

# The Randolph Glacier Inventory (RGI) and its role in future glacier monitoring and GLIMS

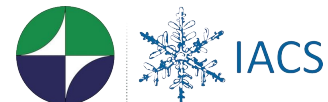
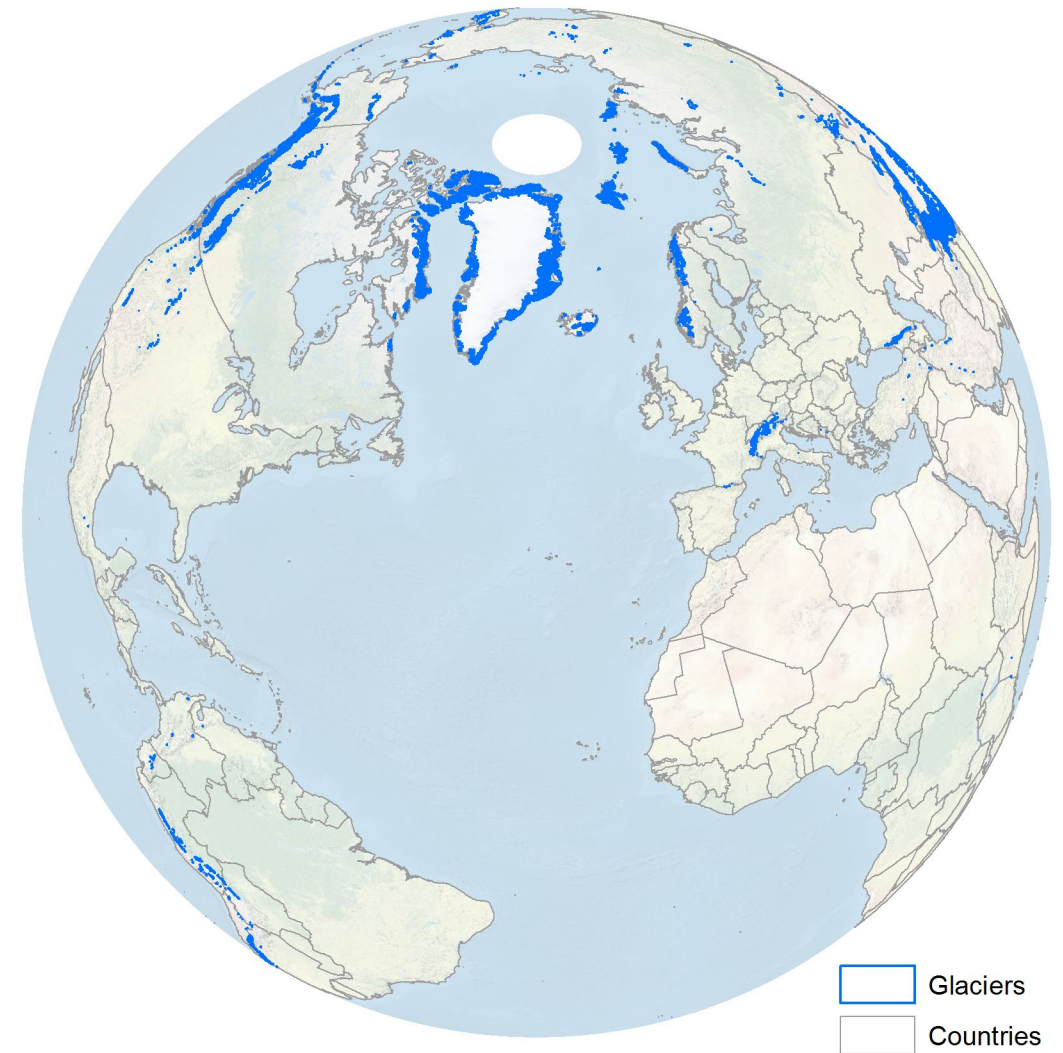
**Kick-off Meeting - 05.05.2020, 18H30**

**Regine Hock, Fabien Maussion, Frank Paul,  
Philipp Rastner, Bruce Raup, Michal Zemp**

Contact:

[fabien.maussion@uibk.ac.at](mailto:fabien.maussion@uibk.ac.at)

[rehock@alaska.edu](mailto:rehock@alaska.edu)



# 1. RGI WG: goals and membership

- **New RGI WG:**

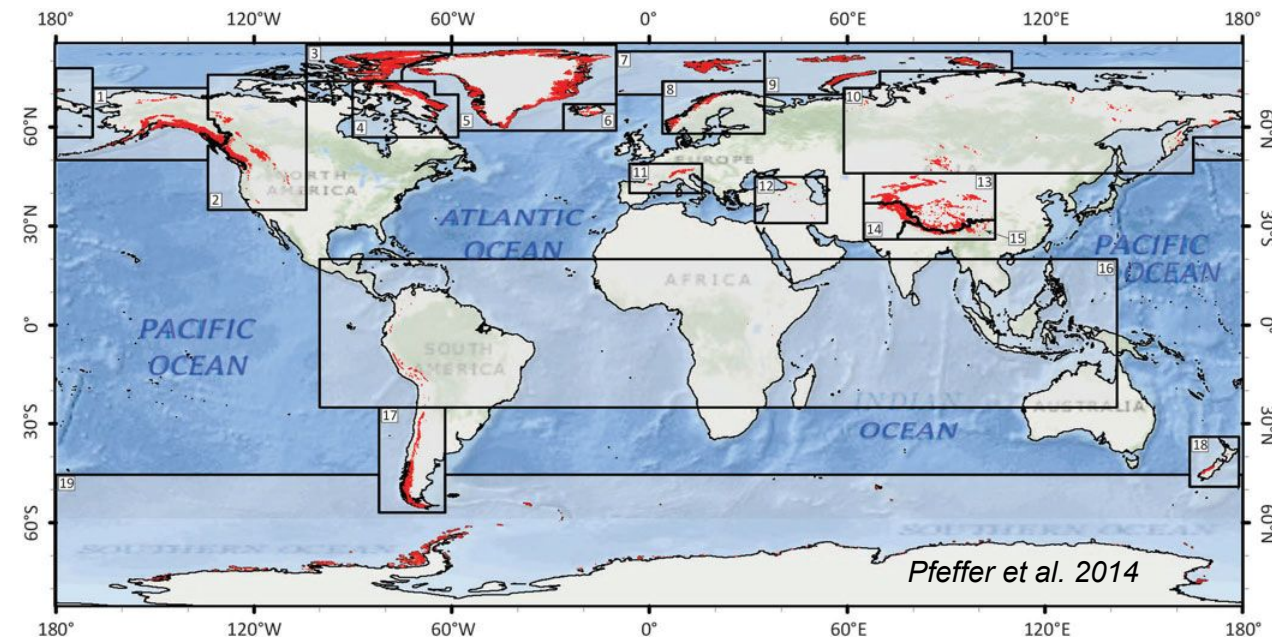
- not a mere “continuation” of the previous WG: new goals and objectives
- IACS gives visibility and legitimacy to the RGI + some financial support

- **Structure:**

- **Steering committee (6):** overlooks the RGI generation process and has final say in case of controversial decision (hopefully there won't be: we will seek consensus)
- **Members (13):** working on substantial contributions and decisions related to the RGI, participate to task forces (see below), participate to meetings
- **Contributors (22):** contribute (or contributed) outlines to GLIMS and potentially to RGI, regional expertise, beta testing, participate to meetings
- **Larger community (everyone):** informed about the RGI and invited to contribute anytime
- Structure can (and will) change in the future

## 2. Evolution of the RGI

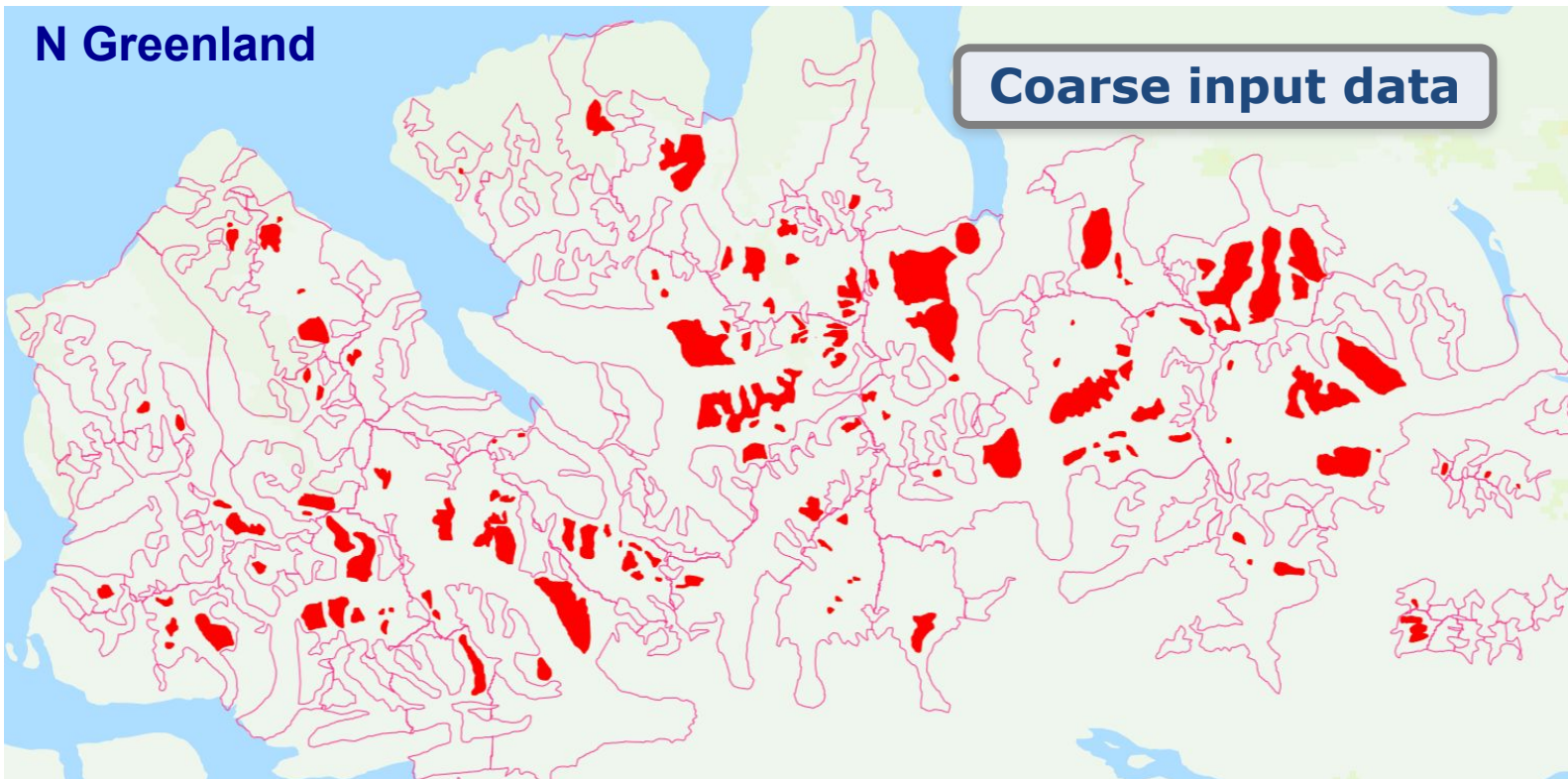
- RGI motivated by IPCC AR5 sea-level projections
- Based on GLIMS outlines & a special community effort for the missing outlines
- Fast compilation was more important than high quality => some regional issues
- Quality constantly improved since then (RGI3.2 for AR5, now RGI6.0)
- New datasets are continuously created and forwarded to GLIMS





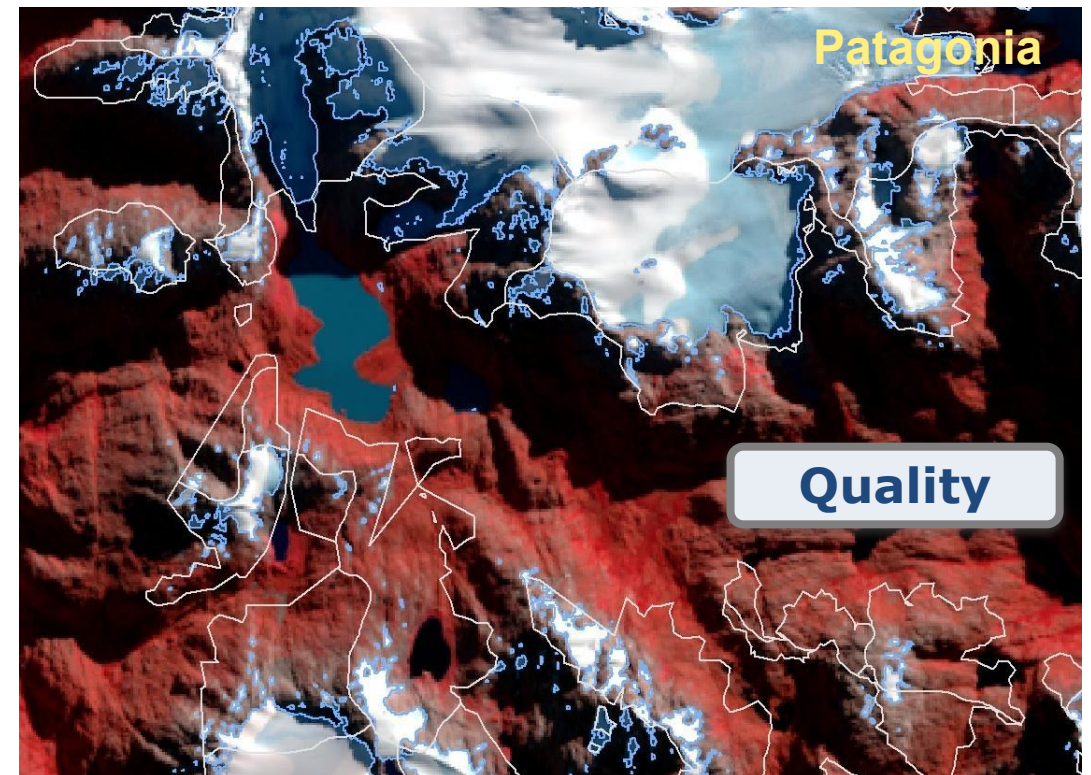
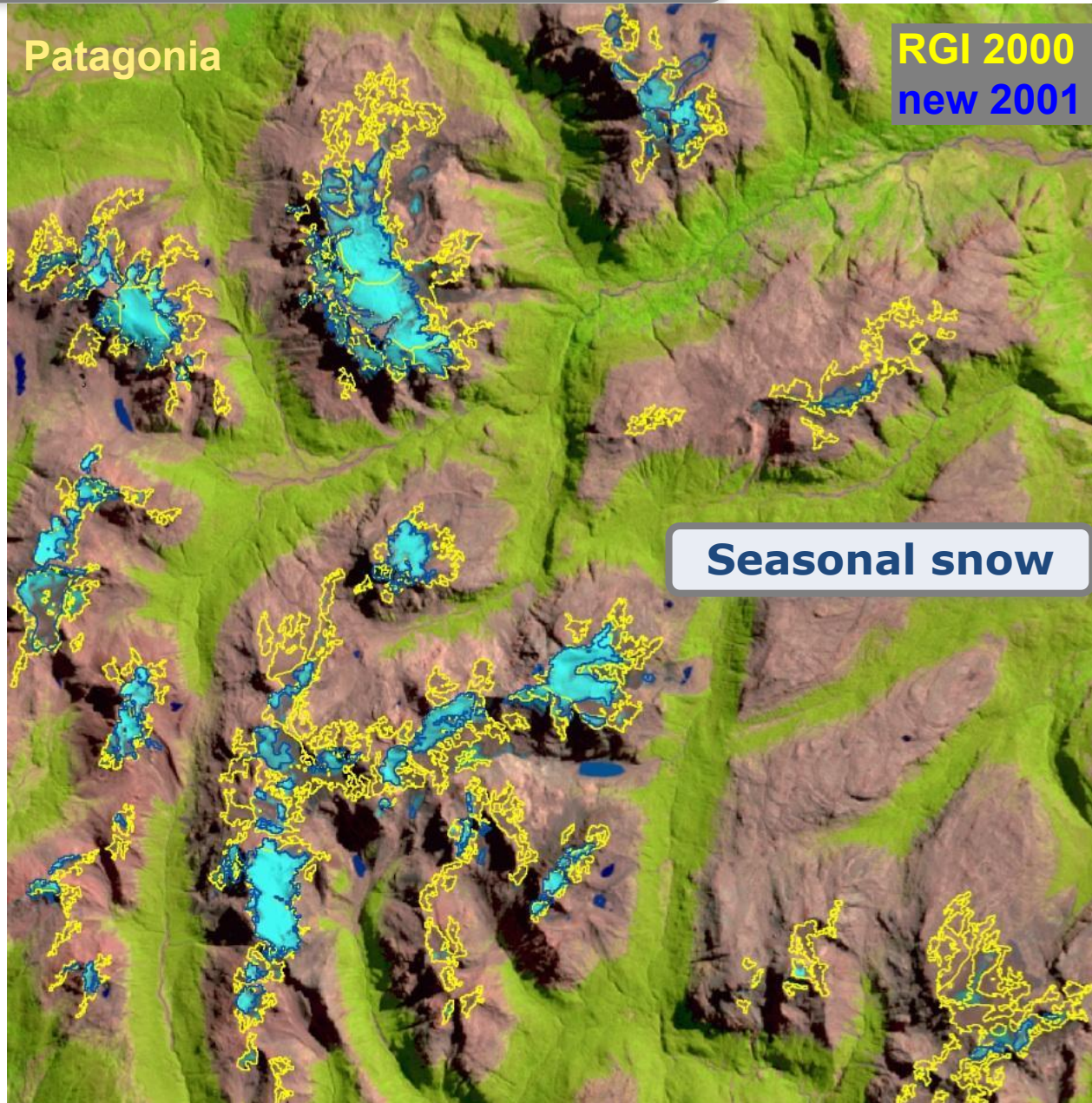
### 3. Known issues in RGI 6

- **large temporal spread:** regional: 10, global: 30 years
- **outlines quality issues:** see examples
- **ad-hoc data generation process:** not traceable, not reproducible



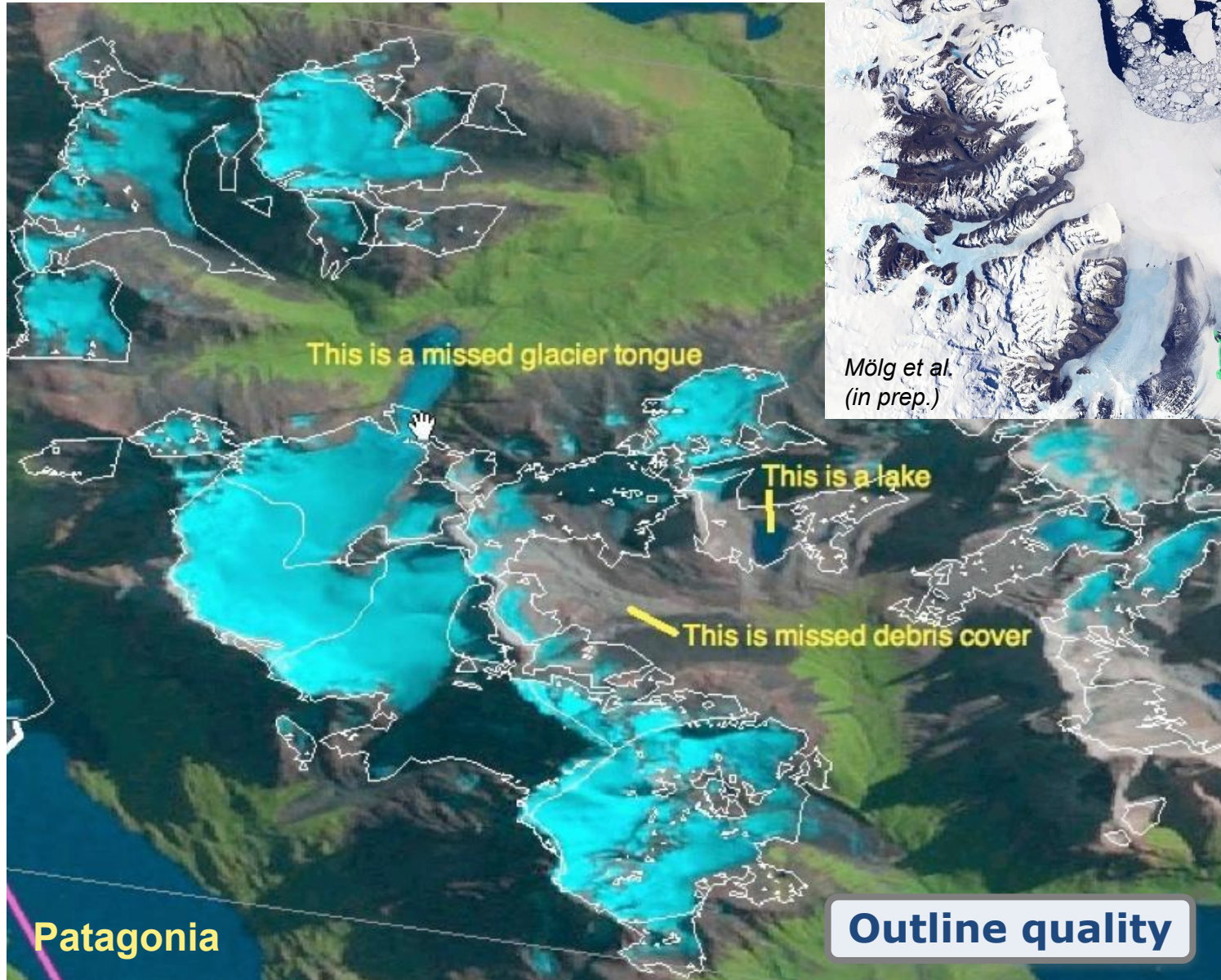


### 3. Known issues in RGI 6

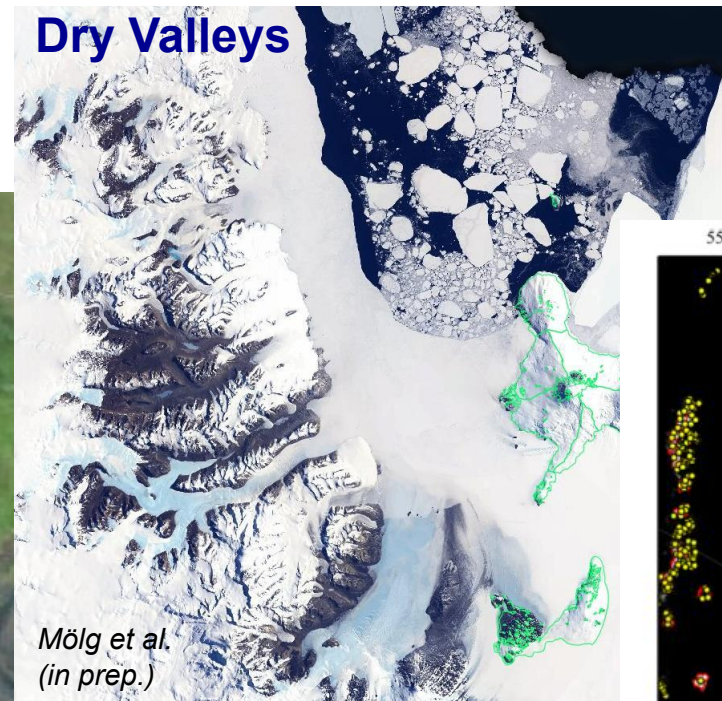




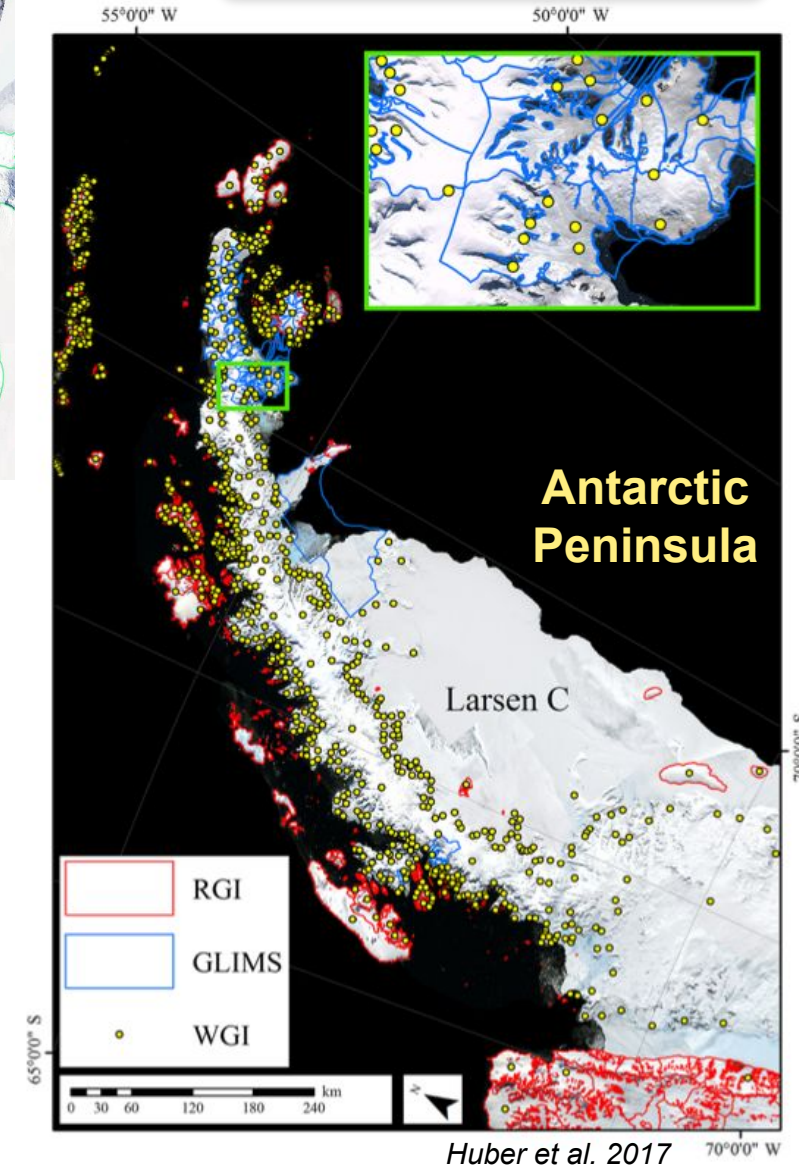
### 3. Known issues in RGI 6



#### Dry Valleys

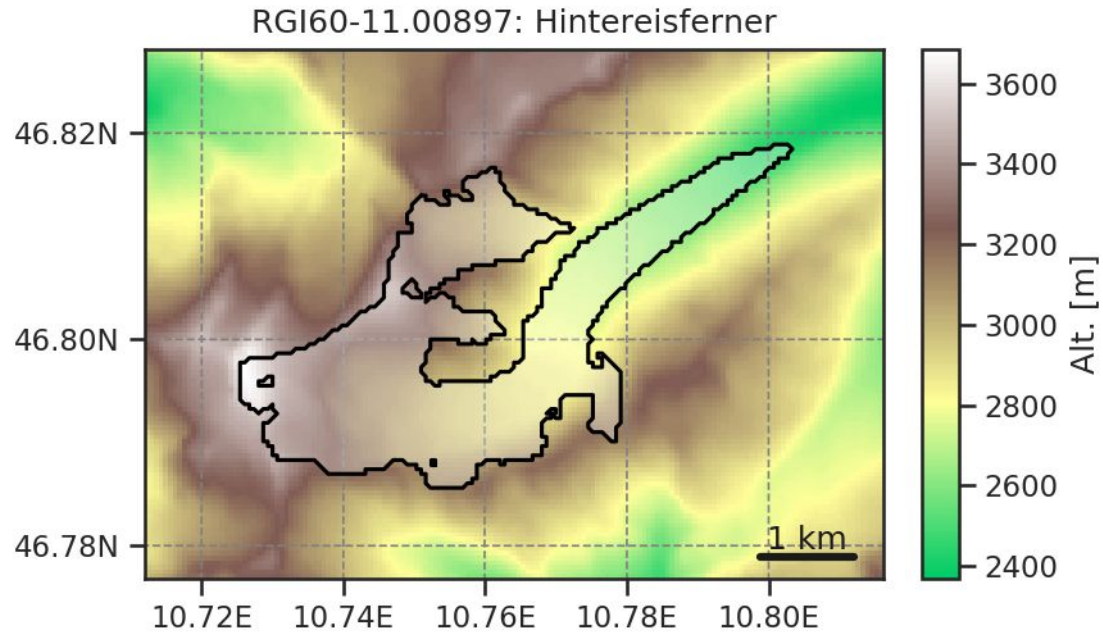


#### Missing regions

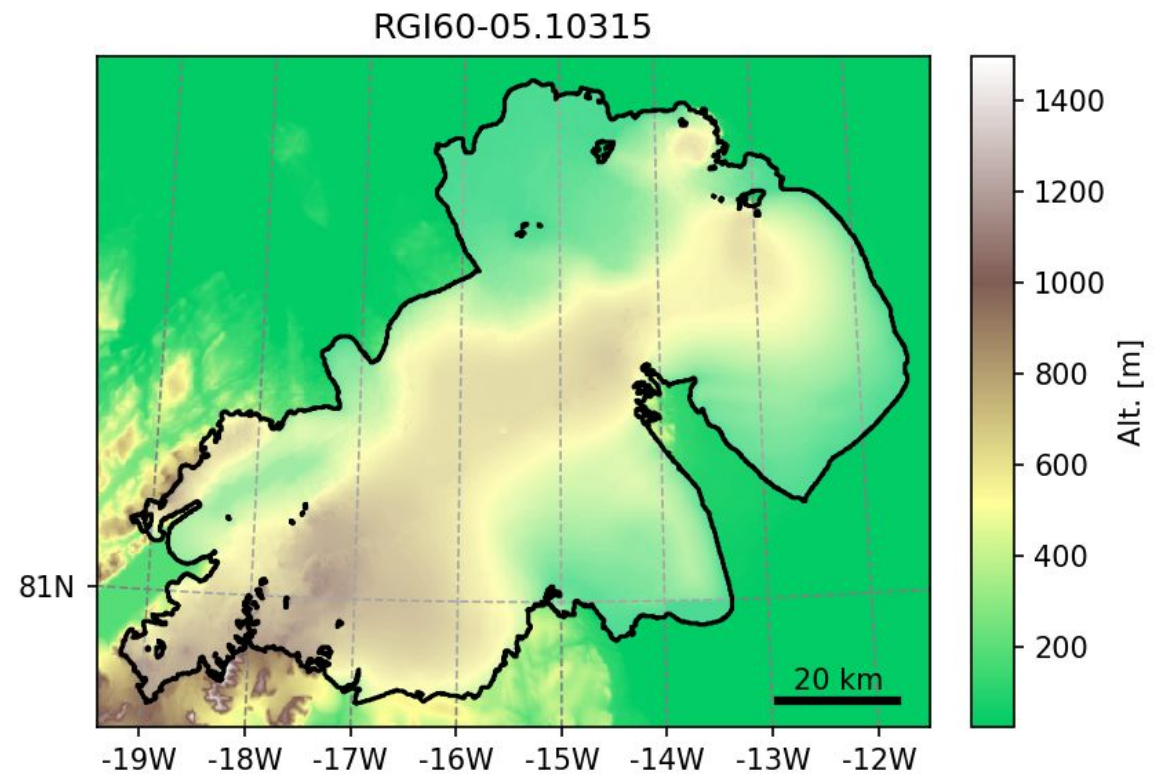




### 3. Known issues in RGI 6



### Flow Divides



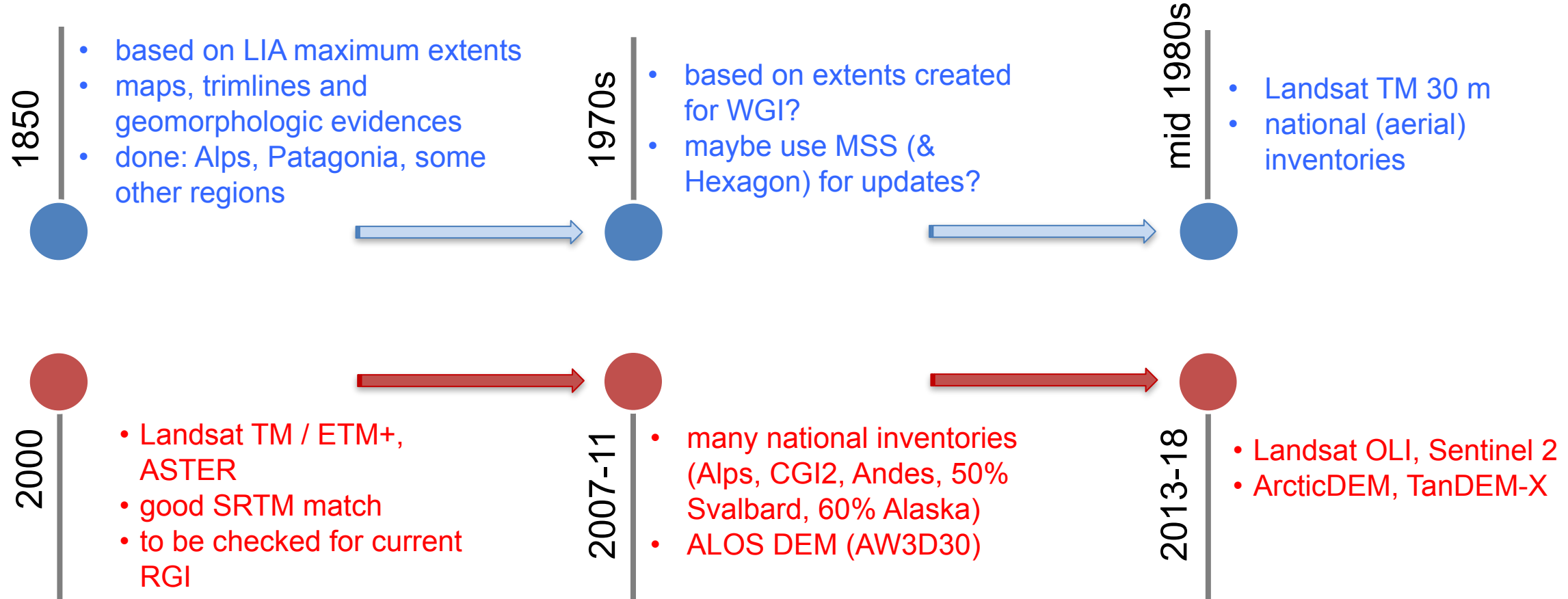
## 4. A roadmap for RGI 7

### **GLIMS as a central tool, complemented by open-source scripts and minimal (but necessary) manual intervention and decision**

- **In progress:** development of the “RGI on demand” button at GLIMS
- **End of June:** freeze of all outlines contributions to GLIMS to be considered for RGI
- **July 1st:** generation of RGI alpha -> first global inventory entirely automated
- **July - Aug:** manual editing and correcting of RGI alpha.
- **Sept:** RGI beta release (outlines freeze)
- **Sept - Oct:** data formatting (regions, spatial resolution, etc.), two products (“with divides” and “merged”), attribute generation
- **November:** technical report, data preparation
- **December:** RGI 7 release
- **Early 2021:** publication in Earth System Science Data or equivalent



## 5. Perspective for RGI 8 and beyond: snapshots





## 6. Call for participation

**Community input to be organized around “task forces”  
RGI generation process to be overlooked by everyone**

1. “RGI on demand” from GLIMS database
2. New inventories and outline selection
3. Tools and attributes



## 6. Call for participation

### **“RGI on demand” from GLIMS database - Raup**

Obtain glacier outlines closest to a target date.

Status of the tool presented at the GLIMS meeting.

Community involvement will occur via testing and feedback, possibly also programmatic tools if interest.

Submitting outlines?

Contact [glacierdata@nsidc.org](mailto:glacierdata@nsidc.org)



## 6. Call for participation

### **New inventories and outline selection - Paul, Rastner**

For the year 2000 update of RGI7, two points are important:

1. bringing outlines closer to the Y2000 (if much older/newer or with large spread)
2. improving their quality (seasonal snow, debris cover, polygon simplification)

Point 2 can supersede 1 for selected reasons (consistency, integrity, time stamp, ...)

## 6. Call for participation

### New inventories and outline selection - Paul, Rastner

Analysis of the RGI6.0 dataset revealed a large set of possible improvements:

1. replace **nominal glaciers**: Caucasus<sup>1</sup>; correct topology: Jan Mayen<sup>1</sup>
2. add **missing regions** in RGI: Dry Valleys<sup>1</sup>, Ant. Peninsula<sup>1</sup> & GLIMS: Pyrenees<sup>1</sup>
3. update **old outlines** (pre-1980s): US<sup>2</sup>, Jan Mayen<sup>3</sup>, New Zealand<sup>1</sup>, Subant. Islands<sup>3</sup>
4. getting closer to **2000**: Sweden<sup>3</sup>, Pyrenees<sup>3</sup> (Alaska, North Asia)
5. reduce **temporal spread**: Svalbard<sup>2</sup>, Russian Arctic<sup>3</sup>, Canadian Arctic South<sup>2</sup>
6. improve **quality** (snow, triangle polygons): Low Latitudes<sup>2</sup>, Southern Andes<sup>1</sup>
7. improve **consistency**: Central Asia, South Asia West/East => GAMDAM2<sup>1</sup>

The upscript numbers <sup>1</sup>, <sup>2</sup>, <sup>3</sup> indicate a first suggestion for a priority list

We will send a table to the WG for a region by region overview.

Interested in joining this task force?

Contact [frank.paul@geo.uzh.ch](mailto:frank.paul@geo.uzh.ch) & [philipp.rastner@geo.uzh.ch](mailto:philipp.rastner@geo.uzh.ch)



## 6. Call for participation

### Tools and attributes - Maussion, Raup

Everything not related to outline generation / selection.

Automated tools to:

- Format GLIMS data to RGI files (attributes, IDs, names, etc)
- Quality check the semi-automatically generated outlines (overlap, etc)
- DEM generation (see <https://rgitools.readthedocs.io/en/latest/dems.html>)
- Centerlines
- etc.

Other attributes and added value to RGI:

- Ice divides
- Ice thickness
- Debris cover
- Other data? Ideas and contributions welcome!

Interested in joining this task force? Contact [fabien.maussion@uibk.ac.at](mailto:fabien.maussion@uibk.ac.at)

## 6. Call for participation

### **RGI release process: beta testing and feedback**

We will pre-release testing versions of the RGI for your scrutiny.

**Give us feedback about RGI6 and RGI7 via mail or the issue tracker:**

[https://github.com/GLIMS-RGI/rgi\\_issue\\_tracker](https://github.com/GLIMS-RGI/rgi_issue_tracker)



## 7. Open discussion



**RGI is great!**

**We need your support  
to make it even better.**



Contact:

[fabien.maussion@uibk.ac.at](mailto:fabien.maussion@uibk.ac.at)

[rehock@alaska.edu](mailto:rehock@alaska.edu)

**Regine Hock, Fabien Maussion, Frank Paul,  
Philipp Rastner, Bruce Raup, Michal Zemp**

