

Timothy J. Mayer

Research Scientist III, S2 | University of Alabama in Huntsville

Education

Master's of Science in Environmental Science, May 2017 — University of Illinois, Springfield

Summa Cum Laude Graduate, Student Marshal for Master's Degree

Graduate Certificate in Geographic Information Systems (GIS), May 2016 — University of Illinois, Springfield

Bachelor's of Science in Biology with an Ecology Specialization, June 2011 — Central Washington University

Cum Laude Graduate, Dean's List, and Honor Roll

University Service

University of Alabama in Huntsville

2021 - 2023: Served as a Graduate Committee Member for McKenna Price-Patak

2020 - 2021: Served as a Graduate Committee Member for Caily Schwartz

2020 - 2021: Served as a Graduate Committee Member for Helen Parache

Memberships / Affiliations

American Geophysical Union (AGU) member

Omicron Delta Kappa national leadership and academic honor society member

Publications

Peer-Reviewed Journals

Yu, Z., Di, L., Zhang, C., Guo, L., Shrestha, S., Qamar, F., **Mayer T.**, *IEEE* 2023.

RiceMapEngine: A Google Earth Engine-based Web Application for Fast Paddy Rice Mapping *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing* (2023), pp. 1–12. DOI: 10.1109/JSTARS.2023.3290677

Crowley, M.A., Stuhlmacher, M., Trochim, E.D., Van Den Hoek, J., Pasquarella, V.J., Szeto, S.H., Howarth, J.T., Platt, R., Roy, S., Tellman, E., Chakraborty, T.C., Ignatius, A., Cherrington, E., Markert, K., Wu, Q., Madhusudan, M.D., **Mayer, T.**, Cardille, J.A., Erickson, T., Moore, R., Clinton, N.E., and Saah, D.S. Pillars of cloud-based Earth observation science education. *AGU Advances* DOI: 10.1029/2023AV000894

- Islam, M.D. Di, L. Qamer, F.M. Shrestha, S. Guo, L. Lin, L. **Mayer, T.J.** Phalke, A.R. Rapid Rice Yield Estimation Using Integrated Remote Sensing and Meteorological Data and Machine Learning. *Remote Sens.* 2023, 15, 2374. <https://doi.org/10.3390/rs15092374>
- Mayer, T.** Bhandari, B. Gomez Martinez, F. Maganini, M. Walker, K. Jiménez, S. Kruskopf, Meryl., Phalke, Ap., Wangchen, T., Phuntsho, L., Dorji, N., Tshering, C., and Dorji, W., *Frontiers in Environmental Science* 2023, Employing the Agricultural Classification and Estimation Service (ACES) for Mapping Smallholder Rice Farms in Bhutan. <https://doi.org/10.3389/fenvs.2023.1137835>
- Schwartz, C., Ellenburg, W.L., Mishra, V., **Mayer, T.**, Griffin, R., Qamer, F., Matin, M. and Tadesse, T., 2022. A statistical evaluation of Earth-observation-based composite drought indices for a localized assessment of agricultural drought in Pakistan. *International Journal of Applied Earth Observation and Geoinformation*, 106, p.102646. <https://doi.org/10.1016/j.jag.2021.102646>
- Mayer, T.**, Poortinga, A., Bhandari, B., Nicolau, A.P., Markert, K., Thwal, N.S., Markert, A., Haag, A., Kilbride, J., Chishtie, F. and Wadhwa, A., 2021. Deep learning approach for Sentinel-1 surface water mapping leveraging Google Earth Engine. *ISPRS Open Journal of Photogrammetry and Remote Sensing*, 2, p.100005. <https://doi.org/10.1016/j.ophoto.2021.100005>
- Parache, H.B., **Mayer, T.**, Herndon, K.E., Flores-Anderson, A.I., Lei, Y., Nguyen, Q., Kunlamai, T. and Griffin, R., 2021. Estimating Forest Stand Height in Savannakhet, Lao PDR Using InSAR and Backscatter Methods with L-Band SAR Data. *Remote Sensing*, 13(22), p.4516. <https://doi.org/10.3390/rs13224516>
- Parekh, J., Poortinga, A., Bhandari, B., **Mayer, T.**, Saah, D., Chishtie, F., Automatic Detection of Impervious Surfaces from Remotely Sensed Data Using Deep Learning- *Remote Sensing*, 2021; 13(16):3166. <https://doi.org/10.3390/rs13163166>
- Poortinga, A., Thwal, N.S., Khanal, N., **Mayer, T.**, Bhandari, B., Markert, K., Nicolau, A.P., Dilger, J., Tenneson, K., Clinton, N. and Saah, D., 2021. Mapping sugarcane in Thailand using transfer learning, a lightweight convolutional Neural Network, NICFI high resolution satellite imagery and Google Earth Engine. *ISPRS Open Journal of Photogrammetry and Remote Sensing*, p.100003. <https://doi.org/10.1016/j.ophoto.2021.100003>
- Markert, K.N., Markert, A.M., **Mayer, T.**, Nauman, C., Haag, A., Poortinga, A., Bhandari, B., Thwal, N.S., Kunlamai, T., Chishtie, F. and Kwant, M., 2020. Comparing Sentinel-1 Surface Water Mapping Algorithms and Radiometric Terrain Correction Processing in Southeast Asia Utilizing Google Earth Engine. *Remote Sensing*, 12(15), p.2469. <https://doi.org/10.3390/rs12152469>
- O'Shea, K., LaRoe, J., Vorster, A., Young, N., Evangelista, P., **Mayer, T.**, Carver, D., Simonson, E., Martin, V., Radomski, P. and Knopik, J., 2020. Improved Remote Sensing Methods to Detect Northern Wild Rice (*Zizania palustris* L.). *Remote Sensing*, 12(18), p.3023. <https://doi.org/10.3390/rs12183023>

Woodward, B.D., Evangelista, P.H., Young, N.E., Vorster, A.G., West, A.M., Carroll, S.L., Girma, R.K., Hatcher, E.Z., Anderson, R., Vahsen, M.L., Vashisht, A., **Mayer T.**, Carver, D., and Jarnevich C., 2018. CO-RIP: A riparian vegetation and corridor extent dataset for Colorado River basin streams and rivers. *ISPRS International Journal of Geo-Information*, 7(10), p.397. <https://doi.org/10.3390/ijgi7100397>

Vorster, A.G., Woodward, B.D., West, A.M., Young, N.E., Sturtevant, R.G., **Mayer, T.J.**, Girma, R.K. and Evangelista, P.H., 2018. Tamarisk and Russian olive occurrence and absence dataset collected in select tributaries of the Colorado River for 2017. *Data*, 3(4), p.42. <https://doi.org/10.3390/data3040042>

Books

Uddin, K., Matin, M., Khanal, N., Maharjan, S., Bajracharya, B., Tenneson, K., Poortinga, A., Quyen, N., Aryal, R., Saah, D., Ellenburg, W.L., Potapov, P., Flore, S., Chishtie, F., Aung K., **Mayer, T.**, Pradhan, S., Markert, A., (2021) Regional Land Cover Monitoring System for Hindu Kush Himalaya. In: Bajracharya B., Thapa R.B., Matin M.A. (eds) *Earth Observation Science and Applications for Risk Reduction and Enhanced Resilience in Hindu Kush Himalaya Region*. Springer, Cham. https://doi.org/10.1007/978-3-030-73569-2_6

Invited Presentations

Mayer, T., Bhandari, B., Thwal, N. S., Becerra Zambrano, M., Gelaye, K., Abramowitz, J., Gurung, I., (2023) Google's Geo For Good: SERVIR and NASA IMPACT - Empowering Decision-Making with Google Technology and Artificial Intelligence to Address Environmental Challenges Presentation October 10th 2022

Mayer, T., (2023) University of Texas El Paso Earth, Environmental and Resource Sciences Department: NASA SERVIR: Connecting Space to Village through Capacity Building and Co-Development in Bhutan Presentation February 13th 2023

Mayer, T., Bhandari, B., Cherrington, E., (2022) Google's Geo For Good: Capacity building with SERVIR's services on HYDrologic Remote Sensing Analysis for Floods (HYDRAFloods) Presentation [October 5th 2022](#)

Mayer, T., Thwal, N. (2021) Google's Geo For Good Earth Engine Deep Learning: SERVIR TensorFlow Working Group Forest and Nature Session Presentation [November 17th, 2021](#)

Mayer, T. (2021) Capacity Building and Knowledge Sharing Through NASA SERVIR's TensorFlow Working Group, University of Twente Big GeoData Presentation Series [June 8th 2021](#)

Mayer, T. (2020) Machine Learning and the Satellite Revolution: How Democratizing AI for Disaster Response Can Build Local to Global Climate Resilience. Discussion with NASA SERVIR, Radiant Earth Foundation, and Cloud to Street [December 2nd 2020](#)

Conference (Selected)

- Mayer, T.,** Bhandari, B., GomezMartinez, F., Kruskopf, M., Maganini, M., Jimenez, S., Walker, K., Phalke, A., (2022) Mapping Small-holder Rice Farms in Bhutan using Earth Observation Datasets and Machine Learning Model, Poster, Dec 14, American Geophysical Union (AGU) Chicago II
- Mayer, T.,** Clinton, N., Thomas, L, Gurung, I., (2022) Addressing Environmental Challenges and Sustainable Development Through Earth Science Applications Utilizing Machine Learning IV Oral I Session Primary Convener and Chair, Dec 12, American Geophysical Union (AGU) Chicago II
- Mayer, T.,** Weigel, A., Bajracharya, B., Towashiraporn, P., (2021) Leveraging Earth Observations for Mitigating Critical Environmental Challenges in South and Southeast Asia I Oral. Primary Convener NASA SERVIR, Dec 17, American Geophysical Union (AGU) New Orleans LA
- Mayer, T.,** Markert, A., Ellenburg, W., Baldwin, H., (2020) SERVIR Asia Hubs Overview & Highlights, Aug 6, Applied Science Program Week, Washington DC NASA Headquarters
- Mayer, T.,** Markert, A., Bajracharya, B., Towashiraporn, P., (2020) Implementing Earth Observations in South and Southeast Asia To Address Environmental Challenges eLightning Primary Convener NASA SERVIR, Dec 7, American Geophysical Union (AGU) San Francisco CA.
- Mayer, T.,** Baldwin, H., Herndon, K., Flores, A., Kunlamai, T., Quyen, N H., Towashiraporn, P., Wilson, S., (2020) Capacity Building Engagement for Estimating Forest Stand Height Utilizing the SAR Handbook. NASA SERVIR, Dec 7, American Geophysical Union (AGU) San Francisco CA.
- Mayer, T.,** Delgado, F., Maskey, M., (2019) Applications of Free and Open-Source Technologies for Advancing Earth and Space Science eLightning Primary Convener NASA SERVIR, Dec 9, American Geophysical Union (AGU) San Francisco CA.
- Mayer, T.,** Markert, A., Chishtie, F., Markert, K., Saah, D., Anderson, E., Towashiraporn P., (2019) Perspectives of a Geospatial Tool Service Design and Implementation into Regional Stakeholder Groups. NASA SERVIR, Dec 9, American Geophysical Union (AGU) San Francisco CA.
- Mayer, T.,** Markets A., Chishtie, F., (2019) HYDRAFloods Near Real-Time Flood End-user technical consultation Myanmar's Department of Disaster Management (DDM), the Department of Meteorology and Hydrology (DHM), June 1, Nay Pay Taw Myanmar

Mayer, T., Carver, D., (2018) NASA DEVELOP Program Water Resource Application Area Profile. NASA Applied Science Program Water Resources Science Team Meeting, June 27, Sustainability, Energy, and Environment Complex (SEEC), Boulder CO.

Mayer, T., (2017). Agent-Based Modeling of Movement of Franklin's Ground Squirrels (*Poliocitellus franklinii*) in a Fragmented Landscape. Illinois State Academy of Science 109th Annual Meeting, Harper, College Palatine, Illinois

Mayer, T., (2017). Habitat Suitability Modeling of Franklin's Ground Squirrels (*Poliocitellus franklinii*) in a Fragmented Landscape. Illinois Chapter of The Wildlife Society Annual Meeting, Western Illinois University, Macomb, Illinois

Mayer, T., (2017). Habitat Suitability Modeling of Franklin's Ground Squirrels (*Poliocitellus franklinii*) in a Fragmented Landscape. Student Technology, Arts & Research Symposium Annual Meeting, University of Illinois, Springfield, Illinois

Technical Reports (Selected)

Qamer, F., Shrestha, S., Shakya, K., Bajracharya, B., Nandan Shah, S., Regmi, R., K., Paudel, S., Shrestha, P., Paudel, S., Pokhrel, P., Di, L., Yu, Z., Cvetojevic, S., Guo, L., **Mayer, T.,** Kruskopf, M., Phalke, A., (2023) [Operational in-season rice area estimation through Earth observation data in Nepal](#) International Centre for Integrated Mountain Development's (ICIMOD), Lalitpur Nepal.

I. Lauer, C. Jurkowski, C. Macek, F. Zurek, D. Coats, **T.J. Mayer** (2018) Evaluating Evapotranspiration and Water Budget Components in Semi-arid Sagebrush Steppe NASA DEVELOP Technical Report. GIS TReC, Idaho State University, Pocatello, ID.

S. Leiker, K. Davis, K. Dennis, L. McGinnis, C. Torrens, **T.J. Mayer** (2018) Utilizing NASA Earth Observations to Quantify Forest Mortality and Burn Severity to Inform Management on Ranches and Open Lands. NASA DEVELOP Technical Report. Fort Collins Center, Fort Collins, CO.

E. Simonson, A. Kunz, V. Martin, N. Pepper **T.J. Mayer** (2018) Employing NASA Earth Observations to Model Distributions of Wild Crop Relatives, in support of USDA ARS Genetic Resource Conservation Efforts. NASA DEVELOP Technical Report. Fort Collins Center, Fort Collins, CO..

J. LaRoe, S. Rasmussen, G. Shelor, M. Schee, **T.J. Mayer** (2018) Employing NASA Earth Observations to Model Availability of Ephemeral Water Sources and Vegetation Change in Support of a USGS Feasibility Assessment and Management Strategy of Bison. NASA DEVELOP Technical Report. Fort Collins Center, Fort Collins, CO.

K. Dennis, A. Call, C.G. Olds, T.J. Mayer (2018) Utilizing Landsat to Detect Ephemeral Water Sources in Support of a USGS Feasibility Assessment and Management Strategy of Equids. NASA DEVELOP Technical Report. Fort Collins Center, Fort Collins, CO.

- K. Walker, D.P. Carver, J. LaRoe, C.N. Whittemore, **T.J. Mayer** (2018) Employing NASA Earth Observations to Model Current and Historic Distribution of Crop Wild Relatives, in Support of USDA ARS Genetic Resource Conservation Efforts. NASA DEVELOP Technical Report. Fort Collins Center, Fort Collins, CO.
- E. Hatcher, S.L. Carroll, A.M. Martinez, **T.J. Mayer**, .B.D. Woodward (2017) Utilizing NASA Earth Observations to Model Potential Suitable Habitat of Invasive Species Threatening Alaskan Wetlands. NASA DEVELOP Technical Report. Fort Collins Center, Fort Collins, CO.
- J. Sullivan, J. LaRoe, **T.J. Mayer**, J. Mehren, C.G. Olds (2017) Utilizing NASA Earth Observations to Forecast Forest Risk to Bark Beetle Attack in Support of a Forest Bioenergy Feasibility Assessment. NASA DEVELOP Technical Report. Fort Collins Center, Fort Collins, CO.