**NASA DEVELOP National Program**

USGS at Colorado State University - Fort Collins, CO

**Summer 2015**

**Short Title: Ethiopia Ecological Forecasting**

**Updated Abstract**

The Bale-Arsi massif of south-central Ethiopia comprises one of the largest and least studied mountain systems in Africa. An internationally recognized biodiversity hotspot, the region is home to Bale Mountains National Park and the Sanetti Plateau, which provide critical alpine habitat for numerous endemic and endangered species such as the Mountain Nyala. Ethiopian agro-pastoralists in the region practice intentional burning to clear land for grazing and planting; however, pressures related to climate change and increasing populations have made understanding the frequency and extent of burning a top data need for conservationists and park managers seeking to balance conservation goals with the needs of local communities. We quantified historical fire occurrence and extent in the unique, high-altitude Ericaceous shrublands of Bale, using 42 years (1973-2015) of Landsat data. Multispectral images were spatially and spectrally linked within the LandsatLinkr R package, masked for clouds using a 30 m Shuttle Radar Topography Mission digital elevation model, and subsequently analyzed using the LandTrendr disturbance algorithm. The resulting fire extents were validated using the Moderate Resolution Imaging Spectroradiometer Burned Area product, as well as ancillary field records compiled from the literature. Maps and spatial data of fire date and extent were disseminated to project partners working in Bale. These will enable targeted conservation efforts in the park, and inform management approaches that ensure the preservation of the region's natural resources and the social-ecological systems they support.