

Climate and water: irenicism to the rescue of an unfinished symphony

Expertise Center for Climate Extremes inaugural event

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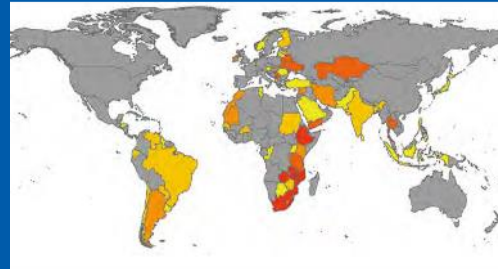
9 February 2024



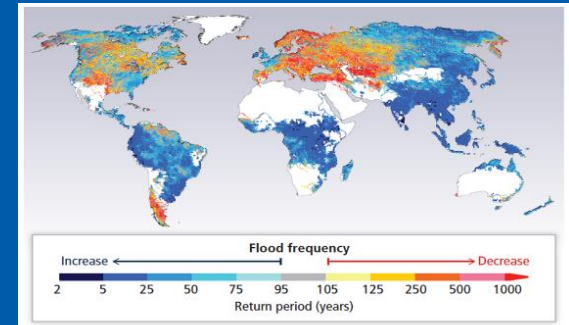
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Climate and water challenges everywhere!

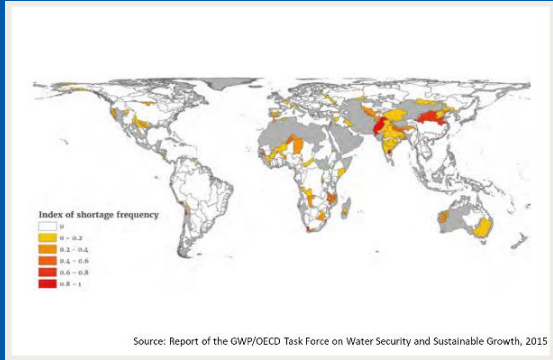
Countries with the largest reduction in growth due to drought



Source: Report of the GWPO/OCED Task Force on Water Security and Sustainable Growth, 2015



Based on 1 hydrological model with 11 Coupled Climate Models for high greenhouse gas emissions (Scenario RCP8.5)
Source: IPCC 5th Assessment Report



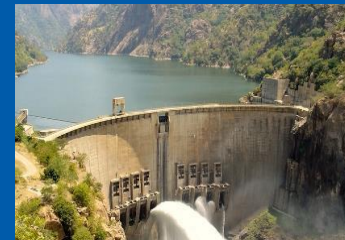
Source: Report of the GWPO/OCED Task Force on Water Security and Sustainable Growth, 2015

Relative economic impacts of water insecurity



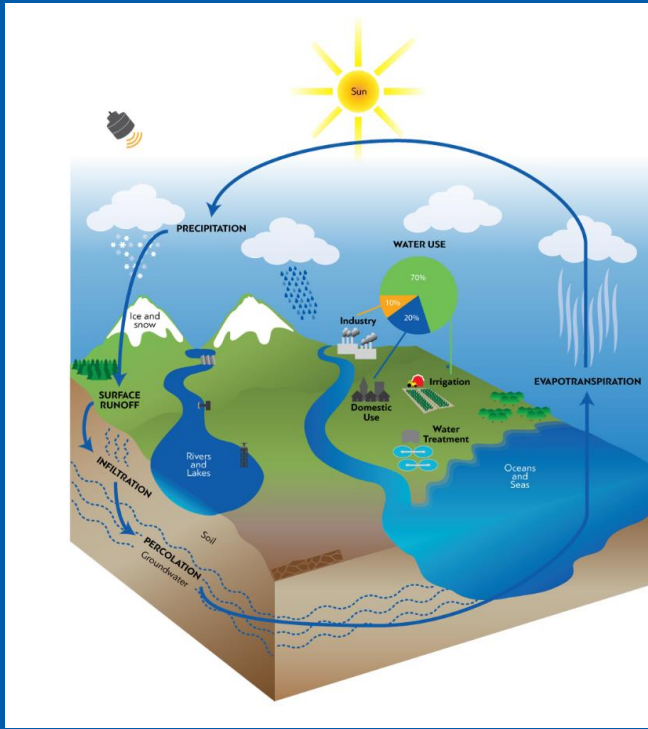
■ Economic impact of water scarcity for agriculture
■ Economic impact of flooding
■ Economic impact of inadequate water supply / sanitation

Source: Report of the GWPO/OCED Task Force on Water Security and Sustainable Growth, 2015



Historical flood of Congo River, January 2024 (credit: J.-B. Dinga)





$$\frac{\partial \rho}{\partial t} + \nabla \cdot (\rho \mathbf{u}) = 0$$

$$\rho \left(\frac{\partial \varepsilon}{\partial t} + \mathbf{u} \cdot \nabla \varepsilon \right) - \nabla \cdot (K_H \nabla T) + p \nabla \cdot \mathbf{u} = 0$$

$$\frac{\partial \mathbf{u}}{\partial t} + (\mathbf{u} \cdot \nabla) \mathbf{u} = -\frac{1}{\rho} \nabla p + \mathbf{F} + \frac{\mu}{\rho} \nabla^2 \mathbf{u}$$

Climatology

Geomorphology

Hydrology

Hydraulics

Topography

Civil engineering

Chemistry

Ecology

Meteorology

Nivology

Geology

Biology

Limnology

Soil science

Statistics

Rheology

Atmosphere physics

Glaciology

Geography

Thermodynamics



Metrology

Stochastics

Informatics

Fluid dynamics

AI vs digital twin

Climate vs personal Development

Mitigation vs Adaptation

End of the world vs End of the Month

Modeling of monitoring

Beatles vs Rolling Stones

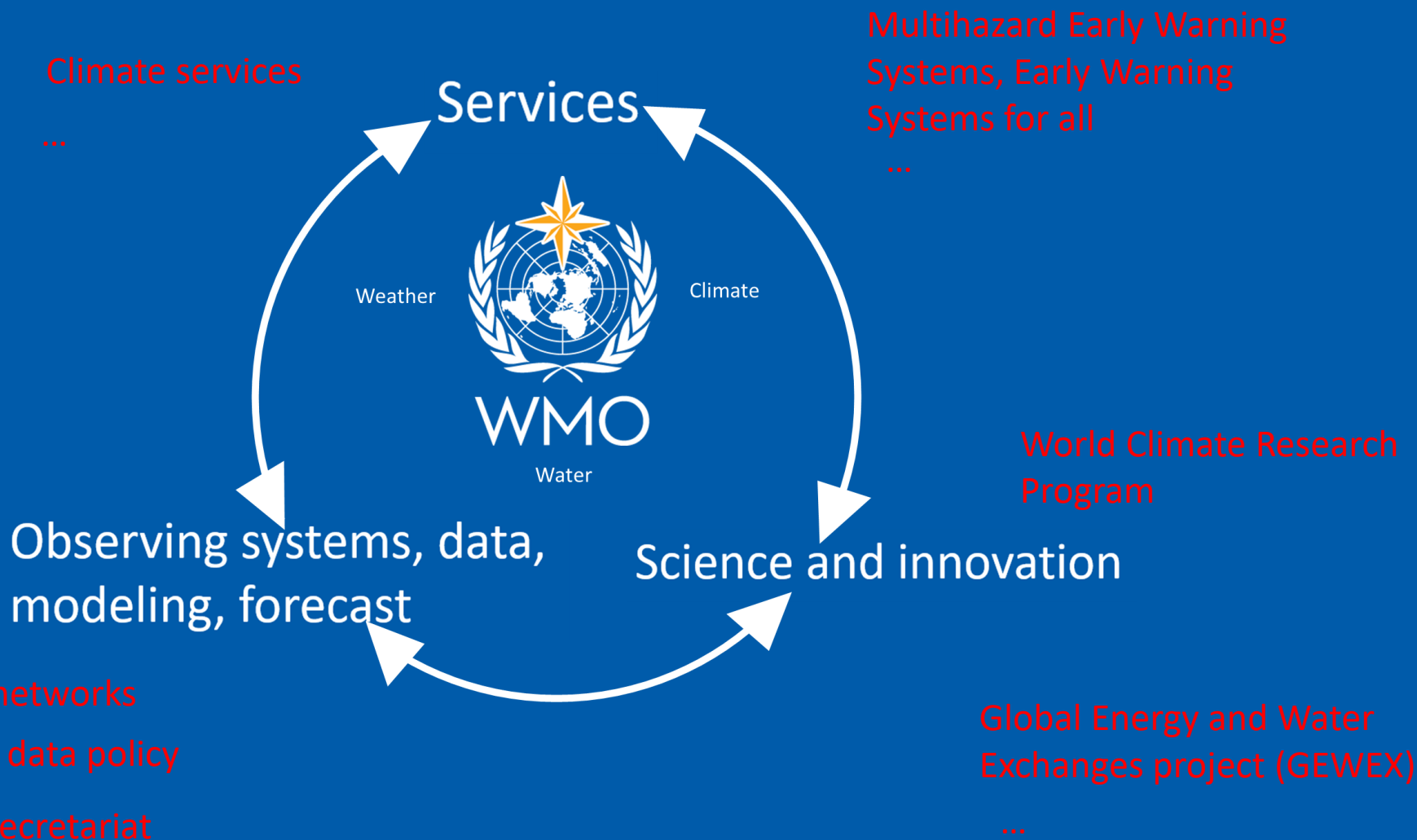
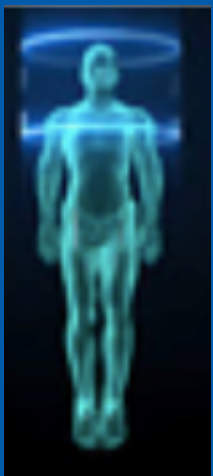
Cat person vs dog person

James Webb Telescope vs hydrometry

Mountain holidays vs Beach holidays

Ecology vs Economy

WMO Earth System Approach



A few dreams

- Fully coupled models: land-atmosphere-ocean
- Hydrological data assimilation
- Seamless prediction

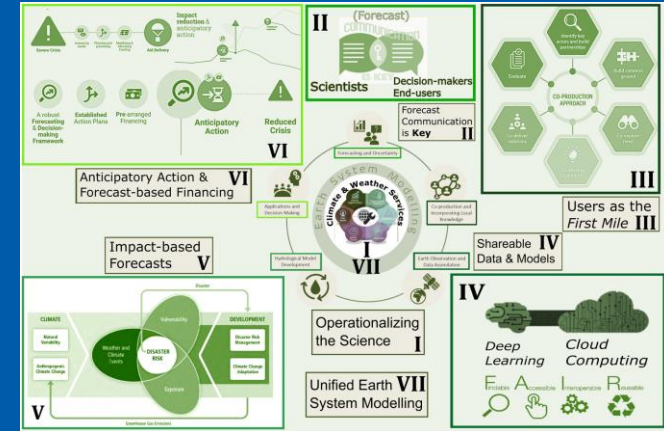


Global Precipitation Experiment (GPEX)

Source: Lincoln Alvey and Xubin Zeng, WCRP

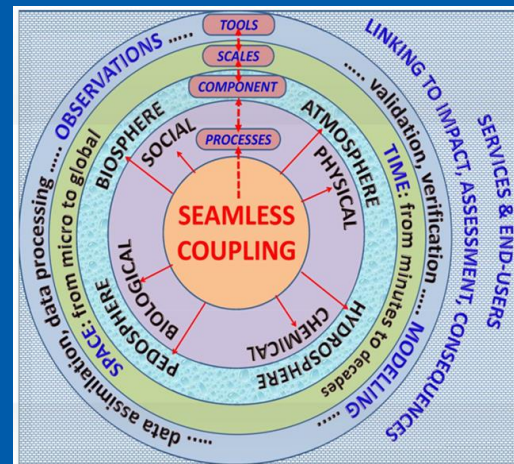


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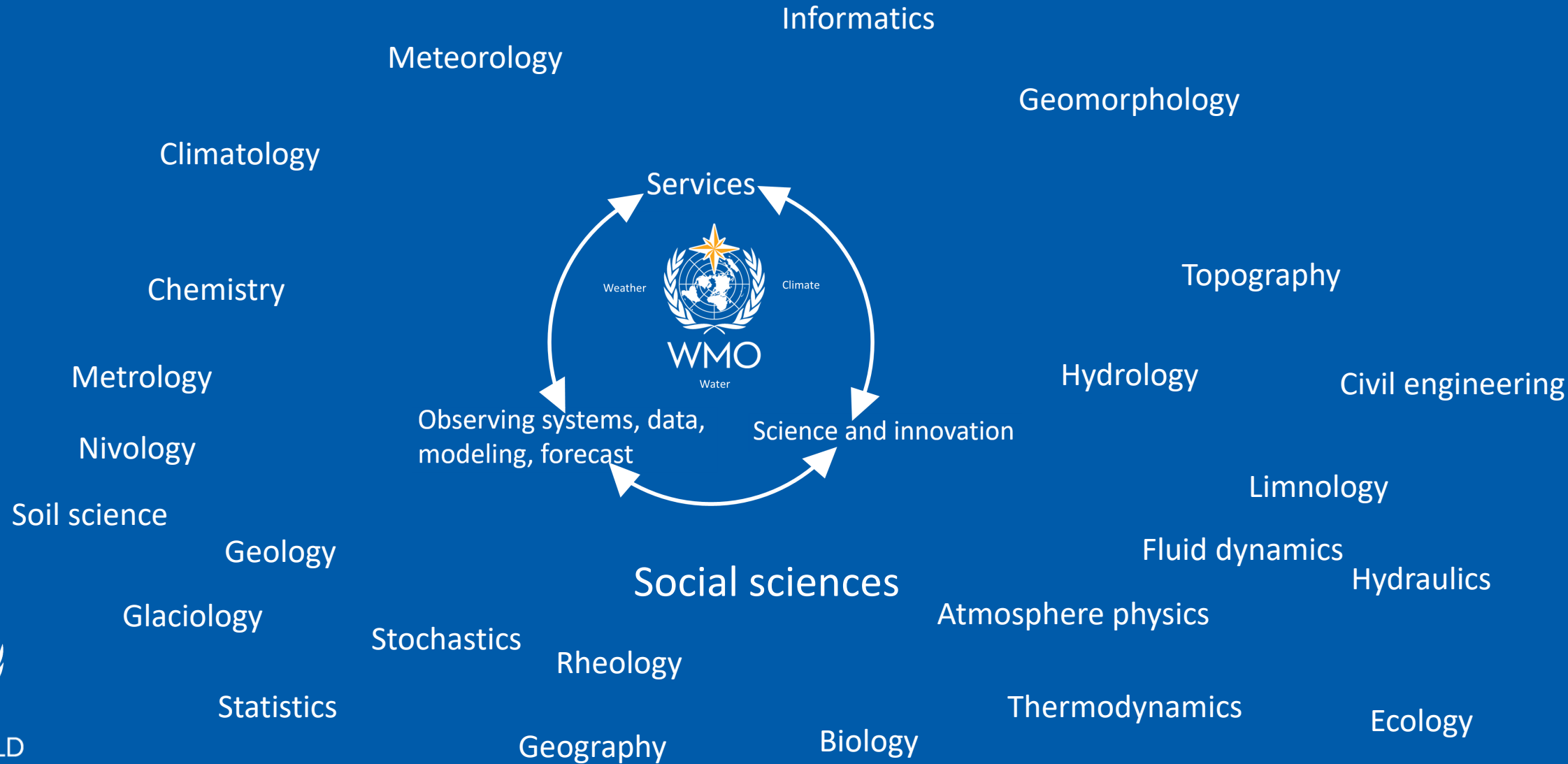
Hydrological Ensemble Prediction Experiment / HEPEX

Source: Dasgupta et al. (2023)
Journal of Flood Risk Management

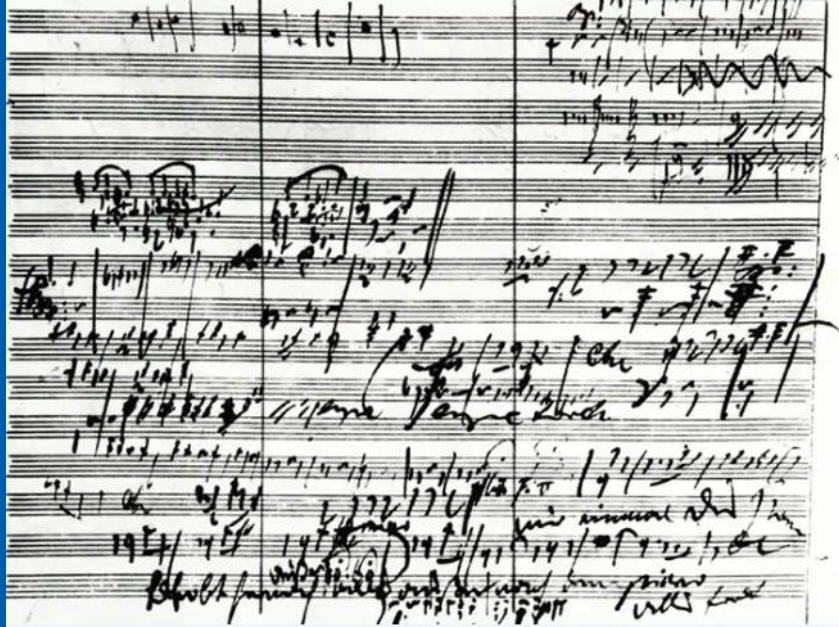


Source: Baklanov et al (2017)

Irenicism: a social temper or condition or a state of public opinion making for peace: looking for commonalities instead of for differences



Beethoven 10th, unfinished symphony



“Achieved “ in 2019 thanks to Artificial intelligence.



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What about **collective intelligence to achieve climate challenges?**, and integrating user needs, communication and outreach as the last movement?

Connections to society and culture



Giving a voice to rivers and crossing the views of scientists and professionals with those of artists and populations living close to rivers



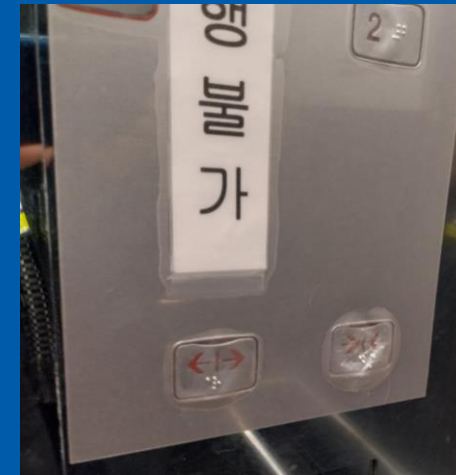
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Saas Fee, Switzerland



Lausanne, Switzerland



Daegu, Korea



Halifax, Canada



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Expertise Center for Climate Extremes:

In Latin, ECCE= BEHOLD

From Climatology to climatosophy: WMO happy to help!

Thank you.



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