# NATIONAL REPORT – SWEDEN

NKG WORKING GROUP OF REFERENCE FRAMES

MARCH 30-31, 2023

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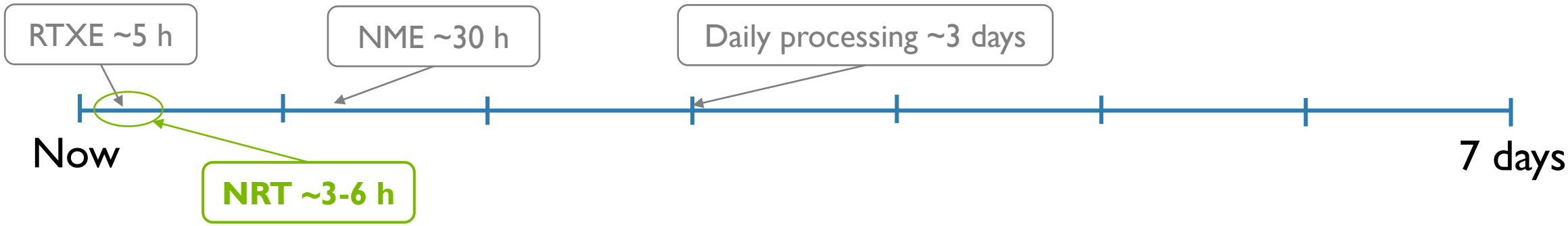
# NEWS FROM SWEPOS™

- Changed work routines in the Control Centre
  - Increased staffing during normal office hours → shorter opening hours of the customer support
  - Maximise benefit for users, technicians and collagues
- Other improvements
  - The e-Service Portal provides extended possibilities for users
  - Automated and simplified handling of subscription orders

# NEAR REAL-TIME COORDINATES FOR MONITORING OF SWEPOS STATIONS

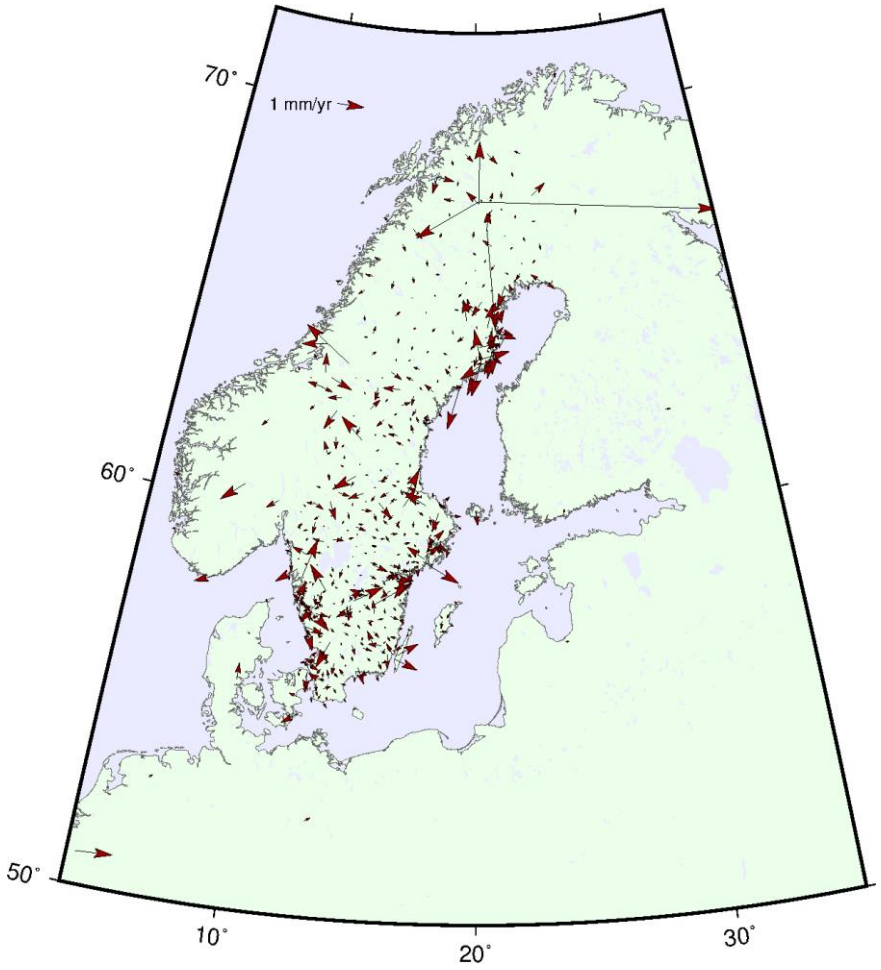
- Since late 2021, hourly coordinate sets are produced for coordinate monitoring of SWEPOS
- Important supplement to other monitoring routines
  - More reliable and accurate than the network RTK software monitoring algorithms
  - Faster than the daily processing
- Bernese GNSS Software is used
- Displacement of the hourly coordinates w.r.t. to the ”official” station coordinates is calculated



# DEVELOPMENT OF NEW POST-PROCESSING SERVICE

- Full RINEX 3 support (actually, RINEX version independent)
- GPS/GLO/GAL possibility
- Possibility of separate RINEX QC
- Based on
  - Bernese GNSS Software 5.4
  - Anubis
  - In-house developed Python-based software

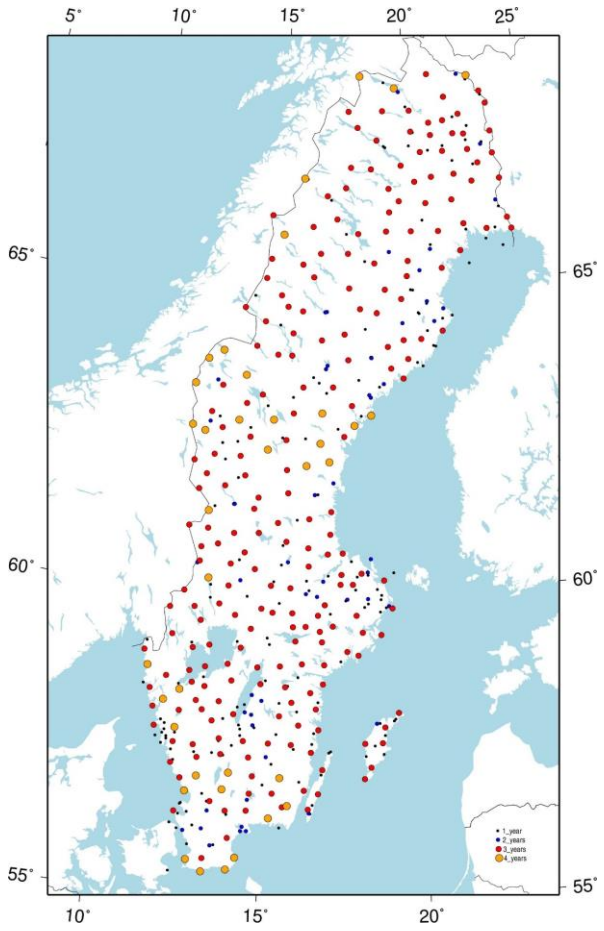
# CUMULATIVE SOLUTION FOR SWEPOS



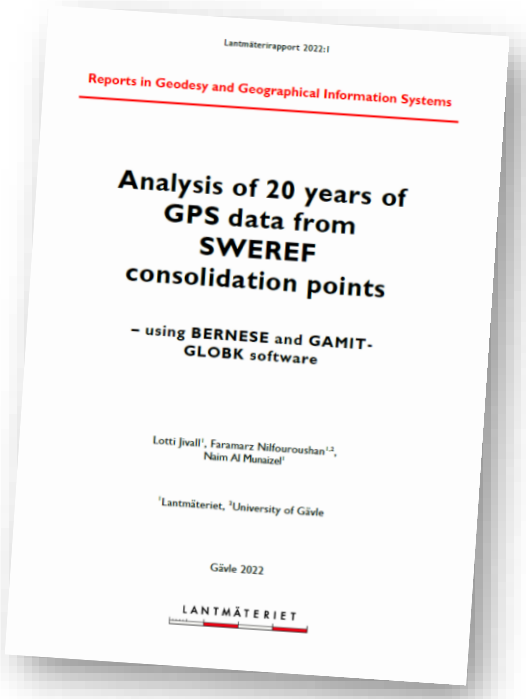

Estimated horizontal velocities in SWEREF 99, after subtracting the NKG_RF17 model

- We have calculated a cumulative solution for (almost) all SWEPOS stations
- Done with CATREF
- Estimated:
  - Station positions
  - Velocities
  - Annual variations
  - Jumps (automatic break and outlier detection)
- Estimated velocities agree well with the NKG_RF17 model
  - Large differences due to local motions (e.g., mining) or short time series

# ANALYSIS OF 20 YEARS OF GPS DATA FROM SWEREF CONSOLIDATION POINTS




- Repeated measurements (2×24 h) of 300 consolidation points
  - Monitor SWEREF 99
  - A passive complement to SWEPOS
  - GNSS/levelling points for geoid fitting
- Consistent reprocessing, as well as operational processing with changed settings over the years
- Uncertainty estimation: 2; 2; 6 mm (1σ)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Reports in Geodesy and Geographical Information Systems

Analysis of 20 years of GPS data from SWEREF consolidation points

– using BERNESE and GAMIT-GLOBK software

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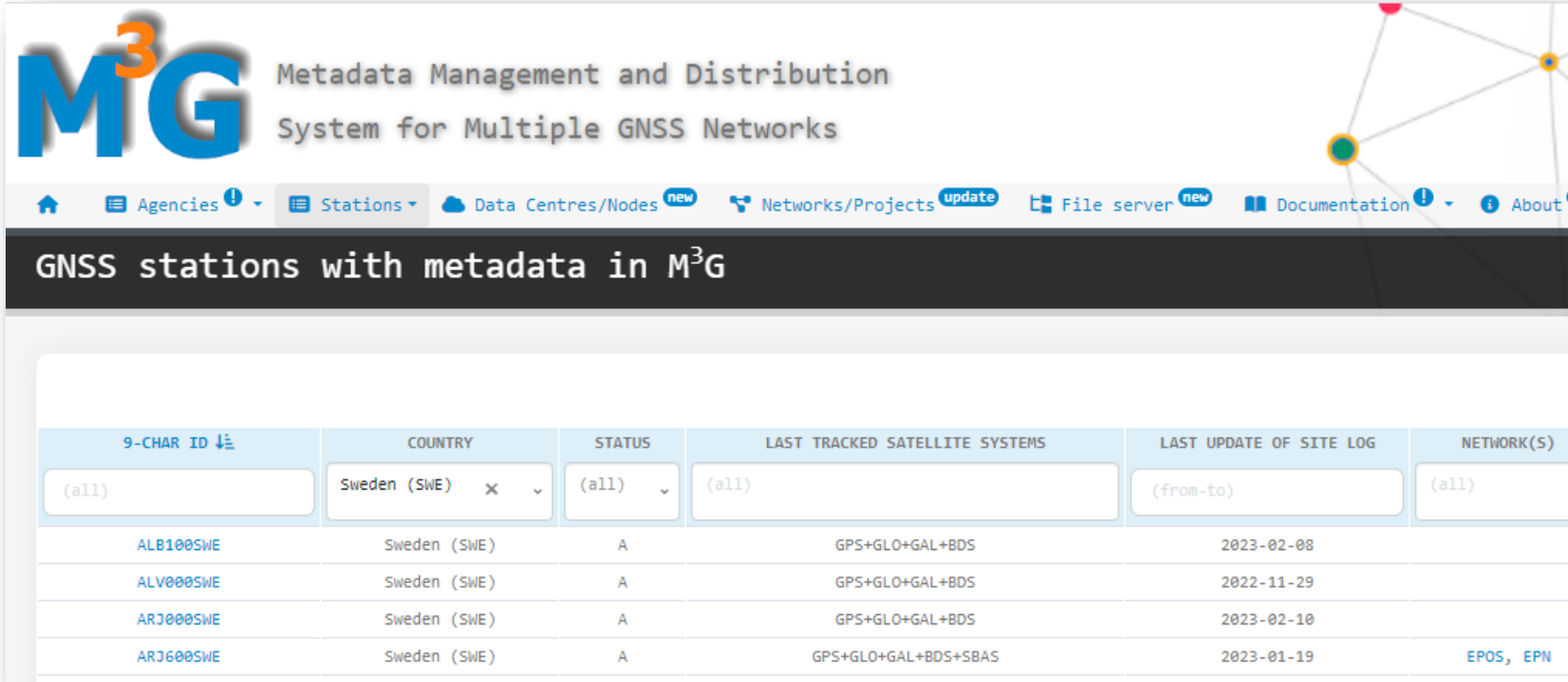
# STATION METADATA TO M3G

- Requirements from EPOS and EPN-D to access station metadata
- Metadata for Swedish EPN-D – NKG GNSS AC – stations now added to M3G (https://gnss-metadata.eu/)
  - Focused on antenna/radome information
- Metadata for Swedish EPN stations have been accessible from M3G since a long time




| 9-CHAR ID | COUNTRY | STATUS | LAST TRACKED SATELLITE SYSTEMS | LAST UPDATE OF SITE LOG | NETWORK(S) |
|---|---|---|---|---|---|
| (all) | Sweden (SWE) | (all) | (all) | (from-to) | (all) |
| ALB100SWE | Sweden (SWE) | A | GPS+GLO+GAL+BDS | 2023-02-08 | |
| ALV000SWE | Sweden (SWE) | A | GPS+GLO+GAL+BDS | 2022-11-29 | |
| ARJ000SWE | Sweden (SWE) | A | GPS+GLO+GAL+BDS | 2023-02-10 | |
| ARJ600SWE | Sweden (SWE) | A | GPS+GLO+GAL+BDS+SBAS | 2023-01-19 | EPOS, EPN |

# THANKS FOR YOUR ATTENTION!

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