



## Michael Zemp

Director WGMS, Prof Dr  
World Glacier Monitoring Service  
Department of Geography  
University of Zurich

- WHY?
- HOW?
- EXAMPLES
  - fly less, work smarter
  - fly less, stay longer
  - fly less, meet virtual
  - fly less, meet hybrid
- YOU!



# Smarter than flying – WHY?

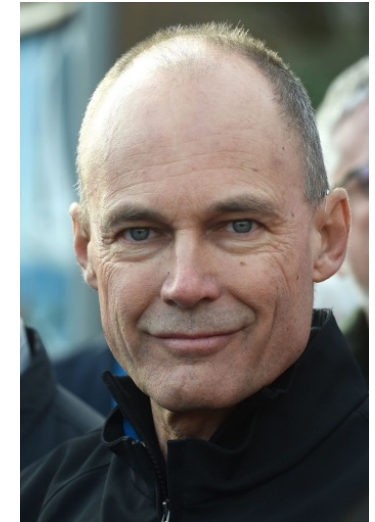


*To be credible, the university has to lead the way when it comes to sustainability.*



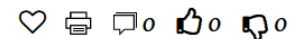
## DIE WELTWOCH

UMWELT



**Prosit Klima!**

Thomas Stocker und Bertrand Piccard sorgen für mehr CO<sub>2</sub> in der Luft.





# Smarter than flying – HOW?



AIRMILES MONITORING  
HOW IS IT  
DONE?



## FLY LESS..



## ..but SMARTER

- First (physical) contacts are important
- Avoid long-haul flights
- Use trains to airport hubs
- Use trains for meetings in Europe
- Fly economy and direct flights
- Meet virtual or hybrid

*The first half is easy, the second half will need a system change!*





## American versus European Geoscience General Assembly

# AGU23

San Francisco, CA & Online Everywhere  
11-15 December 2023



**By airplane: 5,700 kg CO<sub>2</sub> eq.**

# EGU General Assembly 2023

Vienna, Austria & Online | 23-28 April 2023



**By airplane: 270 kg CO<sub>2</sub> eq.**  
**By train: 10 kg CO<sub>2</sub> eq.**



## Fly less – stay longer



HOME ABOUT PARTICIPATION PROGRAM INFORMATION ÍSLENSKA CONTACT

Program available under the link:

[Symposium Program](#)

Volcanic eruption has started at Fagradalsfjall in Reykjanes. [Further information about the eruption](#)

Covid-19: Currently no restrictions are in place for visitors to Iceland. [Further information about Covid-19 policy at the Symposium](#)

## INTERNATIONAL SYMPOSIUM ON ICE, SNOW AND WATER IN A WARMING WORLD

August 21–26, 2022  
Reykjavík, Iceland

Interested in updates on the symposium?

Contact: [cryosphere2022@vedur.is](mailto:cryosphere2022@vedur.is)  
for information on abstract submission & the scientific program

Bulletin No. 5 (2020–2021)

## Global Glacier Change Bulletin

A contribution to  
the Global Terrestrial Network for Glaciers (GTN-G) as part of the Global Climate Observing System (GCOS) and its Terrestrial Observation Panel for Climate (TOPC),  
the Science Division and the Global Environment Outlook as part of the United Nations Environment Programme (Science Division and GEO, UNEP),  
and the International Hydrological Programme of the United Nations Educational, Scientific and Cultural Organization (IHP, UNESCO)



Compiled by  
the World Glacier Monitoring Service (WGMS)

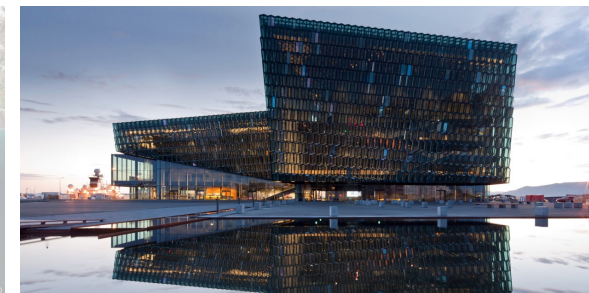


ISC (WDS) – IUGG (IACS) – UNEP – UNESCO – WMO | 2023

**Global estimations of glacier mass changes from glaciological and geodetic methods**

- Review of our observational knowledge across time
- Summary of current change rates, in the context of future developments

Michael Zemp  
World Glacier Monitoring Service  
Department of Geography, University of Zurich, Switzerland



Getting ready to play: [www.kahoot.it](http://www.kahoot.it)



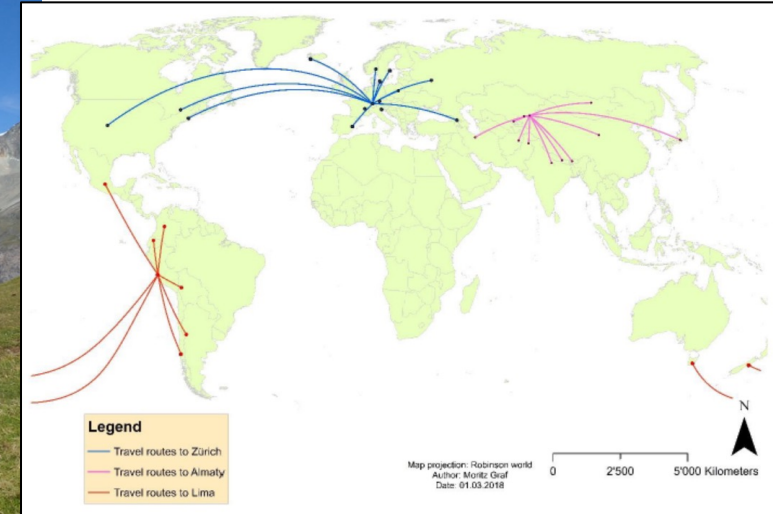
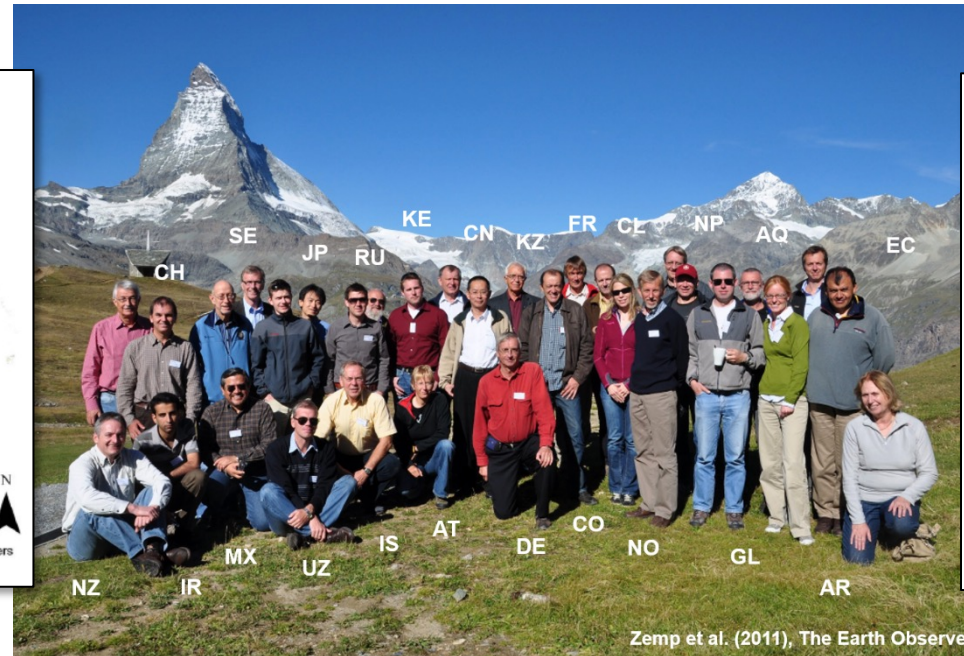
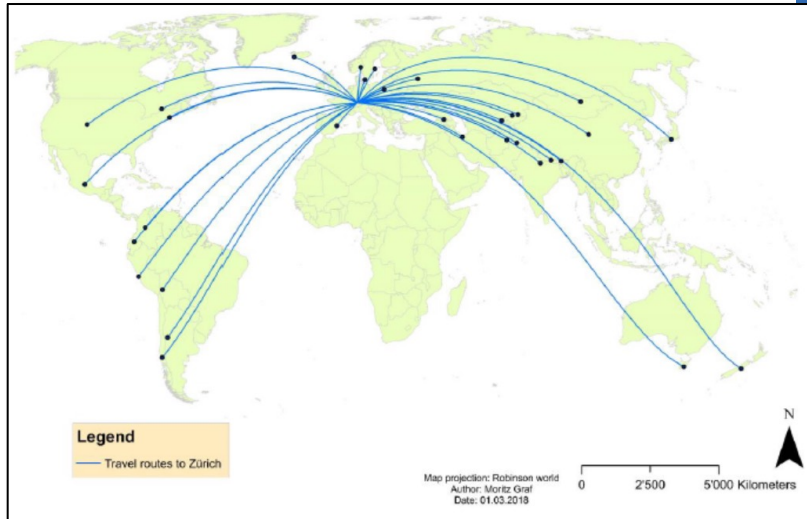




## General Assembly of the World Glacier Monitoring Service

2010

2019



Air miles reduction by 50%  
 Better focus on regional topics!



## Video presentations



Click on the images on the map and follow the journey of our [General Assembly in 2019](#).







## Video presentations

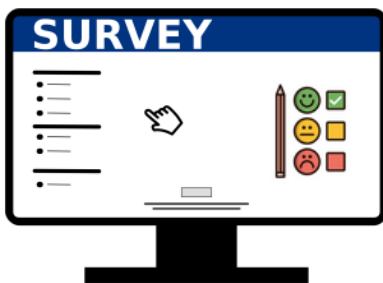
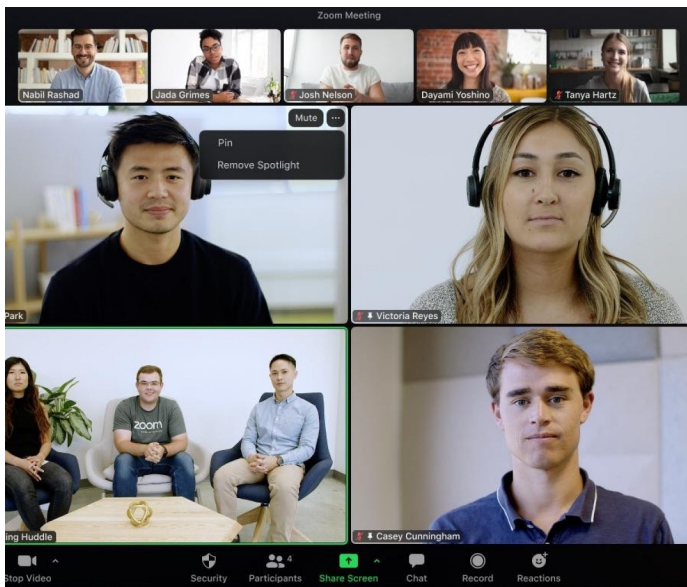
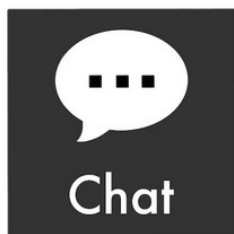


<https://wgms.ch/contact-ncs/>





## Virtual meetings, workshops, conferences



☰
📍 🔄 ⬇️ 🖼️ 🚫 🔍

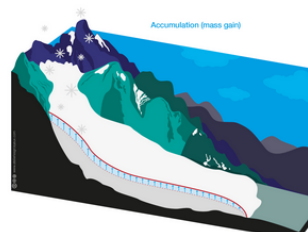
Goals of this notebook:

- Gain a basic understanding of accumulation, ablation and glacier mass balance
- Understand the link between mass balance and ice flow
- Implement a simple experiment to calculate ice flow on a glacier in equilibrium

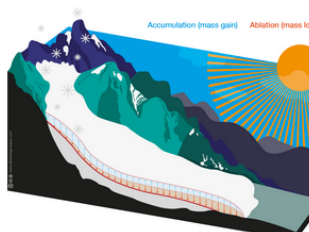
```
from oggm_edu import Glacier, MassBalance, GlacierBed
```

*Copyright notice: the following sections are heavily based on the book "The Physics of Glaciers" by Cuffey and Paterson, (2010). The glacier images are taken from the open glacier graphics on OGGM-Edu, made by Anne Maussion, Atelier les Gros yeux.*

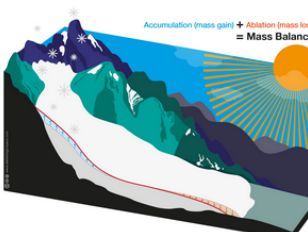
The **mass balance** is the result of several processes that either add mass to the glacier (**accumulation**) or remove mass from the glacier (**ablation**).



Accumulation (mass gain)



Accumulation (mass gain) Ablation (mass loss)



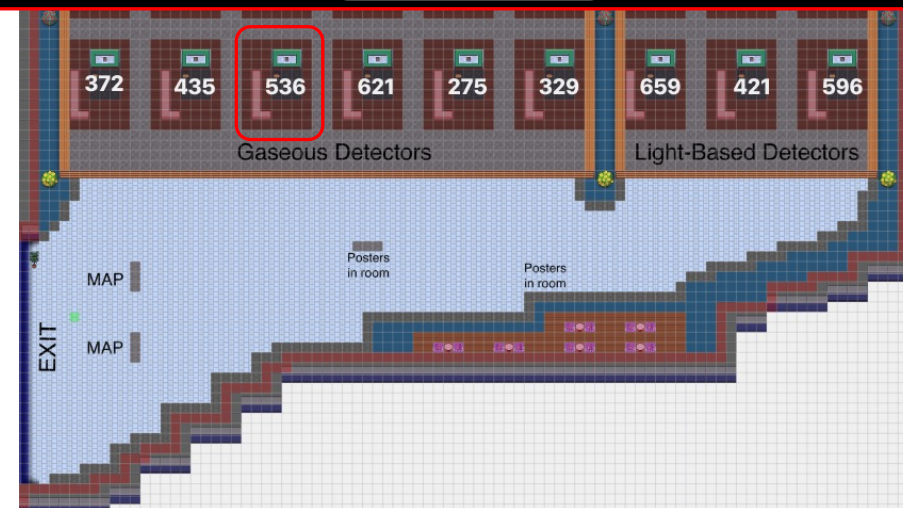
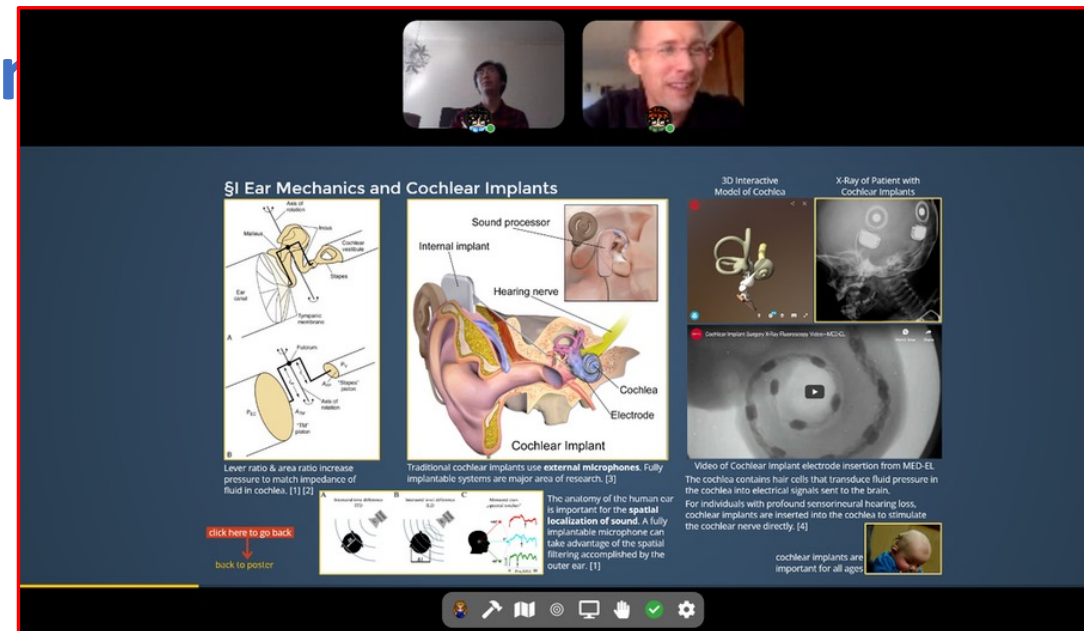
Accumulation (mass gain) + Ablation (mass loss) = Mass Balance



# Smarter than flying – examples from practice



## Virtual meetings, workshops, conferences







## Virtual excursions

# Aletschgletscher 2076

Gletscherrückzug bei einer globalen  
Temperaturzunahme von +2°C  
Mehr zu [Expedition2Grad.ch](https://www.expedition2grad.ch)



Dr. Andreas Linsbauer



## Hybrid meetings, workshops, conferences



### Cryosphere and Geomorphology & Water and Climate

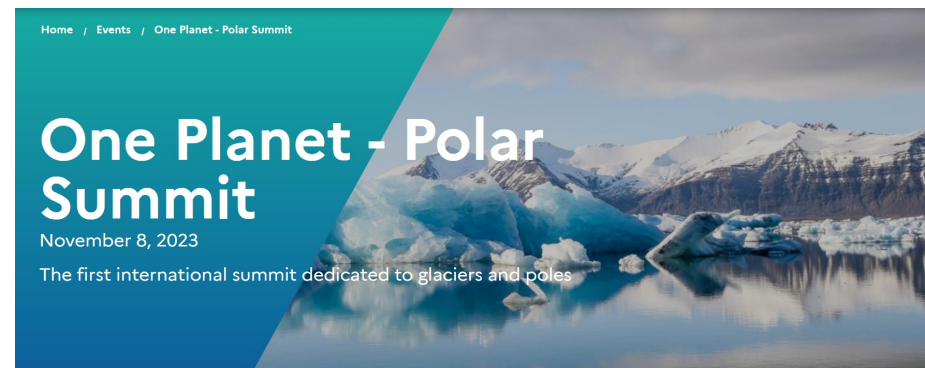
Fall semester 2023, Tuesday, 14:00 - 15:00 hrs, room Y25-H-79

The presentations will be organised also remotely. Interested persons can participate using zoom:

> <https://uzh.zoom.us>

[/j/69575843886?pwd=RGw5RTM2RndGbIVQc2FPbU9rRmtuZz09](https://uzh.zoom.us/j/69575843886?pwd=RGw5RTM2RndGbIVQc2FPbU9rRmtuZz09)

Meeting ID: 695 7584 3886 / Passcode: 855870



One Planet - Polar Summit | Launching of high-level meeting between heads of State and government





# Smarter than flying – YOU!



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*The first half is easy, the second half will need a system change.*

***Let's tackle the first half!***

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