



Field Observation in Climatology and Environmental Hydrology

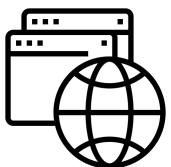
Prof. Dr. Tobias Sauter
Date 20.04.2023

Important organisational details



Where do the classes take place?

- ④ Thu. 9-13 h (ct), 20.04, 27.04, 11.05, 01.06, 15.06, 29.06, 13.07
- ④ Alfred-Rühl-Haus **Room 2'108** Rudower Chaussee 16



Moodle

- ④ <https://moodle.hu-berlin.de/course/view.php?id=117803>
- ④ Self-registration password: **environ23**
- ④ All further general correspondence happens via Moodle, and for matters regarding your talks, via your HU email address

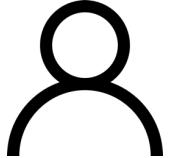
Important organisational details



What you need to successfully complete the course?

- ④ You must attend the course regularly
- ④ You must have passed 3 of the 6 homework assignments
- ④ Write a scientific paper about the field work (due on **October 15th, 2023**)
- ④ Final module examination in the form of an oral examination of approximately 20 minutes, scheduled for the **23th** and **30th October**, and **6th November, 2023**.

Important organisational details



The lecture is designed for those who ...

- ④ are interested in land-atmosphere interactions
- ④ wants to learn more about the processes in the Earth system
- ④ learn about observation techniques and interpretation of data



Learning objectives

- ④ The fundamentals of boundary layer processes
- ④ Turbulence and turbulent fluxes
- ④ Measurement techniques
- ④ Data evaluation
- ④ How to share and communicate model results
- ④ Learning by hands-on exercises on real-world problems

Participants

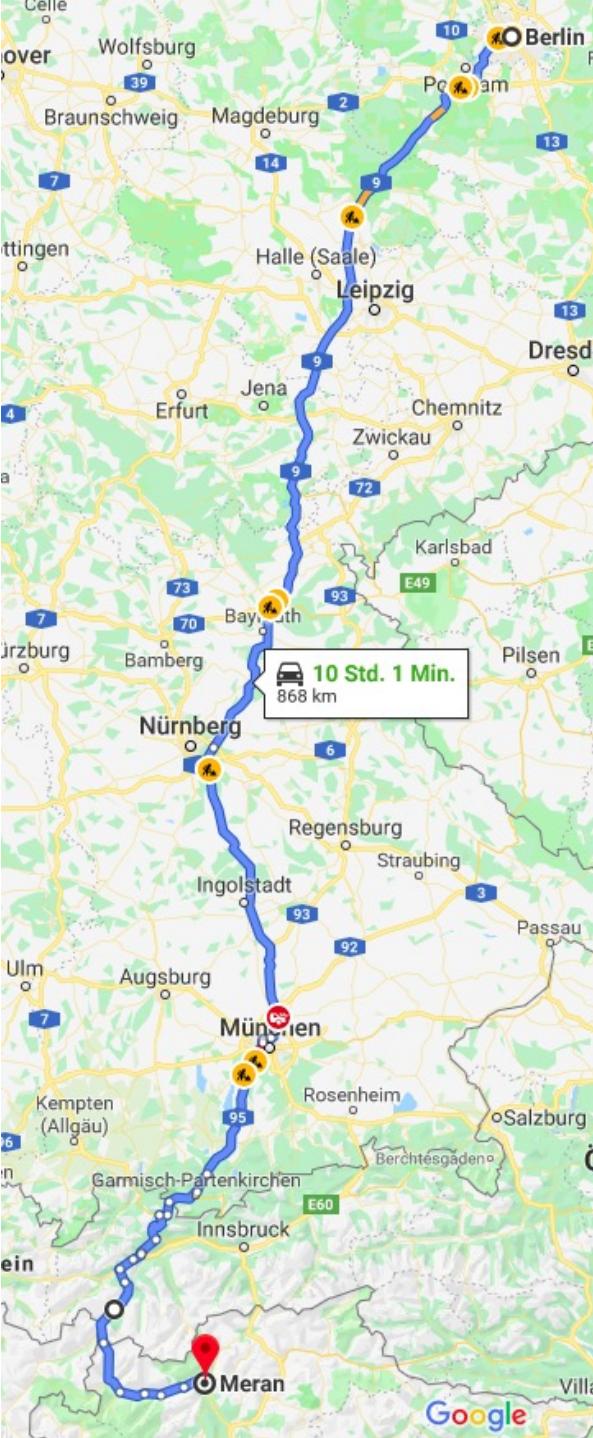
Nr:	MtkNr:	Name:
1:	496525	Joosten
2:	529030	Wilken
3:	555248	Pechhold
4:	596461	Butzer
5:	597851	Radecke
6:	598438	Mennerich
7:	606176	Diel
8:	609184	Brites Alves
9:	610155	Zimmermann
10:	611110	Bozkurt
11:	625617	Dolu
12:	628580	Winkelmann
13:	629690	Schneider
14:	630274	Wurbs
15:	631017	Kirchhof
16:	631188	Khodayarmohebbi
17:	633006	de Castro Franca



Fürkelenferner (in the left corner) and Zufallferner in 2018 (Picture: Lukas Langhamer).

Excursion to the Martell Valley





Getting there:

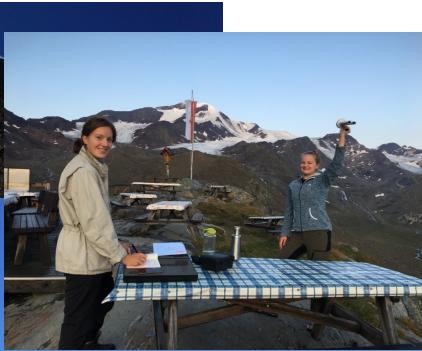
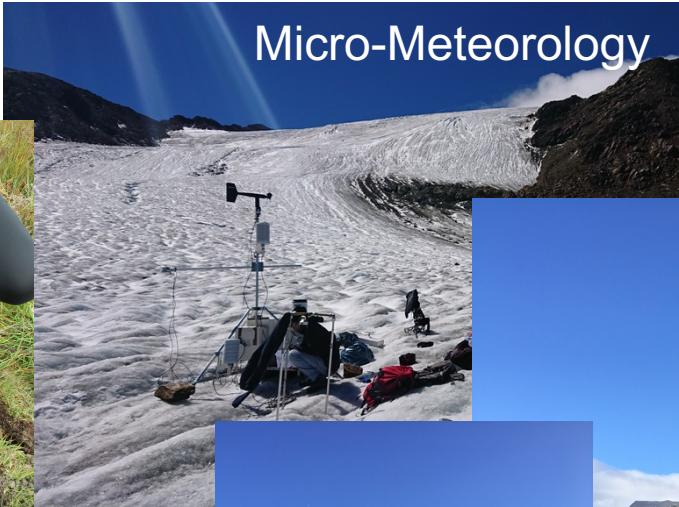
- September 3: Berlin – Meran in South Tyrol, Italy (one day bus ride)
- September 4 – September 9: Obermartelltal - Marteller Hütte
- September 10: Martell Valley – Berlin (descent and one day bus ride)





What will we be doing?

Hydrology



Glaciology



Evening Sessions



Micro-Meteorology



What do you need?

Physical endurance (7-8 hours working outside)

Hike and work in steep and challenging terrain

Be prepared for all weather conditions (sun, rain, snow, wind)

Deal with limited comfort (space/privacy, no hot shower, food)



What does it cost?

We estimate total cost of **320€** per person

The money has to be transferred by **1st of June 23:59 CET**

Lukas Langhamer

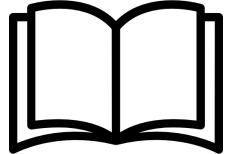
IBAN: DE45 2004 1144 0667 0996 00

Comdirect Bank AG

Subject: Martell2023 <InsertParticipantsName>



Important organisational details



Fundamental textbooks

Stull, R.B., 2015: Practical Meteorology. The University of British Columbia.

Foken, T., 2008: Applied Meteorology: Micrometeorology. Springer Berlin.

Advanced textbooks

Stull, R.B., 2008: An Introduction to Boundary Layer Meteorology. Canada.

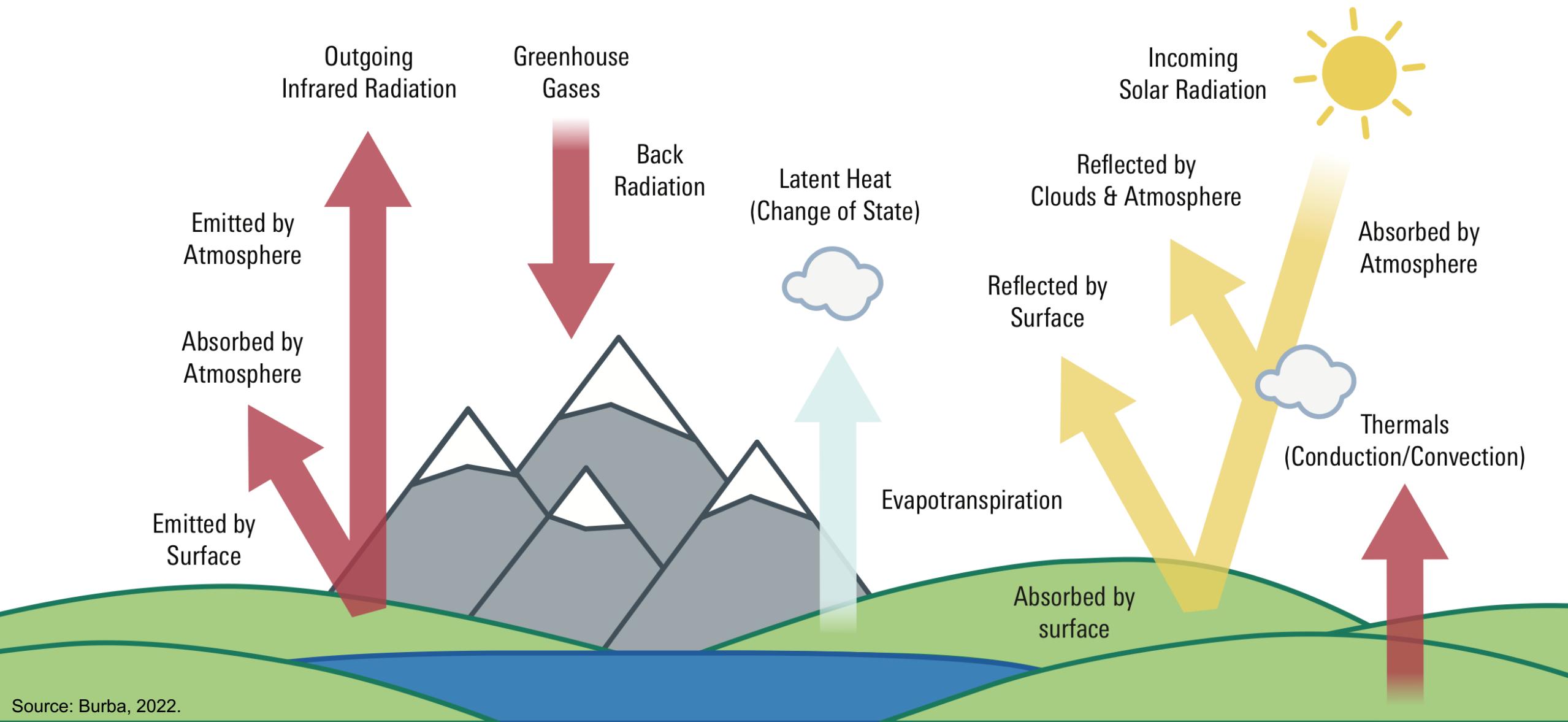
Krauss, H., 2008: Grundlagen der Grenzschicht-Meteorologie. Springer.



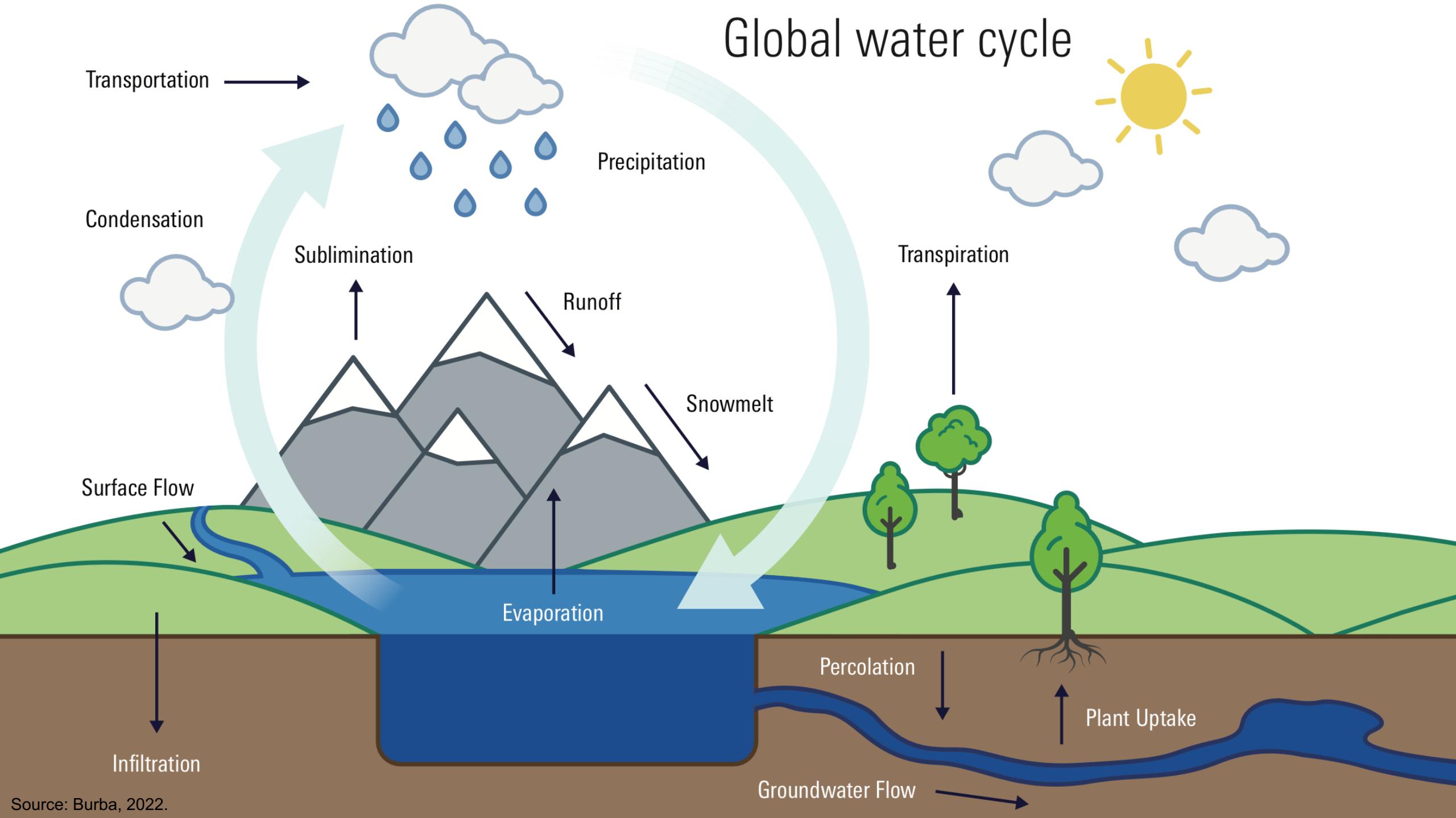
Fürkelenferner (in the left corner) and Zufallferner in 2018 (Picture: Lukas Langhamer).

What is this course about?

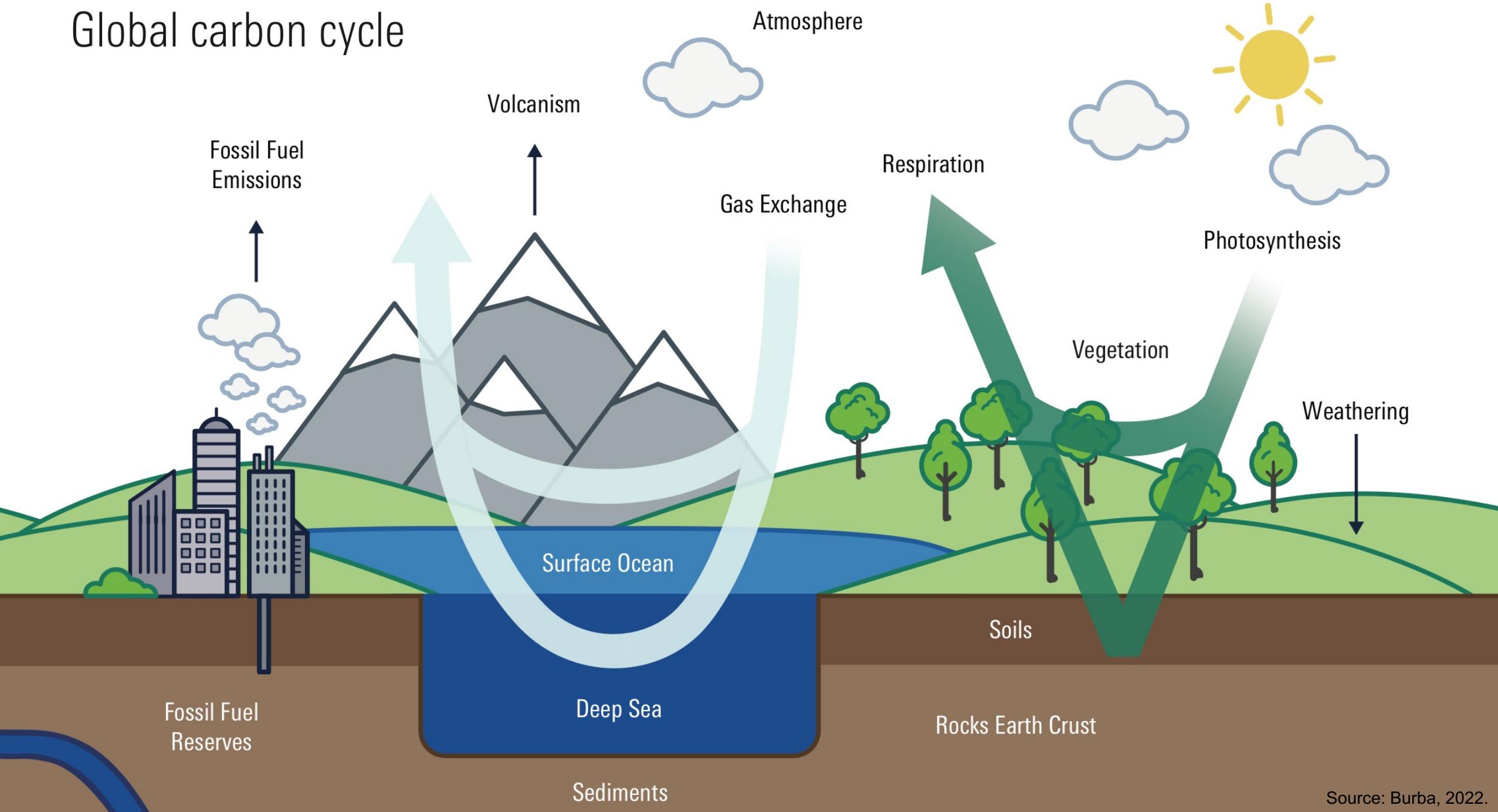
Global energy budget



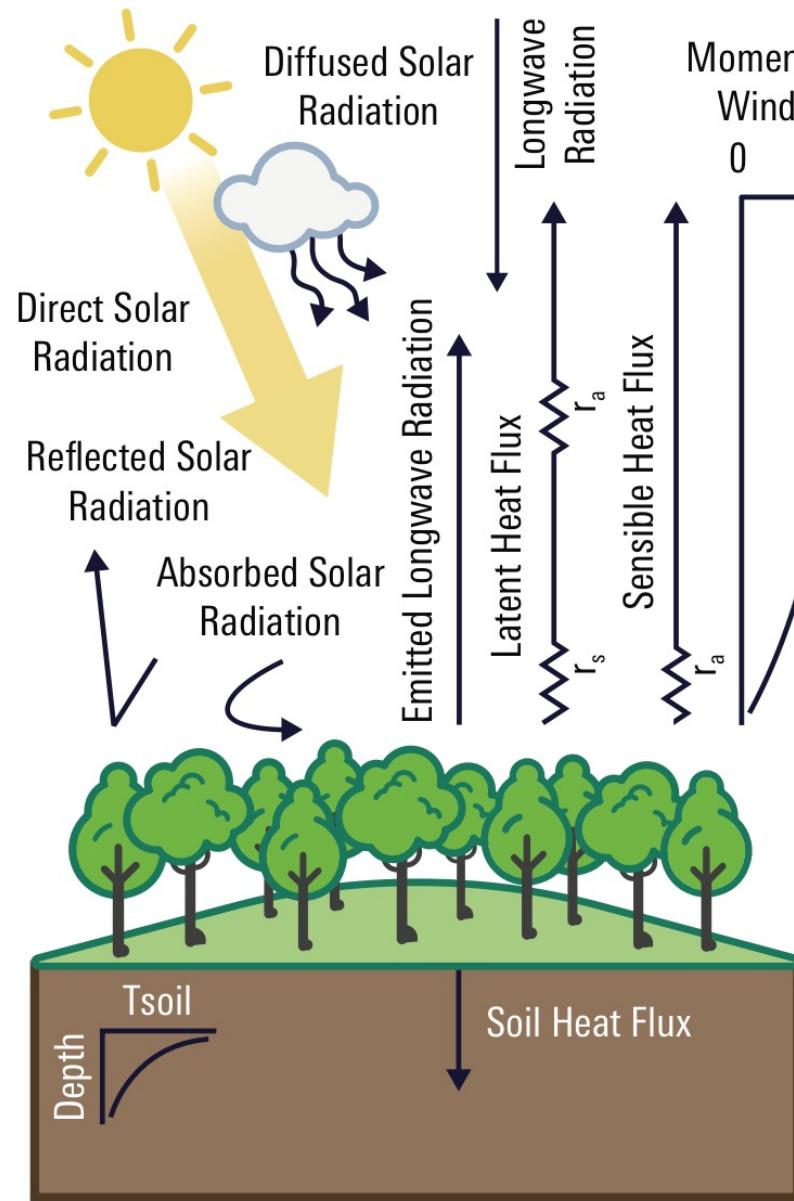
Global water cycle



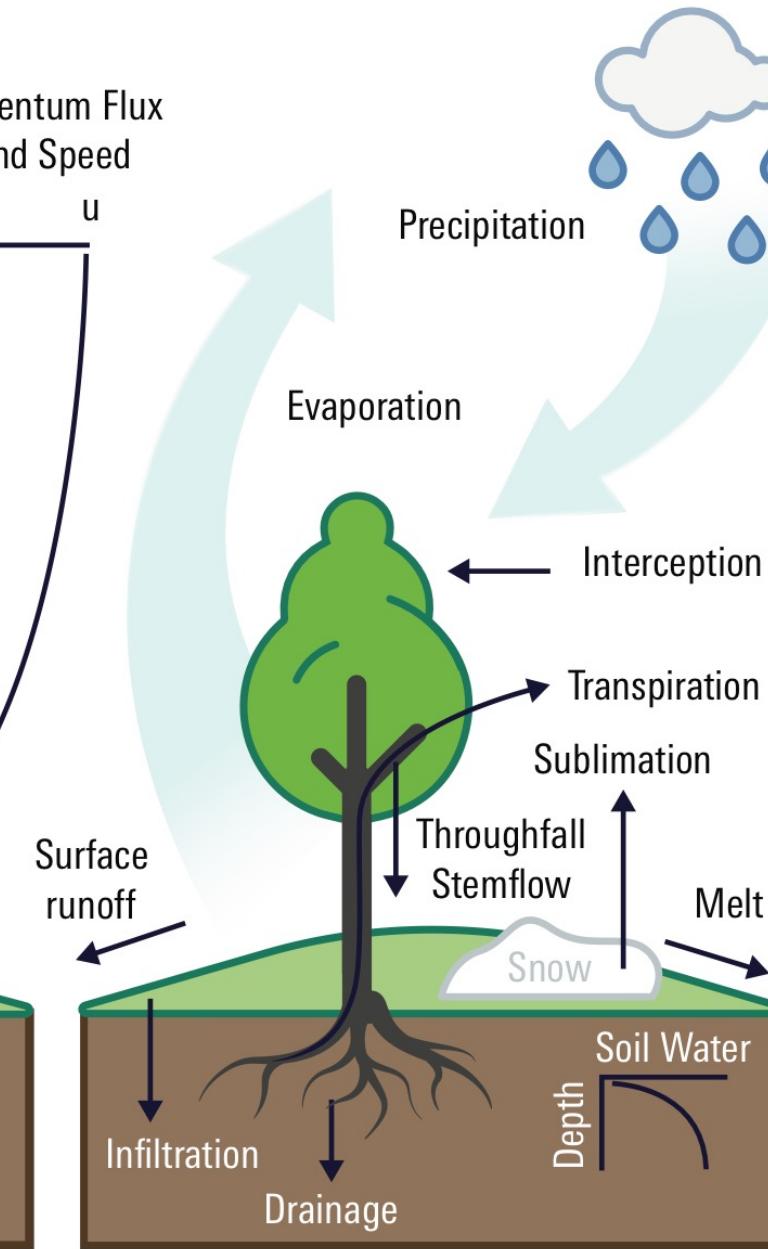
Global carbon cycle



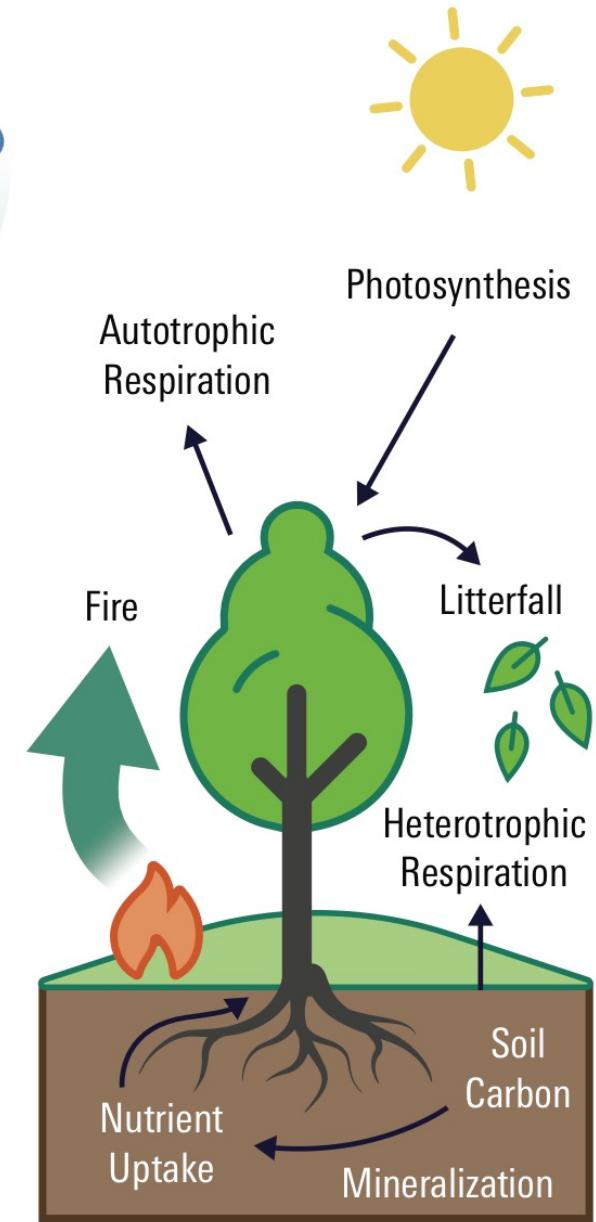
Smaller processes



Surface Energy Fluxes

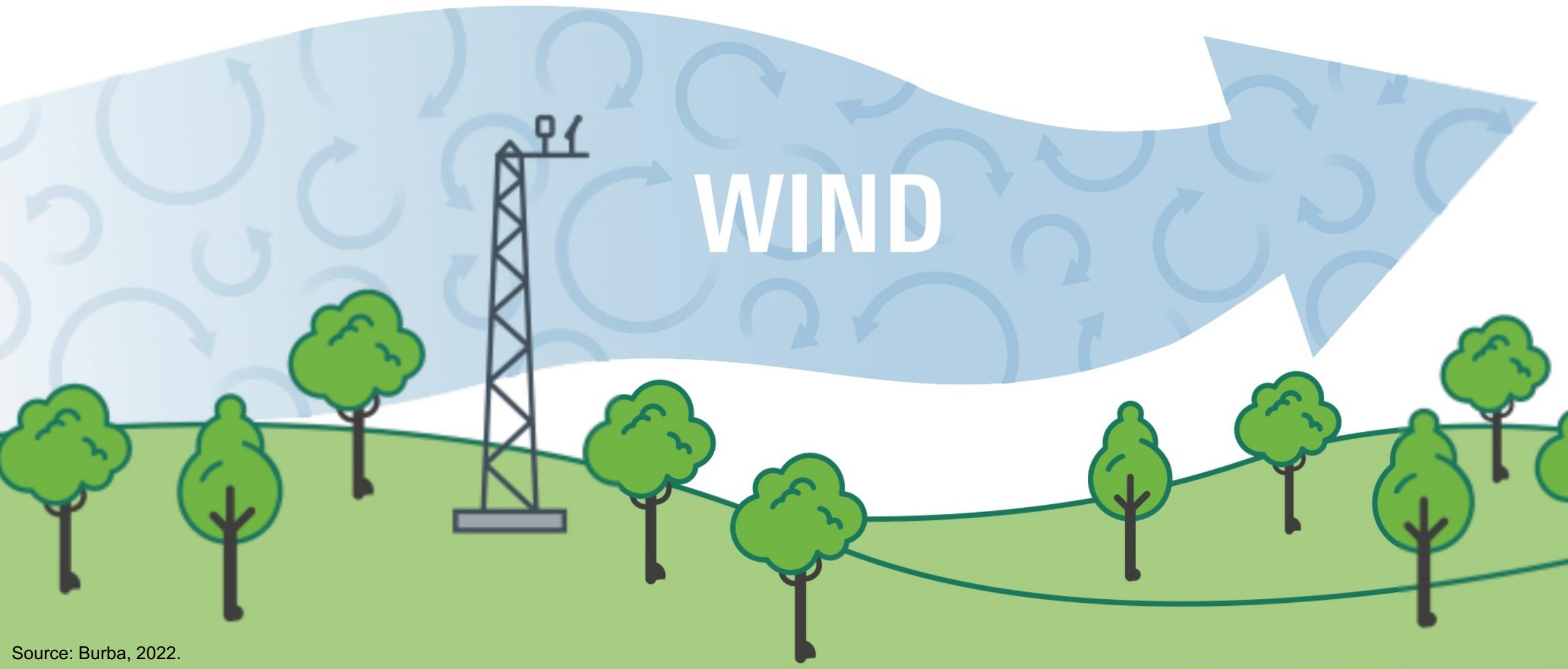


Hydrology

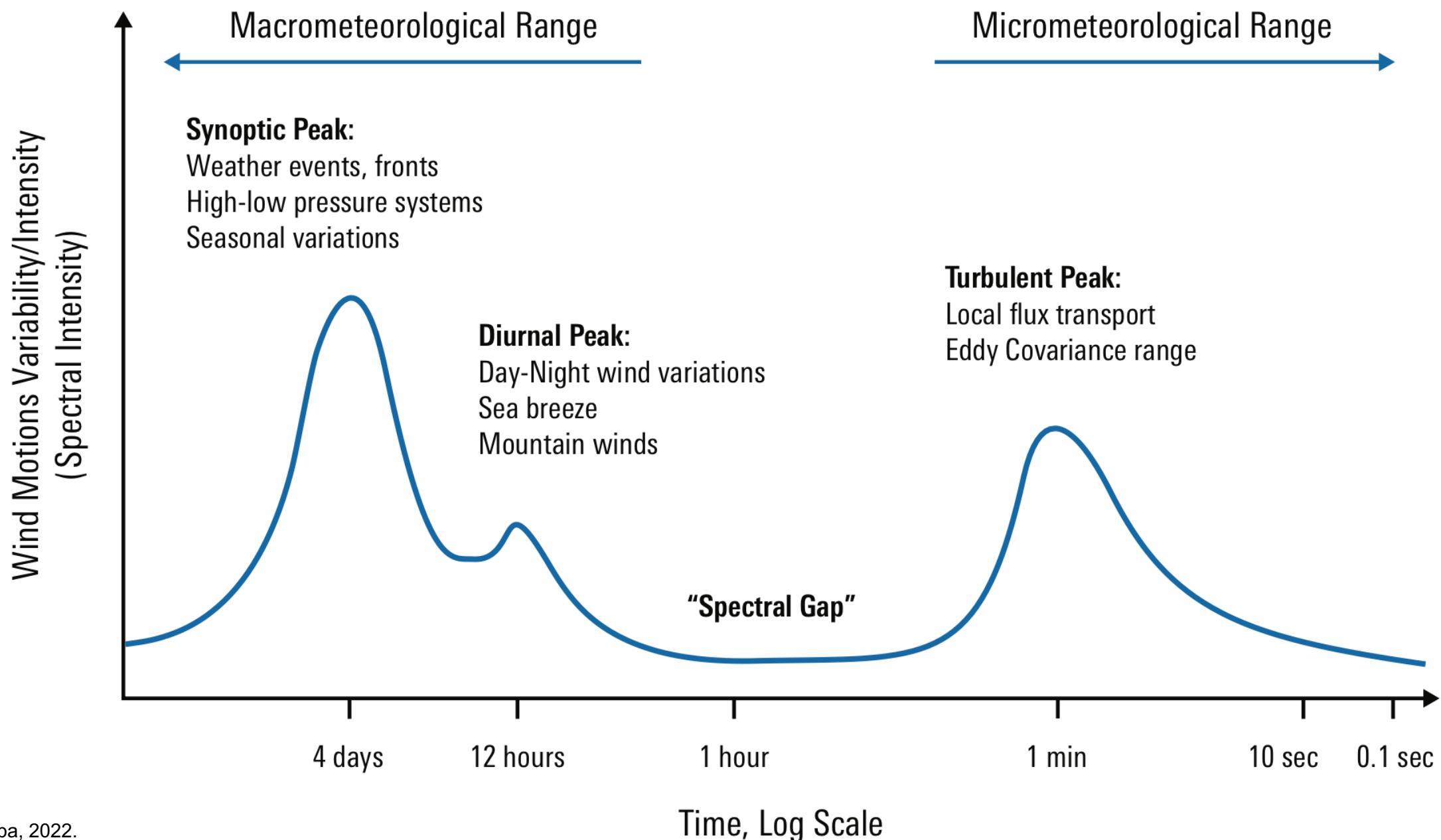


Carbon Cycle

Airflow in ecosystems



Airflow in ecosystems (continued)



Design

Set purpose and variables

Decide on hardware
(instruments, tower, etc.)

Decide on software
(data collection, processing)

Establish location

Make maintenance plan

Typical workflow

Overview

- ④ **Module: Weather Observations**
Temperature, wind, radiation
- ④ **Module: Turbulence and energy fluxes**
What is turbulence, sensible heat flux, latent heat flux
- ④ **Module: Regional Wind Systems**
Katabatic flow, thermal wind systems, large-scale flow, Föhn events
- ④ **Module: Alpine Glaciers and snow**
Mass- and energy balance of alpine glaciers
- ④ **Module: Hydrology**
Runoff, evaporation, orographic precipitation
- ④ **Module: Weather maps**
Interpretation of weather maps, radiosoundings



What's next?

Setting up the learning environment

https://sauterto.github.io/clim_env_hydro/welcome.html