Remote sensing monitoring of bean crop cultivated in the Boi Branco watershed (Brazil)

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Nowadays, the concern of the effect of climate change on water availability on a global scale is getting bigger and bigger. In average, about 65 % of the world water consumption is devoted to irrigated agriculture. In countries such as Brazil, water scarcity has been a main issue in populated areas (i.e. São Paulo) in the last two years. This has affected not only water availability for the population but also irrigation water to maintain crop yield and Brazilian economy.

Remote sensing is a tool broadly used in multiple fields of science such as water management in irrigated agriculture. Actually, there are several satellites moving around the earth, and they take images of every place in a weekly or biweekly basis. The images can be downloaded from the internet site at no cost by the users. Then, they are used to determine the vegetation index NDVI which is based in the energy reflected in red and infrared spectrum and it depends on the vegetation photosynthetic activity.

Within the above context, this study focus on remote sensing monitoring of a bean crop located in the basin of Boi Branco, São Paulo - Brazil, which is irrigated by pivot center. The images from the Landsat and Modis satellites were downloaded throughout the bean growing period and then, they were processed and analyzed with the Qgis software. In addition, soil moisture was measured by several TDR probe sensors deployed in the irrigated area, and the leaf area index was measured as well in the field. Both variables were used to estimate the Normalized Difference Vegetation Index (NDVI) for each bean phenology state.