Tsegaye Tadesse, Ph.D.

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Research Associate Professor
Applied Climatologist and Remote Sensing Expert

Transforming Research into Action ◆ Driving Two-way Dialogue ◆ Building Innovative Solutions

QUALIFICATION SUMMARY

- Successful, enthusiastic researcher with 15+ years of post-doctoral experience (35+ years total) in drought and vegetation monitoring, remote sensing, agricultural development, food security, and climate change/variability at national and international levels
- Effective at managing professional teams and collaborating with others to reach objectives
- Proficient at developing partnerships among universities, business, and industry
- Excellent at developing educational programs that connect with many learning groups focused on practical and hands-on learning

CURRENT & PREVIOUS POSITIONS

2015-present	**Research Associate Professor/ Climatologist and Remote Sensing Expert,** National Drought Mitigation Center (NDMC), School of Natural Resources, University of Nebraska-Lincoln
2005-2015	**Research Assistant Research Professor/ Climatologist and Remote Sensing Expert,** National Drought Mitigation Center (NDMC), School of Natural Resources, University of Nebraska-Lincoln
2002-2005	**Research Associate/Assistant Geoscientist,** National Drought Mitigation Center (NDMC), School of Natural Resources, University of Nebraska-Lincoln
1998-2002	**Graduate Research Assistant**, Department of Agronomy & Horticulture, University of Nebraska-Lincoln
1984-1997	**Meteorologist & Team Leader**, National Meteorological Services Agency (NMSA), Ethiopia
1982-1984	**Physics Teacher**, Technical School, Ethiopian Air Force Academy, Ethiopia

AREA OF EXPERTISE & RESEARCH INTERESTS

Drought Monitoring & Prediction	Agricultural Development/Food Security	Remote Sensing
Geographic Information Systems	Climate change/Climate variability	Data Mining
Natural Resource Management	Human Impacts on the Environment	Agribusiness
Team Leadership/Development	Judgment/Problem Solving	Risk Management

EDUCATION

Ph.D. Agronomy (Agro-meteorology), University of Nebraska-Lincoln, 2002.
Dissertation title: Identifying drought and its associations with climatic and oceanic parameters using data mining techniques. Dissertation advisor: Dr. Don A. Wilhite.

M.S. Space Studies, International Space University, Strasbourg, France, 1998.

Thesis title: Improving Drought Management through better Monitoring. Thesis advisors: Dr. Michael J. Rycroft (France) and Dr. Don A. Wilhite (U.S.A.).

B.Sc. Physics (Mathematics minor), Addis Ababa University, Ethiopia, 1982.

Post-Graduate Courses in meteorology/agro-meteorology:

Month/Year	Institution	Main course of study
01- 02/1997	Meteorological Office College, Reading, UK.	Advanced Forecasting Course
09/1995	Meteorological Office College, Reading, UK	Remote sensing and Numerical Weather Prediction appreciation.
05 –06 /1995	WMO Regional Center for Postgraduate Training in Applied Meteorology, Bet-Dagan, Israel	International Postgraduate Course in Data Base construction, maintenance & management in Agro-meteorology
05-06/1994	International Center for Theoretical Physics (ICTP), Trieste, Italy	Atmospheric Boundary Layer and Air Pollution Modeling
04-06/1992	European Center for Medium Range Weather Forecast (ECMWF), Reading, UK	Advanced Training in Numerical Weather Prediction
09/1986 – 09/1987	Indian Meteorological Dept, Pune, India	General and Synoptic Meteorology

AWARDS

2016 Certificate of Completion Upward Bound Math/Science: The Environmentors Program.
2015 UNL 2015 10-year Service Award, UNL.
2014 Certificate of Appreciation, Advanced Information Systems Technology (AIST) Program and the NASA Science Technology Office,
2014 Faculty Fellow, *Center for Advanced Land Management Information Technologies (CALMIT),*
2014 Faculty Fellow, *Robert B. Daugherty Water for Food Institute (DWFI).*
2013 *UNL-IANR Omtvedt Innovation Award* for exceptional service at UNL and IANR (NDMC team award).
2013 Certificate of Recognition for excellent participation in "Global Outlook Forum of SAGARPA Forum" in Mexico City, Mexico.
2010 Fellow, *Center for Great Plains Studies* for exceptional scholarship and concern with the past, the present, and the future of the Great Plains.
2009 *Competent Leader Award* by Toastmasters International for exceptional achievements in the Toastmasters International Leadership Program.
2009 *Competent Communicator Award* by Toastmasters International for exceptional achievements in the Toastmasters International Communication Program.
2007 *IPCC Nobel Peace Prize winning document*, Contributed to the reports of the IPCC as a reviewer, which was awarded the Nobel Peace Prize in 2007.
2006 *Marquis Who's Who in America* for achievements that influence the people today
2005 *Madison Who's Who* for outstanding work for professionals & executives
2003 *Best Oral Presentation Award* at the 30th International Symposium on Remote Sensing of Environment, International Society for Photogrammetry and Remote Sensing, Honolulu, Hawaii.
1998 *Graduate Assistantship Award*, Department of Agronomy & Horticulture, University of Nebraska-Lincoln

GRANTS

Grants funded

- Hands-on Training on the Vegetation Drought Response Index (VegDRI) model and products, Agriculture and Agri-Food Canada, $4,258; 02/06/2017 - 02/10/2017; Project Leader and Trainer.

- U.S.-India Partnership: Improving Water Management, Agricultural Production and Food Security in Drought-Prone Areas, US-India Educational Foundation, $182,804; 09/01/2016 - 08/31/2019; Investigator.
- Global Inventory and Comparative Assessment of Drought Risk Modeling Tools, World Bank Group-IBRD/ Deltares, Netherlands, $11,484; 01/01/2017 - 06/30/2018; Co-Principal Investigator.
- Development of a Global Evaporative Stress Index Based on Thermal and Microwave LST towards Improved Monitoring of Agricultural Water and Vegetation Stress, NASA, $20,822; 04/01/2017-03/31/2020; co-Investigator.
- Providing Drought Information Services for the Nation (US): the Drought Risk Management Research Center (DRMRC), NOAA, $2,439,400; 06/01/2015 – 05/31/2018; Co-Principal Investigator.
- Development of the MENA Regional Drought Management System, International Center for Bio-saline Agriculture (ICBA), Associations/Foundations, Research, $1,025,440.00, 01/01/2016 - 03/31/2018; Investigator.
- Drought Information Services for Agriculture in the US, Dept of Agriculture-OCE, Federal, Public Service, $827,501.00, 10/01/16 – 09/30/17; Investigator.
- Improving U.S. Drought Monitoring - Integrating Soil Moisture Data and Developing a Drought Blends Portal, USDA, $150,000; 09/26/2014 – 10/30/2015; Investigator.
- Drought Early Warning and Policy in the Eastern Caribbean, Organization of Eastern Caribbean States (OECS) and the Caribbean Institute of Meteorology and Hydrology (CIMH), $49,227; 01/22/2015 – 05/20/2016; Co-Principal Investigator.
- Drought Risk Management for the US, NOAA/NIDIS - University of Oklahoma, $693,696; 06/02/2014 – 08/31/2015; Investigator.
- Improving US Drought Monitoring - Integrating Soil Moisture Data and Developing a Drought Blends Portal – Co-Principal Investigator. Funded by the USDA Office of the Chief of the Economist (Agency), $150,000; 10/31/2014 – 01/30/2016; Co-Principal Investigator.
- Seasonal Prediction of Hydro-Climatic Extremes in the Greater Horn of Africa under Evolving Climate Conditions to Support Adaptation Strategies, NASA, $1,625,032; 01/14/2014 - 2/31/2017; Principal Investigator.
- Developing the Vegetation Drought Response Index (VegDRI) model and producing Experimental VegDRI Maps for Canada (VegDRI-Canada- Phase 2), Agriculture and Agri-Food Canada, $21,943, 12/24/2013 – 03/31/2014; Principal Investigator.
- Drought Information Service in Support of the National Integrated Drought Information System (NIDIS), NOAA/NIDIS, $739,803; 10/01/2013 - 09/30/2014; Investigator.
- The Quick Drought Response Index (QuickDRI): An Integrated Approach for Rapid Response Agricultural Drought Monitoring, NASA, $1,158,701; 05/01/2012-08/14/2016; Investigator.
- It's all about TEF: International Teaching, Extension and Farming Research in Ethiopia, USDA/NIFA, $149,579; 09/01/2011 – 07/31/2014; Co-Principal Investigator.
- A Holistic Approach to sustainable food security through adaptive Ecoregion-based Watershed Management in Ethiopia, Water for Food Institute (UNL), $99,784; 09/01/2011 – 10/01/2014; Co-Principal Investigator.
- The Assessment of Climate and Biophysical Data Sets for Input in the Vegetative Drought Response Index (VegDRI) model, Agriculture and Agri-Food Canada, $24,000; 02/21/2013 - 03/28/2013; Principal Investigator.
- Evapotranspiration (ET) Mapping over North America, University of Maryland, $29,144; 09/28/2012-09/30/2013; Investigator.
- USGS: Evaluation of FEWS NET Satellite Products for Drought Monitoring in Food Insecure Areas of Ethiopia, USGS/EROS, $5,755; 10/24/2011 – 02/23/2012; Principal Investigator.

- Designing and developing drought early warning information system using satellite products and mobile information systems for mitigating climate change in Ethiopia. Swedish International Development Cooperation Agency (SIDA), $40,669; 01/01/2011 – 12/31/2012, Collaborator.
- Farming, Food and Fitness: A Holistic Approach to Agricultural Productivity, Food Insecurity & Nutrition, UNL Agricultural Research Division, $60,000; 04/01/ 2010- 12/31/ 2012; Co-Principal Investigator.
- Rangeland and Forage Geospatial Decision Support System for Drought Risk Management, *USDA/RMA*, $1,023,038; 10/01/2005 – 09/30/2010; Investigator.
- Drought Risk, Impact, and Mitigation Information System, *USDA/RMA*, $6,407,472; 10/01/2005 – 09/30-2010 (D. A. Wilhite & S. Goddard, lead PIs); Collaborator.
- Incorporating Remote Sensing Information into the U.S. Drought Monitor, *USGS/NASA*, $152,608; 04/01/2007 - 03/31/2010; Co-Principal Investigator.
- The Impact of Weather Extremes on Agricultural Production Methods: Dose Drought Increase the Adoption of Conservation Tillage Practices? *UNL Agricultural Research Division*, $39,876; 10/01/ 2007- 06/30/ 2010; Investigator.
- DIGITAL GOVERNMENT: A Geospatial Decision Support System for Drought Risk Management, *National Science Foundation (NSF)*, $1,007,914; 7/1/2001 - 6/30/2004, (S. Goddard, lead PI); Collaborator.

PROFESSIONAL SERVICE ACTIVITIES

Doctoral and Masters Students Graduate Committees and Advisee

Ph.D. Completed

Haileselassie G/Mariam Weldemariam, Earth Science and Engineering, Addis Ababa University, Ethiopia.

Bisrat Kifle, University of South Africa (UNISA), Science College of Agriculture and Environmental Science, Tshwane, South Africa. December 2017.

Solomon M. Mwagha, Central University of Technology, Free State, South Africa (co-Principal advisor), August 2016.

Getachew Berhan Demisse, Information technology (IT) Program, Addis Ababa University, Ethiopia (Principal Advisor), July 2013.

Jaroslav Vido, Department of Applied Ecology, Technical University in Zvolen, Slovak Republic (Advisor), July 2012.

Assefa Zebene, Health Management, A.T. Still University (Advisor). December 2011.

Ph.D. in Progress

Andualem Shimeles Shiferaw, Natural Resource Sciences, Climate Assessment and Impacts, University of Nebraska-Lincoln, USA. Course in progress.

Denis Mariano, Natural Resource Sciences, Climate Assessment and Impacts, University of Nebraska-Lincoln, USA. Course in progress.

Olushola Kaffo, Natural Resource Sciences, Climate Assessment and Impacts, University of Nebraska-Lincoln, USA. Course in progress.

Feyera Merga Liben, Agronomy, University of Nebraska-Lincoln, USA. Course in progress.

Yared Ashenafi Bayissa, Department of Hydro-informatics and Knowledge management, UNESCO-IHE, Netherlands. ABD.

Genemo Berissa Uka, Remote sensing, Entoto Observatory and Research Center (EORC), Ethiopia. ABD.

Getachew Tesfaye Ayehu, Remote sensing, Entoto Observatory and Research Center (EORC),

Ethiopia. ABD.

Master's Completed

Mohammed Abdu Mohammedhabib, Water Resources, Ethiopian Institute of Water Resources, Addis Ababa University, Ethiopia. July 2014.

Yismashewa Feyisa, Plant Science, Haramaya University, Ethiopia, July 2014.

Samuel Sisay, Computer Science, Addis Ababa University, Ethiopia, July 2013.

Yonatan Getachew, Computer Science, Addis Ababa University, Ethiopia, July 2013.

Masters in Progress

Anthony Mucia, Natural Resource Sciences, Climate Assessment and Impacts, University of Nebraska-Lincoln, USA. Course in progress.

Aaron Greuel, Geography, University of Nebraska-Lincoln, USA. Course in progress.

Liangzi Zhang, Natural Resource Sciences, Climate Assessment and Impacts, University of Nebraska-Lincoln, USA. Course in progress.

Other Students Mentoring Roles

I have been helping and mentoring the following graduate students in identifying research topics and conducting their research while doing their Ph.D. and Master's research:

Sharmistha Swain, Ph.D. student, School of Natural Resources (SNR,) UNL, Graduated in 2012.

Baburao Kamble, Ph.D. student, School of Natural Resources (SNR,) UNL, Graduated in 2012.

Meixiu Yu, Ph.D., Ph.D. student, Hohai University, China. Graduated in 2013.

Eric Hunt, Ph.D. student, School of Natural Resources (SNR), UNL, Graduated in 2015.

Linglin Zeng, Ph.D. student, State Key Laboratory of Information Engineering in Surveying, Mapping and Remote Sensing, Wuhan University, Wuhan, China, 2014 (Course in progress).

Yigrem Assefa, Ph.D. student, Department of Civil & Environmental Engineering, University of Connecticut (UConn), 2014 (Course in progress).

Kaku Ajaere, M.A. student in Geography, UNL, Graduated in 2009.

Borlaug Fellowship Program mentor: Prudence Legando from Tanzania (October – December 2016).

Teaching* - Courses taught at UNL *including guest lectures

NRES 208	Introduction to Applied Climate Sciences
NRES 418/818	Introduction to Remote Sensing
NRES/GEOG 312	Introduction to Geospatial Information Sciences
NRES/AGRO 429A/829A	Food Security: A Global Perspective
NRES 452/852	Climate & Society
NRES 299	Climate in Crisis
NRES 103	Introduction to Agriculture & Natural Resources Systems
NRES 999	Doctoral Dissertation
NRES 996	Research Other than Thesis
NRES 896	Independent Study
ANTH498/898	Advanced Current Topics in Anthropology/Study Abroad
PHYSICS 101	Introduction to College Physics

Journal Reviewer

Advances in Meteorology (2 manuscript), Bulletin of the American Meteorological Society (2 manuscript), Climatic Change (1 manuscript), Encyclopedia of Digital Government (2 manuscripts), International Journal of Biometeorology (1 manuscript), International Journal of Climatology (5 manuscripts), International Journal of Remote Sensing (1 manuscript), ISPRS Journal of Photogrammetry and Remote Sensing (2 manuscripts), Journal of Applied Meteorology (2 manuscript), Journal of Applied Meteorology and Climatology (2 manuscript), Journal of Environmental Management (1 manuscript), Journal of Hydrology (3 manuscript), Natural Hazards (2 manuscripts) , Remote Sensing of Environment (1 manuscript), Scientific Data (1 manuscript), Water International (1 manuscript), and Water Resources Management (1 manuscript).

IPCC Fourth Assessment Report Reviewer

IPCC Fourth Assessment Report - Climate Change 2007 (AR4): Working Group II Report "Impacts, Adaptation and Vulnerability." This report helped the IPCC to be awarded the Nobel Peace Prize "for their efforts to build up and disseminate greater knowledge about man-made climate change, and to lay the foundations for the measures that are needed to counteract such change." I reviewed the chapter on Africa.

Proposal Reviewer

- Served as a member of the National Academy of Sciences - SERVIR Review Panel. Nine proposals were reviewed by the panel (June 2016).
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Served as a member of the NASA-SERVIR Food Security and Agriculture Technical Assessment Group. Reviewed and assessed three projects that include SERVIR's existing agricultural monitoring and cropland mapping products and tools to determine if they represent best practice. The final review report was submitted on 12 December 2016.
Reviewed a proposal submitted to UK's Natural Environment Research Council (NRCS) for consideration of "Science for Humanitarian Emergencies & Resilience (SHEAR)" fund in 2016.

Reviewed a proposal submitted for consideration by the Geography and Spatial Sciences (GSS)
Program at the U.S. National Science Foundation (NSF) in 2014.

- Reviewed 3 proposals submitted to NASA for the 2014 Advanced Information Systems Technology (AIST)) solicitation.
- Reviewed and provided my professional opinion (review) on the scientific merits of one research proposal submitted to the Netherlands Space Office (NSO) on behalf of the Dutch research council in 2014.
- Served on NASA Wildland Fires Review Panel to review proposals submitted to NASA from 5 to 8 June 2012. The review panel evaluated 49 proposals and ranked them to provide recommendation to the appropriate NASA administration team.
- Reviewed one proposal submitted to the U.S. Civilian Research and Development Foundation (CRDF) Science Centers in 2011.

Professional Societies/Committees / Working Groups

Member, American Geophysical Union (2014-present)
Member, American Meteorological society (2002-present)
Member, National Geographic Society (2002-present)
Representative & coordinator of North America, Ethiopian Meteorological Society (2008-present)
Member, International Editorial Advisory Board (EAB) of the Advances in Knowledge Communities & Social Networks (AKCSN) Book Series (2006-present)
National Phenology Network (NPN) Land Surface Phenology and Remote Sensing Working Group (2009-present)
NASA Soil Moisture Active Passive (SMAP) Satellite Applications Working Group (2009-present).

University Service

Member, Academic Standards Committee, University of Nebraska-Lincoln (2013-present).
Member, University of Nebraska-Lincoln Chancellor's commission on the status of people of color (2008-2013; 2015-present).
Member, Research Committee, School of natural resources (2006-2009).
Member, Search committees for the position of the Director of High Plains Regional Climate Center (2009).
Member, Search Committee for the Extension Educator (Climate Change & Variability), School of Natural Resources (2009).

LANGUAGE

English (fluent: speak, write, read, and translate)

Amharic (fluent: speak, write, read, and translate)

French (basic: speak, write, and read)

GEOSPATIAL TOOLS and COMPUTER PROGRAMMING

GeoSpatial tools and software: ArcGIS Desktop, ArcMap, ERDAS Imagine, ENVI+IDL, See5, Cubist, GeoClim, NLCD Mapping tools, GPS, and Geospatial Analyst Extension

Others: Perform QA/QC in life cycle geospatial product development activities, MS Office suite (Word, Excel, PowerPoint), Adobe Photoshop, illustrator, scan, print

Programming: Working knowledge and experience in C++, Java, and Python.

PROJECTS AND ACTIVITIES

- **Providing Drought Information Services for the Nation (US): Drought Risk Management Research Center (DRMRC)** – Co-Principal Investigator. Funded by National Oceanic and Atmospheric Administration. This goal of the DRMRC is to improve drought monitoring and drought risk management across the United States. The objectives are to: advance societal components and economic benefits of NIDIS RDEWS; coordinate, develop, enhance USDM and supporting products, tools, data, web mapping services and map/data archive; develop and implement strategies to advance innovations in drought planning; engage & integrate with partners, stakeholders, and key economic sectors at all scales on drought preparedness and impact-related issues; and facilitate communication and coordination across NIDIS partner network.
- **Drought Early Warning and Policy in the Eastern Caribbean** - Co-Principal Investigator. Funded by Organisation of Eastern Caribbean States (OECS) and the Caribbean Institute of Meteorology and Hydrology (CIMH). This project's ultimate goal is to increase drought resilience in participating Caribbean three countries through drought awareness and the establishment of national drought policies and early warning systems. The objectives include training of national agencies in interpreting indices and indicators of drought.
- **Improving US Drought Monitoring - Integrating Soil Moisture Data and Developing a Drought Blends Portal** – Co-Principal Investigator. Funded by the USDA Office of the Chief of the Economist (Agency). The main goal of this project is to identify drought-related indices (e.g., the North American Drought Monitor, a cooperative effort between drought experts in Canada, Mexico and the United States developed to monitor drought across the continent) that may be useful in developing a statistical model for tracking changes in cattle movement caused by drought.
- **Drought Risk Management for the United States** – Co-Principal Investigator. Funded by NOAA's Non-Competitive Grant Program (NIDIS). This project addresses the long-term goal of NOAA,

especially the goal on "Climate Adaptation and Mitigation: an informed society anticipating and responding to climate and its impacts." The objectives associated with this goal include: improving the scientific understanding of drought and its impacts, improving the assessment of droughts to improve decision-making at all levels, identifying and promoting drought risk management and mitigation strategies, and educating the public on drought- and climate-related issues. In addition to addressing these NOAA-developed goals, this project will benefit multiple federal agencies, states, tribes, regional organizations, municipalities, and individuals.

- **Development of the Middle East and North Africa (MENA) Network of Water Centers** - Co-Principal Investigator. Funded by Development Alternatives, Inc. [Further Advancing the Blue Revolution (FABRI) Program, USAID)]. This project focusses on "Modeling and Monitoring Agriculture and Water Resources for Development (MAWRED).' The objectives includes bringing drought monitoring and early warning systems to the MENA region to empower decision-makers in managing water and food security from the regional to farm level.

- **Seasonal Prediction of Hydro-Climatic Extremes in the Greater Horn of Africa under Evolving Climate Conditions to Support Adaptation Strategies** – Principal Investigator. A 3-year NASA funded collaborative project that includes researchers from UNL, Johns Hopkins University, NASA/JPL, USGS/EROS, University of California-Santa Barbara's Climate Hazard Group, Famine Early Warning Systems Network (FEWS), IRI at Columbia University, and the University of Wisconsin-Madison,. The team examines large-scale teleconnections for predictive power in the study region, including the El Niño Southern Oscillation, the Pacific Decadal Oscillation, sea surface temperatures in the Indian Ocean, and predictors associated with the Indian monsoon. The project also examines state-of-the-art techniques based on climatology, remote sensing, environmental modelling and other forecast methods that can provide early warning of drought or flood conditions.

- **Developing the Vegetation Drought Response Index model for Canada (VegDRI-Canada)** – Principal Investigator. Funded by Agriculture and Agri-Food Canada – Agri-Environment Services Branch (AAFC-AESB) to develop an operational drought monitoring tool called the Vegetation Drought Response Index for Canada (VegDRI-Canada). The project has three phases: build the VegDRI-Canada model, produce experimental maps for testing and evaluation, and implement operational (or semi-operational) models that produce VegDRI-maps comparable to the U.S. VegDRI maps and products.

- **Southern Plains Drought Services Assessments** – Investigator. In this project the NDMC leads the consolidation and synthesis of appropriate information to develop a Southern Plains drought service assessment. The information includes: a climatological overview of the recent drought events (e.g., 2011 and 2012) including attribution information, a description of regional environmental and economic impacts, a summary of regional climate services response to the event, an evaluation of drought's impact on decision making in water sectors, and recommendations for addressing future events and implementing best practices based on lessons learned.

- **Development and Evaluation of the Quick Drought Response Index (QuickDRI): An Integrated Approach for Rapid Response Agricultural Drought Monitoring** – Investigator. This is a joint NASA/USDA/USGS/NOAA/NDMC/CALMIT collaborative project designed to map and monitor early-stage and rapid-onset vegetation "flash drought" stress, which is critical information needed to enhance the targeted application of the U.S. Drought Monitor (USDM) and associated key decision-making activities such as the multi-million dollar USDA Livestock Forage Disaster Program that use the USDM.

- **Adaptive Ecoregion-based Watershed Management for Sustainable Food Security in Ethiopia** - Co-Principal Investigator. This is a joint NDMC/UNL, International Development Enterprise (IDE), and two Ethiopian Universities project to assess or map groundwater resources for irrigation potential

at the selected sites in Ethiopia; and monitor irrigation water efficiency by closely evaluating crop and water management systems for selected irrigated farms.

- **A Holistic Approach to Agricultural Productivity, Food Security and Nutritional Improvement in Africa –** Co-Principal Investigator. This is a joint NDMC/UNL and two Ethiopian Universities project to develop comprehensive baseline information on major causes of food insecurity in two different drought prone areas; develop strategies to improve agricultural productivity and improved dietary practices and measure the efficacy of these strategies through demonstration projects and action research by UNL faculty and students and partner institutions; and develop study abroad and summer school programs that involves UNL faculty and students to participate in the action research and demonstration projects.
- **Development of the Vegetation Drought Response Index (VegDRI) for the United States** – Investigator. This is a joint NDMC-USGS research project to develop a VegDRI as new vegetation drought monitoring tool for the United States. The project includes applied research, operational development, various publication and outreach activities (e.g., papers, presentations, and surveys).
- **Development of the Vegetation Outlook (VegOut) Tool for Vegetation Condition Prediction** – Investigator. This research project investigates the use of satellite, climate, oceanic, and biophysical data for mapping and predicting the general vegetation conditions for the U.S. Great Plains.
- **Investigation of New NASA Instruments and Products for Enhancing U.S. Drought Monitoring Capabilities** – Co-principal Investigator. This is a joint NASA/NDMC project to assess the accuracy and utility of emerging products (soil moisture and terrestrial water storage estimates) from new satellite sensors (GRACE, QuikScat, and AMSR-E) for national- to continental-scale drought monitoring in North America and inclusion into the U.S. Drought Monitor map's development.
- **The Impact of Weather Extremes on Agricultural Production Methods: Dose Drought Increase the Adoption of Conservation Tillage Practices? –** Investigator. This is a joint NDMC and Department of Agricultural Economics research project to develop an economic model in estimating the impact of weather extremes (e.g., drought and flood) on the adoption rates of alternative tillage methods isolating the changes in economic factors such as commodity prices and related policies.

PUBLICATIONS

Journal Articles (Peer Reviewed)

Dinku, T., Funk, C., Peterson, P., Maidment, R., **Tadesse, T.,** Gadain, H., Ceccato, P. (in press). Validation of the CHIRPS Satellite Rainfall Estimates over Eastern of Africa. *To appear in Quarterly Journal of the Royal Meteorological Society*.

Jung, H. C., Getirana, A., Policelli, F., McNally, A., Arsenault, K. R., Kumar, S., **Tadesse, T.,** Peters-Lidard, C. D., 2017. Upper Blue Nile Basin Water Budget from a Multi-Model Perspective. Journal of Hydrology, 555, 535-546.

Tadesse, T., Champagne, C., Wardlow, B.D., Hadwen, T.A., Brown, J.F., Demisse, G.B., Bayissa, Y.A. and Davidson, A.M., 2017. Building the vegetation drought response index for Canada (VegDRI-Canada) to monitor agricultural drought: first results. GIScience & Remote Sensing, 54(2), 230-257.

Demisse, G., **Tadesse, T**., Bayissa, Y. A., Atnafu, S., Argaw, M., Nedaw, D. (in press). Vegetation Condition Prediction for Drought Monitoring in Pastoralist Areas: A Case Study in Ethiopia. *To appear in International Journal of Remote Sensing*.

Nam, W.-H., **Tadesse, T.,** Wardlow, B., Hayes, M. J., Svoboda, M., Hong, E., Pachepsky, Y., Jang, M.-W. (in press). Developing the Vegetation Drought Response Index for South Korea

(VegDRI-SKorea) to assess the vegetation condition during drought events. *To appear in International Journal of Remote Sensing*.

Kifle, B., Mengistu, G., Stoffberg, H., **Tadesse, T.,** 2017. Climate change and Population Growth Impacts on Surface water Supply and Demand of Addis Ababa, Ethiopia. *Climate Risk Management, 18, 21-33*.

Bayissa, Y. A., **Tadesse, T.,** Demisse, G., Shiferaw, A., 2017. Evaluation of Satellite-Based Rainfall Estimates and Application to Monitor Meteorological Drought for the Upper Blue Nile Basin, Ethiopia. Remote Sensing (9), 669. http://www.mdpi.com/2072-4292/9/7/669/html

Demisse, G., **Tadesse, T.,** Atnafu, S., Bayissa, Y. A., Shiferaw, A., Hill, S., 2017. Information Mining from Heterogeneous Data Sources: A Case Study on Drought Predictions. Information, 8(3), 79; doi:10.3390/info8030079.

Demisse, G., **Tadesse, T.,** Bayissa, Y., 2017. Data mining attribute selection approach for drought modelling: a case study for Greater Horn of Africa. International Journal of Data Mining & Knowledge Management Process (IJDKP), Vol.7, No.4, DOI: 10.5121/ijdkp.2017.7401.

Satti, S., Zaitchik, B., Badr, H., **Tadesse, T.** (2017). Enhancing Dynamical Seasonal Predictions through Objective Regionalization. Journal of Applied Meteorology and Climatology, 56(5), 1431–1442. http://journals.ametsoc.org/doi/abs/10.1175/JAMC-D-16-0192.1

Zambrano, F., Wardlow, B., **Tadesse, T.,** Lillo-Saavedra, M., Lagos, O. (2017). Evaluating satellite-derived long-term historical precipitation dataset for drought monitoring in Chile. Atmospheric Research, 186, 26-42. http://dx.doi.org/10.1016/j.atmosres.2016.11.006.

Tadesse, T., Haigh, T., Wall, N., Shiferaw, A. S., Zaitchik, B., Beyene, S., Berhan, G., Petr, J., 2016. Linking Seasonal Predictions into Decision-making and Disaster Management in the Greater Horn of Africa, *Bulletin of the American Meteorological Society*, ES89–ES92, doi: http://dx.doi.org/10.1175/BAMS-D-15-00269.1.

Zeng, L., B.D. Wardlow, R. Wang, J. Shan, **T. Tadesse**, M. J. Hayes, and D. Li, 2016. A hybrid approach for detecting corn and soybean phenology with time-series MODIS data, *Remote Sensing of Environment 181:237-250*. http://dx.doi.org/10.1016/j.rse.2016.03.039.

Otkin, J., M. C. Anderson, C. Hain, M. Svoboda, D. M. Johnson, R. Mueller, **T. Tadesse**, B. Wardlow, and J. Brown, 2016. Assessing the evolution of soil moisture and vegetation conditions during the 2012 United States flash drought, Agricultural and Forest Meteorology, 218–219:230–242, doi:10.1016/j.agrformet.2015.12.065.

Taye, M. T., **Tadesse, T**., Senay, G. B., Block, P., 2016. The Grand Ethiopian Renaissance Dam: a Source of Cooperation or Contention? *Journal of Water Resources Planning and Management*, 10.1061/(ASCE)WR.1943-5452.0000708 , 02516001.

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Book Chapters (peer reviewed)

Tadesse, T., Haigh, T., Wall, N., Hayes, M. J., Zaitchik, B., Wardlow, B., 2015. Lessons Learned in Monitoring and Predicting Hydroclimatic Extremes in the Greater Horn of Africa. In Evaluation of drought and drought impacts through interdisciplinary methods, Miroslav Trnka and Michael J. Hayes (Ed.), (pp. 36-41). Academy of Sciences of the Czech Republic.

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Willis, M., S. Beyene, B. Legesse, M. Mamo, T. Regassa, **T. Tadesse,** and Y. Woldehawariat, 2014. Chat Away: A Multipurpose Plant in the Ethiopian Highlands, 74th Annual Meeting, Society for Applied Anthropology, Albuquerque, New Mexico. March 18-22, 2014.

Beyene, S., M. Willis, B. Legesse, M. Mamo, T. Regassa, **T. Tadesse**, and Y. Woldehawariat, 2014. Ups and Downs in the Ethiopian Highlands: Farming in the Highest Altitudes Yields Poor Nutrition and Health Status, 74th Annual Meeting, Society for Applied Anthropology, Albuquerque, New Mexico. March 18-22, 2014.

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Mamo, M., T. Regassa, S. Beyene, R. Hames, B. Legesse, **T. Tadesse**, M. Willis, and Y. Woldehawariat, 2012. Farm Level Crop and Livestock Management In South Wollo and Eastern Hararghe. *Proceedings of the American Society of Agronomy (ASA) International Annual Meetings*, Cincinnati, Ohio, October 21-24.

Regassa, T., S. Beyene, M. Mamo, B. Legesse, T. Tadesse, Y. Woldehawariat, M. Willis, and R. Hames, 2012. Understanding the Aspiration of Small Scale Producers and Their Constraints is the Key to Food Security in Africa: Example from Ethiopia. Proceedings of the American Society of Agronomy (ASA) International Annual Meetings, Cincinnati, Ohio, October 21-24.

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Wardlow, B.D., **T. Tadesse**, J.F. Brown, and Y. Gu, 2008. The Vegetation Drought Response Index (VegDRI): A New Drought Monitoring Approach for Vegetation. *National Integrated Drought Information System (NIDIS) Knowledge Assessment Workshop – Contributions of Satellite Remote Sensing to Drought Monitoring*, pp. 1-13, Boulder, CO, February 6-7.

Ryu, J., Svoboda, M., Knutson, C., and **Tadesse, T.,** 2008. Climate Impacts on Hydrology in the Central United States: Application to Forecast Capability in the Republican River Basin. In *Proceedings of World Environmental and Water Resources Congress*, eds. R.W. Babcock, Jr., and R. Walton, American Society of Civil Engineers (ASCE), pp. 1-10, Honolulu, HI, May 12-16.

Tadesse, T. and B Wardlow, 2007. The Vegetation Outlook (VegOut): A New Tool for Providing Outlooks of General Vegetation Conditions Using Data Mining Techniques. *Seventh IEEE International Conference on Data Mining*, pp. 667-672, Omaha, NE, October 28-31.

Waltman, W.J., S. Goddard, S.E. Reichenbach, G. Gu, I.J. Cottingham, J.S. Peake, **T. Tadesse**, S.K. Harms, and J.S. Deogun, 2004. Digital Government: Reviving the Newhall Simulation Model to Understand the Patterns and Trends of Soil Climate Regimes and Drought Events. *The 2004 annual national conference on Digital government research 2004 (DG.O 2004)*, pp. 1-10, Seattle, WA, May 24-26.

Harms, S.K., J. S. Deogun, S. Goddard, and **T. Tadesse**, 2003. Building Knowledge Discovery into a Geo-spatial Decision Support System. *The 2003 ACM Symposium on Applied Computing (SAC)*, Melbourne, FL, March 9-12.

Harms, S.K., D. Li, and **T. Tadesse**, 2002. Efficient Rule Discovery in a Geo-spatial Decision Support System. *National Conference on Digital Government Research*, pp. 235-241, Los Angeles, CA, May 2002.

Harms, S.K., D. Li, J. Deogun, J. Saquer, and **T. Tadesse**, 2001. Discovering Representative Episodal Association Rules from Event Sequences Using Frequent Closed Episode Sets and Event Constraints. *First IEEE International Conference on Data Mining (ICDM'01)*, pp. 603-606, San Jose, CA, November 29-December 2.

Invited Presentations

07/17/2017 NDMC Research on Developing Drought Monitoring Tools, JPL and UNL scientists meeting, NASA, Pasadena, California.

04/27/2017 The Need for a Paradigm Shift from Crisis to Drought Risk Management to address Water and Food Insecurity in Africa: Ethiopia as an Example, The 2017 Water for Food Global Conference, WFI, Lincoln, Nebraska.

04/27/2017 Vegetation Outlook for the Greater Horn of Africa (VegOut-GHA): A Seasonal Prediction Model, Workshop on Climate Information for Climate Resilient Agriculture: Enhancing Agrometeorological Advisory Services to build climate resilience smallholder farmers in Ethiopia, Addis Ababa, Ethiopia.

04/27/2017 Precipitation Extremes in Dynamically Downscaled Climate Scenarios over the Greater Horn of Africa, The 2017 Water for Food Global Conference, WFI, Lincoln, Nebraska.

12/07/2016 Drought and Remote Sensing Tools, Winter Season Outlook and Impacts Forum for Lower Valley Agriculture, Weslaco, TX.

10/27/2016 International Drought Initiatives, 2016. MENA Regional Drought Management System Workshop: Morocco, Rabat, Morocco.

10/24/2016 The Use of Drought Maps for Drought Monitoring and Early Warning, Development of the MENA Regional Drought Management System: Stakeholder Engagement Forum, Amman, Jordan.

08/15/2016 Strategic framework on drought risk management and resilience in Africa, African Drought Conference, Windhoek, Namibia.

08/29/2016 Delivering Drought Information Services, National Drought Mitigation Center, University of Nebraska-Lincoln, on Applications of Wireless Sensor Networks for Weather and Water Quality Monitoring in Southern Africa and the Launch of the MoU between CUT and the University of Nebraska-Lincoln, Bloemfontein, South Africa.

04/27/2016 Quick Drought Response Index (QuickDRI) A Composite Index for Monitoring Rapid-Onset Agricultural Drought, NASA Applied Sciences Program: Water Resources Meeting, Tuscaloosa, AL.

03/01/2016 Drought Monitoring and Early Warning Information Systems: Local to Global, OECS RRAC 2016 Caribbean Drought Training Writeshop, Saint Kitts, Caribbean Island.

06/22/2016 Building MODIS-based VegDRI-Canada Models, North American Drought Monitor Forum, Fort Worth, Texas.

01/27/2016 International Association of Emergency Managers (IAEM) Webinar: "Drought Mitigation and Emergency Management." Discussion of long-onset disaster mitigation with a focus on drought hazards. This webinar was offered jointly by the IAEM-USA Food & Agriculture Caucus and IAEM-USA Climate, Water & Weather Caucus.

11/13/2015 Seasonal predictions of vegetation in the Greater Horn of Africa: Experimental Vegetation Outlook (VegOut-GHA) Model, Workshop on Food Security Implications of a Changing Arctic, UNL, Lincoln, NE.

06/22/2015 Climate Data and Modeling VegDRI, VegDRI Canada Status and Plans Meeting, Sioux Falls, SD.

06/19/2015 General Progress Report on NASA GHA Project (Coordinator/Organizer), NASA GHA project pre-workshop webinar, UNL, Webinar.

06/10/2015 Lessons Learned to Monitor and Predict Hydro-climatic Extremes in the Greater Horn of Africa, InterDrought project summer school - Drought addressing multifaceted extreme by multidisciplinary approach, CzechGlobe, Mikulov, Czech Republic.

05/14/2015 Seasonal Prediction of Hydro-Climatic Extremes in the Greater Horn of Africa (GHA), MENA drought monitoring - developing a Composite Drought Index, Phase 1 Technical Workshop, Lincoln, NE, International, Invited.

04/15/2015 Quick Drought Response Index Tool (QuickDRI): A Composite Index for Monitoring Rapid-Onset Agricultural Drought, The 2015 U.S. Drought Monitor Forum, Reno, NV.

03/10/2015 A step forward towards Seasonal Prediction of Hydro-Climatic Extremes in the Greater Horn of Africa (GHA), Drought Monitoring, Water Management and Food Security in the MENA region Meeting, Lincoln, NE, International, Invited (March 10, 2015).

02/28/2014 Invited as a keynote speaker at the Remote Sensing Tools in Drought Monitoring workshop by CzechGlobe in Brno, Czech Republic. The focus of my presentation was on new remote sensing tools, including VegDRI and VegOut. More than 20 members of the Inter-Drought team (composed of senior researchers, post-docs, and other experts doing research on drought monitoring, impact analysis, and forecasting) participated.

06/18/2014 Invited to the 2014 North American Drought Monitor Workshop. Presentation title: *The Canadian Vegetation Drought Response Index Pilot Study.*

10/02/2013 Presented "From Lewellen to Delhi: Drought Risk Management for the World" at the SNR Research Series in Hardin Hall Auditorium, Lincoln, Nebraska, as part of an invited NDMC team presentation.

10/28/2013 Made a presentation on climate- and satellite-based vegetation indices and drought monitoring tools at the International Workshop on East African Regional Climate and Impact Modelling, sponsored by the International Centre for Theoretical Physics (ICTP) in collaboration with Addis Ababa University (AAU) in Ethiopia from October 28 to November 8, 2013. The workshop was designed to provide lectures and laboratory classes on the use and uncertainty of the main observational datasets available from remote sensing to drive impacts models; climate variability and climate change on various time scales; the theory and use of regional climate models for down-scaling seasonal forecasts from major climate prediction centers and long-term climate projections from CMIP5 datasets; the use and uncertainty of impacts data for monitoring/model validation; and impact modeling with a particular focus on health (ICTP's VECTRI).

05/3/2012 Invited to give a presentation at a technical workshop organized by the European Commission's Joint Research Centre (JRC) and the International Research Institute for Climate and Society (IRI, Earth Institute, Columbia University), Ispra, Italy, May 2-3, 2012. The title was "Integrating Drought- and Satellite-based Indices in Support of Risk Management and Insurance in East Africa." The presentation is published in "The challenges of index-based insurance for food security in developing countries."

02/08/2010 Presented "Sharpening the Focus on Drought: An NDMC Overview" to a group from Ethiopia, including 12 high-ranking government officials; the state ministers of Water Resources, Agriculture and Urban Development, and Federal Affairs of Ethiopia; and 9 additional officials and experts, February 8. Invited by the USDA Forest Service's International Programs Office.

02/08/2010 Presented "Brief Overview of the U.S. Drought Monitor: A Composite Indicator Approach" to a group from Ethiopia including 12 high-ranking government officials; the state ministers of Water Resources, Agriculture and Urban Development, and Federal Affairs of Ethiopia; and 9 additional officials and experts, February 8. Invited by the USDA Forest Service's International Programs Office.

12/03/2010 Made an invited presentation, "Remote Sensing Application to Drought and Food Security," at the Technology and Food Security Round Table Meeting at the Ethiopian Embassy, Washington D.C.

05/23/2010 Presented "Remote Sensing and Drought Monitoring: An Overview, Options for Middle-east, and Future Directions" to the Borlaug Workshop at ICARDA, Aleppo, Syria. Invited Presentation at the workshop.

04/02/2006 Presented "Information Circulation Systems (ICS) in Drought Monitoring and Impact Assessment in the United States: Past, Present, and Future Prospects," at the International Seminar on Role of Information Circulation System in Scientific and Practical Approaches to Combat Desertification, Windhoek – Ondangwa, Namibia. [AIDCCD – Active exchange of experience on indicators and development of perspectives in the context of UNCCD.]

07/3-14/2006 Presented "Drought Indices, Drought Concepts, Characteristics, and Definitions" to the Mediterranean Training Programme (MTP) for the Harmonization of Early Warning Systems and Operational Instruments for Monitoring Climate Change and Desertification, Second MTP Training Course on Climate Change and Extreme Events, Florence, Italy.

05/10/2005 Presented seminar, "Expanding the Role of Remote Sensing in Drought Monitoring," at USGS Earth Resources Observation and Science (EROS), Sioux Falls, South Dakota.

Professional Meeting Presentations and Conference Proceedings (non-peer reviewed)

Tadesse, T., Bayissa, Y. A., Demisse, G., and Wardlow, B. Predicting the Vegetation Condition of the 2015/16 Drought across the Great Horn of Africa (GHA): Model Evaluation and Preliminary Result, The 2017 AGU Fall Meeting, AGU, New Orleans, Louisiana (December 14, 2017).

Tadesse, T., Demisse, G., Bayissa, Y. A., and Wardlow, B. Vegetation Outlook for the Greater Horn of Africa (VegOut-GHA): A Seasonal Prediction Model, NASA IDS: Seasonal Prediction of Hydro-Climatic Extremes in the Greater Horn of Africa (GHA)- Third participatory research workshop, NASA/UNL/NMA/AAU, Addis Ababa, Ethiopia. (October 25, 2017).

Tadesse, T. Prediction of Hydro-Climatic Extremes in the Greater Horn of Africa (GHA): NASA GHA project overview and brief progress report, NASA IDS: Seasonal Prediction of Hydro-Climatic Extremes in the Greater Horn of Africa (GHA)- Third participatory research workshop, NASA/UNL/NMA/AAU, Addis Ababa, Ethiopia. (October 24, 2017).

Tadesse, T. The NASA-GHA Project: Purpose of the Meeting and introductions", NASA IDS: Seasonal Prediction of Hydro-Climatic Extremes in the Greater Horn of Africa (GHA)" - Third participatory research workshop, NASA/UNL/NMA/AAU, Addis Ababa, Ethiopia. (October 24, 2017).

Sanchez, N., González-Zamora, Á, Martínez-Fernández, J., Piles, M., Pablos, M., Wardlow, B., **Tadesse, T.,** and Svoboda, M. Preliminary assessment of an integrated SMOS and MODIS application for global agricultural drought monitoring, IGARSS 2017 - 2017 IEEE International Geoscience and Remote Sensing Symposium, Fort Worth, Texas, USA. (July 24, 2017).

Wardlow, B. and **Tadesse, T.** The Quick Drought Response Index (QuickDRI), NASA Water Resources Science Team Meeting, NASA, Pasadena, California. (July 18, 2017).

Tadesse, T. and Wardlow, B. NDMC Research on Developing Drought Monitoring Tools, JPL and UNL scientists meeting, NASA, Pasadena, California. (July 17, 2017).

Tadesse, T. Demisse, G. (Author Only), Bayissa, Y. A., and Wardlow, B. Vegetation Outlook for the Greater Horn of Africa (VegOut-GHA): A Seasonal Prediction Model, Climate Information for Climate

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