Geophysical Research Abstracts
Vol. 14, EGU2012-13898, 2012
EGU General Assembly 2012

Towards Geostationary Satellite Applications in Mediterranean Water Cycle and Fire-Carbon Estimates

J. Stoyanova (1), C. Georgiev (1), and C. Barroso (2)

(1) National Institute of Meteorology and Hydrology, Bulgaria (julia.stoyanova@meteo.bg), (2) Instituto de Meteorologia, Lisboa, Portugal

Adaptation to climate change is essentially dependent on the ability to monitor key terrestrial quantities associated with the water, energy, and carbon cycles. Under a suite of global climate change scenarios (IPCC 2007) major changes in the Mediterranean region are projected. In particular these are: a 'Hot Spot' in hydrological change with significant impacts on both a decrease of mean precipitation and variability, as well as increasing surface temperature and fire activity. To detect future long-term changes early-on it calls to improve our capability to monitor the related Terrestrial Essential Climate Variables (ECVs, e.g. water cycle and fires) and understand their variability.

The main objective of this study is to explore the possibilities for using geostationary satellite data and products in conjunction with numerical modeling of the land surface processes, related to the Mediterranean climate as water deficit and fire carbon emissions. An approach adopted for assessment of water cycle elements on a regional scale (in the NIMH Bulgaria) is presented. Regular 10-daily in situ measurements and daily SVAT model outputs are used for monitoring soil moisture dynamics and seasonal variations. In parallel, high temporal (30 min) evapotranspiration (ET) product from the Land Surface Analyses Satellite Application Facility (LSA SAF) afforded by MSG satellites is comparatively used for the evaluation of field vegetation water cycles. Meteorological products based on SVAT modelling approach for assessing moisture deficiency and continuous vegetation stress monitoring, are designed.

Moisture depletion, which might be related to thermal anomalies on the land surface, favourable for biomass burning, is evaluated by the satellite LSA SAF Fire Radiative Power (FRP) product as a new tool for determining the emitted radiant energy and the rate of production of gaseous pollutants emitted from terrestrial vegetation fires.