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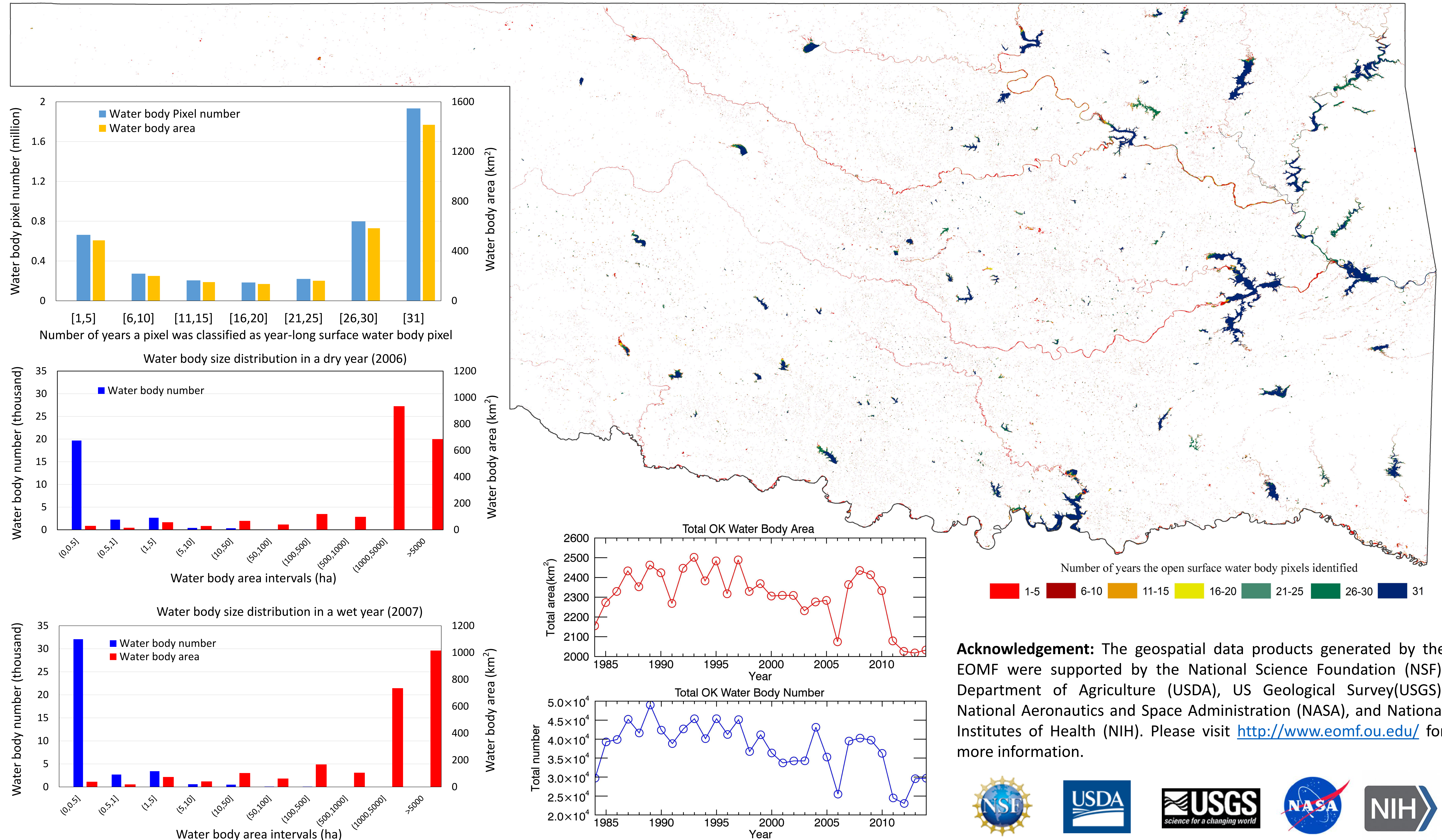
# Dynamics of Open Surface Water Bodies in Oklahoma from 1984 to 2014

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**Abstract:** Open surface water bodies are important water resource for irrigation, livestock, wildlife, and human livelihood in Oklahoma. We used tens of thousands of Landsat TM/ETM+ images from 1984 to 2014 to track the dynamics of open surface water bodies. Both water-related spectral indices and vegetation indices were used to identify water bodies for individual images. We generated annual maps of open surface water bodies at 30-m resolution, including both year-long and seasonal surface water body types. Our result shows that on the average year-long open surface water body area over the 31 years is  $\sim 2307 \text{ km}^2$ , accounting for 1.27 % of the entire Oklahoma state ( $181,195 \text{ km}^2$ ). Out of all year-long open surface water body pixels identified from 1984 to 2014 (4.3 million pixels,  $\sim 3132 \text{ km}^2$ , see map below), only 45% ( $\sim 1415 \text{ km}^2$ ) has water throughout the 31 years. In drought and pluvial years (e.g., 2006, 2007), both small water bodies and large water bodies had large changes. Severe drought in 2011/2012 resulted in the smallest amount of water bodies in the state. These water body maps could be used to support water resource management, crop and livestock production, and biodiversity conservation in the state.



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