TEAMx – state of affairs

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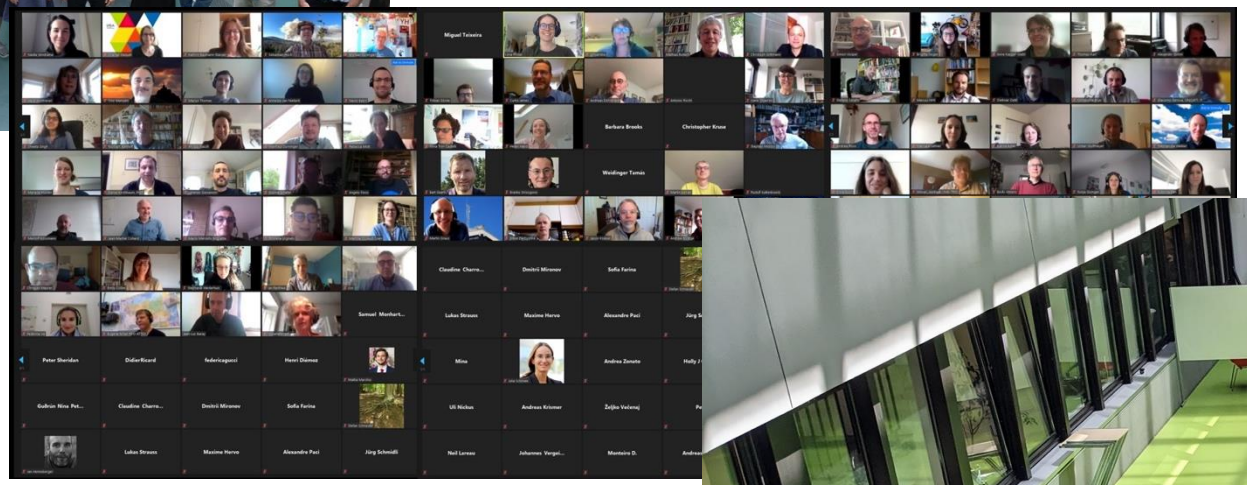
TEAMx

The first TEAMx workshop 2019 fully **on site**



The second TEAMx workshop 2021 fully **online**

The third TEAMx workshop last week fully **hybrid**

…the onsite participants on Friday 5 pm …

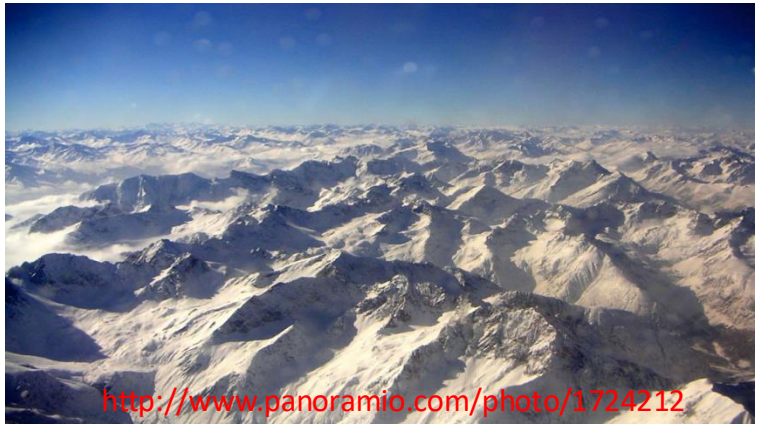
TEAMx

Multi-scale Transport and
Exchange Processes in the
Atmosphere over
Mountains
Programme and experiment

- ...a bottom-up financed research program on weather, climate & air pollution in mountain areas
- in the 'tradition' of international mountain meteorology programs (ALPEX, PYREX, MAP → **TEAMx**)
- Institutional 'crowd funding' for a Programme Coordination Office (*PCO* - @ UIBK)
- endorsed by the World Weather Research Programme (WWRP) of WMO cross-cut project of the GEWEX Hydroclimate Panel (WCRP)

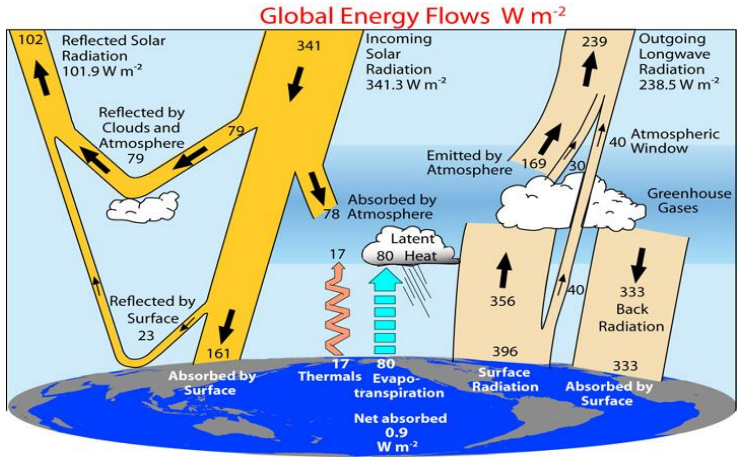
It is about … exchange processes over mountains

Momentum



- orographic blocking
- gravity wave breaking
- orographic drag parameteri-zations in general circulation models

Heat

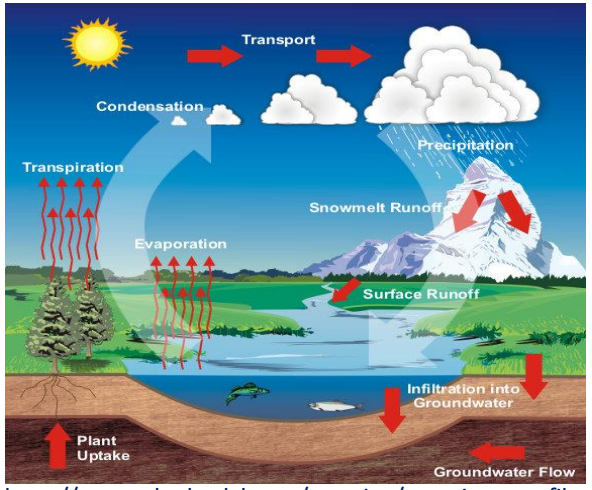


https://scied.ucar.edu/longcontent/energy-budget

- thermally driven breezes
- cold air pooling
- interaction meso- ↔ local scales
- no parameterizations

It is about … exchange processes over mountains

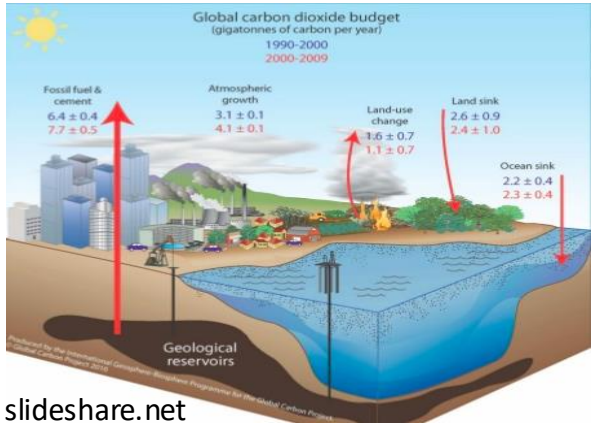
Mass: water



http://www.algebralab.org/practice/practice.aspxfile=Reading_WaterCycle.xml

- orographic precipitation
- triggering of convective precipitation
- “water towers” for the surrounding plains

Mass: CO_2 (trace gas)



slideshare.net

- global (regional) budgets most uncertain over land
- poorly represented exchange over orography may be one reason for ‘missing sink’

TEAMx Science Plan

Objective	Primary Focus	Target
Process understanding	Micro- and meso-scale processes within and above the *mountain boundary layer* (MoBL); Interaction between scales.	Quantitative understanding of momentum, energy and mass exchange over mountainous terrain
TEAMx Joint Experiment(s)	Collaborative use of multi-platform instrumentation to sample the spatial heterogeneity of turbulence and mesoscale circulations over and near mountains	Quality-controlled observational data pool, available for process investigation, high-resolution model verification, parameterization development
Improving Weather and Climate Models	*Models right for the right reason*, i.e., identification and reduction of model biases and uncertainties over complex terrain	Weather forecasts and climate simulations over mountains as good as over flat terrain, and less reliant on model output post-processing
Support to Weather and Climate Service Providers	Air pollution, hydrology, climate change scenarios (e.g., elevation-dependent climate change).	Smaller uncertainty of impact models, due to reduced errors in weather and climate information.

Serafin et al. 2020

State of affairs

Process understanding

⟶ WGs are working …

⟶ several projects have already started

⟶ some results are presented here at ICAM
- O2.1, O2.3 (already past), O11.1, O14.2, O14.4
- P5.3, P7.4, P9.2, P9.4

Serafin et al. 2020

State of affairs

Joint TEAMx Observational Campaign (TOC)

⟶ Field Observational Plan is put together (Helen Ward [Ed] and many contributors)

⟶ working on the implementation plan (last week's workshop)

⟶ pre-campaign(s): O8.1 by Alexander Gohm

⟶ pre-campaign HEFEX 2:

- ➢ this summer on Hintereisferner Glacier

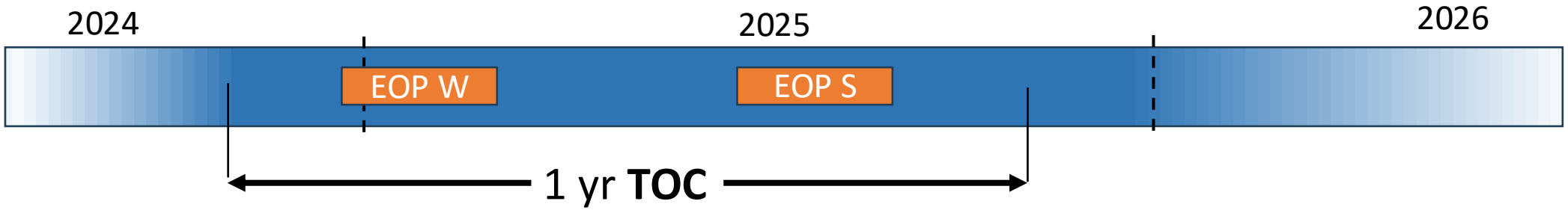
State of affairs

Joint TEAMx Observational Campaign (TOC)

→ planned TOC autumn 2024 - autumn 2025

TEAMx Observational Campaign (TOC)

Autumn 2024 - autumn 2025 (EOPs and IOPs):



TOC: 1 year duration - operational plus semi-operational networks
- additional deployments (> 'an additional AWS')

Extended Operations period Winter (EOP W): 4-6 weeks
- additional deployments - project based
- IOPs (airborne observations, RaSo, …)

Extended Operations period Summer (EOP S): 4-6 weeks
- additional deployments – project
- IOPs (airborne observations, RaSo, …)

State of affairs

Joint TEAMx Observational Campaign (TOC)

→ planned TOC autumn 2024 - autumn 2025

→ substantial funded (3rd party) and secured (internal resources of the partner institutions) contributions (instrumentation and personnel)

→ major challenge:

- ➢ two key proposals not funded
- ➢ a third is on the edge

State of affairs

Joint TEAMx Observational Campaign (TOC)

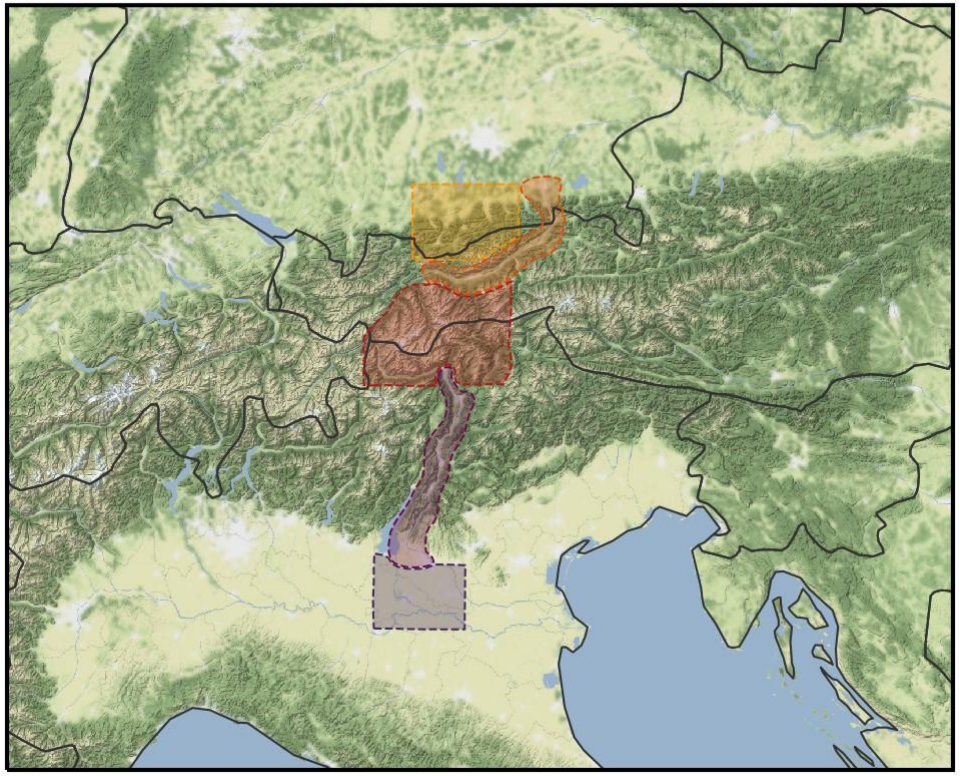
→ re-shape the focus
& geographical extension

→ ‘re-distribute’ the available resources

→ to maintain the strengths of the experimental design

→ to maintain the advantages of the collaborative approach

Original experimental layout



State of affairs

Numerical modeling

→ numerical modeling plan: first complete document reviewed during workshop

→ model intercomparison studies by WGs
> cold air pool / thermally driven flows / moist convection / orographic drag
> some (first) results are presented here at ICAM: O16.5 / O16.6

State of affairs

Numerical modeling

⟶ very-high resolution regional climate simulations
> EURO-CORDEX FPS ‘Convection’ ↔ TEAMx

⟶ planned high-res operational forecast support during TOC

→ towards a TEAMx-REA
> presentation O15.1


TEAMx
Thank you!