

CURRICULUM VITAE

CV SECTION 1: Employment History/Awards

NAME Subhas Karan Venayagamoorthy

ADDRESS Department of Civil and Environmental Engineering
Colorado State University
Campus Delivery 1372
Fort Collins, CO 80523-1372
Webpage: <http://www.engr.colostate.edu/~vskaran/>

PHONE (970) 491-1915 (office)
EMAIL: vskaran@colostate.edu

EDUCATION

2006 Ph.D., Environmental Fluid Mechanics, Civil and Environmental Engineering, Stanford University.
2002 MScEng (*cum laude*), Civil Engineering, University of Natal, Durban, South Africa.
2000 BScEng (*summa cum laude*), Civil Engineering, University of Natal, Durban, South Africa.
1992 Diploma in Civil Engineering (*with distinction*), Lerotholi Polytechnic, Maseru, Lesotho.

ACADEMIC POSITIONS

(July 1, 2018 -) Professor, Department of Civil and Environmental Engineering, CSU
(July 2017 -) Borland Professor of Fluid Mechanics, Department of Civil and Environmental Engineering, CSU
(July 2018 -) Honorary Professor, School of Engineering, University of KwaZulu-Natal, South Africa
(July 2015 - June 30, 2017) CSU Monfort Professor
(January - July 2016) - UPS Foundation Visiting Professor, Department of Civil and Environmental Engineering
Stanford University.
(July 2013 –June 2018) Associate Professor, Dept. of Civil and Environmental Engineering, Colorado State
University (CSU)
(Jan. 2008 - June 2013) Assistant Professor, Department of Civil and Environmental Engineering, CSU.
(2010 - 2013) Borland Chair of Hydraulics, Department of Civil and Environmental Engineering, CSU.
(2008 -) Honorary Research Fellow, University of KwaZulu-Natal, Durban, South Africa.
(2006 - 2007) Postdoctoral scholar, Department of Civil & Environmental Engineering, Stanford University
(2003 - 2006) Research Assistant, Department of Civil & Environmental Engineering, Stanford University.
(2001- 2002) Lecturer, Department of Civil Engineering, University of KwaZulu-Natal, Durban, South Africa.

SABBATICALS

(2015-2016 Academic Year), UPS Foundation Visiting Professor, Stanford University and Honorary Research Fellow, University of KwaZulu-Natal, South Africa.

I was on a full academic year sabbatical during which I was able to forge substantial collaborations with researchers and students in two major universities: University of KwaZulu-Natal (UKZN) in South Africa and Stanford University. During the first half of my sabbatical (from August – December, 2016), I was instrumental in organizing and participating in an international collaborative research project funded by the Office of Naval Research in South Africa with leading researchers at UKZN where I have the honor of serving as an Honorary Professor. During the second half of my sabbatical (January 1 – July 31, 2016), I was invited to serve as the UPS Foundation Visiting Professor in the Department of Civil and Environmental Engineering at Stanford University, where I conducted research in environmental fluid mechanics.

OTHER ENGINEERING POSITIONS HELD

(1999, 2000) Engineering Intern, Ninham Shand Consulting Engineers, Durban, South Africa.

(1997 - 1998) Junior Engineer/Engineering surveyor, Xialangdi Multipurpose Dam Project, Henan, China.

(1994 - 1997) Civil Engineering Technician/Surveyor, Muela Hydropower Project Contractors, Lesotho.

(1993 - 1994) Site Engineer, Lerotholi Polytechnic, Maseru, Lesotho.

(1992 - 1993) Freelance Consultant, Lerotholi Polytechnic, Maseru, Lesotho.

CURRENT JOB DESCRIPTION

50 % Teaching 40 % Research/Creative Activity 10 % Service/Outreach 0 % Admin

HONORS AND AWARDS

2021, Most Inspiring Professor Award, Engineering College Council, CSU.

2020, CSU Board of Governors Excellence in Undergraduate Teaching Award (one award given for entire CSU).

2019, George T. Abell Award for Outstanding Teaching in the Walter Scott, Jr. College of Engineering.

2018, Faculty Excellence in Service Award, Department of Civil and Environmental Engineering, CSU.

2017, Meroney Family Award for Excellence in Teaching in Civil and Environmental Engineering

2017, Invited participant, 5th Arab-American Frontiers Symposium, National Academies of Science, Engr. & Med.

2017, Monfort Professor Lecture, Colorado State University.

2017, Invited speaker – 2017 Environmental & Water Resources Congress, ASCE.

2016, UPS Foundation Visiting Professor, Stanford University.

2016, Invited speaker – 69th Annual meeting, Division of Fluid Dynamics, American Physical Society.

2016, Invited speaker – 2016 Environmental & Water Resources Congress, ASCE.

2015, Monfort Professor, Colorado State University (two awards given across CSU).

2015, George T. Abell Outstanding Mid-Career Faculty Award in the College of Engineering.

2015, Invited speaker, Fundamental Aspects of Geophysical Turbulence Workshop, NCAR.

2014, Frenkiel Award for Fluid Dynamics, American Physical Society, Division of Fluid Dynamics.

2014, Faculty Excellence in Teaching Award, Department of Civil and Environmental Engineering, CSU.

2014, Invited participant, Arab-American Frontiers Symposium, National Academies of Science, Engr. & Med.

2014, Invited participant, Indo-American Frontiers of Eng. Symposium, National Academy Engineering.

2013, Invited participant, U.S. Frontiers of Engineering Symposium, National Academy of Engineering.

2012, Young Investigator Award, Office of Naval Research, Washington D.C.

2012, Early CAREER Award, National Science Foundation, Washington D.C.

2012, Outstanding Faculty Performance Award, Department of Civil and Environmental Engineering, CSU.

2011, Best Teacher Award, Alumni Association, Colorado State University.

2011, Dr. Vujica Yevjevich Faculty Scholarship, Department of Civil and Environmental Engineering, CSU.

2010, Borland Professor (Chair) of Hydraulics, Department of Civil and Environmental Engineering, CSU.

2010, Outstanding Faculty Performance Award, Department of Civil and Environmental Engineering, CSU.

2010, Lorenz G. Straub Award for meritorious PhD dissertation from Stanford University, St. Anthony Falls Lab.

2009, ASCE ExCEED Teaching Fellow, American Society of Civil Engineers.

2006, Best Speaker award at the Physical Oceanography Dissertation Symposium (PODS IV), Honolulu, Hawaii.

2006, Offshore Mechanics Scholarship, International Society of Offshore and Polar Engineers (ISOPE).

2005, Best Speaker award, SIAM, Stanford Student Chapter.

2005, Harvey Fellow, Mustard Seed Foundation, 2005.

2003, S2A3 medal for outstanding MS thesis, South African Association for the Advancement of Science.

2000, Merit medal for the top graduating engineering student, Engineering Council of South Africa (ECSA).

2000, Prize for the best student in fluid mechanics, Water Institute of Southern Africa.

2000, Walter Morgan Thomas Prize for the best final year student in civil engineering, University of Natal.

2000, Prof. J R Daymond Prize for the highest academic merit in fluid mechanics, University of Natal.

2000, Prof. H A Smith Prize for the highest academic merit in transportation engineering, University of Natal.

2000, Prof. K. Knight Prize for the highest academic merit in geotechnical engineering, University of Natal.

2000, Dissertation Prize for the best final year research dissertation, Civil Engineering, University of Natal.

2000, Concrete Society Prize for a meritorious design project, Civil Engineering, University of Natal.

2000, Best student in structural engineering, Joint Institution of Structural Engineering (UK).

1998 & 1999, Prestige scholarship for the top two undergraduate students, University of Natal, South Africa.

1992, Best graduating student in civil engineering at Leretholi Polytechnic, Lesotho.

CV SECTION 2: Publications/Scholarly Record

Brief Synopsis of My Research Career at Colorado State University (CSU)

My research interests and activities focus both on fundamental cutting edge research in environmental fluid mechanics (e.g. flow turbulence, mixing and transport) and water resources engineering as well as its broader applications in engineering, oceanography and atmospheric science, especially concerning climate change, environmental sustainability and renewable energy. Over the last fourteen years at CSU, I have developed a strong research program in computational and environmental fluid dynamics in the Department of Civil and Environmental Engineering (CEE) at CSU. I have graduated ten PhD and sixteen M.S. (by thesis) students (7 PhDs and 8 MS students in the last 8 years) and have mentored three postdoctoral scholars. Two of my funded projects included the highly competitive and prestigious ONR Young Investigator Award and NSF CAREER Award. I am currently the primary advisor of four PhD students. The research conducted in my group has been published in the most prestigious journals in my field of research, including the *Journal of Fluid Mechanics*, *Journal of Physical Oceanography*, *Journal of Hydraulic Research*, *Nature*, *Physics of Fluids*, *Geophysical Research Letters*, *Journal of Geophysical Research*, *Journal of Atmospheric Sciences* and *Environmental Science and Technology*. There are at least 10 journal articles that are either currently in review or being prepared for submission shortly to several prestigious journals. My long-term goal is to continue to actively contribute in a collaborative manner to the Department of Civil and Environmental Engineering and WSCOE to confront and solve engineering problems of societal importance

Major new initiatives undertaken at CSU over the last 10 years

1. Development of the Environmental Fluid Mechanics Laboratory (EFML) at CSU

In March 2014, I embarked on an ambitious project to develop a new state-of-the-art Environmental Fluid Mechanics Laboratory (EFML) at CSU. Over the last 7 years, we have developed this new laboratory facility that is housed in the Glover Engineering Building on CSU's main campus. The EFML is a state-of-the-art facility that has rich capabilities for tackling a diverse array of fundamental and applied research problems in environmental and geophysical fluid flows. A variety of research projects such as drinking water quality, river engineering, wind energy, and ocean and atmospheric flow physics are currently being undertaken in the EFML. Some of these projects are externally funded through competitive grants sponsored by federal funding agencies such as the National Science Foundation (NSF) and the Office of Naval Research (ONR). I have put significant effort into the acquisition of several main pieces of equipment namely: (i) a modern 5 m recirculating flume that is self-contained and (ii) a Laser Doppler Velocimetry (LDV) system and (iii) a time resolved Particle Image Velocimetry (PIV) system. The EFML was officially commissioned on September 22, 2016 when an open house was held. More details and pictures can be provided on request.

2. **A new drinking water initiative to explore sustainable transfer of technology to Sub-Saharan Africa**

Another important initiative that was birthed during my sabbatical in South Africa in 2015 that pertains to drinking water quality issues in Sub-Saharan Africa. My research group at CSU has focused on developing optimal drinking water disinfection contact tanks that are commonly used by small public water systems in the United States. Our research funded by the Colorado Department of Public Health and Environment (CDPHE) culminated in a guidance document that CDPHE now uses to help small drinking water systems in Colorado. During my visit to South Africa, I was able to do some reconnaissance on drinking water issues in South Africa and neighboring African countries (including Zambia). I was startled to learn that despite the advancements evident in a country of the stature of South Africa; only a small fraction (~ 10%) of assessed water systems fully satisfied the standards set by the water regulatory agencies in South Africa. Most of the violations on record (similar to the situation in the US) were from small drinking water systems. As a result of these findings, I have been motivated to explore the possibility of working in this research arena in Sub-Saharan Africa and globally. I have now initiated a collaborative project entitled “*Sustainable Innovative Drinking Water Technology for Optimal Impact*” in partnership with Umgeni Water (which is a major water board responsible for supply of potable water to the EThekweni Metropolis that serves over 5 million people in South Africa). To cast this issue in a broader perspective, it is evident that access to clean water remains an acute problem in many developing countries in this part of the world. The United Nations estimates that one in nine people do not have access to clean and safe drinking water worldwide, and nearly 2 billion people drink contaminated water that can lead to severe illness and even death. Our goal is to develop effective and sustainable solutions for treatment of drinking water in Sub-Saharan Africa and many other areas of our world where there are critical needs for simple but effective water treatment systems in order to improve the quality of potable water.

PUBLISHED WORKS

Books:

None

Published Refereed Journal Articles:

56. Rastello, M., Klema, M. R., Carpenter, A. B., Garanaik, A., Venayagamoorthy, S. K., Gates, T. K. (2021) Velocity measurements in developing narrow open-channel flow with high free-stream turbulence: Acoustic Doppler Velocimetry (ADV) and Laser Doppler Anemometry (LDA). *Flow Measurement and Instrumentation (in-review)*.

55. Klema, M. and Venayagamoorthy, S. K. (2021). On the use and misuse of the Osborn model: Implications for improved estimates of ocean mixing rates. *Journal of Fluid Mechanics (in revision)*.

54. Pugh, J. E., Gates, T. K., Venayagamoorthy, S. K. 2021, “Adjusting protocols to mitigate uncertainty of ADCP moving-boat discharge measurements for irrigation water management”. *Flow Measurement and Instrumentation*, 82 (2021) 102060. <https://doi.org/10.1016/j.flowmeasinst.2021.102060>.

53. Baker, J., Venayagamoorthy, S. K., and De Long, S. 2021. “Random packing material in disinfection contactors: effects on baffling and energy loss”, *Journal of Water Science, American Water Works Association*,

<https://doi.org/10.1002/aws2.1231>.

52. Sinclair, J., Venayagamoorthy, S. K., and Gates, T. K. 2021, “Some insights on flow over sharp-crested weirs using computational fluid dynamics”, in press, *Journal of Irrigation and Drainage*, ASCE.
51. Masunaga, E., Venayagamoorthy, S. K., Wada, K., and Yamazaki, H, 2021. “Variability of diapycnal mixing coefficient in coastal oceans investigated with direct microstructure measurements, in revised review, *Journal of Marine Systems*.
50. Garanaik, A. and Venayagamoorthy, S. K. 2021. “Some new insights for inferring diapycnal diffusivity in stably stratified turbulence, to be submitted for rereview, *Journal of Fluid Mechanics*.
49. Klema, M., Venayagamoorthy, S. K., Pouquet, A., Rosenberg, D. and Marino, R. 2021. “Analysis of mixing in homogeneous stratified and decaying turbulence, in-review, *Environmental Fluid Mechanics*.
48. Zhou, J. and Venayagamoorthy, S. K. 2020. “Impact of ambient stable stratification on gravity currents propagating over a submerged canopy” *Journal of Fluid Mechanics*, 898A15, doi:10.1017/jfm.2020.418.
47. Klema, Matthew R., Pirzado, Abdul G., Venayagamoorthy, S. Karan, Gates, Timothy K. 2020, “Analysis of Acoustic Doppler Current Profiler Mean Velocity Measurements in Shallow Flows”, *Flow Measurement and Instrumentation*, 74(2020) 101755.
46. Zhang, J., Liu, X., Nielsen, K., Tejada-Martinez, A., Venayagamoorthy, S. K. Wicklein, E., Kamojjala, S., 2020. “Emerging Applications of Computational Fluid Dynamics in Water Treatment” *Journal of Environmental Engineering*, [https://doi.org/10.1061/\(ASCE\)EE.1943-7870.0001766](https://doi.org/10.1061/(ASCE)EE.1943-7870.0001766).
45. Baker, J., De Long, S. and Venayagamoorthy, S. K. 2020. “Random packing material in disinfection contactors: Effects on final drinking water quality”, *Journal of Water Science, American Water Works Association*, DOI: 10.1002/aws2.1187
44. Zhou, J. and Venayagamoorthy, S. K. 2020. “How does the three-dimensional canopy geometry affect the front propagation of a gravity current?” *Physics of Fluids*, 32, 096605 (2020), <https://doi.org/10.1063/5.0019760>.
43. Garanaik, A. and Venayagamoorthy, S. K. 2019. “On the inference of the state of turbulence and mixing efficiency in stably stratified flows”, *Journal of Fluid Mechanics*, 867: 323-333
42. Zhou, J. and Venayagamoorthy, S. K. 2019. “Near-field mean flow dynamics of a cylindrical canopy patch suspended in deep water”, *Journal of Fluid Mechanics*, 858: 634-655, doi:10.1017/jfm.2018.775.
41. Garanaik, A. and Venayagamoorthy, S. K. 2018. “Assessment of small scale anisotropy in stably stratified turbulent flows using direct numerical simulations”, *Physics of Fluids*, 30 126602 (2018); <https://doi.org/10.1063/1.5055871>.
40. Arthur, R. S., Venayagamoorthy, S. K., Koseff, J. R. and O. B. Fringer 2017. "How we compute N matters to estimates of mixing in stratified flows, *Journal of Fluid Mechanics* 831: R2, doi:10.1017/jfm.2017.679 (Impact Factor: 2.821).
39. Zhou, J. Cenedese, C., William, T., Ball, M., Venayagamoorthy, S. K. and Nokes, R. 2017. “On the propagation of gravity currents over and through a submerged array of circular cylinders, *Journal of Fluid Mechanics*. 831: 394-417, doi:10.1017/jfm.2017.604 (Impact Factor: 2.821).
38. Schaad, S. and Venayagamoorthy, S. K. 2017. “Direct numerical simulations of decaying stably stratified turbulence”, <http://dx.doi.org/10.1016/j.compfluid.2017.05.022>, *Computers and Fluids*. (Impact Factor: 2.313).

37. Zhou, J. and Venayagamoorthy, S. K. 2017. “Numerical simulation of intrusive gravity currents Interacting with a bottom-mounted obstacle in a continuously stratified ambient”, *Environmental Fluid Mechanics*, **17**, 191-209 DOI 10.1007/s10652-016-9454-3. (Impact Factor: 1.603).
36. Venayagamoorthy, S. K. and Koseff, J. R. 2016. “On the flux Richardson number in stably stratified turbulence”, *Journal of Fluid Mechanics*, **798**, R1:1–10. (Impact Factor: 2.821).
35. John, J., Radford, D., Venayagamoorthy, S. K. and Heyliger, P. 2016 “Elastic Field and Frequency Variation in Extendable Wind Turbine Blades”, *Journal of Solar Energy Engineering*, **138**, 054502-1:5. (Impact Factor: 1.19).
34. Shroyer, E. L., Rudnick, D. L., Farrar, T., Lim, B., Venayagamoorthy, S. K., St. Laurent, L., Garanaik, A. and Moum, J. N. 2016. “Modification of upper ocean temperature structure by subsurface mixing in the presence of strong salinity stratification”, *Oceanography*, **29**(2):62–71, <http://dx.doi.org/10.5670/oceanog.2016.39>. (Impact Factor: 3.883).
33. Wijesekara, H. & co-authors (including Venayagamoorthy, S. K) 2016 “Decrypting a Mystery Bay - ASIRI Ocean-Atmosphere Initiatives on Bay of Bengal”, *Bulletin of American Meteorological Society*, **October 2016**, 1859-1884, DOI:10.1175/BAMS-D-14-00197.1. (Impact Factor: 7.281).
32. David, C., Gil, Y., Duffy, C. J., Peckham, S. D. and Venayagamoorthy, S. K. 2016. “An introduction to the special issue on Geoscience Papers of the Future”, *Earth and Space Science*, **3**, 441–444, doi:10.1002/2016EA000201. (Impact Factor – none yet).
31. Kattnig, J. J., and Venayagamoorthy, S. K. 2015. "A hybrid approach for increasing baffling factors in contact tanks", *Journal of American Water Works Association*, **107**(12), pp E702-E711, <http://dx.doi.org/10.5942/jawwa.2015.107.0164>. (Impact Factor –not provided, leading peer-reviewed journal for thought leaders in the water and wastewater industry by the American Water Works Association).
30. Mater, B.D., Venayagamoorthy, S. K., St. Laurent, L. and Moum, J. N. 2015. “Biases in Thorpe scale estimation of turbulence dissipation from large overturns in the ocean”, *Journal of Physical Oceanography*. **45**: pp 2497-2521, DOI: 10.1175/JPO-D-14-0128.1. (Impact Factor: 3.130).
29. Karimpour, F. and Venayagamoorthy, S. K. 2015 “On turbulent mixing in stably stratified wall-bounded flow”, *Physics of Fluids*, **27**, 046603(2015). (Impact Factor: 2.232).
28. Alford, M. and co-authors (including Venayagamoorthy, S. K.) 2015. “The formation and fate of internal waves in the South China Sea”, *Nature*, **521**, pp 65-69, doi:10.1038/nature14399. (Impact Factor: 40.137).
27. Taylor, Z. H., Carlston, J. C. and Venayagamoorthy, S. K. 2015. “Internal hydraulics of disinfection contact tanks”, *Journal of Hydraulic Research*, DOI: 10.1080/00221686.2015.1040086. (Impact Factor: 1.268).
26. Carlston, J. C. and Venayagamoorthy, S. K. 2015. “Impact of Modified Inlets on Residence Times in Baffled Tanks”, *Journal of American Water Works Association*, **107**(6), pp E292-E300, DOI:<http://dx.doi.org/10.5942/jawwa.2015.107.0078>. (Impact Factor –not provided, leading peer-reviewed journal for thought leaders in the water and wastewater industry by the American Water Works Association).
25. Wilson, J. M. and Venayagamoorthy, S. K. 2015. “A shear-based parameterizations of turbulent mixing in the stable atmospheric boundary layer”, *Journal of Atmospheric Sciences*, **72**, pp 1713-1726, DOI: 10.1175/JAS-D-14-0241.1. (Impact Factor: 3.207).
24. Wilson, J. M., Davis, C. J., Venayagamoorthy, S. K. and Heyliger, P. R. 2015. “Comparisons of horizontal-axis wind turbine wake interactions models using numerical simulations”, *Journal of Solar Energy Engineering*, DOI: 10.1115/1.4028914. (Impact Factor: 1.19).

23. Mater, B. D. and Venayagamoorthy, S. K. 2014. "The quest for an unambiguous parameterization of mixing efficiency in stably stratified geophysical flows", *Geophysical Research Letters*, DOI: 10.1002/2014GL060571. (Impact Factor: 4.253).
22. Karimpour, F. and Venayagamoorthy, S. K. 2014. "A revisit of the equilibrium assumption predicting near-wall turbulence", *Journal of Fluid Mechanics*, **760**, pp 304-312. (Impact Factor: 2.821).
21. Mater, B. D. and Venayagamoorthy, S. K. 2014. "A unifying framework for parameterizing stably stratified shear-flow turbulence", *Physics of Fluids*, **26**, 036601 (2014). (Impact Factor: 2.232).
20. Karimpour, F. and Venayagamoorthy, S. K. 2014. "A simple zero-equation turbulence model for stably stratified wall-bounded flows", *Journal of Geophysical Research (Oceans)*, DOI: 10.1002/2013JC009332, pp: 1-11. (Impact Factor: 2.939).
19. Barnett, T. C. and Venayagamoorthy, S. K. 2014. "Laminar and Turbulent Regime Changes in Drinking Water Contact Tanks", *Journal of American Water Works Association*, **106(12)**, DOI: 10.5942/jawwa.2014.106.0149. (Impact Factor –not provided, leading peer-reviewed journal for thought leaders in the water and wastewater industry by the American Water Works Association).
18. Barnett, T. C., Kattnig, J., Venayagamoorthy, S. K. and Whittaker, G. 2014. "Improving drinking water contact tank hydraulics using random packing material", *Journal of American Water Works Association*, **106(2)**, pp E98-104. (Impact Factor –not provided, leading peer-reviewed journal for thought leaders in the water and wastewater industry by the American Water Works Association).
17. Karimpour, F. and Venayagamoorthy, S. K. 2013. "Some insights for the prediction of near-wall turbulence", *Journal of Fluid Mechanics* **723**, pp 126-139. (Impact Factor: 2.821).
16. Mater, B. D., Schaad, S. M. and Venayagamoorthy, S. K. 2013. "Relevance of the Thorpe length scale in stably stratified turbulence", *Physics of Fluids*, **25(7)**, 076604(2013) (**won the Frenkiel Award from American Physical Society in 2014 for significant contributions in fluid mechanics by young investigators**). (Impact Factor: 2.232).
15. Khandakar, N. M., Venayagamoorthy, S. K., and Dasi, L. P. 2013. "Intermittency and local dissipation scales under strong mean shear", *Physics of Fluids*, **25**, 011701 (2013). (Impact Factor: 2.232).
14. Sangdo An, Julien, P. Y. and Venayagamoorthy, S. K. 2012. "Numerical simulation of particle-driven gravity currents", *Environmental Fluid Mechanics*, **12**, pp 495–513. (Impact Factor: 1.603).
13. Venayagamoorthy, S. K. and Fringer, O. B. 2012. "Examining breaking internal waves on a shelf slope using numerical simulations", *Oceanography*, **25(2)**, pp 132-139. (Impact Factor: 3.883).
12. Venayagamoorthy, S. K., Ku, H., Fringer, O. B., Chiu, A., Naylor, R. L. and Koseff, J. R. 2011. "Numerical modeling of aquaculture dissolved waste transport in a coastal embayment", *Environmental Fluid Mechanics*, **11**, pp 329–352. (Impact Factor: 1.603).
11. Elliott, Z. and Venayagamoorthy, S. K. 2011. "Evaluation of turbulent Prandtl (Schmidt) number parameterizations for stably stratified environmental flows", *Dynamics of Atmospheres and Oceans*, **51**, pp137-150. (Impact Factor: 1.111).
10. Wilson, J. M., and Venayagamoorthy, S. K. 2010. "Evaluation of hydraulic efficiency of disinfection systems based on residence time distribution (RTD) curves", *Environmental Science and Technology*, **44**, pp 9377–9382. (Impact Factor: 6.198).
9. Venayagamoorthy, S. K., and Stretch, D. D. 2010. "On the turbulent Prandtl number in homogeneous stably

stratified turbulence", *Journal of Fluid Mechanics*, **644**, pp 359-369.

8. Stretch, D. D., and Venayagamoorthy, S. K., 2010. "Diapycnal diffusivities in homogeneous stratified turbulence", *Geophysical Research Letters*, **37**, L02602, doi:10.1029/2009GL041514. (Impact Factor: 4.253).
7. Stretch, D. D., Rottman, J. W., Venayagamoorthy, S. K., Nomura, K. K. and Rehmann, C. R. 2010. "Mixing efficiency in decaying stably stratified turbulence", *Dynamics of Atmospheres and Oceans*, **49**, pp 25-36. (Impact Factor: 1.111).
6. Venayagamoorthy, S. K., and Fringer, O. B. 2007. "On the formation and propagation of nonlinear internal boluses across a shelf break", *Journal of Fluid Mechanics*, **577**, pp 137-159. (Impact Factor: 2.821).
5. Venayagamoorthy, S. K., and Fringer, O. B. 2007. "Internal wave energetics on a shelf break", *International Journal of Offshore and Polar Engineering*, **17(1)**, pp 22-29.
4. Venayagamoorthy, S. K., and Stretch, D. D. 2006. "Lagrangian mixing in decaying stably stratified turbulence", *Journal of Fluid Mechanics*, **564**, pp 197-226. (Impact Factor: 2.821).
3. Venayagamoorthy, S. K., and Fringer, O. B. 2006. "Numerical Simulations of the interaction of internal gravity waves with a shelf break", *Physics of Fluids*, **18(7)**, 076603/9, DOI:10.1063/1.2221863. (Impact Factor: 2.232).
2. Venayagamoorthy, S. K. and Fringer, O. B. 2005. "Nonhydrostatic and nonlinear contributions to the energy flux budget in nonlinear internal waves", *Geophysical Research Letters*, **32**, L15603, DOI:10.1029/2005GL023432. (Impact Factor: 4.253).
1. Venayagamoorthy, S. K., Koseff, J. R., Ferziger, J. H., and Shih, L. H. 2003. "Testing of RANS turbulence models for stratified flows based on DNS data", *Annual Research Briefs, Center for Turbulence Research, NASA-AMES*, pp 127-138.

Refereed Journal Articles under preparation that are nearing submission

10. Venayagamoorthy, S. K., 2021. "Turbulence and mixing in stratified flows: Quo Vadis?", in preparation, *Environmental Fluid Mechanics*.
9. Ku, H. and Venayagamoorthy, S. K. 2021. "Lateral mixing of passive scalars around porous obstacles in uniform and oscillatory flows", in preparation, *Environmental Fluid Mechanics*.
8. Sin, K-S., Venayagamoorthy, S.K. and Thornton, C. I. 2021. "Implications for neglecting free-surface effects in numerical simulations of flow in curved channels", in preparation, *Water Resources Research*.
7. Taylor, Z. H., and Venayagamoorthy, S. K. 2021. "Modified inlet configurations for improving the hydraulic residence time in small disinfection systems", in preparation, *Journal of Environmental Engineering*.
6. Wilson, J. M. and Venayagamoorthy, S. K. 2021. "An analysis of turbulent mixing in strongly stably stratified flows, in preparation, *Physics of Fluids*.
5. Nithianantham, A. and Venayagamoorthy, S. K. 2021. "A practical model for prediction of turbulent diffusivity of passive scalars", in preparation, *Physics of Fluids*.
4. Carlston, J. C. and Venayagamoorthy, S. K. 2021. "Impact of Modified Inlets on Residence Times in un-baffled Tanks", in preparation, *Journal of Water Science, American Water Works Association*.
3. Karimpour, F., Garanaik, A. and Venayagamoorthy, S. K. 2021. "Evaluation of the standard $k-\epsilon$ closure scheme

for modeling stably stratified wall-bounded flows”, in preparation, *Ocean Modelling*.

2. Zhang, Y. and Venayagamoorthy, S. K. 2021. “Inlet/outlet location and size influence on hydraulic disinfection efficiency in contact tanks”, in preparation, *Journal of Environmental Engineering*.

1. Karimpour, K., Wilson, J. M. and Venayagamoorthy, S. K. 2021. “On the stress-intensity ratio in the logarithmic region of turbulent wall-bounded flows, in preparation, *Physics of Fluids*.

Refereed Chapters in Books:

2. Wilson, J. M. and Venayagamoorthy, S. K. 2019. “Optimization of Residence Time Distribution in Small Water Treatment Systems”, *Computational Fluid Dynamics – Applications in Water, Wastewater and Stormwater Treatment*, ASCE pp 123-132.

1. Karney B., and Venayagamoorthy, S. K. 2013. “Sustainability Implications”, *Handbook of Environmental Fluid Dynamics* (Editor: H. J. S. Fernando) – Taylor & Francis Publishing, Part 1: 53-62.

Refereed Proceedings/Transactions:

19. Klema, M., Pirzado, A., Gates, T. and Venayagamoorthy, S. K. 2019. “Assessment of acoustic flow measurement instrumentation for mean flow measurements” pp 7-8, Colorado Water, August 2019.

18. Aseperi O. and Venayagamoorthy, S. K. 2017. “Dynamics and structure of flow in river bends”, In *Proceedings of World Environmental and Water Resources Congress 2017*, ASCE, 248773.

17. Zhang Y. and Venayagamoorthy, S. K. 2017. “Effect of Inlet/Outlet Locations on Baffling Factor in Disinfection Contact Tanks”, In *Proceedings of World Environmental and Water Resources Congress 2017*, ASCE, 247652.

16. Arthur, R., Venayagamoorthy, K., Koseff, J., Fringer, O. (2016). Quantification of highly unsteady and inhomogeneous stratified turbulence in breaking internal waves on slopes. *VIIIth International Symposium on Stratified Flows* (1st ed., vol. 1).

15. Venayagamoorthy, K., Koseff, J. (2016). On the mixing efficiency in stably stratified turbulence. *VIIIth International Symposium on Stratified Flows* (1st ed., vol. 1).

14. Kattnig, J. J. and Venayagamoorthy, S. K. 2014. “Use of innovative techniques to enhance the hydraulic disinfection efficiency of drinking water contact tanks”, In *Proceedings of World Environmental and Water Resources Congress 2014*, ASCE, pp 826-835.

13. Taylor, Z., Xu, Q., Wilson, J. W. and Venayagamoorthy, S. K. 2012. “Computational Modeling of Baffled Disinfection Tanks”, In *Proceedings of World Environmental and Water Resources Congress 2012*, ASCE, pp 1280-1289.

12. Ku, H. and Venayagamoorthy, S. K. 2012. “Scalar Dispersion around a Cylindrical Obstacle in Oscillatory Flows”, In *Proceedings of the Third International Symposium on Shallow Flows*, 4-6 June 2012, Iowa City, USA.

11. Karimpour, F. and Venayagamoorthy, S. K. 2012. “Improved RANS Turbulence models for Stably Stratified Environmental Flows”, In *Proceedings of the third International Symposium on Shallow Flows*, 4-6 June 2012, Iowa City, USA.

10. Ku, H. and Venayagamoorthy, S. K. 2011. "Passive scalar dispersion around obstacles in tidal flows using numerical simulations", In Proceedings of the 7th International Symposium on Stratified Flows, 22-26 August 2011, Rome, Italy.
9. Wilson, J. W. and Venayagamoorthy, S. K. 2011. "Hydraulics and Mixing Efficiency of Small Public Water Disinfection Systems", In Proceedings of World Environmental and Water Resources Congress, ASCE, pp 243-252.
8. Elliot, Z. A. and Venayagamoorthy, S. K. 2011. "Implementation and testing of RANS turbulence models for stably stratified flows", In Proceedings of World Environmental and Water Resources Congress 2011, ASCE, pp 2156-2165.
7. Xu, Q., and Venayagamoorthy, S. K. 2010. "Hydraulic efficiency of baffled disinfection contact tanks", In Proceedings of the 6th International Symposium on Environmental Hydraulics, 23-25 June 2010, Athens, Greece, pp 1041- 1046.
6. Venayagamoorthy, S. K., Fringer, O. B., Koseff, J. R. and Naylor, R. L. 2009. "Simulations of aquaculture dissolved waste transport and mixing in near-coastal waters", In Proceedings of World Environmental and Water Resources Congress, ASCE, pp 2916-2923.
5. Venayagamoorthy, S. K., Fringer, O. B., Koseff, J. R. and Naylor, R. L. 2007. "Simulations of mixing and transport of dissolved waste discharged from an aquaculture pen", In Proceedings of the 5th International Symposium on Environmental Hydraulics, 4-7 December, 2007, Phoenix, USA.
4. Venayagamoorthy, S. K., and Fringer, O. B. 2006. "Dynamics of breaking internal gravity waves over a shelf break", In Proceedings of the Sixth International Symposium on Stratified Flows , 11-14 December 2006, Perth, Australia, pp 384-389.
3. Venayagamoorthy, S. K., and Fringer, O. B. 2004. "Energy partitioning in breaking internal waves on slopes", In Proceedings of the 4th International Symposium on Environmental Hydraulics and 14th Congress of the Asia & Pacific Division of the International Association of Hydraulic Engineering and Research, 15-18 December 2004, Hong Kong, pp 1051- 1057.
2. Venayagamoorthy, S. K., Stretch, D. D., Rottman, J. W., and Nomura, K. K. 2002. "Mixing efficiency of turbulence in environmental flows", In Proceedings of the 1st International Conference on Heat Transfer, Fluid Mechanics and Thermodynamics (HEFAT), 8-10 April 2002, Kruger Park, South Africa.
1. Stretch, D. D., Rottman, J. W., Venayagamoorthy, S. K., and Nomura, K. K. 2001. "Transient mixing event in stably stratified turbulence", In Proceedings of the 14th Australasian Fluid Mechanics Conference, 10-14 December 2001, Adelaide, Australia.

Non-Refereed Journal Articles/Chapters/Proceedings/Transactions:

67. Venayagamoorthy, S. K. 2020. "Towards improved prediction of turbulent diapycnal mixing in oceanic flows: Challenges and Insights" American Geophysical Union, ASLO and TOS, New Orleans, LA, United States. (16-21 February, 200).
66. Baker, J., De Long, S. and Venayagamoorthy, S. K. 2019. "Investigating the innovative use of random packing material to improve the internal hydraulics of decentralized water systems" Hydrology Days, March, 27-29, 2019, Seattle, Fort Collins, Co.
65. Klema, M., Pirzado, A., Gates, T. and Venayagamoorthy, S. K. 2019. "Assessment of acoustic flow measurement instrumentation for mean flow measurements" Hydrology Days, March, 27-29, 2019, Seattle, Fort

Collins, Co.

64. Venayagamoorthy, S. K., “Turbulent mixing in oceanic flows: challenges and insights for improved prediction,” in the Transactions of the 72nd Annual Meeting of the Division of Fluid Dynamics American Physical Society, 23-26 November 2019, Seattle, Washington, USA.
63. Klema, M., Pouquet, A., Rosenberg, D. and Venayagamoorthy, S. K. 2019. “Analysis of mixing in rotating stratified turbulence” in the Transactions of the 72nd Annual Meeting of the Division of Fluid Dynamics American Physical Society, 23-26 November 2019, Seattle, Washington, USA.
62. Zhou, J. and Venayagamoorthy, S. K. 2019. “Impact of ambient stratification on gravity currents propagating over a submerged canopy” in the Transactions of the 72nd Annual Meeting of the Division of Fluid Dynamics American Physical Society, 23-26 November 2019, Seattle, Washington, USA.
61. Zhou, J. and Venayagamoorthy, S. K. 2018. “Gravity currents interacting with a submerged array of obstacles” in the Transactions of the 8th International Symposium on Environmental Hydraulics, 4-7 June 2018, Notre Dame, Indiana, USA.
60. Carpenter, A., Rastello, M., Garanaik, A., Venayagamoorthy, S. K. and Gates, T. K. 2018. “Uncertainty analysis of flow velocity measurements using LDA and ADV in laboratory experiments.” in the Transactions of the 8th International Symposium on Environmental Hydraulics, 4-7 June 2018, Notre Dame, Indiana, USA.
59. Aseperi, O. and Venayagamoorthy, S. K. 2018. “The effects of curvature on flow structure in river bends” in the Transactions of the 8th International Symposium on Environmental Hydraulics, 4-7 June 2018, Notre Dame, Indiana, USA.
58. Zhou, J. and Venayagamoorthy, S. K. 2018. “Intrusive gravity currents over bottom topography in a continuously stratified ambient” in the Transactions of the 8th International Symposium on Environmental Hydraulics, 4-7 June 2018, Notre Dame, Indiana, USA.
57. Garanaik, A. and Venayagamoorthy, S. K. 2018. “Estimation of small scale anisotropy in stably stratified turbulent flows” in the Transactions of the 8th International Symposium on Environmental Hydraulics, 4-7 June 2018, Notre Dame, Indiana, USA.
56. Zhou, J. and Venayagamoorthy, S. K. 2018. “Flow adjustment in the vicinity of a cylindrical canopy suspended in deep water” in the Transactions of the 71st Annual Meeting of the Division of Fluid Dynamics American Physical Society, 18-20 November 2018, Atlanta, Georgia, USA.
55. Venayagamoorthy, S. K. and Garanaik, A. 2018. “Utility of Thorpe and Ozmidov length scales to infer the state of turbulence and mixing in geophysical flows” in the Transactions of the 71st Annual Meeting of the Division of Fluid Dynamics American Physical Society, 18-20 November 2018, Atlanta, Georgia, USA.
54. Garanaik, A. and Venayagamoorthy, S. K. 2018. “Some insights to infer turbulent diapycnal mixing in geophysical flows” in the Transactions of the 71st Annual Meeting of the Division of Fluid Dynamics American Physical Society, 18-20 November 2018, Atlanta, Georgia, USA.
53. Aseperi, O. and Venayagamoorthy, S. K. 2018. “The effects of curvature on flow structure in river bends” in the Transactions of the 71st Annual Meeting of the Division of Fluid Dynamics American Physical Society, 18-20 November 2018, Atlanta, Georgia, USA.
52. Venayagamoorthy, S. K., 2018 Ocean Sciences Meeting, " On the Prediction of Diapycnal Mixing in Stably

- Stratified Turbulence," American Geophysical Union, ASLO and TOS, Portland, OR, United States. (11-16 February, 2018).
51. Zhou, J. and Venayagamoorthy, S. K. 2017. "Three-dimensional hydrodynamics of a suspended cylindrical canopy patch" in the Transactions of the 70th Annual Meeting of the Division of Fluid Dynamics American Physical Society, to be presented at 19-21 November 2017, Denver, Colorado, USA.
50. Garanaik, A. and Venayagamoorthy, S. K. 2017. "Evaluation of small-scale anisotropy in stably stratified turbulence" in the Transactions of the 70th Annual Meeting of the Division of Fluid Dynamics American Physical Society, to be presented at 19-21 November 2017, Denver, Colorado, USA.
49. Fringer, O., Arthur, B., Venayagamoorthy, S. K. and Koseff, J. R. 2017. "The effect of different methods to compute N on estimates of mixing in stratified flows" in the Transactions of the 70th Annual Meeting of the Division of Fluid Dynamics American Physical Society, to be presented at 19-21 November 2017, Denver, Colorado, USA.
48. Venayagamoorthy, S. K. 2017. "Use of Computational Fluid Dynamics in Water Engineering", **Invited Speaker**, In Proceedings of World Environmental and Water Resources Congress, ASCE, May 21-25, 2017, Sacramento, California.
47. Venayagamoorthy, S. K. 2016. "On turbulent mixing in stably stratified geophysical flows", **Invited Talk**, in the Transactions of the 69th Annual Meeting of the Division of Fluid Dynamics American Physical Society, 20-22 November 2016, Portland, Oregon, USA.
46. Venayagamoorthy, S. K. 2016. "Innovative approaches for improving the hydraulic disinfection efficiency of drinking water contact tanks using CFD", **Invited Speaker**, Abstract ID# 131105, In Proceedings of World Environmental and Water Resources Congress, ASCE, May 22-26, 2016, West Palm Beach, Florida.
45. Garanaik, A. and Venayagamoorthy, S. K. 2016. "Mixing efficiency of turbulent patches in stably stratified flows" in the Transactions of the 69th Annual Meeting of the Division of Fluid Dynamics American Physical Society, 20-22 November 2016, Portland, Oregon, USA.
44. Zhou, J. William, T., Ball, M., Cenedese, C., Venayagamoorthy, S. K. and Nokes, R. 2016. "The dynamics of bottom-boundary gravity currents propagating over a submerged array of cylinders" in the Transactions of the 69th Annual Meeting of the Division of Fluid Dynamics American Physical Society, 20-22 November 2016, Portland, Oregon, USA.
43. Garanaik, A. and Venayagamoorthy, S. K., 2016 Ocean Sciences Meeting, "A discussion on diapycnal mixing efficiency in stably stratified geophysical flows," American Geophysical Union, ASLO and TOS, New Orleans, LA, United States. (21-26 February, 2016).
42. Venayagamoorthy, S. K. 2015. "On the prediction of turbulent diapycnal mixing in stably stratified geophysical flows", Proceedings of the Mathematics of Layers and Interfaces", sponsored by Banff International Research Station for Mathematical Innovation and Discovery, 8-13 November, 2015, Oaxaca, Mexico (**invited talk**).
41. Venayagamoorthy, S. K. 2015. "A framework for the prediction of turbulent diapycnal mixing in stably stratified geophysical flows", Proceedings of the Fundamentals Aspects of Geophysical Turbulence Workshop, National Center for Atmospheric Research, 5-7 August, 2015, Boulder, Colorado, USA (**invited lecture**).
40. Venayagamoorthy, S. K. 2015. "On the prediction of turbulent diapycnal mixing in stably stratified geophysical flows", In Transactions of the 13th U.S. National Congress on Computational Mechanics, 27-30 July, 2015, San Diego, California, USA (**invited talk**).
39. Garanaik, A., Venayagamoorthy, S. K., and Stretch, D. D. 2015. "An analysis of diapycnal mixing efficiency in stably stratified turbulent flows", In Transactions of the 68th Annual Meeting of the Division of Fluid Dynamics

American Physical Society, 22-24 November 2015, Boston, Massachusetts, USA.

38. Zhou, J. and Venayagamoorthy, S. K. 2015. “Intrusive gravity currents interacting with obstacles in a continuously stratified environment”, In Transactions of the 68th Annual Meeting of the Division of Fluid Dynamics American Physical Society, 22-24 November 2015, Boston, Massachusetts, USA.

37. Nithianantham, A. and Venayagamoorthy, S. K. 2015. “A simple parameterization of mixing of passive scalars in turbulent flows”, In Transactions of the 68th Annual Meeting of the Division of Fluid Dynamics American Physical Society, 22-24 November 2015, Boston, Massachusetts, USA.

36. Carlston, J. S. and Venayagamoorthy, S. K. 2015. “Impact of Modified Sharp Inlets on Residence Time Distribution of Internally-Baffled Hydraulic Contact Tanks”, Abstract ID# 1063, In Proceedings of World Environmental and Water Resources Congress 2015, ASCE, May 17-21, Austin, Texas.

35. Mater, B. D., Schaad, S. M. and Venayagamoorthy 2014 “**Francois N. Frenkiel Award Talk:** Relevance of the Thorpe length scale in stably stratified turbulence”, In Transactions of the 67th Annual Meeting of the Division of Fluid Dynamics American Physical Society, 23-25 November 2014, San Francisco, California, USA.

34. Venayagamoorthy, S. K. and Karimpour, F. 2014. “Inference of the turbulent dissipation rates in wall-bounded turbulent flows”, In Transactions of the 67th Annual Meeting of the Division of Fluid Dynamics American Physical Society, 23-25 November 2014, San Francisco, California, USA.

33. Garanaik, A, Karimpour, F. and Venayagamoorthy, S. K. 2014. “Evaluation of the standard k-e closure scheme for modeling stably stratified wall-bounded turbulence”, In Transactions of the 67th Annual Meeting of the Division of Fluid Dynamics American Physical Society, 23-25 November 2014, San Francisco, California, USA.

32. Wilson, J. M. and Venayagamoorthy, S. K. 2014. “On Parameterizing Turbulence in the Stably Stratified Atmospheric Boundary Layer”, In Transactions of the 67th Annual Meeting of the Division of Fluid Dynamics American Physical Society, 23-25 November 2014, San Francisco, California, USA.

31. May, I., Morshed, K. N., Venayagamoorthy, S. K. and Dasi, L.P. 2014 “On the distribution of local dissipation scales in turbulent flows”, In Transactions of the 67th Annual Meeting of the Division of Fluid Dynamics American Physical Society, 23-25 November 2014, San Francisco, California, USA.

30. Karimpour, F. and Venayagamoorthy, S. K. 2014. “A revisit of the equilibrium assumption for prediction of near-wall turbulence”, In Transactions of the 67th Annual Meeting of the Division of Fluid Dynamics American Physical Society, 23-25 November 2014, San Francisco, California, USA.

29. Mater, B. and Venayagamoorthy, S. K. 2014. “A unifying framework for parameterizing stably stratified turbulence”, In Transactions of the Ocean Sciences Meeting, ASLO, TOS, Honolulu, Hawaii, USA.

28. Karimpour, F. and Venayagamoorthy, S. K. 2014. “Improved RANS modeling of stably stratified wall-bounded turbulent flows”, In Transactions of the Ocean Sciences Meeting, ASLO, TOS, Honolulu, Hawaii, USA.

27. Mater, B. and Venayagamoorthy, S. K. 2013. “Abstract: H36.00001: Relevancy of the buoyancy Reynolds number in stably stratified turbulence”, In Transactions of the 66th Annual Meeting of the Division of Fluid Dynamics American Physical Society, 24-26 November 2013, Pittsburgh, Pennsylvania, USA.

26. Farid, K. and Venayagamoorthy, S. K. 2013. “Abstract: D22.00002: A hybrid RANS closure scheme for the near-wall turbulence”, In Transactions of the 66th Annual Meeting of the Division of Fluid Dynamics American Physical Society, 24-26 November 2013, Pittsburgh, Pennsylvania, USA.

25. Venayagamoorthy, S. K. and Karimpour, F. 2013. “Abstract: M1.00004: Turbulent mixing in stratified wall-bounded turbulent flows”, In Transactions of the 66th Annual Meeting of the Division of Fluid Dynamics American

Physical Society, 24-26 November 2013, Pittsburgh, Pennsylvania, USA.

24. Barnett, T. and Venayagamoorthy, S. K. 2013. "Computational modeling and experimental testing of disinfection tanks", In Proceedings of 2013 World Environmental and Water Resources Congress, ASCE, May 20-22, 2013 Cincinnati, Ohio.
23. Wilson, J and Venayagamoorthy, S. K. 2012. "Abstract: G5.00007: Evaluation of Wind Turbine Wake Interaction Models in a RANS Framework", In Transactions of the 65th Annual Meeting of the Division of Fluid Dynamics American Physical Society, 18-20 November 2012, San Diego, California, USA.
22. Mater, B. and Venayagamoorthy, S. K. 2012. "Abstract: M7.00007: Parameterization of turbulent diffusivity in stratified flows using microstructure observations and DNS", In Transactions of the 65th Annual Meeting of the Division of Fluid Dynamics American Physical Society, 18-20 November 2012, San Diego, California, USA.
21. Farid, K. and Venayagamoorthy, S. K. 2012. "Abstract: M7.00003: A zero-equation closure model for wall-bounded stably stratified flows", In Transactions of the 65th Annual Meeting of the Division of Fluid Dynamics American Physical Society, 18-20 November 2012, San Diego, California, USA.
20. Venayagamoorthy, S. K. and Ku, H. 2012. "Lateral mixing around obstacles in coastal flows", In Transactions of the Aquatic Sciences Meeting, ASLO, Lake Biwa, Shiga, Japan.
19. Venayagamoorthy, S. K. and Stretch, D. D. 2012. "Mixing in stratified turbulence", In Transactions of the Ocean Sciences Meeting, ASLO, TOS, Salt Lake City, Utah, USA.
18. Venayagamoorthy, S. K., Dasi, L. P. and Mater, B. 2011. "Abstract: L11.00002: Relevant length scales and time scales in shear flow turbulence", In Transactions of the 64th Annual Meeting of the Division of Fluid Dynamics, American Physical Society, 20-22 November 2011, Baltimore, Maryland, USA.
17. Schaad, S., Venayagamoorthy, S. K. and Stretch, D. D. 2011. "Abstract: M1.00003: Dynamics and structure of stably stratified turbulence", In Transactions of the 64th Annual Meeting of the Division of Fluid Dynamics, American Physical Society, 20-22 November 2011, Baltimore, Maryland, USA.
16. Dasi, L. P. and Venayagamoorthy, S. K. 2011. "Abstract: L11.00003: On the smallest sub-Kolmogorov mean length scale and its implications on phenomenology", In Transactions of the 64th Annual Meeting of the Division of Fluid Dynamics, American Physical Society, 20-22 November 2011, Baltimore, Maryland, USA.
15. Farid, K. and Venayagamoorthy, S. K. 2011. "Abstract: L1.00007: Evaluation and Improvement of RANS models for Stably Stratified Turbulence", In Transactions of the 64th Annual Meeting of the Division of Fluid Dynamics American Physical Society, 20-22 November 2011, Baltimore, Maryland, USA.
14. Ku, H. and Venayagamoorthy, S. K. 2011. "Abstract: H1.00006: Lateral mixing of passive scalars around porous obstacles in tidal flows", In Transactions of the 64th Annual Meeting of the Division of Fluid Dynamics, American Physical Society, 20-22 November 2011, Baltimore, Maryland, USA.
13. Elliot, Z. A. and Venayagamoorthy, S. K. 2010. "Abstract: EG.00006: Evaluation of turbulent Prandtl (Schmidt) number parameterizations for stably stratified turbulent flows", In Transactions of the 63rd Annual Meeting of the Division of Fluid Dynamics, American Physical Society, 21-23 November 2010, Long Beach, California, USA.
12. Venayagamoorthy, S. K. and Dasi, L. P. 2010. "Abstract: MA.00007: Relevant length scales in wall-bounded turbulence", In Transactions of the 63rd Annual Meeting of the Division of Fluid Dynamics, American Physical Society, 21-23 November 2010, Long Beach, California, USA.

11. Ku, H. and Venayagamoorthy, S. K. 2010. “Abstract: MH.00010: Numerical simulations of the transport of passive scalars around obstacles in tidal flows”, In Transactions of the 63rd Annual Meeting of the Division of Fluid Dynamics, American Physical Society, 21-23 November 2010, Long Beach, California, USA.
10. Venayagamoorthy, S. K. and Stretch, D. D. 2009. “On the turbulent Prandtl number in homogeneous stably stratified turbulence”, In Transactions of the 62nd Annual Meeting of the Division of Fluid Dynamics, American Physical Society, 22-24 November 2009, Minneapolis, MN, USA.
9. Stretch, D. D. and Venayagamoorthy, S. K. 2009. “On the diapycnal diffusivity in homogeneous stably stratified turbulence”, In Transactions of the 62nd Annual Meeting of the Division of Fluid Dynamics, American Physical Society, 22-24 November 2009, Minneapolis, MN, USA.
8. Venayagamoorthy, S. K., Fringer, O. B., Koseff, J. R. and Naylor, R. L. 2008. “Numerical simulations of aquaculture dissolved waste transport in a coastal embayment”, In Transactions of the 61st Annual Meeting of the Division of Fluid Dynamics, American Physical Society, 23-25 November 2008, San Antonio, USA.
7. Venayagamoorthy, S. K., Fringer, O. B., Koseff, J. R. and Naylor, R. L. 2008. “Simulations of mixing and transport of dissolved waste discharged from near-coastal aquaculture pens”, In Transactions of the Ocean Sciences Meeting, ASLO, TOS and AGU, 2-7 March 2008, Orlando, Florida, USA.
6. Venayagamoorthy, S. K., and Fringer, O. B. 2006. “Dynamics of internal boluses on a shelf break”, In Transactions of the 59th Annual Meeting of the Division of Fluid Dynamics, American Physical Society, 19-21 November 2006, Tampa, USA.
5. Venayagamoorthy, S. K., and Stretch, D. D. 2006. “Modeling small scale mixing in stably stratified turbulence”, In Transactions of the 59th Annual Meeting of the Division of Fluid Dynamics, American Physical Society, 19-21 November 2006, Tampa, USA.
4. Venayagamoorthy, S. K., and Fringer, O. B. 2006. “OS12J-05 Dynamics of the interaction of breaking internal gravity waves with a shelf break”, In Transactions of the Ocean Sciences Meeting, ASLO, TOS and AGU, 20-24 February 2006, Honolulu, Hawaii, USA.
3. Venayagamoorthy, S. K., and Fringer, O. B. 2005. “Energetics of internal boluses on a shelf break”, In Transactions of the 58th Annual Meeting of the Division of Fluid Dynamics, American Physical Society, 20-22 November 2005, Chicago, USA.
2. Venayagamoorthy, S. K., and Fringer, O. B. 2005. “Numerical simulations of internal gravity waves”, Gallery of Fluid Motion Poster (#49), In Transactions of the 58th Annual Meeting of the Division of Fluid Dynamics, American Physical Society, 20-22 November 2005, Chicago, USA.
1. Venayagamoorthy, S. K., and Fringer, O. B. 2004. “OS11A-0498 Generation and Evolution of Solibores on Slopes”, In Transactions of the American Geophysical Union (AGU) Fall Meeting, 13-17 December 2004, San Francisco, USA.

Other (e.g. lab texts, book reviews, technical reports, in-house reports):

4. Venayagamoorthy, S. K. 2013 – Baffling Guidance Document, Final document, Water Quality Control Division, Colorado Department of Public Health and Environment.
3. Davis, C., Wilson, J., Venayagamoorthy, S. K. and Heyliger, P. 2012, “Coupled Structural Dynamic-Aerodynamic Behavior of Multiple Turbines: Influences Within Large Wind Farms” Final Technical Report, Center for Research and Education in Wind (CREW), Colorado Renewable Energy Collaboratory.

2. Wilson, J., Xu, Q. and Venayagamoorthy, S. K. 2011, "System Disinfection Contact Basin Project", Final Technical Report, Water Quality Control Division, Colorado Department of Public Health and Environment.
1. Venayagamoorthy, S. K., Fringer, O. B., Koseff, J. R., Chiu, A. and Naylor, R. L. 2009, "Numerical modeling of aquaculture dissolved waste transport in a coastal embayment" Woods Institute Technical Report, Stanford University.

CONTRACTS & GRANTS

Externally-Funded Projects as PI

| | |
|-------------|---|
| 2022 – 2025 | Diapycnal Mixing Induced by Breaking Internal Waves Over Topography," Sponsored by NSF-National Science Foundation, \$332,306. |
| 2021- 2024 | Dynamics and modeling of small-scale nonlinear and nonhydrostatic phenomena in oceanic flows, Office of Naval Research, \$332,939. |
| 2020-2022 | Crash Modeling of High-Profile Moving Vehicles under Strong Crosswinds based on Computational Fluid Dynamics (CFD), Mountain-Plains Consortium, \$60,000 |
| 2020 -2022 | Sustainable Agricultural Water (SAW) Workshop, US-Israel Binational Agricultural Research and Development Fund (BARD), \$45,000 |
| 2019-2022 | Assessment of Acoustic Flow Measurement Devices used for Agricultural Water Management, Agricultural Experimental Station, USDA \$90,000 |
| 2018-2022 | Early student support; Turbulence and mixing in stably stratified flow encountering topography, Office of Naval Research, \$189,289. |
| 2018- 2019 | A high Resolution Particle Image Velocimetry (PIV) System for Turbulence Measurements, Office of Naval Research, \$150,000. |
| 2016- 2021 | Development of robust and unifying Parameterizations of Turbulent Mixing in Oceanic Flows, Office of Naval Research, \$251,335. |
| 2012-2019 | CAREER: Internal waves, turbulence and diapycnal mixing in oceanic flows, National Science Foundation (NSF), \$517,151. This is an early CAREER award project that integrates basic and applied multi-disciplinary (fluid mechanics and oceanography) research with a strong educational program. |
| 2015-2016 | A laboratory facility for turbulence measurements around obstacles in oceanic flows, Office of Naval Research (ONR), \$76,875. |
| 2012-2016 | Internal wave-driven transport in the coastal ocean, Office of Naval Research (ONR), \$471,121. This is the Young Investigator Program (YIP) Award from ONR. |
| 2011-2015 | Flow dynamics and turbulent mixing around obstacles in oceanic flows, Office of Naval Research (ONR), \$224,629. |
| 2011-2014 | Early student support; improved turbulence parameterizations for oceanic flows, Office of Naval Research (ONR), \$159,425 |

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| 2014-2017 | CAREER: Supplement to Internal waves, turbulence and diapycnal mixing in oceanic flows, National Science Foundation (NSF), \$40,000. |
| 2011-2014 | Baffle factors of small system disinfection contact basins - Amendment", Colorado Department of Public Health and Environment (CDPHE), \$160,000. |
| 2010-2012 | Dynamics and modeling of turbulent mixing in oceanic flows, Office of Naval Research, \$142,106. |
| 2009-2011 | Baffle factors of small system disinfection contact basins", Colorado Department of Public Health and Environment (CDPHE), \$160,000. |

Externally-Funded Projects as Co-PI

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| 2021-2024 | Novel Integrated Characterization of Microphysical Properties of Ice Particles using In-Situ Field Measurements and Polarimetric Radar Observations, PI: B. Notaros, National Science Foundation, \$647,003 |
| 2016 -2018 | Revised Clear-Water and Live-bed Contraction Scour Analysis (co-PI, with Rob Ettema at CSU as PI) – to NCHRP and Ayres Associates, \$290,000. |
| 2015-2018 | Monitoring Alfalfa and Grass Water Use Under Deficit Irrigation Using a Spatially Distributed Temperature Model, PI: J Chavez, Agricultural Experimental Station, USDA \$120,000 |
| 2010 – 2012 | Coupled structural dynamic-aerodynamic behavior of multiple turbines: influences within large wind farms, PI: P. Heyliger, Center for Research and Education in Wind (CREW), \$50,000. |

Externally-Funded Pending Projects as PI

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| 2021- 2024 | Diapycnal mixing induced by breaking internal waves over topography, National Science Foundation, \$332,306. |
| 2022- 2025 | Innovating the deployment of hydraulic structures to enhance irrigation water management (co-PI Gates, T.), USDA-NIFA, \$650,000. |

Externally-Funded Pending Projects as CoPI

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| 2021 -2024 | Chavez, J. L. (PI), Bartolo, M. E. (Key Person), Venayagamoorthy, S. K. (Key Person), "Improvement of Sensible Heat Flux Measurements for Better Estimation of Crops Evapotranspiration," Sponsored by Binational Agricultural Research and Development Fund, \$310,000. |
| 2021-2024 | Chen, S. and Venayagamoorthy, S. K. (co-PI), "Environment-adaptive and risk informed crash modeling and traffic decision-support for windstorms," Sponsored by National Science Foundation, \$399,904. |

International Projects (as main collaborator)

- 2015 – 2017 Microstructure and Mixing: Interactions of Energetic Flow and Eddies with Complex Topography in the Western Indian Ocean” (PI – Derek Stretch, University of KwaZulu-Natal, South Africa), Office of Naval Research – Global, \$100,000.
- 2014 - 2017 General irreversible mixing in turbulent flows (PI – Derek Stretch, University of KwaZulu-Natal, South Africa), National Research Foundation, South Africa, Rand 1,000,000 (~\$75,000).

Internally-Funded Awards

- 2020-2021 Development of Sustainable Agricultural Water (SAW) Research Consortium with Israeli Institutions,” workshop funding, PI: Thomas Borch, co-PIs: Jens Blotevogel, Jose Chavez, Karan Venayagamoorthy, Sponsor: CSU Quarterly OVPR Investment Funding, \$20,000 (+\$10k matching from CAS, WSCOPE, CIVE).
- 2019 CSU – Israel Collaboration – Advanced Monitoring, treatment, and management technologies to address global water problems in irrigated agriculture, \$12,500 (OVPR, WSCOPE and CAS).
- 2015-2017 Monfort Professorship – which is one of the University's top honors with a funding of \$75,000 annually for two years for the research and teaching activities.
- (2016) Internal equipment grant to purchase a high end compute server for the Environmental Fluid Mechanics Lab from the Borland Endowment, \$9,000.
- (2015) Internal equipment grant to purchase a 2D Traverse system for a 2D Laser-Doppler Anemometry System to be purchased for the Environmental Fluid Mechanics Lab from the Borland Endowment, \$10,000.
- (2014) Internal equipment grant to purchase a high end compute server for the Environmental Fluid Mechanics Lab from the Borland Endowment, \$8,000.
- (2013) Internal equipment grant to purchase an acoustic Doppler velocimeter from the Borland Endowment, \$12,000.
- (2012-2013) Variability in Power Production and Capital Costs: The Economic Consequences of Nonlinear Wind Farm Dynamics, PIs: Heyliger P. R. and Venayagamoorthy, S. K., Clean Energy Supercluster, \$24,800.
- (2010-2013) Borland Chair in Hydraulics – This endowed professorship comes with an annual funding of \$25,000 for student support and equipment.

PAPERS PRESENTED, SYMPOSIA, INVITED LECTURES, PROFESSIONAL MEETINGS AND WORKSHOPS

56. 12/10/2019 – Invited Speaker at the 9th Warnemunde Turbulence Days WTD) on “Ocean mixing and its efficiency” held at Vilm Island in Germany, December 8 – 12, 2019. Talk entitled: “Turbulent mixing in oceanic flows: Challenges and insights for improved prediction.
55. 11/01/2019 Innovative approaches for improving the hydraulic disinfection efficiency of small drinking water systems. Water Engineering and Science Seminar, Colorado State University.

54. Invited Senior Leader at the Sixth Pattullo Conference for Mentoring Physical Oceanography Women to Increase Retention) – September 22-25, 2019.
53. 07/19/2019 Invited lecture on Diapycnal mixing in stably stratified turbulence: an overview and some insights for improved prediction at the Geophysical Fluid Dynamics Program, Woods Hole Oceanographic Institution.
52. 03/20/2019 – Mixing in stratified turbulence flows, Tokyo University of Marine Science and Technology, Tokyo, Japan.
51. 01/25/2019 – On the inference of the state of turbulence and mixing in stably stratified geophysical flows, Environmental Fluid Dynamics: Confronting Grand Challenges, Les Houches, France.
50. 12/04/2018, Physics of environmental flows interacting with obstacles, Invited seminar, Coastal and Deep Ocean Physics Group, Oregon State University.
49. 10/31/2018, Physics of environmental flows interacting with obstacles, Invited seminar, Civil and Environmental Engineering, Technion, Israel.
48. 10/29/2018, Turbulent mixing in geophysical flows, Invited seminar, Mechanical Engineering, Technion, Israel.
47. 01/09/2018, On the prediction of diapycnal mixing in stratified turbulence, Invited seminar, Fluid Mechanics, Department of Mechanical Engineering, Stanford University.
46. Invited Webinar for training of California State engineers (2 hours) – Division of Drinking Water, State of California, 10 August 2017. (Feedback: “*On behalf of the DDW Training Committee, thank you so much for the excellent presentation that you provided today. The insight that you shared will help our staff to evaluate and assist water systems to improve hydraulic disinfection efficiency in their distribution systems*”).
45. Monfort Professor Lecture, **Invited** University wide lecture at Colorado State University, 23 February 2017 (see Appendix B for details and pictures).
44. Seminar on drinking water quality presented at the Water Research Commission of South Africa, January 13, 2017.
43. Seminar on turbulent mixing presented at the Indian Institute of Technology, Madras, January 10, 2017.
42. Seminar presented at Umgeni Water, Durban, South Africa, January 3, 2017.
41. **An invited talk** at the 69th meeting of the American Physical Society - Division of Fluid Dynamics, held in Portland, Oregon in November 2016.
40. **An invited talk** at the 2016 World Environmental and Water Resources Congress held in West Palm Beach, Florida in May 2016.
39. 05/19/2016, Presented an **invited seminar** on turbulent flows to the Environmental Fluid Mechanics Group in Department of Civil and Environmental Engineering at Stanford University.
38. 05/13/2016, Presented **an invited seminar** on modeling of small drinking water systems to the Environmental Engineering and Science Program in the Department of Civil and Environmental Engineering at Stanford University.

37. 05/09/2016, Presented the inaugural Mechanical Engineering Graduate Seminar (**Student Invited**) hosted by University of California, Santa Barbara Mechanical Engineering (Please see this link: <https://me.ucsb.edu/news/first-ever-me-graduate-student-invited-seminar-success>).
36. 04/15/2016, Presented an **invited seminar** in the Department of Civil and Environmental Engineering at University of California, Berkeley.
35. 12/09/2015, Approaches to enhance hydraulic disinfection efficiency for small drinking water systems, School of Engineering, University of KwaZulu-Natal, Durban, South Africa.
34. 09/29/2015, On the prediction of turbulent diapycnal mixing in stably stratified geophysical flows, Boulder Fluid-Thermal Seminar Series, Department of Mechanical Engineering, University of Colorado, Boulder, CO.
33. 02/03/2014, A unifying framework for the parameterizing stably-stratified, shear flow turbulence, Department of Civil & Environmental Engineering, University of Notre Dame, South Bend, IN.
32. 01/24/2014, Physics of environmental flows using numerical simulations, Department of Civil and Environmental Engineering, Virginia Tech, Blacksburg, VA.
31. 01/07/2014, the joys and tribulations of a turbulent life, Invited seminar, School of Civil Engineering, University of KwaZulu-Natal, Durban, South Africa.
30. 10/14/2013, A unifying framework for parameterizing stably stratified shear flow turbulence, Invited seminar, Fluid Mechanics, Department of Mechanical and Aerospace Engineering, University of California, San Diego.
29. 09/11/2013, Approaches to enhance contact tank efficiency for small drinking water systems, 2013 Rocky Mountain Water Environment Association (RMWEA) and Rocky Mountain Section of the American Water Works Association (RMSAWWA) Joint Annual Conference, Keystone, Colorado.
28. 07/23/2013, Mixing in stably stratified turbulence, **Invited seminar**, Physical Oceanography/Environmental Fluid Dynamics, Ocean Mixing Group, College of Earth, Ocean and Atmospheric Sciences, Oregon State University.
27. 05/23/2013: Probing the Physics of Internal Waves on a Shelf Break Using Numerical Simulations, Invited seminar, Naval Research Laboratory, Stennis Space Center, Mississippi
26. 01/25/2013, Physics of environmental flows, Invited seminar, Chemical and Biological Engineering Department, Colorado State University.
25. 12/05/2012, The joys and tribulations of a turbulent life, **Invited** faculty lecture, Department of Civil and Environmental Engineering, CSU.
24. 07/11/2012, Lateral mixing around obstacles in coastal flows, Invited talk, Coastal Processes and Mixing Session, Aquatic Sciences Meeting, ASLO, Lake Biwa, Shiga, Japan.
23. 07/06/2012, Dynamics of nonlinear internal waves across a shelf break, Invited talk, Tokyo University of Marine Science and Technology, Tokyo, Japan.
22. 03/23/2012, Computational Fluid Dynamics and Hydraulic Modeling, Session Chair, Hydrology Days, Colorado State University, Fort Collins.
21. 03/21/2012, Modeling the Environmental Effects of Marine Fish Cage Aquaculture, Invited lecture at a workshop to assess application, capacity, and validation needs, Washington DC, National Oceanic and Atmospheric Administration (NOAA).

20. 03/06/2012, Mixing in stably stratified turbulence, Invited lecture, Workshop on Physical Processes in the Bay of Bengal and Monsoon ISO, Indian Institute of Science, Bangalore, India.
19. 02/21/12, Mixing and transport due to nonlinear internal waves, Session co-organizer, Salt Lake City, Ocean Sciences Meeting (AGU/ASLO/Oceanographic Society).
18. 07/22/2011, Mixing and dispersion in stably stratified turbulence, Invited seminar, Applied Physics Laboratory, University of Washington, Seattle.
17. 05/31/2011, Mixing and dispersion in stably stratified turbulence, Invited seminar, Woods Hole Oceanographic Institution, Woods Hole, Massachusetts.
16. 04/13/2011, Probing the physics of environmental flows using computational fluid dynamics, Invited seminar, Department of Civil and Environmental Engineering, Massachusetts Institute of Technology, Boston, Massachusetts.
15. 03/23/2011, Fluid Mechanics and Hydraulic Engineering, Session Chair, Hydrology Days, Colorado State University, Fort Collins
14. 01/13/2011, On the turbulent Prandtl number in homogeneous stably stratified turbulence, Invited participant, Internal Waves in Straits Experiment (IWISE) Joint Workshop, Grand Hyatt, Taipei, Taiwan
13. 11/22/2010, Geophysical Fluid Dynamics: Atmospheric flow, Session Chair, Long Beach, 63rd Annual Meeting of the APS Division of Fluid Dynamics.
12. 04/07/2010, Energetics and dynamics of internal waves, **Lorenz G. Straub Award seminar**, Invited Award Recipient seminar, St. Anthony Falls Laboratory, University of Minnesota.
11. 03/09/2010, Lagrangian mixing in stably stratified turbulence, Stanford, Invited seminar, Fluid Mechanics, Department of Mechanical Engineering, Stanford University.
10. 03/08/2010, Lagrangian mixing in stably stratified turbulence, Berkeley, Invited seminar, Fluid Mechanics, Department of Civil and Environmental Engineering, University of California, Berkeley.
9. 02/11/2010, Probing the physics of environmental flows using numerical simulations, Fort Collins, Invited seminar, Department of Atmospheric Science, Colorado State University.
8. 06/01/2009, Mixing in environmental flows, Kingston, Canada, Invited seminar, Department of Civil and Environmental Engineering, Queens University, Canada.
7. 05/28/2009, Mixing in environmental flows, Toronto, Canada, Invited seminar, Department of Civil Engineering, University of Toronto, Canada.
6. 06/11/2008, Mixing in stratified flows, Ancona, Italy, Invited talk at the Euromech Colloquium on Mixing of Coastal, Estuarine and Riverine Shallow Flows.
5. 03/20/2008, Probing the Physics of Internal Waves on Shelf Break using Numerical Simulations, College Station, invited seminar, Zachry Department of Civil Engineering, Texas A&M University.
4. 11/26/2007, Mixing and transport of aquaculture wastes, Invited seminar, Department of Civil Engineering, Stanford University.

3. 10/09/2006, Energetics and dynamics of internal waves over slopes, Invited seminar, Physical Oceanography Dissertation Symposium (PODS IV), Honolulu, Hawaii- **Awarded the best speaker prize.**
2. 07/03/2006, Dynamics of nonlinear internal waves across a shelf break, Invited talk, University of KwaZulu-Natal, Durban, South Africa.
1. 01/05/2004, Energetics of internal waves over slopes, Invited seminar, Department of Ocean Engineering, Indian Institute of Technology, Madras, India.

COLLABORATIVE & INTEGRATIVE INTERDISCIPLINARY SCHOLARSHIP

1. I was involved as a steering committee member on an Office of Naval Research Initiative entitled “Air-Sea Interactions in Northern Indian Ocean (and its relation to the Monsoonal dynamics of the Bay of Bengal)”. This is a multi-disciplinary initiative that brings together scientists from many different fields including physical oceanography, atmospheric science, hydrology, and flow physics, to address the topic above. I was invited by ONR program managers to be on the steering committee during the initiation of this project, to brainstorm and formulate a plan for this initiative. As part of this project, I conducted visits and work-shops in India and Sri Lanka in 2010, 2011, 2012, 2014 and 2017. This initiative has now evolved into two currently funded directed research initiatives (DRIs) at ONR namely ASIRI and MISO-BoB.
2. I have been involved in the Internal Waves in Straits Experiment (IWISE) funded by ONR. I collaborate with open ocean scientists on assessment of small-scale mixing processes in the ocean. In July 2011, I was a participating scientist on the ONR IWISE cruise led by Dr. Lou St. Laurent of Woods Hole Oceanographic Institution in South China Sea. A publication in Nature appeared in 2015 on our work related to IWISE.
3. Wind Energy – I have collaborated with Professor Paul Heyliger (a structural mechanics professor at CSU) on a wind farm modeling project where our goals are to integrate flow modeling with fatigue analysis. Our research has been funded by Center of Research and Education in Wind (CREW) and the CSU Clean Energy Supercluster. This project involves collaboration with the National Renewable Energy Laboratory (NREL) in Golden, Colorado. We are currently working to expand our collaboration to a range of applications in Fluid-Structure Interaction.

OTHER ACTIVITIES/ACCOMPLISHMENTS – PUBLICATIONS/SCHOLARLY RECORD

1. Venayagamoorthy, S. K. (2006), Energetics and Dynamics of Internal Waves on a Shelf Break using Numerical Simulations (PhD Dissertation, Stanford University, Copyrighted with UMI).

CV SECTION 3: TEACHING, MENTORING AND ADVISING**Brief Synopsis of My Teaching and Advising Career at CSU**

I can earnestly say that teaching, mentoring and advising students are the most enriching and rewarding aspects of being a professor for me and hence it forms an integral part of my academic life. I firmly believe I am a researcher with a strong inclination to awaken the curiosity and critical thinking skills in my students. I have taught 42 semester long courses (5 courses taught multiple times) in the last 14 years (2008-2021) calendar years at CSU. These include two core undergraduate courses (CIVE300 - Fluid Mechanics and CIVE261 - Dynamics), two new graduate courses that I have developed and taught (CIVE607 - Computational Fluid Dynamics for Civil Engineers and CIVE604 – Fluid turbulence and Modeling) and two new upper level senior undergraduate/graduate level course (CIVE580A3 – Models and Computational Methods in Civil Engineering, listed since Fall 2013 as ENGR550 – Numerical Methods in Science and Engineering and CIVE502 – Advanced Fluid Mechanics). I have also given 5 independent/group study courses to cater for specialized topics that are not currently taught as formal classes. In 2020, I was delighted to receive the Board of Governors Excellence in Undergraduate Teaching Award at CSU (only given to one faculty member in the entire university). Also, I was honored to be selected as one of six Best Teacher Award Recipients in 2011 from the CSU Alumni Association. This was especially gratifying to me as the CSU Alumni Award is a student driven award. I also received the Excellence in Teaching Award in the Department of Civil and Environmental Engineering in 2014 and the Meroney Family Award for Excellence in Teaching in 2017. Furthermore, I am serving on the Faculty Council Committee on Teaching and Learning (CoTL) since January 2013. I was also invited by the Provost to serve on the Provost GAPS Action Team Member for Student Learning Success (the Early Feedback in Foundational Classes Action Team) from 2017-2019. I am a founding faculty member of the Graduate Center for Inclusive Mentoring (GCIM) and have mentored several minority and female graduate students in my research group. Prior to my arrival at CSU, I have also served as a teaching assistant and guest lecturer for a number of undergraduate and graduate courses at Stanford University and taught two formal undergraduate courses (in fluid mechanics and structural analysis) at the University of KwaZulu-Natal (UKZN) in South Africa. My long term goal is to continue teaching classes at both the undergraduate and graduate levels with excellence and promote the integration of research with education at CSU. In summary, one of the most important and enriching aspects of my academic career is teaching, advising and mentoring both undergraduate and graduate students. Their success is my reward. Hence, I will always continue to strive to be an excellent teacher and mentor to both undergraduate and graduate students for the rest of my academic career.

TEACHING:

A summary of the courses I have taught over the last five years is provided in Table 1.

Table 1: Summary of courses taught (during last 5 years) with credit hours, enrollment, and average student evaluation scores

| <u>Year</u> | <u>Semester</u> | <u>Course No./Title</u> | <u>Cr. Hrs</u> | <u>Enrollment</u> |
|-------------|-----------------|--|----------------|-------------------|
| 2016 | Fall | CIVE300 - Fluid Mechanics ¹ | 3 | 66 |
| 2016 | Fall | ENGR550 – Numerical Methods in Science and Engineering | 3 | 19 |
| 2017 | Spring | CIVE607 - Computational Fluid Dynamics | 3 | 8 |
| 2017 | Fall | ENGR550 – Numerical Methods in Science and Engineering | 3 | 6 |
| 2018 | Spring | CIVE300 - Fluid Mechanics ¹ | 3 | 82 |
| 2018 | Spring | CIVE604 - Fluid Turbulence and Modeling | 3 | 9 |
| 2018 | Fall | ENGR550 – Numerical Methods in Science and Engineering | 3 | 13 |
| 2019 | Spring | CIVE300 - Fluid Mechanics ¹ | 3 | 81 |
| 2019 | Spring | CIVE607 - Computational Fluid Dynamics | 3 | 9 |
| 2019 | Fall | ENGR550 – Numerical Methods in Science and Engineering | 3 | 11 |
| 2019 | Fall | CIVE502 - Fluid Dynamics | 3 | 12 |
| 2020 | Spring | CIVE300 - Fluid Mechanics ¹ | 3 | 33 |
| 2020 | Spring | CIVE604 - Fluid Turbulence and Modeling | 3 | 8 |
| 2020 | Fall | ENGR550 – Numerical Methods in Science and Engineering | 3 | 9 |
| 2020 | Fall | CIVE502 - Fluid Dynamics | 3 | 11 |
| 2021 | Spring | CIVE300 - Fluid Mechanics ¹ | 3 | 100 |
| 2021 | Spring | CIVE607 - Computational Fluid Dynamics | 3 | 7 |
| 2021 | Fall | CIVE300 - Fluid Mechanics ¹ | 3 | 101 |
| 2021 | Fall | CIVE502 - Fluid Dynamics | 3 | 18 |

2021 Fall ENGR550 – Numerical Methods in Science and Engineering 3 11

¹Indicates course with laboratory sections

Course Syllabi, Assignments, and Other Materials

I have developed Course syllabi for the following courses that I have developed and taught formally at CSU.

- CIVE300 – Fluid Mechanics
- CIVE607 - Computational Fluid Dynamics
- CIVE604 – Fluid Turbulence and Modeling
- ENGR550– Numerical Methods in Science and Engineering
- CIVE502 – Advanced Fluid Mechanics

Course Syllabi and the final exam for my undergraduate course (CIVE 300 – Fluid Mechanics) is included in my teaching portfolio to provide a feel for the scope of this course.

Peer Evaluations of Teaching

I have received several encouraging comments and feedback from my colleagues based on excellent comments that they have heard from students they advise both at the undergraduate and graduate levels. I have also been fortunate to have had Prof. Pierre Julien as a mentor during my first semester at CSU (Spring 2008). Prof. Julien attended two of my classes in Dynamics (CIVE261) and gave me excellent informal feedback. More recently, (Fall 2017), Professor Christian Pullitz who is a Professor of Mechanical Engineering and Biomedical Engineering, attended one of my graduate classes (ENGR550) as part of a formal teaching evaluation done by the CEE Department and provided excellent feedback. His letter of evaluation is provided in my teaching portfolio.

Student Course Surveys

A brief summary of students' evaluations for the course I have taught at CSU for several questions related to the instructor of the Student Course Survey are shown in Table 2. The teaching evaluation scores (until 2018 December) are based on a scale from 1 (Poor) to 5 (Excellent). As an example, the average score for four pertinent questions as shown in Table 2 on my teaching for the 32 formal courses is well over 4.8/5. All distributions show strong agreement for the respective questions. Besides the student evaluation scores that I have received, numerous students have also provided extensive written comments in their course survey forms as well in emails and impact surveys. A subset of the comments is listed below.

Fluid Mechanics (CIVE300 – 2009-2021)

- As a woman in engineering I would just like to tell you all that Dr. Karan made me feel more included and welcome than any other professor at CSU has made me feel. While most professors are inclusive, Dr, Karan

went above and beyond. He made an effort to show everyone in the class that he saw them as an equal and wanted to help them succeed.

- “I took fluids with Dr. V. I had heard so many stories about how difficult and scary fluid mechanics is, so I was not excited about the class at all. I changed my mind after the first day of class. Dr. V is incredibly knowledgeable in his field, and his passion for the subject is obvious. His enthusiasm is undeniable and very contagious. To this day, fluids remains one of my favorite classes.” *(Senior Impact Survey Comment taken from email sent to me from Vice President of Student Affairs – Dr. Blanche Hughes on 04/20/2019).*
- Not only did he make me love Fluid Mechanics, but also changed my attitude and perspective towards life and its meaning. You’re such an amazing human being Dr. Karan and I’m so proud to be one of your students” *(Senior Impact Survey Comment taken from email sent to me from Vice President of Student Affairs – Dr. Blanche Hughes on 04/30/2018).*
- Dr. Karan has been one of the great professors I've ever had. He inspires students to thrive. Dr. Karan does much more for students than just teach the subject matter of his class. I AM SO GRATEFUL TO HAVE A PROFESSOR LIKE HIM!
- “Dr. Karan totally understands the hardships of being an engineering student. He makes fluid mechanics fun, and keeps the lectures interesting. He deeply cares about his students” *(Senior Impact Survey Comment taken from email sent to me from Vice President of Student Affairs – Dr. Blanche Hughes on 04/30/2018).*
- Karan was by far the best teacher I have had thus far at CSU. His respect toward his students was much appreciated. I felt he consistently went above and beyond what was expected of him, and he had a genuine desire to see his students succeed. His preparedness for each class was also very helpful, as well as the increased in-class examples, and thorough class notes. I hope to be fortunate enough to have him for another class in the future! He is great at providing explanations.
- As with CIVE 261, Dr. Karan has driven and inspired me to learn and be passionate about fluid mechanics. His enthusiasm and knowledge makes me want to do well in his class and learn it to the fullest extent. I consider Dr. Karan the best teacher I have had at CSU.
- Karan was so passionate about fluids that he drove my desire to learn and excel in the subject. I have never had so much respect for a professor because of his honesty and desire for us to learn. This course was great and definitely caused me to switch my mind about going forward in the fluids field. Karan also encouraged me to continue my education and apply to graduate school.

Table 2: Summary of courses taught with average student evaluation scores for 4 key questions

| Course # | Semester taught | # of Student enrolled | Overall, I would rate this teacher as good* (Q23) | How do you rate the instructor's effectiveness at managing class sessions? (Q17) | How effectively did the instructor facilitate student learning? (Q13) | How prepared was the instructor for class sessions? (Q16) | Remarks |
|---|-----------------|-----------------------|---|--|---|---|---|
| CIVE 261- Dynamics (undergraduate core course) | Spring 2008 | 65 | 4.8 | 4.7 | 4.7 | 4.8 | First course taught at CSU in Spring 2008- |
| | Fall 2008 | 37 | 4.8 | 4.7 | 4.6 | 4.8 | |
| CIVE 300- Fluid Mechanics (undergraduate core course) | Spring 2009 | 34 | 4.8 | 4.8 | 4.9 | 4.8 | New/take over course. Course notes developed entirely by me |
| | Spring 2010 | 50 | 4.7 | 4.9 | 4.7 | 4.7 | |
| | Spring 2011 | 62 | 4.9 | 4.9 | 4.9 | 5.0 | |
| | Spring 2012 | 42 | 4.9 | 4.8 | 5 | 4.8 | |
| | Spring 2013 | 47 | 4.7 | 4.9 | 4.6 | 4.9 | |
| | Fall 2013 | 64 | 4.9 | 4.7 | 4.9 | 4.9 | |
| | Spring 2014 | 59 | 4.9 | 4.8 | 4.9 | 4.8 | |
| | Spring 2015 | 68 | 4.9 | 4.9 | 4.9 | 4.8 | |
| | Fall 2016 | 66 | 4.8 | 4.8 | 4.9 | 4.8 | |
| | Spring 2018 | 82 | 4.7 | 4.6 | 4.8 | 4.7 | |
| | Spr. 2019** | 81 | | | | | |
| | Spr. 2020** | 33 | | | | | |
| Spr. 2021 | 100 | | | | | | |
| CIVE607 Computational Fluid Dynamics | Spring 2009 | 8 | 4.8 | | | | New graduate level course developed and taught for the first time by me in Spring 2009. |
| | Spring 2010 | 14 | 4.9 | | | | |
| | Spring 2011 | 9 | 4.6 | 4.4 | 4.7 | 4.6 | |
| | Spring 2012 | 6 | 4.9 | 5.0 | 4.9 | 5.0 | |
| | Spring 2014 | 8 | 5.0 | 5.0 | 4.9 | 4.9 | |
| | Spring 2017 | 8 | 4.5 | 4.4 | 4.9 | 4.4 | |
| CIVE604– Fluid Turbulence and Modeling | Spring 2011 | 9 | 4.9 | 4.9 | 4.8 | 4.9 | New graduate level course developed and taught for the first time by me |
| | Spring 2013 | 7 | 5.0 | 5.0 | 4.9 | 5.0 | |
| | Spring 2015 | 7 | 5.0 | 5.0 | 5.0 | 4.9 | |
| | Spring 2018 | 9 | 5.0 | 5.0 | 5.0 | 4.8 | |
| | Spr. 2020** | 8 | | | | | |
| CIVE 502 Advanced Fluid Mechanics | Fall 2019** | 12 | | | | | |
| | Fall 2020** | 11 | | | | | |
| ENGR5550 – Numerical Methods in Science and Engineering | Fall 2013 | 16 | 4.9 | 4.9 | 4.9 | 4.8 | New senior undergraduate/graduate level course |
| | Fall 2016 | 19 | 4.7 | 4.4 | 4.9 | 4.3 | |
| | Fall 2017 | 6 | 5.0 | 5.0 | 5.0 | 5.0 | |
| | Fall 2018 | 13 | 4.8 | 4.6 | 4.8 | 4.8 | |
| | Fall 2019** | 11 | | | | | |
| | Fall 2020** | 9 | | | | | |

**Course evaluation scale from 1 (strongly disagree) to 5 (strongly agree). Note all distributions of the evaluations show that student strongly agree with respective question posed. **New Course surveys adopted in 2019. Outstanding comments received from students using the new surveys.*

- This was one of the best capstone engineering courses I have taken at CSU. Karan is extremely fair and judicious when 1) writing tests and 2) giving grades. More engineering professors should adopt his teaching style and mode because it emphasizes a firm understanding of the subject matter than the grade.
- Dr. Karan was a great professor. Always enthusiastic about the subject material. He took every opportunity to explain the broader field of fluid dynamics and was great at motivating students about career fields related to fluid dynamics.
- Karan is the most knowledgeable, enthusiastic, hardworking professor I have ever had. I am normally critical on evaluations, but I have nothing bad to say. I feel privileged to have taken this course.
- Loved the class, you were by far one of the best teachers I have had and I really appreciate and respect you, I do not really have any criticism!
- Karan was the best professor I have had at CSU. His knowledge of the subject is impressive and he really challenged the students to learn and become better students. Excellent job.
- I would have to say this has been my favorite class at CSU in the last 3 years. I hope that I will have the same teaching enthusiasm and knowledge for the rest of my classes at CSU. By far my favorite teacher.
- Teacher is very enthusiastic about teaching/learning and is more than willing to teach outside of class and office hours.

Computational Fluid Dynamics (CIVE607 Spring 2009, 2010, 2011, 2012, 2014, 2017, 2019 and 2021)

- An excellent course for CFD. Professor is very enthusiastic about teaching course and gave good fundamental background to the subject. Very helpful course for people working in this field.
- Very knowledgeable about subject matter. Enthusiasm for teaching the subject is infectious. Very helpful outside of class as well. Always organized and ready for lecture. Assignments were representative of lecture material.
- This class is very challenging. It requires a basic background before you take it seriously, though the teacher is really a good and helpful instructor.
- Karan is a fantastic professor that has the intellect and common sense to relay the most difficult subjects. The value of this class was tremendous and not replaceable. Thanks for the semester.
- Thank you for investing in the students and challenging them to learn. You are always willing to help and give of your time to help students succeed.
- Karan is a great teacher, definitely challenges his students.

Numerical Methods in Science and Engineering (ENGR550 – new undergraduate/graduate level course, Fall 2010, 2011, 2012, 2013, 2016, 2017, 2018, 2019, and 2020, previously taught as CIVE580A3)

- Karan was an excellent teacher for the following reasons
 - He is extremely knowledgeable about the subject and its applications in the real world.
 - He is enthusiastic, which in turn makes me enthusiastic about the course.

- He was very willing to help outside of the class.
- He demanded a lot of quality work from us, which is rare.
- He always had a positive attitude in class.
- As with every class that Dr. Karan teaches, a lot of material is covered in depth. However, his ecstatic attitude and his ability to explain the material make attending his classes a joy for students.
- This is one of the best class that I ever took. I really appreciate efforts put by Professor in developing course structure. More engineering students should take this course.
-

Fluid Turbulence (CIVE604, Spring 2011, 2013, 2015, 2018 and 2020)

- As with every class that Dr. Karan teaches, a lot of material is covered in depth. However, his ecstatic attitude and his ability to explain the material make attending his classes a joy for students.
- Excellent class.
- Overall, I had an amazing experience in the course. I feel confident about my knowledge on turbulence theory and I wish we could have turbulence 2 class focusing more on modelling aspect of turbulence and I will be the first one to sign in for the course. Dr. Karan is an amazing professor and I highly recommend to take his courses.

Examples of Course Improvements

Over the last few years, I have made significant progress in enhancing our undergraduate fluid mechanics curriculum. Specifically, I have led an effort to introduce computational fluid dynamics (CFD) in the curriculum using packaged software. Students now undertake a CFD modeling study of flow around a cylinder as part of their fluid mechanics laboratory and evaluate their model results with experimental measurements they make in the laboratory. Furthermore, I have also proactively worked with our Department Head to acquire and set up new equipment in the Jack E. Cermak undergraduate Fluid Mechanics Laboratory at CSU over the last few years.

Development of New Courses

I have developed and taught four new upper level undergraduate/graduate courses at CSU. These include the following:

CIVE607 - Computational Fluid Dynamics

This new course in CFD fills a much needed gap in our fluid mechanics and water engineering program in the CEE Department. The goal of this course is to provide students with an in-depth introduction to numerical methods used in computational solutions of fluid mechanics, hydraulic and wind engineering problems.

CIVE604 - Fluid Turbulence and Modeling

This new course aims to provide students (through a lecture and discussion style format) with a solid introduction to the state of the art in turbulence modeling, as well as discuss cutting edge research findings in the classroom

CIVE580 – Models and Computational Methods in Civil Engineering (please note this course is now listed as ENGR550 – Numerical Methods in Science and Engineering and offered across the whole College of Engineering)

This is a course for civil and environmental engineers on mathematical modeling and computational techniques with an emphasis on fundamentals of numerical methods for the solution of differential equations (both ordinary and partial) encountered in all the different disciplines in civil and environmental engineering.

CIVE502 - Advanced Fluid Mechanics (course developed and offered in Fall 2019)

This first graduate level/upper undergraduate level course primarily for engineers and scientists focuses on fundamental physical concepts of fluid mechanics, including ideal and viscous fluid flows and boundary layers. Course topics include: physical properties, dimensional analysis, conservation laws, vorticity dynamics, gravity waves, laminar flows, boundary layers, hydrodynamic instability, turbulence and geophysical fluid dynamics. This course is aimed at first year graduate students as well as senior undergraduate students.

Written Comments from Students

I was selected as one of six best teachers by the CSU Alumni Association in 2011 from over 300 nominations. The CSU Alumni Association gave me copies of all the letters that were written by students to nominate me for this award. I have attached some of these letters in my teaching portfolio.

Conference/Workshop Assessments

I attended a week long workshop sponsored by the American Society of Civil Engineers (ASCE) Committee on Faculty Development as an ExCEED (Excellence in Civil Engineering Education) in 2009. For details, please see the next section.

Participation in Professional Development Activities Related to Teaching

I was selected by the American Society of Civil Engineers (ASCE) Committee on Faculty Development as an ExCEED (Excellence in Civil Engineering Education) 2009 Teaching Fellow, which allowed me to participate in a week-long teaching workshop in July 2009 in Arizona. The workshop included the following topics: principles of effective teaching and learning, learning styles, communication skills, learning objectives, class organization and course organization, development of interpersonal rapport with students, teaching with technology and classroom assessment techniques. It also included demonstration lectures illustrating implementation, evaluation of peer lectures and presentation of lectures by each fellow for evaluations. I received excellent feedback on my teaching from ASCE mentors. In particular, I was fortunate to get direct feedback from the Director of the Educational Division of ASCE (Jim O'Brien) who attended one of my 50 minute lectures at the workshop. Mr. O'Brien's overall comments were "a nice class with lots of strengths to build on". In particular, he noted the high level of intellectual

excitement and interpersonal rapport in my teaching.

I have also attended a number of TILT workshops to enhance my teaching experience. I use a variety of teaching techniques and deliver my courses using the blackboard, overheads and PowerPoint presentations. I also strive to integrate my research with teaching. I have shown examples of how some of the basic concepts we teach in fluid mechanics are essential for research and also how research advances current understanding of fundamental issues in fluid flows.

Professional Consultation Related to Teaching

Not Applicable

Other Evidence

In order to promote engineering education at CSU, the university has recently released a video of my teaching (see http://www.youtube.com/watch?v=0A9u_A0AfQA).

ADVISING:

STUDENT ADVISING/GRADUATE SUPERVISION

UNDERGRADUATE STUDENTS:

- 7 Current Undergraduate Advisees – 2020
- 8 Undergraduate Advisees – 2019
- 3 Undergraduate Advisees – 2018
- 3 Undergraduate Advisees – 2016
- 7 Undergraduate Advisees - 2014
- 6 Previous Undergraduate Advisees - 2013
- 5 Previous Undergraduate Advisees - 2012
- 7 Previous Undergraduate Advisees - 2011
- 11 Previous Undergraduate Advisees - 2010
- 5 Previous Undergraduate Advisees – 20

GRADUATE STUDENTS:

Current Graduate Advisees:

- Matthew Klema (PhD, - all requirements complete – graduating December 2021)
- Jessica Baker (PhD, - all requirements complete – graduating December 2021)
- Harshit (PhD, – expected June 2023)
- Joseph Pugh (PhD – expected June 2023)

- Daniel Sanchez MS – expected June 2022).
- Kasun Sahabandu MS (expected summer 2023)

Current Graduate Committee Memberships (excluding those chaired):

 2 MS by thesis

 11 PhD

Graduate Committee Memberships (for past 5 years, not including those above)

 3 MS Plan B

 17 MS by thesis

 13 PhD

Graduate Degrees Completed under My Supervision:

- Oladapo Aseperi, 2018 (PhD).
- Amrapalli Garanaik, 2018 (PhD), Postdoc at Los Alamos National Lab.
- Farid Karimpour, 2014 (PhD), Postdoc from Dec 2014-June 2015, now at University of Massachusetts, Dartmouth.
- Hyeyun Ku, 2011 (PhD), now at Seoul National University.
- Benjamin Mater, 2014 (PhD) – was at Princeton University, now at Alden Labs.
- Kyung-Seop Sin, 2014 (PhD), Postdoc from Dec 2014-May 2015, now at Washington State DoT.
- Jordan Wilson, 2014 (PhD), Postdoc from Oct 2014- May 2015, CDM Smith Engineers, now at Lipscomb University.
- Jian Zhou, 2017 (PhD), Postdoc at UC Berkeley, UCLA, now at Hohai University.
- Ajithsanthar Nithianantham, 2015 (MS with thesis)
- Jessica Baker, 2018 (MS with thesis, now PhD student)
- Taylor Barnett, 2013 (MS with thesis)
- Jeremy Carlston, 2015 (MS with thesis)
- Jongseok Cho 2013 (MS)
- Zachary Elliot, 2011 (MS with thesis)
- Justin Kattnig, 2014 (MS with thesis)
- Joe Pugh, 2021 (MS with thesis)
- Simon Schaad, 2012 (MS with thesis)
- Joey Sinclair, 2021 (MS with thesis)
- Ali El-Turki, 2013 (MS with thesis)
- Zachary Taylor, 2012 (MS with thesis)
- Sydney Turner, 2018 (MS with thesis)
- Jordan Wilson, 2010 (MS with thesis)

- Qing Xu, 2010 (MS with thesis)
- Yishu Zhang, 2017 (MS with thesis)

POSTDOCTORAL STUDENTS/RESEARCH ASSOCIATES:

Current:

None

Past 5 years:

- Farid Karimpour, 2014 (PhD), Postdoc from Dec 2014-June 2015
- Jordan Wilson, 2014 (PhD), Postdoc from Oct 2014- May 2015, now at Lipscomb Univ.
- Kyung-Seop Sin, 2014 (PhD), Postdoc from Dec 2014-June 2015.

Evaluations from Faculty and Professional Peers

My teaching has been evaluated in 2017 by two faculty peers that were appointed by the Promotion Committee in the Department of Civil and Environmental Engineering to provide their evaluations on my teaching. Dr. Timothy Gates from the CEE Department and Dr. Christian Puttlitz from the Department of Mechanical Engineering (ME) observed two of my classes in both spring and fall 2017 semesters. Their evaluation letters are included in my portfolio). As evinced in the letters, I am pleased to get highly positive feedback on my teaching effectiveness from my faculty peers. Their summary statements are provided below:

“Overall, I was very impressed with Dr. Venayagamoorthy’s teaching style and effectiveness. It’s clear that he really enjoys teaching and puts a substantial effort into student learning. I left the classroom wishing that I could come back for the next lecture!” (Dr. Christian Puttlitz, ME)

“In summary, it is my opinion that Dr. Venayagamoorthy displayed the traits of a very good teacher in the class session that I observed” (Dr. Timothy Gates, CEE).

I have also been evaluated annually by the Department Head every year. These evaluations are also available on request. My overall annual rating in teaching and advising category have been **superior**.

Descriptions of Mentoring Activities

I have mentored several undergraduate students by providing them with training during summers and during regular academic semester. The students have worked on conducting research in the laboratory including tracer studies and flow measurements. A few of these students are also first generation as well as minority students.

OTHER ACTIVITIES/ACCOMPLISHMENTS – TEACHING/ADVISING

I hosted Professor Derek Stretch who is an expert in environmental fluid dynamics from the University of KwaZulu-

Natal in South Africa as a visiting scholar during his sabbatical from April to September 2009, May-July 2013 and May-June 2015. I also supported the training of several visiting undergraduate students in 2008. The first was Baird Langenbrunner (from Brown University) who was an REU (Research Experiences for Undergraduates) fellow during summer 2008 at CSU. The second was Krishna Chaitanya (from Indian Institute of Technology, Madras) who was an international summer fellow in 2008. I have since advised several undergraduate interns every summer from CSU work in my research group to promote interest in graduate education in environmental fluid mechanics.

Together with Professor Pierre Julien, I have organized the fluid mechanics and hydraulics seminar series for many years. The goal of the seminar series is to give graduate students the opportunity to enhance their presentation skills and network with other students and faculty.

CV SECTION 4: Outreach/Service

A Synopsis of My Outreach/Service at CSU

I am actively and substantially involved over the last 14 years in outreach and service activities both internally at CSU and externally in professional societies. Internally, I serve on several department committees (including chairing three committees in 2017), a number of College of Engineering committees and several University-wide committees. Externally, I am actively involved in substantial service as reviewer for peer-reviewed journal articles, funding proposals for federal and international agencies and panel committees. I have also organized and chaired some major sessions at international scientific meetings and serve on a number of task committees. In sum, I greatly enjoy engaging in service and outreach activities at CSU and in academe in general.

COMMITTEES

University Committees, year(s)

Faculty Council - Committee on Teaching and Learning (CoTL), 2013-to date.

Executive Committee – Graduate Center for Inclusive Mentoring (GCIM).

Provost GAPS Action Team Member for Student Learning Success (the Early Feedback in Foundational Classes Action Team, 2017 – 2019.

Faculty Council - Committee on Scholarship, Research and Graduate Education (CoSRGE), 2010-2013.

Graduate Center for Diversity Access (GCDA) Faculty member, 2017 -2018.

Founding member of Graduate Center of Inclusive Mentoring (GCIM), 2018 – to date

Multicultural Staff and Faculty Network (MSFN) – member, 2010 – to date.

College Committees

- Ad hoc committee appointed by the Dean to review ENS (Engineering Network Services)
- Ad hoc committee appointed by the Dean of Engineering for SCOE Strategic Plan Implementation Committee for Initiative: *Accelerate innovation and enhance learning experiences for our students in order to improve and bolster student success*
- ABET Accreditation Committee member, 2017-2018

Department Committees, year(s)

- Promotion Committee, 2018 – to date (chair in 2021-2021)
- Graduate Instruction Committee, 2019 – to date
- Promotion and Tenure Committee, 2013 - to 2018 (chair in 2017-2018)
- Undergraduate Instruction Committee (UGIC), 2014 - to date (chair in 2017-2018).
- Department Awards Committee, 2014 - to date (chair in 2017-2018).
- Search Committee Chair - Engineering Lab Manager (2017)
- Search Committee member for faculty position in environmental engineering (2016-2017).
- Ad hoc Committee for guidelines for PhD qualifying examinations.
- Graduate Admission Committee, 2009-2013 (Chair in 2012-2013).
- Graduate Instruction Committee (GIC), 2008-2011 (Chair in 2010-2011).
- Search Committee member for 3 faculty position in water resources engineering (2011-2012).

PROFESSIONAL AFFILIATIONS AND ACTIVITIES

Memberships in professional societies

- American Society of Civil Engineers (ASCE)
- American Geophysical Union (AGU)
- American Meteorological Society (AMS)
- American Physical Society (APS)
- American Water Works Association (AWWA)
- South African Institution of Civil Engineering (SAICE)
- Association for the Sciences of Limnology and Oceanography
- International Society of Offshore and Polar Engineers (ISOPE)

Review/editorial boards

- Associate Editor on Special Issue on “Geoscience Paper of the Future”, July 2015 - June 2017, Journal of Earth and Space Science, American Geophysical Union.

- Associate Editor on Special Issue on “Computational Fluid Dynamics”, July 2017 – to date, Journal of Environmental Engineering, American Society of Civil Engineers.
- Editorial Board Member, Environmental Fluid Mechanics (2020-to date)
- Editor – Special Issue on “Stratified Turbulence and Mixing”, April 2021 – to date, Environmental Fluid Mechanics.

Grant review panels

- Served as an invited international reviewer/expert for the German Research Foundation (DFG) to evaluate the Trans-Regional Collaborative Research Centre (TRR) 181 “Energy transfers in Atmosphere and Ocean, March 2016. Invited again to serve on panel in March 2020.
- Served as a panelist for proposal reviews for the Physical Oceanography Program at the National Science Foundation – May 2011 and May 2017
- Served as a panelist for proposal reviews for the Fluid Dynamics Program at the National Science Foundation – February 2017
- Served as a panelist for proposal reviews for the Fluid Dynamics Program at the National Science Foundation – January 2018.
- Served as a panelist for proposal reviews for the Energy for Sustainability Program at the National Science Foundation – January 2011.
- Served as a panelist for proposal reviews for the Environmental Sustainability Program at the National Science Foundation – December 2009.
- Served as a panelist for proposal reviews for the Environmental Sustainability Program at the National Science Foundation – May 2008.

Grant Refereeing

Referee for numerous proposals from Environmental Sustainability Program, Office of International Science and Engineering (OISE), Dynamics Meteorology and Physical Oceanography Program, National Science Foundation.

Manuscript Refereeing

- Journal of Fluid Mechanics
- Physics of Fluids
- Journal of Hydraulic Engineering
- Journal of Hydraulic Research
- Journal of Environmental Engineering
- Journal of Irrigation and Drainage
- Geophysical Research Letters
- Journal of Physical Oceanography

- Journal of Geophysical Research – Oceans
- Journal of Atmospheric and Oceanic Technology
- Journal of Solar Energy Engineering
- Journal of Computational Physics
- Continental Shelf Research
- Limnology and Oceanography
- Environmental Fluid Mechanics
- Environmental Modeling and Software
- Environmental Science and Technology
- Water Resources Research
- Water Research
- Advances in Water Research
- Ocean Dynamics

OTHER ACTIVITIES/ACCOMPLISHMENTS – SERVICE/OUTREACH

- Member of the local organizing committee for the 70th APS – Division of Fluid Dynamics Meeting held in Denver, November 19-21, 2017.
- Member of the International Scientific Committee for the 8th International Symposium on Environmental Hydraulics, held at the University of Notre Dame, June 4-7, 2018.
- Invited Webinar for training of engineers (2 hours) – Division of Drinking Water, State of California, 10 August 2017. (Feedback: “*On behalf of the DDW Training Committee, thank you so much for the excellent presentation that you provided today. The insight that you shared will help our staff to evaluate and assist water systems to improve hydraulic disinfection efficiency in their distribution systems*”).
- I was actively involved as primary proposer and chair to organize a thematic session entitled “The Ocean's Energy Cascade: Measuring and Modeling of Instabilities, Internal Waves, and Turbulence at the Submesoscale and Smaller”, at the 2016 Ocean Sciences Meeting sponsored by the American Geophysical Union (AGU), the Association for the Sciences of Limnology and Oceanography (ASLO) and The Oceanography Society (TOS). I served as the primary chair for this session at the meeting held in New Orleans in February 2016. The session consisted of a total of 4 oral sessions (32 talks) and over 50 poster presentations.
- Member, ASCE -EWRI Task Committee on Computational Fluid Dynamics, 2015 – to date.
- I was one of four lectures from the USA that were invited to give a workshop course on upper ocean physics at the Indian Institute of Science in Bangalore from July 9- July 21, 2014 as part of a joint Indo-US collaboration on Ocean Monsoon Mission.
- Co-organized and chaired a session entitled “Measuring and modeling internal waves and the turbulence cascade: a tribute to David Tang, Ocean Sciences Meeting, Honolulu, February 23-28, 2014
- I have participated for the last few years in the CSU Meet & Greet Program organized by the Department of Residence Life at CSU. The goal of the program is to encourage and promote greater student contact with faculty and staff at the University.

- External examiner for fluid mechanics and modeling courses for the Master of Science in Engineering program at the University of KwaZulu-Natal, South Africa.
- Session Chair, Turbulence modeling session, American Physical Society - Division of Fluid Dynamics Meeting, Sand Diego, California, November 2012
- Session Chair for the Numerical Simulations of Shallow Open Channel Flows Session at the International Symposium on Shallow Flows, University of Iowa, June 4-7, 2012.
- Organized and chaired a session entitled “Mixing and transport due to nonlinear internal gravity waves, Ocean Sciences Meeting, Salt Lake City, February 20-24, 2012.
- Session Chair, Geophysical Fluid Dynamics session, American Physical Society - Division of Fluid Dynamics Meeting, Long Beach, California, November 2010.
- Steering Committee member for the Air-Sea Interactions in Northern Indian Ocean (ASIRI), Office of Naval Research Initiative, 2010 onwards.
- Taught review sessions in engineering dynamics and fluid mechanics for the Fundamentals in Engineering (FE) exam for engineering students at CSU during fall and spring semesters of 2008, 2009, 2010, 2011 and 2012 academic years.
- Session Chair, Geophysical Fluid Dynamics – Physical Oceanography session, American Physical Society - Division of Fluid Dynamics Meeting, Long Beach, California, November 2018.