Resume

Tewodros Alemayehu Tesfamichael, PhD

Research Associate IV	Phone:	(737) 213-9329
New Mexico Bureau of Geology	Email:	Tewodros.tesfamichael@nmt.edu
& Mineral Resources,	Office:	*801 Leroy Place*
New Mexico Tech		*Socorro NM 87801-4796*

PROFESSIONAL SUMMARY

I am a hydrogeologist with over a decade of experience in groundwater assessment and management, environmental investigations, and hydrogeochemical analysis. My work integrates field investigations, data analysis, and modeling to better understand and manage groundwater systems. I have expertise in qualitative and quantitively analysis of geological, geochemical, hydrogeological, and geophysical data. My work focuses on water-rock interactions, surface and groundwater coupled hydrologic systems, hydrogeochemical modeling, and the application of isotopic and chemical tracers to understand subsurface processes. I am also deeply in teaching of geology and environmental science courses.

EDUCATION

Ph.D., Geoscience at Graz University of Technology, Austria, May, 2011
Dissertation: Water-rock interaction and geochemistry of groundwater in Axum Area, Ethiopia
M.S., Earth System Science at Wageningen University, The Netherlands., August, 2005
Thesis: The potential impact of climate change on drylands of Ethiopia
B.S., Applied Geology, Mekelle University, Ethiopia., July, 2001

EXPERIENCE

- 10/2025 - Present: Research Associate IV-Hydrogeologist, NM Bureau of Geology and Mineral Resources, NM Tech
- Oct 2023 – Sept. 2025: Visiting Professor at Bureau of Economic Geology/Jackson School of Geosciences, University of Texas at Austin, TX
- Aug 2020 – Sept 2023: Associate Professor, School of Earth Sciences, Mekelle University
- July 2011 – July 2020: Assistant Professor, School of Earth Sciences, Mekelle University
- 09/2005 - 02/2008: Lecturer, Mekelle University, Ethiopia
- 07/2001 - 09/2003: Graduate assistant, Mekelle University, Ethiopia

TECHNICAL SKILLS

- **Field Work**: Geological, geophysical (VES), and hydrological surveys, surface and groundwater sampling, well logging, aquifer testing
- **Software**: Phreeqc, Python, MODFLOW, AquaChem, ArcGIS, GEE,
- **Analytical Skills**: Isotope hydrology, XRD, XRF, remote sensing, big data analysis,

PROFESSIONAL AFFILIATIONS

- American Association for the Advancement of Science (AAAS), 2025-
- Geological Society of America, Member, 2023-
- Geological Society of Africa, Member, 2010–2011

SELECTED PAPERS

- Haile T. Abadi, **Tewodros Alemayehu**, Berihu A. Berhe, 2024. Assessing the suitability of water for irrigation purposes using irrigation water quality indices in the Irob catchment, Tigray, Northern Ethiopia. *Water Quality Research Journal* 2024; wqrj2024055. doi: https://doi.org/10.2166/wqrj.2024.055
- Haile T. Abadi, **Tewodros Alemayehu**, Berihu A. Berhe, 2024. Heavy metal's pollution health risk assessment and source appraisal of groundwater and surface water in Irob catchment, Tigray, Northern Ethiopia. *Appl Water Sci* 14, 201. https://doi.org/10.1007/s13201-024-02237-9.
- Haile T. Abadi, **Tewodros Alemayehu**, Berihu A. Berhe, 2024. Hydrogeochemical characterization of groundwater in mountainous catchment and its suitability for drinking purposes in Irob, Tigray, Northern Ethiopia. *Water Practice and Technology* 19 (4): 1495–1512. https://doi.org/10.2166/wpt.2024.067
- Emnet Negash, Emiru Birhane, Aster Gebrekirstos, Mewcha A. Gebremedhin, Sofie Annys, Meley M. Rannestad, Daniel Hagos Berhe, Amare Sisay, **Tewodros Alemayehu**, Tsegai Berhane, Belay M. Gebru, Negasi Solomon, Jan Nyssen 2023. Remote sensing reveals how armed conflict regressed woody vegetation cover and ecosystem restoration efforts in Tigray, *Ethiopia. Science of Remote Sensing* 8, 100108. https://doi.org/10.1016/j.srs.2023.100108
- Brhanemeskel Weleabzgi, **Tewodros Alemayehu** and Samual Estifanos, 2022. Assessing the environmental impact of artisanal gold mining activities on waters and sediments of Meli area, northwestern Tigray, Ethiopia. *Momona Ethiopian Journal of Science (MEJS)*: Volume 13 (2):281-299.10.4314/mejs.v13i2.6
- **Tewodros Alemayehu,** Abdulaziz Osman and Haddush Goitom, 2021. The challenges of construction waste management in Mekelle, northern Ethiopia. *MEJS* Volume 13 (1):177-190. 10.4314/mejs.v13i1.10
- **Tewodros Alemayehu**, Leis, A., Dietzel, M., 2020. Environmental isotope and hydrochemical characteristics of groundwater in central portion of Mekelle sedimentary outlier, northern Ethiopia, *Journal of African Earth Sciences*, Vol 171. doi: https://doi.org/10.1016/j.jafrearsci.2020.103953
- **Tewodros Alemayehu**, M. Gebreslassie and H. Amanuel, D. Bekele, 2019. Assessment of the Impact of Landfill Leachate on Groundwater and Surrounding Surface Water - A Case Study of Mekelle City, Northern Ethiopia. *Sustainable Water Resources Management*, 5 https://doi.org/10.1007/s40899-019-00328-z
- **Tewodros Alemayehu**, Albrecht Leis, Anton Eisenhauer, Martin Dietzel, 2011. Multi-proxy approach (2H/H, 18O/16O, 13C/12C and 87Sr/86Sr) for the evolution of carbonate-rich groundwater in basalt dominated aquifer of Axum area, Northern Ethiopia. *Chemie der Erde* 71, pp.177-187. https://doi.org/10.1016/j.chemer.2011.02.007

CHAPTERS AND CONFERENCE PAPERS

- **Tewodros Alemayehu**, Bridget R Scanlon, and Sofia Berdysheva, 2024. Increased vulnerability of hydropower generation to climate extremes in Sub-Saharan Africa AGU Fall Meeting Abstracts 2024, GC31P-0035

- **Tewodros Alemayehu**, Paul Bauman, and Bridget R Scanlon, 2024. Challenges of Accessing Water Supplies in Protracted African Refugee Camps. AGU Fall Meeting Abstracts 2024 H43Q-1113
- **Tewodros Alemayehu**, Solomun Atsbaha Gebru, 2023. Geophysical and Infiltration Surveys to Characterize the Subsurface Groundwater Storage in the Alamata Graben of Ethiopian Rift Valley Margin AGU Fall Meeting
- **Tewodros Alemayehu**, Albrecht Leis and Martin Dietzel, 2018. Groundwater Evolution in the Multilayer Aquifers of the Mekelle Sedimentary Outlier (Northern Ethiopia): A Chemical and Isotopic Approach In: Chaminé H., Barbieri M., Kisi O., Chen M., Merkel B. (eds) Advances in Sustainable and Environmental Hydrology, Hydrogeology, Hydrochemistry and Water Resources. Advances in Science, Technology & Innovation (IEREK Interdisciplinary Series for Sustainable Development). Springer, Cham https://doi.org/10.1007/978-3-030-01572-5_50
- **Tewodros Alemayehu,** Martin Dietzel, 2013. Environmental isotopes as a tool to identify groundwater chemical characteristics and sources in crystalline rocks, Axum, 24th Colloquium of African Geology (CAG24) Jan 8-14, 2013, Addis Ababa, Ethiopia.
- **Tewodros Alemayehu,** Martin Dietzel, 2011. The nature of CO_2-rich groundwater in basalt aquifer (Axum); Source and reaction pathways. International Water Congress 2011, 19-26 September 2011, Mekelle, Ethiopia.
- **Tewodros Alemayehu,** Martin Dietzel and Albrecht Leis, 2010. Evolution of groundwater in volcanic aquifer of Axum, Ethiopia: Isotopic and hydrochemical evidence. In: P. Birkle& I.S. Torres-Alvarado (eds.) Water-Rock Interaction–13, Taylor & Francis, pp.47-50. ISBN 987-0-415-60426-0
- **Tewodros. Alemayehu,** M. Dietzel and A. Leis, 2010. Geochemical Evolution of Groundwater Quality in Shallow and Deep Wells of Volcanic Aquifer in Axum, Ethiopia. In: A. Zuber, J. Kania and E. Kmiecik (eds.) Groundwater Quality Sustainability, proceedings, **pp 413-418**.
- **Tewodros Alemayehu,** Martin Dietzel and Albrecht Leis, 2010. Deciphering natural variability of groundwater chemistry using hydrochemical and stable isotope data in Axum aquifer, Ethiopia. Geophysical Research Abstracts, Vol. 12, Vienna, Austria.

TECHNICAL REPORTS

- 2020, Assessment of Ground Vibrations and Environmental Impacts Induced Due to Blasting on Messebo's Quarry site and Proposal for Remedial measures, Ethiopia
- 2020, Exploration and Evaluation of Industrial Minerals and Dimension Stones in Eastern and South Eastern zones of Tigray, Ethiopia
- 2019, Geological and Environmental Report for Design of Drainage System in Mekelle
- 2017, Environmental Impact Assessment and Resettlement Action plan for Raya Integrated Agro-industry Park
- 2017, Geological and Environmental Report for Master Plan of Mekelle City
- 2015, Environmental Impact Assessment and Resettlement Action plan for Textile Industry
- 2014, Environmental Impact Assessment for Giba Dam, Mekelle Water Supply Project
- 2014, Assessment of the Potential Alternative Low Fluoride Water Supply Resources in Selected Woredas of the Main Ethiopian Rift Valley