Geophysical Research Abstracts
Vol. 19, EGU2017-8527, 2017
EGU General Assembly 2017

Land product validation of MODIS derived FPAR product over the tropical dry-forest of Santa Rosa National Park, Guanacaste, Costa Rica.

Iain Sharp (1) and Arturo Sanchez (2)

(1) University of Alberta, Edmonton, Canada (iain@ualberta.ca), (2) University of Alberta, Edmonton, Canada (gasanche@ualberta.ca)

Land-product validation of the MODIS derived FPAR product over the tropical dry-forest of Santa Rosa National Park, Guanacaste, Costa Rica.
By Iain Sharp & Dr. Arturo Sanchez-Azofeifa
In remote sensing, being able to ensure the accuracy of the satellite data being produced remains an issue; this is especially true for phenological variables such as the Fraction of Photosynthetically Active Radiation (FPAR). FPAR, which is considered an essential climate variable by the Global Terrestrial Observation System (GTOS), utilizes the 400–700 nm wavelength range to quantify the total amount of solar radiation available for photosynthetic use. It is a variable that is strongly influenced by the seasonal, diurnal, and optic properties of vegetation making it an accurate representation of vegetation health. Measurements of ground level FPAR can be completed using flux towers along with a limited number of wireless ground sensors, but due to the finite number and location of these towers, many research initiatives instead use the Moderate resolution Imaging Spectroradiometer (MODIS) FPAR product, which converts Leaf Area Index (LAI) to a FPAR value using Beer's Law. This is done despite there being little consensus on whether this is the best method to use for all ecosystems and vegetation types. One particular ecosystem that has had limited study to determine the accuracy of the MODIS derived FPAR products are the Tropical Dry Forests (TDFs) of Latin America. This ecosystem undergoes drastic seasonal changes from leaf off during the dry season to green-up during the wet seasons.
This study aims to test the congruency between the MODIS derived FPAR values and ground-based FPAR values in relation to growing season length, growing season start and end dates, the peak and mean of FPAR values, and overall growth/phenological trends at the Santa Rosa National Park Environmental Monitoring Super Site (SR-EMSS) in Costa Rica and FPAR MODIS products. We derive our FPAR from a Wireless Sensor Network (WSN) consisting of more than 50 nodes measuring transmitted PAR, temperature, relative humidity, and soil moisture over custom time intervals ranging from 2-Hz to 15 min since 2013. Our fundamental goal is to demonstrate how accurate and reflective the MODIS derived FPAR product is of TDF phenology. This will be the first step taken in identifying potential problems with the MODIS derived FPAR products over TDFs in the Americas.