# TERMS OF REFERENCE FOR THE CGMS IESWG

## 1. Background

### 1.1 Introduction to the International Earth Surface Working Group

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 harnessing Earth Observations (EO) to improve modeled surface-atmosphere interactions including fluxes of energy and water, with a particular focus on improving NWP, real time monitoring, and reanalysis applications. The IESWG 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 ultimate aim of this work is to improve weather and climate monitoring and prediction through improved data assimilation of land-surface related observations and their use to improve model parameterisations.

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 modeling; 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.

***The Objectives of the IESWG are:***

- 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.

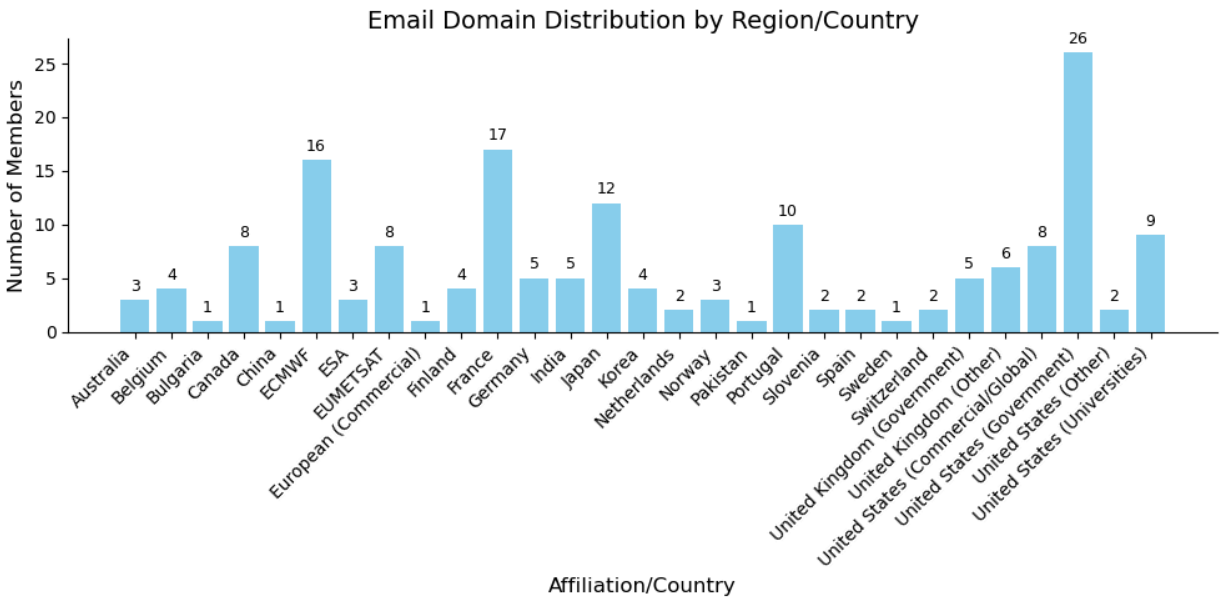
***Working Arrangements:***

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 meetings of the CGMS.

Under the lead of the Co-Chairs, the IESWG will organize workshops, co-sponsored by CGMS, the WMO, 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.

***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, modeling, 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.


Email Domain Distribution by Region/Country
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Belgium
Bulgaria
Canada
China
ECMWF
ESA
EUMETSAT
European (Commercial)
Finland
France
Germany
India
Japan
Korea
Netherlands
Norway
Pakistan
Portugal
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Spain
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