

# RETREAT: A new freely available data set of Sentinel-1 glacier velocities in regions outside the polar ice sheets

FAU-Glacier Portal



<http://retreat.geographie.uni-erlangen.de>

DE EN



Time Range

Oct 21, 2014 - Mar 16, 2021

From Date

21. October 2014

To Date

16. March 2021

Area of interest

worldwide

Please choose your area of interest ...

worldwide

... or draw your individual area of interest

Start drawing on map

Selected BoundingBox:

worldwide : -180,-90,180,90

Change geometry color

Topic

velocity fields

Please choose your topic

velocity fields

Search



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EGU General Assembly 2021, Vienna

Institut für Geographie

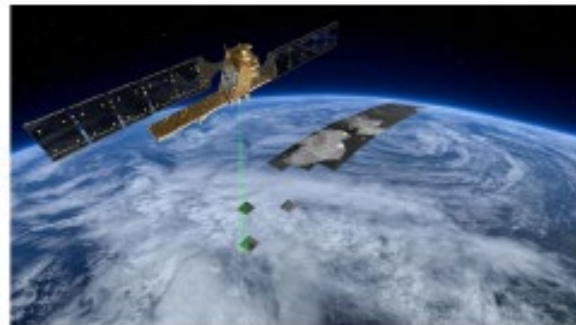


FRIEDRICH-ALEXANDER  
UNIVERSITÄT  
ERLANGEN-NÜRNBERG



Bundesministerium  
für Wirtschaft  
und Energie

# Data processing scheme



Sentinel-1 a + b radar satellites  
12 – 6 day repeat cycle

Parallel download of massive Sentinel-1 data

Archived data

New data



Saturn HPC storage (75 TB)



Front end



S1 pair job

S1 pair job

S1 pair job

⋮

GAMMA, R, Python Processing

Woody-Cluster (286 Nodes,  
1144 CPU's, 5.5 TB RAM )



Node



Node



Node

Results

Data dissemination

RETREAT-Server (8 TB)



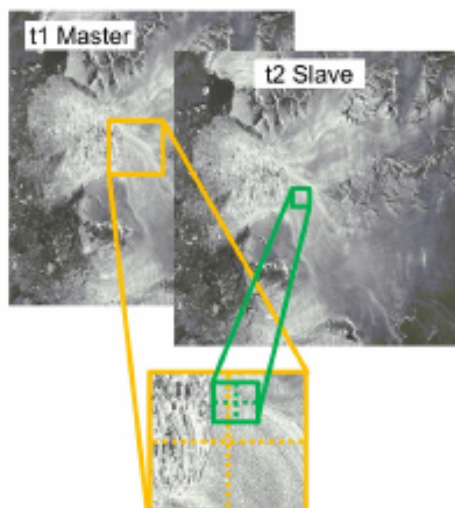
AG members

External users

More than 110.000 individual Sentinel-1 scenes ( > 450 TB) have been processed until today.

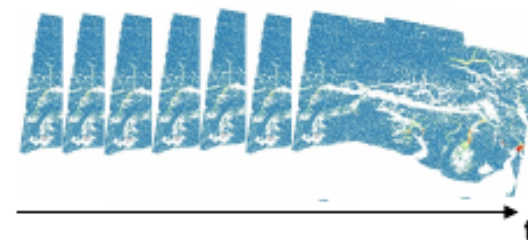
# Data processing scheme

## GAMMA, R, Python Processing



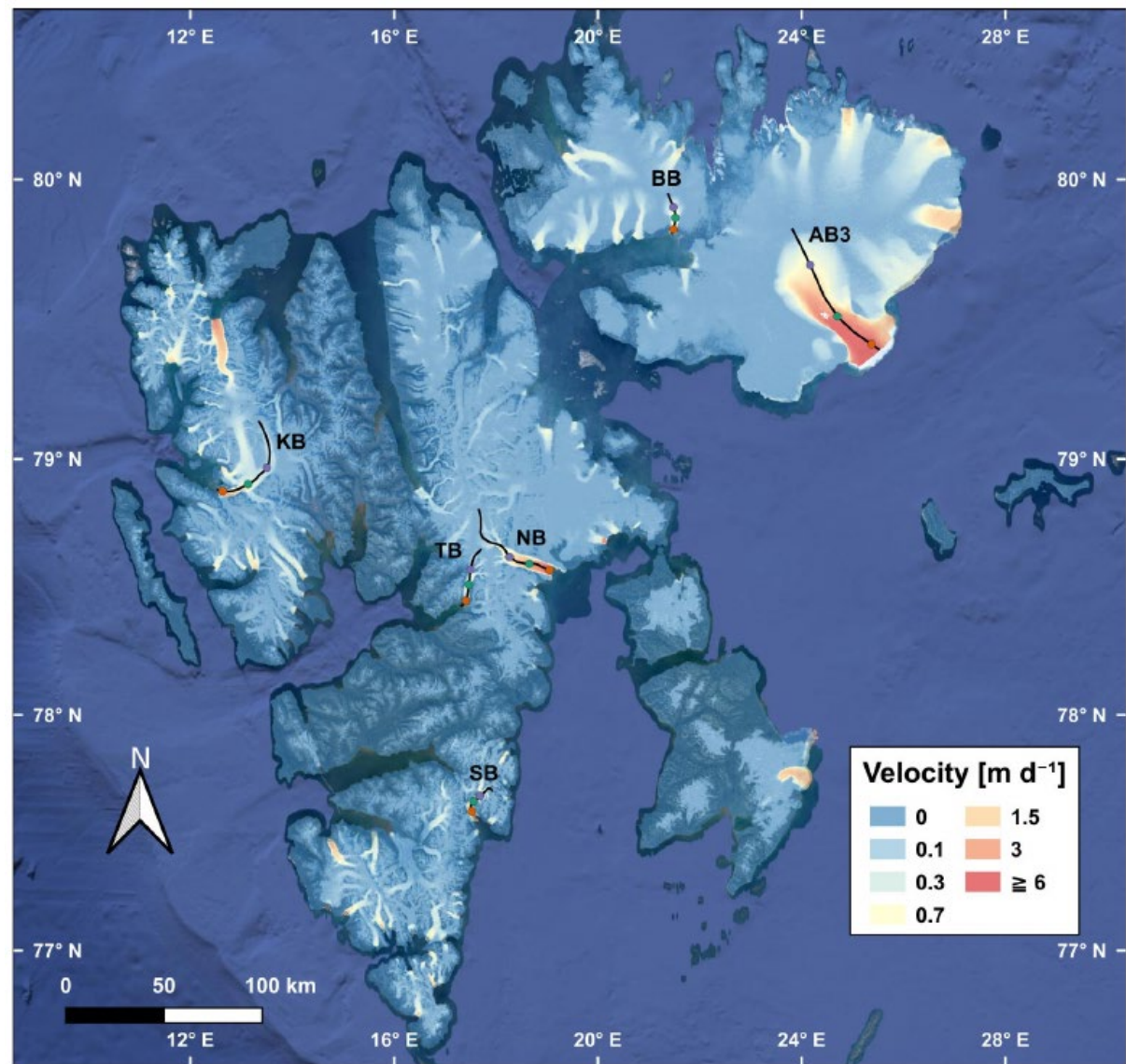
- Image coregistration
- Tracking
- Orthorectification
- Filtering
- Calibration

Time series of single glacier velocity fields  
(2014 – today, 200 m resolution)

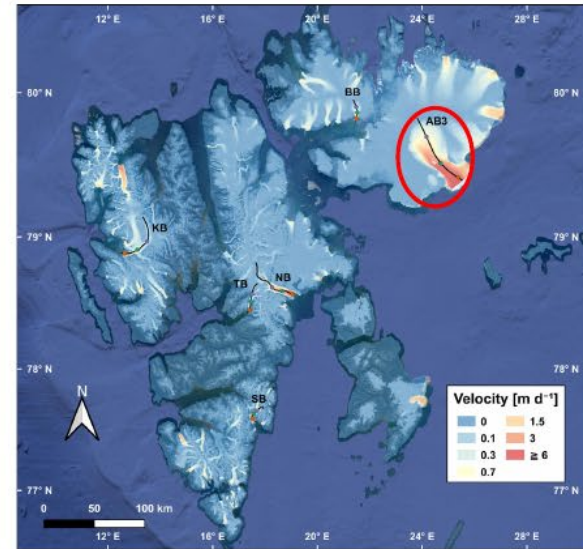
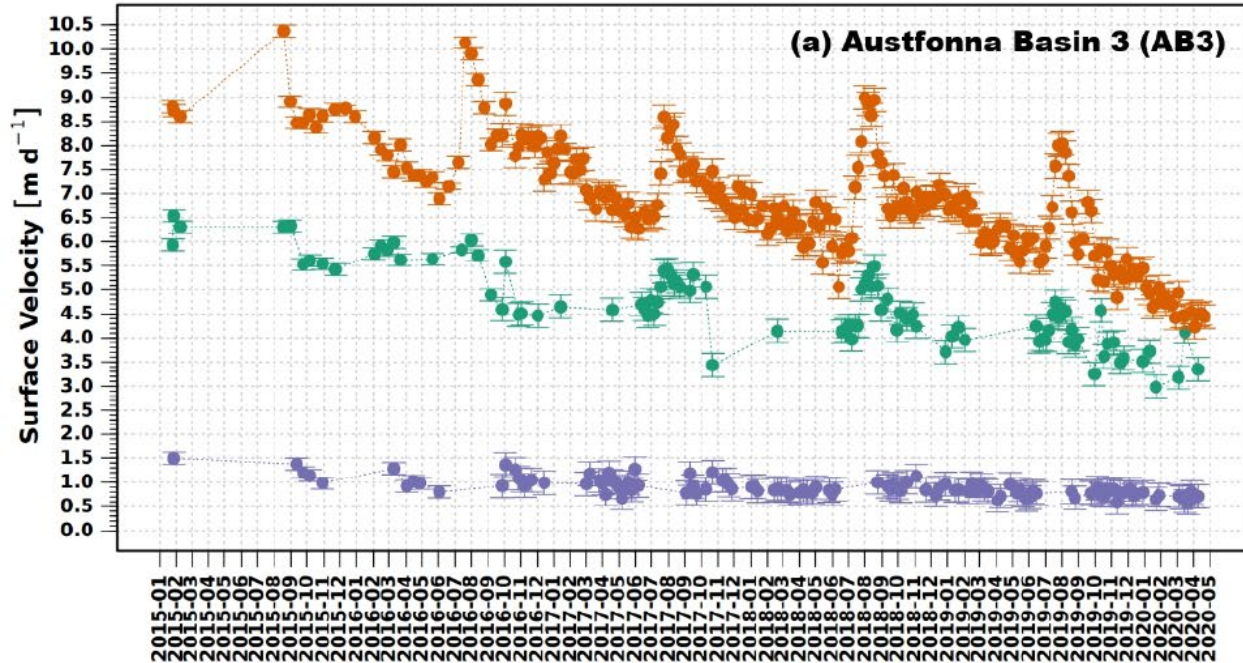


Averaged yearly and monthly velocity mosaics

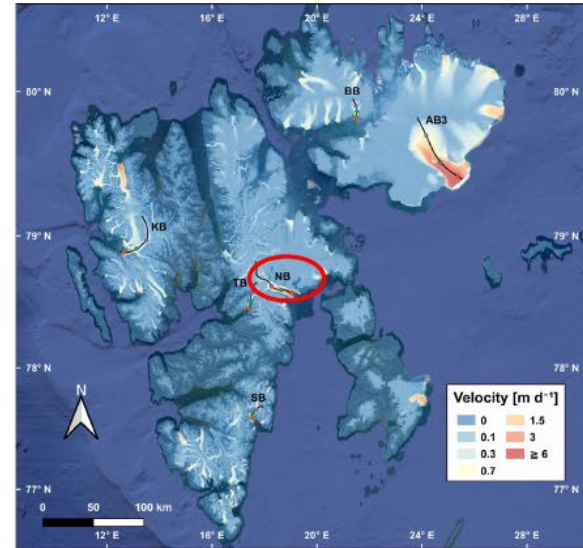
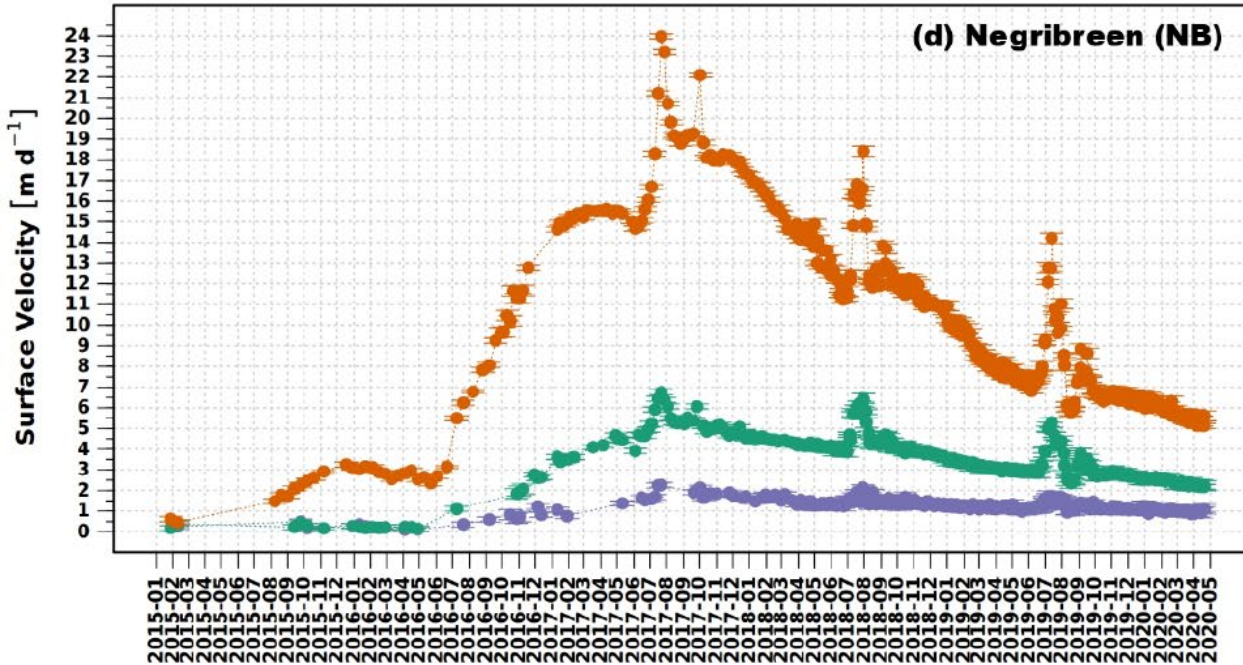
# Example: Velocity mosaic of Svalbard (2019)

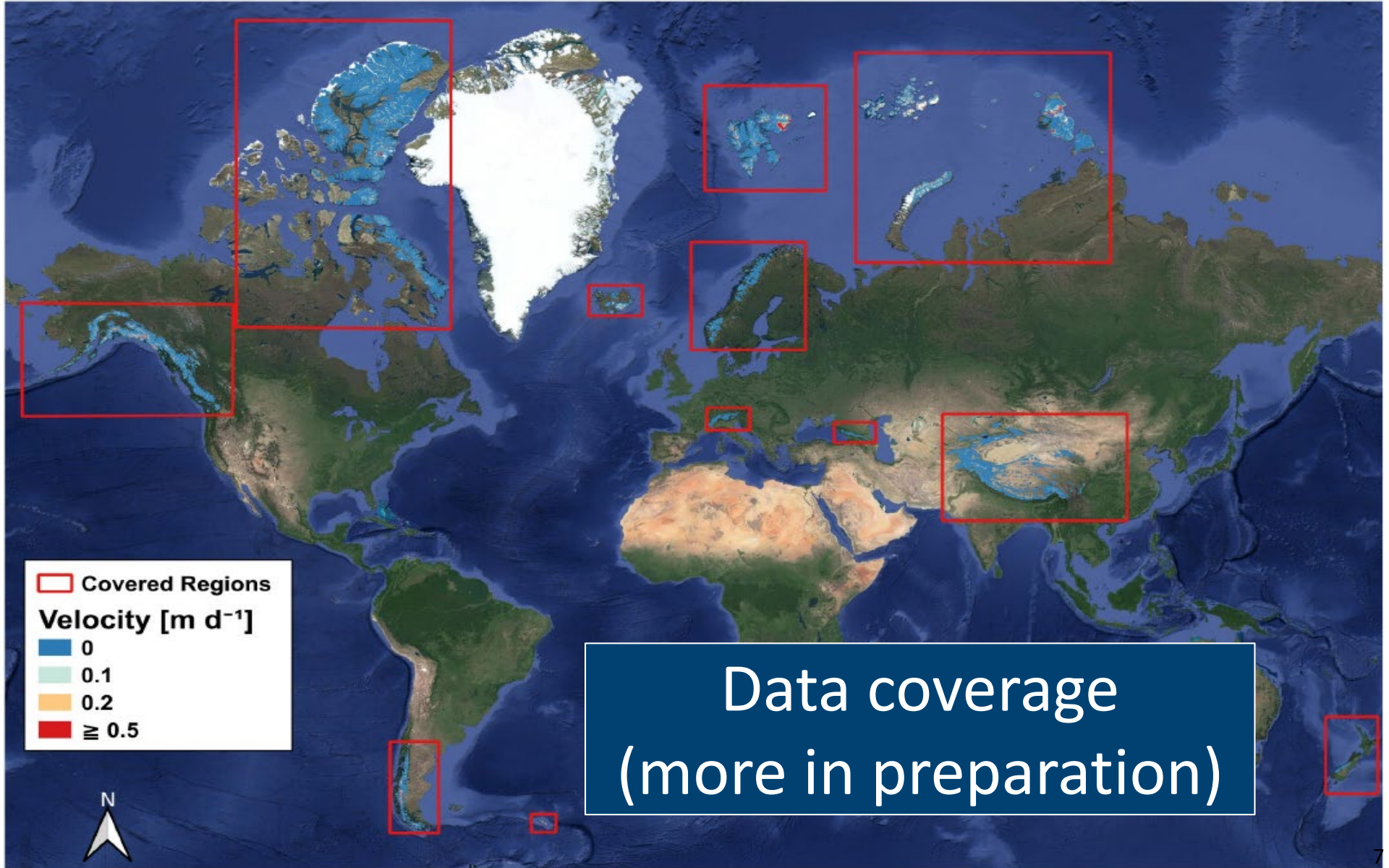


# Example: Velocity time series of selected glaciers on Svalbard



# Example: Velocity time series of selected glaciers on Svalbard





# Data access

<http://retreat.geographie.uni-erlangen.de>

FAU-Glacier Portal 

Q search analyze 

DE EN 

> Time Range Oct 21, 2014 - Jan 10, 2021

> Area of interest individual

> Topic velocity fields

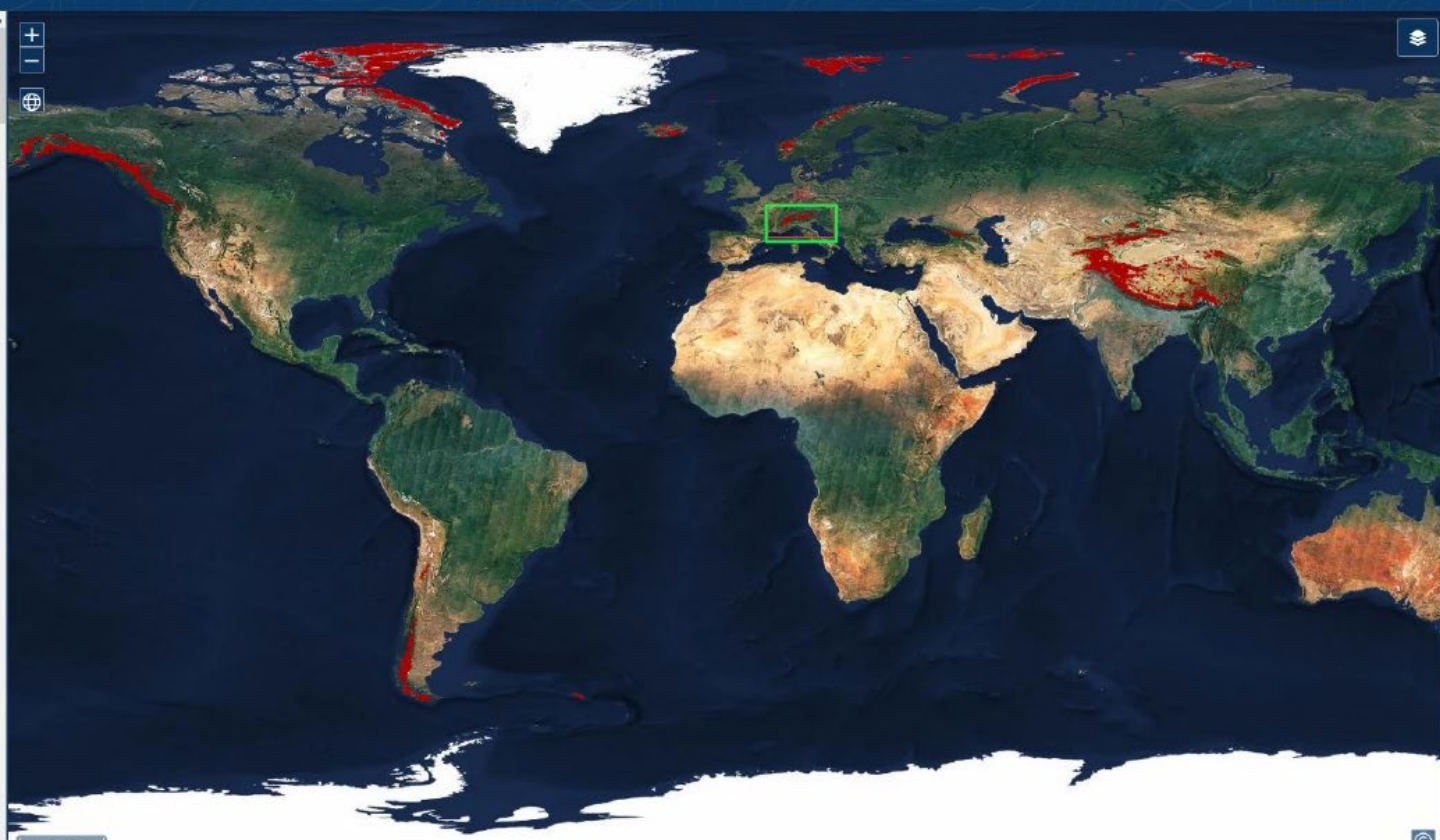
Search

Results

Alps 06  159

☐ Check all / Uncheck all

|                                                |                                                                                                                                                                            |
|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> Orbit 015 / Frame 001 |   63     |
| <input type="checkbox"/> Orbit 015 / Frame 005 |   20     |
| <input type="checkbox"/> Orbit 015 / Frame 006 |   20     |
| <input type="checkbox"/> Orbit 015 / Frame 007 |   61     |
| <input type="checkbox"/> Orbit 015 / Frame 010 |   4      |
| <input type="checkbox"/> Orbit 015 / Frame 011 |   4      |
| <input type="checkbox"/> Orbit 015 / Frame 012 |   23     |
| <input type="checkbox"/> Orbit 015 / Frame 013 |   23     |
| <input type="checkbox"/> Orbit 015 / Frame 018 |   11 |
| <input type="checkbox"/> Orbit 015 / Frame 019 |   11 |
| <input type="checkbox"/> Orbit 015 / Frame 020 |   48 |



2000 km

Imprint Privacy Policy

## Data paper coming

- More information regarding data processing, quality and comparison to other data sets will be soon available at ESSD.

Please inform us, if you use the data in any kind of applications/publication. Would be interesting for us to see, what you are doing with the data.