

# Teleconnection between ENSO and Vegetation

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Since 1980s, strong ENSO disturbed weather, environment, economy, and human lives worldwide. Total impact of these events on society is estimated in billions of dollars and consequences include famine, human health problems, loss of life, property damage and destruction of the environment. Areas sensitive to ENSO have been identified in some world areas from climatic records and recently from 15-year satellite data. This presentation examines teleconnection between ENSO and terrestrial ecosystems worldwide using 24-year satellite and in situ data records. ENSO events were characterized by monthly sea surface temperature (SST) anomalies in the tropical Pacific. They were collected from the improved SST analysis data set (Reynolds and Smith, 1994). Average anomalies were calculated for the region 5°N - 5°S and 170° - 120°E (3.4 area). Terrestrial ecosystems were presented by the vegetation health (condition) indices (VHI, Kogan 1997). The VHIs, derived from AVHRR-based NDVI and 10-11  $\Phi$ m thermal radiances, were designed to monitor moisture and thermal impacts on vegetation health (greenness and vigor). Two types of responses were identified. In boreal winter, ecosystems of northern South America, southern Africa, and Southeast Asia experienced severe moisture and thermal stress during El Niño and favorable conditions during La Niña years. In central South America and the Horn of Africa regions the response was opposite. World ecosystems are less sensitive to SSTs during boreal summer, except for the areas in northern Brazil and Southeast Asia, where vegetation conditions deteriorate/improve during warm/cold water cycle in the tropical Pacific. In addition to the tropical Pacific, we investigated also sensitivity of vegetation to SST in some other ocean areas.