



HAL
open science

Evaluation of EVASPA, a tool for mapping evapotranspiration from space

Albert Oliosio, Belen Gallego-Elvira, Malik Bahir, A.G. Garcia, J. Hunink, Y. Inoue, A. Baille, Gérard Boulet, O. Boutron, P. Chauvelon, et al.

► **To cite this version:**

Albert Oliosio, Belen Gallego-Elvira, Malik Bahir, A.G. Garcia, J. Hunink, et al.. Evaluation of EVASPA, a tool for mapping evapotranspiration from space. GV2M: Global Vegetation Monitoring and Modeling, Feb 2014, Avignon, France. 2014. hal-02801014

HAL Id: hal-02801014

<https://hal.inrae.fr/hal-02801014v1>

Submitted on 5 Jun 2020

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



GV2M: Global Vegetation Monitoring and Modeling



GLOBAL VEGETATION MONITORING AND MODELING

International Conference
Avignon 3-7 February 2014

EVALUATION OF EVASPA, A TOOL FOR MAPPING EVAPOTRANSPIRATION FROM SPACE.

Abstract type : Oral presentation

Session : S6 - Site measurements, scaling, modeling and remote sensing

Submitted by : Albert Olioso

Authors and Speakers : Albert Olioso

Information about other authors :

Gallego-Elvira, B. (1,2), Bahir, M. (3), Garcia, A.G. (4), Hunink, J. (5), Baille, A. (6), Boulet, G. (3), Boutron, O. (7), Chauvelon, P. (7), Courault, D. (1,2), Di Bella, C. (4), Garrigues, S. (1,2), Inoue, Y. (8), Marloie, O. (9), Martin, B. (6), Merlin, O. (3), Mira, M. (1,2,10), Olioso, A. (1,2), Reyes-Castillo, S. (1,2), Rivalland, V. (3), Weiss, M. (1,2)

Correspondance to olioso@avignon.inra.fr

- (1) INRA, UMR1114, EMMAH, Avignon, France
- (2) UAPV, UMR1114, EMMAH, Avignon, France
- (3) Centre d'Etudes Spatiales de la Biosphère (CESBIO UMR5126), Toulouse, France
- (4) INTA, Instituto de Clima y Agua, Hurlingham, Buenos Aires, Argentina
- (5) Future-Water, Cartagena, Spain
- (6) Universidad Politécnica de Cartagena, Cartagena, Spain
- (7) Tour du Valat, Research Center for the Conservation of Mediterranean Wetlands, Arles, France
- (8) National Institute for Agro-Environmental Sciences, Tsukuba, Japan
- (9) INRA, UR629, Écologie des Forêts Méditerranéennes, Avignon, France
- (10) Department of Earth Physics and Thermodynamics, UPV, Burjassot, Spain

Evapotranspiration is a fundamental variable of the hydrological cycle and plays a major role in surface water and energy balances. The estimation of evapotranspiration is required for water resources management and climate studies. At the local scale evapotranspiration can be accurately determined from detailed ground observations (eddy covariance towers, lysimeters) but these measurements are too time-consuming and costly to assess the evapotranspiration variability at the regional scale. Therefore, remote sensing provides cost-effective methodologies to assess the spatial distribution of evapotranspiration at regional scale.

EVASPA (**EV**apotranspiration **A**ssessment from **SP**AcE) is a tool that has been developed to produce evapotranspiration maps at relevant spatial and time scales for hydrological or agronomical purposes. The tool includes several evapotranspiration estimation methods (S-SEBI method, the triangle approach and aerodynamic equations from SEBAL and SEBS) and various equations for estimating the required input information (e.g. albedo, net radiation and ground heat flux). Highlighted features of this tool are: (i) the possibility of integrating and comparing data from various remote sensing sensors, (ii) a flexible design which allows easily

adaptation to new sensors, (iii) options to evaluate the uncertainties related to the evapotranspiration estimates obtained through the different approaches and (iv) the provision of continuous daily evapotranspiration maps including for days without available remote sensing images (by means of interpolation procedures).

Using MODIS data (freely available since 2001), EVASPA makes it possible to provide long time series of daily evapotranspiration with a 1km spatial resolution over areas of 1×10^5 to 3×10^5 square kilometres. In this study, evapotranspiration estimations by EVASPA are being evaluated against surface energy balance data acquired (using flux towers) over different ecosystems, mainly in semi-arid areas, several of them in the Mediterranean area. The spatial distributions produced by EVASPA are also compared with global remote sensing products, such as MOD16 or WACMOS, and against evapotranspiration maps obtained in earlier studies at higher resolution (using Landsat and ASTER data).

Evaluation sites include (in brackets land use with flux tower):

- the Crau-Camargue area, south-east France (saltmarsh scrubs, dry grassland, irrigated grassland, agricultural area)
- the Campo de Cartagena in Murcia region, south-east Spain (citrus orchards)
- the Yaqui valley in the state of Sonora, north-west of Mexico (vegetable and arable crops)
- the Merquellil watershed near Kairouan, north-east Tunisia (cereals and olive trees)
- central and north Argentina (forest, dry woods, agricultural area)
- several network flux sites in monsoon Asia (e.g., rice paddy, upland crop fields, grassland)

The EVASPA tool is a software currently in the prototype phase and is developed with support of CNES through the TOSCA research calls and within the frame of the European FP7 project SIRRIMED.

References :

Keywords :

Evapotranspiration, surface energy balance, MODIS, LANDSAT, Thermal infrared

Comments

No comment for this abstract

[New comment](#)