



Land Monitoring

Water, Snow and Ice Products

NCP training

Bio-Geophysical Variables at Pan-European Level

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Key specifications



Continues and expands the former HR Snow & Ice portfolio by **adding improved methods** and **water-related products**.



Uses **S-1** and **S-2** data to generate products ranging from **10 - 60 m**.



Includes **NRT, annual and multi-annual** products showing changes over time.



All data are **free and openly accessible**



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Product portfolio – key features

Mapping the
extent/presence



Assess the
characteristics



Estimate the
duration



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Product portfolio



Snow

- Fractional Snow Cover
- Gap-filled Fractional Snow Cover
- Wet/Dry Snow
- SAR Wet Snow
- Snow Phenology



Water

- Water Layer
- Water Cover Duration



Ice

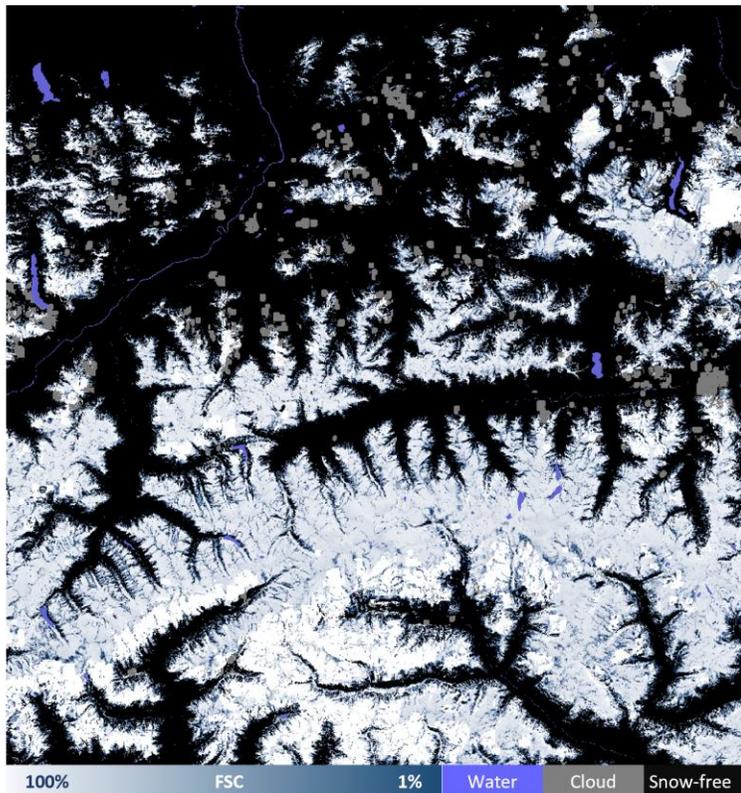
- Water and Ice Cover
- Aggregated Water and Ice Cover
- Ice Cover Duration



Mapping Snow Extent

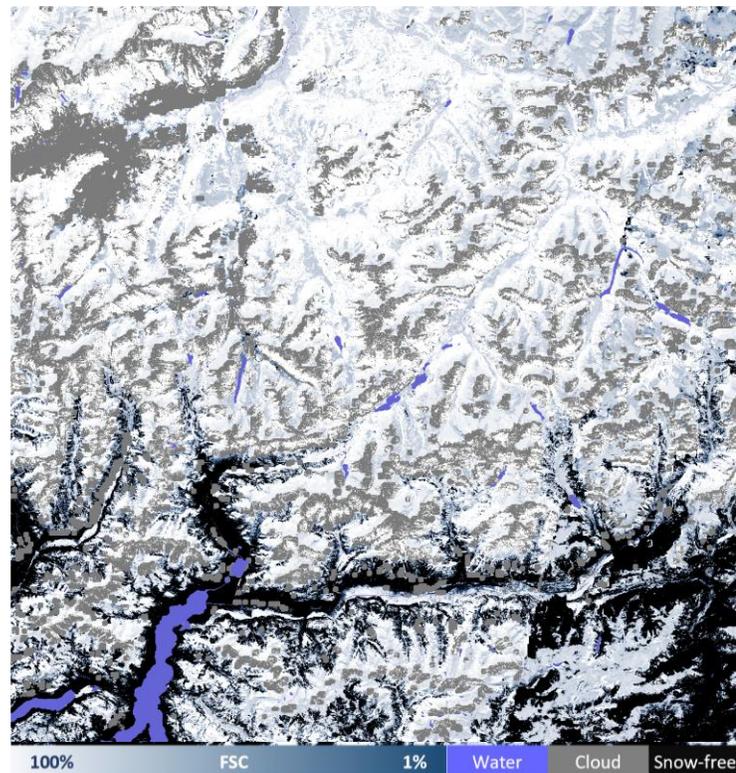


Fractional Snow Cover
20 m, ~5 day (2016-now, NRT)



 Sentinel-2

Gap-filled Fractional Snow Cover
60 m, ~6 day (2016-now, NRT)



 Sentinel-1
Sentinel-2

Monitoring: climate change impacts
Input for: land surface models, hydrological models, hydropower management

 % of snow cover for each pixel



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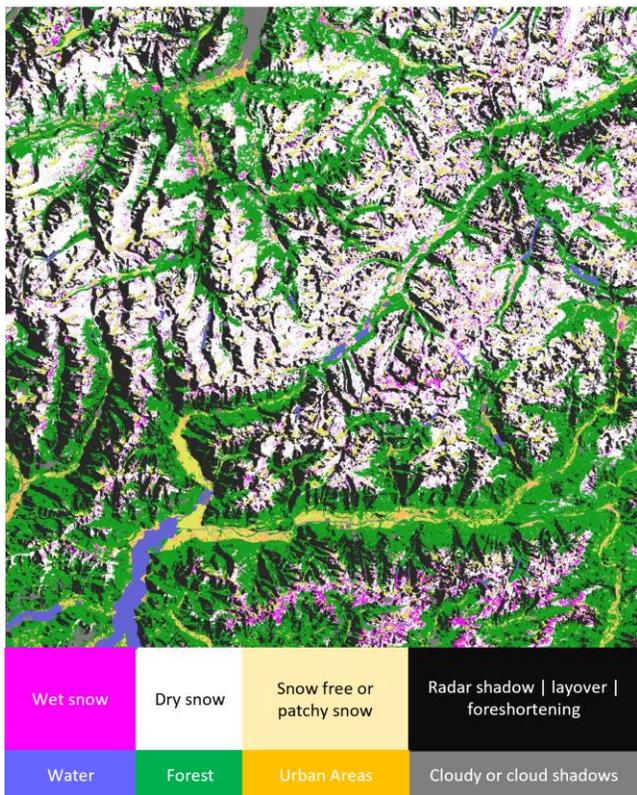


Assessing Snow state

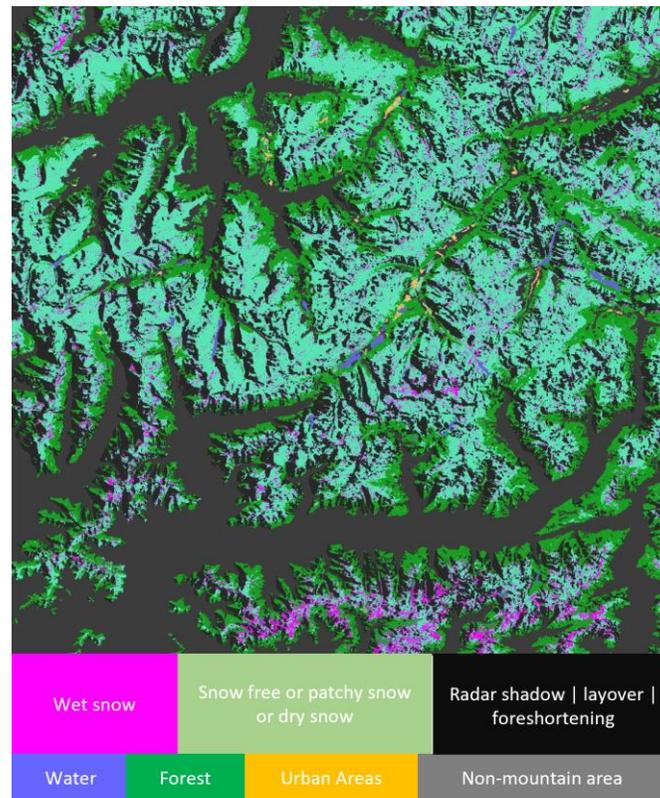


Wet/Dry Snow: 60 m, ~5 day (2016-now, NRT)

SAR Wet Snow: 60 m, ~5 day (2016-now, NRT)



 Sentinel-1
Sentinel-2



 Sentinel-1

 State of snow – is it melting?

Monitoring: snow dynamics on spatio-temporal scales
Input for: hydrological and snow models, avalanche forecasting

Estimate the duration of the Snow Period

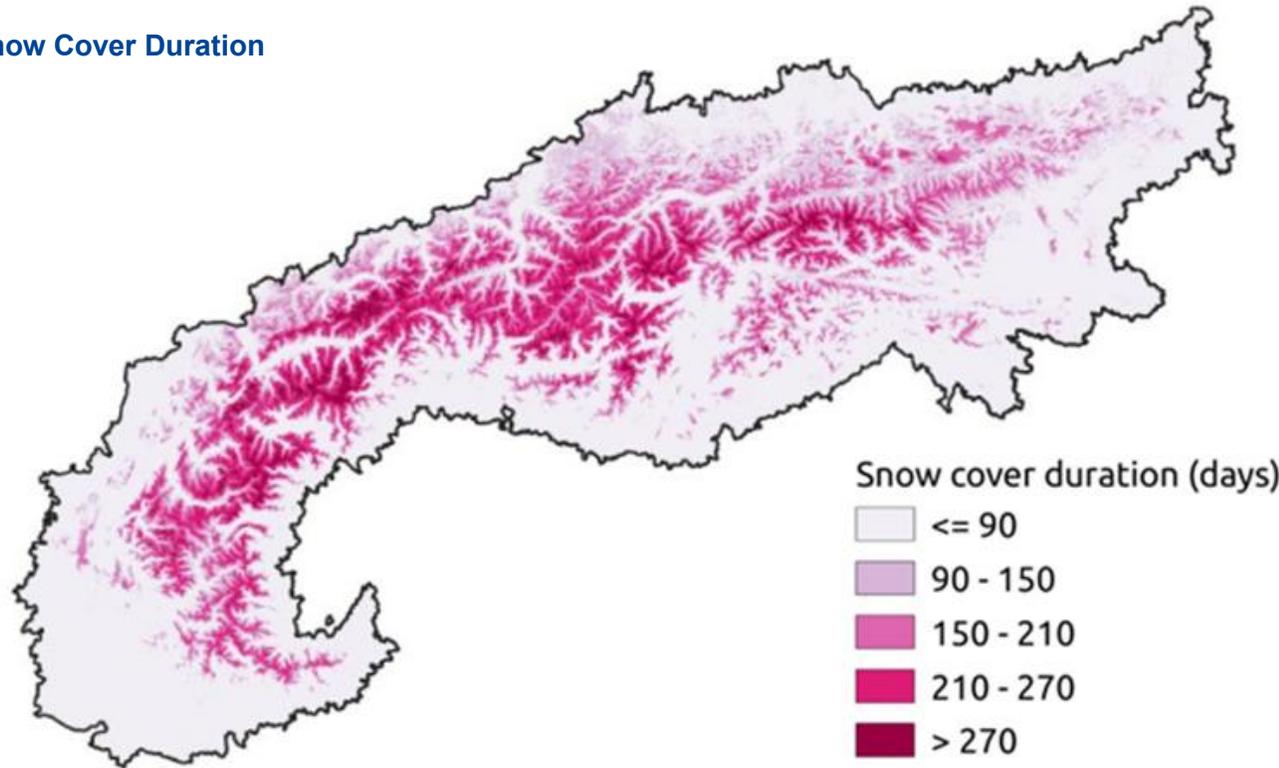


Snow Phenology, 20/60/100 m, yearly (2016-now), first data in Jan. 2026

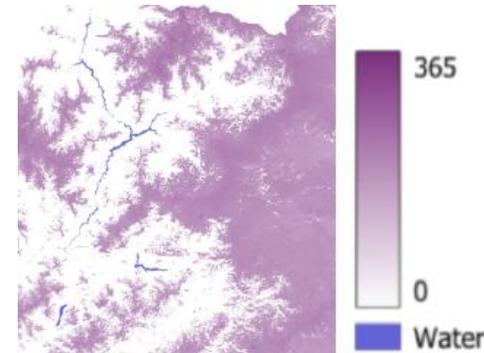


Sentinel-1
Sentinel-2

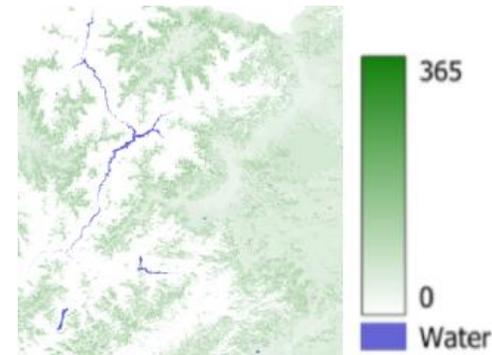
Snow Cover Duration



Snow Cover Onset



Snow Cover Melt-out



Monitoring: annual characteristics of the snow cover
Input for: climate change studies, analysing frequent extreme weather events



When is the snow season?



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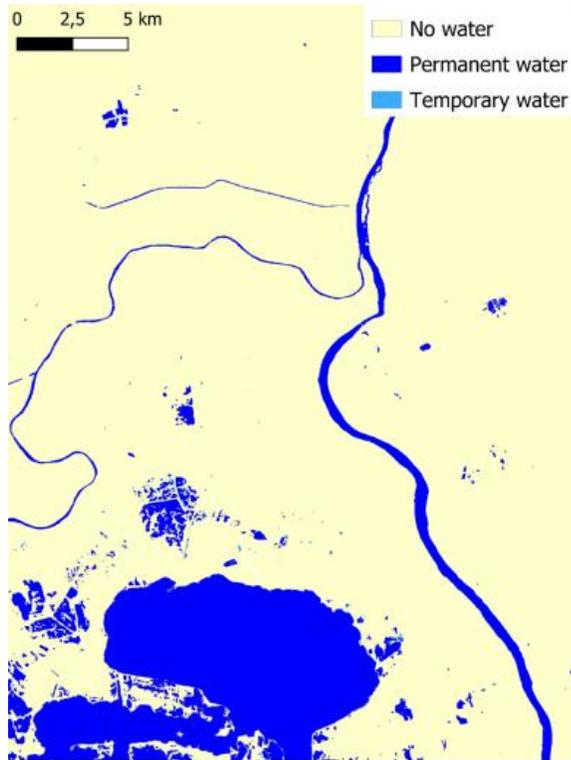


Water layers

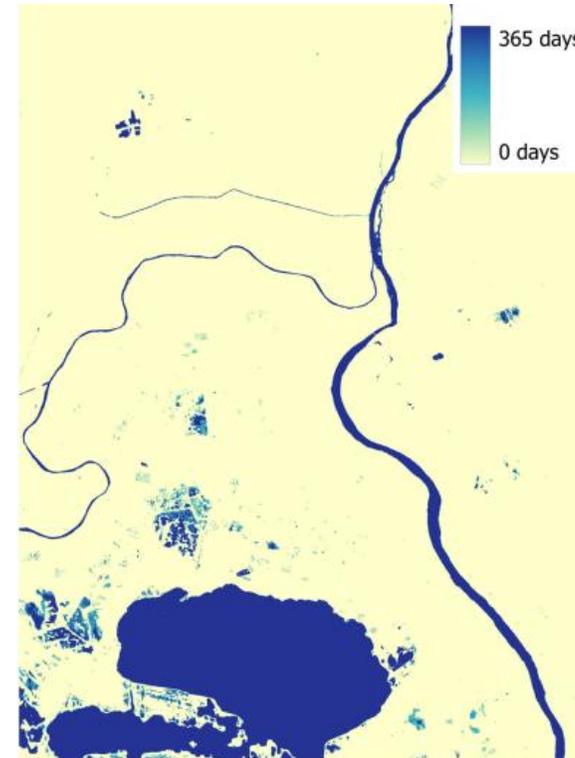


HR Water Layer, 10/100 m, 3-yearly, 2021-2024, first data in Q3 2026

Water Cover Duration: 10/100 m, yearly (2016-now), first data in Jan. 2026



Sentinel-1
Sentinel-2



Where has water been present over the last 7 years?

How long was there water last year?

Monitoring: presence of open water surfaces and the duration of surface water occurrence
Input for: hydrological monitoring, water management, flood/drought risk assessment



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River and lake ice extent

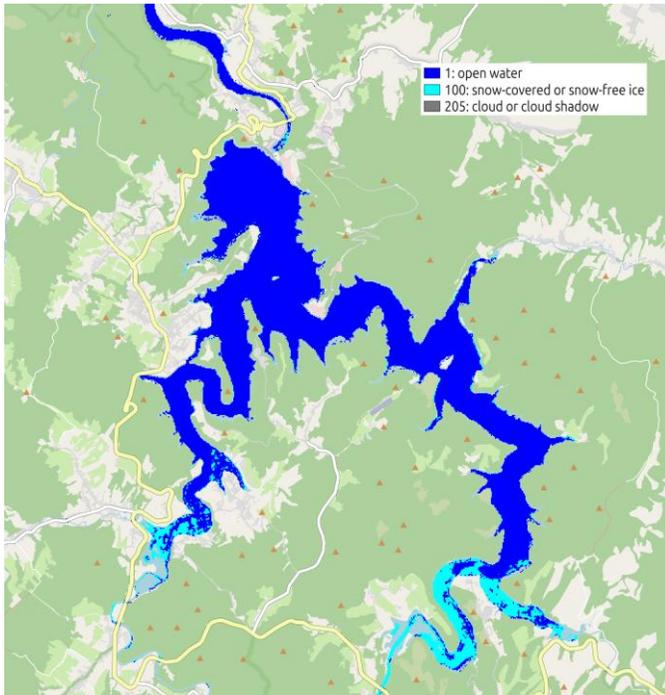


Water & Ice Cover (WIC) 20/60 m, ~5 day (2016-now, NRT)

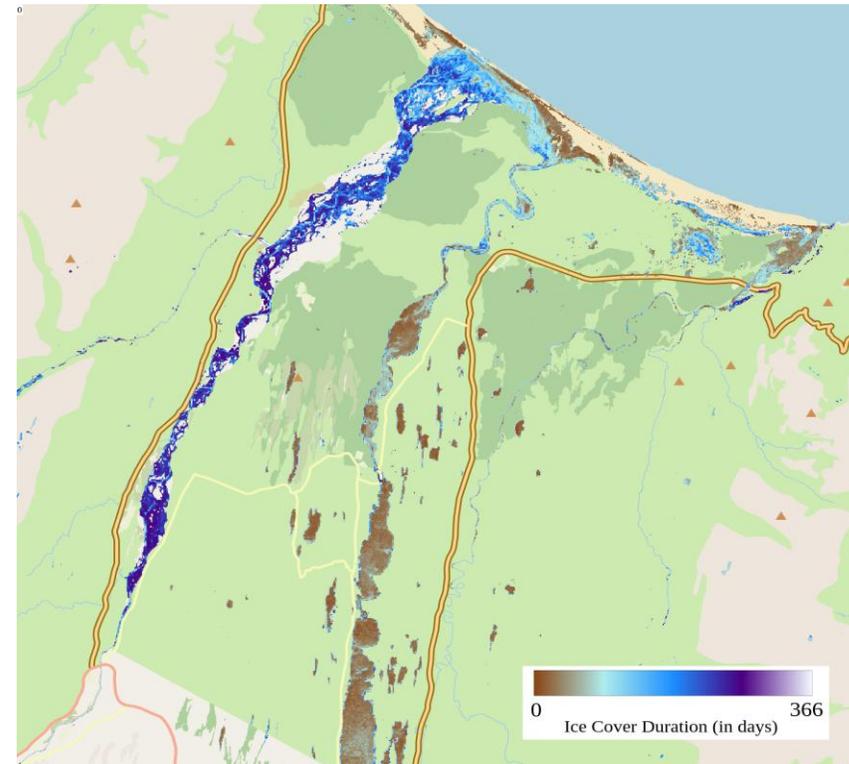
Aggregated WIC (AWIC) ~5 day (2016-now, NRT)



Sentinel-1
Sentinel-2



Ice Cover Duration (ICD) 20/100 m, yearly (2016-now), first data in Jan. 2026



Sentinel-1
Sentinel-2

Where has water been present over the last 7 years?

Monitoring: climate change impacts, lake ecosystems

Input for: hydrometeorological centres (ice condition), hydropower providers, shipping industry



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Driving the evolution

- CLMS is establishing an Inland Water Working Group – IWWG



To **define**

- User requirements from policies (NRR, WFD, ...)
 - Product specifications to serve those requirement
 - A roadmap for the implementation of these products

To **give input** on

- Strategic visibility
- The Copernicus Water Thematic Hub

Data availability timeline

- Fractional Snow Cover
- Gap-filled Fractional Snow Cover
- Water and Ice Cover
- Aggregated Water and Ice Cover
- Wet/Dry Snow
- SAR Wet Snow

Near Real Time data are generated from 15 Jan. 2025

- Snow Phenology
- Water Cover Duration
- Ice Cover Duration

Annual products available in stages from Jan. 2026

2024-2025 & 2016-2017 processed, then one year every month

- Water Layer

WL21 available in Q3 2026

Data accessibility

<https://github.com/eea/clms-hrws-i-api-client-python>

Until March 2026

Python client for accessing the Copernicus Land Monitoring Service - High Resolution Water, Snow & Ice (HR-WSI) products

After March 2026



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