UPV

EHL

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THE REPORT AND A DECEMBER OF THE



1850: 52 glaciers 2060 hectars
1984: 39 glaciers 810 hectars
2011: 24 glaciers 293 hectars
2020: 21 glaciers 219 hectars
2022: 18 glaciers 170 hectars

- 1850: Moraines from the end LIA
- 1984: Aerial photographs and satellite images
- 1990 y 2002: Start of glaciological mass balance in Maladeta (Spain) and Ossoue (France) glaciers



2011: Use of TLS in Monte Perdido Glacier





Average thinning 2011-2022



2020: Use of UAV for applying SfM algorithms





2020: Use of UAV for applying SfM algorithms Reference for 2011: Airborne LIDAR National Geographic Service



Ice cover los 2011-2020: 23.2% Average thinning 2011-2020: -6.3 meters

Area 2011 (ha)

▲ 5

▲ 10 ▲ 20 40

60

Elevation 2011

(m a.s.l.)

3300

3100

2900

2700

Aspect 2011

-0.94

-0.71

Î

-0.47 혼

-0.24

Portillon

Coronas

Barrancs

60

Geophysical Research Letters, 2021

2017 and onwards: Use of GPR to estimate remaining ice (5 glaciers analyzed)





The Cryosphere 2023

Monitoring the vanishing of the Pyrenean glaciers 2020: Use of GPR + SfM using historic aerial photographs to reconstruct ice thickness in 1984 to estimate remaining ice





Monitoring the vanishing of the Pyrenean glaciers 2020: Use of GPR + SfM using historic aerial photographs to reconstruct ice thickness in 1984 to estimate remaining ice





Effects of extreme 2022



Effects of extreme 2022 Ice thickness: -3,4 meters



Effects of extreme 2022: Unprecedent reductions and 5 glaciers degraded to ice patches



Our initial hypothesis that glacier wastage slows down during their last stages is far to be observed

CBC MENU -



Bob Sandford, left, the Athabasca Glacier as seen in the summer of 2020, middle, and John Pomeroy, right. (David Stapleton/CBC, submitted by John Pomeroy, Helen Pike/CBC)



In 2025 (International Year of Glacier Preservation) more than half of the remaining glaciers in the Pyrenees are likely to disappear, no more glaciers could exist before 2030

Debris covered glaciers



Debris covered glaciers





Average thinning 2021-2022

Monitoring the vanishing of the Pyrenean glaciers Ongoing work: Microbiology, soils and vegetation in recently deglaciated areas





Ongoing work: New lakes



Ongoing work: New lakes



Dissemination and outreach



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Pyrenees Glaciers Are Rapidly Disappearing

Three of the remaining glaciers in the Pyrenees mountain range have stopped flowing in the past decade.

By Joshua Rapp Learn 4 October 2021



Aneto Glacier in the Pyrenees mountains mells in September 2020. Credit: txela Vidalier/Pyrenean Glaciers

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nature climate change

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Research Highlight | Published: 30 September 2021

CRYOSPHERE

Ice loss in the Pyrenees

<u>Graham Simpkins</u> 🗠

Nature Climate Change 11, 801 (2021) Cite this article

352 Accesses | 14 Altmetric | Metrics

Geophys. Res. Lett. https://doi.org/gvp4 (2021)

Globally, very small glaciers (<0.5 km²) located in temperate mountain ranges have lost substantial mass over the past century. One region exhibiting such changes is the Pyrenees in southern Europe, where glaciers might disappear in only a few decades. To better assess





ENVIRONMENT

Spain's largest glacier could only have ten years

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Study documents dramatic loss of remaining Pyrenees glaciers





Thanks for your attention!

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