

## Catalina Segura

Assistant Professor

Department of Forest Engineering, Resources, and Management

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## Education

2008, PhD. Geography. University of Colorado

2003, MS. Environmental Engineering. University of Washington

1997, BS. Forest Engineering. Universidad Distrital Francisco José de Caldas. Bogota, Colombia.

## Academic Experience

- 2013– Assistant Professor Forest Hydrology, Department of Forest Engineering, Resources, and Management, Oregon State University.
- 2012–2013: Post–Doctoral Fellow Department of Marine Earth, and Atmospheric Sciences, North Carolina State University.
- 2010–2012: Universidad Autónoma de Colombia, Instructor.
- 2008–2010: Post-Doctoral Fellow Department of Forestry and Natural Resources, North Carolina State University.

## Non-Academic Experience

1997–2001. Forest Engineer, AMBIOTEC LTDA Bogotá, Colombia.

## Publications (\*Denotes student/post-doctoral fellow under Segura’s advisement)

26. Ward, A.S., Zarnetske, J.P., Baranov, V., Blaen, P.J., Brekenfeld, N., Chu, R., Derelle, R., Drummond, J., Fleckenstein, J., Garayburu-Caruso, V., Graham, E., Hannah, D., Harman, C., Hixson, J., Knapp, J.L.A., Krause, S., Kurz, M.J., Lewandowski, J., Li, A., Martí, E., Miller, M., Milner, A.M., Neil, K., Orsini, L., Packman, A.I., Plont, S., Renteria, L., Roche, K., Royer, T., Schmadel, N.M., Segura, C., Stegen, J., Toyoda, J., Wells, J., Wisnoski, N.I. and Wondzell, S.M. (2019b) Co-located contemporaneous mapping of morphological, hydrological, chemical, and biological conditions in a 5th order mountain stream network, Oregon, USA. *Earth Syst. Sci. Data*, *in press*.
25. Bladon, K.D., Bywater-Reyes, S., LeBoldus, J.M., Keriö, S., Segura, C., Ritóková, G., and Shaw, D.C. (2019) Increased streamflow in catchments affected by a forest disease epidemic. *Science of the Total Environment*. 691: 112-123,
24. \*Bair, R. T., Segura, C., and Lorion, C. M.: Quantifying the restoration success of wood introductions to increase coho salmon winter habitat, *Earth Surf. Dynam.*, 7, 841–857, <https://doi.org/10.5194/esurf-7-841-2019>, 2019.
23. Segura, C., Noone, D., Warren, D., Jones, J., Tenny, J\*, & Ganio, L. ( 2019). Climate, landforms, and geology affect baseflow sources in a mountain catchment. *Water Resources Research*, 55. <https://doi.org/10.1029/2018WR023551>.
22. Mosquera, G., Segura, C., Crespo, P., 2018. Flow Partitioning Modelling Using High-Resolution Isotopic and Electrical Conductivity Data. *Water*, 10(7), 904.
21. McDonnell, J.J., Evaristo, J., Bladon, K.D., Buttle, J., Creed, I.F., Dymond, S.F., Grant, G., Iroume, A., Jackson, C.R., Jones, J.A., Maness, T., McGuire, K.J., Scott, D.F., Segura, C., Sidle, R.C., Tague, C., 2018. Water sustainability and watershed storage. *Nature Sustainability*, 1(8), 378-379.

20. \*Bywater-Reyes, S., Bladon, K.D., Segura, C., 2018. Relative Influence of Landscape Variables and Discharge on Suspended Sediment Yields in Temperate Mountain Catchments. *Water Resour. Res.*, 54(7), 5126-5142.
19. Bladon, K.D., Segura, C., \*Cook, N.A., \*Bywater-Reyes, S., Reiter, M., 2018. A multicatchment analysis of headwater and downstream temperature effects from contemporary forest harvesting. *Hydrological Processes*, 32(2), 293-304
18. Hatten, J.A., Segura, C., Bladon, K.D., Hale, V.C., Ice, G.G., Stednick, J.D., 2018. Effects of contemporary forest harvesting on suspended sediment in the Oregon Coast Range: Alsea Watershed Study Revisited. *Forest Ecology and Management*, 408, 238-248.
17. \*Katz, S.B., Segura, C., Warren, D.R., 2018. The influence of channel bed disturbance on benthic Chlorophyll a: A high resolution perspective. *Geomorphology*, 305, 141-153.
16. \*Bywater-Reyes, S., Segura, C., Bladon, K.D., 2017. Geology and geomorphology control suspended sediment yield and modulate increases following timber harvest in temperate headwater streams. *Journal of Hydrology*, 548, 754-769.
15. \*Nickolas, L.B., Segura, C., Brooks, J.R., 2017. The influence of lithology on surface water sources. *Hydrological Processes*, 31(10), 1913-1925.
14. Pace, K.M., Tullos, D., Walter, C., Lancaster, S., Segura, C., 2017. Sediment Pulse Behaviour Following Dam Removal in Gravel-Bed Rivers. *River Research and Applications*, 33(1), 102-112.13.
13. \*Mosquera, G.M., Segura, C., Vache, K.B., Windhorst, D., Breuer, L., Crespo, P., 2016. Insights into the water mean transit time in a high-elevation tropical ecosystem. *Hydrology and Earth System Sciences*, 20(7), 2987-3004.
12. Bladon, K.D., Cook, N.A., Light, J.T., Segura, C., 2016. A catchment-scale assessment of stream temperature response to contemporary forest harvesting in the Oregon Coast Range. *Forest Ecology and Management*, 379, 153-164.
11. Segura, C., and J. Pitlick (2015), Coupling fluvial-hydraulic models to predict gravel transport in spatially variable flows, *Journal of Geophysical Research: Earth Surface*, doi:10.1002/2014JF003302.
10. Segura, C., P. Caldwell, G. Sun, S. McNulty, and Y. Zhang (2015), A model to predict stream water temperature across the conterminous USA, *Hydrological Processes*, 29(9), 2178-2195, doi:10.1002/hyp.10357.
9. Caldwell, P., C. Segura, S. G. Laird, G. Sun, S. G. McNulty, M. Sandercock, J. Boggs, and J. M. Vose (2015), Short-term stream water temperature observations permit rapid assessment of potential climate change impacts, *Hydrological Processes*, 29(9), 2196-2211, doi:10.1002/hyp.10358.
8. Segura, C., G. Sun, S. McNulty, and Y. Zhang (2014), Potential impacts of climate change on soil erosion vulnerability across the conterminous United States, *Journal of Soil and Water Conservation*, 69(2), 171-181, doi:10.2489/jswc.69.2.171.
7. Sun, G. and C. Segura. 2013. Interactions of Forests, Climate, Water Resources, and Humans in a Changing Environment: Research Needs. Volume 3, Issue 2 (April-June) - Special Issue. (Editorial)
6. Segura, C., D. Lazzati, and A. Sankarasubramanian (2013), The use of broken power-laws to describe the distributions of daily flow above the mean annual flow across the conterminous US, *Journal of Hydrology*, 505, 35-46, doi:10.1016/j.jhydrol.2013.09.016.

5. Segura, C., A. L. James, D. Lazzati, and N. T. Roulet (2012), Scaling relationships for event water contributions and transit times in small-forested catchments in Eastern Quebec, *Water Resources Research*, 48, W07502-W07502, doi:10.1029/2012WR011890.
4. Segura, C., J. H. McCutchan, W. M. Lewis, Jr., and J. Pitlick (2011), The influence of channel bed disturbance on algal biomass in a Colorado mountain stream, *Ecohydrology*, 4(3), 411-421, doi:10.1002/eco.142.
3. Segura, C., and D. B. Booth (2010), Effects of Geomorphic Setting and Urbanization on Wood, Pools, Sediment Storage, and Bank Erosion in Puget Sound Streams, *Journal of the American Water Resources Association*, 46(5), 972-986, doi:10.1111/j.1752-1688.2010.00470.x.
2. Segura, C., and J. Pitlick (2010), Scaling frequency of channel-forming flows in snowmelt-dominated streams, *Water Resources Research*, 46, W06524-W06524, doi:10.1029/2009WR008336.
1. Pitlick, J., E. R. Mueller, C. Segura, R. Cress, and M. Torizzo (2008), Relation between flow, surface-layer armoring and sediment transport in gravel-bed rivers, *Earth Surface Processes and Landforms*, 33(8), 1192-1209, doi:10.1002/esp.1607.

### **Book Chapters**

- 2 Nelson, M.P., H. Gosnell, D.R Warren, C. Batavia, M. Betts, J. Burton, E.J. Davis, C. Friesen, S. Perakis, M. Schulze, C. Segura. 2017. Enhancing Public Trust in Federal Forest Management. In: Olson D.H., Van Horne B. (eds) *People, Forests, and Change*. Island Press, Washington, DC.
- 1 Pitlick, J., Mueller, E.R., Segura, C., 2012. Differences in sediment supply to braided and single-thread river channels: What do the data tell us? In: M.A. Church, P. Brion, A.H. Roy (Eds.), *Gravel Bed Rivers: Processes, Tools, Environments*. Wiley and Sons, Chichester, pp. 502-511.

### **Invited conference presentations/panels**

- 19 Segura, C., Lorion, C., Suring, E. Initial effects of habitat restoration using large wood: linking stream geomorphic change and fish response in the Oregon Coast Range, *American Geophysical Union Fall Meeting Washington D.C. December, 2018*.
- 18 Segura, C. Workshop: Respiration Regimes in River Networks: A cross-biome perspective, Ovronnaz, Switzerland. September, 2018. Supported by NSF Macrosystems and the Swiss National Foundation.
- 17 Segura, C., Noone, D., Warren, D., Ganio, L. M. Network Scale Variability in Base Flow Water Sources, HJ Andrews Experimental Forest LTER Summer Seminar Series, Blue River, OR. July 2018.
- 16 Segura C., Noone, D., Warren, D., Ganio, L. M. Network Scale Variability in Base Flow Water Sources, National Convection Society of American Foresters, Portland. October, 2018.
- 15 Segura, C. Bretz Club Meeting, Controls on sediment transport, and primary production, Warrenton, Oregon. National. April, 2018.
- 14 Segura C. \*Katz, S, Warren, D.R. Sediment transport influence on primary production in rainfall dominated system. Binghamton Symposium. San Marcos TX. October 2017.

- 13 Bladon, K.D., Segura, C., \*Bywater-Reyes, S., \*Cook, N.A., and Reiter, M. Impacts of contemporary forest management on stream temperature in western Oregon. Oregon Forest and Industries Council Policy Committee Meeting. Salem, OR. September 2017.
- 12 \*Bywater-Reyes, S., Segura, C., and Bladon, K.D. 2017. Relative influence of landscape physiography, hydrologic conditions, and land management on sediment yield in a temperate mountain watershed. U.S. Geological Survey Assessing Trends in Sediment Processes in Puget Sound Watersheds Workshop. Seattle, WA. April 2017.
- 11 LeBoldus, J.M, Bladon, K.D., \*Bywater-Reyes, S., Segura, C., Ritokova, G., Shaw, D. C. Swiss Needle Cast Cooperative Quarterly Meeting, The effects of Swiss needle cast foliage disease on annual streamflow in western Oregon, Corvallis, OR. 2017.
- 10 Segura, C. Bladon, K.D., Hatten, J.A., \*Bywater-Reyes, S., \*Cook, N., Maryanne, R, Temperature & Sediment Impacts in Managed Forests, California Licensed Foresters Association Fall Workshop Chico, CA. September 2017.
- 9 Segura, C., Bladon, K.D., \*Cook, N.A., \*Bywater-Reyes, S., Reiter, M. Studies of the impacts of contemporary forest management on stream temperature in western Oregon, National Council for Air and Stream Improvement Annual Meeting Eugene, OR. July 2017.
- 8 Segura C, Caldwell P, Cohen E, Sun G McNulty S Modeling the impacts of climate change on stream water temperature across scales, GC51E-1126, American Geophysical Union (AGU), Fall Meeting, San Francisco, CA, Dec 2015.
- 7 Segura, C., Caldwell, P., Sun, G., Cohen, E., McNulty, S. Modeling Impacts of Environmental Change on Ecosystem Services. Presented at the Workshop "Reducing vulnerability from climate change, and conserving biodiversity through reforestation and restoration, and urban forestry". Crowne Plaza, EL SALVADOR, July 2013.
- 6 Segura, C., Sun, G., McNulty, S., Zhang, Y. Potential Impacts of Climate Change on Soil Erosion Vulnerability Across the Conterminous U.S South Atlantic Landscape Conservation Cooperative, brown bag May 2013.
- 5 Segura, C. and Pitlick, J. Methodology for the prediction of flows of geomorphic and ecological importance in mountain rivers. First International conference of ecological flow and climate change. Bogotá, Colombia, June 10 –11 2010.
- 4 Pitlick J., Segura C, and Mueller E. Influence of Sediment Transport Intensity and Hydrology on the Bankfull Hydraulic Geometry of Gravel Bed Rivers. 2010 Western Pacific Geophysics Meeting, Taipei, Taiwan, 22–25 June 2010
- 3 Pitlick, J., Mueller, E.R., Segura, C. Differences in sediment supply to braided and single thread river channels: What do the data tell us? Paper presented at the 7th Conference on Gravel Bed Rivers, Tadoussac, Ontario, CA. 2010.
- 2 Pitlick, J., Mueller, E.R, and Segura, C. Surface-layer armoring and its effect on sediment transport in high-gradient channels. 2nd Annual Hydrologic Sciences Student Research Symposium, University of Colorado, March 2007.
- 1 Booth, D.B., Alberti, M, Avolio, C., and Segura, C. Determinants of urban stream degradation. Channel Protection and Restoration Conference. The Ohio State University, October 7 2003.

**Volunteer oral presentations (selected 17 out of 36)**

- 17 \*Fratkin, M., Segura, C., \*Bywater-Reyes, S. Longitudinal transport capacity trends in steep unglaciated basins with contrasting lithology in the Oregon Coast Range. American Geophysical Fall Meeting. New Orleans, LA. December 2017

- 16 Bladon, K.D., \*Bywater-Reyes, S, LeBoldus, J.M., Segura, C., Ritokova, G., and Shaw, D.C. 2017. Increased annual runoff ratios in Pacific Northwest catchments impacted by epidemic foliage disease of Douglas-fir. American Geophysical Meeting Fall Meeting. New Orleans, LA. December 2017.
- 15 \*Bywater-Reyes, S., Bladon, K.D., and Segura, C. 2017. Relative influence of landscape variables, discharge, and forest management on sediment yields in temperate mountain catchments. Geological Society of America Annual Meeting, Seattle, WA. October 2017.
- 14 Segura, C.\* Bair, R., and \*Yeager, A. Qualifying fish relevant hydraulic changes triggered by Large Wood Additions. American Geophysical Union Fall Meeting, San Francisco, CA. December 2016
- 13 \*Cook, N.A., Bladon, K.D., and Segura, C. 2016. An analysis of the downstream propagation of stream temperature changes following headwater forest management in western Oregon. American Geophysical Union Fall Meeting. San Francisco, CA. December 2016.
- 12 \*Nickolas, L., Segura, C., and Brooks, R, Exploring Controls on the Temporal and Spatial Variation of Surface Water Stable Isotopes in the Marys River Basin, OR, 6th Annual Water Research Symposium. Corvallis, Oregon. April 2016.
- 11 \*Bair, R., and Segura, C. Modeling the Effect of Geomorphic Change Triggered by Large Wood Addition on Salmon Habitat in a Forested Coastal Watershed 2016 River Restoration Northwest symposium, Stevenson, WA. February 2016.
- 10 \*Katz, S. and Segura, C. Can fluvial hydraulic models accurately predict bed load transport in gravel bed streams? 2016 River Restoration Northwest symposium, Stevenson, WA, February 2016.
- 9 \*Katz, S., Segura, C., and Warren, D. Sediment transport dynamics and its relation to primary production in mountain headwater streams. American Geophysical Union Fall Meeting, San Francisco, CA. December 2015.
- 8 Segura, C., \*Nickolas, L., and Bladon, K.B. Investigation of the scaling properties of the rainfall runoff generation processes and its relation to nutrient flushing mechanisms in the Oregon Cascade Mountains: A nested approach, 4th International Conference on Forests and Water in a Changing Environment, Kelowna, BC, Canada. July 2015.
- 7 Segura, C. and Pitlick, J. A model to predict annual bed load transport in ungauged watersheds. American Geophysical Union Fall Meeting, San Francisco, CA. December 2015.
- 6 Segura, C., Sun, G., McNulty, S., and Y. Zhang 2013. Climate change impacts on soil erosion vulnerability across the conterminous US. American Water Resources Association Summer Specialty Meeting 'Healthy Forests=Healthy Waters'. Hartford, CT. June 2013.
- 5 Segura, C. and Lazzati, D. Modeling the daily-flow distribution of unregulated basins in the continental US. American Geophysical Union Fall Meeting, San Francisco, CA. December 2011.
- 4 Segura, C. and James, A. Combining hydrometric, stable isotope and hydrochemical analysis in the development of a multi-scale catchment model of a forested headwater system. 2nd International Conference on Forests and Water in a Changing Environment, Raleigh, NC. September 2009.
- 3 Segura, C. and Pitlick, J. Relation between shear stress, surface-layer armoring, and sediment transport in a mountain stream. AGU, Fall Meeting, San Francisco, CA, December 2006.

- 2 Segura, C. and Booth, D.B. Morphological Effects of Channel Confinement and Riparian Vegetation on Urban and Non-urban Streams of the Pacific Northwest. American Geophysical Union Fall Meeting, San Francisco, CA. December 2003.
- 1 Segura, C., Rylko, M., Booth, D.B, and Nelson, P. Comparing and evaluating rapid assessment techniques of stream-channel conditions for assessing the quality of aquatic habitat at the watershed scale. Georgia Basin/Puget Sound Research Conference, Vancouver, BC, March 2003.

## **Professional activities**

### **Journal Reviewer**

Water Resources Research, Hydrological processes, Journal of Geophysical Research, Journal of the American Water Resources Association, Journal of Hydrology, EOS, Guest Editor for the Third Special Issue of the British Journal of Environment and Climate Change.

### **Membership in Professional Organizations**

Member, American Geophysical Union, Catchment Hydrology Technical Committee-AGU.

### **Conference Session organization**

- Segura, C. (Chair), van Meerveld, I, Emanuel, R., Bogaard, T American geophysical Union Fall Meeting. Runoff generation processes– integrating observations, hydrological and geomorphological processes over variable scales. San Francisco December 2019.
- Segura, C. (Chair), Goosey, S., Ali, G, Hrachowitz, M. American geophysical Union Fall Meeting, Runoff generation processes– integrating observations and processes over variable scales," Washington D.C. December 2018.
- Member of the organization committee for the Second International Forests and Water Conference, Valdivia Chile November 2018

### **National Science Foundation Panelists Reviewer**

- 2015- Present: National Science Foundation Proposal Reviewer.
- 2016-2018: National Science Foundation Panelist for Grant Reviewing

### **Service to the Public**

2019–present: Oregon Museum of Science and Industry (OMSI) Science Fellow  
Communicator

### **Funding**

I have received federal, state, tribal, forest industry funding, and competitive grants within the Oregon State University. Between 2014 and 2019, I have secured grants and contracts totaling \$2.4 million (as Principal Investigator or Co-Principal Investigator) with control of over \$1.5 million. The most important sources of funding to my research program are federal (National Science Foundation) and state (California Department of Forestry and Fire Protection).

### **Honors and Awards**

Fulbright Scholarship, 2001–2003.