ALEXANDER R. HORNER-DEVINE

Curriculum Vitæ

Civil and Environmental Engineering
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EDUCATIONAL HISTORY

Stanford University, Stanford, CA
PhD, Civil and Environmental Engineering
December 2003
Dissertation: The dynamics of buoyant, rotational river plumes.

Stanford University, Stanford, CA
MS, Civil and Environmental Engineering
June 1998

Princeton University, Princeton, NJ
BSE, Mechanical and Aerospace Engineering
June 1995

EMPLOYMENT HISTORY

University of Washington, Seattle, WA, USA
Professor, 2017-present

Delft University of Technology, Delft, The Netherlands
Visiting researcher, 2012-2013

University of Washington, Seattle, WA, USA
Associate professor, 2011-2017

University of Washington, Seattle, WA, USA
Assistant professor, 2004-2011

Stanford University, Stanford, CA, USA
Postdoctoral scholar, 2003-2004

Stanford University, Stanford, CA, USA
Research assistant / teaching assistant 1996-2003

Delta Geoscience, Vancouver, BC, Canada
Field engineer, 1996

Imperial College of Science Technology and Medicine, London, UK
Hydraulics laboratory summer intern, 1994

AWARDS AND HONORS

Allan & Inger Osberg Associate Professorship, 2012-2018
CEE Outstanding Teacher Award, 2011, 2015

AFFILIATIONS AND OTHER APPOINTMENTS

Adjunct Professor, School of Oceanography (University of Washington), 2017-present
Adjunct Associate Professor, School of Oceanography (University of Washington), 2012-2017
Adjunct Assistant Professor, School of Oceanography (University of Washington), 2009-2012

PUBLICATIONS

Refereed archival journal publications and book chapters

1. Branch, R. A., **A.R. Horner-Devine**, N. Kumar and A. R. Poggioli (2020) River plume liftoff dynamics and surface expressions. *Water Resour. Res.* doi:10.1029/2019WR026475

2. McKeon, M.A., **A.R. Horner-Devine** and S.N. Giddings. (2020) Seasonal changes in structure and dynamics in an urbanized salt wedge estuary. *Estuaries and Coasts,* 19pg *doi:10.1007/s12237-020-00788-z*

3. J.A. Morgan, N. Kumar, **A.R. Horner-Devine**, S. Ahrendt, E. Istanbullouglu, C. Bandaragoda (2020), The use of a morphological acceleration factor in the simulation of large-scale fluvial morphodynamics, *Geomorph*, 356, 107088, doi: 10.1016/j.geomorph.2020.107088

4. Flores, R., S. Rijnsburger, **A.R. Horner-Devine**, N. Kumar, A.J. Souza, J.D. Pietrzak, 2020. The formation of turbidity maximum zones by minor axis tidal straining in regions of freshwater influence. *J. Phys. Oceanogr.* 50, 1265–1287, doi:/10.1175/JPO-D-18-0264.1

5. Kastner, S.E., **Horner-Devine, A.R**., and Thomson, J.M. (2019). A conceptual model of a river plume in the surf zone. *J. Geophys. Res.*, 124, doi:10.1029/2019JC015510

6. Poggioli, A.R. and **A.R. Horner-Devine**, 2018. Two-layer hydraulics at the river-ocean interface. *J. Fluid Mech.* **(**856)633-672. doi:10.1017/jfm.2018.688

7. Kastner, S.E., **A.R. Horner-Devine** and J.M. Thomson, 2018. The influence of wind and waves on spreading and mixing in the Fraser River plume. *J. Geophys. Res. 123.* https://doi.org/10.1029/2018JC013765

8. Flores, R., S. Rijnsburger, S. Meirelles, **A.R. Horner-Devine**, A.J. Souza, J.D. Pietrzak, M. Henriquez and A.J.H.M. Reniers, 2018. Wave generation of gravity-driven sediment flows on a predominantly sandy seabed. *Geophys. Res. Lett.* doi: 10.1029/2018gl077936

9. Rijnsburger, S., Flores, R., J.D. Pietrzak, **A.R. Horner-Devine**, A.J. Souza, 2018. The influence of tide and wind on the propagation of fronts in a shallow river plume *J. Geophys. Res. 123,* doi: 10.1029/2017jc013422

10. Branch, R. **A. Horner-Devine**, C. Akan, C. Chickadel, G. Farquharson, A. Hudson, S. Talke, J. Thomson, and A. Jessup, 2018. Airborne Lidar measurements and model simulations of tides, waves, and surface slope at the Mouth of the Columbia River. *Geosci. Remote Sens.* doi: 10.1109/TGRS.2018.2847561

11. Yuan, Y., **A.R. Horner-Devine**, M. Avener, and S. Bevan, 2018. The role of periodically varying discharge on river plume structure and transport. *Cont. Shelf Res.*, 158: 15-25.

12. Meirelles, S., Henriquez, M., A. Reniers, A.P. Luijendijk, J.D. Pietrzak, **A.R. Horner-Devine,** A. Souza, M. Stive, 2018. Cross-shore stratified tidal flow seaward of a mega nourishment. *Estuar. Coast Shelf Sci. 200, 59-70*

13. Yuan, Y. and **A.R. Horner-Devine**, 2017. Experimental investigation of vortex dynamics in a freely spreading gravity current. *Phys. Fluids, 29, 106603.*

14. Flores, O., Riley, J.J. and **A.R. Horner-Devine**, 2017. On the dynamics of turbulence near a free surface. *J. Fluid Mech.* 821: 248-265, *doi:10.1017/jfm.2017.209.*

15. **Horner-Devine, A.R.,** J.D. Pietrzak, A. Souza, S. Meirelles, M. Henriquez, M.A. McKeon, R. Flores, S. Rijnsburger, 2017. Cross-shore transport of surf-zone sediment by river plume frontal pumping. *Geophys. Res. Lett., 44, doi:10.1002/2017GL073378.*

16. Flores, R., S. Rijnsburger, **A.R. Horner-Devine**, A. Souza, J.D. Pietrzak, 2017. Sediment fluxes in the mid-field region of the Rhine region of freshwater influence. *J. Geophys. Res.* 122, doi:10.1002/2016JC012362.

17. **Horner-Devine, A. R.** and C.C. Chickadel, 2017. Lobe - cleft instability in the buoyant gravity current generated by estuarine outflow. *Geophys. Res. Lett.* 44, doi:10.1002/2017GL072997.

18. Beuzen, T., C.C. Chickadel and **A.R. Horner-Devine**, 2016. The Influence of Sub-Surface Stratification on Turbulence and Aeration in a Tidal River. *IEEE Geosci. Remote Sens. Lett.* 13(12): 1975-1978.

19. Poggioli, A.R. and **A.R. Horner-Devine**, 2015. The sensitivity of salt wedge estuaries to channel geometry, *J. Phys. Oceanogr.,* 45(12):3169–3183.

20. Hooshmand, A., **A.R. Horner-Devine** and M. P. Lamb, 2015. Structure of turbulence and sediment stratification in wave-supported mud layers, *J. Geophys. Res*. 120(4): 2430-2448.

21. **Horner-Devine, A. R.,** R.D. Hetland and D.G. MacDonald, 2015. Transport and mixing in coastal river plumes. *Annu. Rev. Fluid Mech.* 47:569–94.

22. Thomson, J., **A. R. Horner-Devine**, S. Zippel, C. Rusch, and W. Geyer, 2014. Wave breaking turbulence at the offshore front of the Columbia River Plume, *Geophys. Res. Lett.,* 41(24): 8987-8993.

23. Kakoulaki, G., D.M. MacDonald, **A.R. Horner-Devine,** 2014. The role of wind in the near field and midfield of a river plume. *Geophys. Res. Lett.,* 41(14): 5132-5138.

24. Yuan, Y. and **A.R. Horner-Devine**, 2013. Laboratory investigation of the impact of lateral spreading on buoyancy flux in a river plume. *J. Phys. Oceanogr., 43(12): 2588-2610*

25. Talke, S.A., **A.R. Horner-Devine**, C.C. Chickadel and A.T. Jessup, 2013. Turbulent kinetic energy and coherent structures in a tidal river. *J. Geophys. Res.* 118: 6965–6981.

26. Nowacki, D.J., **A.R. Horner-Devine**, J.D. Nash, D.A. Jay, 2012. Rapid sediment removal from the Columbia River plume near field. *Cont. Shelf Res.* 35:16–28.

27. Giddings, S. N., D. A. Fong, S. G. Monismith, C. C. Chickadel, K. A. Edwards, W. J. Plant, B. Wang, O. B. Fringer, **A. R. Horner-Devine**, and A. T. Jessup, 2012. Frontogenesis and frontal progression of a trapping-generated estuarine convergence front and its influence on Mixing and Stratification. *Estuaries Coasts*, 35(2): 665-681.

28. Roberts, P. L. D., J. V. Steinbuck, J. S. Jaffe, **A. R. Horner-Devine**, P. J. S. Franks and F. Simonet, 2011. Estimation of in situ, three-dimensional particle distributions from a stereo laser imaging profiler. *IEEE J. Oceanic Eng.,* 36(4): 586-601.

29. Chickadel, C. C., S. A. Talke, **A. R. Horner-Devine**, A. T. Jessup, 2011. Infrared based measurements of velocity, turbulent kinetic energy, and dissipation at the water surface in a tidal river. *IEEE Geosci. Remote Sens. Lett..* 8(5):849-853.

30. Yuan, Y., M.E. Avener and **A.R. Horner-Devine**, 2011. A two-color optical thickness method for determining layer depth in two interacting buoyant plumes. *Exp. Fluids.* 50(5): 1235-1245.

31. Kudela, R. M., **A. R. Horner-Devine**, N. S. Banas, B. M. Hickey, T. D. Peterson, E. J. Lessard, E. Frame, K. W. Bruland, M. Lohan, D. A. Jay, J. Peterson, B. Peterson, M. Kosro, S. Palacios and E. P. Dever, 2010. Multiple trophic levels fueled by recirculation in the Columbia River plume. *Geophys. Res. Lett*. 37: 7 pg. L18607 doi:10.1029/2010GL044342.

32. Talke, S.A., **A.R. Horner-Devine** and C.C. Chickadel, 2010. Mixing layer dynamics in periodically stratified flow over an estuarine sill. *J. Geophys. Res.*,115: 17 pg, C09004.

33. J.V. Steinbuck, P. Roberts, C.D. Troy, **A.R. Horner-Devine**, F. Simonet, Uhlman, J.S. Jaffe, S.G. Monismith and P.J.S. Franks, 2010. An Autonomous Open-Ocean Stereoscopic PIV Profiler. *J. Atmos. Ocean. Tech.* 27:1362-1380.

34. 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. *J. Geophys. Res*., 115: 26 pg, C00B17.

35. Spahn, E.Y., **A.R. Horner-Devine**, J.D. Nash, D.A. Jay and L. Kilcher, 2009. Particle re-suspension in the Columbia River plume near-field. *J. Geophys. Res.*, 114: 16 pg, C00B14.

36. **Horner-Devine, A.R.**, 2009. The bulge circulation in the Columbia River plume. *Cont. Shelf Res.*, 29: 234–251.

37. Plant, W.J., R. Branch, G. Chatham, C.C. Chickadel, K. Hayes, B. Hayworth, **A.R. Horner-Devine**, D.A. Fong, O.B. Fringer, S. N. Giddings, and B. Wang, 2009 Remotely sensed river surface features compared with modeling and in-situ measurements. *J. Geophys. Re*s., 114: 13 pg, C11002.

38. Chickadel, C. C., **A. R. Horner-Devine**, S. A. Talke, A. T. Jessup, 2009. Vertical boil propagation from a submerged estuarine sill. *Geophys. Res. Lett*., 36: 6 pg.

39. Curtiss, G.M., P.D. Osborne and **A.R. Horner-Devine**, 2009. Seasonal patterns of coarse sediment transport on a mixed sand and gravel beach due to vessel wakes, wind waves, and tidal currents. *Mar. Geol.*, 259: 73-85.

40. **Horner-Devine, A.R**., D. A. Jay, P. M. Orton and E.Y. Spahn, 2009. A conceptual model of the strongly tidal Columbia River plume. *J. Mar. Sys.*, 78: 460–475.

41. Morrison, R.R., R.H. Hotchkiss, M. Stone, D. Thurman and **A. R. Horner-Devine**, 2009. Turbulence characteristics of flow in a spiral corrugated culvert fitted with baffles and implications for fish passage. *Ecol. Engineer.* 35: 381-392.

42. Jay, D. A., J. Pan, P. M. Orton, and **A.R. Horner-Devine**, 2009. Asymmetry of Columbia River tidal plume fronts. *J. Mar. Sys.*, 78: 442–459.

43. **Horner-Devine, A.R.**, D.A. Fong, and S.G. Monismith, 2008. Evidence for the inherent unsteadiness of a river plume: Satellite observations of the Niagara River discharge. *Limnol. Oceanogr*., 53: 2731-2737.

44. MacDonald, D. G., and **A. R. Horner-Devine**, 2008. Temporal and spatial variability of vertical salt flux in a highly stratified estuary. *J. Geophys. Res.*, 113: 16 pg, C09022.

45. **Horner-Devine, A.R.**, 2006. Velocity, density, and transport measurements in rotating, stratified flows. *Exp. Fluids,* 41: 559-571.

46. **Horner-Devine, A.R.**, D.A. Fong, S.G. Monismith and T. Maxworthy, 2006. Laboratory experiments simulating a coastal river discharge. *J. Fluid Mech*., 555: 203-232.

Book chapters (refereed)

47. **Horner-Devine, A.R.** C.C. Chickadel and D.M. MacDonald, 2013. Coherent Structures and Mixing at a River Plume Front. *Coherent Flow Structures in Geophysical Flows at the Earth's Surface* eds. J.G. Venditti, J. Best, M. Church and R.J. Hardy. Pg. 359-369

48. Jessup, A.T. , C.C. Chickadel, S.A. Talke and **A.R. Horner-Devine**, 2013. COHSTREX: Coherent Structures in Rivers and Estuaries Experiment. *Coherent Flow Structures in*

Geophysical Flows at the Earth's Surface eds. J.G. Venditti, J. Best, M. Church and R.J. Hardy. Pg. 215-230.

Refereed archival journal publications (*Submitted and in review*)

49. Rijnsburger, S., R.P. Flores, J.D. Pietrzak, F. Zijl, **A.R. Horner-Devine**, A.J. Souza. The evolution and interaction of multiple plume fronts in the tidal Rhine region of freshwater influence. *Submitted Journal of Geophys. Res.*

50. Rijnsburger, S., R.P. Flores, J.D. Pietrzak, K.G. Lamb, N.L. Jones, **A.R. Horner-Devine,** A.J. Souza. Observations of multiple internal wave packets in a tidal river plume. *Submitted Journal of Geophys. Res.*

51. Safar, Z., S. Rijnsburger, M.E. Ibanez Sanz, C. Chassagne, A. Manning, J.D. Pietrzak, A. Souza, T. van Kessel, **A.R. Horner-Devine** and R.P. Flores. Characterization of Suspended Particulate Matter in the Rhine Region Of Freshwater Influence (ROFI) during neap tide using various optical techniques. *Submitted Cont. Shelf Res.*

52. Henriquez, M., S. Meirelles, **A.R. Horner-Devine,** J.D. Pietrzak, A.J. Souza, M. Stive. Cross-shore sediment transport by the tide on the shoreface. *Submitted Journal of Geophys. Res.*

Conference proceedings and other non-journal articles (*Refereed by abstract only*)

1. S. Kastner, C. Stearns, **A. Horner-Devine** and J. Thomson, 2019. Ferry Vessel Propeller Wash Effects on Scour at the Kingston Ferry Terminal, WA, USA, Ports 2019: Port Planning and Development, ASCE, 500-511. doi:10.1061/9780784482629.048

2. L. Yue, Z. Cheng, T.-J. Hsu, **A.R. Horner-Devine** and A.J. Manning (2018). Turbulence-resolving numerical simulation of fine sediment transport over bedforms. *Coastal Engineering Proceedings*, *1*(36). https://doi.org/10.9753/icce.v36.sediment.24

3. Meirelles, S, M. Henriquez, A.J. Souza, **A.R. Horner-Devine**, J.D. Pietrzak, S. Rijnsburg, and M.J.F. Stive, 2016. Small Scale Bedform Types off the South-Holland Coast, *J. Coastal Res.* 75:423-426.

4. Meirelles, S.; Henriquez, M.; Horner-Devine, A.R.; Souza, A.J.; Pietrzak, J.; Stive, M.. 2015 Bed shear stress on the middle shoreface of the south of Holland coast. In: Wang, P.; Rosati, J.D.; Cheng, J., (eds.) *The Proceedings of the Coastal Sediments 2015.* Singapore, World Scientific, 10p.

5. Meirelles, S., **A.R. Horner-Devine**, M. Henriquez, M. Stive, J. Pietrzak and A.J. Souza, 2014. Middle shoreface sand transport under the influence of a river plume, *J. Coastal Res.* 70:182-186.

6. **Horner-Devine, A.R.**, Y. Yuan and M. Avener, 2009. Measuring volume and transport in laboratory-generated gravity currents, IAHR Congress, Vancouver, Canada.

7. **Horner-Devine, A.R.**, B.A. Hayworth and A. Venturato, 2007. Acoustic imaging of estuarine coherent structures downstream of a sill, ASCE Hydraulic Measurements & Experimental Methods Conference, Lake Placid, NY.

8. Chickadel, C.C., **Horner-Devine, A. R.** and A.T. Jessup, 2007. Thermal remote sensing of macroturbulent boil generation in a tidal estuary, ASCE Hydraulic Measurements & Experimental Methods Conference, Lake Placid, NY.

9. **Horner-Devine, A.R.** and B.A. Hayworth, 2007. Generation of coherent structures due to tidal forcing in an estuary, IAHR International Symposium on Environmental Hydraulics, Tempe, AZ.

10. Thurman, D.R., **A.R. Horner-Devine**, R.R.Morrison, R.H. Hotchkiss, 2007. Juvenile Salmon Passage in Sloped-Baffled Culverts, International Conference on Ecology and Transportation, Little Rock, AR.

11. Thurman, D.R., **A.R. Horner-Devine**, A.Compton, R.R.Morrison, R.H. Hotchkiss, 2006. Hydrodynamics of Juvenile Salmon Passage in Sloped-Baffle Culverts, World Environmental and Water Resources Congress, Omaha, NE.

12. Morrison, R.R., D.R. Thurman, R.H. Hotchkiss, **A.R. Horner-Devine**, 2006. Turbulence Characteristics of Flow in a Culvert with Sloped-weir Baffles, World Environmental and Water Resources Congress, Omaha, NE.

13. **Horner, A.R.**, D.A. Fong, J.R. Koseff, T. Maxworthy and S.G. Monismith, 2000. The control of coastal current transport. Fifth International Symposium on Stratified Flows, IAHR, 2:865-870, Vancouver, B.C.

Abstracts, letters, non-refereed papers, technical reports

Technical reports

1. Thurman, D.R., **A.R. Horner-Devine**, 2007. Hydrodynamic regimes and structures in weir baffle culverts and their influence on juvenile salmon passage. WA-RD 687.1, Washington State Department of Transportation (WSDOT), Olympia, WA.

2. Pearson, W.H., S.L. Southard, C.W. May, J.R. Skalski, R.L. Townsend, **A.R. Horner-Devine**, D.R. Thurman, R.H. Hotchkiss, R.R. Morrison, M.C. Richmond, D. Deng, 2006. Research on the Upstream Passage of Juvenile Salmon through Culverts: Retrofit Baffles. WA-RD 644.1, Washington State Department of Transportation (WSDOT), Olympia, WA.

OTHER SCHOLARLY ACTIVITY

Invited lectures, seminars and panels.
Note: Invited talks at conferences listed in next section

1. University of Washington, Earth and Space Science, Seattle, WA. *Field observations of lobe-cleft instability in a gravity current traveling along a free-slip boundary,* February 2019
2. Marine-Terrestrial Interactions in the Coastal Temperate Rainforest Domain workshop, Vancouver, B.C., Canada. *Sediment transport at the river-ocean interface: estuary and river plume dynamics,* Feb 1, 2018

3. Stanford University, Stanford, CA. *Field observations of lobe-cleft instability in a gravity current travelling along a free-slip boundary.* Jan. 2018
4. East China Normal University, Shanghai, China. *The role of sand in wave-supported gravity currents,* Nov 6, 2017
5. Zhejiang University, Zhoushan, China. *The role of sand in wave-supported gravity currents***,** Nov 2, 2017
6. National Taiwan University, Taipei, Taiwan. *The role of sand in wave-supported gravity currents***,** Oct 28, 2017
7. US Environmental Protection Agency, Region 10, Seattle WA. *Measurements and modeling of hydrodynamics and sediment transport in the Duwamish River estuary.* Sept 2017
8. WA Dept of Ecology, Bellevue WA, *Measurements and modeling of hydrodynamics and sediment transport in the Duwamish River estuary.* May 2017
9. University of Washington, Center for Engineering Teaching and Learning. *Doing a Partial Flip: How to Move Some Lecture Content Online Without Landing on Your Head,* May 2015
10. University of Washington, College of the Environment. *Meet, Greet, Teach: Wag the Dog – A panel discussion on the merits of technology in teaching,* May 2015
11. University of Ottawa, Ottawa, Canada. *Infrared sensing of coherent structures in rivers, estuaries and the coastal ocean*, Feb 2015
12. University of British Columbia, Department of Earth, Ocean and Atmospheric Sciences Vancouver, Canada. *The impact of stratification on coastal sediment transport. Aug. 2014.*
13. U.S Army Corps of Engineers. Seattle WA. *The sensitivity of hydrodynamics and sediment transport in the Duwamish River estuary to changes in river discharge.* Aug 2014.
14. Stanford University, Stanford, CA. *Instabilities and Mixing in Coastal River Plumes: Insights and Questions from Laboratory and Field Studies.* May 2014.
15. U.S. Environmental Protection Agency. Region 10. Seattle, WA. *The sensitivity of hydrodynamics and sediment transport in the Duwamish River estuary to changes in river discharge*, Dec. 2013
16. Deltares research institute and consultancy, Delft, The Netherlands, *The STRAINS experiment: sediment transport in the Rhine River ROFI*, June 2013
17. Leibniz Institute for Baltic Sea Research, Warnemunde, Germany, *The STRAINS experiment: sediment transport in the Rhine River ROFI*, May 2013
18. National Oceanography Centre, Liverpool, United Kingdom, *The STRAINS experiment: sediment transport in the Rhine River ROFI*, May 2013
19. Faculty of Civil Engineering and Geosciences, Delft University of Technology, The Netherlands, *Exploiting infrared imaging for characterizing environmental flows*, December 2012.
20. Royal Netherlands Institute for Sea Research, The Netherlands, *Exploiting infrared imaging for characterizing fluid structures and dynamics in the environment*, October 2012
21. Ecole Polytechnique Fédérale de Lausanne, Lausanne, Switzerland. Declined
22. Department of Civil and Environmental Engineering, University of Washington, *Interpreting remotely sensed coherent structures on the water surface in rivers and estuaries,* January 2010.
23. Department of Civil Engineering, Saint Anthony Falls Laboratory, University of Minnesota, *Interpreting remotely sensed coherent structures on the water surface in rivers and estuaries*, October 2009.

24. Department of Civil Engineering, Purdue University, *Interpreting remotely sensed coherent structures on the water surface in rivers and estuaries*, October 2009.
25. Department of Civil and Environmental Engineering, Hydrosystems Laboratory, University of Illinois, *Interpreting remotely sensed coherent structures on the water surface in rivers and estuaries*, October 2009.
26. Department of Civil and Environmental Engineering, Stanford University, *Nine orders of magnitude and a lot more plankton: testing laboratory results on the continental shelf*, February 2009.
27. Zachary Department of Civil Engineering, Texas A & M University, *The onset of surface boils in the Snohomish River estuary*, April 2008.
28. Annual Review of Research, The Water Center, University of Washington, *Plume soup: How a dash of river water affects Washington's coastal ecosystem*, February 2008.
29. The Water Center, University of Washington, *Retention and transport in coastal river plumes: how a plume-generated eddy may affect coastal productivity*, October 2007.
30. Applied Ocean Physics and Engineering Department, Woods Hole Oceanographic Institution, *Retention and transport in coastal river plumes: how a plume-generated eddy may affect coastal productivity*, May 2007.
31. School of Oceanography, University of Washington, *The role of turbulence and stratification in determining the source of sediment to the Columbia River plume*, April 2007.
32. Civil, Environmental and Architectural Engineering Department, University of Colorado, *Retention and transport in coastal river plumes: how a plume-generated eddy may affect coastal productivity*, March 2007.
33. Department of Physical and Environmental Sciences, University of Toronto, Canada, *Retention and transport in coastal river plumes: how a plume-generated eddy may affect coastal productivity*, March 2007.
34. Department of Applied Mathematics, University of Washington, *Retention and transport in coastal river plumes: how a plume-generated eddy may affect coastal productivity*, February 2007.
35. Department of Civil and Environmental Engineering, University of Washington, *Boil, boil, toil and trouble: Characterization of coherent structures in the Snohomish River estuary using subsurface acoustic imaging*, January 2007.
36. Department of Civil and Environmental Engineering, University of Washington, *Take two: Why the Columbia River plume comes back around*, February 2006.
37. Hydrology Group, Pacific Northwest National Laboratory, *Plumes, Blooms, and Flumes: Modeling Large-Scale Coastal River Inflows in the Fluid Mechanics Lab*, May 2005.
38. Department of Civil and Environmental Engineering, University of California at Berkeley, *Plumes, Blooms, and Flumes: Modeling Large-Scale Coastal River Inflows in the Fluid Mechanics Lab*, April 2005.
39. Department of Civil and Environmental Engineering, University of Washington, *Plumes, Blooms, and Flumes: Modeling Large-Scale Coastal River Inflows in the Fluid Mechanics Lab*, January 2005.
40. Department of Civil Engineering, Queen's University, Canada, *Alongshore transport in a buoyant river plume: can the near-field affect the far-field?* October 2002.
41. Department of Civil Engineering, University of British Columbia, Canada, *The alongshore transport of buoyant water in a river plume: implications and mechanisms of an unsteady bulge*, December 2001.

Presentations given at conferences.

The presenter is in bold. Only presentations by Horner-Devine are listed.

1. **A.R. Horner-Devine**, R.P. Flores, M. Williams, S. Kastner, J. Thomson "Scaling wave-plume interactions in two coastal river discharges" AGU Ocean Sciences Meeting, San Diego, CA. February 2020.

2. R. Flores and **A.R. Horner-Devine** "Observations of a wave-supported gravity flow on a sandy seabed", Physics of Estuaries and Coastal Seas, Galveston, TX, October 2018

3. **A.R. Horner-Devine** and A.R. Poggioli, "The hydraulics of the river-ocean interface" AGU Ocean Sciences Meeting, Portland, OR. February 2018.

4. **A.R. Horner-Devine "**Field observations of lobe-cleft instability in a gravity current traveling along a free-slip boundary", Stanford University CA, January 2018

5. **A.R. Horner-Devine** "The influence of shifting sediment dynamics on flood risk in the coastal watersheds of the Pacific Northwest", H2O Headwaters to Oceans Conference, UC Irvine, May 2017. (*Invited)*

6. **A.R. Horner-Devine** "The three-dimensional structure of river plume fronts", Gordon Research Conference, University of New England, Biddeford, ME, June 2017.

7. **A.R. Horner-Devine** "Surface wave processes in river plumes", Physics of Estuaries and Coastal Seas, Scheveningen, The Netherlands, October 2016

8. A.R. Poggioli and **A.R. Horner-Devine**. "River-estuary dynamics and implications for river morphodynamics," *Coastal and Estuarine Research Federation Conference*, Portland, OR, Nov. 2015.

9. A.R. Poggioli and **A.R. Horner-Devine**. "Laboratory experiments at the estuary – river plume interface," *Coastal and Estuarine Research Federation Conference*, Portland, OR, Nov. 2015.

10. **Horner-Devine, A.R.** and J. Pietrzak, M. Stive, A. Souza, S. Meirelles, M. Henriquez, M. McKeon, G. de Boer. "Cross-shore sediment transport due to near-shore frontal processes in the Rhine region of freshwater influence," *American Geophysical Union, Ocean Sciences Meeting*, Honolulu, HI, February 2014.

11. **Horner-Devine, A.R.** "A recipe for a plume: Can we construct at plume mixing budget?" Workshop on river plume mixing, Timberline, OR, Oct. 2013. *Invited speaker*

12. **Horner-Devine, A.R.** "STRAINS: The impact of density stratification on sediment transport in the Rhine ROFI," Coastal and Estuarine Research Federation Conference, San Diego, CA, Nov. 2013. *Invited speaker*

13. **Horner-Devine, A.R.** "The impact of stratification on coastal sediment transport," Gordon Research Conference on Coastal Ocean Circulation, Biddeford, ME, June 2013. *Invited speaker*

14. **Horner-Devine, A.R.** and C.C. Chickadel. "The multiscale physics of river plumes," *International workshop on Multi-scale Unstructured mesh numerical Modeling*, Delft, The Netherlands. August 2012.

15. **Horner-Devine, A.R.** and C.C. Chickadel. "Mixing and instability at a river plume front," *American Geophysical Union, Ocean Sciences Meeting*, Salt Lake City, UT, February 2012.

16. **Horner-Devine, A.R.** and C.C. Chickadel. "Lobe and cleft structures in the Merrimack River plume front: detailed measurements of a geophysical-scale gravity current," *Coherent Flow Structures in Geophysical Flows*, Vancouver BC, August, 2011.

17. **Horner-Devine, A.R.** and C.C. Chickadel. "Instability in a river plume front: the Merrimack plume at night," *American Geophysical Union, Fall Meeting*, San Fransisco, CA, December, 2010.

18. **Horner-Devine, A.R.**, S.A. Talke, C.C. Chickadel, A.T. Jessup. "Near surface turbulence and coherent structures: Part II near-surface modification of turbulent structures," *American Geophysical Union, Ocean Sciences Meeting*, Portland, OR, February, 2010.

19. **Horner-Devine, A. R.** and D. A. Fong, "The role of inflow angle in the alongshore momentum balance in a coastal river plume," *Coastal and Estuarine Research Federation conference*, Portland, OR, November, 2009.

20. **Horner-Devine, A.R.**, M. Nagamine, S. Bevan, and Y. Yuan, "The distribution of age in a coastal river plume," *American Physical Society – Division of Fluid Dynamics Conference*, Minneapolis, MN, November, 2009.

21. **Horner-Devine, A.R.**, Y. Yuan and M. Avener, "Measuring volume and transport in laboratory-generated gravity currents," *International Association of Hydraulic Researchers Congress*, Vancouver, Canada, August, 2009.

22. **Horner-Devine, A.R.**, M. Nagamine and S. Bevan, "The distribution and evolution of age in a coastal river plume," *Gordon Research Conference*, New London, NH, May, 2009.

23. **Horner-Devine, A.R.**, E.Y. Spahn, J.D. Nash, D.A. Jay and L. Kilcher, "Sediment removal and entrainment in the Columbia River plume," *Physics of Estuaries and Coastal Seas*, Liverpool, UK, August, 2008.

24. **Horner-Devine, A.R.**, S.A. Talke and C. C. Chickadel, "COHSTREX: The structure of estuary boils observed with a digital echosounder," *American Geophysical Union, Ocean Sciences Meeting*, Orlando, FL, March, 2008.

25. **Horner-Devine, A.R.**, "The half-meter plume: a comparison of recent laboratory results and river plume observations," *Physics of Estuaries and Coastal Seas*, Astoria, OR, August, 2006.

26. **Horner-Devine, A.R.**, Jay, D.A. and P.M. Orton, "Plume within a plume: a conceptual model of the strongly tidal Columbia River Plume," *American Geophysical Union, Ocean Sciences Meeting*, Honolulu, HI, February, 2006.

27. **Horner-Devine, A.R.**, D.A. Jay and T.A. Chisholm, "Frontal circulation and particle distribution in the Columbia River plume during the 2004 RISE cruise," *American Geophysical Union, Annual Fall Meeting*, San Francisco, CA, December, 2004.

28. **Horner-Devine, A.R.**, D.A. Fong, S.G. Monismith and T. Maxworthy, "Bulge dynamics and alongshore transport in a river plume," *American Geophysical Union, Ocean Sciences Meeting*, Portland OR, February, 2004.

29. Horner-Devine, A.R. and **D.A. Fong**, "Modeling alongshore transport as a function of river inflow angle," *American Geophysical Union, Ocean Sciences Meeting*, Portland, OR, February, 2004.

30. **Horner-Devine, A.R.**, S.G. Monismith[5] and D.A. Fong, "High resolution measurement of density and velocity in a laboratory scale river plume," *American Geophysical Union, Annual General Meeting*, San Francisco, CA, December, 2002.

31. **Horner, A.R.**, D.A. Fong and S.G. Monismith, "The river plume bulge: Does it grow and why?" *Gordon Conference on Coastal Circulation*, New London, NH, June 2001.

32. **Horner, A.R.**, S.G. Monismith, D.A. Fong, and T. Maxworthy, "Laboratory investigation of buoyant river plumes," *American Geophysical Union, Ocean Sciences Meeting*, San Antonio, TX, February, 2000.

Professional society memberships.

International Association of Hydraulic Researchers (2005-2010)
American Geophysical Union (1998-present)
American Society of Civil Engineers (1996 – present)
American Physical Society (2004, 2009 - 2012)
Coastal and Estuarine Research Foundation (2009 – present)

Other.

Editorial: Associate editor, Journal of Geophysical Research – Oceans, 2015-2019

Journal reviewer (approximate number of reviews): Journal of Geophysical Research (15), Geophysical Research Letters (6), Journal of Physical Oceanography (8), Environmental Fluid Mechanics (6), Continental Shelf Research (6), Limnology and Oceanography (5), Journal of Fluid Mechanics (4), Journal of Hydraulic Research (4), Water Resources Research (4), Journal of Marine Research (4), Experiments in Fluids (2), Ocean Modeling (2), Estuaries and Coasts (3), Nature (2), Climate Dynamics (1), Journal of Hydraulic Engineering (1), Measurement Science and Technology (1), Journal of Marine Systems (1), Ecological Engineering (1), Marine and Freshwater Research (1), Sedimentology (1), PLOS ONE (1), Geology (1), Marine Geology (1), Marine Pollution Bulletin (1), Geochemistry, Geophysics, Geosystems (1), Philosophical Transactions of the Royal Society (1).

Proposal reviewer: National Science Foundation (2-3 total per year; Hydrology, Marine Geology and Geophysics, Physical Oceanography, Major Research Instrumentation, Sedimentary Geology and Paleobiology), National Oceanic and Atmospheric Administration, Louisiana Board of Regents Support Fund, Oregon Transportation Research and Education Consortium, UW Royalty Research Fund, Woods Hole SeaGrant.

GRADUATE STUDENTS

Chaired Doctoral Degrees

Student Name	Dissertation Title	Completed (Year)	Current Employer
Yeping Yuan	The effect of lateral spreading on river plumes *Dissertation won international Lorenz G. Straub Award *Burges Fellowship	2012	Assoc. Prof. Zhejiang University
Abbas Hooshmand	Turbulence and sediment re-suspension in the wave boundary layer	2015	Uber
Anthony Poggioli	Backwater effects on spreading and mixing in a coastal river plume	2015	Postdoc UC Berkeley
Raul Flores	Sediment transport processes along the Dutch coast * Fullbright Fellowship	2018	Asst. Prof. Universidad Técnica Federico Santa María
Ruth Branch	Remote sensing of river discharge at river mouths * NASA Fellowship	2020	Postdoc Pacific Northwest National Labs

Current Doctoral Students

Student Name	Dissertation Title	Expected graduation
Sabine Rijnsburger (TU Delft, co-advised with J. Pietrzak)	Frontal dynamics in the Rhine River plume	2020
Zhuochen Han	Grain-size dependence in wave-supported gravity currents * Burges Fellowship	2020
Samuel Kastner (Co-advise with J. Thomson)	Wave-plume interactions in a small coastal discharge	2020
Samantha Fung (Co-advise with B. Neumann)	Geochemical and physical fluxes of arsenic from lake bed sediments	2021
Shelby Ahrendt (Co-advise with Nirnimesh Kumar)	Modeling geomorphic flood hazards	2022
Yingzhong Lou (Co-advise with Nirni Kumar)	Modeling river plumes in the surf zone	Start Summer 2020

Eli Schwat (Co-advise with Erkan Istanbulluoglu	Modeling upland sediment sources	Start Summer 2020

Chaired Masters Degrees

Student Name	Level of Supervision	Thesis/Paper Title	Completed	Current Employer
Bronwyn Hayworth	Chair	Observations of Tidally Generated Coherent Structures in the Snohomish River Estuary	2007	US EPA
Emily Spahn	Chair	Particle re-suspension in the Columbia River plume near-field	2007	West Consultants
David Thurman	Chair	Hydrodynamic regimes and structures in weir baffle culverts and their influence on juvenile salmon passage	2007	Golder Associates
Gregory Curtiss	Chair	Seasonal patterns of coarse sediment transport on a mixed sand and gravel beach due to vessel wakes, wind waves, and tidal currents	2008	Golder Associates
Yeping Yuan	Chair	A two-color optical thickness method for determining layer depth in two interacting buoyant plumes	2008	Zhejiang University
Margaret Avener	Chair	Modification of river plume structure and transport due to periodically varying discharge	2009	Temple University
Daniel Nowacki	Chair	Rapid sediment removal from the Columbia River Plume near field	2010	US Geological Survey
Samuel Kastner	Co-chair J. Thomson	Wave-plume interactions	2017	UW CEE PhD

Current Masters Students

Student Name	Level of Supervision	Thesis/Paper Title	Expected graduation
NA			

DOCUMENTATION OF TEACHING EFFECTIVENESS

Courses Taught & Student Evaluations

Course	Title	Quarter	Credit Hrs	Enroll-ment	Item 1^+	Item 3^+	Item 4^+	Average, Items 1-4
CEE 474	Sediment Transport	Spring 2019	3	33	4.9	5.0	5.0	4.9
CEE348	Environmental Flows	Spring 2019	4	25	4.5	4.7	4.7	4.6
CEWA 570	Hydrodynamics	Winter 2019	4	12	4.6	4.6	4.8	4.7
CEE 347	Fluid Mechanics	Fall 2018	5	72	4.6	4.9	4.8	4.8
CEE 474	Sediment Transport	Spring 2018	3	28	4.9	4.8	5.0	4.9
CEE348	Environmental Flows	Spring 2018	4	17	4.1	4.6	4.4	4.3
CEWA 570	Hydrodynamics	Winter 2018	4	10	4.9	5.0	5.0	5.0
CEE 474	Sediment Transport	Spring 2017	3	26	4.8	4.9	4.9	4.8
CEE 570	Hydrodynamics	Winter 2017	4	6	4.4	4.6	4.5	4.5
CEE 474	Sediment Transport	Spring 2016	3	25	4.4	4.8	4.7	4.6
CEE 570	Hydrodynamics	Spring 2016	4	8	4.2	4.7	4.7	4.8
CEE 474	Sediment Transport	Spring 2015	3	33	4.4	4.9	5.0	4.8
CEE 570	Hydrodynamics	Spring 2015	4	10	3.4	3.7	3.4	3.6
CEE 347	Fluid Mechanics	Winter 2015	5	66	4.8	5.1	5.1	5.0
CEE 570	Hydrodynamics	Spring 2014	4	20	4.4	4.8	4.8	4.5
CEE 474	Sediment Transport	Spring 2014	3	18	4.8	5.0	4.8	4.9
CEE 347 (prev. 342)	Fluid Mechanics	Winter 2014	5	119	4.8	5.0	4.9	4.9
CEE 570	Hydrodynamics	Spring 2012	4	8	4.0	4.7	4.7	4.4
CEE 474	Sediment Transport	Winter 2012	3	42	4.3	4.6	4.6	4.4
CEE 342	Fluid Mechanics	Fall 2011	4	62	4.4	4.7	4.5	4.5
CEE 570	Hydrodynamics	Spring 2011	4	11	4.9	5.0	4.8	4.9
CEE 474	Sediment	Winter	3	34	4.5	4.8	4.9	4.7

	Transport	2011						
CEE 342	Fluid Mechanics	Fall 2010	4	61	4.5	4.8	4.6	4.6
CEE 570	Hydrodynamics	Spring 2010	4	9	4.0	4.5	4.7	4.2
CEE 474	Sediment Transport	Winter 2010	3	35	4.3	4.6	4.6	4.4
CEE 570	Hydrodynamics	Spring 2009	4	9	4.3	4.8	4.2	4.5
CEE 474	Sediment Transport	Winter 2009	3	24	4.0	4.2	4.2	4.1
CEE 342	Fluid Mechanics	Fall 2008	4	64	4.1	4.4	4.1	4.2
CEE599	Topics in Env. Fluid Mechanics	Winter 2008	2	4	3.7	4.0	4.5	4.3
CEE 474	Sediment Transport	Winter 2008	3	20	3.3	3.5	3.7	3.5
CEE 342	Fluid Mechanics	Fall 2007	4	61	4.1	4.4	4.0	4.2
CEE 474	Sediment Transport	Winter 2007	3	18	4.4	4.9	4.9	4.8
CEE 570	Hydrodynamics	Spring 2006	4	9	4.0	4.1	4.1	4.1
CEE 342	Fluid Mechanics	Winter 2006	4	44	4.2	4.6	4.4	4.4
CEE 474	Sediment Transport	Fall 2005	3	18	4.0	4.5	4.6	4.4
CEE 342	Fluid Mechanics	Winter 2005	4	69	4.4	5.0	4.4	4.6

[+] Item 1: Adjusted median rating of course as a whole, Item 2: Course content (not shown), Item 3: Adjusted median rating of instructor's contribution, Item 4: Adjusted median rating of instructor's effectiveness. All ratings are on a scale from 0 – 5.

Other teaching contributions

- Catalyst focus group on technology in the classroom (May 2005).
- UW Center for Engineering Learning and Training workshop to incorporate new pedagogical research into engineering education (April 2009).
- Built and developed a new 3m flume equipped for Particle Image Velocimetry (PIV) and an accompanying set of labs for CEE and ME undergraduate and graduate fluids classes together with Alberto Aliseda, ME. This was funded through a competitive grant from the College of Engineering for $60K.
- Technology Teaching Fellows. As part of the TTF program I developed a new component in my junior-level Fluid Mechanics course (CEE347) using online teaching methods in winter 2015.

Teaching Awards, Nominations for Teaching Awards

- CEE Outstanding Teacher of the year in 2011 and 2015. Nominated and voted by graduate and undergraduate students.

- Nominated for College of Engineering, Junior Faculty Innovator Award (2009), based in large part on teaching in CEE342 (Fluid Mechanics) and development of new laboratory curriculum associated with the PIV flume listed above.

SERVICE

Departmental service

CEE leadership

- CEE executive committee (2006-2007, 2013-2019).
- Program head, Environmental and Water Program (2013-2019)
- Graduate admissions coordinator, Hydrology and Hydrodynamics program (2007- 2011).
- Departmental affairs committee (2017-present)

Search committees

- Hydrology faculty search committee (2005).
- Transportation faculty search committee (2005).
- Hydrology faculty search committee (2009).
- Chair of Hydrodynamics faculty search committee (2016).
- Chair of Innovations in Water Treatment faculty search committee (2018).

Other committees and functions

- Mentor committee chair, Nirni Kumar (2017 – present)
- UWE Tsunami Certificate Advisory Board (2007).
- Curriculum committee (2010-2011).
- CEE Faculty Affairs committee (2013-2016).
- Valle Fellowship Committee (2013-present).
- BS Environmental Engineering degree program development committee (2013-present).
- CEE Departmental Affairs committee (2016-2019).

Student mentoring

- Chi Epsilon CEE student honor society faculty advisor (2007 – 2010).
- Mentored undergraduate and graduate students for COE open house (2005-2011).

College service

- Leader, College of Engineering Mountain to Sea Research Initiative

University service

- College of the Environment Working Group on proposed college structure (2008).

Professional society and other service

Professional committee membership

- ASCE Technical Committee on Hydraulic Measurements and Experimentation (2009-present).

Conference organization

- ASCE Hydraulic Measurements & Experimental Methods Conference (2012).

Conference scientific advisory panel

- "Coherent Structures in Geophysical Flows," Aug. 2011, Vancouver, Canada.

Conference session organizer, chair or moderator

- Session co-chair and co-organizer, "River plumes and buoyancy-driven shelf circulation," American Geophysical Union, Ocean Sciences Meeting, Feb. 2014, Honolulu, HI (with R. Hetland).
- Session co-chair and co-organizer, "Oceanic fronts: observations, modeling and applications," American Geophysical Union, Ocean Sciences Meeting, Feb. 2012, Salt Lake City, UT (with I. Belkin, P. Cornillon, D. Wang and J. Nash).
- Session co-chair and co-organizer, "Turbulence, Mixing, and Multi-Scale Interactions in Rivers and Estuaries," American Geophysical Union, Fall Meeting, Dec. 2010, San Francisco CA (with A. Jessup and S. Monismith).
- Session co-chair and co-organizer, "Mixing Processes and Buoyant Flows II: Plumes and the Coastal Ocean," American Geophysical Union, Ocean Sciences Meeting, Feb. 2010, Portland, OR (with D. MacDonald and R. Hetland).
- Session co-chair and co-organizer, "Structure and function of river plumes in coastal margins," American Geophysical Union, Ocean Sciences Meeting, Mar. 2008, Orlando, FL (with T. Petersen).
- Session co-chair and co-organizer, "River and estuary dynamics," IAHR International Symposium on Environmental Hydraulics, Dec. 2007, Tempe, AZ (with B. Hickey).
- Session co-chair and co-organizer, "River Plume – Ocean Interactions," American Geophysical Union, Ocean Sciences Meeting, Feb. 2006, Honolulu, HI (with M. Lohan).
- Session moderator, "Drops and emulsions," American Physical Society, Division of Fluid Dynamics Meeting, Nov. 2004, Seattle, WA.
- Session co-chair and co-organizer, "Dynamics of River Plume Systems," American Geophysical Union, Ocean Sciences Meeting, Feb. 2004, Portland OR (with D. Fong).

Community service

- *Pro bono* consulting on sedimentation impact on sewer overflows at low-income housing development.

Technical advisory committee

- Contamination Assessment and Reduction Project, Port of New York contaminated sediment remediation
- Deschutes Estuary – Capitol Lake restoration

International, national or governmental service

- Associate editor on Scientific Review Committee for Washington Department of Natural Resources.

Outreach activities

- Mentored student teams for demos in College of Engineering Open House (approximately 7000 K-12 students) every year at UW. Demos won CEE Departmental awards in two years.
- Two BRIDGE workshops for entering engineering students from under-represented groups. 1) Measurements of planktonic thin layers in a local reservoir (with M. Brett), and 2) Scale model laboratory experiments describing residence time in Puget Sound.