

## YONGHONG YI, Ph.D.

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### Research interests

- Cold region hydrology, permafrost-hydrology-carbon interactions
- Remote sensing algorithms and modeling development, applications in regional water and carbon cycle studies
- Climate change studies in the high latitude and high-altitude region

### Education

- Ph.D. *Hydrology*, Tsinghua University, Beijing, China, 2008
- M.S. *Photogrammetry and Remote Sensing*, Peking University, China, 2005
- B.E. *Hydrology*, Wuhan University, Wuhan, China, 2002

### Professional Experience:

- 2021/10-present: Research Professor, Tongji University, China.
- 2020/03-2021/09: Assistant Researcher affiliated with JIFRESSE, University of California, Los Angeles, USA
- 2018/03-2021/09: NPP senior fellow at NASA Jet Propulsion Lab (JPL), USA
- 2009/09-2018/02: Research Scientist, Numerical Terradynamic Simulation Group, University of Montana, USA
- 2008/09-2009/08: Postdoc, Dept. Civil Engineering, University of Manitoba, Canada

### Refereed Publications (\* indicates corresponding author)

#### *Papers Under Review:*

1. He, M., **Yi, Y.\***, Li, X., Wigneron, J.P., Kimball, J.S., Endsley, A., Reichle, R., Fan, L., Chen, H. The capability of multi-frequency vegetation optical depth products to monitor vegetation dynamics in China under a changing climate. *Agricultural and Forest Meteorology*, in review.
2. **Yi, Y.\***, Wu, T., Wu, M., Jiang, H., Yang, Y., Rogers, B.M. Abrupt thaw and its effects on permafrost carbon emissions in the Tibetan Plateau: a remote sensing and modeling perspective. *Earth-Science Reviews*, in review.
3. Chang, T., **Yi, Y.\***, Jiang, H., Li, R., Lu, P., Liu, L., Wang, L., Zhao, L., Zwieback,

- S., Zhao, J., Chen, J. Unraveling the non-linear relationship between seasonal deformation and active layer thickness. *Npj Climate and Atmospheric Science*, in review.
4. Chang, T, Li, R., **Yi, Y.**, Hao, T., Lu, P., Han, J., Li, Z., and Zhao, L. New InSAR ALT map reveals accelerated thermokarst-induced permafrost degradation in the Qinghai-Tibet Plateau., *in revision*.

***Papers published in referred journals:***

5. He, M., Cui, J.\*, **Yi, Y.\***, et al. Vegetation increases global climate vulnerability risk by shifting climate zones in response to rising atmospheric CO<sub>2</sub>. *Science of The Total Environment*, 2024.
6. Jiang, H., **Yi, Y.\***, Yang, K., Zhao, L., Chen, D., Kimball, J.S., Lu, F.: Soil Freeze/Thaw Dynamics Strongly Influences Runoff Regime in a Tibetan Permafrost Watershed: Insights from a Process-Based Model. *CATENA*, 2024.
7. Zhao, Y., Bakian-Dogaheh, L., Whitcomb, J., Chen, R.H., **Yi, Y.**, Kimball, J.S., Moghaddam, M.: Integrating multi-source remote sensing data for mapping boreal forest canopy height and species in interior Alaska in support of radar modeling. *Environmental Research Letters*, 2024.
8. Liu, L., **Yi, Y.\***, Jiang, H., Ran, Y., Chen, D.: ERA5-Land overestimates runoff coefficient but underestimates runoff recession rate in the central Tibetan permafrost region. *Journal of Hydrology: Regional studies*, 53, 101792, 2024.
9. Miller, C. et al (including **Yi, Y.**): The ABoVE L-band and P-band airborne synthetic aperture radar surveys, *Earth Syst. Sci. Data*, 16, 2605–2624, 2024.
10. Whitcomb, J., Chen, R., Clewley, D., Kimball, J. S., Pastick, N. J., **Yi, Y.**, & Moghaddam, M.: Maps of active layer thickness in northern Alaska by upscaling P-band polarimetric synthetic aperture radar retrievals. *Environmental Research Letters*, 19(1), 014046, 2024.
11. Liu, Z., Kimball, J. S., Ballantyne, A., Watts, J. D., Natali, S. M., Rogers, B. M., **Yi, Y.** et al.: Widespread deepening of the active layer in northern permafrost regions from 2003 to 2020. *Environmental Research Letters*, 19(1), 014020, 2024.
12. Jiang, H., **Yi, Y.\***, Xu, J., Chen, D., Lu, F., Li, R., Wang, X., Zhou, B.: Characterizing precipitation uncertainties in a high-altitudinal permafrost watershed of the Tibetan Plateau based on regional water balance and hydrological model simulations. *Journal of Hydrology: Regional Studies*. 2023.
13. Lu, P., Han, J., **Yi, Y.**, Hao, T., Zhou, F., Meng X., Zhang, Y., Li, R.: InSAR unveils dynamic permafrost disturbances on Tibetan Plateau hinterland. *IEEE Trans. Geosci. Remote Sensing*, 2023.
14. **Yi, Y.**, Bakian-Dogaheh, Moghaddam, M., Mishra, M., Kimball, J.S.: Mapping surface organic soil properties in Arctic tundra using C-band SAR data. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*. 2023.
15. Schiferl, L., Arndt, K., Biraud, S., Euskirchen, E.S., Henderson, J., Larson, E., McKain, K., Munger, J.W., Oechel, W., Sweeney, C., Watts, J.D., **Yi, Y.**, Zona, D., and Commane, R.: Using atmospheric observations to quantify annual biogenic

- carbon dioxide fluxes on the Alaska North Slope. *Biogeosciences*, 2023.
16. Chang, T., **Yi, Y.\***, Wen, Y., Lu, P., Zhou, F., Meng, X., et al.: Bias Correction for ERA5-Land Soil Moisture Product Using Variational Mode Decomposition in the Permafrost Region of Qinghai–Tibet Plateau. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, 15, 7025–7041, 2022. (1/3)
  17. Byrne, B., Liu, J., **Yi, Y.**, Chatterjee, A., Basu, S., Cheng, R., Doughty, R., Chevallier, F., Bowman, K. W., Parazoo, N. C., Crisp, D., Li, X., Xiao, J., Sitch, S., Guenet, B., Deng, F., Johnson, M. S., Philip, S., McGuire, P. C., and Miller, C. E.: Multi-year observations reveal a larger than expected autumn respiration signal across northeast Eurasia, *Biogeosciences*, 2022.
  18. **Yi, Y.**, Chen, R. H., Kimball, J. S., Moghaddam, M., Xu, X., Euskirchen, E. S., et al.: Potential Satellite Monitoring of Surface Organic Soil Properties in Arctic Tundra From SMAP. *Water Resources Research*, 58(4), 2022.
  19. Bakian-Dogaheh, K., Chen, R. H., **Yi, Y.**, Kimball, J. S., Moghaddam, M., & Tabatabaenejad, A.: A model to characterize soil moisture and organic matter profiles in the permafrost active layer in support of radar remote sensing in Alaskan Arctic tundra. *Environmental Research Letters*, 17(2), 025011, 2022.
  20. **Yi, Y.**, Chen, R.H., Moghaddam M., Kimball J.S., Jones, B.A., Jandt, R., Miller,E. Miller, C.: Sensitivity of multi-frequency polarimetric SAR data to post-fire permafrost changes and recovery processes in Arctic tundra. *IEEE Trans. Geosci. Remote Sensing*, doi: 10.1109/TGRS.2021.3125715, 2021.
  21. Kim, J., Kim, Y., Zona, D., Oechel, Park, S., Lee, B., **Yi, Y.**, Erb, A., Schaaf, C.: Carbon response of tundra ecosystems to advancing greenup and snowmelt in Alaska. *Nature Communications*, 12(1), 6879, 2021.
  22. **Yi, Y.**, Kimball, J.S., Watts, J., Natali, S., Zona, D., Liu, J., Ueyama, M., Kobayashi, H., Oechel, W., and Miller, C.E.: Investigating the sensitivity of soil heterotrophic respiration to recent snow cover changes in Alaska using a satellite-based permafrost carbon model. *Biogeosciences*, 17, 5861-5882, 2020.
  23. Jiang, H., Zhang, G., **Yi, Y.\***, Chen, D., Zhang, W., Yang, K., Miller, C.E.: Progress and challenges in studying regional permafrost in the Tibetan Plateau using satellite remote sensing and models. *Frontiers in Earth Science*, 8:560403, 2020.
  24. Zheng, G., Yang, Y., Yang, D., Dafflon, B., **Yi, Y.**, Zhang, S., Chen, D., Gao, B., Wang, T., Shi, R., and Wu, Q.: Remote sensing spatiotemporal patterns of frozen soil and the environmental controls over the Tibetan Plateau during 2002–2016. *Remote Sensing of Environment*, 247, 111927, 2020.
  25. Jiang, H., **Yi, Y.**, Zhang, W., Yang, K., Chen, D.: Investigating the sensitivity of soil freeze/thaw dynamics to environmental conditions at different scales in the Central Tibetan Plateau. *Science of the Total Environment*. 734, 129261, 2020.
  26. **Yi, Y.**, Kimball, J.S., Chen, R.H., Moghaddam, M., and Miller, C.E.: Sensitivity of active-layer freezing process to snow cover in Arctic Alaska, *The Cryosphere*, 13, 197-218, 2019.
  27. He, M., Kimball, J.S., **Yi, Y.**, Mu, Q., Running, S.W., Guang, K., Maneta, M.: Satellite data-driven modeling of field scale evapotranspiration in croplands using the MOD16 algorithm framework. *Remote Sensing of Environment*, 230, 2019.

28. He, M., Kimball, J.S., **Yi, Y.** et al. Impacts of the 2017 flash drought in the US Northern plains informed by satellite-based evapotranspiration and solar-induced fluorescence. *Environmental Research Letters*, 14, 074019, 2019.
29. **Yi, Y.**, Kimball, J.S., Chen, R., Moghaddam, M., Reichle, R.H., Mishra, U., Zona, D., Oechel, W.: Characterizing permafrost soil active layer dynamics and sensitivity to landscape spatial heterogeneity in Alaska. *The Cryosphere*, 12, 145-161, 2018.
30. Jiang, H., Zhang, W., **Yi, Y.** et al.: The impacts of soil freeze/thaw dynamics on soil water transfer and spring phenology in the Tibetan Plateau. *Arctic, Antarctic and Alpine Research*, 50(1), e1439155, 2018.
31. Wang, J., Dong, J., **Yi, Y.** et al.: Decreasing net primary production due to drought and slight decreases in solar radiation in China from 2000 to 2012. *Journal of Geophysical Research-Biogeosciences*, 122, doi:10.1002/2016JG003417. 2017.
32. Zhang, W., **Yi, Y.**, Song, K., Kimball, J.S.: Hydrological sensitivity of alpine wetlands to climate warming in the eastern Tibetan Plateau. *Remote Sensing*, 8, 336, 2016.
33. **Yi, Y.**, Kimball, J. S., Rawlins, M. A., Moghaddam, M., Euskirchen, E. S.: The role of snow cover affecting boreal-arctic soil freeze-thaw and carbon dynamics, *Biogeosciences*, 12, 5811-5829, 2015.
34. Zhang, W., **Yi, Y.**, Kimball, J.S., Kim, Y.: Climatic controls on spring onset of Tibetan Plateau grasslands from 1982 to 2008. *Remote Sensing*, 7(12), 2015.
35. **Yi, Y.**, Kimball, J. S., Reichle, R. H.: Spring hydrology determines summer net carbon uptake in northern ecosystems, *Environmental Research Letters*, 9, 064003, 2014.
36. **Yi, Y.**, Kimball, J. S., Jones, L. A., Reichle, R. H., Nemani, R., Margolis, H. A.: Recent climate and fire disturbance impacts on boreal and arctic ecosystem productivity estimated using a satellite-based terrestrial carbon flux model, *Journal of Geophysical Research-Biogeosciences*, 118, 606-622, 2013.
37. McGuire, A. D. et al. (including **Yi, Y.**): An assessment of the carbon balance of Arctic tundra: comparisons among observations, process models, and atmospheric inversions, *Biogeosciences*, 9, 3185-3204, doi:10.5194/bg-9-3185-2012, 2012.
38. **Yi, Y.**, Kimball, J. S., Jones, L. A., Reichle, R. H., McDonald, K. C.: Evaluation of MERRA land surface estimates in preparation for the Soil Moisture Active Passive Mission, *Journal of Climate*, 24, 3797-3816, 2011.
39. **Yi, Y.** and Yang, D.: An operational method to estimate evapotranspiration using MODIS data during winter wheat growing season, *International Journal of Remote Sensing*, 32, 4915-4932, 2011.
40. Zhang, W., Wang, H., Yang, F., **Yi, Y.** et al.: Underestimated effects of low temperature during early growing season on carbon sequestration of a subtropical coniferous plantation, *Biogeosciences*, 8, 1667-1678, 2011.
41. **Yi, Y.**, Yang, D., Huang, J., Chen, D.: Evaluation of MODIS surface reflectance products for wheat leaf area index (LAI) retrieval, *ISPRS Journal of Photogrammetry and Remote Sensing*, 63, 661-677, 2008.
42. Xu, J., Yang, D., **Yi, Y.** et al.: Spatial and temporal variation of runoff in the

Yangtze River basin during the past 40 years, *Quaternary International*, 186, 32-42, 2008.

43. Yi, Y., Yang, D. W., Chen, D. Y., Huang, J.: Retrieving crop physiological parameters and assessing water deficiency using MODIS data during the winter wheat growing period, *Canadian Journal of Remote Sensing*, 33, 189-202, 2007.

## Research Projects

### *Current projects:*

- *Shanghai 1000-talent program*, China, 2021-2026, ¥2,000K, PI
- *The National Natural Science Foundation of China*, “Joint retrieval of soil organic carbon content and soil moisture in the pan-Arctic permafrost region using SMAP Tb data”, 2024-2027, ¥480K, PI
- *2023 Shanghai Action Plan for Science, Technology and Innovation Program*, “Potential soil carbon emissions with permafrost degradation in the Tibetan Plateau grasslands”, 2023-2026, ¥500K, PI.
- *Changjiang River Scientific Research Institute*, “The changing trends of evapotranspiration and fractions of green water resources in the Yangtze river basin”, 2024-2025, ¥195K, PI.
- *The Second Tibetan Plateau Scientific Expedition and Research Program*, “Understanding the driving processes of runoff production in the Tibetan Permafrost region”. 2023-2024, ¥8900K, co-I (¥900K to Tongji)

### *Recently completed projects:*

- *NASA Terrestrial Hydrology Program*, “Enhancement of High-Resolution Soil Moisture Algorithm and Product for Arctic Region Using the Multi-Sensor Data Fusion Approach”, 2021-2024, \$600K, co-I
- *Ministry of Science and Technology Collaborative Program*, “Investigating pan-Arctic abrupt thaw and associated carbon emissions”, 2022-2023, ¥290K, PI
- *NASA Terrestrial Ecology Program*, “Improving Understanding and Prediction of Permafrost Active Layer Processes Using a Coupled Radar Inversion and Soil Process Model Framework”, Co-PI, 2019-2022, \$780K
- *NASA NPP fellowship*, “Developing an Integrated Modeling Framework to Characterize Soil Moisture Effects on Boreal-Arctic Soil Freeze/thaw Dynamics and Cold-season Carbon Emissions”, PI, 2018-2020, \$180K

## Advising Experiences

- Huiru Jiang, 2023-, Postdoc, Tongji University
- Tian Chang, 2020-, PhD student, Tongji University
- Qianhui Liu, 2023-, PhD student, Tongji University
- Ziting Chen, 2023-, Msc student, Nanjing University
- Wei Peng, 2023-, Msc student, Tongji University
- Lingbo Su, 2023-, Msc student, Tongji University
- Di Qiang, 2024-, Msc student, Tongji University