

Dr. Tonie M. van Dam

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Employment History:

2020-present	Professor, University of Utah, College of Sciences, Department of Geology and Geophysics
2019-2020	Professor, Interdisciplinary Center for Security and Trust; Head of Remote Sensing Group
2018-2019	Vice President for Strategic Projects, University of Luxembourg
2017-2018	Vice-President – Doctoral Education and Training, International Relations, and Gender, University of Luxembourg
2016-2019	Chargée de mission – Doctoral Education and Training and International Relations, University of Luxembourg
2013-2019	Professor, Faculté des Sciences, de la Technologie et de la Communication, University of Luxembourg
2006-2013	Associate Professor, Faculté des Sciences, de la Technologie et de la Communication, University of Luxembourg
2000-2006	Research Geophysicist, European Center for Geodynamics and Seismology
1993-2000	Research Geophysicist, Geosciences Laboratory NOAA/NGS
1991-1993	Post-doc, MIT

Education:

- Ph.D., Geophysics, University of Colorado, Boulder, CO, 1991, Thesis title: "Atmospheric Load Response of the Solid Earth and Oceans"
- BS, Physics and Geology, Mary Washington College (now Mary Washington University),
Fredericksburg, VA 1982
- Top Management Program (40) Leadership Foundation, 2017.

Honors:

- Fellow, American Geophysical Union, 2019
- Bowie Lecturer, American Geophysical Union, 2017
- Grand Prix en Sciences de l'Institut Grand-ducal, Science Geologiques/Prix Feidt (2017)
- European Geosciences Union's Vening Meinesz Medal (2019).
- Higher Education Academy Fellow (2014).

Research Narrative:

My research focuses on using geodetic observations to understand Earth system processes, particularly the interactions among climate, water storage, cryospheric change, and solid Earth deformation. Over the course of my career, I have worked at the intersection of geodesy, hydrology, and geophysics, helping to establish how measurements from GNSS, terrestrial gravity, and satellite gravity can be used to quantify environmental loading and mass redistribution within the Earth system.

My early work focused on atmospheric and hydrologic loading of the solid Earth and the implications of these processes for geodetic measurements. Over time, this work expanded into broader investigations of time-variable gravity, terrestrial reference frames, geocenter motion, and environmental corrections for space geodetic observations.

A major theme of my research has been the use of geodesy to study climate-related mass redistribution, particularly in Greenland and other cryospheric regions. Through collaborations involving GNSS, GRACE/GRACE-FO, and terrestrial gravity observations, my colleagues and I demonstrated how

geodetic observations can resolve transient ice mass changes, glacial isostatic adjustment, and hydrologic loading signals associated with climate variability and long-term climate change. These efforts helped establish geodesy as an important tool for monitoring Earth system change.

More recently, my research has increasingly focused on hydrology and water resources in the western United States. Since joining the University of Utah, I have developed projects that integrate GNSS, GRACE, terrestrial gravity, seismic, and hydrologic observations to investigate groundwater storage, snowpack variability, and hydrologically induced deformation in the Great Salt Lake Basin and along the Wasatch Front. This work aims to improve understanding of drought, groundwater recharge, and the relationship between mountain hydrology and basin aquifer systems in arid and snow-dominated environments.

Professional Society Memberships

- American Geophysical Union
- European Geosciences Union

Publications in Review or Preparation

Rahmani, Y. and T. van Dam, Offset Detection in GNSS Time Series Using Statistical and Machine Learning Methods: A Comparative Study, in preparation.

Cvijanovich, B., M. Thorne, S. Pachhai, I. Tochimani-Hernandez, L. Anderson, C. Hardwick, and T. van Dam, The internal ice content of Timpanogos rock glacier, Utah, USA from 3-D Bayesian inversion of gravity data, in review, *Geophysical Research Letters*.

Jacketta, M., M. Thorne, S. Pachhai, and T. van Dam, Evidence for fresh groundwater beneath the eastern playa of the Great Salt Lake from electrical resistivity tomography, in review.

Recent Refereed Publications

Salehian Ghamsari, S., T. van Dam, J. Hale (2006) A Random Model of Anisotropic Hydraulic Conductivity tailored to the InSAR-based Analysis of Aquifers, in review *Stochastic Environmental Research and Risk Assessment*, *Stochastic Environmental Research and Risk Assessment*, 40,

Jacketta, M., M. Thorne, S. Pachhai, I. Tochimani-Hernandez, T. van Dam, C. Hardwick, E. Adomako-Mensah, W. Johnson, and L. Anderson, Characterization of hydrogeologic and lithologic heterogeneity along the southern shore of the Great Salt Lake, Utah from electrical methods, in review, *Geosciences*. 2026; 16(3):114. <https://doi.org/10.3390/geosciences16030114>.

Abbaszadeh, M., T. van Dam (2026) GNSS evaluation of GRACE-assimilated water storage models over 89 river basins worldwide. *Sci Rep* 16, 4307 (. <https://doi.org/10.1038/s41598-025-31887-1>

Feng, K.-F., M. Denolle, M., F.-C. Lin, and T. van Dam, (2026). A decadal survey of the near-surface seismic velocity response to hydrological variations in Utah, United States. *Journal of Geophysical Research: Solid Earth*, 131, e2024JB030689. <https://doi.org/10.1029/2024JB030689>

Salehian Ghamsari, S., T. van Dam, J. Hale, Can the anisotropic hydraulic conductivity of an aquifer be determined using surface displacement data? A case study, *Computers and Geosciences*, 26, <https://doi.org/10.1016/j.acags.2025.100242>, 2025.

van Dam, T., P. Whitehouse, L. Liu, Chapter 12 - GNSS and the cryosphere, Editor(s): Yosuke Aoki, Corn  Kreemer, *GNSS Monitoring of the Terrestrial Environment*, Elsevier, Pages 215-242, ISBN 9780323955072, <https://doi.org/10.1016/B978-0-323-95507-2.00015-3>, 2024.

Li, Z., W. Jiang, T. van Dam, X. Zou, Qusen, and H. Chen, Advances in Modeling Environmental Loading Effects: A Review of Surface Mass Distribution Products, Environmental Loading Products, and Their Contributions to Nonlinear Variations of Global Navigation Satellite System (GNSS) Coordinate Time Series, *Engineering*, <https://doi.org/10.1016/j.eng.2024.09.001>, 2024.

Ran, J., Ditmar, P., van den Broeke, M.R. *et al.* Vertical bedrock shifts reveal summer water storage in Greenland ice sheet. *Nature* 635, 108–113, <https://doi.org/10.1038/s41586-024-08096-3>, 2024.