Qing Chang

O'Neill School of Public and Environmental Affairs
Indiana University-Bloomington, IN, 47405
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PROFESSIONAL DEGREES

Summer 2024 **Indiana University, Bloomington**
Ph.D. in Environmental Science
Thesis: "Incorporating land-atmospheric feedback into ecological drought monitoring and prediction".
Supervisor: Dr. Kimberly Novick

2017 **University of Chinese Academy of Sciences**
Ph.D. in Geography Information System (GIS)
Thesis: "Observing the spatial-temporal changes of phenology from space".

2014 **University of Chinese Academy of Sciences**
MS in Geography Information System (GIS)

2011 **Zhengzhou University**
BSc in Geography Information System (GIS)

RESEARCH EXPERIENCE

2022-2024 NASA Earth and Space Science and Technology (FINESST)
Research Fellow, Future Investigator

2021-2024 Indiana University
Graduate Research Assistant, Environmental Science

2017-2020 The University of Oklahoma
Graduate Research Assistant, Plant Biology Science

2014-2017 University of Chinese Academy of Sciences
Graduate Research Assistant, GIS

FOUNDED PROPOSAL & GRANTS

2021 NASA Future Investigators in NASA Earth and Space Science and Technology (FINESST) (2021 - 2024). ***Incorporating land-atmosphere feedback into agricultural drought monitoring and forecasting***. $135,000

2019 Linda Wallace Research Award for A Distinguished Publication. $500

TEACHING EXPERIENCE

2023 Applied Math for Environmental Science, Recitation Section
Instructor

2023 Applied Math for Environmental Science
Teaching Assistant

2020 Environmental Remote Sensing
Teaching Assistant
2019 Environmental Remote Sensing
Teaching Assistant

AWARDS

2021 NASA Future Investigators in NASA Earth and Space Science and Technology (FINESST) Fellowship

2019 Linda Wallace Research Award

2017 Excellent Graduate of the Chinese Academy of Sciences
2011 Excellent Graduate of the Zhengzhou University

PEER-REVIEWED PUBLICATIONS

Google Scholar: https://scholar.google.com/citations?user=Yg8Zni8AAAAJ&hl=en

2023 **Chang, Q.,** Ficklin, D. L., Jiao, W., Denham, S. O., Wood, J. D., Brunsell, N. A., ... & Novick, K. A. (2023). Earlier Ecological Drought Detection by Involving the Interaction of Phenology and Eco‐Physiological Function. Earth's Future, 11(3), e2022EF002667.

2023 Denham, S. O., Barnes, M. L., **Chang, Q.,** Korolev, M., Wood, J. D., Oishi, A. C., ... & Novick, K. A. (2023). The rate of canopy development modulates the link between the timing of spring leaf emergence and summer moisture. Journal of Geophysical Research: Biogeosciences, e2022JG007217.

2022 Jiao, W., … **Chang, Q.,** & Novick, K. A. (2022). Comprehensive quantification of the responses of ecosystem production and respiration to drought time scale, intensity and timing in humid environments: A FLUXNET synthesis. Journal of Geophysical Research: Biogeosciences, 127(5), e2021JG006431.

2022 Zhang, X., Xiao, X., Qiu, S., Xu, X., Wang, X., **Chang, Q.,** ... & Li, B. (2022). Quantifying latitudinal variation in land surface phenology of Spartina alterniflora saltmarshes across coastal wetlands in China by Landsat 7/8 and Sentinel-2 images. *Remote Sensing of Environment*, *269*, 112810.

2021 **Chang, Q.,** Xiao, X., Doughty, R., Wu, X., Jiao, W., & Qin, Y. (2021). Assessing variability of optimum air temperature for photosynthesis across site-years, sites and biomes and their effects on photosynthesis estimation. *Agricultural and Forest Meteorology*, 298, 108277.

2021 Jiao, W., Wang, L., Smith, W. K., **Chang, Q.,** Wang, H., & D'Odorico, P. (2021). Observed increasing water constraint on vegetation growth over the last three decades. Nature Communications, 12(1), 1-9.

2020 **Chang, Q.,** Xiao, X., Wu, X., Doughty, R., Jiao, W., Bajgain, R., ... & Wang, J. (2020). Estimating site-specific optimum air temperature and assessing its effect on the

photosynthesis of grasslands in mid-to high latitudes. *Environmental Research Letters*, 15(3), 034064.

2020 Guo, L., Gao, J., Ma, S., **Chang, Q.,** Zhang, L., Wang, S., ... & Xiao, X. (2020). Impact of spring phenology variation on GPP and its lag feedback for winter wheat over the North China Plain. *Science of The Total Environment*, 138342.

2019 **Chang, Q.**, Xiao, X., Jiao, W., Wu, X., Doughty, R., Wang, J., ... & Qin, Y. (2019). Assessing consistency of spring phenology of snow-covered forests as estimated by vegetation indices, gross primary production, and solar-induced chlorophyll fluorescence. *Agricultural and Forest Meteorology*, 275, 305-316.

2019 Jiao, W., **Chang. Q.**, L. Wang, (2019)**.** The Sensitivity of Satellite Solar-Induced Chlorophyll Fluorescence to Meteorological Drought**.** *Earth's Future* 7, 558-573.

2019 Jiao, W., Tian, C., **Chang, Q.,** Novick, K.A., Wang, L. (2019). A new multi-sensor integrated index for drought monitoring. *Agricultural and Forest Meteorology*, 268: 74-85.

2019 Jiao, W., L. Wang, K. A. Novick, **Chang. Q.**, (2019)**.** A new station-enabled multi-sensor integrated index for drought monitoring. *Journal of Hydrology* 574, 169-180.

2019 Wang, J., X. Xiao, R. Bajgain, P. Starks, J. Steiner, R. B. Doughty, and **Chang. Q.** (2019), Estimating leaf area index and aboveground biomass of grazing pastures using Sentinel-1, Sentinel-2 and Landsat images, *ISPRS Journal of Photogrammetry and Remote Sensing*, 154, 189-201.

2018 **Chang, Q.,** Zhang, J., Jiao, W., & Yao, F. (2018). A comparative analysis of the NDVIg and NDVI3g in monitoring vegetation phenology changes in the Northern Hemisphere. *Geocarto International*, 33(1), 1-20.

2016 **Chang, Q.,** Zhang, J., Jiao, W., Yao, F., & Wang, S. (2016). Spatiotemporal dynamics of the climatic impacts on greenup date in the Tibetan Plateau. *Environmental Earth Sciences*, 75(20), 1343.

2016 Jiao**,** W., Zhang, L., **Chang, Q.,** Fu, D., Cen, Y., & Tong, Q. (2016). Evaluating an enhanced vegetation condition index (VCI) based on VIUPD for drought monitoring in the continental United States. *Remote Sensing*, 8(3), 224.

2016 Igbawua, T., Zhang, J., **Chang, Q.,** & Yao, F. (2016). Vegetation dynamics in relation with climate over Nigeria from 1982 to 2011. *Environmental Earth Sciences*, 75

PRESENTATIONS

Oral Presentation

2023 **Chang, Q.**, and Novick, K. A., 2023 March. Novel approaches for leveraging FLUXNET tower data and remote sensing information to understand long-term ecological drought trends. AGU Global Environmental Change Early Career Webinar Series.

2022 **Chang, Q.,** Ji ao, W., & Novick, K. A. 2022 December. Are plants experiencing more water limitation under greening and increasing productivity? AGU Fall Meeting, Chicago, USA.

2021 **Chang, Q.**, and Novick, K. A., 2021 January. Can Popular Drought Indices Capture Drought Effects on Plant Function? 101st AMS Annual Meeting & 35th Conference on Hydrology, USA.

2021 **Chang, Q.**, Novick, K. A., Ficklin, D. L., Jiao, W., 2021 December. A phenology-based improvement for early agricultural drought detection. AGU Fall Meeting, New Orleans, USA.

Poster Presentation

2021 **Chang, Q.**, Novick, K. A., Jiao, W.. 2022 December. Are plants experiencing more water limitation under greening and increasing productivity (B45G-1794)? AGU Fall Meeting, Chicago, USA.

2021 Jiao, W., Wang, L., Smith, W., **Chang, Q.,** Wang, H., & D'Odorico, P. (2021, December). Satellite observations revealed increasing water constraint on vegetation growth over the last 30 years. American Geophysical Union 2021 Fall Meeting, (H23B-06).

2019 **Chang,Q.,** Xiao,X., Jiao,W., Wu,X., Doughty,R., Wang,J., Zou,Z., Qin,Y., A comparison of spring phenology estimated by multi datasets for snow-covered forests (B33k-2631). American Geophysical Union 2019 Fall Meeting, December 8-13, 2019, San Francisco, California, USA.

2019 Xiao, X., Doughty, R., Wu, X., Zhang, Y., **Chang, Q.,** Qin, Y., ... & Bajgain, R. (2019, December). Spatial-Temporal Dynamics of Global Terrestrial Gross Primary Production during 2000-2018: An Update on Vegetation Photosynthesis Model and it Simulations with Terra/MODIS images (GC11K-1116). American Geophysical Union 2019 Fall Meeting, December 8-13, 2019, San Francisco, California, USA.

2019 Wu, X., Xiao, X., Zhang, Y., He, W., Wang, J., **Chang, Q.,** ... & Qin, Y. (2019, December). Improving estimation of sub-daily vegetation GPP by optimizing VPM parameters across FLUXNET sites (B41L-2459). American Geophysical Union 2019 Fall Meeting, December 8-13, 2019, San Francisco, California, USA.

2019 Jiao, W., Wang, L., Novick, K. A., & **Chang, Q.** (2019, December). A new remote sensing framework for drought monitoring (H44A-05). American Geophysical Union 2019 Fall Meeting, December 8-13, 2019, San Francisco, California, USA.

2019 **Chang, Q.,** Xiao, X., Jiao, W., Validation for vegetation Green-up Date Extracted from GIMMS NDVI and NDVI3g Using variety of Methods (B11E-1706). B11E: Multiscale Measurements and Modeling of Greenhouse Gas (CO2, CH4, and N2O) Emissions from Livestock, Grasslands, and Croplands Posters. The American Geophysical Union (AGU) 2017 Fall Meeting, New Orleans, 12/11-12/15/2017.

SERVICE

Journal Referee

Agricultural and Forest Meteorology;

Earth's Future;

Environmental Research Letters;

Environmental Science and Pollution Research;

Geocarto International;

Geomatics Natural Hazards and Risk;

International Journal of Applied Earth Observation and Geoinformation;

International Journal of Remote Sensing;

Nature Climate Change;

Remote Sensing;

Science of The Total Environment;

Conference Abstract Referee

Ecological Society of America (ESA)

MENTORING

Tertsea Igbawua, Graduate student, University of Chinese Academy of Sciences; Co-Advisor with Dr. Jihua Zhang, 2015 - 2017. Topic: Monitoring vegetation dynamics from space.

Publications:

Igbawua, T., Zhang, J., **Chang, Q.,** & Yao, F. (2016). Vegetation dynamics in relation with climate over Nigeria from 1982 to 2011. *Environmental Earth Sciences*, 75

Xi Zhang, Graduate student, Fudan University; Co-Advisor with Dr. Xiangming Xiao, 2020-2021. Topic: Observing land surface phenology through high-spatial remote sensing.

Publications:

Zhang, X., Xiao, X., Qiu, S., Xu, X., Wang, X., **Chang, Q.,** ... & Li, B. (2022). Quantifying latitudinal variation in land surface phenology of Spartina alterniflora saltmarshes across coastal wetlands in China by Landsat 7/8 and Sentinel-2 images. *Remote Sensing of Environment*, *269*, 112810.

Mitch Korolev, Undergraduate student, Indiana University; Co-Advisor with Dr. Kimberly Novick, 2021 - 2022. Topic: Phenology variation analysis with in-situ observed datasets using R

MEMBERSHIPS

American Geophysical Union (AGU)

American Meteorological Society (AMS)

Ecological Society of America (ESA)

PROFICIENT SKILLS & TOOLS

Remote Sensing Data Analysis

GIS (ArcGIS, QGIS)

Geospatial Analysis

High-Performance Computing

Eddy-covariance Data Processing

Terrestrial Ecosystem Modeling

Hydrological Modeling

R Statistics

Python

Matlab

ENVI, IDL

NEWS COVERAGE

2022 ESA Newsletter, EAS Students awarded grants in the NASA FINESST (Future Investigators in NASA Earth and Space Science and Technology) competition. [link]

2022 NSF News, Vegetation growth in Northern Hemisphere stunted by water constraints in warming climate. [link]

2021 Indiana University News, Vegetation growth in Northern Hemisphere stunted by water constraints in warming climate. [link]