

## Context

The Swiss FluxNet initiative combines all ecosystem-scale CO<sub>2</sub> and H<sub>2</sub>O vapour (at some sites also CH<sub>4</sub> and N<sub>2</sub>O) flux measurement sites in Switzerland. It currently encompasses eight long-term ecosystem sites, covering the major land-use types in Switzerland: forest (deciduous: Lägeren; coniferous: Davos), cropland (Oensingen), grassland (Oensingen, Chamau, Frübüel, Alp Weissenstein, Rietholzbach) and an urban area (Basel). Further sites with short-term measurements such as Dischma (grassland-winter) provide additional information. Besides the Grassland Sciences Group, three further research groups contribute to Swiss Fluxnet (see Project partners).

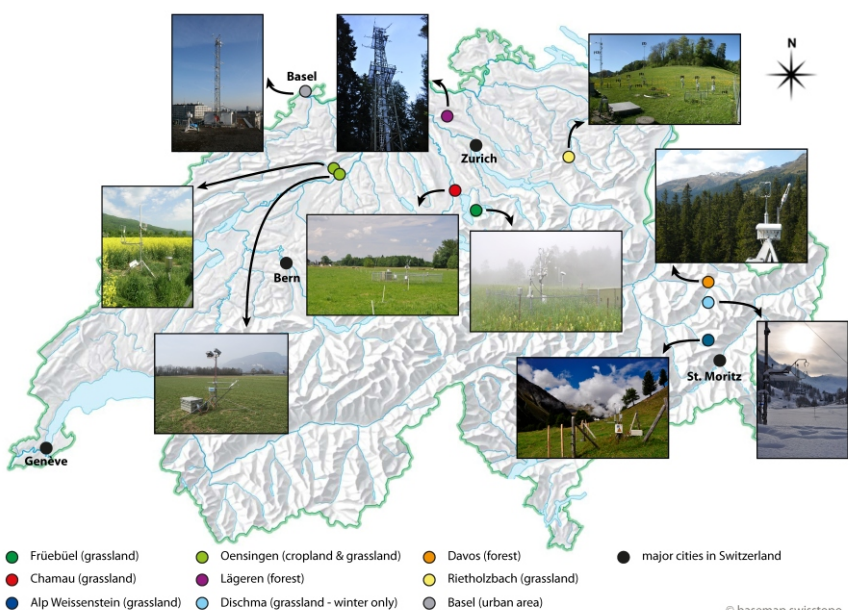
## Approach

Ecosystem flux measurements of CO<sub>2</sub>, H<sub>2</sub>O vapour, CH<sub>4</sub> and N<sub>2</sub>O are typically performed with the eddy covariance (EC) method. The EC method is based on high frequency measurements (10–20 Hz) of turbulent fluctuations in vertical wind velocity and the mixing ratio of a trace gas. The ecosystem flux itself is calculated from the covariance between these two measurements using time averaging of typically 30 or 60 min.

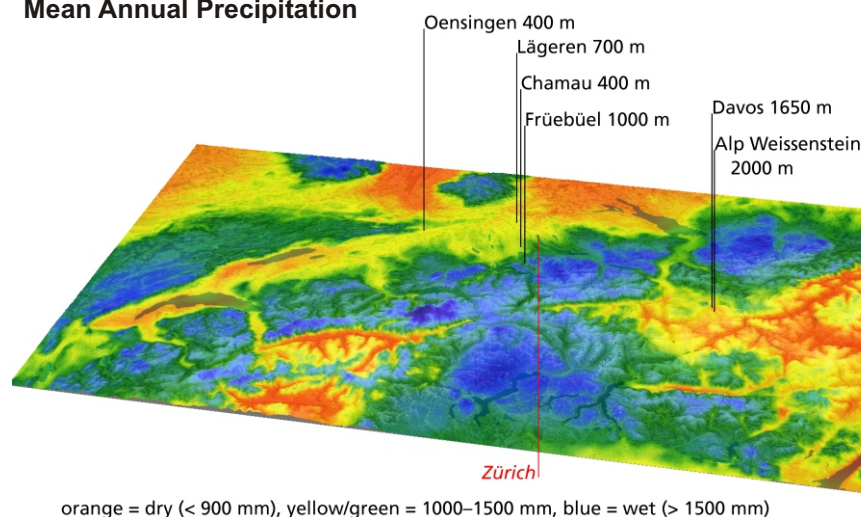
## Instrumental set-up

- Highest-quality infrared gas analyzers and laser spectroscopy (CH<sub>4</sub>) to resolve turbulent short-term fluctuations in the trace gas mixing ratio
- Micrometeorology sensors: 3D sonic anemometer for wind speed and directions; radiation sensors, particularly for radiation balance
- Soil climate profiles (temperature, moisture, soil heat flux)
- Auxiliary instrumentation to measure variables such as soil CH<sub>4</sub> and N<sub>2</sub>O fluxes, soil/stem/leaf respiration, xylem sap flow, phenology, leaf area index (LAI), biomass, precipitation, fog, etc.

## Swiss FluxNet Sites



## Mean Annual Precipitation



## Project partners

Sonia Seneviratne, Institute for Atmospheric and Climate Science (IAC), ETH Zurich  
→ Rietholzbach

Jürg Fuhrer, Research Station Agroscope Reckenholz-Tänikon (ART), Federal Administration  
→ Oensingen

Eberhard Parlow, Institute for Meteorology, Climatology and Remote Sensing, University of Basel  
→ Basel

