BOG: LAND COMPONENT

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Notes: Sabine Griesbach (FZ-Jülich)

WHAT WE DID…

26 Participants from a range of groups and disciplines

‣ Compared to 2023 lacking some key groups (e.g. LPJ- and impact modelling communities)

Presentations from R. Schnur (MPI-M), J. Pongratz (LMU) ,

L. Schlemmer (DWD), S. Zaehle (MPI-BGC)

‣ Current developments in the JSBACH4, TERRA and QUINCY groups

‣ Additional discussions of work on eCLM5+Parflow @ FZJ

Discussion of

‣ Concrete plans to harmonise configurations and process representations

‣ Ways to enable the NatESM community to interact and contribute to the ongoing Land developments

ICON-LAND

*Framework for modelling land processes in ICON*

Goals

Integration of concurrent process and surface descriptions in a flexible and easy-to-use way

Separate the infrastructure required to implement physical, bio-geophysical and bio-geochemical land processes from concrete process implementations accessed by abstract interfaces

Support various experimental configurations regarding scope and complexity, spatial and temporal extend, offline as well as coupled

Open Source (BSD-C3)

Gitlab-based wiki for documentation (work in progress)
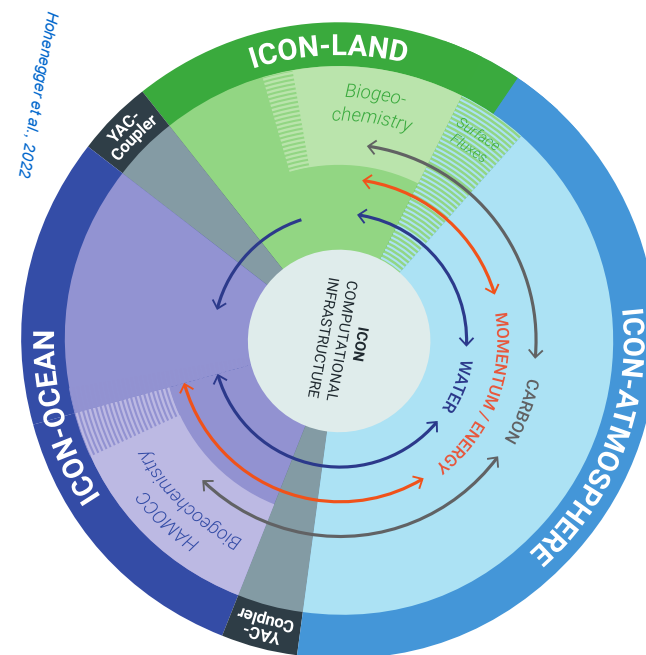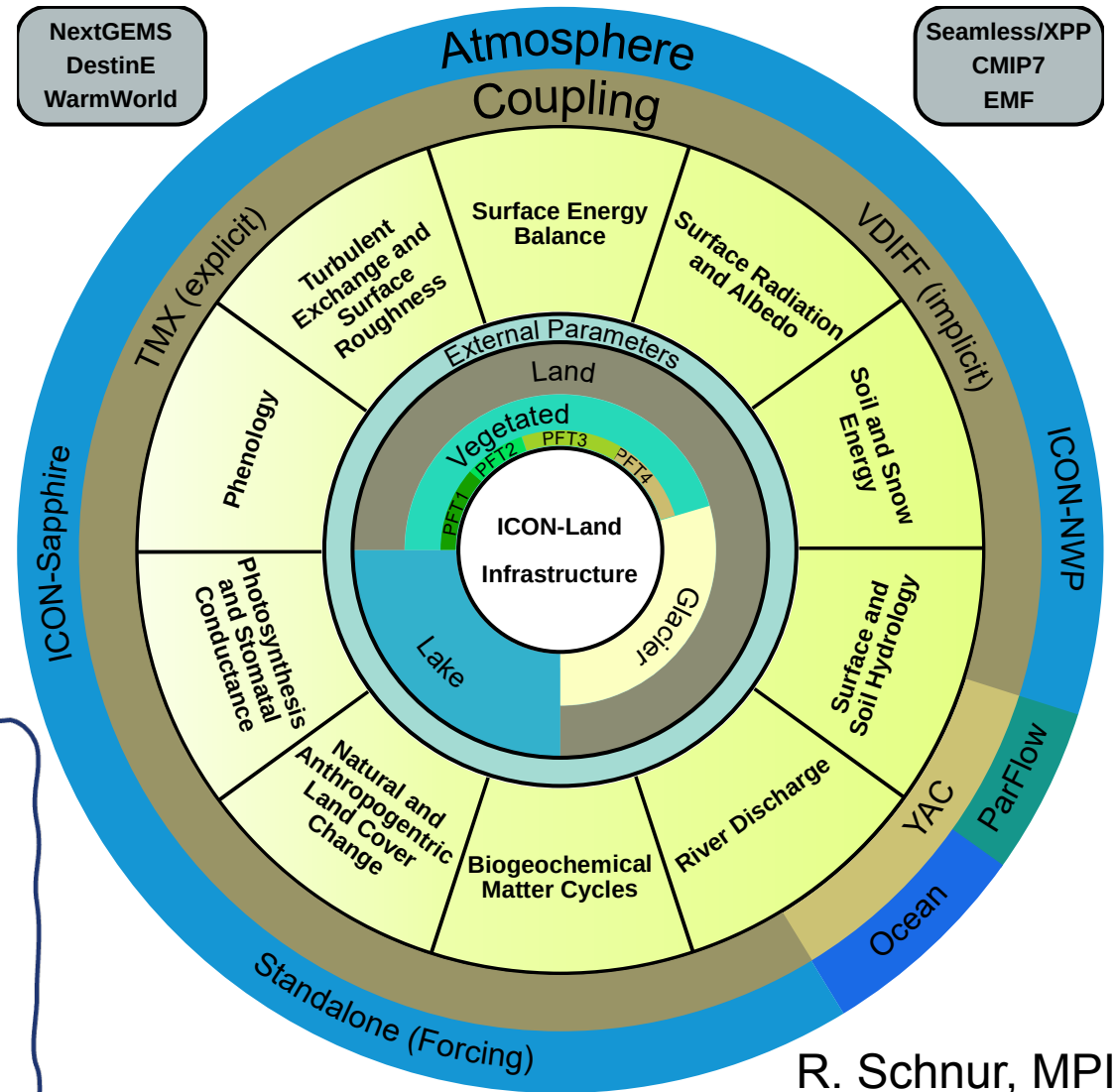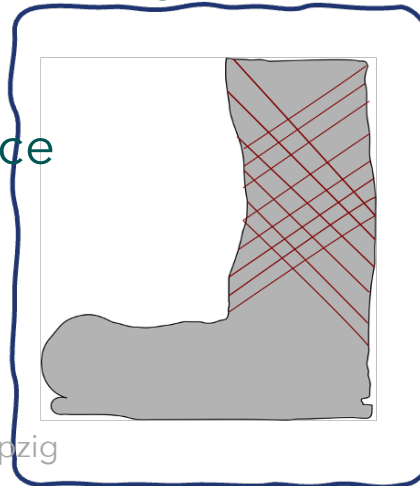

ICON-Land is developed by a consortium:

- Victor Brovkin (MPI-M)
- Cathy Honegger (MPI-M)
- Julia Pongratz (LMU)
- Linda Schlemmer (DWD)
- Reiner Schnur (MPI-M)
- Sönke Zaehle (MPI-B)

ICON-LAND MODEL

‣ Clarification of what ICON-Land is (not)

‣ Significant progress towards a "unified" ICON-Land model with configurations based on JSBACH4, TERRA and QUINCY

‣ Still significant work required to harmonise common process representation and allow "required configurability"

‣ Topics:

  ‣ Turbulence parameterisation & tiling

  ‣ Soil physics and hydrology

  ‣ Land-use change + disturbance

NextGEMS
DestinE
WarmWorld

Seamless/XPP
CMIP7
EMF

Atmosphere
Coupling

TMX (explicit)

Turbulent Exchange and Surface Roughness

Surface Energy Balance

Surface Radiation and Albedo

VDIFF (implicit)

External Parameters

Land

Vegetated

PFT1 PFT2 PFT3 PFT4

Soil and Snow Energy

ICON-NWP

ICON-Land Infrastructure

Phenology

ICON-Sapphire

Photosynthesis and Stomatal Conductance

Lake

Glacier

Surface and Soil Hydrology

Natural and Anthropogentric Land Cover Change

Biogeochemical Matter Cycles

River Discharge

YAC

ParFlow

Ocean

Standalone (Forcing)

R. Schnur, MPI-M

L. Schlemmer, DWD

ICON-LAND GOVERNANCE AND COMMUNITY?

Request for more transparency and information on how to contribute

- Management committee driven by strategies in individual institutions
  - Current structure makes it difficult for wider community to engage, use and potentially contribute
  - Clear gate-keeping policies, but no resources to support community developments
  - No clear strategy to include down-stream modelling activities (e.g. impact modelling)

Suggested measures:

- NatESM gitlab "meta-model" as source of information on available ICON-Land configurations/processes and development areas and gaps
- Promote NatESM SG as channel to contact ICON Land management committee
- Revive ICON-Land webpage (lost in MPI-M webpage restructuring)
- Initiate specific working groups?

ICON-LAND GOVERNANCE AND COMMUNITY?

How independent is ICON-Land from ICON?

- ‣ ICON-Land has its own governance, but

- ‣ Need for co-ordination of ICON-Land and ICON model development

  - ➡ Interfaces/turbulence scheme etc. (lots of work going on at DWD and MPI-M)

  - ➡ Would coupling via YAC be an option for the future

  - ➡ Important to realise that in the future ICON-Land will exist in many different configurations to meet demands from NWP to past and future climate projections

ICON-Land 1st community meeting:

- ◉ 27-29.11.2024 @ MPI-BGC in Jena (jointly with Gingko meeting)

- ◉ Will focus on bringing the ICON-Land community together

- ◉ Open to wider land modelling community in Germany

- ◉ More details still to be developed….