National Report - Denmark

By: Casper Jepsen

Agency for Climate Data

New name, new strategy

- Klimadatastyrelsen – Agency for Climate Data
  - *The new name reflects the tasks that the agency performs and the value that the agency's work creates for society.*
  - *As a society, we face a wide range of challenges related to climate adaptation, the green transition, and security.*
  - *Data and digital solutions are important contributions to addressing these challenges.*
  - *The telecommunications area has been transferred to the Agency for Digital Government.*


A Climate Resilient Denmark
A Secure Denmark
A Green Denmark
Digital Solutions
Mapping
Infrastructure

Digital Solutions

Data Foundation

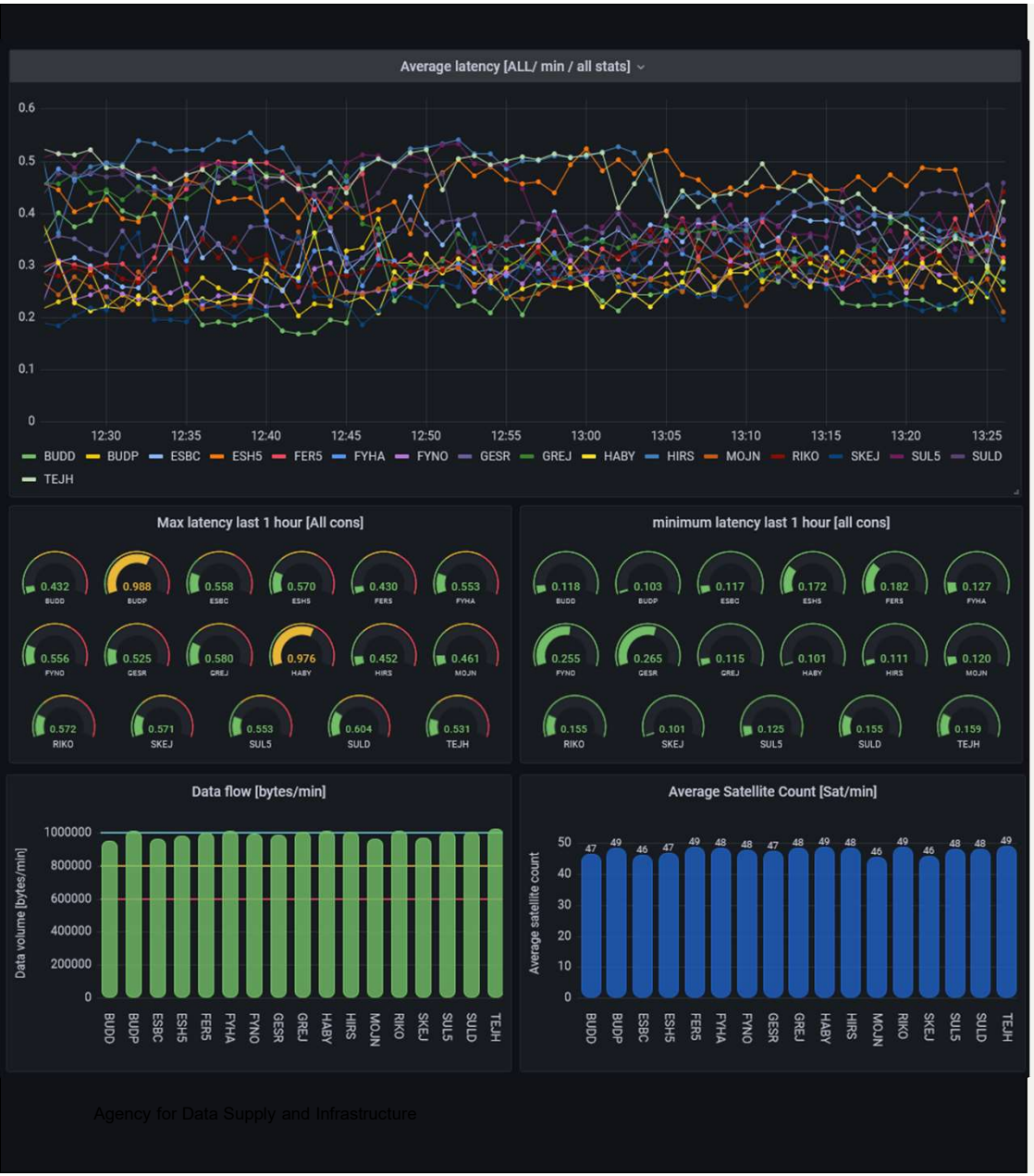
In the last 10 years, we have created a foundation of high-quality data

Digital Twin of Denmark

My Climate Data

Digital Twin of Roads

New CORS station in Jutland



Transition of our NTRIP solution

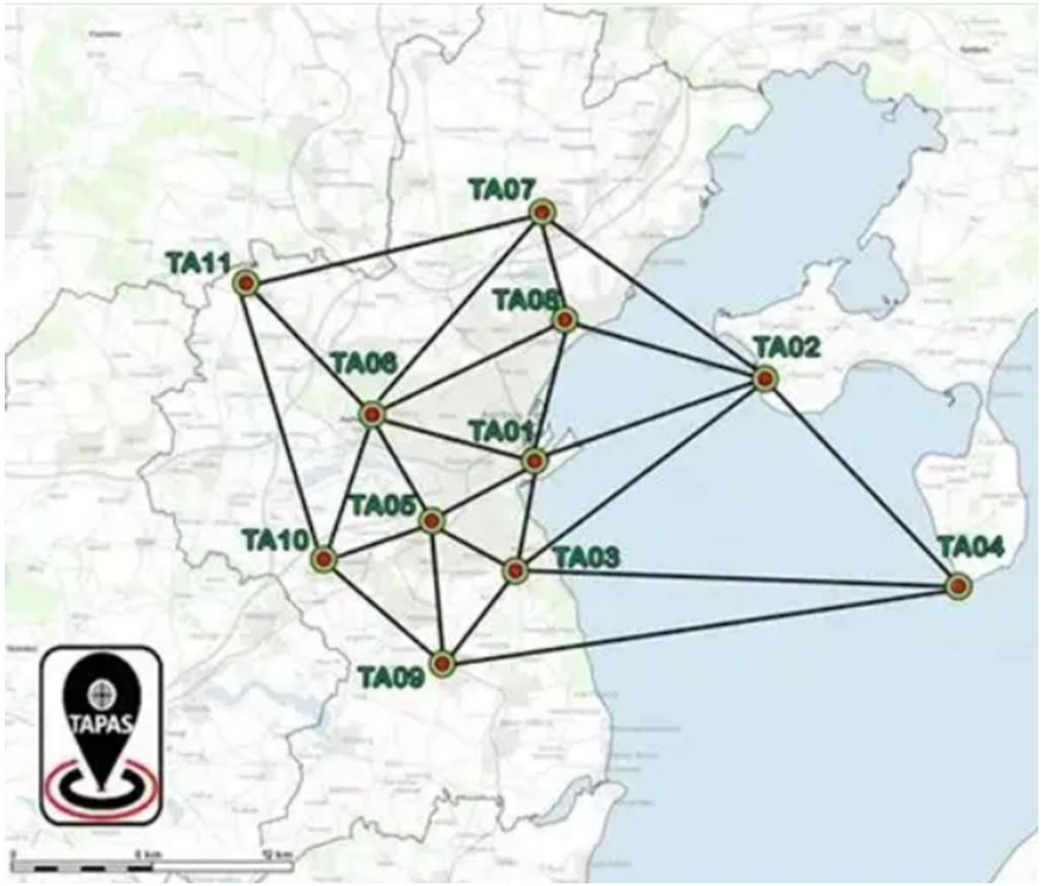
- Next generation real time caster based on BKG software
- Streaming NTRIP v. 2s (s for secure)
- Data available for Danish stations at ntrip.dataforsyningen.dk
- Official release of the new caster is coming 31/3 -2025
- Some Client software are not ready yet.
- NTRIPmonitor software is under development.
- Old Leica Spidernet software closed down 31/3 2025

Regulation of private GNSS positioning services providers

- New guidelines is official
  - First revision since introduction in 2008
  - Three accuracy classes
    - A: 1.0 cm, 2.0 cm
    - B: 2.0 cm, 4.0 cm
    - C: 2.5 cm, 5.0 cm
  - Coverage map
  - New control procedures using independent monitoring stations

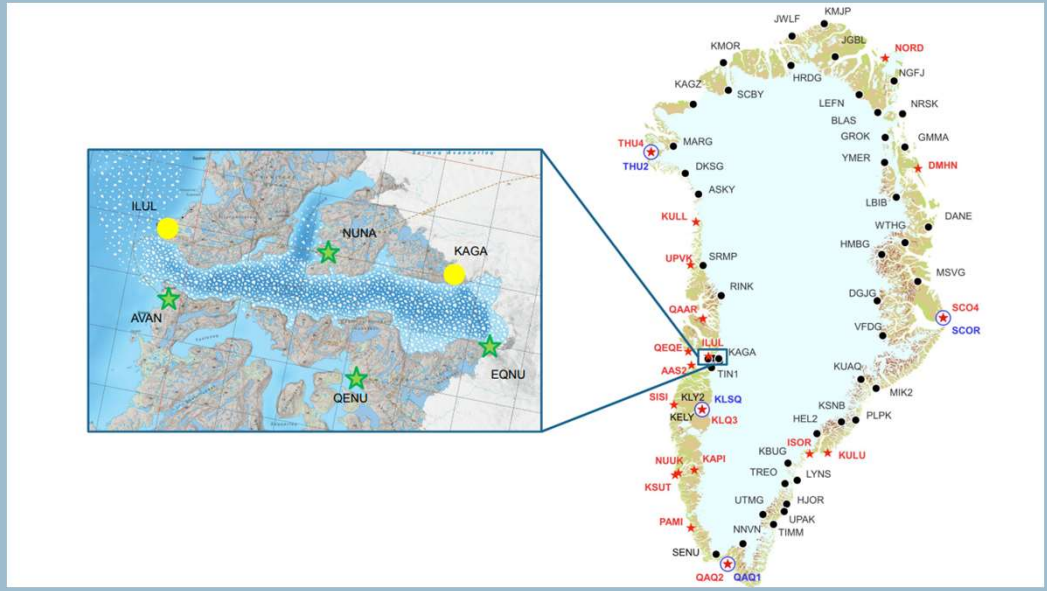
TAPAS

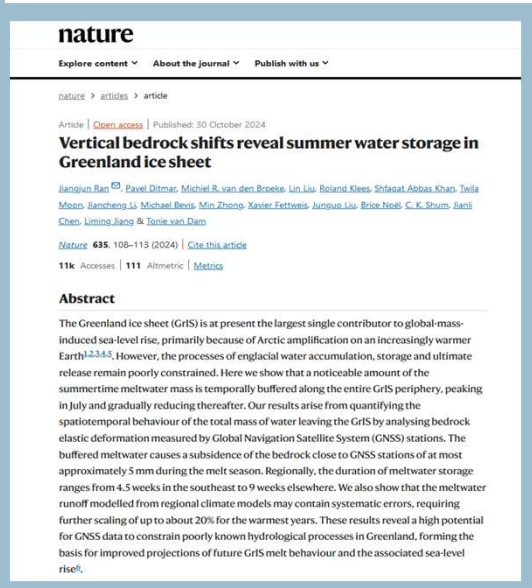
- TAPAS project is nearing completion
- Current strategy expires end of 2025
- TAPAS partners (Århus, DTU Space) in discussion on a derived network/project.
- TAPAS has delivered valuable insight into possibilities of the potential of sub 1 cm precision in an urban environment
- Final evaluation report to be carried out 2025



GNET

- 71 GNSS (GPS) stations along the coast of Greenland
- Fundamental geodetic infrastructure
- Maintained and developed in cooperation with DTU Space
- Expansion 2024:
  - Four stations at Ilulissat
  - Two on the east coast
- GNET provides real time monitoring of the change in Greenland Ice sheet mass.
- Potential in water level measurement (reflectometry) and space weather monitoring.
- Data link (Iridium) uncertain. Various initiatives to maintain realtime communication is investigated
- October: Article in Nature based on GNET data





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Vertical bedrock shifts reveal summer water storage in Greenland ice sheet

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Abstract

The Greenland ice sheet (GrIS) is at present the largest single contributor to global-mass-induced sea-level rise, primarily because of Arctic amplification on an increasingly warmer Earth[1,2,3,4,5]. However, the processes of englacial water accumulation, storage and ultimate release remain poorly constrained. Here we show that a noticeable amount of the summertime meltwater mass is temporally buffered along the entire GrIS periphery, peaking in July and gradually reducing thereafter. Our results arise from quantifying the spatiotemporal behaviour of the total mass of water leaving the GrIS by analysing bedrock elastic deformation measured by Global Navigation Satellite System (GNSS) stations. The buffered meltwater causes a subsidence of the bedrock close to GNSS stations of at most approximately 5 mm during the melt season. Regionally, the duration of meltwater storage ranges from 4.5 weeks in the southeast to 9 weeks elsewhere. We also show that the meltwater runoff modelled from regional climate models may contain systematic errors, requiring further scaling of up to about 20% for the warmest years. These results reveal a high potential for GNSS data to constrain poorly known hydrological processes in Greenland, forming the basis for improved projections of future GrIS melt behaviour and the associated sea-level rise[6].