Chao Wang

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104 South Rd. CB #3315, 27599-3315, Chapel Hill, NC, USA

Professional Background

Postdoctoral Research Associate, University of North Carolina, Chapel Hill, USA 2019-present

- Monitoring inundation and wetland plant species with advanced airborne sensors for future satellite missions
- Advisor**:** *Prof. Tamlin Pavelsky*

Ph.D., University of Puerto Rico, San Juan, PR, USA 2013-2019

- Land use/cover changes and their drivers, Dept. of Environmental Sciences
- Dissertation committee: *Prof. Qiong Gao (mentor), Jess Zimmerman, Nicholas Brokaw, Luis Santiago, Mei Yu*

M.Sc., Anhui Normal University, Anhui, China (Finish courses and thesis research in first year (2012-2013), and Thesis Defense at 2015) 2012-2015

- Cloud cover analysis using satellite data (National Scholarship for Graduate Students), RS&GIS
- Thesis mentor: *Prof. Jinji Ma*

B.Sc., Anhui Normal University, Anhui, China 2008-2012

- Urban air quality quantification using satellite data, GIS
- Thesis mentor: *Prof. Jinji Ma*

Visiting scholar, Kansas State University, USA Fall 2017

- High-frequency global lake and reservoirs areas monitoring
- Advisor: *Dr. Jida Wang*

Research interests

- Ecohydrological processes, interactions, and feedbacks
- Arctic-Boreal wetland vegetation species monitoring and related carbon fluxes
- Flooding monitoring with advanced airborne sensors and satellite data
- Land change science (natural-human interaction & disturbance ecology)
- Advanced RS techniques on geospatial analysis and data mining

Papers under or ready for peer-review

2021 **C. Wang,** T. Pavelsky, F. Yao, X. Yang, S. Zhang, B. Chapman, C. Song, A.a Sebastian, B. Frizzelle, E. Frankenberg (2021) Flood extent mapping during Hurricane Florence with repeat-pass L-band UAVSAR images. WRR. Under Revision.

2021 **C. Wang,** T. Pavelsky, E. Kyzivat, E. Podest, F. Yao, X. Yang, S. Zhang, B. Chapman, C. Song, D. Butman, and L. Smith (2021) Quantification of Wetland vegetation communities features with airborne AVIRIS-NG, UAVSAR, and UAV Lidar data in Peace-Athabasca Delta. Ready for submitting

2021 **C. Wang**, Q. Gao, and M. Yu (2021). The impacts of solar photovoltaic farms on land

surface temperature in the continental United States. Preparing for submitting

2021 **C. Wang**, Q. Gao, and M. Yu (2021). Solar farms replaced shrubland, farmland, grassland, and woodland in the Continental United State. Revised for resubmitting

2021 **C. Wang**, Q. Gao, and M. Yu (2021). Spatial dynamics and drivers of land use and land cover change in China: linked to human pressure, economics, policies, topography, and climatic conditions. Preparing for submitting

2021 E. Kyzivat, L. Smith, **C. Wang, T.** Langhorst, T. Pavelsky (2021). Lake littoral Zones Raise Arctic-boreal Methane Emissions Estimates. Ready for submitting

Peer-reviewed Publications

2021 Abdalla, S., Kolahchi, A. A., Ablain, M., Adusumilli, S., ... **C. Wang**, …& Hamon, M. Altimetry for the future: Building on 25 years of progress. *Advances in Space Research*.

2021 X. Liu, L. Kah, A. Knoll, H. Cui, **C. Wang**, A. Bekker, and R. Hazen. A persistently low level of atmospheric oxygen in Earth's middle age. *Nat Commun 12, 351.*

2020 D. Dong, **C. Wang**, J. Yan, Q. He, J. Zeng, Z. Wei. Combing Sentinel-1 and Sentinel-2 image time series for invasive Spartina alterniflora mapping on Google Earth Engine: a case study in Zhangjiang Estuary. *Journal of Applied Remote Sensing* 14, no. 4 (2020): 044504.

2019 **C. Wang**, M. Yu, and Q. Gao. Quantifying Trends of Land Change in Qinghai-Tibet Plateau during 2001–2015. *Remote Sensing* 11, no. 20, 2435.

2019 F. Yao, J. Wang, **C. Wang**, and J.-F. Crétaux. Constructing long-term high-frequency time series of global lake and reservoir areas using Landsat imagery. *Remote Sensing of Environment* 232, 111210.

2018 F. Yao, J. Wang, K. Yang, **C. Wang**, B. Walter, and J.-F. Crétaux. Lake storage variation on the endorheic Tibetan Plateau and its attribution to climate change since the new millennium. *Environmental Research Letters* 13, no. 6: 064011.

2018 X. Liu, X. Zeng, X. Zou, G. González, **C. Wang**, and S. Yang. Litterfall production prior to and during Hurricanes Irma and Maria in four Puerto Rican forests. *Forests* 9, no. 6, 367.

2017 **C. Wang**, M. Yu, and Q. Gao. Continued Reforestation and Urban Expansion in the New Century of a Tropical Island in the Caribbean. *Remote Sensing*, 9(7), 731.

2017 M. Yu, Q. Gao, C. Gao, and **C. Wang**. Extent of Night Warming and Spatially Heterogeneous Cloudiness Differentiate Temporal Trend of Greenness in Mountainous Tropics in the New Century. *Scientific Reports*.7:41256.

2017 X. Wang, Q. Gao, **C. Wang**, and M. Yu. Spatiotemporal patterns of vegetation phenology change and relationships with climate in the two transects of East China, *Global Ecology and Conservation*, 10, 206-219

2017 K. Yang, F. Yao, J. Wang, J. Luo, Z. Shen, **C. Wang**, and C. Song. Recent dynamics of alpine lakes on the endorheic Changtang Plateau from multi-mission satellite data. *Journal of Hydrology*, 552, 633-645.

2016 **C. Wang**, Q. Gao, X. Wang, and M. Yu. Spatially differentiated trends in urbanization, agricultural land abandonment and reclamation, and woodland recovery in

Northern China. *Scientific Reports*. 6:37658.

2015 **C. Wang**, Q. Gao, X. Wang, and M. Yu. Decadal Trend in Agricultural Abandonment and Woodland Expansion in an Agro-Pastoral Transition Band in Northern China. *PloS one*, 10(11), e0142113.

2015 F. Yao, **C. Wang**, D. Dong, J. Luo, Z. Shen, and K. Yang. High-Resolution Mapping of Urban Surface Water Using ZY-3 Multi-Spectral Imagery. *Remote Sensing* 7(9), 12336-12355.

2015 R. Jing, J. Ma, **C. Wang** (2015). Methods of PM2.5 Inversion Based on Multi-Source Data. *Journal of Atmospheric and Environmental Optics* 10(01), 51-62 (In Chinese with English Abstract)

2014 J. Ma, H. Wu, **C. Wang**, X. Zhang, Z. Li, and X. Wang. Multiyear satellite and surface observations of cloud fraction over China. *Journal of Geophysical Research: Atmospheres*, 119(12), 7655-7666.

2013 **C. Wang**, Q. Liu, N. Ying, X. Wang, and J. Ma. Air quality evaluation on an urban scale based on MODIS satellite images. *Atmospheric Research*, 132, 22-34.

Conference Proceedings

2021 **C. Wang**, T. M. Pavelsky, E. D. Kyzivat, T. Langhorst, F. Yao, X. Yang, S. Zhang, ..., M.M. Dornblaser (2021, May). Mapping vegetation communities in the Arctic-boreal wetlands of the Peace-Athabasca Delta using AVIRIS-NG hyperspectral data. *ABoVE Science Team Virtual Meeting 7*

2021 **C. Wang**, T. M. Pavelsky, E. D. Kyzivat, T. Langhorst, F. Yao, X. Yang, S. Zhang, ..., M.M. Dornblaser (2021, March). Arctic-boreal wetland vegetation community mapping by AVIRIS-NG hyperspectral data for upscaling of methane emission flux, a case in Peace-Athabasca Delta. *7th North American Carbon Program Open Science Meeting*

2020 **C. Wang**, T. M. Pavelsky, F. Yao, X. Yang, S. Zhang (2020, December). Repeat-pass L-band UAVSAR images for flood extents mapping during Hurricane Florence. *AGU Fall Virtual Meeting*

2020 E. D. Kyzivat, L. C. Smith, T. M. Pavelsky, D. E. Butman, C. J. Gleason, F. Garcia-Tigreros, C. Huang, **C. Wang**, T. Langhorst, J. V. Fayne, C. Kuhn, R. Spencer, K. P. Wickland, M. M. Dornblaser, Martin Kurek, R. G. Striegl (2020, December). Sensitivity of lake and wetland methane emissions upscaling to littoral zone area using airborne synthetic aperture radar. *AGU Fall Virtual Meeting*

2020 **C. Wang**, T. M. Pavelsky, Ethan Kyzivat. (2020, June). Characterizing vegetation communities around Chillowes Lake in the Athabasca Peace Delta using AVIRIS-NG hyperspectral data. *ABoVE Science Team Virtual Meeting 6*

2020 D. Butman, T. M. Pavelsky, L. C. Smith, R. G. Striegl, R. Spencer, C. Huang, F. Garcia-Tigreros, **C. Wang**, C. Kuhn, E. D. Kyzivat (2020, June). Integrating ABoVE airborne datasets and field campaigns to identify hotspots of surface water inundation and carbon flux across Arctic-Boreal ecosystems (2019-2022). *ABoVE Science Team Virtual Meeting 6*

2020 E. D. Kyzivat, L. C. Smith, F. Garcia-Tigreros, **C. Wang**, C. Huang, J. V. Fayne, Martin

Kurek, C. Kuhn, K. P. Wickland, M. M. Dornblaser, R. G. Striegl, T. M. Pavelsky, R. G.M. Spencer, D. E. Butman (2020, June). Arctic-Boreal Wetland Mapping by Airborne SAR to Upscale Greenhouse Gas Emissions. *ABoVE Science Team Virtual Meeting 6*

2019 M. Yu, **C. Wang**, and Q. Gao. (2019, December). Differentiated trends in land cover changes in Qinghai-Tibet Plateau during 2001-2015 in response to climate and human activities. AGUFM 2019. EP53F-2204.

2019 **C. Wang**, M. Yu, Q. Gao, F. Yao (2019, December). The impacts of solar photovoltaic farms on land surface temperature in the continental United States

2019 M. Cartagena, Q. Gao and **C. Wang** (2019, March). Land changes in Jobos Bay, Puerto Rico during 1991-2000: urban expansion and agriculture conversion. *The 35th Annual Louisiana Remote Sensing & GIS Workshop*. Lafayette, Louisiana.

2018 **C. Wang**, M. Yu, Q. Gao, F. Yao (2018, December). The expansion of solar photovoltaic farms could have unexpected consequences on farmlands, pastures, and woodlands in the United States. *AGU Fall Meeting*. Washington, D.C.

2018 F. Yao, J. Wang, **C. Wang**, J.-F. Cretaux (2018, December). Constructing high-frequency time series of global lake and reservoir storage changes using Landsat imagery and radar altimetry. *AGU Fall Meeting*. Washington, D.C.

2018 F. Yao, J. Wang, K. Yang, **C. Wang**, B.A. Walter, and J.-F. Crétaux (2018, September). Lake Storage Variation on the Endorheic Tibetan Plateau and its Attribution to Climate Change since the New Millennium. *Ocean Surface Topography Science Team (OSTST) meeting*. Ponta Delgada, São Miguel Island Azores Archipelago, Portugal.

2018 F. Yao, J. Wang, K. Yang, **C. Wang**, B. Walter, and J.-F. Crétaux (2018, October). Recent volumetric variability in alpine lakes on the endorheic Tibet and its link to climate change. *2018 Regional AAG*. Manhattan, KS.

2017 K. Yang, F. Yao, D. Dong, **C. Wang,** J. Luo, Z. Shen, J. Wang (2017). The mechanisms of the alpine lake outburst flood and its impacts on downstream areas - a case study on Zhuonai lake, Tibetan Plateau. *2017 AAG Annual Meeting*. Boston, MA

2017 F. Yao, J. Wang, K. Yang, **C. Wang**, B. Walter, J.-F. Cretaux (2017). Recent volumetric variability in alpine lakes on the endorheic Tibet and its link to climate change *2017 AGU Fall Meeting*. New Orleans, LA

2016 **C. Wang**, X. Wang, Q. Gao, and M. Yu (2016) Fusion of optical and SAR remote sensing images for tropical forests monitoring. *2016 AGU Fall Meeting*. San Francisco, CA

2016 K. Yang, F. Yao, J. Luo, Zhanfeng Shen, and **C. Wang** (2016) Combined Landsat Satellite and HJ Satellite for Monitoring Large Alpine Lakes on the Changtang Plateau over 2009-2014. *2016 AGU Fall Meeting*. San Francisco, CA

2016 M. Yu, C. Gao, and **C. Wang** (2016) Extent of Night Warming Differentiates the Temporal Trend of Tropical Greenness over 2001-2015. *2016 AGU Fall Meeting*. San Francisco, CA

2011 F. Yao, **C. Wang**, C. Wu, X. Wang, J. Ma (2011). The enterprise solutions of police geography information system based on the framework of ArcGIS platform, *The 9th Esri China Users Conference Proceedings*

Published Scientific Datasets

2021 **C. Wang**, T. Pavelsky, E. Kyzivat, E. Podest, F. Yao, X. Yang, S. Zhang, B. Chapman, C. Song, D. Butman, and L. Smith (2021) Wetland vegetation communities maps derived from airborne AVIRIS-NG, UAVSAR, and UAV Lidar data in Peace-Athabasca Delta, ready for on-line.

2021 E. Kyzivat, L.C. Smith, C. Huang, **C. Wang**, T. Langhorst (2021) ABoVE: UAVSAR Lake and wetland classification for Yukon Flats, Peace-Athabasca Delta, and Canadian Shield, 2017-2019, ready for on-line.

2020 **C. Wang**, T. Pavelsky, F. Yao, X. Yang, S. Zhang, B. Chapman, C. Song, A.a Sebastian, B. Frizzelle, E. Frankenberg (2021) Flood extent maps during Hurricane Florence derived from repeat-pass L-band UAVSAR images, ready for on-line.

2018 F. Yao, J. Wang, K. Yang, **C. Wang**, B.A. Walter, and J.-F. Crétaux. 2018. High resolution data set of annual lake areas and water storage across the Inner Tibet, 2002-2015. In: *PANGAEA*, doi.org/10.1594/PANGAEA.888706.

2016 **C. Wang**, Yu, M., Gao, Q., & Wang, X. (2016). Puerto Rico Land Cover/Land Use Map in 2010. In: *Harvard Dataverse https://doi.org/10.7910/DVN/VS5JDP*

Presentations

Invited Talking in Urban & Human Landscapes session for Geo for Good Summit (2019)
Give an oral presentation about the solar farm monitoring and its land use impacts.

Workshop on Google Earth Engine application (2018)
Give a hands-on workshop about the applications of GEE to the graduate students.

Brown-Bag Talking in Kansas State University (2017):
Remote sensing applications in phenology and land use/land cover dynamics (to talk about my studies, including 1) the spatiotemporal dynamics of vegetation phenology along two transects and 2) land use/land cover change in China, such as urbanization and agricultural lands replacement as well as agricultural lands abandonment and reclamation)

Oral in San Francisco, 2016 AGU Fall Meeting:
Fusion of optical and SAR remote sensing images for tropical forests monitoring (to talk about the tropical forests mapping using multisource satellite images on Google Earth Engine platform)

Invited talk in Puerto Rico (2014):
The shift of forest area in Agro-pastoral Ecotone of Northern China (to present the land cover mapping methodology and spatial pattern of reforestation in an important vegetation transition zone based on four years' land cover maps)

Poster for a conference in Beijing (2012):
Retrieval of cloud cover and cloud phase based on satellite imagery (to talk about the spatial distribution maps of the four seasons' cloud cover and cloud phase derived from CloudSat and CALIPSO)

Oral for college GIS competition in Beijing (2010):

Intelligent patrol command and dispatch system (to introduce and show the framework and advantage of our GIS application software project)

Professional skills

My greatest strengths are firstly professional **cartography, GIS, RS,** and **ecohydrological** knowledge to develop interesting interdisciplinary researches; secondly, the abundant working experience to use **python, R, and IDL** programming languages and **Google Earth Engine** platform (**SIX** years) to operate multisource geospatial datasets (**optical, Lidar, and SAR**) at large-scale (TB level) enables me to conduct ecological and geosciences research quickly; thirdly, the ability to present results with quantitative analysis and vivid graphics accurately assists the interpretation of research results; finally, I have a strong motivation to bridging interdisciplinary perspectives in understanding land surface processes based on multisource satellite observations and model simulations in my academic career.

Academic Experience

Postdoctoral Research Associate at the Dept. of Earth, Marine and Environmental Sciences, UNC. Advisor: Dr. Tamlin Pavelsky	08/2019-current
Teaching Assistant (TA) at the Dept. of Environmental Sciences, UPRRP, CIAM 8225: Advanced Spatial Analysis CIAM 8205: Environmental Modeling and Geospatial Analysis, Mentor: Dr. Mei Yu and Dr. Qiong Gao	07/2016 –05/2019
Visiting Scholar at Dr. Jida Wang's lab, Dept. of Geography, KSU	09/2017–11/2017
Research Assistant (RA) in the Spatial Analysis group of Dr. Qiong Gao and Dr. Mei Yu, UPRRP	08/2013–07/2016
RA in the "Atmospheric Remote Sensing" group of the Anhui Normal University (China), Mentor: Dr. Jinji Ma	07/2012–07/2013

Scholarships and Awards

2016	Graduate Student Conference Travel Award, UPRRP, $800
2015	Excellent Master Thesis Award, Anhui Normal University, $200
2013	National Scholarship for Graduate Students, Anhui Normal University, $3,400
2012	Excellent Undergraduate Thesis Award, Anhui Normal University, $180
2011	Outstanding Undergraduate Scholarship, Anhui Normal University, $120
2010	The GIS application programming development group of the National "Esri Cup" GIS Skills Contest for college students, two submitted projects won the third prize and encouragement prize, respectively. Beijing, China, $500
2010	The GIS application programming development group of the first "Esri Cup" GIS Skills Contest for college students. One project won the second prize. Anhui, China, $180

Reviewing Activities

Reviewer for the following journals:
Geophysical Research Letter
RS related Journals,
Land use related Journals,
Atmospheric Research,
Environmental Pollution

Society Memberships

American Geophysical Union (AGU), IEEE Geoscience and Remote Sensing Society (IGARSS), American Association of Geographers (AAG), and Association for the Sciences of Limnology and Oceanography (ASLO)