

# Drainage basins and glacier catchments for the Greenland Ice Sheet

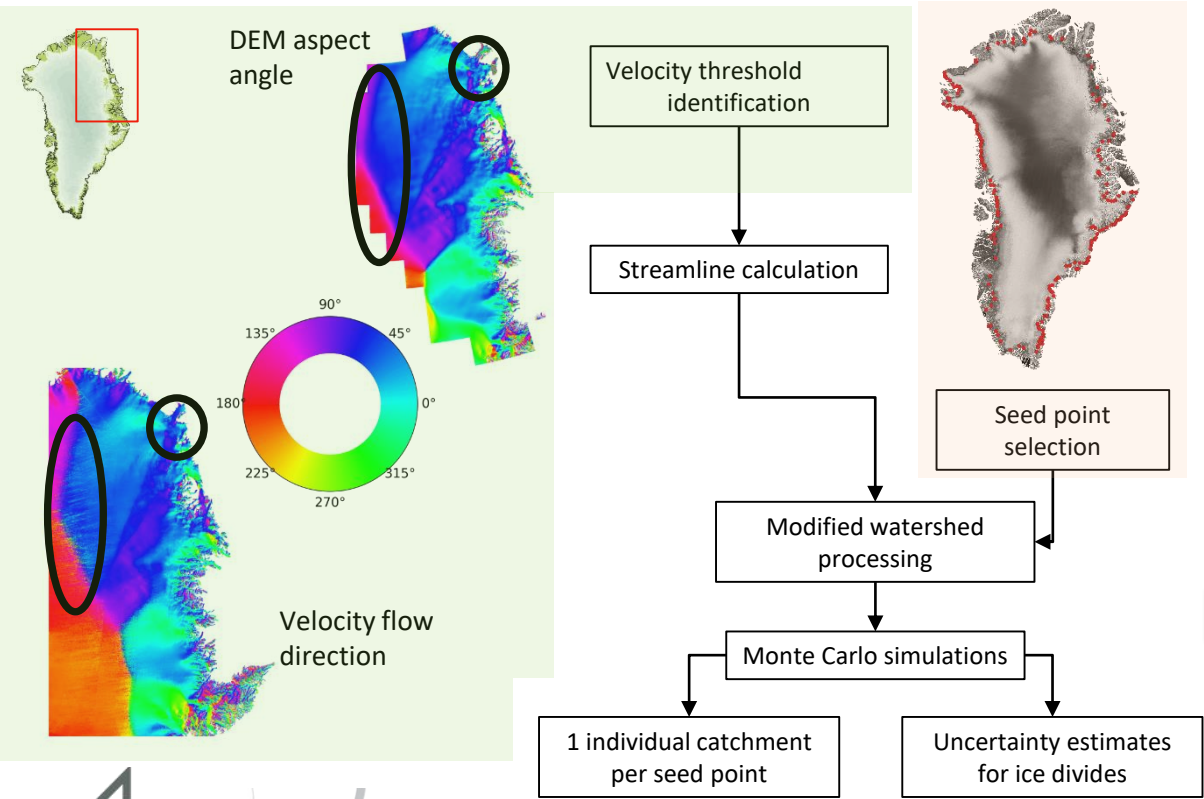
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Methodology in: [Krieger, Lukas et al. 2020. „Drainage Basin Delineation for Outlet Glaciers of Northeast Greenland Based on Sentinel-1 Ice Velocities and TanDEM-X Elevations“. \*Remote Sensing of Environment\* 237 \(Februar\): 111483. <https://doi.org/10.1016/j.rse.2019.111483>.](#)

## Introduction

- Glacier inventories like GLIMS and RGI do not contain individual glacier basins on the ice sheets
- The basins are needed to partition glaciological measurements to the individual glacier scale

## Method

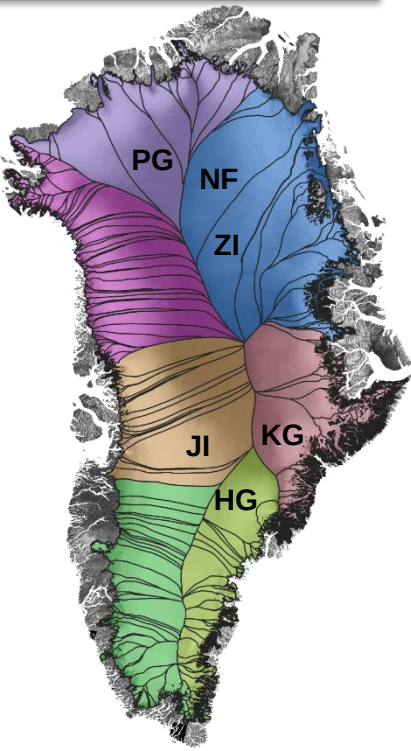


## Results

- **328** individual glacier catchments of the Greenland Ice Sheet were delineated
- Input DEM: 90m **TDM global DEM** (2011-2014)
- Input velocity map: **AIS\_cci Greenland<sup>1</sup>** (Sentinel-1 offset tracking 2014-2019)
- Velocity threshold of  $30 \text{ m a}^{-1}$  was used

|    | Name                            | Area (km <sup>2</sup> ) | Area of GrIS (%) |
|----|---------------------------------|-------------------------|------------------|
| NF | Nioghalvfjærdsfjorden (79North) | 110 661                 | 6,4              |
| ZI | Zachariae Isstrøm               | 85 503                  | 5,0              |
| PG | Petermann Gletscher             | 78 439                  | 4,6              |
| JI | Jakobshavn Isbræ                | 75 535                  | 4,4              |
| KG | Kangerlussuaq Gletscher         | 51 430                  | 3,0              |
| HG | Helheimgletscher                | 51 039                  | 3,0              |

<sup>1</sup>[Nagler, Thomas et al. 2015. „The Sentinel-1 Mission: New Opportunities for Ice Sheet Observations“. \*Remote Sensing\* 7 \(7\): 9371–89.](#)



## Conclusion

- The method can be **iteratively applied** to create smaller, more granular basins
- The developed method is also applicable for the **Antarctic Ice Sheet**
- Delineations available via author contact [lukas.krieger@dlr.de](mailto:lukas.krieger@dlr.de)