Towards a European Coordinated Effort on Greenland

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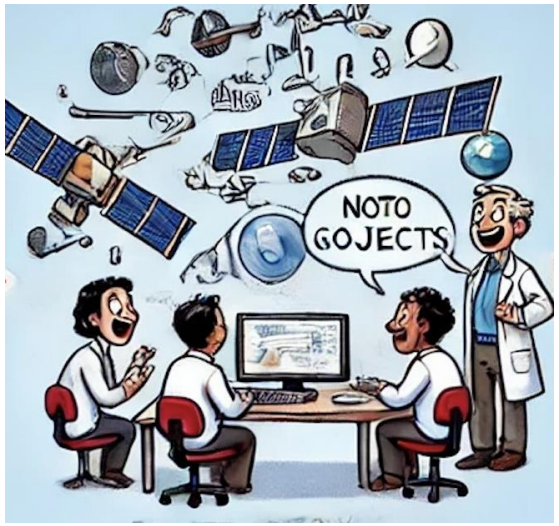
How it used to be.

- Ice sheet and climate modelling and EO research are two different communities.
- There was no or little overlap or collaboration between these communities.
- Agencies did not necessarily support collaboration.
- Great advances within each field.

Modelling



Earth Observation

How it started to change

- Earth Observation data used as
  - validation / benchmarking of model output.
  - boundary conditions for model runs.
- Not actual collaboration but uptake of data
- One-way data flow

Modelling

Earth Observation

Current progress

- Fruitful communication - encouraged by agencies
- Data and information exchange between communities
- Common workshops and conferences (like this one)
- Towards data assimilation into models
- Co-creation of data cubes

Modelling & Earth Observation

Towards a European Coordinated Effort on Greenland

- Continue and increased funding for collaborative projects which include both modelling and EO communities.
- Projects must be co-designed
- Exchange of data and information in both directions.
- Data assimilation into models.
- Use of models to interpret EO data
- Tailored and easy-to-handle EO data
- Inclusion of Greenland partners and stakeholders in projects.

Modelling & Earth Observation

Towards a European Coordinated Effort on Greenland – great examples

European Commission

HORIZON-CL5-2024-D1-01-02:
Inland ice, including snow cover, glaciers, ice sheets and permafrost, and their interaction with climate change

"This topic is part of a coordination initiative between the European Space Agency (ESA) and the EC on Earth System Science."

The research actions should contribute to observing, modelling, and projecting…

IGS 2024
Bringing Data and Models Together
Northumbria University

Towards a European Coordinated Effort on Greenland – great examples

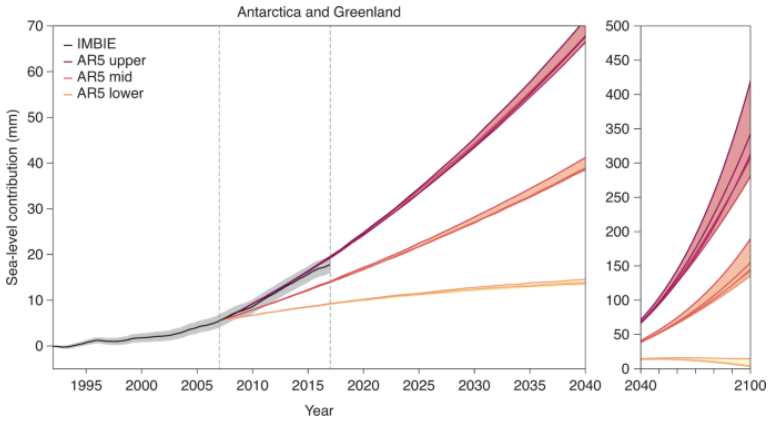
→ “Ice sheets” chosen as one of the initial components.

ESA Tender Action 1-12469 - INTERFACING THE CLIMATE OBSERVATIONS AND MODELLING COMMUNITIES

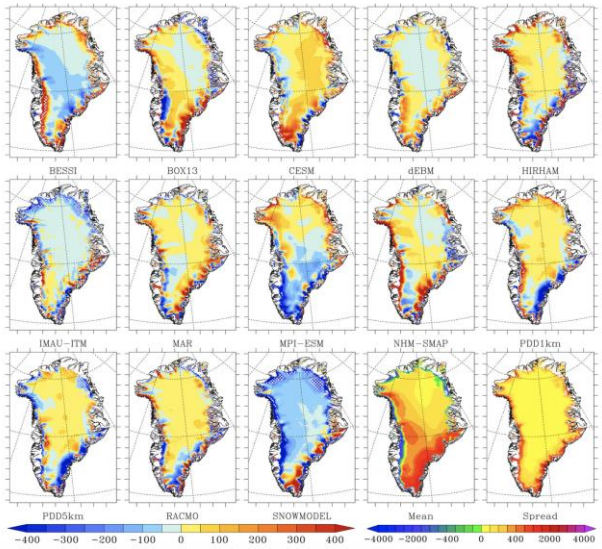
Work will focus on the use of multiple ESA/CCI Essential Climate Variables (ECV) […] to improve aspects of climate modelling, such as model benchmarking, assimilation, reanalysis, initialisation, […]

Towards a European Coordinated Effort on Greenland – some scientific objectives

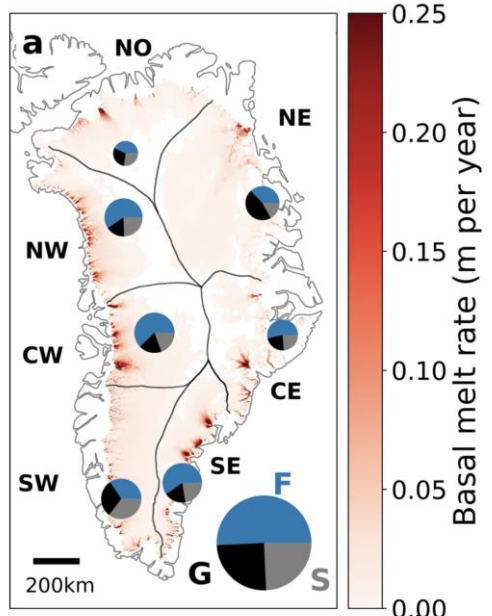
- Data assimilation into models.
- Surface mass balance of the ice sheet.
- Reducing uncertainties in model projections.
- Feedback loops
- Tipping points.
- Subglacial hydrology
- …. and more



[Slater et al., 2021]



[Fettweis et al., 2021]



Karlsson et al., 2021