

Establishing a GNSS-Based Geodesy Capacity-Building Hub at Madda Walabu University to Support Geodetic Research in Ethiopia

The overarching objective of this project is to establish a sustainable GNSS-based geodesy capacity-building hub at Madda Walabu University (MWU), Ethiopia, to strengthen geodetic research, education, and international cooperation in Earth and space sciences within a developing-country context.

Specifically, the project seeks to:

1. **Foster International Cooperation:** Forge structured, long-term partnerships between MWU and leading international geodetic bodies affiliated with the International Association of Geodesy (IAG), including universities and GNSS service providers. This collaboration will be realized through joint expert workshops, virtual seminars, and hands-on training in GNSS data processing, reference frame realization, and Earth system applications, thereby integrating Ethiopian researchers into global geodetic networks.
2. **Build Sustainable Local Expertise:** Develop in-depth capacity in GNSS-based geodesy by training early-career researchers, graduate students, and academic staff at MWU. The program will cover modern geodetic theory and practice, including GNSS observations, precise positioning, tropospheric sensing, and geophysical applications, creating a core of local experts who can sustain and expand geodetic research in Ethiopia and the East African region.
3. **Promote Innovative Interdisciplinary Research:** Catalyze research that applies GNSS techniques to critical societal and environmental challenges. By integrating geodesy with hydrology (e.g., groundwater monitoring), climate studies (e.g., atmospheric water vapor), and natural hazard assessment (e.g., land subsidence, seismic risk), the project will equip participants to conduct solution-oriented science with tangible local relevance.
4. **Champion Inclusion and Equitable Access:** Prioritize the participation of researchers and students from underrepresented and resource-limited backgrounds, with a strong emphasis on gender balance and career-stage diversity. By establishing this hub at a university in a geographically and scientifically underserved region, the project directly addresses disparities in geodetic capacity.
5. **Generate Visible and Measurable Outputs:** Deliver concrete outcomes, including: (i) an international GNSS training workshop; (ii) open-access, multilingual teaching materials and processing software; (iii) strengthened institutional GNSS infrastructure; (iv) initiation of collaborative research outputs (joint publications, student theses); and (v) policy briefs for stakeholders on the value of geodesy for sustainable development.

The primary beneficiaries are MWU students and faculty. Secondary beneficiaries include Ethiopian and regional research networks, which will gain enhanced capacity, and the international geodetic community, which will benefit from broader participation and cooperation in global geodetic initiatives.