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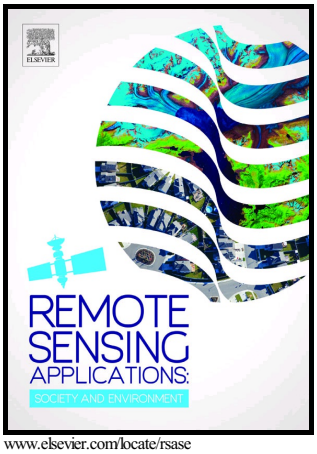

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Impact of drought on vegetation carbon storage in arid and semi-arid regions

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Abstract

Drought is a common phenomenon in arid and semi-arid regions. In global carbon cycle, semi-arid ecosystem plays a crucial role in interannual variability and greening trend. The vegetation carbon storage and its relation with drought in India are not well understood. The impact of drought on vegetation carbon storage is investigated using Standardized Precipitation Evapotranspiration Index (SPEI) and CASA (Carnegie-Ames-Stanford Approach) derived Net Primary Production (NPP) during 2001-2013. A strong positive correlation is found between regional NPP and SPEI. CASA derived NPP shows good agreement (r = 0.57, significance > 95%) with field based observation in arid and semi-arid regions of Gujarat. A significant Increasing trend of 0.2 TgC Yr^{-1} (about 2 % per year) is observed during the period of 2001 – 2013. The highest decreased of 24 % (2.79 TgC Yr^{-1}) in NPP was found during 2002 and a notable increase of 17 % (1.61 TgC Yr^{-1}) was seen during 2013 due to consecutive drought and surplus rainfall years respectively. The study suggests that consecutive droughts have brought an

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