

**Mapping Woody Plant Encroachment in Grassland Using Multiple Sources
Remote Sensing Images: Case Study in Oklahoma**

Jie Wang*, Xiangming Xiao, and Yuanwei Qin

Department of Microbiology and Plant Biology, University of Oklahoma, Norman, OK

wjhlc0601@gmail.com

Woody plant encroachment (mainly *Eastern Red cedar*) in the native grassland has been rapidly increasing in the Southern Great Plains. Increasing woody plants significantly influence the local grassland ecosystem, such as carbon storage, soil nutrient availability, herbaceous forage production, livestock, watershed hydrology and wildlife habitats. However, very limited data are available to monitor the spatio-temporal dynamics of woody plant encroachment to the native grassland at regional scale. Data from remote sensing could potentially provide relevant information and improve the conversion of native grassland to woody plant encroachment. This study examined the potential of medium resolution images to detect the woody encroachment in tallgrass prairie. We selected Landsat images with Path 28 Row 35 (covering more than 20 counties in Oklahoma) as case study area. Phased Array Type L-band Synthetic Aperture Radar (PALSAR) images and time-series Landsat images were used to identify the invaded woody species (*Juniperus virginiana*). The resulting woody plant encroachment map was compared with the Oklahoma ecological system mapping. These results showed that integrating PALSAR and Landsat had good performance to identify the woody encroachment in the study area.