HRISHIKESH A. CHANDANPURKAR
Research Scientist, Arizona State University
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APPOINTMENTS

2025 – present	Research Scientist, School of Sustainability, Arizona State University
2022 – present	Consultant, The World Bank, Washington D.C.
2021 – 2023	Fellow, Centre for Sustainability, Environment, and Climate Change, FLAME University, Pune, India
2021 – 2022	Research Scientist, Global Institute for Water Security, University of Saskatchewan, Saskatoon, Canada
2018 – 2021	Postdoctoral Researcher, NASA Jet Propulsion Laboratory (JPL), Pasadena, USA
2016 – 2018	Research Associate, Colorado Center for Astrodynamics Research, Department of Aerospace Engineering Sciences, University of Colorado, Boulder, USA
2015 – 2016	Graduate Student Visitor, National Center for Atmospheric Research (NCAR), Boulder, USA
2011 – 2016	Graduate Student Researcher and Teaching Assistant, University of California, Irvine
2009 – 2010	Environmental Analyst, VK:e environmental, Pune, India
2006 – 2009	Research Intern, Advanced Center for Water Resources Development and Management (ACWADAM), Pune, India

UNIVERSITY EDUCATION

2011 – 2016	Ph.D., Earth System Science University of California, Irvine, USA
2007 – 2009	M.Sc., Environmental Sciences University of Pune, India
2003 – 2007	B.Sc., Geology University of Pune, India

CERTIFICATIONS

2016	Summer School in Modeling Arctic Climate System, International Arctic Research Center (IARC), University of Alaska, Fairbanks, USA
2010 – 2011	Post Graduate Diploma in Geoinformatics, Centre for Development of Advanced Computing, Pune, India
2008	Post Graduate Diploma in Sustainable Management of Natural Resources and Conservation, Ecological Society of Pune, India
2007	Green Star Certificate Course in Disaster Management, Disaster Management and Research Foundation, Pune, India
2005	Diploma in Geopolitics and international Relations, Jagannath Rathi Institute, Pune, India

AWARDS AND FELLOWSHIPS

2016	Fellowship for Summer School in Modeling Arctic Climate System, Fairbanks, USA
2015 – 2016	Advanced Study Program Graduate Visitor Fellowship, NCAR, Boulder, USA
2008	World Wildlife Fund (India) grant to lead efforts to document Siberian Crane (*Leucogeranus leucogeranus*) species in northern India
2007	Dr. Anil Lalwani Award in Hydrogeology, Fergusson College, University of Pune, India

PEER REVIEWED PUBLICATIONS

Chandanpurkar, H. A., J.S. Famiglietti, K. Gopalan, Y. Wada, K. Kakinuma, F. Zhang, Continental Drying, Shrinking Freshwater Availability, and Sea Level Rise, (*accepted*), *Science Advances*

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Abdelmohsen, K, J. S. Famiglietti, Y. A. Zoe, B. Mohajer, and **H. A. Chandanpurkar**, Declining Freshwater Availability in the Colorado River Basin Threatens Sustainability of its Critical Groundwater Supplies *(accepted), Geophysical Research Letters*

Xiong, J, Abhishek, C. Zhang, X. Li, **H. A. Chandanpurkar**…, Comparing evaporation from water balance framework and multiple models on a global scale *(2024), Journal of Hydrology, 643, 131924. doi: 10.1016/j.jhydrol.2024.131924*

Rohde, M,…**H. A. Chandanpurkar**…, Groundwater-dependent ecosystem map exposes global dryland protection (2024), *Nature, 632, 101–107. doi:10.1038/s41586-024-07702-8*

Huo, F., L. Xu, Z. Li, J.S. Famiglietti, **H. A. Chandanpurkar**, Can climate change signals be detected from the terrestrial water storage at daily timescales? (2024), *npj Climate and Atmospheric Science, 7, 158. doi: 10.1038/s41612-024-00646-w*

Fournier, S., J. T. Reager, **H. A. Chandanpurkar**, M. Pascolini-Campbell, S. Jarugula, The salinity of coastal waters as a bellwether for global water cycle changes (2023), *Geophysical Research Letters, 50, e2023GL106684, doi: 10.1029/2023GL106684*

Xiong, J, Abhishek, X. Li, **H. A. Chandanpurkar**…, ET-WB: water balance-based estimations of terrestrial evaporation over global land and major global basins (2023), *Earth System Science Data, 15, 4571–4597, doi: 10.5194/essd-15-4571-2023*

Xu., L., D. Ferris, X. Huggins, J. Wong, C. Mohan, S. Sadri, **H. A. Chandanpurkar**, P. Sanyal, J. S. Famiglietti, From coarse resolution to practical solution: GRACE as a science communication and policymaking tool for sustainable groundwater management (2023), *Journal of Hydrology, 623 (129845), doi: 10.1016/j.jhydrol.2023.129845*

Chandanpurkar, H. A., B. D. Hamlington, J. T. Reager, Global terrestrial water storage reconstruction using cyclostationary empirical orthogonal functions (2022), *Remote Sensing, 14 (22), doi:10.3390/rs14225677*

Chandanpurkar, H. A., T. Lee, X. Wang, Z. Hong, J. T. Reager, S. Fournier, I. Fenty, I. Fukumori, D. Menemenlis, C. G. Piecuch, J. T. Reager, O. Wang, and J. Worden. (2022). Influence of Nonseasonal River Discharge on Sea Surface Salinity and Height, *Journal of Advances in Modeling Earth Systems, 14(2), doi:10.1029/2021MS002715*

Elder, C. D., D. R. Thompson, A. K. Thorpe, **H. A. Chandanpurkar**, P. J. Hanke, N. Hasson, S. R. James, B. Minsley, N. J. Pastick, D. Olefedt, K. M. W. Anthony, and C. E. Miller. (2021). Characterizing extreme thermokarst methane emissions from the air and the ground in interior Alaska, *Global Biogeochemical Cycles, 35(12). doi: 10.1029/ 2020GB006922*

Harvey, T., B. D. Hamlington, … **H. A. Chandanpurkar**, …, and C. Boening (2021). Ocean mass, sterodynamic effects and vertical land motion largely explain US coast relative sea level rise, *Communications Earth & Environment, 2(1), 233. doi: 10.1038/s43247-021-00300-w*

Cheon, S.-H., B. D. Hamlington, J. T. Reager, and **H. A. Chandanpurkar** (2021) ENSO-related Changes in Terrestrial Water Storage, *Nature Scientific Reports, 11, 13595. doi: 10.1038/s41598-021-92729-4*

Pascolini-Campbell, M. A., J. T. Reager, **H. A. Chandanpurkar**, and M. Rodell (2021, *retracted*). A 10 per cent increase in global land evapotranspiration from 2003 to 2019, *Nature, 593, 543–547. doi: 10.1038/s41586-021-03503-5*

Chandanpurkar, H. A., J. T. Reager, J. S. Famiglietti, R. S. Nerem, D. P. Chambers, M-H. Lo, B. D. Hamlington, and T. H. Syed. (2021). The seasonality of global land and ocean mass and the changing water cycle, *Geophysical Research Letters, 48, e2020GL091248. doi:10.1029/2020GL091248*

Hamlington, B. D., C. G. Piecuch, T. J. Reager, **H. A. Chandanpurkar**, T. Frederikse, R. S. Nerem, J. T. Fasullo, and S.-H. Cheon. (2020). Origin of Interannual Variability in Global Mean Sea Level, *Proceedings of the National Academy of Sciences of the United States of America, 117 (25), 13983-13990. doi: 10.1073/pnas.1922190117*

Hamlington, B. D., A. Gardner, ... **H. A. Chandanpurkar**, …, and M. Willis. (2020). Understanding of Contemporary Regional Sea-Level Change and the Implications for the Future, *Survey in Geophysics. doi: 10.1029/2019RG000672*

Chandanpurkar, H. A., J. T. Fasullo, R. S. Nerem, J. T. Reager, and J. S. Famiglietti. (2019). Nonlinear Land Storage Response to ENSO Phase and Duration, *Water, 11(11), 2249. doi:10.3390/w11112249*

Purdy, A. J., C. H. David, M. S. Sikder, J. T. Reager, **H. A. Chandanpurkar**, N. L. Jones, and M. A. Matin. (2019). GRACE satellites observe the fingerprint of water management in Bangladesh, *Front. Environ. Sci.*

7:155. doi: 10.3389/fenvs.2019.00155

Hamlington, B. D., J. T. Reager, **H. A. Chandanpurkar**, and K. Y. Kim. (2019). Amplitude Modulation of Seasonal Variability in Terrestrial Water Storage. *Geophysical Research Letters*, *doi:10.1029/2019GL082272*

Chandanpurkar, H. A., J. T. Reager, J. S. Famiglietti, and T. H. Syed. (2017). Satellite- and reanalysis-based mass balance estimates of global continental discharge (1993-2015)*, Journal of Climate, 30(21), 8481-8495. doi: 10.1175/JCLI-D-16-0708.1*

REPORTS AND DISSERTATIONS

Zhang and Borja-Vega. 2024. "Water for Shared Prosperity." World Bank, Washington, DC. © World
Bank (http://documents.worldbank.org/curated/en/099051624105021354) - Provided assessment of droughts and flood risks featured in Chapter 4.

Chandanpurkar, H. A. 2016. 'Global continental discharge and its influence on ocean and climate'- PhD dissertation

Chandanpurkar, H. A., P. K. Moudgal. 2011. 'Analysis of Simulation Models for GLOFs Risk Assessment in Sikkim Himalayas', - Thesis for the Post-graduate Diploma in Geoinformatics

Chandanpurkar, H. A. 2009. 'Developing Basic Understanding of the Water Resources in Naukuchiatal watershed of Nainital District, Uttarakhand; with special reference to the hydrogeological characters'- MSc dissertation

CONFERENCE PRESENTATIONS

Chandanpurkar, H. A., J.S. Famiglietti, K. Gopalan, Y. Wada, K. Kakinuma, F. Zhang. 2024. Continental Drying, Shrinking Freshwater Availability, and Sea Level Rise, *American Geophysical Union Fall Meeting, Washington D.C., USA.*

Abdelmohsen, K., J.S. Famiglietti, and **H. A. Chandanpurkar**. 2024. Groundwater Droughts in the Colorado River Basin: Identifying Key Drivers and Impacts on Water Resources*, American Geophysical Union Fall Meeting, Washington D.C., USA.*

Fournier, S., J. T. Reager, **H. A. Chandanpurkar**, M. Pascolini-Campbell. 2022. The salinity of coastal waters as a bellwether for global water cycle changes, *American Geophysical Union Fall Meeting, San Francisco, USA*

Chandanpurkar, H. A., J. T. Reager, and B. D. Hamlington. 2020. Investigating GRACE land water storage trends in the context of natural climate variability, *Asia Oceania Geosciences Society Meeting, Hongcheon-gun, South Korea.* Conference cancelled due to COVID-19 pandemic.

Chandanpurkar, H.A., X. Wang, T. Lee, Z. Hong, J.T. Reager, and S. Fournier. 2020. Influence of Non-seasonal River Discharge on the Ocean, *Ocean Sciences Meeting, San Diego, USA*

Chandanpurkar, H. A., B. D. Hamlington, and J. T. Reager. 2019. Isolating human-driven trends in satellite-observed terrestrial water storage, *American Geophysical Union Fall Meeting, San Francisco, USA*

Hamlington, B. D., J. T. Reager, **H. A. Chandanpurkar**. 2019. Extension of Satellite-Measured Terrestrial Water Storage for Longer-Term Water Cycle Studies. *American Geophysical Union Fall Meeting, San Francisco, USA*

Meyer, V., A. Bloom, J. T. Reager, N. Parazoo, M. Longo, Y. Yang, M. Shi, **H. A. Chandanpurkar**, and J. Worden. 2019. Assimilation of GRACE Data into CARbon Data-Model framework (CARDAMOM). *American Geophysical Union Fall Meeting, San Francisco, USA*

Wang X., **H. A. Chandanpurkar**, T. Lee, S. Fournier, H. Zhang, O. Wang, I. G. Fenty, D. Menemenlis, John T Reager, and I. Fukumori. 2019. Influence of Non-seasonal Discharge on Global Ocean State. *American Geophysical Union Fall Meeting, San Francisco, USA*

Huda, J., J. T. Reager, **H. A. Chandanpurkar**. 2019. Understanding the social drivers of satellite-observed changes in freshwater availability. *American Geophysical Union Fall Meeting, San Francisco, USA*

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Lo, M-H., L-W Chao, J. T. Reager, Y. Wada, V. Humphrey, **H. A. Chandanpurkar**, C-W. Hsu, and B. D. Hamlington. 2019. The role of groundwater in modulating the global mean sea level variations during ENSO events. *American Geophysical Union Fall Meeting, San Francisco, USA*

Wang, X., T. Lee., I. G. Fenty, H. Zhang, **H. A. Chandanpurkar**, S. Fournier, I. Fukumori, D. Menemenlis, D. E. Waliser, O. Wang, J. R. Worden, and J. T. Reager. 2018. Developing the Capability to Inversely Constrain the Estimates of Time-Varying River Discharge Using Ocean Observation. *American Geophysical Union Fall Meeting, Washington D.C., USA*

M. S. Sikder, C. H. David, G. H. Allen, X. Qiao, E. J. Nelson, M. A. Matin, and **H. A. Chandanpurkar**. 2019. Evaluation of Multiple Runoff Datasets over Ganga-Brahmaputra-Meghna and Mekong. *Regional Knowledge Forum on Early Warning for Flood and High Impact Weather Events, ICIMOD, Kathmandu, Nepal*

Chandanpurkar, H. A., J. S. Famiglietti, J. T. Reager, R. S. Nerem, D. Chambers, D. N. Wiese, and M. H. Lo. 2018. Seasonality of global land and ocean mass as a metric of global water cycle variability, *American Geophysical Union Fall Meeting, Washington D.C., USA*

Chandanpurkar, H. A., J. T. Fasullo, J. T. Reager, R. S. Nerem, and J. S. Famiglietti. 2018. Nonlinear Land Water Storage Response to Multi-Year ENSO*, Asia Oceania Geosciences Society Meeting, Honolulu, USA*

Chandanpurkar, H. A., J. T. Fasullo, and R. S. Nerem. 2017. Nonlinearity in ENSO-Precipitation-Terrestrial Water Storage Relationships, *American Geophysical Union Fall Meeting, San Francisco, USA*

Chandanpurkar, H. A, S. G. Yeager, J. T. Reager, and J. S. Famiglietti. 2016. Role of continental discharge in ocean and climate dynamics through influence on ocean salinity, *Ocean Science Meeting, New Orleans, USA*

Chandanpurkar, H. A, S. G. Yeager, J. T. Reager, and J. S. Famiglietti. 2016. Ocean's sensitivity to uncertainties in continental discharge, *CESM Ocean Model Working Group Meeting, Boulder, USA*

Chandanpurkar, H. A, J. T. Reager, T. H. Syed, and J. S. Famiglietti. 2014. How much continental freshwater do global oceans receive? *Ocean Science Meeting, Honolulu, USA*

Chandanpurkar, H. A, J.T. Reager, C. H. David, J.S. Famiglietti, and T. H. Syed. 2012. Global runoff estimates derived from GRACE dataset, *American Geophysical Union Fall Meeting, San Francisco, USA*

Chandanpurkar, H. A, and K.A. Subramanian. 2008. Odonata of Naukuchiatal, a tectonic lake in Western Himalaya, India, *International Symposium of Odonatology, Nagpur, India*

INVITED PRESENTATIONS

2023	'Trends and changes in terrestrial water cycle', Technical Workshop on Global Water Monitoring Report, World Bank, Washington D.C., USA
2023	**'**Observing the changing water cycle from space', B.G. Deshpande Memorial Public Lecture, *Pune, India*
2020	'Observing global water cycle changes and implications on the Earth System', Indian Institute of Science Education and Research (IISER), Pune, India
2020	'The changing global water cycle and implications on the Earth System', Indian Institute of Technology, Bombay (IIT-B), Powai, India
2019	'Evaluation of Multiple Runoff Datasets over Ganga-Brahmaputra-Meghna and Mekong', International Centre for Integrated Mountain Development, Kathmandu, Nepal

RESEARCH MENTORING

2021-present	A. Arora (undergraduate student, FLAME University, Pune)
2019	C. Wicker (summer intern, Jet Propulsion Laboratory, Pasadena)
2017	A. Putnam (graduate student, University of Colorado, Boulder)
2017	C. Harvey (graduate student, University of Colorado, Boulder)

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UNIVERSITY TEACHING EXPERIENCE

Instructor of Record

FLAME University, Pune, India

2022, 2023 Climate Change (ENVS 231; advanced undergraduate course)

California Institute of Technology, Pasadena, USA

2019 Climate Science Summer School (for Ph.D. students)

University of California, Irvine, USA

2015 Oceanography (ESS3; introductory undergraduate course)

Teaching Assistant

University of California, Irvine, USA

2016 Remote Sensing (ESS138; advanced undergraduate and graduate course)
2013 Data Analysis (ESS 116; advanced undergraduate course)
2012 Data Analysis (ESS 116; advanced undergraduate course)
2015 Oceanography (ESS3; introductory undergraduate course)
2013 The Atmosphere (ESS5; introductory undergraduate course)
2012 Oceanography (ESS3; introductory undergraduate course)

Invited Lectures

2023 'Changes in Global Water Availability', School of Sustainability, Arizona State University, Tempe, USA
2016 'Concept of geoid and gravimetric remote sensing using GRACE', Remote Sensing, UCI
2013 'Advanced data analysis methods', Data Analysis, UCI
2012 'Marine ecosystems', Oceanography, UCI
2008, 2010 'Study tour of Geology and Biodiversity of Western Ghats', Department of Environmental Sciences, University of Pune, India
2009 'Environmental Technologies and Waste Management', Shrimati Bhanuben Nanavati College of Architecture, Pune, India

PROFESSIONAL SERVICE

2023 Co-lead, Nature Walks for Environmental Club, FLAME University, Pune, India
2022 Advisor, Maharashtra State Faculty Development Academy (MSFDA) on development of a long-term climate research and education curriculum at the university and for the state of Maharashtra, India
2022 Panelist, Pune's Aquifers, A Multistakeholder Workshop on Pune City's Groundwater systems Conducted By ACWADAM in Partnership with Bhujal Abhiyan, Center for Environment Education, and Jeevitnadi, Pune, India
2021 Reviewer, NASA Review Panel on a ROSES solicitation (virtual)
2019, 2020 Science Chair, Scientific inputs to several Earth Venture Missions (EVM) concepts at JPL Foundry
2019 Reviewer, NASA Review Panel on a ROSES solicitation (Washington D.C., USA)
2018 – 2019 Chair, weekly group meeting for Terrestrial Hydrology group at JPL
2018 Member, Editorial Advisory Board for the book: *Environmental Impacts of Tourism in Developing Nations,* IGI Global
2017 Judge, Outstanding Student Presentation Award, *American Geophysical Union Fall Meeting*
2016 Learner's Academy, Pune, Maharashtra, India
- Introduce 'earth system science' to high school students

2014 Orange County Water Festival, Irvine, California, USA
- Demonstrate 'Environmental Issues in the Global Oceans' to K-12 students

2013 La Jolla Indian Reservation, California, USA

- Teach field hydrology methods during Summer Camp for indigenous K-12 students

2012, 2013 Aquarium of the Pacific, Long Beach, California, USA
- Address public queries on NASA Earth remote sensing missions at 'Ask a scientist' booth during 'NASA night' event

2011 Volunteer, *in-situ* soil moisture measurement, California, USA

2008 Central Himalayan Rural Action Group (CHIRAG), Uttarakhand, India
- Train CHIRAG staff on 'Hydrogeological setting in Naukuchia area, Nainital District' during a workshop on participatory groundwater management

2004, 2005 Volunteer, Tsunami Relief Camp for 500 victims, Kerala, India
- Look after the food and medicine supply

Manuscript Reviews

Nature Communications, Geophysical Research Letters, Water Resources Research, Journal of Hydrometeorology, Journal of Hydrology, Geoscientific Model Development, Hydrology and Earth System Sciences, Climatic Change, Advances in Water Resources, MDPI Water, MDPI Remote Sensing

Memberships

American Geophysical Union

SKILLS

Remote Sensing

Multiple datasets of earth observation variables such as gravimetry, altimetry, precipitation, evapotranspiration, soil moisture, land use, land cover, temperature, sea surface salinity, as well as reanalyses datasets across diverse spatial and temporal resolutions

Numerical Simulations & Models

Numerical Simulations: CESM-Large Ensemble, GLDAS, Coupled Model Intercomparison Project (CMIP)
Model usage: CESM, WRF, CaMa-Flood, MODFLOW, HEC-RAS, ANUGA Hydro

Computer Skills

Current expertise: Python, UNIX, CDO, NCO, QGIS, Google Earth Engine, Github, Docker, LaTeX
Past expertise: Matlab, NCL, ArcGIS, R, GRASS GIS

Software Development

Lead developer, mvstats (https://github.com/hrishikeshac/mvstats) – a python package of vectorized multivariate statistical functions for analyzing multi-dimensional earth system data
Lead developer, CHEESE CURDS (https://github.com/hrishikeshac/cheesecurds) – a python package to provide CHambEr-flux EStimatE for Cavity Ultraportable Ring-Down Spectroscopy
Contributor, SHBAAM (https://github.com/c-h-david/shbaam) – a python package on Satellite Hydrology Bits Analysis And Mapping (SHBAAM)

Field Methods

Hydrology and hydrogeology methods: Measuring water quality and quantity parameters, lake bathymetry, soil moisture, conducting pumping tests, geological mapping
Snow processes measurement methods: Snow depth transects using snow stakes, Snow water equivalent (SWE) from snow tube, Snow density, and SWE from snow pits

Wilderness travel

Mountaineering (alpine style), Traditional ('trad') rock climbing, Backcountry skiing, SCUBA diving

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Certifications:

2018	AIARE Avalanche Companion Rescue
2016	PADI Open Water Diver