COST-G
Combination Service for Time-variable Gravity Models

The Combination Service for time-variable Gravity Fields

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Swiss Geoscience Meeting
Bern, 06/12/2025

Session 23: Geodesy

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UNIVERSITÄT BERN

G3P

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- Introduction to COST-G

- COST-G operations (example GRACE-FO):
  - Quality control
  - Combination
  - Validation

- COST-G products

COST-G: product center of the IGFS

Gravity and geoid metadata

Online applications for the creation of metadata for gravity and geoid data. Service for searching the metadata database.
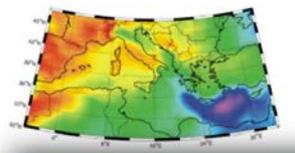
g–μeta
the gravity metadata editor
(v0.2.6 – beta edition)

N–μeta
the geoid metadata editor
(v0.1.3 – alpha edition)

Gravity data

Land, marine, airborne gravity data as point and gridded values. Absolute and relative gracity data, WGM
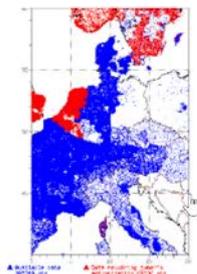
Geoid

Geoid models and geoid determination software, geoid modeling processing methodologies

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SG and Earth tide data

Temporal variations of the Earth gravity field through long-term records from ground gravimeters, SG data, Earth tide data.

Global Earth Models

Collection and archive of all existing global gravity field models, web interface for access to GEMs, model visualization and service.
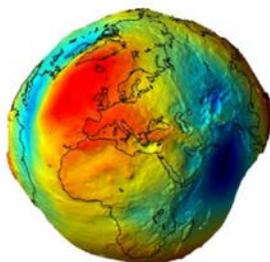
Time-variable GEMs

Combined gravity field solutions in SH coefficients and spatial grids for hydrological, oceanic and polar ice sheets applications.

COST-G
Combination Service for Time-variable Gravity Models

DEM data

Digital Elevation Models, relevant software for DEM creation, assessment, manipulation and display, global relief and crustal models and spherical harmonic data sets.
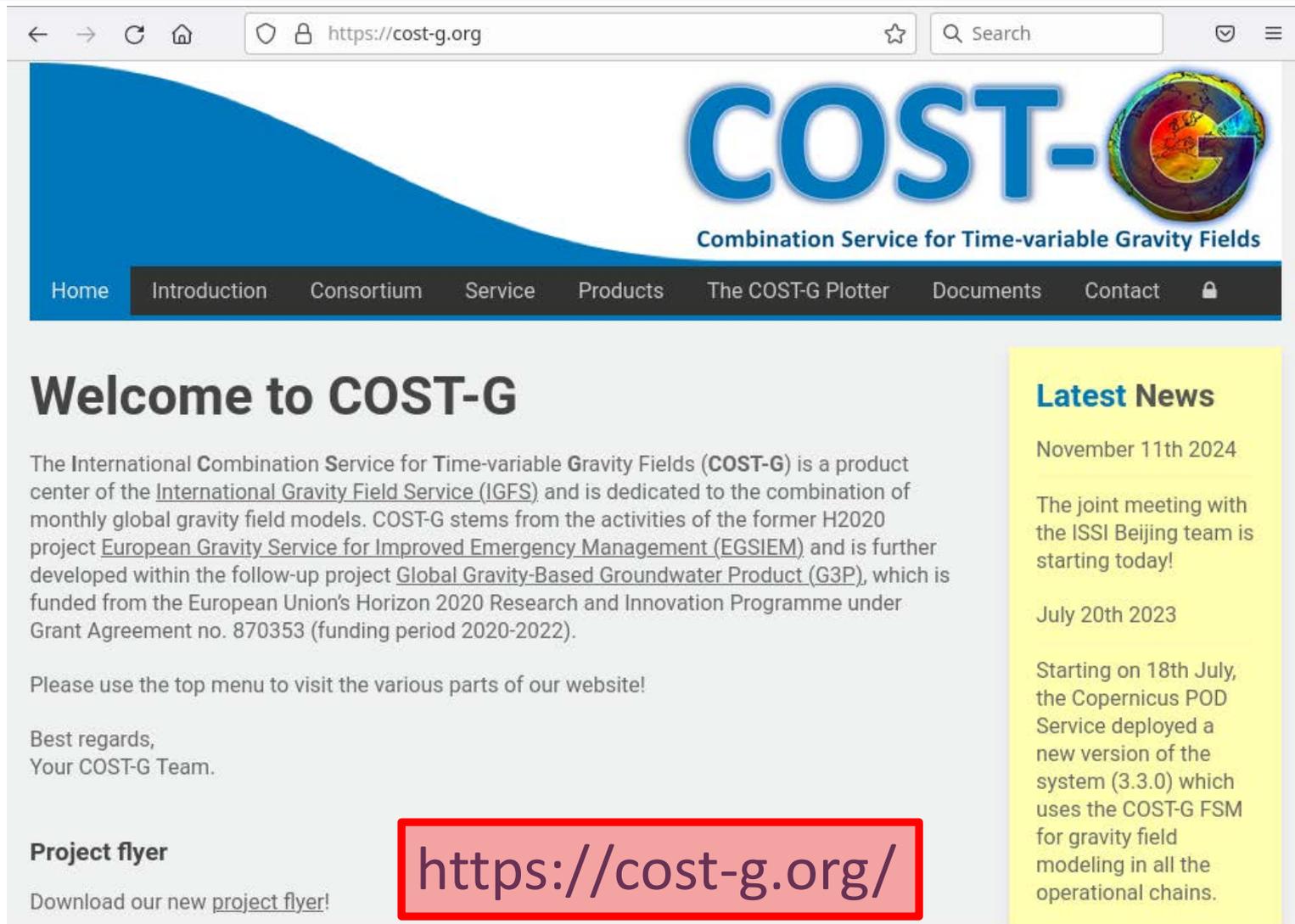
COST-G is a product center of the

International Association of Geodesy
IAG
I G F S

http://igfs.topo.auth.gr/

COST-G: Website

COST-G: Permanent Components

COST-G accomplishes its objectives through the following permanent components and roles:

- **Central Bureau (CB) & Analysis Center Coordinator (ACC)**
  - AIUB
- **Analysis Centers (ACs)**
  - AIUB, GRGS, GFZ, HUST, LUH, Tongji, TUG
- **Level-3 Center (L3C)**
  - GFZ
- **Validation Centers (VCs)**
  - GRGS, GFZ
- **Product Evaluation Group (PEG)**
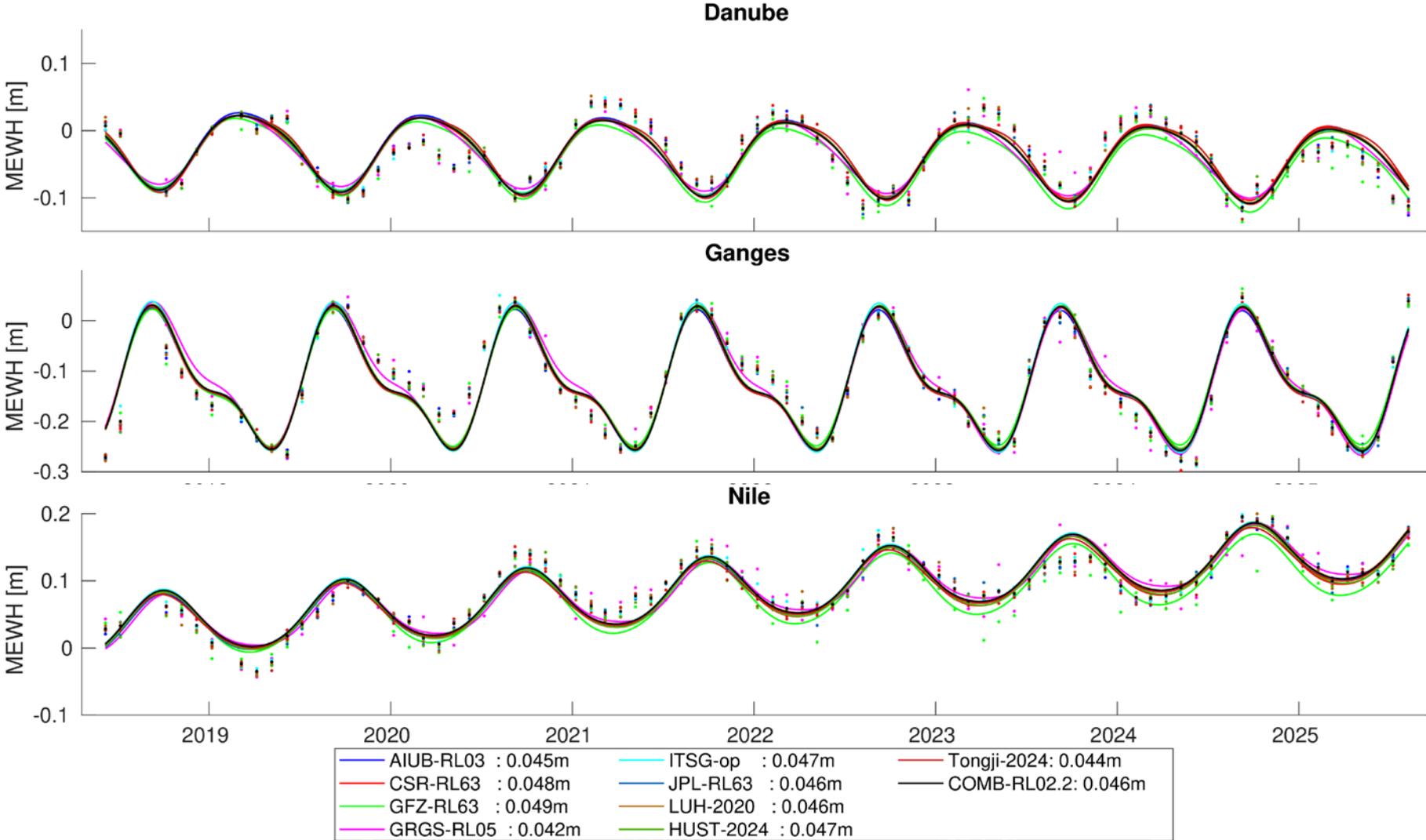 - A. Eicker, M. Horwath, B. Meyssignac

- **Partner ACs:** CSR, JPL
- **Candidate ACs:** further Chinese ACs

COST-G operations: Harmonization
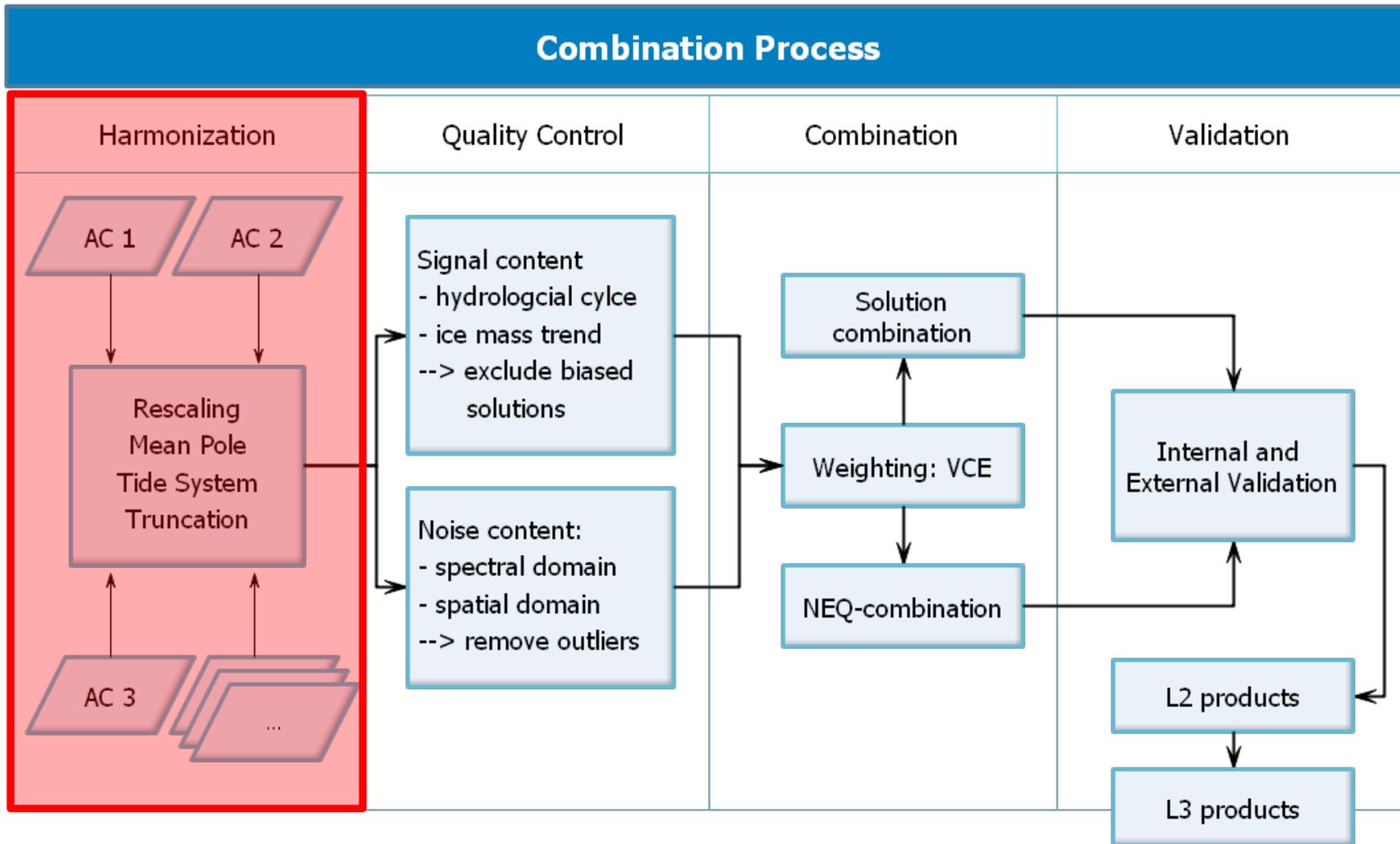
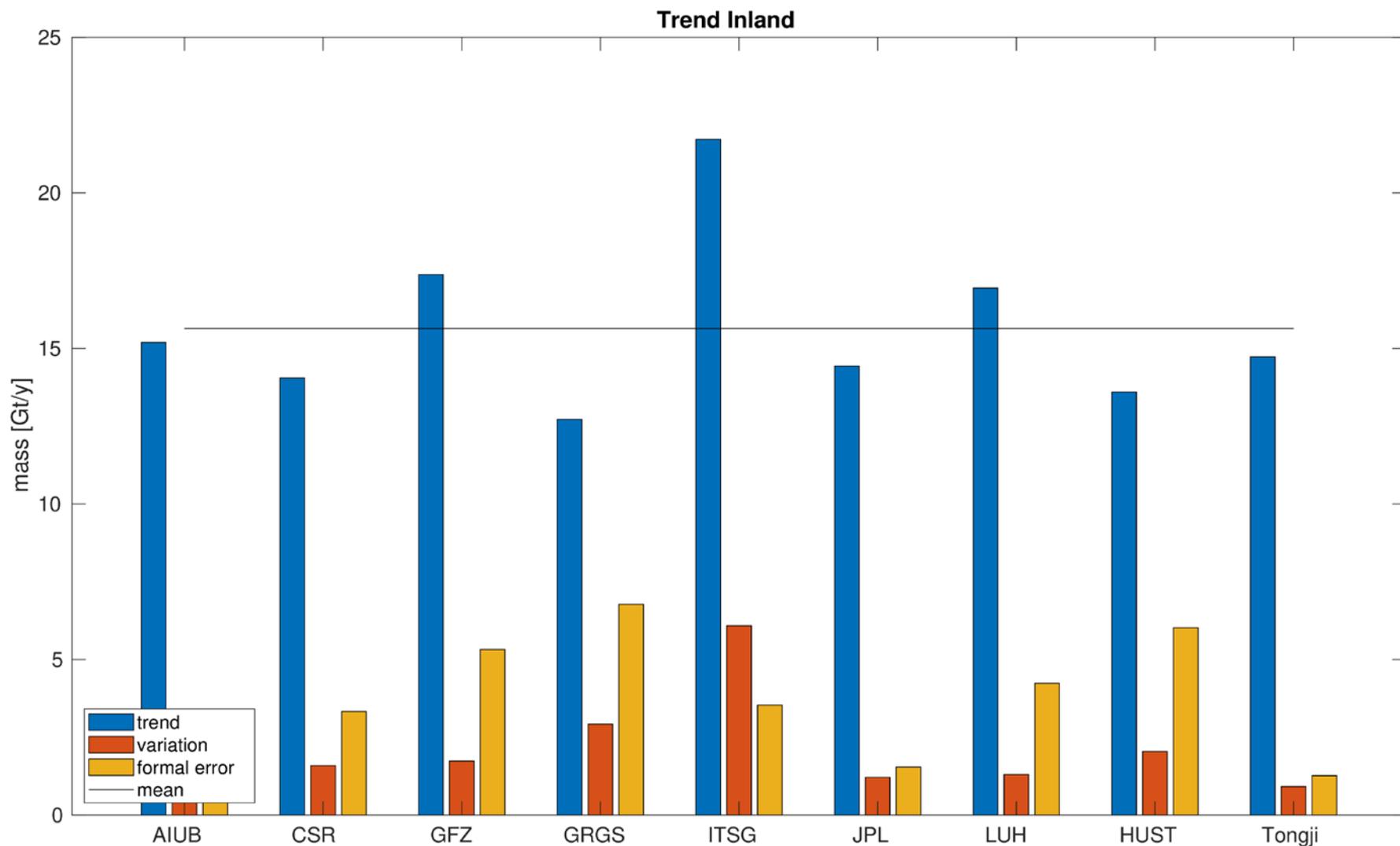# COST-G operations: Quality Control
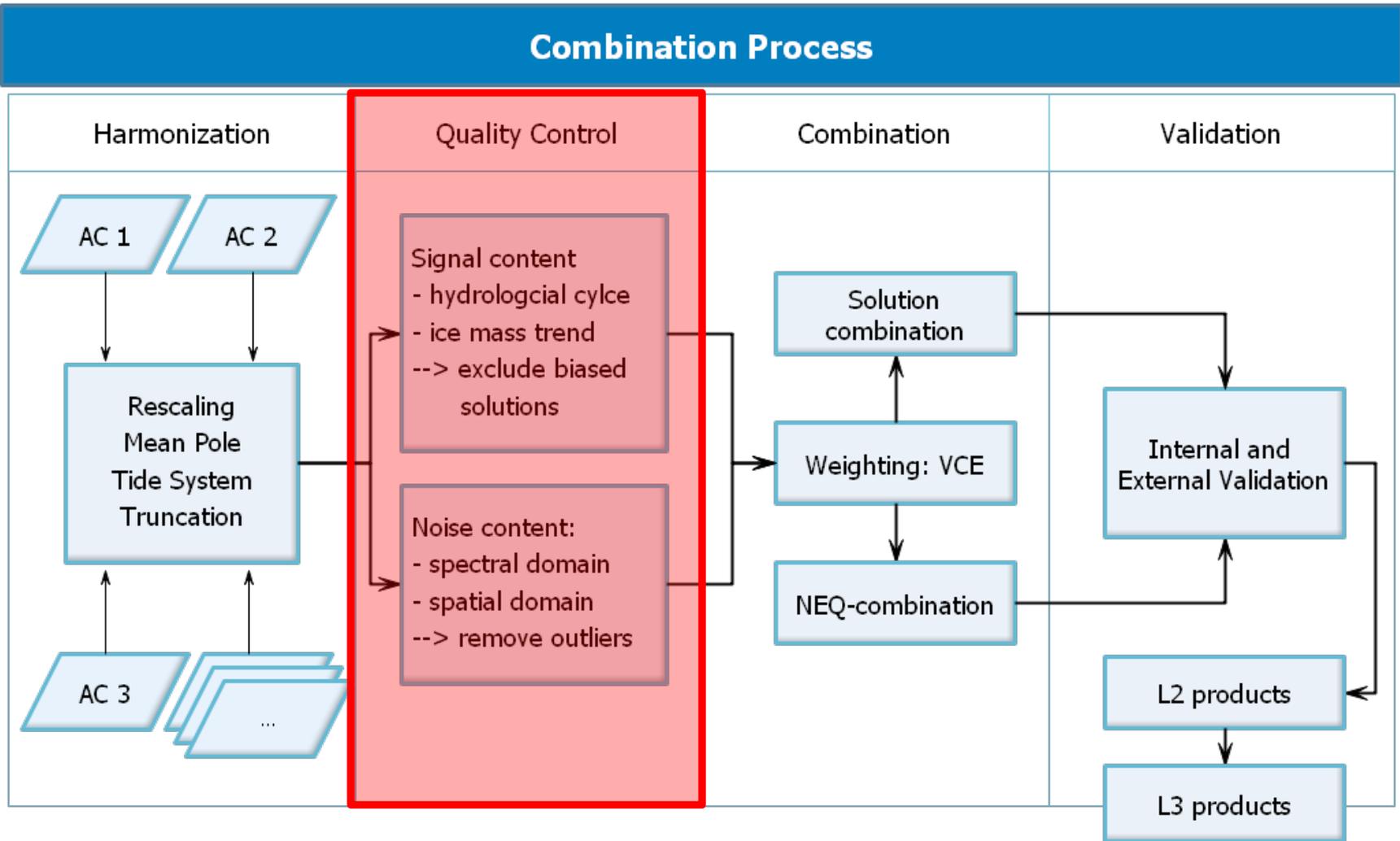
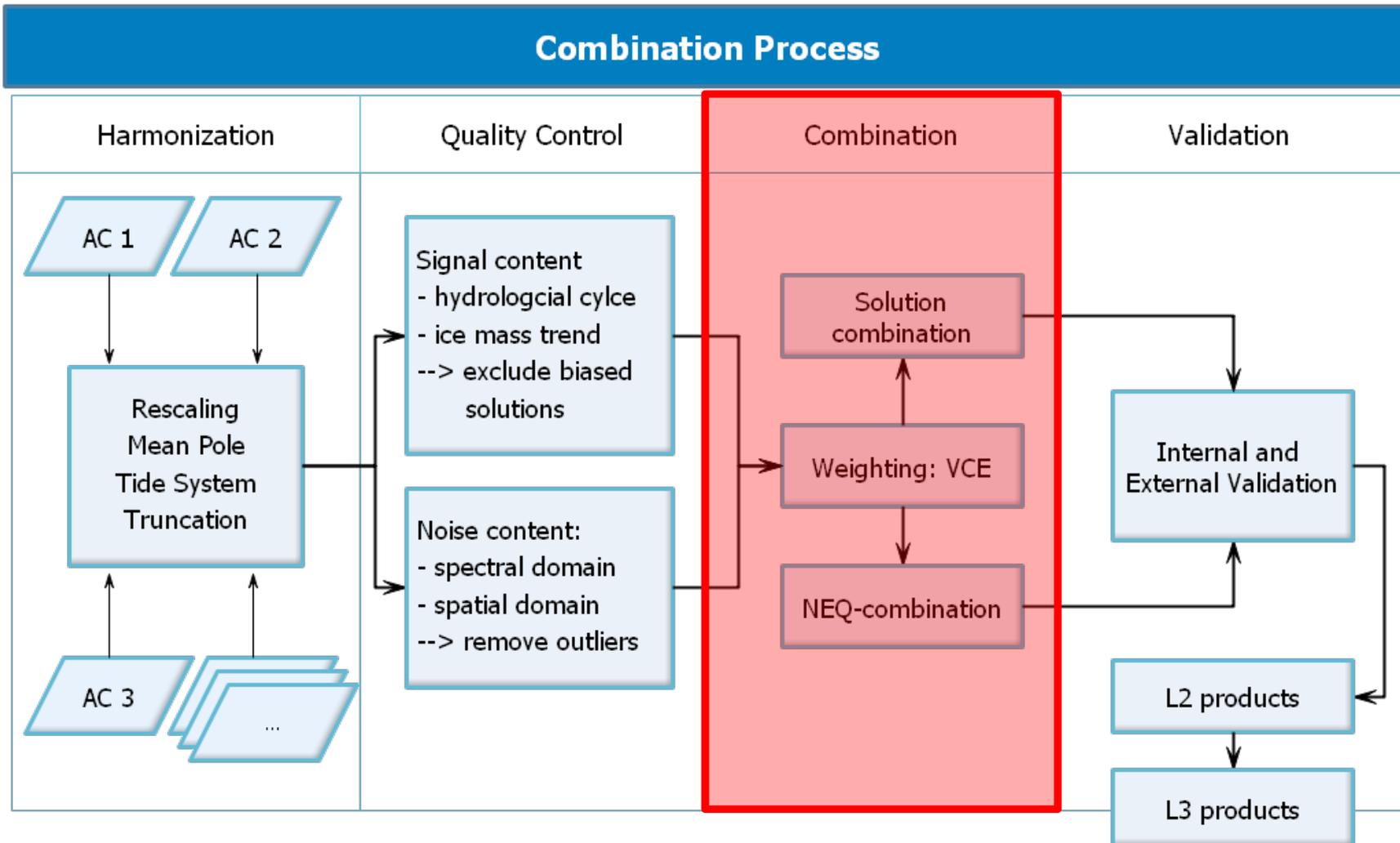# Quality control: Hydrological signal content (GRACE-FO)

Quality control: Ice mass change in Greenland (GRACE-FO)
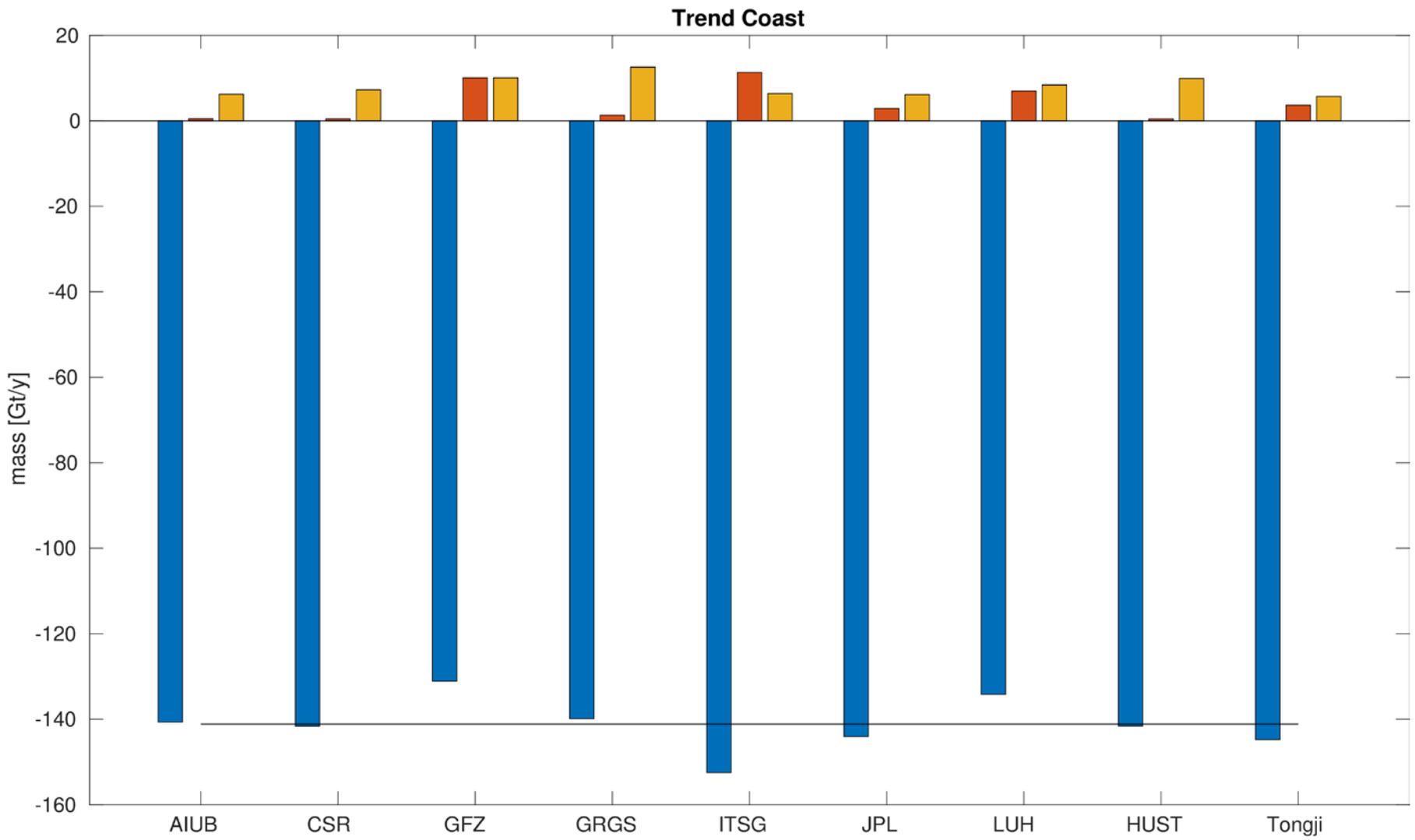
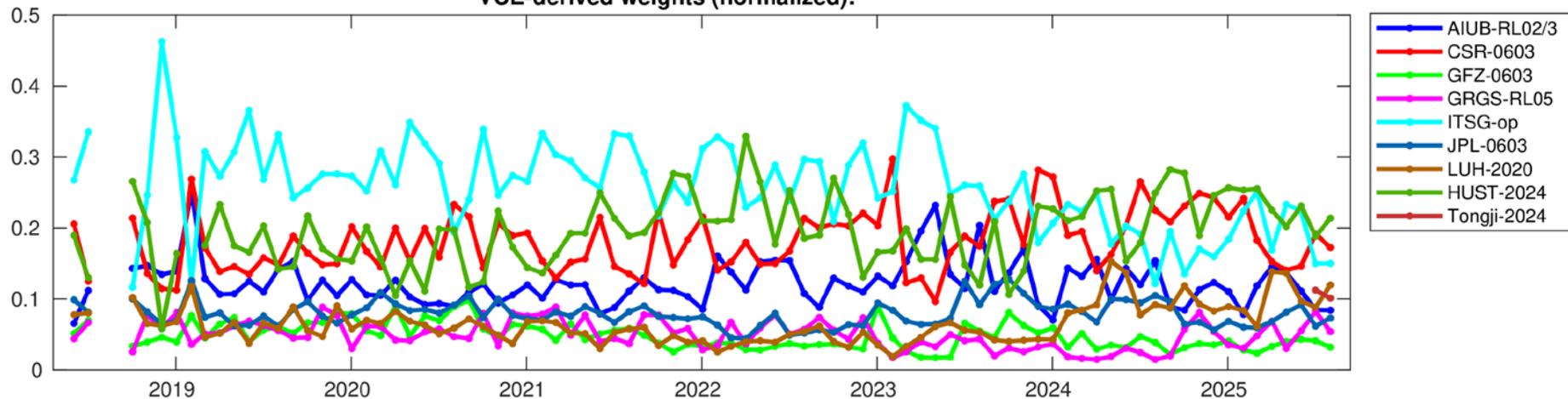# Quality control: Ice mass change in Greenland (GRACE-FO)
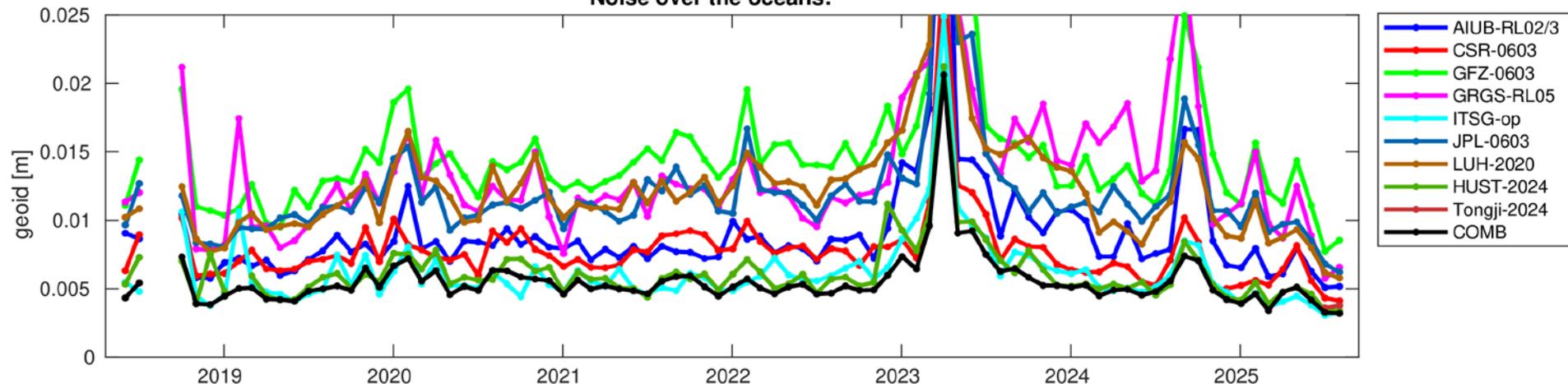
COST-G operations: Combination
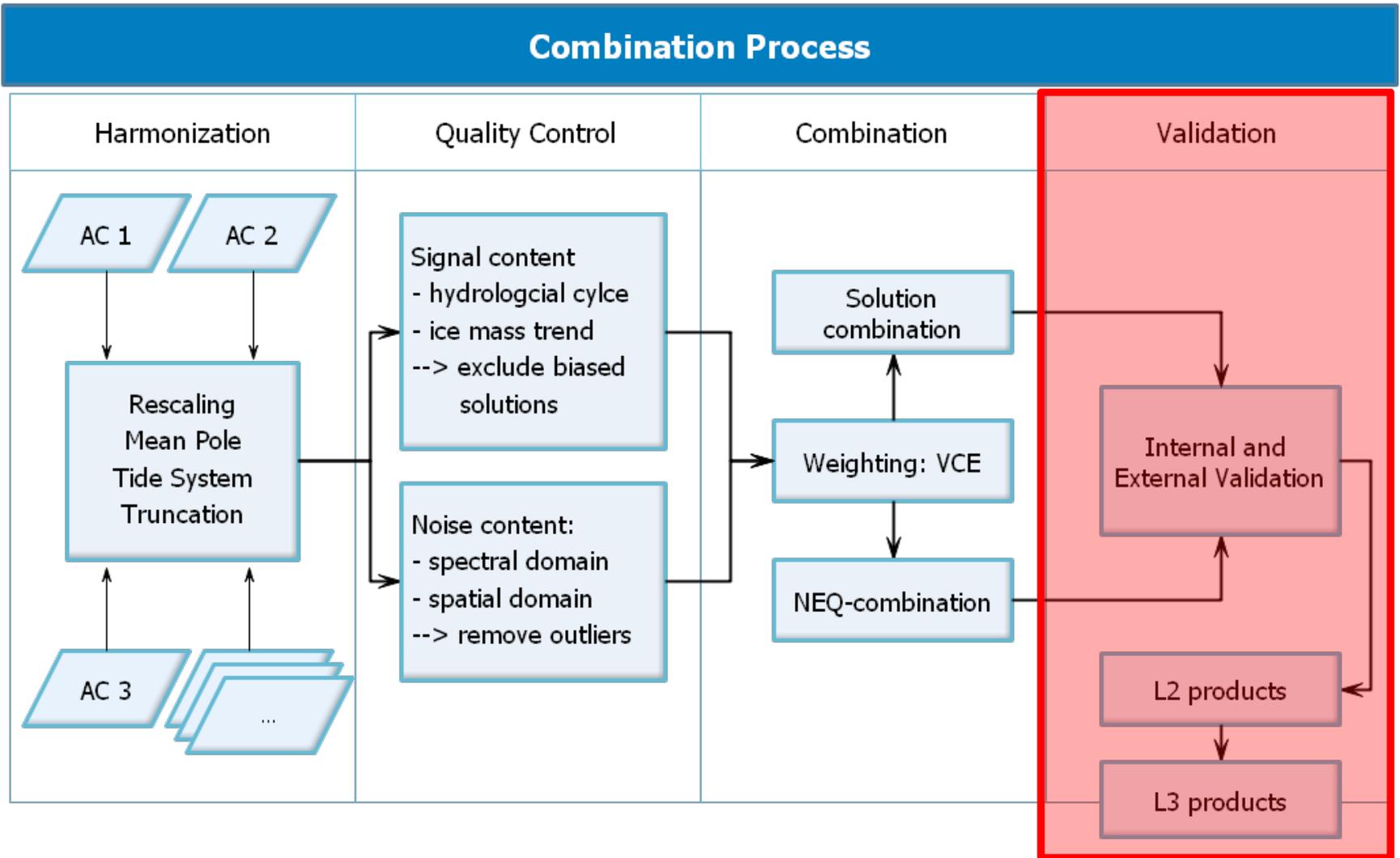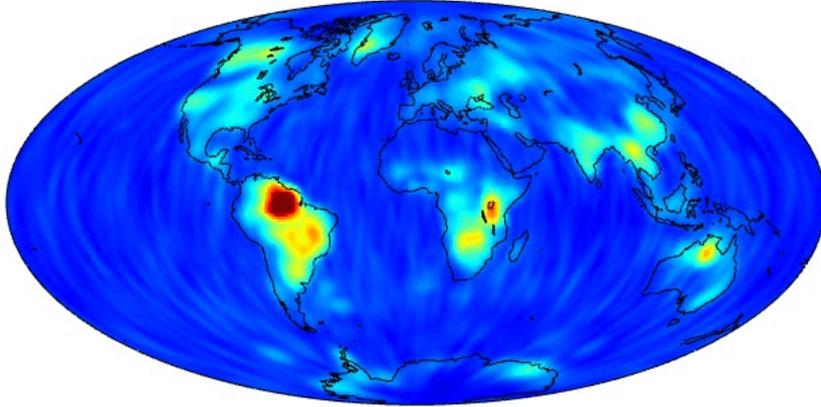
Relative weights by Variance Component Estimation
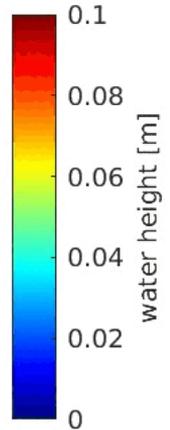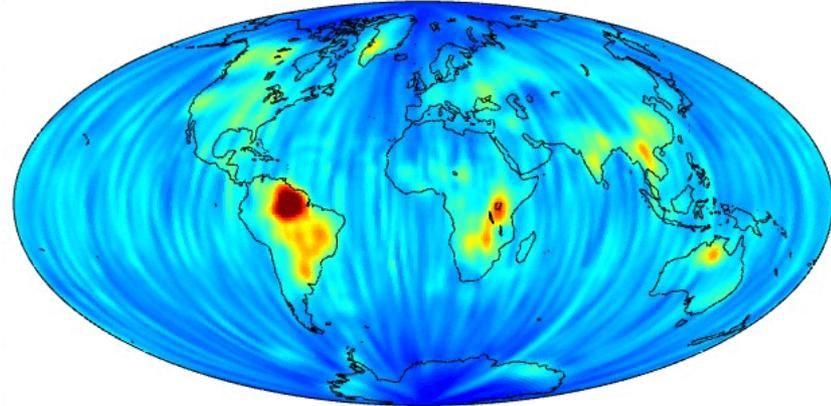
COST-G operations: Validation
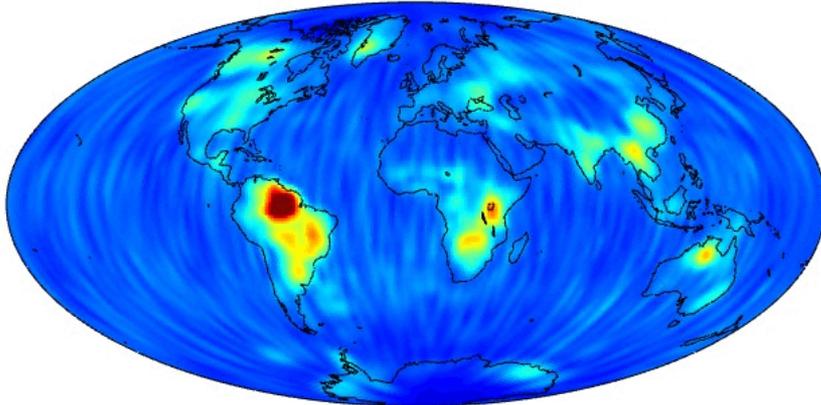
Validation: Noise Levels (spatial domain)

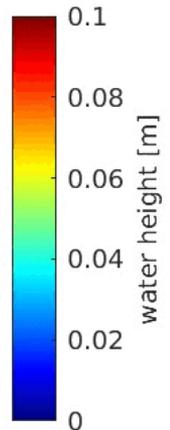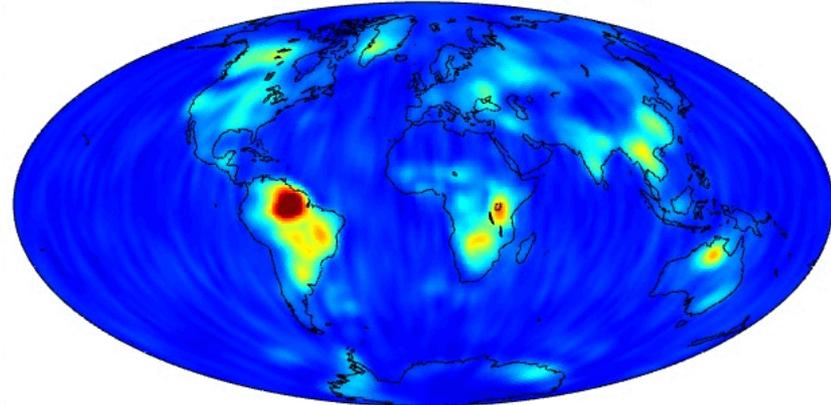Residual variability of CSR-0603

Residual variability of GFZ-0603

Residual variability of JPL-0603

Residual variability of ITSG-op

water height [m]
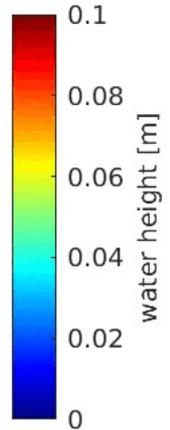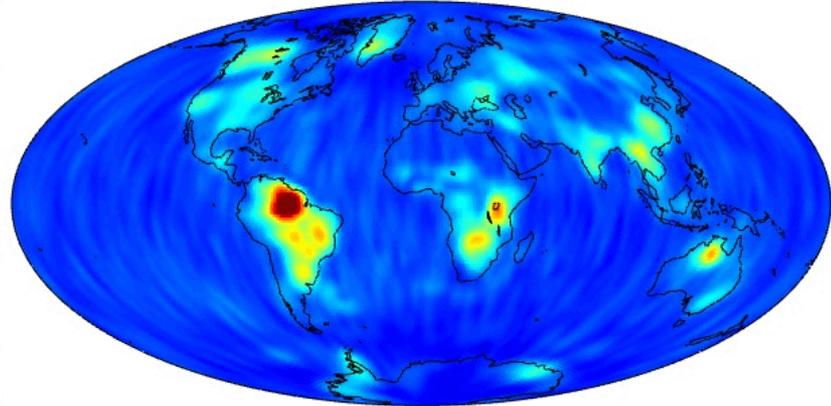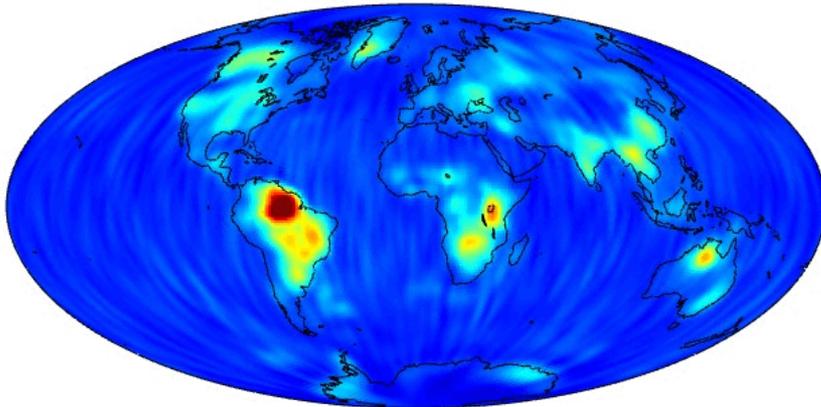
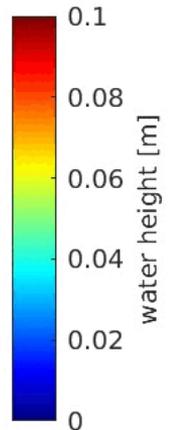# Validation: Noise Levels (spatial domain)

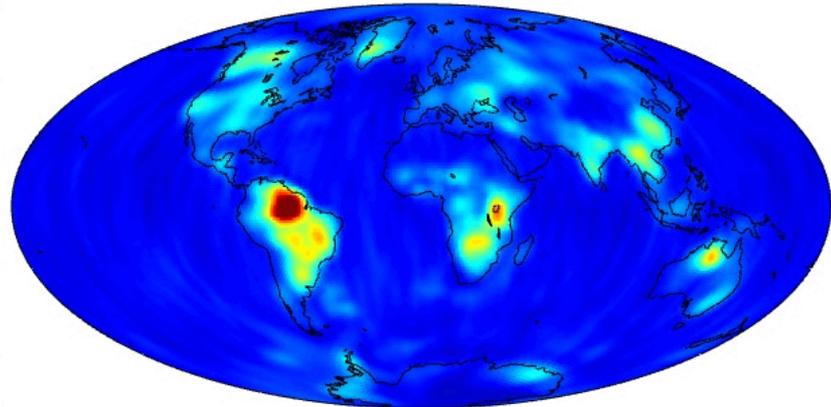Residual variability of Tongji-2024
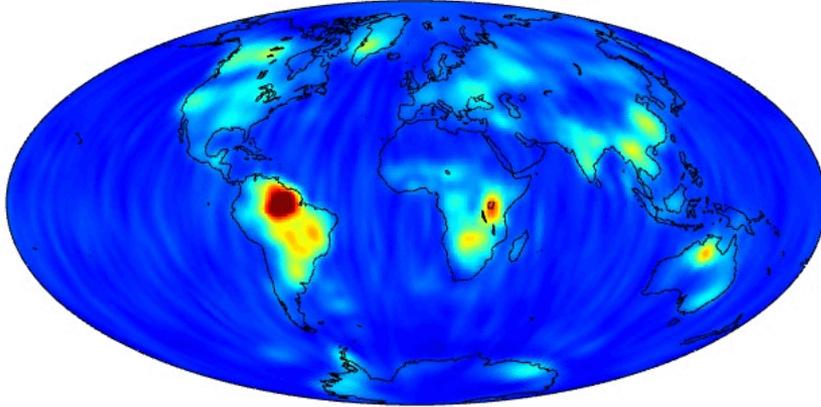
Residual variability of HUST-2024

Residual variability of AIUB-RL03

Residual variability of COSTG-RL02.2

water height [m]
0.1
0.08
0.06
0.04
0.02
0

COST-G: products (GRACE/GRACE-FO)
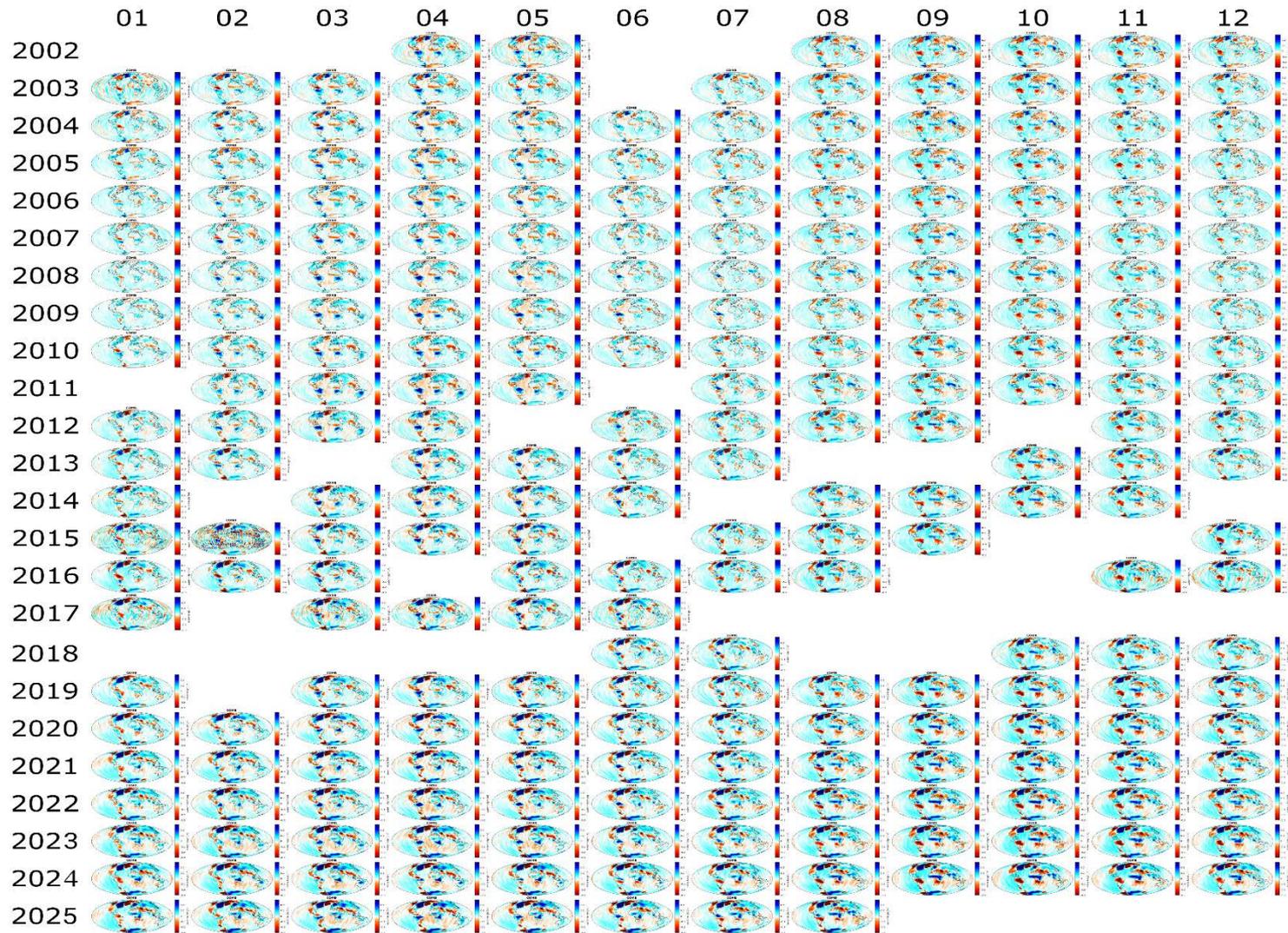
COST-G: products (Swarm)
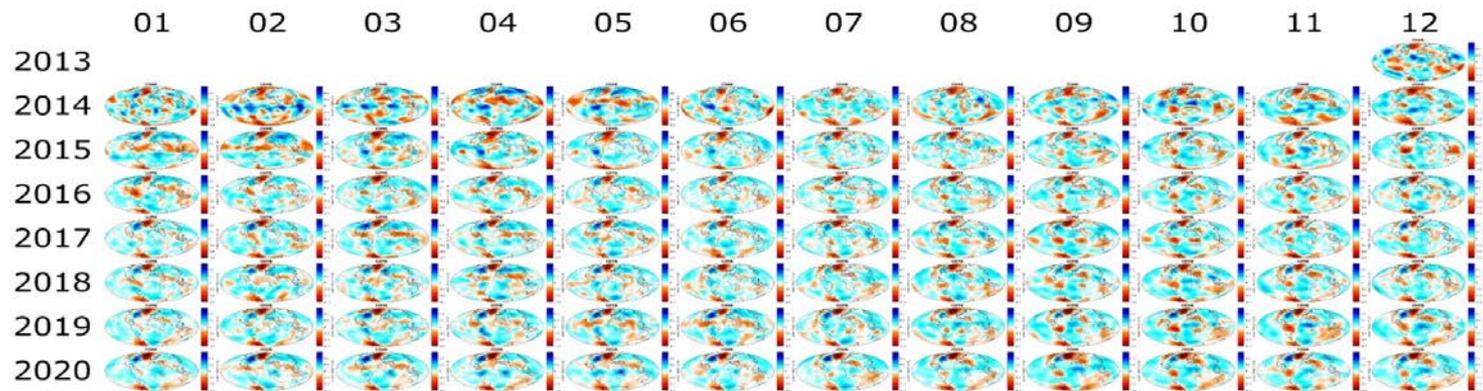
COST-G products: Level-2 (spherical harmonic)

COST-G products: Level-3 (post-processed grids/time-series)

COST-G products: Level-3 (post-processed grids/time-series)
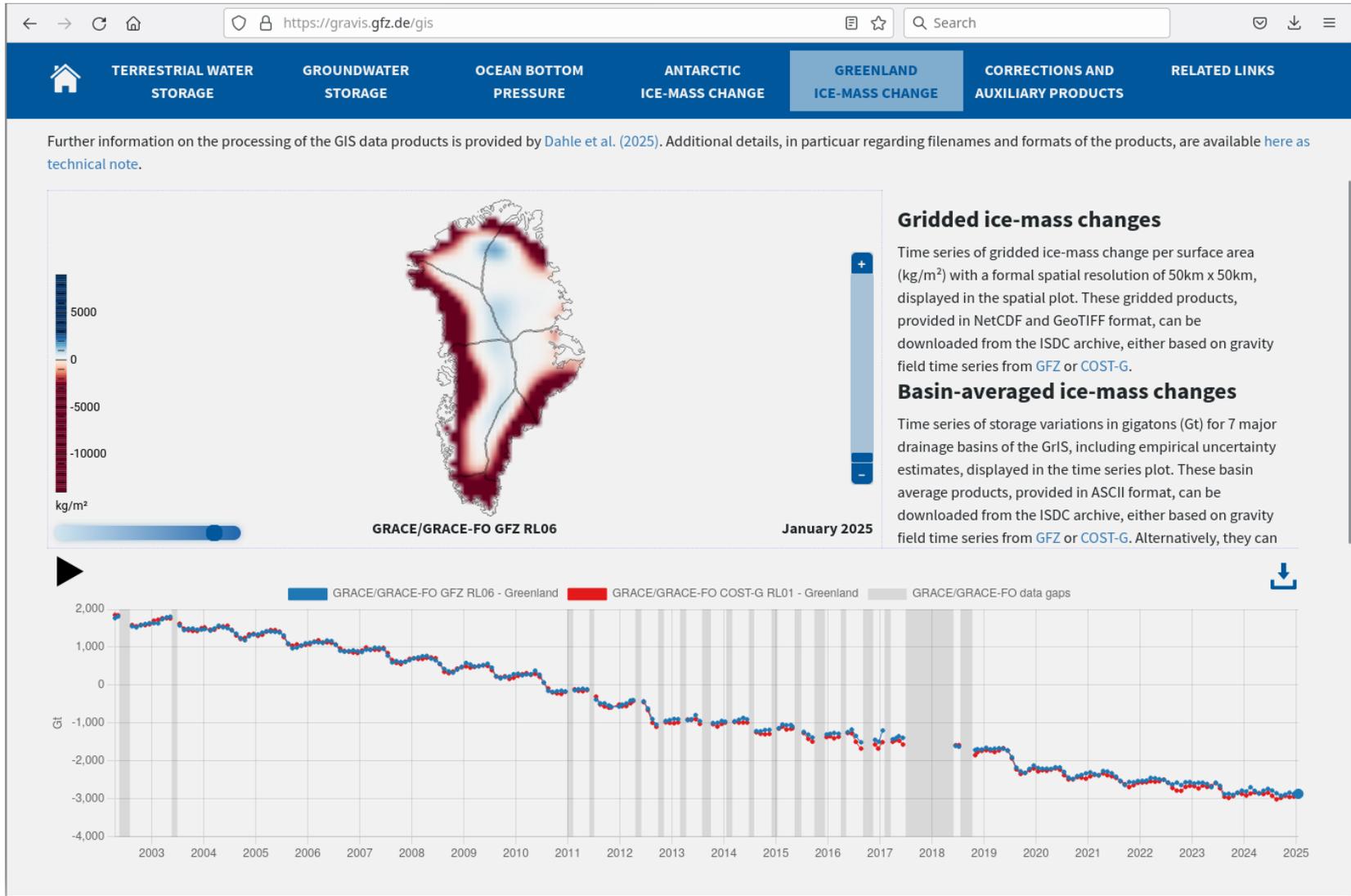
Summary and Outlook

- **COST-G combined Level-2 products for GRACE (repro), Swarm (operational), and GRACE-FO (repro/operational) are available from ICGEM (https://icgem.gfz-potsdam.de/sl/temporal).**

- **COST-G Level-3 products for GRACE and GRACE-FO are available via GFZ's GravIS portal (https://gravis.gfz.de/home).**

- **When GRACE SDS RL07 time-series with realistic uncertainty information will become available, a re-combination either on solution, or on normal equation level is foreseen.**