

# National Report from Iceland

The General Assembly of NKG - Planet Ocean and Geodesy

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National Land Survey of Iceland

# The National Land Survey of Iceland

- Main activities are within Geodesy, GIS and Remote Sensing
- Responsible for mapping and monitoring of 103.000 km<sup>2</sup>
- 23 employees
- 3 employees at Geodesy



# Administration

- New Director General for at least for one year
  - Gunnar H. Kristinsson
- A new office in Akranes
  - Due to mold and mildew in our current location
  - Hopefully, this year
- Possibility of a merge with some other institution in near future
- We will still be under the Ministry of the Environment, Energy and Climate

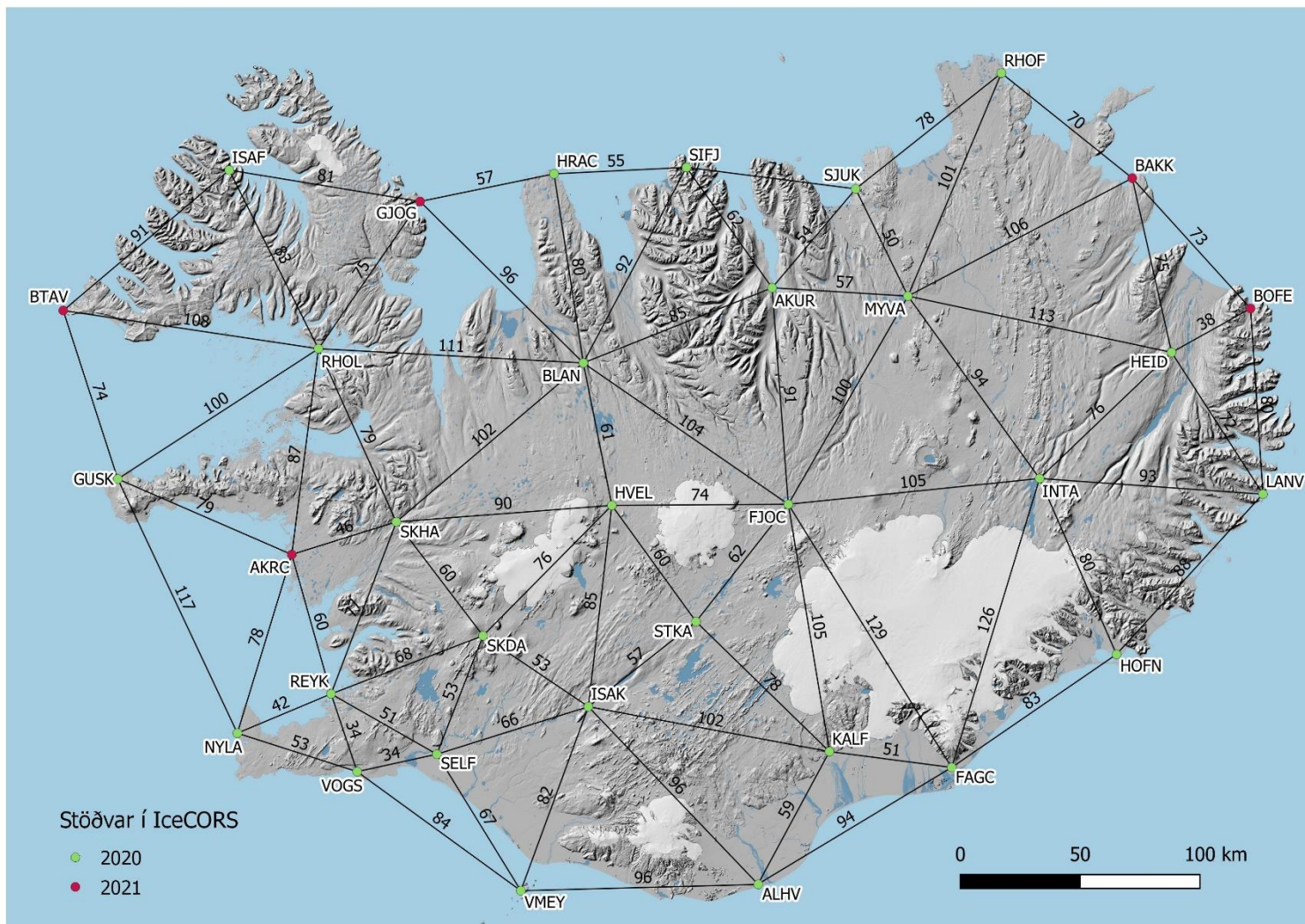
# Geodetic activities 2019-2022

- Work on the CORS network for Iceland
- Reprocessing data from all CORS in Iceland
- Maintenance/monitoring of the geodetic networks due to crustal deformation
- Accurate 0 contour line in ISH2004
- Database for geodetic benchmarks
  - New Geodetic Map Viewer
- Unrest in Reykjanes peninsula
- GNSS campaign for the National Power Company
- New INSAR map of Iceland 2015-2020

# IceCORS - The Icelandic CORS network

- The first stage of building up a CORS network for Iceland is completed
  - Today we are operating 32 stations
  - We use GNSMART from Geo++
  - Use of older GPS receivers like Trimble NetR5
- The stations are also a part of the NKG AC center project
- Cooperation with the geophysical community and foreign institutions like BKG and BAdW
- Successful testing of sending out streams both in ISN2016 and ISN\_DRF
- All data are available free of charge

# IceCORS





# Processing of all CORS data in Iceland

- Processing GPS only with Bernese NKG AC style
- Reprocessing period 1999-2021
- Around 80 - 118 stations
- Fixed stations: HOFN, HERS, NYA1, ONSA, QAQ1, SCOR, TRO1, WSRT, PDEL, STJO, CHUR, TIXI, BRMU, N RIL
- IGB14 Geodetic Datum





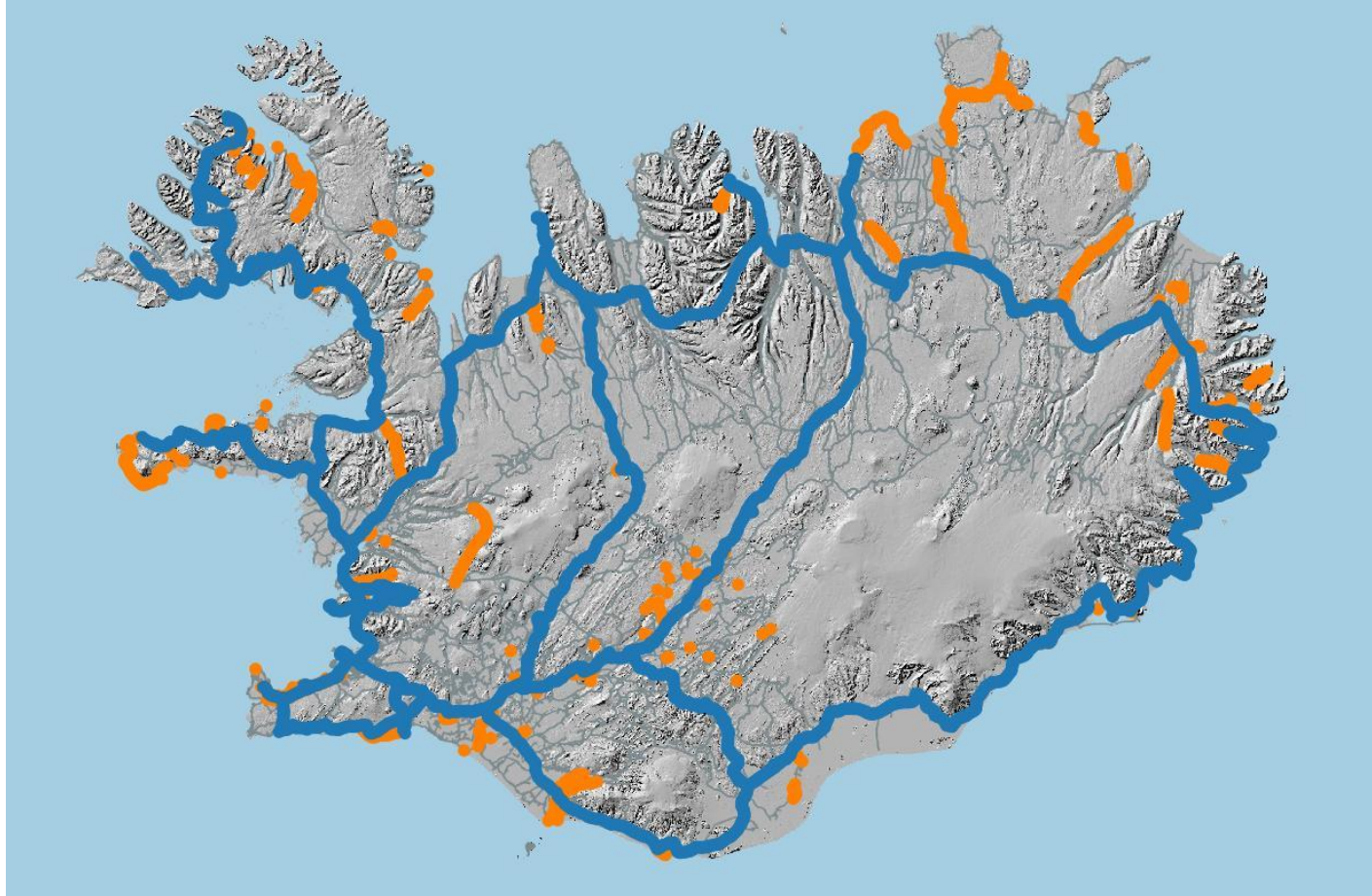
# The Height Reference System, ISH2004

- Continue with establishment of the ISH2004
  - Densifying the network
    - Kjölur, new levelline
- Re-computation of ISH2004
  - Finished computation of the Kjölur levelling line
  - Re-computation of ISH2004 in southwest Iceland with updated land uplift model
- Control surveying on old levelling line
  - GNSS surveying, 40-45 hours on each benchmark
  - Vestfirðir 2019
  - Dalir og Barðaströnd 2019
  - Vestfirðir og Húnavatnssýslurnar 2020

# The Kjölur levelling line

- 220 km over Kjölur highland route
- Geometric and trigonometric levelling
- 32mm fit between ISH2004 benchmarks in north and south
- Data from 2010-2019

# Possible use of old levelling data from the road administration



# Surveying and mapping in municipalities

- Local benchmarks to ISN2016
- Local height and harbor systems to ISH2004
- Very accurate 0 contour line in ISH2004 with drone
- Drone maps of small towns

# Database for geodetic benchmarks + Map Viewer



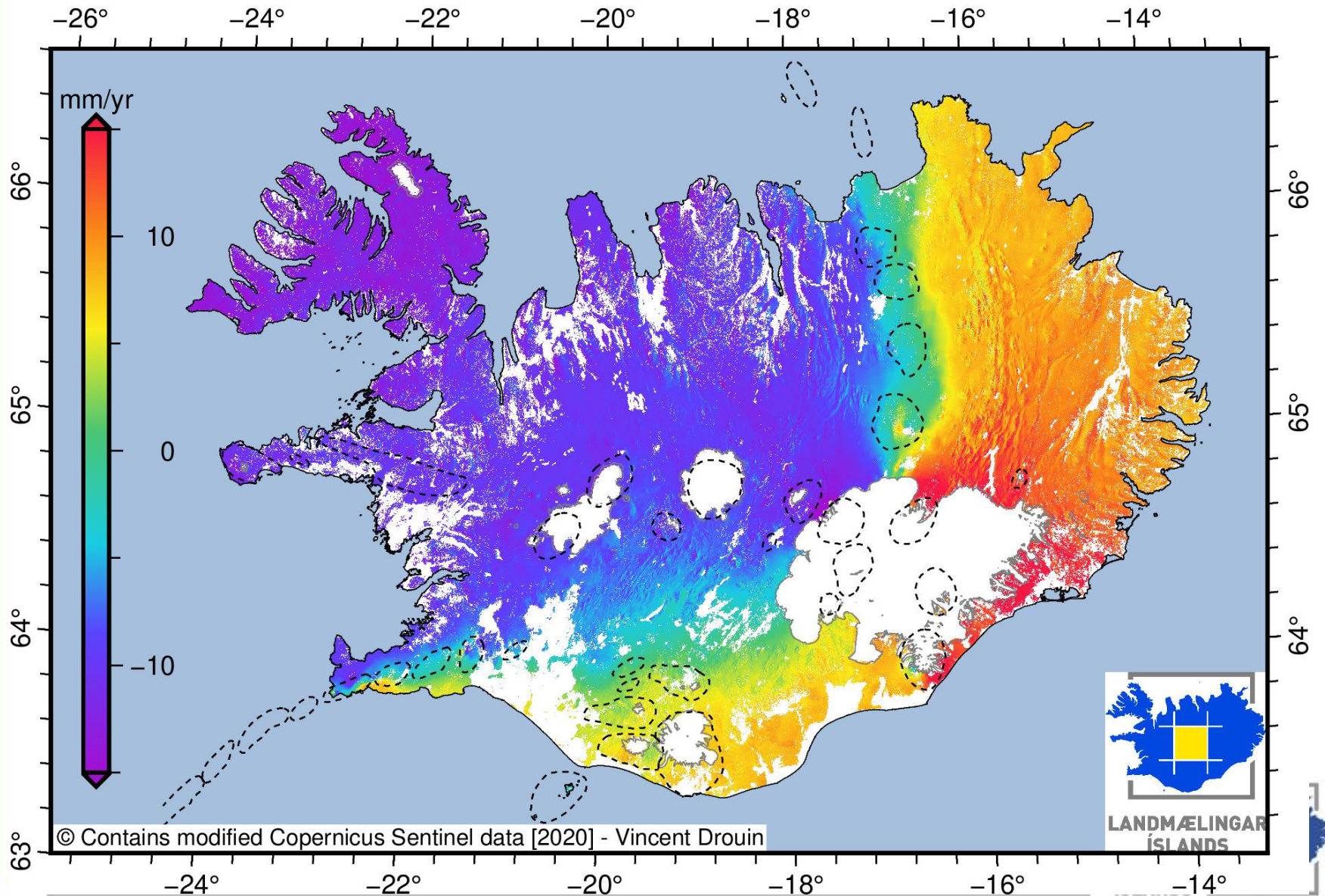
# Other Tasks (1)

- Investigate and determine landuplift
  - Landsvirkjun – National Power Company of Iceland
    - Hydro stations on Þjórsársvæði
      - The water surface on the lake Þórisvatn “leaned / tilted”
    - Hydro station on Blöndulón
    - Hydro station on Kárahnjúkar
- IceCORS and farming
  - Cooperation with the Agricultural University in Hvanneyri
  - Focus on very affordable GNSS solutions
- We’ve published a new coordinate transformation tool COCODATI
- NKG Science week 2020

# Other Tasks (2)

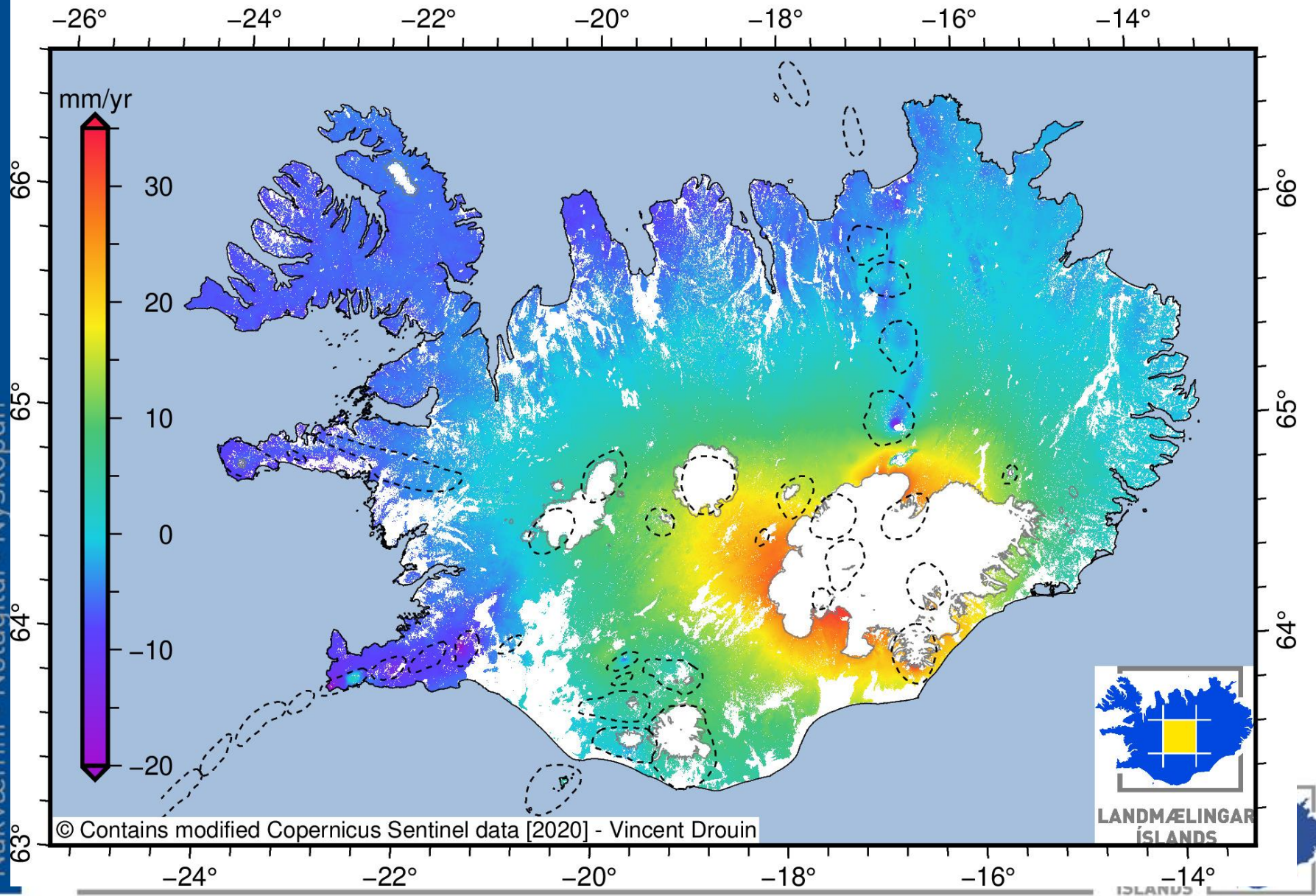
- DORIS was moved from Reykjavík to Höfn
- Patch for Reykjanes
  - INSAR
  - GNSS
- New INSAR map of Iceland 2015-2020
  - Based on Sentinel 1 data from 2015 to 2020
  - Work done by Vincet Drouin
- More details
  - Geophysical Research Letter: Countrywide Observation of Plate Spreading and Glacial Isostatic Adjustment in Iceland Inferred by Sentinel-1 Radar Interferometry, 2015-2018

# 2015-2020 near-East velocities





# 2015-2020 near-Up velocities



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# Long-term goals and measures for the next years

- Continue with establishment of the IceCOR network
  - Renew the equipment
  - Testing and evaluate the accuracy, reliability and the performance
  - Build up higher densities in some part of Iceland
  - IceCORS and farming
- Maintenance/monitoring of the geodetic networks due to crustal deformation
  - ISN2016
  - ISH2004
  - IceCORS
- Create a database for “all” Icelandic geodetic benchmark
- New 1<sup>st</sup> order gravity network 2022-2026
- Study the use of InSAR data in deformation models
- InSAR database of major events in Iceland
- **Unrest and eruption in Iceland**

# Thank you

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