Summary of EWGLAM Surface Sessions 2021

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Summary of Surface Plenary session

We had three Consortia overviews:

- COSMO by Jürgen Helmert
- ECMWF by Patricia de Rosnay and Gianpaolo Balsamo
- ACCORD by Ekaterina Kurzeneva and Patrick Samuelsson

We ALL go towards more advanced surface physics, e.g. multi-layer snow schemes, dynamic vegetation processes, more advanced urban processes. And we look into new physiography, e.g. ESA-CCI land cover.

We also saw developments related to mires (COSMO), river routing and its coupling to snow pack (ECMWF), air-sea/ocean/waves coupling (ACCORD).

For surface assimilation we see increased number of algorithms applied which allow for satellite observations to be used (soil moisture, LAI, snow extent, …). The need for monitoring of observation usages was emphasized. And nice, better surface physics means less job for the assimilation.

Summary of Surface Plenary session

Matt Nagle: "Can we rely on citizen weather measurements for operational use?"

- **Evaluation of Irish WOW-observations and Quality Control by the MetNorway software titanlib. The answer to the question is yes, as long as proper QC is applied.**

Agenda of Surface Breakout Session

We were nicely brought back to the basic theory by:

- Daniel Regenass: "Numerics of the 1d Richards Equation and implications for land surface modelling on the kilometer-scale"

    - **The Richards soil moisture equation is very sensitive to model time step and soil layer discretization. Thus, e.g. surface runoff can be easily overestimated with coarse discretization or long time step.**

- Samuel Viana and Metodija Shapkalijevski: "Implementation of Roughness Sublayer in SURFEX"

    - **Roughness Sublayer theory gives better fluxes and wind speed profiles over forested areas compared to classical Monin-Obukhov similarity theory.**

Agenda of Surface Breakout Session

Three physiography related talks:

- Geoffrey Bessardon: comparing land covers' pros and cons
- Eoghan Keany: ML related to urban building heights.
- Patrick Samuelsson: survey of the use of ESA-CCI land cover.

Emily Gleeson (Met Éireann) asked the question in the chat: "Do you think at some stage that we should hold a cross consortium physiography meeting to discuss lots of things?"

The question illustrates the quite intense discussion and that ALL of us are looking at alternative ways forward including e.g.

- **different databases representing different resolutions and regions of land cover**

- **… and how to complement them with still missing information (urban and water classes),**

- **… and how ML shows promising potential in combining existing land cover databases with satellite information to reach more precise physiography at higher resolution (but still with cons, e.g. need for tuning)**