

Yu Zhou

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EDUCATION:

M.S., Institute of Remote Sensing and Digital Earth, CAS –June 2014 (expected)

- Cartography & GIS
- Thesis title: *Analysis of spatial and temporal patterns of water use efficiency (WUE) in Central Asia*

B.S., Shandong University of Science and Technology –June 2012

- Remote Sensing Science & Technology
- Ranking: 1/40
- Thesis title: *Relationships between Vegetation Indices and Vegetation Productivity Parameters in Northern China grasslands (Excellent Graduation Thesis)*

RESEARCH EXPERIENCE:

✧ *Graduate research assistant, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, Beijing, China* **2012–present**

1. *Analysis of spatial and temporal patterns of water use efficiency (WUE) in Central Asia*

Based on MODIS and climate data, I estimated NPP (CASA model), ET (P-M formula and SEBAL model) and WUE from 2000 to 2012 in Central Asia region. Through comparing WUE among vegetation greening and browning areas, I found the browning areas tend to have lower WUE than greening areas. I will also analyze variations of these parameters for different land cover types, and discuss their responses to contemporary climate change and new policies of these five countries during pre- and post- Soviet collapsed. My research will provide useful insights for alleviating water crisis and improving the use efficiency of water resources in dryland regions under climate change and human disturbance.

2. *Contributions of climate change and socioeconomic factors to vegetation changes in Central Asia drylands, supported by National Key Technology R&D Program (Grant No. 2012BAH27B05)*

Through analyzing inter-annual and intra-annual variations in vegetation greenness based on GIMMS3g NDVI dataset in Central Asia during 1982–2011, I found different performances for vegetation pre- and post- Soviet collapse (1991). According to lag-correlation between climate factors and vegetation greenness, precipitation and temperature were key factors controlling vegetation greenness before 1991, but only partially explained the decreasing greenness with longer lag response after 1991. This might be explained by human impacts from the collapse of the former Soviet Union. I am currently exploring the potential human impacts on this phenomena and working on a manuscript of climate contributions to vegetation variations (submitted to Remote sensing, major revision).

3. *A Comparison of Satellite-Derived Vegetation Indices for Approximating GPP of Grasslands, Supported by Director Innovation Foundation of CEODE, CAS (Grant Y2ZZ19101B)*

I examined the relationships between the nine VIs derived from MODIS and tower-based GPP at five eddy covariance flux sites over the grasslands of northern China. Results showed EVI is the best predictor for GPP, and their correlation exhibited closer relationships in more southerly sites with higher vegetation cover. Considering seasonal influence, SAVI exhibited the best correlation with GPP in spring when the grassland canopy was sparse, while EVI was the best with GPP in summer when the grassland cover was dense. This study provides useful insight on the selection of vegetation indices for approximation and modeling GPP for grasslands.

4. Droughts effects on vegetation greenness in China

This research aimed to explain how droughts influence vegetation greenness in different seasons. My work mainly included trend analysis, correlation analysis, anomaly analysis, temporal and spatial statistic of NDVI and PDSI, and result layouts.

5. Climate-driven and human-induced increases in vegetation productivity in China

This research analyzed the trends of vegetation productivity in China over the period 1982–2006 and assessed the contributions of multiple environmental and human factors using NDVI, climate data, nitrogen (N) deposition data, and agricultural and forestry statistics. My work mainly included the annual and seasonal trend analysis, and statistic of NDVI and climate data for different regions.

6. Fieldworks in Xinjiang (July 2013) and Qinghai (August 2014) rangelands

Measurement of biomass, vegetation coverage, and soil moisture; Surveys for dominant species and degree of artificial disturbance.

✧ *Undergraduate student researcher, Shandong University of Science and Technology, Qingdao, China* *2008–2011*

Construct a database student information management using SQL server; Urban planning and management based on ArcGIS Engine (C#); Aerial triangulation in photogrammetry.

PUBLICATIONS:

1. **Zhou, Y.**, Zhang, L., Xiao, J., Chen, S., Kato, T., & Zhou, G. (2014). A Comparison of Satellite-Derived Vegetation Indices for Approximating Gross Primary Productivity of Grasslands. *Rangeland Ecology & Management*, 67, 9-18
2. **Zhou, Y.**, Zhang, L., Fensholt R., Wang K., Tian F. The contributions of climate change to vegetation changes in Central Asia drylands during 1982 to 2011. *Remote Sensing*, major revision.
3. Zhang, B., Zhang, L., Guo, H., Leinenkugel, P., **Zhou, Y.**, Li, L., & Shen, Q. (2014). Drought impact on vegetation productivity in the Lower Mekong Basin. *International Journal of Remote Sensing*, 35, 2835-2856
4. Xiao, J., **Zhou, Y.**, Zhang, L. Climate-driven and human-induced increases in vegetation productivity in China. *Environmental Research Letter*, revision submitted.
5. Liu, S., Zhang, L., Wang, C., Yan, M., **Zhou, Y.**, Lu, L. Analysis of Vegetation Phenology in the Tibetan Plateau Using MODIS data (2000–2010). *Remote sensing information (in Chinese)*, in press.
6. Zhang, J., Zhang, L., Zheng, Y., Tian X., **Zhou, Y.** Analysis of Net Primary Productivity and Actual Evapotranspiration Based on LPJ model in Central Asia. *Geography and Geo-Information Science (in Chinese)*, under revision.

Oral Presentations:

Zhou, Y., Zhang, L., Xiao, J., Chen, S., Kato, T., & Zhou, G. Exploring the relationship between GPP and Vegetation Indices in the arid and semi-arid grassland of Northern China. *International Symposium on Earth Observation for Arid and Semi-Arid Environment*, Kashgar, China. Sept 2012.

COMPUTER SKILLS:

- Basic Software: MS Office, Adobe Photoshop, Endnote, Origin, SPSS, MATLAB.
- Professional Software: ERDAS (modeler), ENVI, IDL, ArcGIS.
- Ecological Model: CASA, CENTURY, SEBAL.

Honors and Awards:

1. Model Student Honors, Chinese Academy of Sciences, certificate NO. 414793, 2013–2014.
2. Best Thesis Prize, Shandong University of Science and Technology, 06/2012.
3. Graduation with Distinction, Shandong University of Science and Technology, certificate NO. 201202455, 03/2012;
4. Outstanding Student Leaders, Shandong University of Science and Technology, 11/2009.
5. Model Student Honors, Shandong University of Science and Technology, 11/2009, 10/2010, 10/2011.
6. Taihua Scholarship, sponsored by Taihua Company, 12/2011.
7. Fellowship, Shandong University of Science and Technology, 02/2008, 10/2008, 02/2009, 10/2009, 02/2010, 10/2011, 02/2012.
8. Excellent service award for the 35th International Symposium on Remote Sensing of Environment held in Beijing, China on 22–26 April, 2013.

Selected Coursework:

- Graduate: Global ecology; Principles and Methods in ecosystem research; Numerical Computing Methods; Global Change; Modern Hydrology and Water Resources; Vegetation Remote Sensing; CENTURY model training.
- Undergraduate: Advanced Mathematics; Linear Algebra; Probability Theory & Mathematical Statistics; Principle & Application of Database; Application of MATLAB; GIS Principle and Application; Digital Image Processing; Microwave Remote Sensing; Foundation of Physics of Remote Sensing; Principle and Method of Remote Sensing.

Research Interest:

Ecosystem ecology modeling and analysis; Climate and human impacts on terrestrial ecosystems; Remote Sensing.