

ICOS-CH: The Swiss Contribution to a Pan-European Environmental Research Infrastructure

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Switzerland contributes with two Candidate Class 1 Sites to ICOS

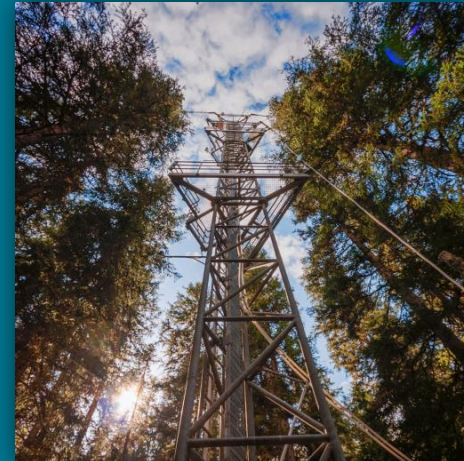
Jungfraujoch (CH-JFJ)

Atmospheric station, 3580 m asl



Davos-Seehornwald (CH-DAV)

Ecosystem station, 1650 m asl



Both stations are ready for step 2



Passed step 1 in March 2016

Observatory established in 1937

Trace gas measurements since 1973

First ICOS variables measured in 1996

With ICOS compatible instrumentation since 2010

Passed step 1 in April 2016

Records of climate variables started in 1876

Eddy covariance measurements since 1997

Climate, tree physiology and air pollution data for over more than 10 years

Measurement program

Category	Gases, continuous	Gases, periodical	Meteorology, continuous	Eddy Fluxes
Class 1	<ul style="list-style-type: none"> CO₂, CH₄, CO : at each sampling height 	<ul style="list-style-type: none"> CO₂, CH₄, N₂O, SF₆, CO, H₂, ¹³C and ¹⁸O in CO₂: weekly sampled at highest sampling height ¹⁴C (radiocarbon integrated samples): at highest sampling height 	<ul style="list-style-type: none"> Air temperature, relative humidity, wind direction, wind speed: at highest and lowest sampling height* Atmospheric Pressure Planetary Boundary Layer Height** 	<ul style="list-style-type: none"> Eddy Fluxes
Mandatory parameters				
	<ul style="list-style-type: none"> ¹³C and ¹⁸O in CO₂, continuous (hourly) 			
Class 2	<ul style="list-style-type: none"> CO₂, CH₄ : at each sampling height 		<ul style="list-style-type: none"> Air temperature, relative humidity, wind direction, wind speed: at highest and lowest sampling height* Atmospheric Pressure 	
Mandatory parameters				
	<ul style="list-style-type: none"> ²²²Rn, N₂O, O₂/N₂ ratio CO for Class 2 stations 	<ul style="list-style-type: none"> CH₄ stable isotopes, O₂/N₂ ratio for Class 1 stations: weekly sampled at highest sampling height 		<ul style="list-style-type: none"> CO₂ : at one sampling height
Recommended parameters***				

Set of variables to be measured at an ICOS Class 1 atmospheric station. Tickmarks illustrate the implemented measurement program.

Continuous Measurements:

- ✓ 1. CO₂, H₂O and sensible heat fluxes (eddy covariance)
- ✓ 2. Eddy covariance CH₄ and N₂O
- ✓ 3. Air CO₂ and H₂O vertical profile
- ✓ 4. Air H₂O concentration
- ✓ 5. In, Out and Net SW and LW radiation, Surface temperature
- ✓ 6. PAR/PPFD incident & reflected
- ✓ 7. Diffuse PAR/PPFD radiation
- ✓ 8. Soil Heat flux
- ✓ 9. Air Temperature and Rh profile
- ✓ 10. Main meteo vars (Ta, Rh, Swin, precipitation)
- ✓ 11. Snow height
- ✓ 12. Soil Water Content profile
- ✓ 13. Soil Temperature profile
- ✓ 14. Air Pressure
- * 15. Soil CO₂ automatic chambers
- * 16. CH₄ and N₂O fluxes by automatic chambers
- ✓ 17. Wind speed and wind direction (additional)

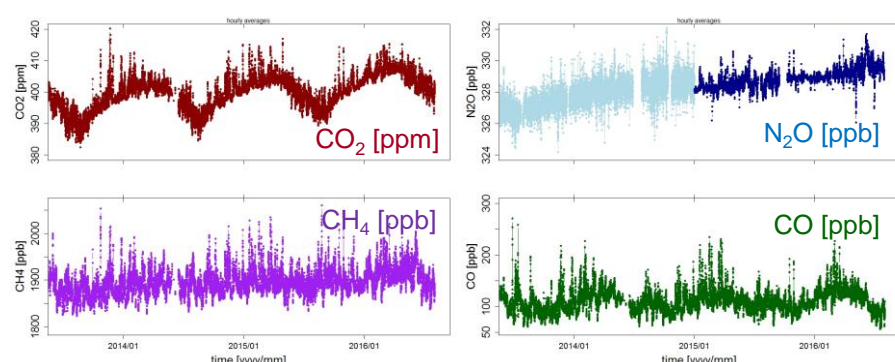
Additional Measurements:

- ✓ 18. Groundwater level
- ✓ 19. Tree diameter
- ✓ 20. Phenology-Camera
- ✓ 21. LAI
- ✓ 22. Above Ground Biomass
- ✓ 23. Soil carbon content
- ✓ 24. Litterfall
- ✓ 25. Leaf N content
- ✓ 26. C and N import/export by management
- ✓ 27. Management and disturbances information

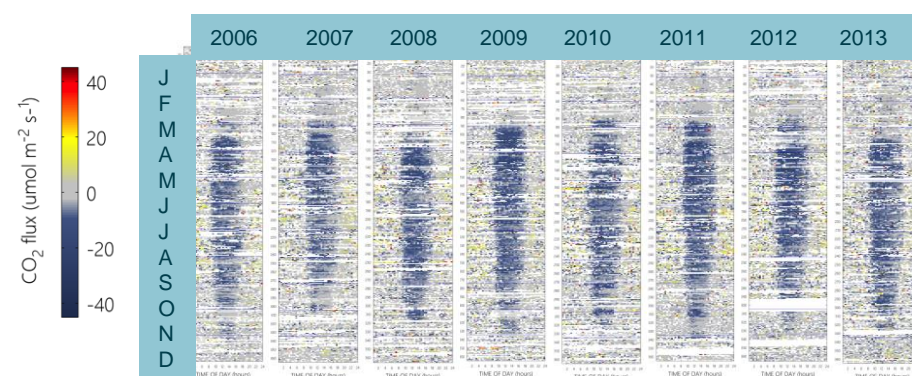
Multi-purpose use of QCL for CO₂, CH₄ and N₂O measurements

Set of variables to be measured at an ICOS Class 1 ecosystem station. Red tickmarks illustrate the implemented measurement programme, red stars mark installations in progress.

Continuous time-series



Continuous observations of CO₂, CH₄, N₂O and CO concentrations at CH-JFJ since the launch of ICOS-CH in summer 2013.



CO₂ flux data (μmol m⁻² s⁻¹) collected at CH-DAV since 2006. Grey and yellow colors indicate a net release of CO₂, blue colors indicate net uptake of CO₂.

Partner networks

Swiss National Air Pollution Monitoring Network NABEL
SwissMetNet
Global Atmosphere Watch programme GAW
Advanced Global Atmospheric Gases Experiment (AGAGE)

Swiss National Air Pollution Monitoring Network NABEL
FLUXNET & Swiss Network of Ecosystem Flux Sites Swiss FluxNet
Swiss Long-term Forest Ecosystem Research programme LWF
International Co-operative Programme on Assessment and Monitoring of Air Pollution Effects on Forests CLRTAP
Biological drought and growth indicator network TreeNet