVISED**

Rachel Holser, (COAS, 2008-2010); MS awarded in 2010; Elizabeth Lakin, (COAS, 2008-2010); MS awarded in 2010; Leah Bandstra, (COAS/OSU 2001-2004) MS awarded in 2004; Paul Covert, PhD candidate (COAS/OSU 2002-2004); Chris Holm ((COAS/OSU 2004-2007) MS awarded in 2007; Mike Wetz (COAS/OSU 2000-2006) PhD awarded in 2006.

### **OTHER COLLABORATORS**

Simone Alin; NOAA-PMEL; David Archer, U. Chicago; Wei-Jun Cai, Univ. Georgia; Mike DeGrandpre, Univ. Montana; Al Devol, UW; Dick Feely, NOAA-PMEL; Dave Hebert, URI; David Ho, U. Hawaii; Bob Houghton, LDEO; Debbie Ianson, DFO-Victoria; Lauren Juranek, NOAA-PMEL; Lee Karp-Boss, U. Maine; John Marra, LDEO; Hans Paerl, UNC; Chris Sabine, NOAA-PMEL; Taro Takahashi, LDEO; Rik Wanninkhof, AOML; Mike Wetz, Texas A&M Corpus Christi.

### **OUTREACH and SYNERGISTIC ACTIVITIES**

Interviewee for multiple media outlets, including Good Morning America and National Public Radio, on the topic of ocean acidification, 2008-2010.

Invited speaker and panelist for “Ocean Acidification: Cause, Effect, and Response” panel, at Public Interest Environmental Law Council, Eugene OR, February, 2009.

Member, US NACP Steering Committee, 2007-2009.

Member, Ocean Carbon and Biogeochemistry Scientific Steering Committee, 2007-2009.

Chair, planning committee for “North American Continental Margins: A Synthesis and Planning Workshop.”

Panel discussion member in “Our Acidic Ocean” on Oregon Public Broadcasting’s Think Out Loud, 27 May, 2008.

## Merrick C. Haller

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### Experience

- 2009 – present Associate Head, School of Civil and Construction Engineering
- 2009 – present Associate Professor, School of Civil and Construction Engineering, Oregon State University, Corvallis.
- 2004 – 2009 Assistant Professor, School of Civil and Construction Engineering, Oregon State University, Corvallis.
- 2001 – 2004 Assistant Professor (Senior Research), Department of Civil, Construction, and Environmental Engineering, Oregon State University, Corvallis.
- 2001 – present joint appointment (same rank), College of Oceanic & Atmospheric Sciences
- 1999 – 2001 Assistant Research Scientist, Cooperative Institute for Limnology and Ecosystems Research, University of Michigan, Ann Arbor.
- 1999 – 2001 Research Engineer, Veridian Systems Division (formerly ERIM International), Ann Arbor, MI.

### Education

- Ph.D., Civil Engineering, University of Delaware, 1999.  
Thesis: *Rip current dynamics and nearshore circulation* (Advisor: R.A. Dalrymple)
- M.C.E., Civil Engineering, University of Delaware, 1996.  
Thesis: *The measurement and analysis of wave groups in the surf zone* (Advisor: R.A. Dalrymple)
- B.S., Earth & Atmospheric Sciences (Geophysics), Purdue University, 1993.

### Awards & Outreach

- 2007 Editors' Citation for Excellence in Refereeing, *JGR-Oceans* (cited by Jim Kirby)
- 2002 Editors' Citation for Excellence in Refereeing, *JGR-Oceans* (cited by John Klinck)
- Awarded National Research Council Research Associateship, 1999 (declined)
- E.C. Davis Fellowship, University of Delaware, Sept. 1993 – Aug. 1994
- Guest speaker: *Science, Music & Marshmallows*, Mary's Peak Interpretive Center, Aug. 5, 2009
- Featured in *Taking Risks, Making Commitments* ("Exploring Beach Recovery"), DVD and booklet, Oregon Sea Grant, 2007. (<http://seagrant.oregonstate.edu/communications/special.html>)
- Interviewed: *The Daily Barometer* ("World's largest wave basin built at OSU", Sept. 30, 2003)

### Professional Service

- Program Committee Member: Atmospheric and Oceanic Propagation of Electromagnetic Waves IV, *SPIE International Symposium* (Photonics West), 2010; Co-Convener and Chair, Nearshore and Shelf Processes Special Session in Honor of Dr. Thomas Kinder, *AGU Fall Meeting*, 2001; Session Chair: *Waves 2001, Coastal Dynamics 2005*.
- Member, Coastal & Estuarine Hydroscience Committee, ASCE 2006-present; Secretary, Ocean Marine and Coastal Engineering Division, ASEE 2006-2009; Member, Science Advisory Team—Columbia River Mouth Beneficial Projects (Lower Columbia River Solutions Group), 2008-present.

- Reviewer: *ASEE Conference Proceedings, Coastal Engineering, Coastal Engineering Journal, Continental Shelf Research, Estuarine Coastal and Shelf Science, IEEE (Geoscience and Remote Sensing Letters, IGARSS 2008, Trans. Geosci. and Remote Sensing), J. Atmos. & Ocean. Tech., J. Coastal Res., J. Fluid Mechanics, AGU (Geophys. Res. Letters, J. Geophysical Research – Oceans) J. Hydraulic Research, J. Hydro-environment Research, J. Wtrwy., Port, Coastal, Ocean Eng., Marine Geophysical Researches, Sensors, Wave Motion*, and J. Wiley & Sons.
- Proposal reviewer: The National Science Foundation (Physical Oceanography, CAREER, MRI), Sea Grant (California, Delaware, Maryland, Texas), Natural Environment Research Council (UK), Research Council of Norway, USACE-ERDC.
- Society memberships: American Geophysical Union 1996-present, American Society of Civil Engineers 2005-present, American Society of Engineering Education 2001-present, Association of Coastal Engineers 2002-present, Coasts Oceans Ports and Rivers Institute 2002-present.

### **Refereed Journal Publications**

1. Chen, Q., Dalrymple, R.A., Kirby, J.T., Kennedy, A.B., and M.C. Haller, Boussinesq modeling of a rip current system, *J. Geophys. Res.*, 104 (C9), 20,617—20,637, 1999.
2. Haller, M.C., Putrevu, U., Oltman-Shay, J., and R.A. Dalrymple, Wave group forcing of low frequency surf zone motion, *Coastal Engineering Journal*, Vol. 41, No. 2, 121-136, 1999.
3. Haller, M.C. and R.A. Dalrymple, Rip current instabilities, *J. Fluid Mech.*, 433, 161-192, 2001.
4. Haller, M.C., R.A. Dalrymple, and I.A. Svendsen, Experimental study of nearshore dynamics on a barred beach with rip channels, *J. Geophys. Res.*, 107 (C6), 3061, doi:10.1029/2001JC000955, 2002.
5. Haller, M.C. and D.R. Lyzenga, Comparison of radar and video observations of shallow water breaking waves, *IEEE Trans. Geosci. Remote Sens.*, vol. 41, pp. 832—844, Apr. 2003.
6. Haas, K.A., I.A. Svendsen, M.C. Haller, and Q. Zhao, Quasi 3-D modeling of rip current systems, *J. Geophys. Res.*, 108 (C7), 3217, doi:10.1029/2002JC001355, 2003.
7. Suh, K.-D., T.-H. Jung, and M.C. Haller, Long waves propagating over a circular bowl pit, *Wave Motion*, 42, 143—154, 2005.
8. Haller, M.C. and H.T. Özkan-Haller, Waves on unsteady currents, *Physics of Fluids*, **19**, 126601, 2007. (See also Publisher's Note: *Physics of Fluids*, **20**, 039901, 2008).
9. Catalán, P.A. and M.C. Haller, Remote sensing of breaking wave phase speeds with application to non-linear depth inversions, *Coastal Engineering*, **55**, 93—111, 2008.
10. Michalsen, D., M.C. Haller, and K.-D. Suh, Wave reflection from nearshore depressions, *J. Waterway, Port, Coastal, and Ocean Engineering*, 134(1), 1-11, 2008.
11. Plant, N.G., K.T. Holland, and M.C. Haller, Ocean wavenumber estimation from wave-resolving time series imagery, *IEEE Trans. Geosci. Remote Sens.*, vol. 46, pp. 2644—2658, Sept. 2008.
12. van Dongeren, A., N. Plant, A. Cohen, D. Roelvink, M.C. Haller, and P. Catalán, Beach Wizard: Nearshore bathymetry estimation through assimilation of model computations and remote observations, *Coastal Engineering*, **55**, 1016—1027, 2008.
13. Haller, M. C., and P. A. Catalán, Remote sensing of wave roller lengths in the laboratory, *J. Geophys. Res.*, 114, C07022, doi:10.1029/2008JC005185, 2009.
14. Lee, C., J.-S. Jung, and M.C. Haller, Asymmetry in directional spreading function of random waves due to refraction, *J. Waterway, Port, Coastal, and Ocean Engineering*, 136(1), 1-9, 2010.
15. Catalán, P.A., M.C. Haller, R.A. Holman, and W.J. Plant, Optical and microwave detection of wave breaking in the surf zone, submitted to *IEEE Trans. Geosci. Remote Sens.*, June 2010.
16. Guannel, G., H.T. Özkan-Haller, M.C. Haller, J.T. Kirby, J. Magalen, and P.T. Cobo, Observations of sand bar migration in a large-scale laboratory setting, in preparation for *Marine Geology*, 2010.

## David W. Jones

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### Professional Employment

2007-Present Director, Center for Environmental and Information Systems Department, Applied Physics Laboratory, University of Washington, Seattle, WA  
2000-2007 Senior Oceanographer/Principal Investigator, Applied Physics Laboratory  
1998-2000 Director of Operations: Fleet Numerical Meteorology and Oceanography Center  
1996-1998 Chief Science Officer: Fleet Numerical Meteorology and Oceanography Center  
1993-1996 Master Instructor: United States Naval Academy, Annapolis, MD  
1991-1993 Operations Officer, Naval Ice Center, Suitland, MD

### Education

1989: University of Washington, Seattle, WA. MS, Physical Oceanography  
1979: N.Y. Maritime College, Bronx, NY. BS, Meteorology and Oceanography, with Honors.  
Commission in U.S. Navy & obtained a US Coast Guard Third Mates license

### Selected Relevant Publications

Jones, D and J. Olsonbaker (2009). Developing Best Practices for IOOS Web Portals. *Proceedings of the MTS/IEEE Oceans 2009 Conference*, Biloxi, MS., October 26-29, 2009.  
Joslyn, S. and D. Jones, Strategies in Naturalistic Decision Making: A Cognitive Task Analysis of Naval Weather Forecasting (2008). In Schraagen, J.M.C., Militello, L., Ormerod, T., & Lipshitz, R. (Eds) *Naturalistic Decision Making and Macrocognition*. Aldershot, UK: Ashgate Publishing Limited.  
Jones, D and S. Maclean (2007). RCOOS and Ocean Information Tools for Decision Makers. *Proceedings of the MTS/IEEE Oceans 2007 Conference*, Vancouver, B.C., October 1-5, 2007  
Joslyn, S., Pak, K., Jones, D., Pyles, J., and Hunt, E., (2007). The effect of probabilistic information on threshold forecasts. *Weather and Forecasting*, 22, 10, 804-812  
Jones, D W., M. H. Miller, J. A. Ballas, and J. I. Olsonbaker, (2004). Analysis of Human-Computer Interaction in the Expeditionary Warfare Decision Support System (EDSS). *APL-UW Technical Report 0402*. Applied Physics Laboratory-University of Washington, September, pp 61.  
Jones, D. W., P. F. Moersdorf, and R. F Clancy, (1999): Toward a teraflop computing infrastructure at FNMOC. In W. Zwiefelhofer & N. Kreitz (Eds), *Towards Tera Computing*. Singapore: World Scientific.

### Research & Professional Accomplishments

David Jones is the Director of the Center for Environmental and Information Systems (CEIS), at the Applied Physics Laboratory, University of Washington. CEIS has over 60 personnel involved in research and development in areas of ocean acoustics, signal processing, ocean observations, environmental modeling, information security, and computer science. His own research has focused on the development of cognitive engineering solutions to applied decision making and problem solving domains. He is the Principal Investigator (PI) for several multi-disciplinary efforts including: Statistical Approaches for the Verification of Mesoscale Models (ONR funded); and Glider Monitoring, Piloting and Communication System (SPAWAR/PMW120 funded), a human-computer control interface for autonomous ocean observing vehicles. He is Co-PI for PROBCAST, a NSF funded project that incorporates new techniques for visualizing and user interaction with weather uncertainty information; and he is also a co-PI for several tasks of the NANOOS Regional Association (NOAA/IOOS funded) including: the development of web-tools for visualizing observations and model information, and the development of an operational POM model for Puget Sound. David served 21 years as a naval officer, the last four as director of operations and department head at Fleet Numerical Meteorology and Oceanography Center, Monterey, CA.

## George M. Kaminsky

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### Education

Ph.D., 2008, Marine Science, University of Sydney, Sydney, NSW, Australia  
Dissertation: *Shoreface Behaviour and Equilibrium*  
M.S., 2000, Oceanography, University of Washington, Seattle, Washington, USA  
B.S., 1989, Ocean Engineering, Florida Institute of Technology, Melbourne, Florida, USA

### Licensing

Registered Professional Engineer (Civil), State of Washington

### Professional Experience

2007-present WA Department of Ecology, Senior Coastal Engineer (Environmental Engineer 5)  
1997-2007 WA Department of Ecology, Coastal Engineer (Environmental Engineer 4)  
1995-1997 WA Department of Ecology, Coastal Engineer (Environmental Engineer 3)  
1991-1995 WA Department of Ecology, Shoreline Engineer (Environmental Engineer 2)  
1989-1991 US Army Corps of Engineers, General Engineer

### Selected Publications

Gelfenbaum, G., and **Kaminsky, G.M.**, 2010. Large-scale coastal change in the Columbia River littoral cell: An overview, *Marine Geology*, doi:10.1016/j.margeo.2010.02.007  
Ruggiero, P, Buijsman, M., **Kaminsky, G.**, and Gelfenbaum, G., 2010, Modeling the effects of wave climate and sediment supply variability on large-scale shoreline change. *Marine Geology*, v. 273, pp 127-140.  
**Kaminsky, G.M.**, Ruggiero, P., Buijsman, M., McCandless, D., and Gelfenbaum, G., 2010, Historical evolution of the Columbia River littoral cell, *Marine Geology*, v. 273, pp. 96-126.  
Warrick, J.A., George, D.A., Gelfenbaum, G., Ruggiero, P., **Kaminsky, G. M.**, and Beirne, M., 2009. Beach morphology and change along the mixed grain-size delta of the dammed Elwha River, Washington. *Geomorphology*,. doi:10.1016/j.geomorph.2009.04.012.  
**Kaminsky, G.M.**, Ferland, M.A., Cowell, P.J., Moritz, H.R., and Ruggiero, P. 2007. Shoreface response to sediment deficit, *Proceedings of Coastal Sediments '07*, ASCE, pp. 633–646.  
Ruggiero, P., Eshleman, J., Kingsley, E., **Kaminsky, G.**, Thompson, D.M , Voigt, B., Kaminsky, G., and Gelfenbaum, G., 2007. Beach monitoring in the Columbia River littoral cell: 1997-2005., U. S. Geological Survey Data Series 260.  
Ruggiero, P., Reid, D., **Kaminsky, G.**, Allan, J. 2007. Assessing shoreline change trends along US Pacific Northwest beaches, *Proceedings of Coastal Zone 2007*, Portland, OR.  
Ruggiero, P., **Kaminsky, G.M.**, Gelfenbaum, G., and Voigt. B., 2005. Seasonal to interannual morphodynamic variability along a high-energy dissipative littoral cell, *Journal of Coastal Research*, (21) 3 pp. 553-578.  
Buijsman, M.C., **Kaminsky, G.M.**, and Gelfenbaum, G. 2003. Shoreline change associated with jetty construction, deterioration, and rehabilitation at Grays Harbor, Washington, *Shore &*

- Beach*, Vol. 71, No. 1, pp. 15-22.
- Kaminsky, G.M.** and Ferland, M.A. 2003. Assessing the connections between the inner shelf and the evolution of Pacific northwest barriers through vibracoring, *Proceedings of Coastal Sediments '03*, East Meets West productions, CD-ROM, 12 p.
- Moore, L.J., Jol, H.M., **Kaminsky, G.M.**, and Kruse, S. 2003. Severe winter storm effects revealed in coastal barrier stratigraphy, southwest Washington, USA, *Proceedings of Coastal Sediments '03*, East Meets West productions, CD-ROM, 12 p.
- Moore, L.J., **Kaminsky, G.M.**, and Jol, H.M. 2003. Exploring linkages between coastal progradation rates and the El Niño Southern Oscillation, Southwest Washington, USA, *Geophysical Research Letters* 13 (9), 1448.
- Ruggiero, P., **Kaminsky, G.M.**, and Gelfenbaum, G. 2003. Linking proxy-based and datum-based shorelines on a high-energy coastline: implications for shoreline change analyses, *Journal of Coastal Research*, SI 38, pp. 57-82.
- Buijsman, M.C., Ruggiero, P. and **Kaminsky, G.M.** 2001. Sensitivity of shoreline change predictions to wave climate variability along the southwest Washington coast, USA, *Proceedings of the 4<sup>th</sup> Conference on Coastal Dynamics*, Lund, Sweden, pp. 617-626.
- Kaminsky, G.M.**, Buijsman, M.C., and Ruggiero, P. 2001. Predicting shoreline change at decadal scale in the Pacific Northwest, USA, *Proceedings of the 27th International Conference on Coastal Engineering*, ASCE, pp. 2400-2413.
- Ruggiero, P., Gelfenbaum, G., Thompson, D. and **Kaminsky, G.M.** 2001. Exploring the relationship between nearshore morphology and shoreline change, *Proceedings of the 4<sup>th</sup> Conference on Coastal Dynamics*, pp. 627-636.
- Kaminsky, G.M.** and Gelfenbaum, G. 2000. The Southwest Washington Coastal Erosion Study: A scientific research project to address management-scale objectives, *Proceedings of the 17th International Conference of The Coastal Society 17<sup>th</sup> Conference*, pp. 505-515.
- Ruggiero, P., Voigt, B., and **Kaminsky, G.** 2000. Beach monitoring for enhanced decision making, *Proceedings of the 17th International Conference of The Coastal Society 17<sup>th</sup> Conference*, pp. 516-524.
- Voigt, B., Ruggiero, P., and **Kaminsky, G.** 2000. Towards the development of a decision support system for the Columbia River littoral cell, *Proceedings of the 17th International Conference of The Coastal Society 17<sup>th</sup> Conference*, pp. 525-532.
- Kaminsky, G.M.**, Buijsman, M., Gelfenbaum, G.R., Ruggiero, P., Jol, H.M., Gibbs, A., and Peterson, C.D. 1999. Synthesizing geological observations and process-response data for modeling coastal change at a management scale, *Proceedings of Coastal Sediments '99*, pp. 1708-1723.
- Kaminsky, G.M.**, Daniels, R.C., McCandless, D., and Ruggiero, P. 1999. Mapping erosion hazard areas in Pacific County, Washington, *Journal of Coastal Research*, SI 28, pp. 158-170.
- Kaminsky, G.M.** and Gelfenbaum, G. 1999. The Southwest Washington Coastal Erosion Study: Research in support of coastal management, *Proceedings of Coastal Zone '99*, pp. 737-739.
- Kaminsky, G.M.**, Ruggiero, P., and Gelfenbaum, G.R. 1998. Monitoring coastal change in southwest Washington and northwest Oregon during the 1997/98 El Niño, *Shore & Beach*, Vol. 66, 3, pp. 42-51.
- Kaminsky, G.M.**, Ruggiero, P., Gelfenbaum, G., and Peterson, C. 1997. Long-term coastal evolution and regional dynamics of US Pacific Northwest littoral cell, *Proceedings of Coastal Dynamics '97*, pp. 614-623.

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**University of Washington**

**Professional Preparation:**

- 2008 Ph.D. Biological Oceanography: College of Oceanic and Atmospheric Sciences,  
Oregon State University
- 1996 M.S. Marine-Estuarine Environmental Sciences: Chesapeake Biological Laboratory,  
University of Maryland System, Solomons, MD
- 1989 B.S. Biology: University of North Carolina at Chapel Hill

**Appointments:**

- 2008-present: Assistant Professor, School of Oceanography, University of Washington, Seattle, WA
- 2003-2008: Ph.D. Candidate, Biological Oceanography, College of Oceanic and Atmospheric  
Sciences, Oregon State University, Corvallis, OR
- 2002-2003 Senior Faculty Research Assistant, Oregon State University, Hatfield Marine Science Center,  
Newport, OR
- 1998-2002 Faculty Research Assistant, Oregon State University, Hatfield Marine Science Center,  
Newport, OR
- 1996-1998 Fisheries Consultant, Hydroacoustic Technology, Inc., Seattle, WA.
- 1992-1995 Graduate Research Assistant, Chesapeake Biological Laboratory, Solomons, MD.

**Select Peer-Reviewed Publications:**

- Keister, J.E. and L.B. Tuttle. Zooplankton response to hypoxia in a seasonally hypoxic shallow estuary. *In preparation* for Marine Ecology Progress Series, March 2010.
- Keister, J.E., E. Di Lorenzo, C.A. Morgan, V. Combes, and W.T. Peterson. Copepod species composition is linked to ocean transport in the Northern California Current. *In review* at Global Change Biology.
- Keister, J.E., D.L. Pascual, N. Kelly, J. Llopiz, S. Moseman, L. Petes, K.N. Hopfensperger, J. Clasen, and B. Bancroft. 2010. Climate and anthropogenic change in aquatic environments: a cross-ecosystem perspective. *In: Ecological Dissertations in Aquatic Sciences: Proceedings of the 2008 Symposium. Accepted* by *Limnol. Oceanogr.*
- Keister, J.E., T.J. Cowles, W.T. Peterson, and C.A. Morgan. 2009. Do upwelling filaments result in predictable biological distributions in coastal upwelling ecosystems? *Progr. Oceanogr.*, doi:10.1016/j.pocean.2009.07.042.
- Keister, J.E., W.T. Peterson, and S.D. Pierce. 2009. Zooplankton distribution and cross-shelf transport of carbon in an area of complex mesoscale circulation in the northern California Current. *Deep-Sea Res. I*, doi:10.1016/j.dsr.2008.09.004.
- Keister, J.E. and P.T. Strub. 2008. Spatial and interannual variability in mesoscale circulation in the northern California Current System. *J. Geophys. Res.* C04015, doi:10.1029/2007JC004256.
- Suchman, C.L., E.A. Daly, J.E. Keister, W.T. Peterson, and R.D. Brodeur. 2008. Prey selection and predation potential of scyphomedusae in a highly productive upwelling region. *Mar. Ecol. Prog. Ser.* 358: 161-172.
- Huyer, A., J.H. Fleischbein, J. Keister, P.M. Kosro, N. Perlin, R.L. Smith, and P.A. Wheeler. 2005. Two coastal upwelling domains in the Northern California Current System. *J. Mar. Res.* 63: 901-929.
- Keister, J.E., T.B. Johnson, C.A. Morgan, and W.T. Peterson. 2005. Biological indicators of the timing and direction of warm-water advection during the 1997/98 El Niño off the central Oregon coast, USA. *Mar. Ecol. Prog. Ser.* 295: 43-48.
- Keister, J.E. and W.T. Peterson. 2003. Zonal and seasonal variations in zooplankton community structure off the central Oregon coast, 1998-2000. *Progr. Oceanogr.* 57: 341-361.
- Peterson, W.T. and J.E. Keister. 2003. Interannual variability in copepod community composition at a coastal station in the northern California Current: a multivariate approach. *Deep Sea Res. II:* 50: 2499-2517.
- Breitburg, D.L., A. Adamack, K.A. Rose, S.E. Kolesar, M.B. Decker, J.E. Purcell, J.E. Keister, and J.H. Cowan,

- Jr. 2003. The pattern and influence of low dissolved oxygen in the Patuxent River, a seasonally hypoxic estuary. *Estuaries* 26 (2A): 280-297.
- Peterson, W.T., J.E. Keister, and L.R. Feinberg. 2002. The effects of the 1997-99 El Niño/La Niña events on hydrography and zooplankton off the central Oregon coast. *Progr. Oceanogr.* 54: 381-398.
- Peterson, W.T. and J.E. Keister. 2002. The effect of a large cape on distribution patterns of coastal and oceanic copepods off Oregon and northern California during the 1998-1999 El Niño-La Niña. *Progr. Oceanogr.* 53: 389-411.
- Keister, J.E., E.D. Houde, and D.L. Breitburg. 2000. Effects of bottom-layer hypoxia on abundances and depth distributions of organisms in Patuxent River, Chesapeake Bay. *Mar. Ecol. Prog. Ser.* 205: 43-59.
- Iverson, T.K., J.E. Keister, and R.D. McDonald. 1999. Summary of the Evaluation of Fish Passage through Three Surface Spill Gate Designs at Rock Island Dam in 1996. *In: Innovations in Fish Passage Technology*. AFS Publications, M. Odeh, Ed, 224 pp.

### **Scientific Service/Outreach:**

- Invited convener of the 5<sup>th</sup> *Annual Zooplankton Production Symposium*, Puñon, Chile, March 2011.
- Member of the *Journal of Plankton Research* editorial board.
- Scientific Steering Committee member for the 2012 *PICES/ICES Early Career Scientists Conference*, to be held in Mallorca, Portugal.
- Member of the PICES “FUTURE” working group writing committee, 2008.
- Session co-chair for 2007 Eastern Pacific Ocean Conference (EPOC).
- Member of the Scientific Steering Committee for the 2007 PICES/ICES Early Career Scientist Conference convened in Baltimore, Maryland, June 2007.
- Proposal reviews for NSF, NOAA, Harvard’s Radcliffe Institute for Advanced Study Fellowship Program.
- Journal referee for *Limnology and Oceanography*, *Deep-Sea Research II*, *Eco-North Proceedings* (special issue), *Progress in Oceanography*, *Hydrobiology*, the *Journal of Plankton Research*, and *Fisheries Oceanography*
- Advisor to 1 PhD Oceanography student, committee member for 5 PhD students (Oceanography, Fisheries, Biology), faculty mentor to 4 undergraduate Oceanography majors.

### **Collaborators/Conflicts:**

Harold Batchelder, Oregon State University (OSU)  
 Steve Bograd, NOAA  
 Annalisa Bracco, Georgia Institute of Technology  
 Emanuele Di Lorenzo, Georgia Institute of Tech.  
 Peter Franks, Scripps Institute  
 Kurt Fresh, NWFSC, NOAA  
 Adriana Huyer, Oregon State University  
 Mike Kosro, Oregon State University  
 Roy Mendelsohn, NOAA  
 Cheryl Morgan, OSU  
 Steve Pierce, OSU  
 Frank Schwing, NOAA  
 Robert Smith, Oregon State University  
 Robert Suryan, Oregon State University  
 P. Ted Strub, Oregon State University  
 Cynthia Suchman, NSF  
 Andrew Thomas, University of Maine  
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### **Graduate Advisors:**

Denise L. Breitburg, Smithsonian Environmental Research Center (M.S. advisor)  
 Timothy J. Cowles, OSU (Ph.D. advisor)  
 Edward D. Houde, Chesapeake Biological Laboratory (M.S. advisor)  
 William T. Peterson, NOAA/NWFSC (Ph.D. advisor)



**P. Michael Kosro**  
**NANOOS OSU lead**

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**Professional Preparation**

University of Calif., Santa Cruz	Physics	1973
University of Calif., San Diego	Oceanography	1985

**Appointments**

Professor, OSU	2007-
Associate Professor, OSU	2001-2007
Associate Professor (Senior Research), OSU	1992-2001
Assistant Professor (Senior Research), OSU	1986-1992
Research Associate (Postdoctoral), Oregon State University	1984-1986

**Relevant Recent Publications**

Kim, S.Y., E. Terrill, B. Cornuelle, B. Jones, L. Washburn, M. Moline, J. Paduan, N. Garfield, G. Crawford, P.M. Kosro, 2010. Observations of high-resolution coastal surface circulation on the U.S. West Coast. Submitted to Geophysical Research Letters.

Hickey, B.M., V.L. Trainer, P.M. Kosro, N.G. Adams, T.P. Connolly, N.B. Kachel and S.L. Geier, 2010. Seasonal differences in sources of toxic *Pseudo-nitzschia* cells on Washington's razor clam beaches. Submitted to Journal of Geophysical Research.

Saraceno, M., P. T. Strub, and P. M. Kosro, 2008. Estimates of sea surface height and near surface alongshore coastal currents from combinations of altimeters and tide gauges, Journal of Geophysical Research, 113, C11013, doi:10.1029/2008JC004756.

Huyer, A., P. A. Wheeler, P. T. Strub, R. L. Smith, R. Letelier, and P. M. Kosro, 2007, The Newport Line off Oregon – Studies in the North East Pacific, Prog. Oceanogr., 75, 126-160, doi:10.1016/j.pocean.2007.08.003

Kosro, P.M., W.T. Peterson, B.M. Hickey, R.K. Shearman and S.D. Pierce, 2006. "The physical vs. the biological spring transition: 2005", Geophys. Res. Letters, 33(22), L22S03, doi: 10.1029/2006GL027072.

Kosro, P.M., 2005. "On the spatial structure of coastal circulation off Newport, Oregon, during spring and summer 2001, in a region of varying shelf width", J. Geophys. Res., 110, C10S06, doi:10.1029/2004JC002769.

Paduan, J.D., P.M. Kosro and S.M. Glenn, 2004. "A national coastal ocean high frequency radar system for the United States". Marine Technology Society Journal 38(2): 76-82.

(for complete list, see

<http://www.coas.oregonstate.edu/index.cfm?fuseaction=content.search&searchtype=people&detail=1&id=546&show=publications> )

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### **Alexander L. Kurapov**

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### **Professional Preparation:**

M.Sc., Department of Fluid Dynamics, St-Petersburg Marine Technical University, Russia, 1991  
Ph.D., Fluid Dynamics, Department of Applied Mathematics and Mathematical Modeling, St-Petersburg Marine Technical University, Russia, 1994  
Post-doctoral visiting researcher, Department of Applied Mathematics and Theoretical Physics, University of Cambridge, UK, 1994-1995

### **Academic Employment:**

Assistant Professor (tenure track), College of Oceanic and Atmospheric Sciences, Oregon State University (COAS, OSU), 2003-2006  
Assistant Professor (Senior Researcher), COAS, OSU, 2003-2006  
Research Associate, COAS, OSU, 1999-2003  
Research Associate, P. P. Shirshov Institute of Oceanology, Russian Academy of Sciences, St-Petersburg Branch, Russia, 1995-1999

### **Five Publications Most Relevant to the Proposed Project:**

- Kurapov, A. L., D. Foley, P. T. Strub, G. D. Egbert, and J. S. Allen, 2010: Variational assimilation of satellite observations in a coastal ocean model off Oregon, *J. Geophys. Res.*, submitted.
- Kurapov, A. L., G. D. Egbert, J. S. Allen, and R. N. Miller, 2009: Representer-based analyses in the coastal upwelling system, *Dyn. Atmos. Oceans*, 48, 198-218, doi:10.1016/j.dynatmoce.2008.09.002.
- Kurapov, A. L., G. D. Egbert, J. S. Allen, and R. N. Miller, 2007: Representer-based variational data assimilation in a nonlinear model of nearshore circulation, *J. Geophys. Res.*, 112, C11019, doi:10.1029/2007JC004117.
- Koch, A. O., A. L. Kurapov, and J. S. Allen, 2010: Near-surface dynamics of a separated jet in the coastal transition zone off Oregon, *J. Geophys. Res.*, 115, C08020, doi:10.1029/2009JC005704.
- Springer, S. R., R. M. Samelson, J. S. Allen, G. D. Egbert, A. L. Kurapov, R. N. Miller, and J. C. Kindle, 2009: A nested grid model of the Oregon Coastal Transition Zone: Simulations and comparisons with observations during the 2001 upwelling season, *J. Geophys. Res.*, 114, C02010, doi:10.1029/2008JC004863.

### **Five Other Significant Publications:**

- Kurapov, A. L., J. S. Allen, and G. D. Egbert, 2010: Combined effects of wind-driven upwelling and internal tide on the continental shelf, *J. Phys. Oceanogr.*, 40, 738-756, doi: 10.1175/2009JPO4183.1.
- Kurapov, A. L., J. S. Allen, G. D. Egbert, R. N. Miller, P. M. Kosro, M. Levine, T. Boyd, J. A. Barth, 2005: Assimilation of moored velocity data in a model of coastal wind-driven circulation off Oregon: multivariate capabilities, *J. Geophys. Res.*, 110, C10S08, doi: 10.1029/2004JC002493, (COAST Special Issue).
- Kurapov, A. L., J. S. Allen, G. D. Egbert, R. N. Miller, P. M. Kosro, M. Levine, and T. Boyd, 2005: Distant effect of assimilation of moored currents into a model of coastal wind-driven circulation off Oregon, *J. Geophys. Res.*, 110, C02022, doi: 10.1029/2003JC002195.
- Kurapov, A. L., J. S. Allen, G. D. Egbert, and R. N. Miller, 2005: Modeling bottom mixed layer variability on the mid-Oregon shelf during summer upwelling, *J. Physical Oceanogr.*, 35, 1629-1649.
- Kurapov, A. L., G. D. Egbert, J. S. Allen, R. N. Miller, S. Y. Erofeeva, and P. M. Kosro, 2003:  $M_2$  internal tide off Oregon: inferences from data assimilation, *J. Physic. Oceanogr.*, 33, 1733-1757.

### **Recent Synergistic Activities:**

2010: Program Committee, 2011 Gordon Research Conference on Coastal Ocean Modeling

2009: Naval Research Laboratory External Review Board Member

2008-2009: Guest Editor, *Dynamics of Atmospheres and Oceans*, Special Issue on Data Assimilation in Support of Coastal Ocean Observing Systems (published, vol. 48)

Chairman, NOAA CIOSS sponsored workshop on Data Assimilation in Support of Coastal Ocean Observing Systems, Oregon State University, Corvallis, OR, 3-5 April 2007

Mentor, NSF Research Experiences for Undergraduates (REU) Program, 2007, 2008, 2010

NSF panel member (Collaboration in Mathematical Geosciences Program)

Manuscript reviewer for *Journal of Physical Oceanography*, *Dynamics of Atmospheres and Ocean*, *Journal of Geophysical Research*, *Geophysical Research Letters*, *Physica D*, *Deep Sea Research*, *Int. J. for Numerical Methods in Fluids*, *Quarterly J. Royal Meteorol. Society*

### **(v) Collaborators & Other Affiliations**

(a) Collaborators:

- at COAS, OSU: J. S. Allen, J. A. Barth, H. Batchelder, G. D. Egbert, S. Y. Erofeeva, R. Holman, P. M. Kosro, R. N. Miller, T. Ozkan-Haller, R. M. Samelson, Y. Spitz, P. T. Strub,
- outside COAS: D. Foley (NOAA-CoastWatch), A. Jessup (U. Wash), L. Miller (STAR-NOAA), P. Mote (OSU), J. Newton (U. Washington, NANOOS), I. Shulman (NRL), S. Springer (ESR, Seattle)

(b) Advisors: Graduate – K. V. Rozhdestvensky (St-Petersburg Marine Technical Univ., Russia), Postdoctoral – P. F. Linden (Cambridge U., now at UCSD)

(c) Thesis Advisor and Postgraduate-Scholar Sponsor: J. Osborne (COAS, OSU)

(d) Post-doctoral associates: A. Koch (COAS, OSU), P. Yu (COAS, OSU)

## BIOGRAPHICAL SKETCH

### MURRAY DAVID LEVINE

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### Professional Preparation

University of California, Irvine	Physics	B.A.	1972
University of Washington	Physical Oceanography	Ph.D.	1979
Oregon State University	Postdoc		1978-81

### Appointments

Co-Director, Science & Technology Center for Coastal Margin Observation & Prediction (CMOP)	2008-present
Professor, College of Oceanic & Atmospheric Sciences, Oregon State University	1997-present
Associate Professor, College of Oceanography, Oregon State University	1987-1997
Assistant Professor, College of Oceanography, Oregon State University	1983-1987
Assistant Professor (Senior Research), School of Oceanography, Oregon State University	1981-1983
Research Associate/Post-Doc, School of Oceanography, Oregon State University	1978-1981

### Relevant Publications

Avicola, G.S., J.N. Moum, A.Perlin, M. Levine, Enhanced Turbulence due to the Superposition of Internal Gravity Waves and a Coastal Upwelling Jet, *J. Geophys. Res.*, 112, C06024, doi:10.1029/2006JC003831, 2007.

Dale, A.C., J. A. Barth, M. D. Levine, and J. A. Austin, Observations of mixed layer restratification by onshore surface transport following wind reversal in a coastal upwelling region, *J. Geophys. Res.*, 113, C01010, DOI:10.1029/2007JC004128, 2008.

Levine, M.D., A modification of the Garrett-Munk internal wave spectrum, *J. Phys. Oceanogr.*, 32, 3166- 3181, 2002.

Levine, M.D., and T.J. Boyd, Tidally-forced Internal Waves and OvertURNS Observed on a Slope: Results from the HOME, *J. Physical Oceanogr.*, 36, 1184-1201, 2006.

Moum, J.N., A. Perlin, J.M. Klymak, M.D. Levine, T. Boyd and P.M. Kosro, Convectively-driven mixing in the bottom boundary layer, *J. Phys. Oceanogr.*, 34, 2189-2202, 2004.

Perlin A., J. N. Moum, J. M. Klymak, M. D. Levine, T. Boyd, P. M. Kosro, A modified law-of-the-wall applied to oceanic bottom boundary layers, *J. Geophys. Res.*, 110, C10S10, doi:10.1029/2004JC002310, 2005.

**Biographical Sketch:****Parker MacCready**

7/22/2010

University of Washington, Box 355351, Seattle, WA 98195-5351 USA

Email: [parker@ocean.washington.edu](mailto:parker@ocean.washington.edu), Phone: (206) 685-9588URL: [faculty.washington.edu/pmacc](http://faculty.washington.edu/pmacc)**(a) Professional Preparation**

Yale University	Architecture	BA 1982
California Inst. Technology Eng.	Science	MS 1986
Univ. of Washington	Phys. Oceanography	PhD 1991
Univ. of Miami (postdoc)	Phys. Oceanography	1991-1993

**(b) Appointments**

2009-present	Professor	Univ. of Washington
2001-2009	Associate Professor	Univ. of Washington
1994-2001	Research Assistant Professor	Univ. of Washington
1993-1994	Research Scientist	Univ. of Washington
1991-1993	Postdoctoral Fellow	Univ. of Miami
1987-1991	Research and Teaching Assistant	Univ. of Washington
1986-1987	Research Assistant	California Inst. of Technology
1977-1985	Aeronautical Eng. Tech.	AeroVironment, Inc.

**(c.i) Publications most closely related to this proposal**

Edwards, K. A., P. MacCready, J. N. Moum, G. Pawlak, J. Klymak, and A. Perlin (2004) Form Drag and Mixing due to Tidal Flow past a Sharp Point. *J. Phys. Oceanogr.*, **34**, 1297-1312.

MacCready, P., and W. R. Geyer (2010) Advances in Estuarine Physics. *Annu. Rev. Mar. Sci.*, **2**, 35-58, doi:10.1146/annurev-marine-120308-081015.

MacCready, P., N. S. Banas, B. M. Hickey, E. P. Dever, and Y. Liu (2009) A model study of tide- and wind-induced mixing in the Columbia River Estuary and plume. *Continental Shelf Res.*, **29**, 278-291, doi:10.1016/j.csr.2008.03.015.

McCabe, R. M., P. MacCready, and B. M. Hickey (2009), Ebb-tide dynamics and spreading of large river plume, *J. Phys. Oceanogr.*, **39**, 2839-2856, doi:10.1175/2009JPO4061.1.

McCabe, R., P. MacCready, and G. Pawlak (2006) Form Drag due to Flow Separation at a Headland. *J. Phys. Oceanogr.*, **36**, 2136-2152.

Warner, S. J., and P. MacCready (2009) Dissecting the pressure field in tidal flow past a headland: When is form drag real? *J. Phys. Oceanogr.*, **39**, 2971-2984.

**(c.ii) Other Publications**

Liu, Y., P. MacCready, B. M. Hickey, E. P. Dever, P. M. Kosro, and N. S. Banas (2009), Evaluation of a coastal ocean circulation model for the Columbia River plume in summer 2004, *J. Geophys. Res.*, **114**, C00B04, doi:10.1029/2008JC004929.

MacCready, P. (2007) Estuarine Adjustment. *J. Phys. Oceanogr.*, **37**, 2133-2145.

MacCready, P. and W. R. Geyer (2001) Estuarine Salt Flux Through an Isohaline Surface. *J. Geophys. Res.*, **106**, 11629-11637.

MacCready, P. and G. Pawlak (2001) Stratified Flow along a Rough Slope: Separation Drag and Wave Drag. *J. Phys. Oceanogr.*, **31**, 2824-2839

MacCready, P., and P. B. Rhines (2001) Meridional Transport Across a Zonal Channel: Topographic Localization. *J. Phys. Oceanogr.*, **31**, 1427-1439.

**(d) Synergistic Activities**

In 2003, 2006, and 2009 Rocky Geyer (WHOI) and I co-taught a 5-week summer school at the Friday Harbor Laboratory. The class, "Estuarine & Coastal Fluid dynamics" has trained a total of 38 graduate students from around the US and internationally in the physics of shallow water flows. This intensive class (9 credits) includes field

work and a final project, and a number of guest lecturers. It provides these students with a strong cross-institutional peer group.

In 2006 David Jay (PSU) and I co-hosted the PECS (Physics of Estuaries and Coastal Seas) conference in Astoria, OR. I was the Managing Guest Editor for the special issue of *Continental Shelf Research* that resulted from this (January 2009).

I engage in a number of activities which connect my work with the public. Since 2001 I have taught an undergraduate honors class for non-scientists on coastal pollution three times, and have lectured on the class at an environmental educators conference. I have consulted for local sewage authorities, and CALFED.

**(e) Collaborators & Other Affiliations (\* = co-editor)**

John Allen (OSU)  
Neil Banas (UW/APL)  
Antonio Baptista (OHSU)  
Ken Bruland (UCSC)  
Frank Bryan (NCAR)  
Ed Dever (OSU)  
Jim Edson (UConn)  
Mike Foreman (IOS)  
Oliver Fringer (Stanford)  
Rocky Geyer (WHOI)  
Barbara Hickey (UW)  
\*David Jay (PSU)  
Andy Jessup (UW)  
Markus Jochum (NCAR\_  
Raphe Kudela (UCSC)

Evelyn Lessard (UW)  
Diane Masson (IOS)  
Stephen Monismith (Stanford)  
Jim Moum (OSU)  
Jonathan Nash (OSU)  
Jan Newton (UW/APL)  
Geno Pawlak (UH)  
Bill Peterson (OSU/NOAA)  
Jeff Richey (UW)  
Roger Samelson (OSU)  
Richard Justin Small (NCAR)  
Robert Street (Stanford)  
Eric Skyllingstad (OSU)  
Rick Thompson (IOS)  
Mike Whitney (UConn)

Graduate Advisors and Postdoctoral Sponsors

MS: Ted Y.-T. Wu (Caltech)  
PhD: Peter Rhines (UW)  
Postdoc: Bill Johns and Claes Rooth (RSMAS)

Graduate Thesis Advisor (total 3 in the last 5 years):

Wayne Martin (MS 2003, PhD 2008), Ryan McCabe (MS 2004, PhD 2007), Sally Warner (MS 2008, continuing)

Postdoctoral-scholar Sponsor (total 5):

Geno Pawlak (now at UH), Kate Edwards (now in the private sector), Neil Banas (now at UW/APL), Yonggang Liu (now at USF), Dave Sutherland (current)

## **Carol J. Falkenhayn Maloy**

Environmental Assessment Program  
Washington State Department of Ecology  
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Phone: (360) 407-6742  
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### **PROFESSIONAL PREPARATION**

University of Washington, Oceanography, Ph.D. program, 1990-1995  
Virginia Institute of Marine Science, College of William & Mary, M.S., 1990  
West Virginia University, Biology, B.A., 1984

### **PROFESSIONAL EXPERIENCE**

*Unit Supervisor*, Marine Monitoring, WA Department of Ecology 2006 - date  
Manage a staff of 16 professional scientists in Ecology's Marine Sediment, Marine Waters, and the Beach Environmental Assessment, Communication and Health Programs. Manage a biennial budget of \$3.3 million.

*Environmental Specialist*, WA Department of Ecology 2001 - 2002

*Oceanographer*, Washington Sea Grant, University of Washington 1997 - 1999

*Instructor*, Pacific Lutheran University, Tacoma Community College, and Pierce College, 1995 – 1997

*Environmental Analyst*, Sobotka & Company, Inc., Washington, D.C. 1986 – 1988

*Environmental Analyst*, Office of Policy Analysis, U.S. EPA, Wash., D.C. 1985 – 1986

### **PROFESSIONAL ACTIVITIES**

Steering Committee member for the 2011 Salish Sea Ecosystem Conference, Vancouver, B. C.; Advisory and Review Committees member for the 2009 Puget Sound Georgia Basin Ecosystem Conference, Seattle, WA; Steering Committee member for the Puget Sound Assessment and Monitoring Program (PSAMP) since 2006; Executive Committee member of the Northwest Association of Networked Ocean Observing Systems (NANOOS), since 2010; Governing Council member for NANOOS, since 2006.

### **PROFESSIONAL PUBLICATIONS/PRESENTATIONS**

Feely, R.A., S.R. Alin, J. Newton, C. L. Sabine, M. Warner, A. Devol, C. Krembs, and **C. Maloy**, 2010. [The combined effects of ocean acidification, mixing, and respiration on pH and carbonate saturation in an urbanized estuary](#), *Estuarine, Coastal and Shelf Science*, 88(4): 429-508.

**Maloy, C.**, S. Albertson, J. Bos, G. Pelletier, M. Roberts, R. McEliece, A. Stutes, and S. Hoffer. 2007. [South Puget Sound Dissolved Oxygen Study – An overview](#), Estuarine Research Federation Conference, Providence, RI, November 4-8.

**Maloy, C.**, B. Grantham, S. Albertson, J. Bos, and A. Stutes, 2007. [Long-term Monitoring of Puget Sound, Gray's Harbor and Willapa Bay: Status and Trends in Water Quality from 2001-2005](#), Puget Sound Georgia Basin Research Conference, Vancouver, B.C., March 26-29.

Newton, J.A., S.L. Albertson, K. Van Voorhis, **C. Maloy**, and E. Siegel, 2002. [Washington State Marine Water Quality, 1998 through 2000](#), Washington State Department of Ecology, Environmental Assessment Program, Publication #02-03-056, Olympia, WA. 110 pp.

**Falkenhayn, C.**, J. Newton, C. Clishe, and K. Nakata. 1999. *Nutrient Dynamics in Willapa Bay*. Pacific Estuarine Research Society Conference, Newport, OR, April 15-16.

**Falkenhayn, C.** and J. Newton. 1999. *Physical and Biological Processes in a Shallow Estuary: Characterizing Willapa Bay, WA by High-resolution Sampling*. Ocean Sciences Conference, Santa Fe, NM, February 1-5.

**Falkenhayn, C.**, C. Clishe, C. Moore, and J. Newton. 1998. *Biological and Physical Oceanographic Processes in Willapa Bay, Washington: Early Results*. Pacific Estuarine Research Society and the Northwest Algal Symposium Joint Meeting, Whidbey Island, WA, May 29-31.

Newton, J. and **C. Falkenhayn**. 1998. *Monitoring Water Conditions in Willapa Bay*. Willapa Alliance Science Conference, Ilwaco, WA, April 24.

**Falkenhayn, C.** and L. Haas. 1990. *The Dynamics of a Summer Cyanobacterial Bloom in the Chesapeake Bay*. Ocean Sciences Conference, New Orleans, LA, February 12-16.

Haas, L., **C. Falkenhayn**, and M. Sieracki. 1989. *Growth and Grazing Dynamics of Coccoid Cyanobacteria in the Lower Chesapeake Bay*. International Estuarine Research Conference, Baltimore, MD, October 8-12.



## **David L. Martin**

### **NANOOS Board Chair**

Applied Physics Laboratory  
University of Washington  
1013 NE 40<sup>th</sup> Street  
Seattle, Washington 98195

Date of Birth: 18 January 1951  
Citizenship: U.S.  
206 543 2945  
dmartin@apl.washington.edu

### **Professional Preparation**

University of Washington, Zoology, BA, 1976  
University of Washington, Oceanography, BS, 1976  
Naval Postgraduate School, Meteorology and Oceanography, M.S., 1983  
University of Washington, Oceanography, Ph.D., 1992

### **Appointments**

2002 - Associate Director, Applied Physics Laboratory, University of Washington  
2000 - 2002 Director, Ocean.US, the federal interagency program office for the IOOS  
1998 - 2000 Assistant for Environmental Sciences for the Deputy Undersecretary of Defense for Science and Technology  
1997 - 1998 Director, National Ice Center, Washington, D.C.  
1995 - 1997 Oceanographer for the Director, Expeditionary Warfare, Staff of the Chief of Naval Operations  
1992 - 1995 Director, Operational Oceanography Center, Naval Oceanographic Office  
1989 - 1992 Doctoral Student, University of Washington  
1987 - 1989 Oceanographer, Staff of the Oceanographer of the Navy  
1985 - 1987 Oceanographer, USS Missouri (BB-63)  
1983 - 1985 Director, Naval and Civil Weather Office, Agana, Guam

### **Relevant Recent Publications**

Martin, D.L., 2003, "The National Oceanographic Partnership Program, Ocean.US, and Real Movement Towards an Integrated and Sustained Ocean Observing System". *Oceanography*, **16**, 13-19.  
Ocean.US, 2002a. "An Integrated and Sustained Ocean Observing System (IOOS) for the United States: Design and Implementation". Martin, D.L., Atkinson, L., Malone, T., Nowlin, W.: Ex Com. Ocean.US, Arlington, VA. 21pp.  
Ocean.US, 2002b. "Building Consensus: Toward An Integrated and Sustained Ocean Observing System (IOOS)". Martin, D.L., Atkinson, L., Malone, T., Nowlin, W.: Executive Committee. Ocean.US, Arlington, VA. 175pp  
Martin, D.L., 2001. "Ocean.US: The National Office for Sustained and Integrated Ocean Observations". *Proceedings, Oceanology International Americas*, Miami, FL  
Martin, D.L. and S. Piotrowicz, 2001, "A U.S. Commitment to Building Ocean Partnerships and an Integrated Ocean Observing System", *Proceedings of AMS 81st Annual Conference*, Albuquerque, NM.

### **Synergistic Activities**

As Director, Ocean.US: Led the national effort involving strong connections with industry, academia, NGOs, industry and other ocean stakeholders in the newly established office charged with establishing and maintaining an integrated and sustained ocean observing system serving research, education and operational needs of the country.

As Director, National Ice Center: Acquired funds from NOAA, Navy and NASA to fund a Visiting Scientist program with funded Post Doctoral Fellows at the National Ice Center that focused on the transition of cryospheric research into operations at the nation's only operational Arctic and Antarctic sea ice analysis and forecasting center.

## BIOGRAPHICAL SKETCH EMILIO MAYORGA

**Address:** Applied Physics Laboratory, University of Washington  
1013 NE 40th St., Seattle, WA 98105-6698  
Tel: (206)-543-6431, mayorga@apl.washington.edu

### (a) Professional Preparation

Massachusetts Institute of Technology	Environmental Engineering Science	B.S., 1992
University of Washington	Chemical Oceanography	M.S., 1997
University of Washington	Chemical Oceanography	Ph.D., 2004
Rutgers University	Global River Nutrient Exports	2007-2008

### (b) Appointments

**Oceanographer 4**, Jan. 2009 – present, Applied Physics Laboratory, University of Washington, Seattle, WA, USA.

**Research Associate**, Jan. 2007 – Dec. 2008, Institute of Marine & Coastal Sciences, Rutgers University, New Brunswick, NJ, USA.

**Principal GIS Analyst**, Sept. 2001 – Dec. 2006, Surface Water Management, Snohomish County, Everett, WA, USA.

**Research Assistant**, 1993-2001, School of Oceanography, University of Washington.

### (c) Publications – Five most closely related to this project

**Mayorga, E.**, T. Tanner, R. Blair, A.V. Jaramillo, N. Lederer, C.M. Risien and C. Seaton. 2010. The NANOOS Visualization System (NVS): Lessons learned in data aggregation, management and reuse, for a user application. *Proc. MTS/IEEE Oceans'10*.

**Mayorga, E.**, S.P. Seitzinger, J.A. Harrison, E. Dumont, A.H.W. Beusen, A.F. Bouwman, B. Fekete, C. Kroeze, G. Van Drecht. 2010. Global Nutrient Export from WaterSheds 2 (NEWS 2): Model development and implementation. *Environmental Modelling & Software* 25: 837-853, doi:10.1016/j.envsoft.2010.01.007.

Risien, C.M., J.C. Allan, R. Blair, A.V. Jaramillo, D. Jones, P.M. Kosro, D. Martin, **E. Mayorga**, J.A. Newton, T. Tanner and S.A. Uczekaj. 2009. The NANOOS Visualization System: Aggregating, displaying and serving data. *Proc. MTS/IEEE Oceans'09*.

**Mayorga, E.**, M.G. Logsdon, M.V.R. Ballester and J.E. Richey. 2005. Extracting cell-to-cell land surface drainage paths from digital channel networks, with an application to the Amazon basin. *Journal of Hydrology* 315: 167-182.

Ballester, M.V., D.C. Victoria, A.V. Krusche, R. Coburn, R.L. Victoria, J.E. Richey, M.G. Logsdon, **E. Mayorga** and E. Matricardi. 2003. A Remote Sensing / GIS-based physical template to understand the biogeochemistry of the Ji-Paraná river basin (Western Amazonia). *Remote Sensing of Environment* 87: 429-445.

### Five Other Significant Publications or Presentations

**Mayorga, E.**, D. Jones and R. Blair. 2010. Regional to local IOOS data management and interoperability: Perspective from the trenches (NANOOS, US Pacific NW). *2010 Ocean Sciences Meeting, Portland, OR, 22-26 Feb.*

Seitzinger, S., **E. Mayorga**, A.F. Bouwman, C. Kroeze, A.H.W. Beusen, G. Billen, G. Van Drecht, E. Dumont, B.M. Fekete, J. Garnier and J.A. Harrison. 2010. Global nutrient river export: A scenario analysis of past and future trends. *Global Biogeochemical Cycles* 24:

GB0A08, doi:10.1029/2009GB003587.

Glibert, P.M., **E. Mayorga** and S. Seitzinger. 2008. *Prorocentrum minimum* tracks anthropogenic nitrogen and phosphorus inputs on a global basis: application of spatially explicit nutrient export models. *Harmful Algae* 8: 33-38.

**Mayorga, E.** 2008. Carbon cycle – Harvest of the century. *Nature* 451: 405-406.

**Mayorga, E.**, A.K. Aufdenkampe, C.A. Masiello, A.V. Krusche, J.I. Hedges, P.D. Quay, J.E. Richey and T.A. Brown. 2005. Young organic matter as a source of carbon dioxide outgassing from Amazonian rivers. *Nature* 436: 538-541.

#### **(d) Synergistic Activities**

**Reviewer.** *Biogeochemistry, Biogeosciences, Ecosystems, Global Biogeochemical Cycles, Hydrological Processes, Limnology and Oceanography, National Science Foundation proposals, National Air and Space Administration panel reviewer, Nature.*

**Member.** American Geophysical Union (AGU), American Society of Limnology and Oceanography (ASLO), Ecological Society of America (ESA), Washington Urban and Regional Information Systems Association (WAURISA)

#### **Working Group Participation.**

*Global Nutrient Export from Watersheds* (Global NEWS – UNESCO's Intergovernmental Oceanographic Commission), 2007 – present.

*Zooplankton Data and Information Infrastructure for the California Current Large Marine Ecosystem (CCLME)*. Scripps Institution of Oceanography La Jolla, CA, 2009.

*Washington Dept. of Fish & Wildlife (WDFW) State Habitat Work Schedule Database* Technical Advisory Committee (salmon conservation and habitat restoration projects), 2006.  
*Merging terrestrial and aquatic perspectives of biogeochemistry*, National Center for Ecological Analysis and Synthesis (NCEAS), 1999 – 2002.

**Environmental Informatics Involvement.** *EPA Network Exchange (Pacific NW Water Quality Data Exchange), Ocean Biogeographic Information System (OBIS), Geochemical Earth Reference Model (GERM), US Integrated Ocean Observing System.*

#### **(e) Collaborators & Other Affiliations**

##### **Collaborators and Co-Editors in the last 48 months**

Anthony Aufdenkampe	Stroud Water Research Center, Avondale, PA
Lex Bouwman	Environmental Assessment Agency (MNP), The Netherlands
Jeremy Cothran	University of South Carolina, Columbia, SC
Balazs Fekete	The City College of New York (CCNY/CUNY), New York, NY
Philip Goldstein	OBIS-USA and University of Colorado, Boulder, CO
John Harrison	Washington State University, Vancouver, WA
David Jones	Applied Physics Lab., University of Washington, Seattle, WA
Albert Kettner	University of Colorado, Boulder, CO
Carolien Kroeze	University of Wageningen, The Netherlands
Alex E. Krusche	Centro de Energia Nuclear na Agricultura (CENA), Brazil
Kon-Kee Liu	National Central University, Taiwan
Jan Newton	Applied Physics Lab., University of Washington, Seattle, WA

##### **Graduate and Postdoctoral Advisors**

Jeffrey E. Richey	M.S. & Ph.D. Advisor	University of Washington, Seattle, WA
Allan Devol	M.S. Co-advisor	University of Washington, Seattle, WA
John I. Hedges	Ph.D. Co-advisor	University of Washington, Seattle, WA
Paul Quay	Ph.D. Co-advisor	University of Washington, Seattle, WA
Sybil Seitzinger	Postdoctoral Supervisor	Rutgers University, New Brunswick, NJ

## BIOGRAPHIC SKETCH

**Bruce A. Menge** (Department of Zoology, Oregon State University, Corvallis, Oregon 97331-2914)

- Education:** B.A. 1965 University of Minnesota, Minneapolis (Zoology)  
Ph.D. 1970 University of Washington, Seattle (Zoology)  
Postdoctoral Fellow 1970-71 Univ. of California, Santa Barbara (Biological Sciences)
- Positions:** 2008- Chairperson, Zoology Department, Oregon State University  
2005- OSU Distinguished Professor of Marine Biology (Zoology)  
1995- Wayne and Gladys Valley Professor of Marine Biology (Zoology)  
1985-95 Professor, Oregon State University (Zoology)  
1979-85 Assoc. Prof., Oregon State University (Zoology)  
1978-83 Research Associate, Smithsonian Tropical Research Inst., Panama  
1976-79 Asst. Prof., Oregon State University (Zoology)  
1971-76 Asst. Prof., University of Massachusetts Boston (Biology)

### **PUBLICATIONS: (five most closely related to project)**

- 2004 Grantham, B. A., F. T. Chan, K. J. Nielsen, D. Fox, J. Barth, A. Huyer, J. Lubchenco, and B. A. Menge. Upwelling-driven nearshore hypoxia signals ecosystem and oceanographic changes in the northeast Pacific. *Nature* 429:749-754.
- 2008 Menge, B. A., F. Chan, and J. Lubchenco. Response of a community dominant to climate patterns in rocky intertidal ecosystems. *Ecology Letters* 11:151-162.
- 2008 Chan, F., J. A. Barth, J. Lubchenco, A. Kirincich, H. Weeks, W. T. Peterson and B. A. Menge. Novel emergence of anoxia in the California Current System. *Science* 319: 920.
- 2008 Broitman, B., C. Blanchette, B. A. Menge, J. Lubchenco, P. A. Raimondi, C. Krenz, M. Foley, D. Lohse and S. D. Gaines. Spatial and temporal patterns of recruitment of intertidal invertebrates along the U.S. West coast. *Ecological Monographs* 78:403-421.
- 2009 Menge, B. A., F. Chan, K. J. Nielsen, E. Di Lorenzo and J. Lubchenco. Climatic variation alters supply-side ecology: impact of climate patterns on mussel recruitment. *Ecological Monographs* 79:379-395 (with cover photo).

### **PUBLICATIONS: (five additional)**

- 2005 Menge, B. A., G. W. Allison, C. A. Blanchette, T. M. Farrell, A. M. Olson, T. Turner, and P. van Tamelen. Stasis or kinesis? Hidden dynamics of a rocky intertidal macrophyte mosaic revealed by a spatially-explicit approach. *Journal of Experimental Marine Biology and Ecology* 314:3-39. (Invited, as first *Monograph in Experimental Marine Biology and Ecology*)
- 2005 Kirincich, A. R., J. A. Barth, B. A. Grantham, J. Lubchenco and B. A. Menge. Wind-driven inner-shelf circulation off central Oregon during summer. *Journal of Geophysical Research* 110: C10S03, doi:10.1029/2004JC002611, 2005.
- 2007 Barth, J. A., B. A. Menge, J. Lubchenco, F. Chan, J. M. Bane, A. R. Kirincich, M. A. McManus, K. J. Nielsen, S. D. Pierce, and L. Washburn. Delayed upwelling alters nearshore coastal ocean ecosystems in the northern California Current. *Proceedings of the National Academy of Sciences, USA* 104: 3719-3724.
- 2009 Tapia, F., S.A. Navarrete, M. Castillo, B.A. Menge, J.C. Castilla, J. Largier, E.A. Wieters, B.R. Broitman, J. Barth. Small-scale indices of upwelling-driven thermal variation in inner-shelf environments. *Progress in Oceanography* 83:278-287.
- 2010 Gouhier, T., F. Guichard, and B. A. Menge. Ecological processes can synchronize marine population dynamics over continental scales. *Proceedings of the National Academy of Science, USA* 107:8281-8286.

### **Synergistic Activities:**

*Conceptual advancement and integration:* (1) Co-developer (with the late J. Sutherland and A. Olson) of environmental stress models of community regulation (see Menge and Sutherland 1987 *American Naturalist*, Menge and Olson 1990 *TREE*). (2) ICORUMBA (International Consortium for Research on

Upwelling Marine Biogeographic Areas): Co-establisher of a network of marine ecologists at OSU (J. Lubchenco co-leader), UCSB (S. Gaines PI), Pontificia Univ. Catolica (Santiago, Chile; S. Navarrete, J. C. Castilla co PIs), Univ. of Canterbury (Christchurch, NZ; D. Schiel PI), and Univ. of CapeTown (G. Branch, PI) with the goal of training students and postdocs in studies of marine ecosystem dynamics in nearshore upwelling regions (see <http://intertidalweb.org>). (3) PISCO (Partnership for Interdisciplinary Studies of Coastal Oceans): Co-Lead PI in the establishment of a large-scale (US West Coast), long-term ecological consortium including OSU (J. Barth co-PI), UCSB (S. Gaines, R. Warner, L. Washburn, G. Hofmann co-PIs), UCSC (M. Carr, P. Raimondi, M. McManus co-PIs), and HMS, Stanford Univ. (M. Denny, S. Palumbi co-PIs). Goals are understanding nearshore ecosystem dynamics in the California Current system; development of scientific basis for marine reserves; training students and postdocs skilled in interdisciplinary study of marine ecosystem dynamics and marine conservation; rapid transference of knowledge to management and policymakers; networking with NGOs, agencies, and other organizations sharing similar goals (see <http://www.piscoweb.org>).

*Technique development:* Developed a technique to quantify rates of recruitment of mussels, now in use worldwide (US East and West coasts, Chile, New Zealand; see Menge et al. 1994 Ecol. Monogr.)

*Professional service:* (1) Active reviewer for ESA journals, Ecology Letters, American Naturalist, Limnology & Oceanography, Oikos, Ecosystems, Sea Grant, NSF, Binational Science Foundation, Biological Bulletin, JEMBE, MEPS. (2) Member of NCEAS Science Advisory Board, 2003-2006. (3) Science Advisory Board, Schmidt Vessel Research Institute, 2009-present.

*Fostering diversity:* Mentor of 16 undergraduate researchers, including 7 OSU Honors College students (one male, 6 females), and 59 research interns (39 women, 20 men over past 3 yr).

**Recent Collaborators** (in addition to recent graduate students and postdocs; see also coauthors of publications and list under Synergistic Activities): Jack Barth (Oregon State University), Elizabeth Dahlhoff (Santa Clara University), Brian Helmuth (University of South Carolina), Gretchen Hofmann (UCSB), Mike Kosro (OSU), David Schiel (University of Canterbury, Christchurch, NZ), Eric Berlow (UC Merced), Carol Blanchette (UCSB), Steve Gaines (UCSB), Bob Warner (UCSB), Libe Washburn (UCSB), Bernardo Broitman (NCEAS), Mark Carr (UCSC), Pete Raimondi (UCSC), Margaret McManus (Univ. of Hawaii), Jane Lubchenco (OSU), Francis Chan (OSU), Sergio Navarrete (Catholic Univ., Santiago, Chile), Ricardo Letelier (OSU), Brian Grantham (Ontario Ministry of Natural Resources), Dave Fox (Oregon Dept. of Fish and Wildlife), Sally Hacker (OSU), Karina Nielsen (Sonoma State Univ).

**Advisors:** Robert T. Paine, Department of Zoology, University of Washington, Seattle, WA 98195 (Ph.D.); Joseph H. Connell, William Murdoch, Department of Biological Sciences, University of California, Santa Barbara, CA 93106 (Postdoctoral)

**Research Training Program:** 7 Ph.D.'s, 7 postdocs during 2005-2010; Current: 9 graduate students, 2 postdoctoral fellows.

**Ph. D. Advisees** (current location)[29 total, 1980-2010]: **2002** Tess Freidenburg (CSU Hayward); **2003** Matt Bracken (UC Davis then Northeastern U.); **2004** Heather Leslie (Brown U.); **2005** Roland Russell (Columbia Univ.); **2006** Anne Guerry (NMFS, Seattle); **2006** Elise Granek (Portland State Univ., Portland, OR); **2007** Christopher Krenz (OCEANA Foundation, Juneau); **2007** Laura Petes (Florida State U.); **2007** Anthony Kirincich (WHOI); **2009** Luis Vinuesa (Univ. of San Francisco, Quito, Ecuador). Current (all at OSU) – Joe Tyburczy, Dafne Eerkes-Medrano, Margo Hensing-Lewis, Jeremy Rose, Alison Iles, Sarah Close, Liz Cerny-Chipman, Chenchen Shen, Allison Barner (24 with Graduate Fellowships include 11 NSF GRFs, 4 NSERC GRFs, 4 Fulbright GRFs, 1 Ford Foundation GRF, 2 AAUW Dissertation Fellows, 1 NERR GRF, and 1 EPA STAR GRF).

**Postdoctoral Fellows** (since 2005; 17 total): **2005-2008** Gil Rilov (Ph. D., Tel Aviv U.; Israel Inst. of Limnol. and Oceanogr.); **2005-2009** Sarah Dudas (Ph. D., U. Victoria, BC; Univ. of Victoria); **2007-pres.** Kirsten Grorud-Colvert (Ph.D., Univ of Miami); **2010-pres.** Tarik Gouhier (Ph. D., McGill Univ, Montreal).

## EDUCATION

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M.S. June 2009. Marine Resource Management: Outreach and Education. College of Oceanic and Atmospheric Sciences. Oregon State University.

Thesis: *Development And Evaluation Of An Interactive Exhibit To Support Real-Time Water Quality Data Interpretation By The Public At An Informal Education Setting.* Advisors: Dr. Shawn Rowe, Nancee Hunter

Relevant Coursework:

Physical Oceanography	Research and Evaluation	Qualitative Analysis in Social Science
Biological Oceanography	Communicating Ocean Sciences	Environmental Sociology
Geological Oceanography	Environmental Interpretation	Ecology and Management of Marine Fishes
Chemical Oceanography	Overview of Free-Choice Learning	Principles and Practices of Marine Resource Management
		Coastal Law

B.S. May 2005. Biology Program: Marine and Freshwater Biology. College of Life Sciences and Agriculture. University of New Hampshire. Cum Laude.

Senior Project: *Effects of Cultch Type on Predatory Crab Abundances on Constructed Oyster Reefs.* Advisor: Dr. Ray Grizzle

## SCIENCE COMMUNICATION & EVALUATION

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Feb 2010-present

**Northwest Association of Networked Ocean Observing Systems (NANOOS) Informal Education Specialist**

University of Washington  
Portland, OR

Designed and created theme page web content based on information gathered from scientists  
Performed general networking and outreach activities at conferences and meetings attended by end-users  
Participated in monthly conference calls with the National Federation of Research Associations for Ocean Observing Education and Outreach Subcommittee

Exhibit: *Eyes On The Sound: Port Townsend*

Designed a modular, interactive computer exhibit for Port Townsend Marine Science Center using oceanographic data to explain seasonal changes in temperature, salinity, dissolved oxygen, and chlorophyll

Nov 2009-Dec 2009

**Science Communication Specialist**

WET Labs, Inc.  
Philomath, OR

Contracted to update research webpage on WET Labs' website with organization and written content  
Compiled presentations, posters, abstracts, and other information from researchers to develop content  
Assessed and assimilated the goals and expectations the researchers have for the new webpage

July 2009-Sept 2009

**NANOOS Informal Education Specialist**

Oregon State University  
Corvallis, OR

Participated in monthly conference calls with the National Federation of Research Associations for Ocean Observing Education and Outreach Subcommittee

Exhibit: *Where has the oxygen gone?*

Designed and developed interpretive text and cartoon animations for a web-based exhibit about coastal and estuarine hypoxia in the Pacific Northwest

Sept 2008-June 2009

**Graduate Research Assistant**

Oregon State University  
Corvallis, OR

Exhibit: *Rhythms Of Our Coastal Waters: Yaquina Bay*

Conducted formative evaluation (unobtrusive observations and interviews) of exhibit at the Hatfield Marine Science Center Visitors Center (HMSC VC)

Modified design and content of an interactive computer exhibit for estuarine water data

Analyzed findings of talk, time, and activity engaged with using quantitative (Chi-square) and qualitative methods to determine the quality of a group's interaction with the exhibit

Exhibit located online: [http://www.nanoos.org/education/learning\\_tools/lobo/lobo\\_exhibit.php](http://www.nanoos.org/education/learning_tools/lobo/lobo_exhibit.php)

Oct 2007-Sept 2008

**Graduate Research Intern**

WET Labs, Inc.  
Philomath, OR

Exhibit: *Rhythms Of Our Coastal Waters: Yaquina Bay*

Designed and developed interpretive text and an interactive computer exhibit for estuarine water data

Conducted front-end evaluation on the first exhibit version at the HMSC VC

## TEACHING

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June-July 2008

**Teaching Assistant**

Oregon State University  
Corvallis, OR

*Marine Science: Principles, Process and Significance*

Developed and presented hands-on lab activities to explain physical oceanography concepts for students who were incoming college freshmen from underserved communities

June-Aug 2007

**Marine Biology and Farm Camp Unit Director**

YMCA Camp Orkila  
Eastsound, WA

Trained, supervised, and managed counselor staff in a small unit of summer camp

Scheduled and prepared camper field, lab, and trip activities each week

Maintained safe and camp appropriate environment for campers and staff

Mar-June 2007

**Outdoor Environmental Educator**

YMCA Camp Orkila  
Eastsound, WA

Taught prepared ecology and challenge course programs to school groups (5<sup>th</sup>-8<sup>th</sup> grade)

Jan-Dec 2006

**AmeriCorps Member: Environmental Educator**

Save The Bay, Inc.  
Providence, RI

Taught prepared marine education programs primarily to low income children (pre-K-12)

Created several education materials and visual aids to facilitate scientific understanding

Collaborated on creating and running a 7-8 week curriculum for fifth grade classes in two local schools and several after-school programs with local Boys and Girls Clubs

Aug-Dec 2004

**Undergraduate Teaching Assistant**

University of New Hampshire  
Durham, NH

*Field Limnology*

Assisted students with data collection, organization and graphing techniques

Prepared equipment for field trips, general support to students and instructors when needed

Aug 2002-May 2003

**Peer Led Team Learning  
Chemistry Group Leader**

University of New Hampshire  
Durham, NH

Introduced activities that reinforce ideas from lecture to a small group of general chemistry students

Led group in discussions about activities and explained concepts if necessary

## SCIENCE RESEARCH

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Jan 2007-Mar 2007

**Research Aide I**

University of Washington  
Friday Harbor, WA

Project: *Long-term Subtidal Benthic Ecology Monitoring in the Gulf of Maine*

Performed data management and quality assurance/quality control

Sept 2005-Dec 2005

**Research Apprentice**

University of Washington  
Friday Harbor, WA

Apprenticeship: *Pelagic Ecosystem Function in the San Juan Archipelago*

Collected data of physical and biological processes to observe spatial and temporal variations  
Investigated water origin and movement using salinity and temperature patterns

May 2005-Sept 2005                      **Field Research Assistant  
and Lab Technician**                      University of New Hampshire  
Durham, NH

Project: *Trematode Infection as a Bioindicator of New England Saltmarsh Ecosystem Function*

Field collection of mud snails, sediment and chlorophyll cores, and fish using minnow traps and a fyke net  
Preserved, processed and identified annelids in sediment cores to family

May 2004-Feb 2005                      **Undergraduate Primary Investigator**                      University of New Hampshire  
Durham, NH

Project: *An Investigation of Factors That Affect Predation on New Hampshire Oyster Reefs*

Independent UNH Summer Undergraduate Research Fellowship Program project

Wrote research proposal and budget and co-wrote the experimental design

Supervised and organized sampling schedule and lab technicians

Processed and identified live samples to species

Sept 2003-May 2005                      **Undergraduate Lab Technician**                      University of New Hampshire  
Durham, NH

Projects:

*New Hampshire Oyster Reef Restoration (Summer 2004)*

Assisted with field monitoring: counting and measuring oysters, video recording of reefs

Assisted with monitoring oyster spat growth and density

*Surface Water Monitoring Program for Great Bay, NH (Summer 2004)*

Assisted with monthly collections and processing of surface water samples and data

*Coastal New Hampshire Marine Invertebrate Monitoring (2003-2005)*

Collected, preserved and processed samples by identifying preserved samples to family or species

Samples: Eelgrass bed and off-shore soft sediment cores, fish cage biofouling quadrats

June 2003-Aug 2003                      **Field Research Assistant**                      University of New Hampshire  
Bartlett, NH

Project: *New Hampshire Stream Bio-monitoring*

Quantified several physical characteristics of the stream bed along a transect line

Collected riparian parameters and several biological samples (kick-net, periphyton, and electroshocking)

## PUBLICATIONS

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Mikulak, S.E. 2005. Spatial and Tidal Differences of Temperature and Salinity Patterns in the San Juan Archipelago, WA. *Pelagic Ecosystem Function of the San Juan Archipelago Class Papers, Fall 2005*. Friday Harbor Laboratories Stacks.

Mikulak, S.E. 2005. A Story About Critters that Dine On New Hampshire Oysters. *Inquiry* (University of New Hampshire's Journal of Undergraduate Research). <http://www.unh.edu/inquiryjournal/05/articles/mikulak.htm>

## PRESENTATIONS (CONFERENCE, SYMPOSIUM, AND WORKSHOP)

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Simoniello, C., L. Spence, S. Mikulak, S. Stewart, and J. Dorton. *The U.S. Integrated Ocean Observing System: Eyes on the Ocean, Hands-On Learning*. National Marine Educators Association Conference. July 2010. Gatlinburg, TN.

Mikulak, S., and A. Sprenger. *Hypoxia in Oregon and Washington: Using Data to Understand the "Dead Zones"*. **Oral Presentation**. Northwest Aquatic and Marine Educators Conference. July 2010. Florence, OR.



- McDonnell, J., C. Parsons, S. Lichtenwalner, H. Clark, R. Lyons, L. Bovitz, C. Ripberger, S. Mikulak. *Building Effective Partnerships Among Scientists, Educators and Informal Science Institutions*. **Oral Presentation**. Ocean Sciences Meeting. February 2010. Portland, OR.
- Mikulak, S., S. Rowe, N. Hunter, C. Orrico. *Ocean Observing Data and Science Center Visitors: Creating Motivation and Relevance*. **Poster Presentation**. Ocean Sciences Meeting. February 2010. Portland, OR.
- Mikulak, S., C. Orrico, S. Rowe, and N. Hunter. *A Partnership Model of How to Develop an Interactive Exhibit to Present Real-Time, Estuarine Water Quality Data to the Public in an Informal Education Setting*. **Oral Presentation**. Coastal and Estuarine Research Federation Conference. November 2009. Portland, OR.
- Sprenger, A. and S. Mikulak. *What Can We Learn from Buoys, Boats, Gliders and Satellites*. **Oral Presentation**. Northwest Aquatic and Marine Educators Conference. July 2009. Vancouver, British Columbia, Canada.
- Mikulak, S. *Educational Outreach in Ocean Observing*. **Invited Oral Presentation**. College of Oceanic and Atmospheric Sciences 50<sup>th</sup> Anniversary Symposium. July 2009. Oregon State University. Corvallis, OR.
- Mikulak, S., S. Rowe, N. Hunter, and C. Orrico. *Rhythms of Our Coastal Waters: How I made graphs of salinity fun and educational for the visitors at HMSC Visitors Center*. **Oral Presentation**. Hatfield Marine Science Center Markham Marine Science Research Symposium. June 2009. Newport, OR.
- Mikulak, S. *Real-time data lesson plans: using data from the Land-Ocean Biogeochemical Observatory System*. **Workshop presentation**. Using Real-time Scientific Data in the Classroom Workshop hosted by Oregon Sea Grant for informal and formal educators. February 2009. Hatfield Marine Science Center, Newport, OR.
- Mikulak, S. *Rhythms of Our Coastal Waters: Using near real-time data to develop Yaquina Bay's oceanographic story for the general public through an interactive exhibit*. **Oral Presentation**. COAS (College of Oceanic and Atmospheric Sciences) Student Seminar Series. January 2009. Oregon State University, Corvallis, OR.
- Mikulak, S., N. Hunter, S. Rowe, and C. Orrico. *Rhythms Of Our Coastal Waters: Developing Yaquina Bay's oceanographic story through an interactive exhibit using near-real time data*. **Poster Presentation**. Hatfield Marine Science Center Markham Marine Science Research Symposium. June 2008. Newport, OR.
- Mikulak, S., C. Orrico, S. Rowe, and N. Hunter. *Rhythms Of Our Coastal Waters: Using estuarine real-time data in a marine science center exhibit in Newport, OR*. **Oral Presentation**. Ocean Sciences Meeting. March 2008. Orlando, FL.
- Mikulak, S. *Spatial and Tidal Differences of Temperature and Salinity Patterns in the San Juan Archipelago, WA*. **Oral Presentation**. Friday Harbor Laboratories Research Apprenticeship Symposium. December 2005. Friday Harbor, WA.
- Mikulak, S., J. Greene, and R. Grizzle. *Effects of Cultch Type on Predatory Crab Abundances on Constructed Oyster Reefs*. **Poster Presentation**. College of Life Sciences and Agriculture Undergraduate Research Conference. April 2005. Durham, NH.
- Mikulak, S., J. Greene, and R. Grizzle. *Effects of Cultch Type on Predatory Crab Abundances on Constructed Oyster Reefs*. **Poster Presentation**. National Shellfisheries Association. April 2005. Philadelphia, PA.

#### GRANTS AND HONORS

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- Curtis and Isabella Holt Education Fund (Hatfield Marine Science Center). 2008-2009. Rhythms Of Our Coastal Waters: Developing Yaquina Bay's oceanographic story through an interactive exhibit using near-real time data. \$6,000
- University of New Hampshire Undergraduate Research Opportunities Program (UROP) Summer Undergraduate Research Fellowship (SURF). 2004. An Investigation of Factors That Affect Predation on New Hampshire Oyster Reefs. \$400

#### VOLUNTEER WORK

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Apr 2008 & 2009	<b>Module Educator</b>	The Science and Math Investigative Learning Experiences (SMILE) Program Oregon State University
Feb 2008 & 2009	<b>Support Assistant</b> <b>Rules Judge</b>	Regional National Ocean Sciences Bowl Challenge Oregon State University
Apr-Oct 2006	<b>Citizen Water Quality Monitor</b>	Watershed Watch Program University of Rhode Island

#### SKILLS AND CERTIFICATES

Computer: Microsoft Office, Excel (dataset management), Sigmaplot (graphing), SPSS (statistics)  
Completed the Collaborative Institutional Training Initiative (CITI) Human Research Curriculum through the Oregon State University Institutional Review Board (IRB)  
Northeastern and Northwestern U.S. marine invertebrate identification  
Boating experience as a field technician, educator and deckhand on various research vessels and small boats  
Field sampling techniques: various water and benthic sampling in several ecosystems

## BIOGRAPHICAL SKETCH

### Kristen L. Milligan

Department of Zoology  
3029 Cordley Hall  
Corvallis, Oregon 97331

[Kristen.Milligan@science.oregonstate.edu](mailto:Kristen.Milligan@science.oregonstate.edu)

541-737-8862 (phone)

514-737-3360 (fax)

### A. PROFESSIONAL PREPARATION

The Evergreen State College, Washington, B.Sc., 1992.  
University of British Columbia, Botany Department, Ph.D., 1998.

### B. APPOINTMENTS

Program Coordinator, Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO). 2004-present.  
Assistant Professor (Senior Research), Zoology, OSU, 2010-Present.  
Research Associate, Zoology, OSU, 2009- 2010.  
Faculty Research Associate, Zoology, OSU, 2004-2009.  
Science Director, Clean Ocean Action non-profit organization, New Jersey, 1999-2004.

### C. PUBLICATIONS

#### *Related to Proposed Project*

- Milligan, K.L.D. and DeWreede, R.E. 2004. Morphological variations do not effectively reduce drag forces at high wave exposure for the macroalgal species, *Hedophyllum sessile* (Laminariales, Phaeophyta). *Phycologia*. 43(3): 236-244.
- Kowalchuk, L.A. and Milligan K. 2002. Comparative Summary of Selected Contaminated Sediment Assessment Programs in the United States. In: Pederson, J. and E. Adams (eds). *Proceedings from the conference on dredged material management: Options and environmental concerns*. Cambridge, Massachusetts.
- Scroggins, R., Berry, W., Hoke, B., Milligan, K., Morrissey, D., Porebski, L. 2001. Regulatory Applications of Porewater Toxicity Testing. In: Carr, R.S. and M. Nipper (eds). *Porewater Toxicity Testing: Biological, Chemical and Ecological Considerations. Methods, Applications and Recommendations for Future Areas of Research, A Summary of a SETAC Technical Workshop*. Society of Environmental Toxicology and Chemistry (SETAC) press: Pensacola, Florida.
- Milligan, K.L.D. and DeWreede, R.E. 2000. Variations in holdfast attachment mechanics with developmental stage, substratum-type, season, and wave-exposure for the intertidal kelp species *Hedophyllum sessile* (C.Agardh) Setchell. *J. Exp. Mar. Biol. Ecol.* 254(2):189-209.
- Milligan, K.L.D., Levings, C.D., DeWreede, R. 1999. Data compilation and preliminary time series analysis of abundance of a dominant intertidal kelp species in relation to the 1997/1998 El Niño event. *Proceedings of the 1998 Science Board Symposium on the Impacts of the 1997/1998 El Niño Event on the North Pacific Ocean and its Marginal Seas*, PICES scientific reports, No. 10. 110pp.

#### *5 Other Publications*

- Milligan, K.L. (Managing Editor), Airame, S (Coordinator), Riley (Coordinator), Saarman (Coordinator), Taylor, P.H. (Senior Editor and Writer), Pessino (Graphics). 2007, 2008, 2009. *PISCO Coastal Connections*. Volumes 4, 5, and 6.
- Drewes, F.W. and Milligan, K.L.D. 2003. *How to Study Science*. 4<sup>th</sup> edition. McGraw-Hill Publishers, Dubuque, IA. 121 pp.

- Milligan, K.L.D. 1998. *Effects of wave-exposure on an intertidal kelp species Hedophyllum sessile (C. Agardh) Setchell: Demographics and Biomechanics*. Ph.D. Thesis. University of British Columbia: Vancouver, British Columbia. 201 pp.
- DeWreede, R.E., Collados-Vidas, L, Milligan, K.L.D. 1998. Habitat-related biomechanical properties of *Udotea* spp. *Phycologia*, 37: 443-449.
- Milligan, K. L. D. and Cospes, E.M. 1994. Isolation of virus capable of lysing the Brown Tide microalga, *Aureococcus anophagefferens*. *Science* 266: 805-807.

#### **D. SYNERGISTIC ACTIVITIES AND HONORS**

- **Science planning:** Overall coordination of PISCO consortium and related activities with major partners and collaborative projects, including PISCO meetings (15-30 Principal Investigators and Lead Staff from four campuses; 1 or 2 meetings per year) and Advisory Committee meetings (10-12 Advisors; approximately 1 meeting per year); PISCO campuses are OSU, UCSB, UCSC, Stanford University; (2004-present). AAAS annual meeting special session organizer, “Strange Days on Planet Ocean: New Insights on the Impacts of Climate Change” (2008).
- **Program leadership:** Co-organizer for major strategic planning initiative for PISCO (2008-present). Lead organizer for central PISCO activities and reports to primary funders, David and Lucile Packard and Gordon and Betty Moore Foundations (2004 to present). Co-director of water quality and sediment review programs for regional non-profit consortium, Clean Ocean Action, of >50 organizations (2000-2004).
- **Input to ocean policy:** Principal Investigator on ODFW-OSU collaborative awards to monitor pilot marine reserves in Oregon (2010). Member of USEPA Reg II/Army Corps NYD “Historic Area Remediation Site” Scientific Review Panel and Remediation Material Workgroup (2000-2004). Invited presentation to EPA external peer review of engineering standards for remedial dredging at the PCB Superfund Site in the Upper Hudson River (2003). New Jersey State Task Force member on artificial reefs (2001). Invited presentation to Pew Oceans Commission (pollution committee) on sediment contamination in the nation’s waters (2001). Testimony to US Congressional Subcommittee on Fisheries, Conservation, Oceans and Wildlife on impacts of dredged material disposal in the ocean (2000).
- **Service to scientific community:** Member of the planning committee for the COMPASS California Current Ecosystem Based Management Initiative (2008). Reviewer for Massachusetts Sea Grant (1999 to 2000).
- **Outreach:** Co-organizer of scientific-fishing community exchanges about hypoxia in Pacific Northwest (2009-present). Work with >10 staff from 3 campuses (OSU, UCSC, UCSB) to redevelop PISCO website and data access portals (2009-present). PISCO Communications Training co-organizer, with staff and SeaWeb/COMPASS (2006). Member of Surfrider Foundation Environmental Issues team (1999-present). American Littoral Society field trip leader for Alaska programs (2001).
- **Christensen Award** for best paper in *Phycologia* during 2004. *Phycologia* 43(3): 236-244.

#### **E. COLLABORATORS & OTHER AFFILIATIONS**

Collaborators within past 5 years on awards: Carr (UCSC), Chan (OSU), Donnellan (ODFW) Gaines (UCSB), Lubchenco (OSU), Menge (OSU).

Graduate Advisor: Robert DeWreede

Joseph Needoba  
Department of Science & Engineering, School of Medicine, Oregon Health & Science  
University, 20000 NW Walker Rd., Beaverton, OR  
Tel. (503) 748-1197, Email: needobaj@ohsu.edu

### **Professional Preparation**

Ph.D., (Botany) University of British Columbia, Vancouver, B.C. Canada 2003  
B.Sc., (Oceanography and Biology, Honors), University of British Columbia 1997

### **Appointments**

Assistant Professor, Oregon Health & Science University 2007-present  
Affiliate Scientist, NSF Center for Coastal Margin Observation & Prediction 2007-present  
Collaborative Researcher, Monterey Bay Aquarium Research Institute 2007-present  
Postdoctoral Fellow, Monterey Bay Aquarium Research Institute 2004-2007  
Postdoctoral Researcher, University of British Columbia 2003-2004

### **Closely Related Publications**

Johnson, K.S. and J.A. Needoba (2008). Mapping the spatial variability of plankton metabolism using nitrate and oxygen sensors on an autonomous underwater vehicle. *Limnology and Oceanography*. 53 (5 part 2), 2237-2250.

Jannasch, H.W., L. J. Coletti, K. S. Johnson, S. E. Fitzwater, J. A. Needoba and J. N. Plant. (2008) Robust mooring systems for continuously monitoring of complex biogeochemical cycles in estuaries: Design, construction and initial results from Elkhorn Slough, CA. *Limnology and Oceanography: Methods*: (6) 263-276.

Needoba, J.A., R.A. Foster, C. Sakamoto, J.P. Zehr, and K.S. Johnson (2007). N<sub>2</sub> fixation by unicellular cyanobacterial diazotrophs in the temperate, oligotrophic North Pacific. *Limnology and Oceanography* 52(4) 1317-1327.

Johnson, K.S., J.A. Needoba, S.C. Riser, and W.J. Showers (2007). Chemical sensor networks for the aquatic environment. *Chemical Reviews* 107(2): 623-640.

### **Other significant publications**

Plant, J. N., K. S. Johnson, J. A. Needoba and L. J. Coletti. 2009. NH<sub>4</sub>-Digiscan: an in situ and laboratory ammonium analyzer for estuarine, coastal and shelf waters. *Limnology and Oceanography: Methods*, 7, 144-156.

Needoba, J.A., A. Marchetti, M.F. Henry, P. J. Harrison, CS. Wong, W. K. Johnson, T.F. Pedersen (2006). Stable nitrogen isotope dynamics of a mesoscale iron enrichment experiment in the NE Subarctic Pacific. *Deep-Sea Research II*, 53(20-22): 2214-2230.

Granger, J., D.M. Sigman, J.A. Needoba, and P. J. Harrison. (2004) Coupled nitrogen and oxygen isotope fractionation of nitrate during assimilation by cultures of marine phytoplankton. *Limnology and Oceanography* 49(5) 1763-1777.

Needoba, J. A., D. M. Sigman, and P.J Harrison. (2004). The mechanism of isotope fractionation during algal nitrate assimilation as illuminated by the <sup>15</sup>N/<sup>14</sup>N of intracellular nitrate. *Journal of Phycology* 40(3): 517-522.

Needoba, J. A. and P. J. Harrison (2004). Influence of low light and a light:dark cycle on NO<sub>3</sub><sup>-</sup> uptake, intracellular NO<sub>3</sub><sup>-</sup>, and nitrogen isotope fractionation by marine phytoplankton. *Journal of Phycology* 40(3): 505-516.

Needoba, J.A., N.A.D. Waser, P.J. Harrison, and S.E. Calvert. (2003). Nitrogen Isotope Fractionation by 12 Species of Marine Phytoplankton during Growth on Nitrate. *Marine Ecology Progress Series* 255: 81-91.

### **Synergistic Activities and Awards**

- Awards: outstanding student poster award, ASLO, 2003, Kit Malkin Scholarship. Dept Zoology, UBC, 2001, University Graduate Fellowship, UBC, 2001, Edith Ashton Award, UBC, 2000, University Graduate Fellowship, UBC, 1999, Dean's List, UBC
- Science Panel Member, Lower Columbia River Estuary Partnership (2008-present)
- Co-chair, SATURN Observatory Research Group, CMOP/OHSU (2008-present)
- Member, Research Incubation Group, CMOP/OHSU (2007-present)
- Instructor, Saturday Academy K-12 Summer Oceanography Camp, OHSU, August 2008
- Mentor, Saturday Academy Apprenticeship in Science and Engineering 2008, 2009
- Contributing research scientist, Monitoring Agricultural Buffer Zones, Moss Landing Marine Labs (2004-present)
- Chief Scientist, R/V Barnes July 7-19, 2008
- Mentor, K-12 research initiative, Pajaro Valley High School, Watsonville, CA. (2006-2007)
- Member, Elkhorn Slough Tidal Wetland Project, Watsonville, CA, (2004-2007)
- Environmental Consultant for LORAX Environmental and RESCAN Environmental Services in Vancouver, B.C. (2000-2002)
- Member of organizing committee, "Coastal Zone Canada '98" Youth Conference, Victoria, B. C. (1998)
- Reviewer, NSF Biological Oceanography, NSF Chemical Oceanography, Journal of Phycology, Marine Chemistry, Journal of Plankton Research, Progress in Oceanography, Journal of Marine Systems, Marine Ecology Progress Series, Estuarine Coastal and Shelf Science

### **Collaborators and other affiliations**

Collaborators: Antonio Baptista (OHSU), Andrew Barnard (WETLabs, Inc), Byron Crump (University of Maryland), Rachel Foster (UC Santa Cruz), Julie Granger (Princeton University), Hans Jannasch (MBARI), Kenneth Johnson, (MBARI), Francis Ligler (Naval Research Labs), Adrian Marchetti (University of Washington), Steven Monismith (Stanford University), Jennifer Morace (USGS), Tom F. Pedersen (University of Victoria), Stewart Rounds (USGS), Daniel Sigman (Princeton University), Holly Simon (OHSU), Kerstin Wasson (Elkhorn Slough NERR), C.S. Wong (Institute of Ocean Science, Canada), Jon Zehr (UCSC)

### **Graduate and Postdoctoral Advisors:**

Paul J. Harrison, P.J., Hong Kong University of Science and Technology, Hong Kong  
Kenneth Johnson, Monterey Bay Aquarium Research Institute

### **Students supervised**

Goldman, J. OHSU (supervisor; PhD), Moeller, F.U. OHSU (supervisor, MSc), Gilbert, M. OHSU (supervisor, MSc) Maier, M. OHSU (thesis committee MSc), Kahn, P. OHSU (thesis committee MSc), Schoen, J. Cornell University (summer REU), Masterman, J (summer REU).

## Jan A. Newton

### NANOOS Executive Director

Applied Physics Laboratory  
1013 NE 40<sup>th</sup> Street  
Seattle, Washington 98105

University of Washington  
206 543 9152  
newton@apl.washington.edu

### Professional Preparation

Western Washington University, Biology (minor Chemistry)	B.S.	1981
University of Washington, Oceanography (biology emphasis)	M.S.	1984
University of Washington, Oceanography (biology emphasis)	Ph.D.	1989

### Appointments

10/04 - present Principal Oceanographer, Applied Physics Laboratory, University of Washington  
6/98 - present Affiliate Assistant Professor, School of Oceanography, University of Washington  
9/99 - 6/04 Senior Oceanographer, Washington State Department of Ecology  
1/94 - 8/99 Marine Waters Monitoring Supervisor, Washington State Department of Ecology  
9/91 - 12/93 Research Associate, School of Oceanography, University of Washington

### Relevant Recent Publications

Feely R A., S.R. Alin, J.A. Newton, C.L.Sabine, M. Warner, A. Devol, C. Krembs, C. Maloy. 2010. The combined effects of ocean acidification, mixing, and respiration on pH and carbonate saturation in an urbanized estuary. *Estuarine, Coastal and Shelf Science* 88 (2010) 442-449.

Moore, S. K., N. J. Mantua, J. A. Newton, M. Kawase, M. J. Warner, and J. P. Kellogg. 2008a. A descriptive analysis of temporal and spatial patterns of variability in Puget Sound oceanographic properties. *Estuarine, Coastal and Shelf Science* 80: 545-554, doi:510.1016/j.ecss.2008.1009.1016.

Moore, S. K., N. J. Mantua, J. P. Kellogg, and J. A. Newton. 2008b. Local and large-scale climate forcing of Puget Sound oceanographic properties on seasonal to interdecadal timescales. *Limnol. Oceanogr.* 53: 1746-1758.

Newton, Bassin, Devol, Kawase, Ruef, Warner, Hannafious, and Rose. 2007. Hypoxia in Hood Canal: An overview of status and contributing factors. *In Proceedings of the 2007 Georgia Basin Puget Sound Research Conference* <http://www.engr.washington.edu/epp/psgb/2007psgb/2007proceedings/index.html>

Simenstad, C, M Logsdon, K. Fresh, H. Shipman, M. Dethier, J. Newton. 2006. Conceptual model for assessing restoration of Puget Sound nearshore ecosystems. Puget Sound Nearshore Partnership Report No. 2006-03. Published by Washington Sea Grant Program, Univ. of Washington, Seattle, WA.

Newton, J.A., E. Siegel, and S.L. Albertson. 2003. Changes in Puget Sound and the Strait of Juan de Fuca during the 2000-01 drought. *Canadian Water Resources Journal*, 28(4): 715-728.

### Synergistic Activities

As NANOOS Executive Director, run extensive outreach workshops to assess user needs for coastal data. Give numerous talks to varied audiences on NANOOS, and what the system can deliver as well as listening to what needs and questions users have.

Developed and implemented a Research Apprenticeship on the "Pelagic Ecosystem Function" at the Friday Harbor Laboratories during fall quarter, 2004 to present, designed to mentor undergraduate apprentices using discovery methods of research. Advise ~twelve undergraduate apprentices each fall.

Co-manage a Hood Canal Dissolved Oxygen Program Integrated Assessment and Modeling study that incorporates community volunteers and cuts across institutional boundaries for the science. It involves extensive outreach and a web-based event response for fish kills/algal blooms. Worked with two local tribes to bring this research into their programs, mentoring tribal members/scientists as part of the study. Featured at UW's 2007-9 Tribal Summit.

Vice Chair of the Puget Sound Partnership Science Panel 2008-2010. Advise on and develop a strategic science plan for Puget Sound. Invited to brief Washington State Legislature several times 2005-2008 on science needs and research status.

## H. Tuba Özkan-Haller

Associate Professor

College of Oceanic and Atmospheric Sciences

104 COAS Admin Building, Oregon State University, Corvallis, OR 97331-5503

Tel: (541) 737-9170. Fax: (541) 737-2064. E-mail: ozkan@coas.oregonstate.edu

### Professional Preparation

Boğazici University, Turkey	Civil Engineering	B.S., 1991
University of Delaware	Civil Engineering	M.S., 1994
University of Delaware	Civil Engineering	Ph.D., 1998
Univ. Cantabria, Spain/Univ. Delaware	Coastal Engineering	Post-doc 1997-1998

### Appointments

2008-present	Associate Professor – College of Oceanic and Atmospheric Sciences, Oregon State University, Corvallis, OR
2008-present	Associate Professor – School of Civil and Construction Engineering, Oregon State University, Corvallis, OR
2001-2008	Assistant Professor – College of Oceanic and Atmospheric Sciences, Oregon State University, Corvallis, OR
2001-2008	Assistant Professor – School of Civil and Construction Engineering, Oregon State University, Corvallis, OR
1998-2001	Assistant Professor – Department of Naval Architecture and Marine Engineering, University of Michigan, Ann Arbor, MI

### Professional Recognition

- Outstanding Faculty Member Award, Dept. of Naval Arch. and Marine Eng., U. of Michigan, 2001.
- Office of Naval Research Young Investigator Award, 1999.
- Best Ph.D. Dissertation Award, Dept. of Civil and Environmental Engineering, U. of Delaware, 1998
- Convener and Chair - 1998 AGU Fall Meeting Special Session: Nearshore Processes, 1998

### Publications

#### 5 most closely related

- Long J. W., H. T. Özkan-Haller (2009), Low-frequency characteristics of wave group–forced vortices, *J. Geophys. Res.*, 114, C08004, doi:10.1029/2008JC004894.
- Haller, M.C. and Özkan-Haller, H.T. (2007), Waves on unsteady currents, *Physics of Fluids*, 19, 126601.
- Long, J.W. and Özkan-Haller, H.T. (2005) “Offshore controls on nearshore rip currents”, *J. Geophys.Res.*, **110**, C1207, doi:10.1029/2005JC003018.
- Özkan-Haller, H.T., Li, Y. (2003) "Wave-current interaction effects on shear instabilities", *J. Geophys.Res.*, **108**, C5, 3139, doi: 10.1029/2001JC001287.
- Özkan-Haller, H.T. and Kirby, J.T. (1999). "Nonlinear evolution of shear instabilities of the longshore current: A comparison of observations and computations." *J. Geophys. Res.*, **104**, 25,953-25,984.

#### Other publications

- Özkan-Haller, H.T., Brundidge, S. (2006) “Equilibrium beach profile concepts for Delaware beaches” *J. Waterways, Coastal and Ocean Engrg.*, in press.
- Holman, R.A., Stanley, J. and Özkan-Haller, H.T. (2003) "Applying Video Sensor Networks to Nearshore Environment Monitoring", **2**, 14-21.
- Özkan-Haller, H.T., Vidal, C., Losada, I.J., Medina, R., Losada, M.A. (2001) "Standing edge waves on a pocket beach." *J. Geophys. Res.*, **106**, C8, 16,981-16,996.



- Chawla, A., Özkan-Haller, H.T. and Kirby, J.T. (1998). "Spectral wave model for wave transformation over irregular bathymetry." *J. Waterways, Port, Coastal and Ocean Engrg.*, **124**, 189-198.
- Özkan-Haller, H.T. and Kirby, J.T. (1997). "A Fourier-Chebyshev collocation method for the shallow water equations including shoreline runup." *Appl. Ocean Res.*, **19**, 21-34.

### **Synergistic Activities**

- Mentor for Interdisciplinary Approach to Coastal Processes and Hazard Mitigation Research Experiences for Undergraduates (REU) program, 2003-2005.
- Organizing committee, Gordon conference on Coastal Oceanography, 2009.
- Invited Speaker, Gordon conference on Coastal Oceanography, June 2005.
- Invited speaker at the House Oceans Caucus Luncheon on "Efforts to understand and predict coastal damage by storms", Library of Congress, May 2003.
- On-screen interviewee in
  - History Channel documentary "Megadisasters: Mega-tsunami", 2008.
  - National Geographic documentary "Ancient Mega Tsunami", 2008.
  - Educational video "Beach Safety Basics: Rip Currents" by Oregon Sea Grant, 2007.
  - full length video "Exploring Beach recovery" by Oregon Sea Grant, 2006
  - video "Living on the Edge: Building and Buying Property on the Oregon Coast", 2005
- Quoted in 6 newspaper and magazine articles, featured on 1 news segment.
- Convener and Chair, 1998 AGU Fall Meeting Special Session: Nearshore Processes, December 1998.
- Co-Chair, Nearshore Research Workshop, St. Petersburg, FL, 1998.

### **Collaborators and Other Affiliations**

#### (i) Collaborators:

Merrick Haller	Oregon State University
James Kirby	University of Delaware
Clare Reimers	Oregon State University
Peter Ruggiero	Oregon State University
Rob Wheatcroft	Oregon State University

#### (ii) Graduate and Postgraduate Advisors:

M.S. and Ph.D. theses – James Kirby (Univ. Delaware)  
 Postgraduate – Miguel Losada (Univ. of Granda, Spain)

#### (iii) Thesis Advisor (6) and Postgraduate-Scholar Sponsor (1):

Masters students: Jamie Lescinski (2004), Joseph Long (2005), Lisa Andes (2007),  
 Greg Wilson (2009), Jeff Oskamp (expected 2011)

Ph.D. students: Joseph Long (2009), Gregory Guannel (2009),  
 Greg Wilson (expected 2012)

Postdoctoral: Haiying Jiao

## **JOHN C. PAYNE**

Email: [jcpayne@uw.edu](mailto:jcpayne@uw.edu)

Tel: (206) 463-3404

### ***Education***

Ph.D. in Zoology, 2003. University of Washington, Seattle, WA.

M.S. in Wildlife Ecology, 1992. Program for Studies in Tropical Conservation, University of Florida, Gainesville FL.

B.A. in Biology, 1984. Brown University, Providence RI.

### ***Research Interests***

I am interested in the technical challenges of obtaining better data on the migratory behavior of marine species, and in the analytical process of integrating movement rules derived from telemetry into ecosystem models, along with fisheries and oceanographic data. My long-range goal is to contribute to our understanding of the forces that control populations of marine animals, both bottom-up environmental forcing that acts via the physiological constraints within which organisms must operate, and top-down forcing caused by predators. These are important real-world conservation and management questions in the context of climate change and human population growth.

### ***Experience***

2005 – Present. Staff Scientist and US Coordinator for the Pacific Ocean Shelf Tracking project, based in Vancouver, BC, Canada. I do telemetry research on squid and other species, support users of the POST array in developing new projects, and work on technological developments including data analysis and visualization.

2003 - 2005: National Research Council postdoc at the Northwest Fisheries Science Center (NOAA), Seattle. Wrote quantitative risk-assessment models for salmon with Paul McElhany, who led the Lower Columbia Technical Recovery Team.

1997 – 2003: Ph.D. student, Zoology, University of Washington, Seattle. Dissertation title: *Dispersal and dynamics of dragonfly communities in a lake network*; advisor: P. Dee Boersma. Also worked for Ray Hilborn (Fisheries) as a programmer on stock assessment models for 3 yrs.

1993 – 1995. Asia Program Officer, Wildlife Conservation Society, New York. Second-in-command of research and conservation projects in Asia.

1989-1991: Master's research in Korup National Park, Cameroon. Thesis title: *A field study of census techniques for duikers (forest antelope) in Cameroon*; advisor: John G. Robinson.

1987 – 1988: Pew Charitable Trust Internship; helped to run leadership courses for directors of non-profits in the northern Rockies.

1984-1986. Ju/Wa Bushman Development Foundation, Windhoek, Namibia. With my wife I ran a small non-profit that helped Bushman people living in the Kalahari of Namibia.

### ***Selected Publications***

Payne, J.C., K. Andrews, C. Chittenden, G. Crossin, F. Goetz, S. Hinch, P. Levin, S. Lindley, S. McKinley, M. Melnychuk, T. Nelson, E. Rechisky, D. Welch. 2010. Tracking fish movements and survival on the Northeast Pacific Shelf. In McIntyre, A., ed., *Marine Life :Diversity, Distribution and Abundance*, Wiley Blackwell, London.

Seitz, A.C., Norcross, B.L., Payne, J.C., Kagley, A.N., Meloy, B., Gregg, J.L., and Hershberger, P.K. 2010. Feasibility of surgically implanting acoustic tags into Pacific herring. *Transactions of the American Fisheries Society* 139:1288-1291.

O'Dor, R., Acosta, J., Bergstad, O.A., Brainard, R., Bratley, J., Canals, M., Costa, D., Gunn, J., Horne, J.K., Iken, K., Kocik, J., Konar, B., Payne, J., Reid, C., Robison, B., Steinke, D., and Vanden Berghe, E. 2010. Bringing new life to ocean observation. In *Proceedings of OceanObs'09: Sustained Ocean Observations and Information for Society*, Venice, Italy, 21-15 September 2009. Edited by J. Hall, D.E. Harrison and D. Stammer. ESA Publication WPP-306

2008. Staaf, Danna J., Susana Camarillo-Coop, Steven H.D. Haddock, C. Nyack, John Payne, Cesar A. Salinas-Zavala, Brad A. Seibel, Lloyd Trueblood, Chad Widmer, and William F. Gilly. Natural egg mass deposition by the Humboldt squid (*Dosidicus gigas*) in the Gulf of California and characteristics of hatchlings and paralarvae. *Journal of the Marine Biological Association of the United Kingdom*: 88(4), 759–770.

2007. Payne, J.C. and O'Dor, R. Comparing squid optimal cost of transport speeds to actual field migrations: new data from 40 g *Loligo opalescens*. In R.J. Olson and J.W. Young (Eds.). 2007. *The role of squid in open ocean ecosystems*. Report of a GLOBEC-CLIoTOP/PFRP workshop, 16-17 November 2006, Honolulu, Hawaii, USA. GLOBEC Report 24: vi, 94pp.

2003. McElhany, P, J. Payne. Population change criteria (PCC). Interim report on viability criteria for Willamette/Lower Columbia Basin Pacific salmonids, Appendix D. Willamette-Lower Columbia Technical Recovery Team, NOAA Fisheries, Seattle, WA, 98112.

Hilborn, R; Maunder, M; Parma, A; Ernst, B; Payne, J; Starr, P. Coleraine: A Generalized Age-Structured Stock Assessment Model: User's Manual Version 2.0. Technical Report. School of Aquatic and Fishery Science, Fisheries Research Institute, Washington University [Rep. Fish. Res. Inst. Wash. Univ.]. no. 0116, [np]. May 2003

### ***Other***

I have given numerous presentations, radio and TV interviews for POST at technical and professional meetings, universities, and other venues, and have been the principal organizer of a number of workshops, symposia, and special sessions regarding telemetry, and often serve as a peer reviewer for proposals and papers.

**William T. Peterson**

NOAA/National Marine Fisheries Service

Hatfield Marine Science Center

Newport, OR 97365

Phone: 541-867-0201; fax: 541-867-0389; e-mail [bill.peterson@noaa.gov](mailto:bill.peterson@noaa.gov)**Education**

1965 B.A. Biology and Chemistry, Pacific Lutheran University

1969 M.S. Oceanography, University of Hawaii

1980 Ph.D. Oceanography, Oregon State University

**Professional Experience:**

Senior Scientist, NOAA-Fisheries	2010-
Oceanographer, NOAA/NMFS, Newport	1995-present
Professor (Courtesy), Oregon State University	1996-present
Program Manager, U.S. GLOBEC/NOAA and NSF, Washington, DC	1992-1995
Adjunct Professor, University of Maryland	1992-1995
Supervisory Physical Scientist, NOAA/National Ocean Service, Monterey, CA	1990-1992
Senior Research Officer/Research Fellow, University of Cape Town	1987-1990
Assistant Professor, State Univ. of New York at Stony Brook	1980-1987
Visiting Scientist: Univ. of Concepcion, Chile, Jan/Feb 1986; Danish Institute For Marine Research, Summer 1988, 1989; Univ. of Cape Town, Sept 1994)	

**Professional Activities:** Editorial Board, J. Plankton Research; Review Editor, Marine Ecology Progress Series; Advisory Board, African J. of Marine Science; Chairman of the Steering Committee for the NOAA/FATE program (2005-2007); Member, Climate Change and Carrying Capacity Program, PICES 2002-2009; Organizing Committee for 3<sup>rd</sup> International Symposium on Zooplankton Production (Gijon Spain, May 2003); U.S.GLOBEC Scientific Steering Committee (1998-2001); NEP GLOBEC Executive Committee (2000-present); Co-Convenor, ICES/PICES/IOC Symposium on "Effects of climate change on the world oceans", Gijón, Spain, 2008; Convened two international Krill Ecology Workshops 2007, 2009.

**Five Recent Publications:**

- Liu, H. and W. Peterson. 2010. Seasonal and interannual variations in the abundance and biomass of *Neocalanus plumchrus/flemingerii* in the slope waters off Oregon. Fisheries Oceanography. 19:354-369.
- Peterson, J. O. and W. T. Peterson. 2009. The influence of the Columbia River plume on cross-shelf transport of zooplankton. Journal of Geophysical Research. J. Geophys. Res. 114, COOB10, 11 pages, doi:10.1029/2008JC004965, 2009.
- Peterson, W. 2009. Copepod species richness as an indicator of long term changes in the coastal ecosystem of the northern California Current. CalCOFI Reports 50:73-81
- Keister, J.E., T.J.Cowles, W.T. Peterson and C.A Morgan. 2009. Do upwelling filaments result in predictable biological distributions in coastal upwelling ecosystems? Prog. Oceanogr. 83:303-313
- Juranek, L.W., R.A.Feely, W.T.Peterson, S.R.Alin, B.Hales, K.Lee, L.L.Sabine and J.Peterson. 2009. A novel method for determination of aragonic saturation state on the continental shelf of central Oregon using multi-parameter relationships with hydrographic data. Geophys. Res. Lett. 36, L24601, doi:10.1029/2009GL040778, 2009

**Five Other Papers:**

- L. R. Feinberg, W.T. Peterson and C. Tracy Shaw. 2010. The timing and location of spawning for the

euphausiid *Thysanoessa spinifera* off the Oregon coast, USA. Deep-Sea Research II, Krill Symposium Special Issue 57:572-583.

- Chan, F., J.A. Barth, J. Lubchenco, A. Kirincich, H. Weeks, W.T. Peterson and B.A. Menge. 2008. Novel emergence of anoxia in the California Current large marine ecosystem. *Science*. 319:920
- Feinberg, L. R., C. T. Shaw and W. T. Peterson. 2007. Long-term laboratory observations of *Euphausia pacifica* fecundity: a comparison of two geographic regions. *Mar. Ecol. Prog. Ser.* 341:141-152.
- Bi, Hongsheng, R. E. Ruppell, W. T. Peterson. 2007. Modeling the salmon pelagic habitat off the Pacific Northwest coast using logistic regression. *Mar. Ecol. Prog. Ser.* 336:249-265
- Hooff, R. C. and W. T. Peterson. 2006. Recent increases in copepod biodiversity as an indicator of changes in ocean and climate conditions in the n. California current ecosystem. *Limnol. Oceanogr.* 51:2042-2051

**Post Graduate Students.** At Stony Brook I served as major professor for 12 M.Sc. Students, 3 Ph.D. students (H. Dam, D. Arcos and T. Johnson) and one Fulbright Scholar (P. Tiselius). At the Univ. of Cape Town I served as major professor for 2 B.Sc. Honors students and served on the Ph.D. committee of J. Huggett. As a Courtesy Professor at Oregon State Univ., I have served on 10 M.S. student committees, 6 Ph.D. committees, and have advised two Ph.D. students: Jaime Gómez-Gutiérrez and Julie Keister.

**Undergraduate Students.** Mentor for seven NSF-REU students (Rachel Ruppel, 2004; Natalie Román, 2005; Kate Ruck, 2006; Marley Jarvis, 2007; Megan Pros, 2008; Jasmine Segura 2009; Melissa Precht, 2010); Other interns include Cascade Sorte (1999, Whitman), Ashley Emerson (2004, Mount Holyoke), and Angela Sremba (2006, Kalamazoo College).

**Professional collaborations within the past 4 years:** Ph.D. major professor was Charlie Miller. Collaborators include J. Barth, H. Batchelder, T. Cowles, A. Huyer, M. Kosro, R. Smith, Y. Spitz, T. Strub, P. Wheeler (all OSU/COAS), J. Lubchenco, F. Chan (OSU), J. Gomez-Gutierrez (Mexico), R. Harris (Plymouth), R. Harvey (U. Maryland), R. Hooff (State of Oregon), Se-J Ju (KORDI, Korea), S. Kawaguchi (CSIRO, Tasmania), S. Landers (Troy State University), B. Lavaniegos (Mexico), J. Largier (Univ. California - Davis), D. Mackas (Canada), M. Ohman (Scripps), C. Suchman (Maryland Sea Grant, now NSF), B. Hickey and E. Lessard (UW), K. Bruland and R. Kudela (UCSC), R. Brodeur and R. Emmett (NOAA/Newport), F. Schwing (NOAA/Monterey), J. Yen and E. DiLorenzo (Georgia Tech).

**Honors and Awards.** Distinguished Teaching Award, Stony Brook, 1981; NOAA Bronze Medal (2004-Individual Award); NOAA/NMFS/NWFSC Employee of the Year (runner-up, 2004); Best Presentation, PICES/Vladivostok/Science Board Symposium, September 2005; NOAA Bronze Medal (2005-Group Award); NOAA Bronze Award (2008) for salmon forecasting web page. Interviewed by Robert Siegel on NPR, "All Things Considered", 12 July 2005, on warm ocean in the northern California Current in 2005.

**Outreach.** Peterson is regularly asked to speak on climate, ocean conditions and salmon, including Oregon's Ocean Policy Advisory Committee, Mid-Coast and Umpqua River Watershed Councils, Oregon State Police/Fish and Game cops, State of Oregon Legislators (climate staff), Quinalt Indian Nation "Salmon and Eagle Festival", Northwest Power Planning Council, Pacific Marine Fish Commission, Pacific States Marine Fisheries Commission, Pacific Coast Shellfish Growers Association, Hatfield Science Center SeaFest, Oregon Coast Community College, Oregon State University Alumni, Capitol Manor Retirement Community, Yaquina View Elementary School. Featured in PBS Series, "Strange Days on Planet Earth"; "The One Degree Factor"; KIRO-TV Seattle, Documentary on "Cold facts about global warming". Oct 2007. OPB Radio, Sept 2009, 15 minute series on salmon and ocean conditions.

**Tawnya D. Peterson**  
Oregon Health & Science University  
Division of Environmental & Biomolecular Systems  
20000 NW Walker Rd., Beaverton, OR 97006  
tel. 503-748-7679 fax. 503-748-1273  
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### Professional preparation

1997 B.S. (Honors with Distinction), Biology, Mount Allison University, Sackville, N.B., Canada  
2005 Ph.D., Oceanography, University of British Columbia, Vancouver, B.C., Canada

### Appointments

2008 *Research Assistant Professor*,  
Oregon Health & Science University, Beaverton OR  
2005 – 2008 *Post doctoral scholar*, Ocean Sciences Department,  
University of California, Santa Cruz CA  
2005 *Instructor*, Ocean Sciences Department,  
University of California, Santa Cruz CA  
2004 *Instructor*, Department of Earth and Ocean Sciences,  
University of British Columbia, Vancouver, B.C., Canada  
1999 – 2005 *Graduate student researcher*  
University of British Columbia, Vancouver, B.C., Canada  
1997 – 1999 *Research assistant*, Louisiana Universities Marine Consortium, Chauvin, LA

### Publications

#### Five most closely related publications

Kudela, R. M., and Peterson, T.D. (2009). Influence of a buoyant river plume on phytoplankton nutrient dynamics: What controls standing stocks and productivity? *J. Geophys. Res.*, 114, C00B11, doi:10.1029/2008JC004913.

Kudela, R.M., Banas, N.S., Barth, J.A., Jay, D., Largier, J., Lessard, E.J., Peterson, T.D., Vander Woude, A.J. (2008). New Insights into the Controls and Mechanisms of Plankton Productivity on the US West Coast. *Oceanography*. Vol. 21(4): 46-59.

Kudela, R.M., Ryan, J.P., Blakely, M.D., Lane, J., Peterson, T.D. (2008). Linking the physiology and ecology of *Cochlodinium* to better understand harmful algal bloom events: a comparative approach. *Harmful Algae*, 7 (3): 278-292.

Peterson, T.D., Toews, H.N.J., Robinson, C.R., Harrison, P.J. (2007). Nutrient and phytoplankton dynamics in nearshore waters of the Queen Charlotte Islands, British Columbia, Canada during the summer upwelling seasons of 2001-2002. *J. Plankton Research*, 29(3): 219-239.

Crawford, D. W., Lipsen, M.S., Purdie, D.A., Lohan, M.C., Statham, P.J., Whitney, F.A., Putland, J.N., Johnson, W.K., Sutherland, N., Peterson, T.D., Harrison, P.J., Wong, C.S. (2003). Influence of zinc and iron enrichments on phytoplankton growth in the northeastern subarctic Pacific, *Limnology and Oceanography*, 48(4): 1583-1600.

#### Five other significant publications

Kudela, R.M., Cochlan, W.P., Peterson, T.D., Trick, C.G. (2006). Impacts on phytoplankton biomass and productivity in the Pacific Northwest during the warm ocean conditions of 2005. *Geophysical Research Letters*. Vol. 33, (22): L22S0610.1029/2006GL026772.

Banas, N. S., Lessard, E.V., Kudela, R.M., MacCready, P., Peterson, T.D., Hickey, B.M., Frame, E. (2009). Planktonic growth and grazing in the Columbia River plume region: A biophysical model study. *J. Geophys. Res.*, 114, C00B10, doi:10.1029/2008JC004993.

Roland, L.A., McCarthy, M.D., Peterson, T.D., Walker, B.D. (2008). A large-volume micro-filtration system for isolating suspended particulate organic matter from seawater: fabrication and assessment of recovery and composition vs. GFF filters from central N. Pacific. *Limnology and Oceanography Methods*, 6: 64-80.

Peterson, T.D., Whitney, F.A., Harrison, P.J. (2005). Macronutrient dynamics in an anticyclonic mesoscale eddy in the Gulf of Alaska, *Deep-Sea Research II*, 52: 909-932.

Crawford, W.R., Brickley, P.J., Peterson, T.D., Thomas, A.C. (2005). Impact of Haida eddies on chlorophyll distributions in the eastern Gulf of Alaska. *Deep-Sea Research II*, 52: 975-989.

### **Synergistic activities**

- Awards & Honors: Invited participant, FORWARD to Professorship, Gallaudet University (2008); Recipient of NOAA scholarship to attend certification course for Harmful Algal Bloom Identification, Copenhagen, Denmark (2007); Invited participant, NSF-sponsored *AdvanceVT* conference (2006); NSERC Post-doctoral fellowship (2005-07); UBC University Graduate Fellowship (2003-04); UBC Jean R. Macdonald Fellowship (2003-04); Fisheries and Oceans Canada award (2002); UBC George W. Pickard award in Oceanography (2001); NSERC Post Graduate Scholarships (1999-2003); UBC Rutherford Rae award in Oceanography (2000)
- Mentor/teacher for Saturday Academy, program for high school students (2008-2009)
- Session co-chair, Ocean Sciences Meeting, Orlando, FL (2008), Estuarine Research Federation, Portland, OR (2009), Ocean Sciences Meeting, Portland, OR (2010)
- Reviewer, *Deep-Sea Research I*, *Deep-Sea Research II*, *Estuarine, Coastal and Shelf Science*, *Int. J. of Remote Sensing*, *J. Phycology*, *Continental Shelf Research*, National Environment Research Council
- Science fair judge, Pacific Collegiate School, Santa Cruz (2006)
- e-mentor, icouldbe.org. Served as a career mentor for teenagers (2004-2005)
- Judge, Graduate Student Research Symposium, OHSU (2008), EBS division research symposium (2009)
- Chair, Graduate Student Symposium in Oceanography, UBC (2002)
- Organizing committee, International Women's Day March/Rally, Vancouver (2002)
- Judge, Vancouver Science Fair (2002)
- Graduate Student Society council member, UBC (1999-2004)
- Member, Gender Equity and Grievances Committee (EOS, 2002-2003)
- Member, Field and Shiptime Committee (EOS, 2003-2004)

### **Collaborators & Other Affiliations**

#### Collaborators and Co-editors

Bruland, K.W., University of California, Santa Cruz, Cochlan, W.P., San Francisco State University, Crump, B., University of Maryland, Edwards, C. University of California, Santa Cruz, Hensen, S, A. University of Southampton, Lohan, M.C., University of Plymouth, Needoba, J.A., Oregon Health & Science University, Palacios, S.L., University of California, Santa Cruz, Prah, F. G., Oregon State University, Simon, H., Oregon Health & Science University, Spitz, Y., Oregon State University, Whitney, F.A., Institute of Ocean Sciences, Fisheries and Oceans Canada, Zehr, J.P., University of California, Santa Cruz, Zuber, P., Oregon Health & Science University

#### Graduate & Postdoctoral advisors

Harrison, P.J., Hong Kong University of Science and Technology, Hong Kong

Kudela, R.M., University of California, Santa Cruz

#### Students advised

Maier, M. Oregon Health & Science University (MSc, 2010)

Goldman, J. Oregon Health & Science University (supervisory committee, PhD, 2013)

Moeller, F.U. Oregon Health & Science University (supervisory committee, MSc, 2010)

Kahn, P. Oregon Health & Science University (co-supervisor, PhD, 2013)

Burla, M., Oregon Health & Science University (supervisory committee, PhD, 2009)

Christmas, A. University of the Virgin Islands (summer research undergraduate student, 2008)

Velando, I., Texas A&M University (summer research undergraduate student, 2009)

## PETER RUGGIERO

### PROFESSIONAL PREPARATION

Ph.D., 1997, Civil Engineering, Oregon State University, Corvallis, Oregon  
M.S., 1993, Civil Engineering, Oregon State University, Corvallis, Oregon  
B.S. 1991, Civil Engineering, Lehigh University, Bethlehem, Pennsylvania

### APPOINTMENTS

2006 – present: Assistant Professor (Senior Research), Dept. of Geosciences, Oregon St. Univ.  
2001 – 2006: Research Geologist, U.S. Geological Survey, Coastal and Marine Geology  
1996 – 2001: Coastal Engineer, Washington Department of Ecology, Olympia, Washington

### PUBLICATIONS CLOSELY RELATED TO CURRENT PROPOSAL

Kaminsky, G.K., **Ruggiero, P.**, Buijsman, M.C., and Gelfenbaum, G., 2010. Historical evolution of the Columbia River littoral cell, submitted to: *Marine Geology*, DOI:10.1016/j.margeo.2010.02.006.  
**Ruggiero, P.**, Buijsman, M.C., Kaminsky, G., and Gelfenbaum, G., 2010. Modeling the effect of wave climate and sediment supply variability on large-scale shoreline change, *Marine Geology*, 273, 127-140, DOI:10.1016/j.margeo.2010.02.008.  
**Ruggiero, P.**, Komar, P.D., Allan, J.C., 2010. Increasing wave heights and extreme-value projections: the wave climate of the U.S. Pacific Northwest, *Coastal Engineering*, 57, 539-552, doi:10.1016/j.coastaleng.2009.12.005.  
**Ruggiero, P.**, Walstra, D.J., Gelfenbaum, G., and Ormont, M.V., 2009. Seasonal scale nearshore morphological evolution: Field observations and modeling, *Coastal Engineering*, (56) 1153-1172, DOI:10.1016/j.coastaleng.2009.09.003.  
**Ruggiero, P.** and List, J.H., 2009. Improving Accuracy and Statistical Reliability of Shoreline Position and Change Rate Estimates, *Journal of Coastal Research*, 25(5), 1069-1081.  
**Ruggiero, P.**, Holman, R.A., and Beach, R.A., 2004. Wave runup on a high-energy dissipative beach, *Journal of Geophysical Research*, Vol. 109, C06025, doi:10.1029/2003JC002160, 2004.  
**Ruggiero, P.**, Komar, P.D., McDougal, W.G., Marra, J.J., and Beach, R.A., 2001. Wave runup, extreme water levels and the erosion of properties backing beaches, *JCR*, 17(2), 407-419.

### SYNERGISTIC ACTIVITIES

Advisor to Natural Capital Project's Marine Invest Marine (Integrated Valuation of Ecosystem Services and Tradeoffs)  
Author of 'Impacts of climate change on Oregon's coasts and Estuaries', chapter in Oregon Climate Change Assessment Report to the Oregon state legislature

### COLLABORATOR AND OTHER AFFILIATIONS

#### (a) Collaborators

Rob Holman, Oceanography, Oregon State University; Paul Komar, OSU; Jon Allan, Dogami; Dan Hanes, Coastal and Marine Geology Program, US Geological Survey; Guy Gelfenbaum, CMGP, USGS; Jeff List, CMGP, USGS; Joan-Oltman Shay, Northwest Research Associates; Pete Adams, Geology, University of Florida; Hilary Stockdon, CMGP, USGS; Dirk-Jan Walstra, Delft Hydraulics, the Netherlands; George Kaminsky, WA Dept. of Ecology

#### (b) Graduate and Postdoctoral Advisors

William G. McDougal, Oregon State University; Paul D. Komar, Oregon State University

#### (c) Thesis Advisor and Postgraduate-Scholar Sponsor

Cote, Jessica, Oregon State University, Shadel, Renee, Evergreen State College, Harris, Erica, Oregon State University, Baron, H., Oregon State University, Mull, Jeremy, Oregon State University, Katherine Serafin, Oregon State University, Diana Di Leonardo, Oregon State University



## Steven S. Rumrill

Chief Scientist and Research Program Coordinator, South Slough National Estuarine Research Reserve  
P.O. Box 5417, Charleston, Oregon 97420

Ph. (541) 888-2581 / Fax (541) 888-2733 / Email: Steve.Rumrill@state.or.us

and

Associate Professor (Courtesy), Oregon Institute of Marine Biology / University of Oregon  
Graduate Faculty, Marine Resource Management Program / Oregon State University

### EDUCATION

Ph.D., Zoology, University of Alberta, Edmonton (1987)

Thesis: *Differential predation upon embryos and larvae of temperate Pacific echinoderms*

M.Sc., Marine Sciences, University of California at Santa Cruz (1983)

Thesis: *Contrasting reproductive patterns among ophiuroids (Echinodermata) from southern Monterey Bay, USA*

B.A., Biology, University of California at Santa Cruz (1981)

### RESEARCH INTERESTS

Reproductive biology, life histories, and larval ecology of marine and estuarine invertebrates

Detection, assessment, and improvement of water quality and habitat conditions in estuaries

Design and implementation of observational systems for marine and estuarine ecosystems

Oceanic forcing of nutrient dynamics, larval supplies, and water quality conditions in Pacific northwest estuaries

Restoration and recovery of native oyster populations

Development of best management practices to minimize adverse environmental impacts of commercial oyster mariculture

Global and regional declines in the status and condition of seagrass beds

Natural history, restoration ecology, and management policy for saltmarshes, seagrass beds, and shellfish

### REPRESENTATIVE PUBLICATIONS AND TECHNICAL REPORTS

Davidson, T.M., A.L. Shanks, and S.S. Rumrill. 2009. The composition and density of fauna utilizing burrow microhabitats created by a non-native burrowing crustacean (*Sphaeroma quoianum*). *Biological Invasions* 10: 1-11.

Dumbauld, B., J. Reusink, and S. Rumrill. 2009. The ecological role of bivalve shellfish aquaculture in the estuarine environment: a review with application to oyster and clam culture in west coast (USA) estuaries. *Aquaculture* 290: 196-223.

Groth, S. and S.S. Rumrill. 2009. History of native oysters (*Ostrea lurida*) in Oregon estuaries, with a description of recovering populations in Coos Bay. *J. Shellfish Research* 28: 51-58.

Rumrill, S.S. and D.C. Sowers. 2008. Concurrent assessment of eelgrass beds (*Zostera marina*) and saltmarsh communities along the estuarine gradient of the South Slough, Oregon. *J. Coastal Research*. 55:121-134.

Davidson, T.M., A.L. Shanks, and S.S. Rumrill. 2008. Colonization and substratum preference of an introduced burrowing crustacean in a temperate estuary. *J. Mar. Biol. Ecol.* 345: 144-149.

Rumrill, S.S., and B. Grupe. 2008. Partnership for monitoring and assessment of non-point source bacterial contamination of south coast beaches. Part B. Temporal and spatial patterns in the delivery and distribution of fecal indicator bacteria within Sunset Bay, Oregon. Oregon Department of Environmental Quality, Technical Report. 75 pp.

Rumrill, S.S. 2007. Measurement of Salinity. In, *Encyclopedia of Tidepools* (M.W. Denny and S.D. Gaines, eds.) University of California Press. pp. 479-481.

Rumrill, S.S. 2006. *The Ecology of the South Slough Estuary: Site Profile of the South Slough National Estuarine Research Reserve*. NOAA / Oregon Department of State Lands. 238 pp.

## COMMITTEES

Chairman, North Pacific Marine Science Organization – PICES Marine Environmental Quality Committee (2010-2013)  
Chairman, Integrated Ecosystem Assessment Work Group; West Coast Governors' Agreement on Ocean Health (2008-2010)  
California Marine Life Protection Act / Science Advisory Team (2009-2012)  
President, Pacific Estuarine Research Society (2010-2012)  
California Sea Grant - Science Advisory Committee (2005-09)  
NANOOS / Northwest Association of Networked Ocean Observing Systems – Governing Council (2007-2010)  
Pacific Regional Marine Research Plan for the California Current Large Marine Ecosystem – Plan Development Committee (2006-09)  
Chairman, NOAA/NERR System-Wide Monitoring Program – Guidance Committee (2008-2012)  
Oregon International Port of Coos Bay – Technical Advisory Committee (Chairman, 1996-2012)

## PENDING, CURRENT AND RECENT GRANT AWARDS AND SUPPORT

- Reproductive Ecology of Native Olympia Oyster Populations in Coos Bay, Oregon (PI; NOAA/NSC; \$445,000; 2010-202013)
- Ecological Effects of Bed Shape and Edges for Experimental Populations of Olympia Oysters in the South Slough Estuary, Oregon (PI; NOAA/NMFS; \$64,000 - pending)
- Ecological Factors that Limit Recovery of Native Olympia Oysters (*Ostrea conchaphila*) in the South Slough Estuary, Oregon (PI; Murdock Trust; \$15,000 / 2008-09)
- Experimental Replanting of Eelgrass (*Zostera marina*) within the Siuslaw River Estuary (PI; ODOT; \$42,400 / 2007-2012)
- Developing a Research and Information Plan for the California Current Large Marine Ecosystem of Coastal Washington, Oregon, and California (Co-PI; NOAA/National Sea Grant Program; \$500,000 / 2006-09)
- Establishment of Near Real-time Hydrodynamic Monitoring Stations in Coos Bay (PI; NOAA/NANOOS; \$90,000 / 2008-2010)
- Physical and Biotic Links between the Coos Bay Estuary and the Nearshore Pacific Ocean (Chief scientists; NOAA/Marine and Aviation Operations; 18 DAS aboard RV McARTHUR 2007, '08, '09)
- Restoration of Native Olympia Oysters (*Ostrea conchaphila*) within the South Slough Estuary, OR (PI; NOAA/CHRP; \$74,922 / 2007-09)
- Assessment of Non-point Source Bacterial Contamination in Oregon South Coast Beaches (PI; USEPA/ODEQ; \$54,336 / 2006-08)
- Short-Term Variability and Long-Term Changes in the Extent of Marine and Riverine Forcing of Estuarine Water Conditions within Five Pacific Coast Estuaries (PI; NOAA/CICEET; \$70,000 / 2006-07)
- Hydrodynamic Transport of Bacterial Contaminants within the South Slough Estuary, OR (PI; USEPA/ODEQ; \$82,650 / 2005-07)
- Establishment of Real-Time Multi-Parameter Telemetry Anchor Stations for the South Slough Estuary, OR; A Pilot Project for the Northwest Association of Networked Ocean Observing Systems (co-PI; NOAA/Coastal Services Center; \$33,000 / 2006)

## Biographical Sketch

### R. Kipp Shearman

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Admin. Bldg. 104, Corvallis, OR 97331-5503  
Phone: (541) 737-1866  
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### (a) Professional Preparation

University of Colorado, Aeronautical Engineering (with Distinction), B.S., 1993  
Oregon State University, Physical Oceanography, Ph.D., 1999  
Woods Hole Oceanographic Institution, Postdoctoral Scholar/Investigator December 1999 – May 2002

### (b) Appointments

Assistant Professor, COAS, Oregon State University, September 2004 – present  
Assistant Scientist, Woods Hole Oceanographic Institution, May 2002 – September 2004  
Postdoctoral Investigator, Woods Hole Oceanographic Institution, May 2001 – May 2002  
Postdoctoral Scholar, Woods Hole Oceanographic Institution, December 1999 – May 2001  
Graduate Research Assistant, COAS, Oregon State University, January 1994–August 1999

### (c) Publications

#### (i) Five most closely related publications

Shearman, R.K., K. H. Brink and F. Bahr, 2010 Evaporative Dense Water Formation and Cross-Shelf Exchange over the Northwest Australian Inner-Shelf, *Journal of Geophysical Research*, *in press*.  
Brink, K. H., and R. K. Shearman, 2006, Bottom boundary layer flow and salt injection from the continental shelf to slope, *Geophys. Res. Lett.*, 33, L13608, doi:10.1029/2006GL026311.  
Shanks, A.L. and R.K. Shearman, 2009, Paradigm lost? Cross-shelf distributions of intertidal invertebrate larvae are unaffected by upwelling or downwelling, *Marine Ecology Progress Series*, 385, 189 – 204, doi: 10.3354/meps08043.  
Shearman, R. K., J. A. Barth, J. S. Allen, and R. L. Haney, 2000. Diagnosis of the three-dimensional circulation in mesoscale features with large Rossby number. *Journal of Physical Oceanography*, 30(11), 2687–2709.  
Shearman, R. K., J. A. Barth, and P. M. Kosro, 1999. Diagnosis of the three-dimensional circulation associated with mesoscale motion in the California Current. *Journal of Physical Oceanography*, 29(4), 651–670.

#### (ii) Five other significant publications

Shearman, R.K. and S. J. Lentz, 2010, Long-Term Sea Surface Temperature Variability along the US East Coast, *Journal of Physical Oceanography*, *J. Phys. Oceanogr.*, 40, DOI:10.1175/2009/JPO4300.1.  
Brink, K.H., F. Bahr and R.K. Shearman, 2007, Alongshore Currents and Mesoscale Variability near the Shelf Edge Off Northwestern Australia, *Journal of Geophysical Research*, doi:10.1029/2006JC003725.  
Shearman, R. K. 2005. Observations of Near-Inertial Current Variability on the New England Shelf. *Journal of Geophysical Research.*, 110, C02012, doi:10.1029/2004JC002341.

Shearman, R. K. and S. J. Lentz, 2004. Observations of tidal variability on the New England Shelf. *Journal of Geophysical Research*, 109, C06010, doi:10.1029/2003JC001972.

Shearman, R. K. and S. J. Lentz, 2003. Dynamics of mean and subtidal flow on the New England shelf. *Journal of Geophysical Research*, 108(C8), 3281, doi:10.1029/2002JC001417.

#### **(d). Synergistic Activities**

- Ocean Sciences 2006, Special Session Co-Convener: Biological, Biogeochemical and Physical Dynamics, and Their Interaction in the Coastal Ocean (92 presenters).
- Ongoing participant in the Scientist and Fishermen Exchange (SAFE). A quarterly meeting between scientists from academic institutions and state and federal government offices and local Oregon fishermen, designed to foster interactions and collaborations. Developed a pilot field program collaborating with commercial crab fishermen to equip crab pots with sensors to monitor near bottom water temperatures over the Oregon shelf.
- Served as a technical advisor to The Oregon Ocean Science and Math Collaborative program. This is the largest single initiative of the Office of Community College and Workforce Development for the State of Oregon. It aims at integrating the expertise of scientists and educators in a collaborative project designed to incorporate ocean sciences into science, math, critical thinking as part of adult education and workforce development. It includes professional development through Instructor Institutes and Teacher at Sea programs, curriculum and web site development. The program provides learning activities that link ocean sciences with real-life issues related to employment, environmental and economic concerns and it is designed to reach an underserved population of adult learners.
- Participated in the Autonomous and Lagrangian Platforms and Sensors (ALPS) Workshop, and I wrote a section on “Coastal Ocean Flux and Exchange” for the final workshop report ([www.geoprose.com/ALPS](http://www.geoprose.com/ALPS)). Also, I developed a research program (funded by a private donor) to demonstrate the scientific utility of autonomous underwater vehicle observations in a coastal setting ([web.mit.edu/mit-who/ww/research/po/autonomous\\_mapping.html](http://web.mit.edu/mit-who/ww/research/po/autonomous_mapping.html)).
- Developed UNIX-based software applications to objectively analyze and diagnose vertical velocity from shipboard hydrographic and velocity surveys. I have made these applications freely available to several colleagues performing similar research.

#### **(e). Collaborators & Other Affiliations**

##### *(i) Collaborators and Co-Editors*

WHOI: K. Brink, S. Lentz, A. Plueddemann, G. Gawarkiewicz, S. Anderson, J. Edson, UNC: A. Scotti, UO: A. Shanks, UW: A. Devol, Princeton: B. Ward, LDEO: D. Ho, U. Chicago: D. Archer,

##### *(ii) Graduate and Postdoctoral Advisors*

Prof. J. A. Barth (OSU), Dr. S. J. Lentz (WHOI)

##### *(iii) Thesis Advisor(1) and Postgraduate-Scholar Sponsor*

Masters: A. T. Peery (OSU, 2008), S. Holmes (OSU, 2007)

PhD: B. Nelson (OSU)

## Amy Glaub Sprenger

Applied Physics Lab, University of Washington  
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Phone: (206) 543-0061, Fax: (206) 543-6785  
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### Education

Huxley College                      Master of Education in Natural Science/Science Education, 2007  
Western Washington University, Bellingham, WA

Boston College                  Bachelor of Science in Biology, minor in Environmental Studies, 1997  
Chestnut Hill, MA

### Employment and Professional Experience

*Education and Outreach Specialist,* 2008-present  
Northwest Association of Networked Ocean Observing Systems (NANOOS),  
Applied Physics Lab, University of Washington, Seattle, WA

*Program Director,* Ocean Inquiry Project, Seattle, WA 2006-present

*Washington State Director,* Northwest Aquatic and Marine Educators 2009-present

*Research Technologist* 2004-2007  
Friday Harbor Laboratories, University of Washington, Seattle, WA

*Teaching Assistant,* Marine Invertebrate Zoology and Marine Botany 2005, 2004  
Friday Harbor Laboratories, University of Washington, Friday Harbor, WA

*Naturalist,* Carkeek Park Environmental Learning Center, Seattle, WA 2003

*Student Teacher,* Meadowdale High School, Lynnwood, WA 2003

*Program Coordinator,* Paralytic Shellfish Poisoning Detection Network 2001-2003  
Puget Sound Restoration Fund, Puget Sound, WA

*Marine Science Educator,* Snow Goose, Bellingham, WA 2002

*Marine Science Educator,* Sound Experience, Port Townsend, WA 2001

*Volunteer Coordinator,* Mountains to Sound Greenway Trust, Seattle, WA 2000

### Publications

Dethier, M.N., Ruesink, J., Berry, H., Sprenger, A.G. and Reeves, B. 2010. Restricted ranges in physical factors may constitute subtle stressors for estuarine biota. *Marine Environmental Research*. 69: 240-247.

### Selected Presentations

Sprenger, A. Eyes on Washington Waters, Bringing Ocean Observing Data Into the Classroom. Washington Science Teachers Association, March 12-14, 2010, Everett, WA.

Sprenger, A, and Stahr, F. Bringing Ocean Researchers, Students and Marine Volunteers Together Through Field Research. Ocean Sciences 2010, ASLO/AGU/TOS, February 22-26, 2010, Portland, OR. (*invited*)

Mikulak, S. and Sprenger, A. What can we learn from buoys, boats, gliders and satellites? ocean observing data from the PNW. Northwest Aquatic and Marine Educators, July 9-12, 2009, Vancouver, B.C.

Sprenger, A., Deans, N., Simoniello, C., McDonnell, J., Cline, A.H., Kerkerling, H., Grabowski,

- M. What Can the Integrated Ocean Observing System Offer Educators? National Marine Educators Association, June 29-July 3, 2009. Monterey, CA.
- Sprenger, A. Why Collect Baseline Data on the Oceans? Exploring the Spectrum of Citizen Science Workshop, April 11, 2009, Fort Worden, Port Townsend, WA.
- Stafki, B., Sprenger, A. and Washer, K. Boats Afloat for Puget Sound. Storming the Sound 2009, April 3, 2009, Seattle, WA.
- Sprenger, A. Using Ocean Observing Data in the Classroom. Northwest Aquatic and Marine Educators, July 9-12, 2008, Friday Harbor, WA.
- Stahr, F., Kawase, M., Sprenger, A. and Sarason, C.P. Puget Sound Main Basin Stratification: A (short) Time Series Comparison of Model Output and In-situ Data. Puget Sound Georgia Basin Research Conference, March 28, 2007, Vancouver, BC, Canada.

### **Awards**

- John Dewey Graduate Scholarship, Western Washington University
- Preuss-Wasisco Scholarship, Western Washington University

Stephen Uczekaj has a bachelors-of-science degree in Electrical Engineering from the University of Seattle, 1982. He has worked for Boeing over 20 years as a senior programming, designer, and developer of embedded and network system software programs. For the last 5 years he has been managing a talented multi-program research team of over 15 people focused on advanced information technology for networked systems.



Stephen is currently the manager of the Boeing Research & Technology (BR&T) Network Systems Technology Information Management program. This program develops and transitions advanced Information Management technology solutions to internal and external customers solving new challenges in processing and sharing rich data in disperse mobile and fixed environments.

Stephen is also the current Data Mgmt and Communications chairperson for the Northwest Association of Networked Ocean Observing Systems (NANOOS) since December 2007.

Notable past accomplishments include an invention patent award on software for object oriented state machines and development of an information architecture and software service which was transitioned into a Boeing licensed product and used on several programs.

Stephen also recently completed a significant research and development

contract with Air Force Rome Labs titled Dynamic Information Management for Air/Gnd Mobile Platforms (DIMAG) which has been replicated for use on several Boeing programs and contracts.

Some of Stephen's accomplishments include:

- > Awarded US Patent No. 5,920,718 Method and Apparatus for Creating Executable Code for Object-Oriented Objects Having Finite State Machine - July 6, 1999
- > Co-Creator and Developer of the Boeing eXtensible Infosphere Information Management Architecture - 2001
- > Boeing Associate Technical Fellow Member - 1996
- > Author of many Contract Research and Development white paper proposals and year-end reports on research and development status and progress.
- > Experienced Software Designer and Developer of Microcode, Assembly, C, C++, Ada, Java network information architectures.

Stephen has two children Cora and Joshua. He enjoys family activities, skiing and is an avid ballroom dancer with his wife of 25 years Cora Lyn. They own and operate an independent ballroom dance studio in Bellevue, WA called Impulse Ballroom.