Desiree D Tullos, Ph.D., PE

Biological and Ecological Engineering Department  
Oregon State University  
116 Gilmore Hall  
Corvallis, OR 97330  
1 (541) 737-2038  
[desiree.tullos@oregonstate.edu](mailto:desiree.tullos@oregonstate.edu)  
<http://blogs.oregonstate.edu/rivers/>

# Education and Employment Information

## Education

2005 Ph.D. North Carolina State University, Biological Engineering Raleigh, NC

2002 M.CE North Carolina State University, Civil Engineering Raleigh, NC

2000 B.Sc. University of Tennessee, Civil Engineering Knoxville, TN

## Employment

**Professor** 07/2017 – present  
Biological and Ecological Engineering Department  
Oregon State University  
Corvallis, OR

**Associate Professor** 07/2011 – 07/2017  
Biological and Ecological Engineering Department  
Oregon State University  
Corvallis, OR

**Fulbright Scholar** 10/2011 - 09/2012  
National Cheng Kung University  
Tainan, Taiwan

**Assistant Professor** 09/2005 – 07/2011  
Biological and Ecological Engineering Department  
Oregon State University  
Corvallis, OR

**Visiting Scientist** 05/2005 – 09/2005  
Research Center for Eco-Environmental Science  
Chinese Academy of Sciences  
Beijing, China

**Teaching/Research Assistant**  09/2000 – 06/2005  
Civil and Agricultural Engineering Departments   
North Carolina State University  
Raleigh, NC

**Engineering Consultant** 01/2002 – 12/2002  
Blue Land Water Infrastructure   
Clayton, NC

# Teaching and Advising

## Philosophy

My approach to teaching reflects the need to train students to thrive and successfully contribute a) as an effective member of a collaborative team in the increasingly complex field of engineering, and b) to approach engineering from a systems perspective that acknowledges the interactions between engineering, ecosystems, and society. My courses are uniquely conceived to emphasize the practical realities of engineering design that will help students stand out in job interviews. I use chalkboard lectures, powerpoint slide decks, worked examples, online and professional resources, laboratory experiments, numerical modeling, case studies, and field trips to deepen students’ knowledge and experience via a variety of routes. My lectures and assignments establish a clearly-defined problem and provide needed resources, but also require students to struggle a bit to integrate their knowledge, simplifying assumptions, and professional resources in order to develop a robust design. I utilize design projects that require students to integrate their knowledge and resources across the entire course. Students’ are evaluated based on weekly assignments that build on previous content, mid-term exams, and term-long design projects. In addition, effective team dynamics are fostered via communication of expectations, training on group management, and peer-evaluation. Finally, I encourage students to use me as a resource both within and outside of class on a range of professional and personal development topics, including connecting with employers, developing and communicating about their skills and strengths, and finding resources for mental health and academic success.

## Instructional and mentoring summary

* Courses offered at OSU
  + Ecological Engineering: Systems Analysis
  + Non-Point Source Pollution and Management
  + Ecohydraulic Engineering
  + River Engineering
* Workshops organized or co-organized
  + International Symposium on modeling dam effects
  + Dams and Sustainability in China
  + International Workshop on Modeling and Management of Floods in High Mountain Areas
* Curriculum Development
  + Contributed to the development and lead accreditation process for the nation’s first accredited undergraduate degree in Ecological Engineering (EcoE-BS)
  + Departmental coordinator for undergraduate EcoE program accreditation through the Accreditation Board for Engineering and Technology (ABET)
* Graduate, Undergraduate Students and Postdoctoral Trainees
  + Primary advisor for
    - 17 MS students
    - 6 PhD
    - 2 Postdoctoral Trainees
    - 1 Engineer in Training
    - >150 REU students mentored as Director of the NSF-funded REU Site: EcoInformatics Summer Institute
    - >40 undergraduate research assistants directly advised on field data collection, numerical modeling, and data analysis
    - 5 Honors College students

# Scholarship and Creative Activity

## Publications (Peer reviewed)

1. Randle T, Morris G, Tullos D, Weirich F, Kondolf M, Moriasi D,l Annandale G, Fripp J, Minear T, Wegner D. (2021). Sustaining US Reservoir Storage Capacity: Need for a New Paradigm. J of Hydrology. https://doi.org/10.1016/j.jhydrol.2021.126686
2. Tullos D, Nelson P, Hotchkiss R, Wegner D. (2020) Regulations and tradition threaten reservoir sustainability in the United States. *Eos,* https://doi.org/10.1029/2021EO157145
3. Tullos D, Baker D, Crowe Curran J, Schwar M, Schwartz J (2020). Enhancing resilience of river restoration design in systems undergoing change**.** J. of Hydraulic Engineering, 147(3)
4. Swanson S, Tullos D, Goodwin A (2020). Experiments on the Hydraulics and Swimming Responses of Juvenile Chinook Salmon Encountering a Floating Guidance Structure. River Research and Applications, https://doi.org/10.1002/rra.3693
5. Tullos D, Walter C, Vache K (2020). Reservoir Operational Performance Subject to Climate and Management Changes in the Willamette River Basin. J. of Water Resources Planning and Mgmt., DOI: 10.1061/(ASCE)WR.1943-5452.0001280
6. Fostvedt M, Tullos D, Tilt B (2020). Institutional Analysis of Small Dam Removals: A Comparison of Non-Federal Dam Removals in Washington and Oregon. Water Alternatives, 13(2): 369-392.
7. L'Hommedieu W, Tullos D, Jones J. (2020). Effects of an engineered log jam on spatial variability of the flow field across submergence depths. River Research and Applications 36: 383– 397.
8. Tullos, D. (2019). Engineering your own education. In. Loucks and Saito (eds). Adventures in Managing Water: Real-World Engineering Experiences. Available online: https://ascelibrary.org/doi/book/10.1061/9780784415337
9. Tullos, D. (2019) Effective communication. In. Loucks and Saito (eds). Adventures in Managing Water: Real-World Engineering Experiences. Available online: https://ascelibrary.org/doi/book/10.1061/9780784415337
10. Elliot S, Tullos D, Walter C (2018) Physical modeling of the feedbacks between a patch of flexible Reed Canarygrass. Environmental Fluid Mechanics. DOI: 10.1007/s10652-018-9622-8
11. Wang HW, Kondolf M, Tullos D, Kuo WC (2018) Sediment Management in Taiwan’s Reservoirs and Barriers to Implementation. Water 10. doi:10.3390/w10081034
12. Tullos, D. 2018. Flood risk governance in the United States. PNAS 115:15 (3731-3734) http://www.pnas.org/content/115/15/3731
13. Jain SK, Mani P, Jain SK, Prakash P, Singh VP, Tullos D, Kumar S, Agarwal SP, Dimri AP. 2017. A Brief review of flood forecasting techniques and their applications. International Journal of River Basin Management. https://doi.org/10.1080/15715124.2017.1411920
14. Jaeger WK, Amos A, Bigelow DP, Chang H, Conklin DR, Haggerty R, Langpap C, Moore K, Mote PW, Nolin AW, Plantinga AJ, Schwartz CL, Tullos D, Turner DP. 2017. Finding water scarcity amid abundance using human natural system models. PNAS 114 (45): 11884-11889.
15. Robinson J, Jarvis T, Tullos D. 2017. Domestic Well Aquifer Storage and Recovery Using Seasonal Springs. Water Resources IMPACT 19(5): 22-23.
16. Friberg N, Harrison L, O’Hare M, Tullos D. 2017. Restoring rivers and floodplains Hydrology and sediments as drivers of change Ecohydrology DOI: 10.1002/eco.1884
17. Foley et al. 2017. Dam removal: Listening In. Water Resources Research
18. Danner A, Safeeq M, Grant G, Tullos D, Santelman M, and Wickham C. 2017. Scenario-based and scenario-neutral assessment of climate change impacts on operational performance of a multipurpose reservoir, J of Water Resources Association. DOI: 10.1111/1752-1688.12589
19. Major, J.J., East, A.E., O’Connor, J.E., Grant, G.E., Wilcox, A.C., Magirl, C.S., Collins, M.J., Tullos, D.D., in press, Geomorphic responses to U.S. dam removals—a two-decade perspective, in Tsutsumi, D., Laronne, J., editors, Gravel Bed Rivers and Disasters. Keynote papers of 8th International Conference. Wiley and Sons.
20. Tullos D, Walter C, Dunham J. 2016. Does resolution of flow field observation influence apparent habitat use and energy expenditure in juvenile coho salmon? *Water Resources Research.*
21. Mateus C, Tullos D. 2016. Reliability, Sensitivity, and Vulnerability of Reservoir Operations under Climate Change. *Journal of Water Resources Policy and Management.*
22. Mateus C, Tullos D. 2016. Reliability, sensitivity, and uncertainty of reservoir performance under climate variability in basins with different hydrogeologic settings. *International Journal of River Basin Management*.
23. Stanton A, Tullos D, Jain S. 2016. Impacts and biases of storm regime and sampling networks on extreme precipitation measurements across the Western Himalaya. *J. of Hydrologic Engineering.* DOI: 10.1061/(ASCE)HE.1943-5584.0001412.
24. Tullos D, Collins M, Bellmore R, Bountry J, Connolly P, Shafroth P, Wilcox A. 2016. Synthesis of common management concerns associated with dam removal. *J. of the American Water Resources Association.*
25. Tullos D, Byron E, Galloway G, Obeysekera J, Prakash O, Sun YH. 2016. Review of challenges of and practices for sustainable management of mountain flood hazards. *Natural Hazards.*
26. Pace K, Tullos D, Walter C, Segura K, Lancaster S. 2016. Sediment pulse behavior following dam removal in gravel-bed rivers. *River Research and Applications.*
27. Dimri AP, Thayyen RJ, Kibler K, Stanton A, Jain SK, Tullos D, and Singh VP. 2016. A review of atmospheric and land surface processes with emphasis on flood generation in the Southern Himalayan rivers. *Science of the Total Environment* 556: 98-115.
28. Tullos D, and Jain SK. 2015. Addressing challenges of mitigating flood risk in mountain areas, Eos, 96, doi:10.1029/2015EO030887. Published on 8 June 2015.
29. Zunka, J., Tullos, D, and Lancaster, S. 2015. Effects of sediment pulses on bed relief in bar-pool channels. Earth Surface Processes and Landforms DOI: 10.1002/esp.3697. Candidate’s role: Primary advisor for graduate student author. Candidate responsible for advising research and substantial writing and revision of text.
30. Tullos, D, and Walter, C. 2015. Fish use of turbulence around wood: Physical experiments on hydraulic variability and habitat selection by juvenile coho salmon, Oncorhynchus kisutch *Environmental Biology of Fishes* DOI 10.1007/s10641-014-0362-4.
31. Tullos DD, Finn DS, Walter C. 2014. Geomorphic and Ecological Disturbance and Recovery from Two Small Dams and Their Removal. PLoS ONE 9(9): e108091. doi:10.1371/journal.pone.0108091.
32. Matheus, C, Tullos, D, and Surfleet, C 2014. Hydrologic sensitivity to changes in climate and land use in the Santiam River Basin, Oregon *Journal of the American Water Resources Association* DOI: 10.1111/jawr.12256.
33. DiFrancesco, K. and Tullos, D 2014. Assessment of flood management systems’ flexibility with application to the Sacramento River basin, California, USA. *International Journal of River Basin Management* DOI: 10.1080/15715124.2014.917316.
34. DiFrancesco, K and Tullos, D 2014. Flexibility in water resources management: Review of concepts and development of assessment measures for flood management systems. *Journal of the American Water Resources Association* 50(6) 1527-1539 DOI: 10.1111/jawr.12214.
35. Tullos, D and Wang, HW 2013. Morphological responses and sediment processes following a typhoon-induced dam failure, Dahan River, Taiwan. *Earth Surface Processes and Landforms.* DOI: 10.1002/esp.3446.
36. Tullos, D, E Foster-Moore, D Magee, B Tilt, AT Wolf, E Schmitt, F Gassert and K Kibler. 2013. Biophysical, Socioeconomic, and Geopolitical Vulnerabilities to Hydropower Development on the Nu River, China. *Ecology and Society* 18 (3): 16.
37. Kibler, K, and Tullos, D 2013. Cumulative biophysical impact of small and large hydropower development, Nu River, China. *Water Resources Research* DOI: 10.1002/wrcr.20243.
38. Surfleet, C, and Tullos, D 2013. Variability in effect of climate change on rain-on-snow peak flow events in a temperate climate.J. of Hydrology 249: 24-34.
39. Surfleet, C, Tullos, D, Chang, H, and Jung, I 2012. Selection of hydrologic modeling approaches for climate change assessment; A comparison of model scale and structures. *Journal of Hydrology* 464-465: 233-248.
40. Surfleet, C, and Tullos, D 2012. Uncertainty in hydrologic modeling for estimating hydrologic response due to climate change, Santiam River, Oregon. *Hydrological Processes* 27(25): 3560-3576.
41. National Research Council. 2012. Sustainable water and environmental management in the California Bay-Delta. National Academy of Sciences, Washington. DC.
42. Czarnomski, N, Tullos, D Thomas, R and Simon, A 2012. Effects of vegetation canopy density and bank angle on near-bank patterns of turbulence and Reynolds stresses. *Journal of Hydraulic Engineering* 138(11) 974-978.
43. Stevens, C and Tullos, D 2011. Effects of temperature and site characteristics on Phosphorus Dynamics in four restored wetlands: Implications for wetland hydrologic management and restoration. *Restoration Ecology* 29(3): 279-291.
44. Chang, H, Jones, J, Gannett, M, Tullos, D, Moradkhani, H, Vache, K, Parandvash, H, Shandas, V, Nolin, A, Fountain, A,  Johnson, S, Jung, IW House-Peters, L, Steele, M and Copeland, B, 2011. Chapter 3: Climate change and freshwater resources in Oregon, in *Oregon Climate Impact Assessment*. Dello, K.D. and Mote, P.W. (eds). College of Oceanic and Atmospheric Sciences, Oregon State University, Corvallis, OR. pp. 69-150.
45. Kibler, K, Tullos, DT, and Kondolf, M 2011. Evolving Expectations of Dam Removal Outcomes: Downstream Geomorphic Effects Following Removal of a Small, Gravel-Filled Dam. *Journal of the Water Resources Association* 47(2): 408-423.
46. National Research Council. 2010. A Scientific Assessment of Alternatives for Reducing Water Management Effects on Threatened and Endangered Fishes in California's Bay Delta. National Academy of Sciences. Washington, DC.
47. Kibler, K, Tullos, D, and Kondolf, M 2010. Learning from dam removals: challenges to selecting experimental design and establishing significance of outcomes *River Research and Applications* 27(8): 967-975.
48. Tullos, D, Brown, P, Kibler, K Magee, D, Tilt, B, Wolf, A 2010. Perspectives on the salience and magnitude of dam impacts for hydro development scenarios in China Water Alternatives 3(2): 71-90.
49. Walter, C and Tullos, D 2009. Downstream channel changes after a small dam removal: Using aerial photos and measurement error for context; Calapooia River, Oregon. *River Research and Applications* 26(10), DOI: 10.1002/rra.1323
50. Tullos, D, Tilt, B, and Reidy-Liermann, C 2009. Understanding and Linking the Biophysical, Socioeconomic and Geopolitical Effects of Dams. *Journal of Environmental Management* 90: S208–S223.
51. Brown, P, Tullos, D, Tilt, B, Magee, D, and Wolf, A 2009. Modeling the Costs and Benefits of Dam Construction from a Multidisciplinary Perspective. *Journal of Environmental Management* 90: S303-S311.
52. Tullos, D 2009. Assessing the influence of environmental impact assessments on science and policy: An analysis of the Three Gorges Project. *Journal of Environmental Management* 90: S203-S207.
53. Tullos, D, Penrose, D, Jennings, G, and Cope, G 2009. Analysis of Functional Traits in Reconfigured Channels: Implications for the Bioassessment and Disturbance of River Restoration.  *JNABS* 28(1).
54. Tullos, D, D Penrose, and G Jennings. 2006. Development and Application of a Bioindicator for Benthic Habitat Enhancement in the North Carolina Piedmont. *Ecological Engineering* 27: 228-241.
55. Tullos, D 2006. River restoration in China: a review of local efforts to improve the quality of lotic life. *Ecological Restoration* 24: 165-172.
56. Tullos, D and M Neumann. 2006. A Qualitative Model for Characterizing Effects of Anthropogenic Activities on Benthic Communities. *Ecological Modeling* 196: 209-220.

## academic and professional presentations

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Year** | **Within region** | **National** | **International** | **Total** | **No. invited** |
| 2005 |  | 1 | 1 | 2 |  |
| 2006 | 1 | 3 | 2 | 6 | 1 |
| 2007 | 3 | 3 | 2 | 8 | 4 |
| 2008 | 1 | 1 | 1 | 3 | 3 |
| 2009 | 3 | 1 | 5 | 9 | 2 |
| 2010 | 2 |  | 3 | 5 | 1 |
| 2011 |  |  |  | 0 |  |
| 2012 |  |  | 1 | 1 |  |
| 2013 | 1 |  | 3 | 4 | 2 |
| 2014 |  | 2 | 2 | 4 |  |
| 2015 |  |  | 1 | 1 |  |
| 2016 |  | 1 | 1 | 2 | 1 |
| 2017 | 1 | 2 |  | 3 |  |
| 2018 | 1 |  |  | 1 |  |
| 2019 | 3 | 2 | 1 | 7 | 1 |
| 2020 |  | 1 |  | 1 | 1 |

## Grant and contract support

Total funded projects at OSU: $ 4,401744

**Grant support**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Start Year** | **PI(s)** | **Role** | **Agency** | **Title** | **Total $** | **$ to my program** |
| 2021 | Tullos | Lead PI | SeaGrant | Resilience of Klamath River ecosystems and coastal communities prior to, during, and following dam removal | $49,921 | $49,921 |
| 2020 | Tullos | Lead PI | Agricultural Research Foundation | Innovative tools for understanding triggers and mitigation of Harmful Algal Blooms | $14,896 | $14,896 |
| 2020 | Tullos | Lead PI | OSU Research Office | Multi-purpose water quality sonde (YSI-EXO2) | $17,253 | $17,253 |
| 2016 | Tullos, Jones | lead PI | NSF | REU Site: Ecoinformatics Summer Institute | $287,793 | $287,793 |
| 2015 | Tullos, Bladon | lead PI | NSF | Fires and floods: Acquisition and analysis of perishable data on the sustainability of reservoirs following wildfires. | $83,117 | $83,117 |
| 2013 | Tullos | lead PI | Oregon Parks and Recreation Department | Discharge monitoring on the Calapooia River post-dam removal to verify flow regulated flow split. | $26,224 | $26,224 |
| 2013 | Tullos, Jones | lead PI | NSF | REU Site: Ecoinformatics Summer Institute | $307,606 | $307,606 |
| 2011 | Tullos, Dunham | lead PI | NSF | Salmonid behavior and the hydraulics of Engineered Log Jams | $313,312 | $313,312 |
| 2011 | McDonnell et al. | senior personnnel | NSF | Anticipating water scarcity and informing integrative water system response in the Pacific Northwest | $4,348,693 | $111,273 |
| 2010 | Tullos, Jones | lead PI | NSF | REU Site: Ecoinformatics Summer Institute | $236,784 | $236,784 |
| 2010 | Tullos | lead PI | NOAA | Gold Ray Dam Removal Monitoring | $158,607 | $158,607 |
| 2009 | Tullos | lead PI | NSF | CAREER: Ecological Engineering and the Sustainability of Dams: Evaluating Ecohydraulic Outcomes of Climate Change and Mitigation Opportunities in a Regulated River. | $400,000 | $400,000 |
| 2008 | Tullos, Wolf, Tilt, Magee, Brown | lead PI | NSF | Interdisciplinary Research and Methods for Assessing Dams as Agents of Change in China. | $494,967 | $280,273 |
| 2007 | Tullos | lead PI | OWEB | Monitoring of the Brownsville, Sodom, and Savage Rapid Dam Removals. | $417,000 | $417,000 |
| 2007 | Tullos | lead PI | NOAA | Monitoring of the Brownsville Dam Removal | $233,649 | $233,649 |
| 2008 | Tullos | lead PI | NFWF | Pre and post removal monitoring of the Chiloquin dam removal | $194,152 | $194,152 |
| 2008 | Tullos | lead PI | USGS | Effects of sediment barrier removal on geomorphic complexity and habitat diversity. | $22,070 | $22,070 |
| 2007 | Tullos | lead PI | South & North Santiam Watershed Councils | Santiam Basin Fish Passage Project | $54,000 | $54,000 |
| 2007 | Tullos | lead PI | Calapooia Watershed Council | Monitoring of the Brownsville Dam Removal. | $10,900 | $10,900 |
| 2007 | Tullos | lead PI | USFWS | Phosphorus dynamics of wetland management around Upper Klamath and Agency Lakes, OR. | $58,594 | $58,594 |
| 2006 | Tullos | lead PI | USGS | Evaluating the phosphorus dynamics in response to restoring historic hydrology at reclaimed wetlands along Upper Klamath Lake, OR | $46,520 | $46,520 |
| 2006 | Tullos, Jones | lead PI | NSF | REU Site: Ecoinformatics Summer Institute | $582,291 | $544,544 |
| 2006 | Tullos, Tilt, Wolf, Magee, Brown | lead PI | NSF | Socio-Ecological Effects of Dams in China | $124,746 | $99,157 |
| 2007 | Goodwin, Tullos | PI | Cooperative Institute for Coastal & Estuarine Environmental Technology | Building SWAMPS in Oregon Coastal Communities | $199,139 | $135,491 |
| 2006 | Gosnell, Tullos | PI | Sustainable Rural Communities Initiative | How Does Oregon’s State Land Use Planning System Affect Rural Sustainability? | $6,000 | $0 |
| 2007 | Gosnell, Tullos | PI | USGS | Beyond Dollars and Acre Feet: Assessing the Social Sustainability of Emerging Environmental Governance Structures and Restoration Efforts on “Off-Project” Irrigated Lands in the Upper Klamath Basin. | $30,000 | $0 |
| 2005 | Tullos | lead PI | NSF | River restoration in China | $3,000 | $3,000 |

# Service

## University Service

* Member or chair of seven faculty search committees; Coordinator of four faculty searches.
* Coordinator–ABET accreditation for Ecological Engineering degree (2016-present)
* Faculty Senator for the College of Agricultural Sciences (2018-2019, 2020-2021)

## D2. Service to the profession

* Associate editor, Journal of Hydraulic Engineering (2018-present), Journal of Ecohydraulics (2021-present)
* Guest editor: Ecohydrology, Journal of Environmental Management
* Grant panels and ad hoc reviews
  + National Science Foundation (2006, 2007, 2008, 2009, 2010, 2013, 2016, 2019, 2020)
  + USGS/IWW small grants (2006)
  + USGS - NIWR (2009)
* Session convener
  + American Geophysical Union (AGU) (2021, 2020, 2019, 2018, 2017, 2016, 2015, 2014, 2013)
  + American Society of Civil Engineers Environmental Water Resources Institute (2014)
* Peer reviewer of ~12-15 manuscripts annually from a range of journals
* Peer Reviewer of Policy documents: California Water Quality Control Board - TMDLs (2007, 2009)

## D3. Service to Public (Professionally Related)

* 2020-present: Oregon Lakes Association Board of Directors
* 2016-present: Natural Heritage Institute Board of Directors
* 2009-2011: Member of the National Research Council Committee on Sustainable Water and Environmental Management in the California Bay-Delta
* 2014-2016: Invited member of the USGS Powell Center Working Group on Dam Removal (2014-2016).
* 2015-present: Independent Scientific Review Panel member for the Northwest Power and Conservation Council, funded by Bonneville Power Administration. Vice-chair of the panel since 2020.
* 2016-2017: Member of the National Research Council Committee on the Long-Term Management of the Spirit Lake/Toutle River System in Southwest Washington

# Awards and certifications

* 2005: North American Benthological Society (NABS) President's Award
* 2009: NSF's Faculty Early Career Development (CAREER) award.
* 2011 – present: Licensed Professional Civil Engineer in Oregon, certificate #85485PE
* 2014: Diplomate of Water Resources Engineering by the American Society of Civil Engineering’s Environmental Water Resources Institute
* 2021: AGU Voices for Science fellow

# PROFESSIONAL DEVELOPMENT

* 2015: OSU Search Advocate training
* 2018: OSU Social Justice 1 & 2 training
* 2019: OSU Leadership Development for Professionals and Executives