Land Surface Focus Group

Breakout

IPWG 2024

Outline for discussion

- Introductions and interest areas
- What are pressing gaps and needs in this area?
  - Low hanging fruit?
  - Synergies with other communities?
- Who are the stakeholders?
- What resources are available to do this work?
  - How do we as a community advocate for resources?
- What can we do now, with present resources?
  - How can we work more collaboratively
  - Those who have volunteered for the review study – best way to move forward on this?

International Earth Surface Working Group (IESWG)

Clara Draper (NOAA) and Samantha Pullen (UK Met Office) - Co-chairs

- Current IESWG ToR ratified by CGMS WG-II:
- https://docs.google.com/document/d/1RfslzrLyEMy7pK_DgQT8FAqVLCTOtFh2/edit

- The IESWG was approved as a probationary CGMS working group, acknowledging its
- distinctive blend of data assimilation and Earth surface modeling expertise, aimed at
- maximizing the utilization of present and upcoming observations.

- The IESWG has a distinct vocation towards earth surface data assimilation, observation
- operators and modelling developments that can advance coupled land-atmosphere
- assimilation in numerical weather prediction and climate/environmental reanalyses.

- The three main topical areas in the IESWG are:
  - Snow ice and cryosphere-atmosphere interaction
  - Vegetation and land-atmosphere fluxes
  - Soil moisture, river-discharge and water cycle

- **Can IPWG identify areas of interaction and exchange with IESWG?**

The Objectives of the IESWG are:

•Coordinate recommendations and actions from the IESWG, particularly focusing on current and emerging environmental observations that focus on the Earth surface, and providing a close connection with CGMS to allow for faster uptake and distribution of these observations

•Use of EO data for modelling the Earth land and snow covered surface using both active and passive remote sensing data relevant to study processes and the surface-atmosphere interactions characterized for the purposes of improvement of Earth surface models for NWP and reanalysis;

•Use of EO-data for NWP and others surface model parameter optimization including surface temperature, albedo, vegetation state, soil moisture, snow water equivalent, water-body extent, canopy parameters, vegetation water content, etc. and the resulting surface emissivity/reflectance/(solar induced fluorescence) spectra;

•Charting the state of the operational Earth Surface and Land Data Assimilation Systems (LDASs); sensitivity studies of surface model parameters to remotely sensed data; outcomes of assimilating sensors such as SMOS, SMAP, ASCAT, GCOM and GPM and the follow-on missions building from this heritage; along with, their combination with higher resolution sensors such as MODIS/VIIRS and Sentinel-3-OLCI;

•Advancing radiative transfer and emissivity/reflectivity/scattering-emission model development for VIS/IR/MW over land and snow covered surfaces. Review current parameterization for forward modelling of the surface boundary; description of available land emissivity databases/atlases; intercomparison and validation of physical models and retrieved emissivity (including land and snow surfaces);

•Advance Coupled Data Assimilation, via parameter optimisation, extended control vector applications, data-driven approaches to observation operators, etc.