

INTERNATIONAL EARTH SURFACE WORKING GROUP (IESWG)

TERMS OF REFERENCE

1. INTRODUCTION

1.1 BACKGROUND

The International Earth Surface Working Group (IESWG) began in 2006 from the sub-group on Remote Sensing and Modelling of Surface Properties (RSMSP) under the International TOVS Working Group. After four successful meetings, at the final RSMSP meeting in Grenoble in March 2016, it was decided to spin-off the IESWG and expand its scope. Specifically, the IESWG now focuses on using Earth Observations (EO) to improve modelled land-atmosphere interactions including fluxes of energy and water, with a particular focus on improving NWP, real time monitoring, and reanalysis applications. The IESWG is motivated by the fact that it is relatively difficult to observe the states and processes most relevant to land-atmosphere interactions, due to the heterogeneity of the land surface and technology limitations on remotely sensing the sub-surface. IESWG then provides a unique opportunity for the scientific community working on land data assimilation applications within NWP and reanalysis to gather, collaborate, and establish priorities for EO relevant to our work.

1.2 INTERNATIONAL FRAMEWORK

The IESWG has a strong connection with the other CGMS International Science Working Groups (ISWG) and actively engages with the CGMS space agencies and operational environmental prediction agencies to address requirements across these partners. The IESWG also seeks engagement with other international specialist groups in related areas such as Global Energy and Water Exchanges (GEWEX) program or the WMO Global Space-based Inter-Calibration System (GSICS) to ensure consistent requirements and help communicate findings and requirements to the CGMS.

2. TERMS OF REFERENCE

The International Earth Surface Working Group aims to enhance the use of remotely sensed Earth Observation (EO)-data for Earth modelling applications, focussing on the study of processes related to land surface-atmosphere interactions. The aim of this work is to improve weather and climate monitoring and prediction through improved data assimilation of land-surface related observations.

The IESWG seeks to facilitate and guide continuity of measurements to advance science; identify significant gaps in and risks to the observational record; promote communication around land data assimilation and observations across agencies to achieve common objectives; promote the science and goals for earth observation and modelling; and foster and explore new areas for research. The IESWG is monitoring and documenting user requirements for EO data used to characterize the surface and the subsequent surface-atmosphere interaction in numerical models. The observational focus are those with sensitivity to variables including surface temperature, albedo, vegetation state, soil moisture, snow water equivalent, water-body extent, canopy parameters, vegetation water content, etc.

3. OBJECTIVES AND ACTIVITIES

The IESWG has the following objectives:

- Improved understanding of weather and climate processes relevant to the land surface through use of EO data to study land surface-atmosphere processes
- Improved land/atmosphere model performance through application of EO-data, including better optimization of model parameters, enhancement to model physics, and improvements to initial model states.
- Coordinating with experts on advancing radiative transfer and emissivity/reflectivity/scattering-emission models for land-relevant variables. This potentially includes reviewing current parameterization for forward models, description of available land emissivity databases/atlases; intercomparison and validation of physical models, AI models, and retrieved emissivity (including land and snow surfaces).
- Collating information on the current and future requirements for EO of the land surface, including as relevant aspects of their performance, stability, spatial and temporal coverage, latency, and processing / retrieval level.

4. WORKING ARRANGEMENTS

The objectives will be achieved via the following working arrangements:

The IESWG is chaired by two or three Co-Chairs, who are nominated by the current IESWG representatives and appointed by the plenary of the CGMS. These chairs will rotate nominally every three meetings, and one of the chairs who must be an employee of a CGMS member, serves as rapporteur. The Co-Chairs oversee that the aims of the Working Group are accomplished and coordinate the required reporting between the IESWG and the CGMS, including compiling reports on relevant activities for the scheduled plenary and working group meetings of the CGMS (WGII in particular). Attendance of those meetings is shared between the Co-Chairs, with the rapporteur being responsible for regular and out-of-meeting submissions.

Under the lead of the Co-Chairs, the IESWG will organize workshops, with support from CGMS and/or the WMO (where relevant), and a local host approximately every two years. The workshops will promote the exchange of scientific and operational information between the producers of satellite land products, the research community, and the user community.

5. MEMBERSHIP:

The IESWG will be open to participation from representatives of the user community expressing interest and/or willing to contribute to science of the Earth surface related to use of Earth observation data for retrieval, modelling, and/or data assimilation relevant to the land/atmosphere interface. The working group includes representatives from the satellite operators of the CGMS, other members of CGMS and relevant research satellite operators. The Working Group membership strives to engage with a broad community across countries and agencies. The current membership exceeds 150 people and spans more than 20 countries.

