

# Curriculum vitae



## Rolf Theodor Walter Siegwolf

### Personal

Born: Nov. 17, 1951, Berne, Switzerland,  
Married, three sons (1980, 1982, 1983)  
Nationality: Swiss

### Education

1974 - 1985 Biology, University of Zürich, Switzerland  
Ph.D. Thesis, University of Innsbruck, (1987)  
Topic: "*The factorial analysis of year-round CO<sub>2</sub> and H<sub>2</sub>O gas exchange of Rhododendron ferrugineum above timberline.*"  
Major: Plant ecophysiology and Ecosystem analysis, Minor: computer sciences and philosophy

### Professional position

**Research Group Leader** of the Ecosystem Fluxes Research Group  
**Head** of the Stable isotope research facility at the Paul Scherrer Inst.  
**Retired since Dec. 1<sup>st</sup>, 2016**

Laboratory of Atmospheric Chemistry  
Ecosystem Fluxes / Stable Isotope Research Group  
Paul Scherrer Institute  
Ch-5232 Villigen –PSI  
Switzerland

Phone: +41 56 310 27 86; Fax: +41 56 310 45 25  
e-mail: rolf.siegwolf@psi.ch

### Professional Experience

1983 -1985 Assistant at the Ecology Department of the Institute of Botany, University of Innsbruck, Austria.  
1985 - 1989 Research associate at the Swiss Federal Institute for Forest, Snow and Landscape Research, WSL, Switzerland.  
1989 - 1991 Research associate at the Paul Scherrer Institute, Switzerland, in the research Lab for Atmosphere and Air Pollution.  
1989 - 1991 Visiting scientist at the Systems Ecology Research Group (San Diego State Univ., USA). Ecological modeling in the US DOE, R4D Program: Effect of perturbation of tundra drainage systems on ecosystem dynamics of tundra and riparian vegetation.  
1991 – Dec. 2016 Head of the research group "Ecosystem Fluxes Research Group" at Paul Scherrer Institute, Switzerland  
1994 – Dec. 2016 Head of the Stable Isotope Research Facility at Paul Scherrer Institute, Switzerland

### Research Grants since 2008:

- 1995 – June 2017 PI and Co-PI of numerous research projects (Funding sources: EU and Switzerland)
- 2003 – 2011 Co-PI in the “*Swiss Canopy Crane Project*” funded by the Swiss National Research Fund (SNF)
- 2008 – 2012 PI, COST 639 “*Carbon cycling in alpine soils in a warmer world*” on-going (SBF, CH).
- 2008 PI of the PSI funded investment project: “*Rapid infrared laser spectroscopic determination of stable C-, O- and H isotopic abundances in environmental and plant ecological research*”
- 2010 PI of the SNF funded REQIP Project, for an upgrading of our isotope lab: “*Compound specific isotope analysis (CSIA) in aerosol, paleo climatological and ecological research*” / (CSIA periphery and IRMS). Nr. 206021\_128761.
- 2010 – 2013 of the SNF funded project: “*Effect of experimentally applied drought and warming stress on three oak species and provenances using C and O isotopes in leaves, shoots, stem, and roots*”. 31003A-31003A\_130782.
- 2010 – 2013 Co-PI of the SNF funded project: “*Carbon isotope fractionation during respiration: mechanisms and environmental drivers*”, starting in Nov. 2010-2013 (SNF, CH).
- 2011 – 2014 Co-PI of the SNF funded project: “*Organic matter dynamics in the plant-soil system under drought: investigating the importance of roots in the soil carbon stabilization using <sup>13</sup>C, <sup>2</sup>H, <sup>18</sup>O Multi-isotope-labeling technique*”. Nr. 200021\_135233
- 2012 – 2016 PI of the SNF funded Sinergia Project “*iTREE: Long-term variability of tree growth in a changing environment - identifying physiological mechanisms using stable C and O isotopes in tree rings.*” CRSII3-136295 /1. Funding: 1,8 Mio CHF
- 2014 – 2016 PI of the SNF funded Postdoc grant: “*Tracing rapid plant responses to environmental changes*” Grant Nr: 31003A\_153428 / SNF Funding: 243'050.- CHF.
- 2014 – 2017 Co-PI of the SNF funded project: “*Carbon isotope fractionation during leaf and root respiration as a function of nitrogen nutrition*“. Grant-Nr. 205321\_153545

1994 – Dec. 2016:

#### University level teaching:

Lectures & lab-courses at the Univ. of Basel, Zürich, ETH Zürich  
Subjects

- Stabile Isotope in den Umwelt und Geowissenschaften
- Stabile Isotope in der Ökologie
- Stable isotopes in plant physiology and ecosystems research
- Ecophysiology of the terrestrial vegetation

2000 – Dec. 2016:

**Summer School Lecturing on Stable isotopes in environm. & plant ecological research** (Portugal, Sweden, Austria, France, USA, Italy)

#### Training of MSC and PhD students:

- all Ph.D. theses under my supervision have been completed successfully.
- all Diploma (MSc) theses under my supervision have been completed successfully
- External Examiner for numerous PhD and Master degrees in Switzerland and abroad (UK, France, Sweden, Finland, Italy)

### **Other Activities:**

- 2007 – 2015      **Vice President** of the German Association of Stable Isotope Research (GASIR)
- 2002 – 2007      Member of the Scientific Steering Committee for the **ESF** Scientific Programme in Stable Isotopes in Biospheric-Atmospheric Exchange (SIBAE).

### **Organization of the most important conferences and workshops:**

- SIBAE-BASIN Conference April 1-3, 2004 Interlaken, Switzerland funded by ESF-SIBAE Program (Organizer, Scientific and Organising Committee)
- CARBOMONT - Workshop on Soil Respiration Innsbruck, 15-16 April, 2004 (University Innsbruck) (Scientific and Organising Committee)
- SIBAE-BASIN Conference March 13-15, 2006 Tomar, Portugal funded by ESF-SIBAE and US-BASIN Programs (Organizer, Scientific and Organising Committee)
- Conference on “Stable Isotopes and Biogeochemical Cycles in Terrestrial Ecosystems”, Monte Verità, Ascona, Switzerland, 2010 (Scientific and Organising Committee)
- General Assembly of European Geosciences Union. Session on “Stable isotopes in tree rings as indicators for environmental change“ 2009 - 2011, Vienna, Austria (Convener)
- Annual Meeting of the German Association for Stable Isotope Research 2011 (GASIR), In Villigen, PSI Oct. 10-12, 2011 (Organizer)
- Isotopes 2017, The Cross-Disciplinary Conference on Stable Isotope Sciences, Monte Verita, Ascona, Switzerland (Scientific and organizing Committee)

**Yearly participations at national and international** conferences and workshops with invited contributions.

**Continuous review activities** for numerous **journals** (Plant Cell & Environment, Plant Physiology, Tree Physiology, Global Change Biology, New Phytologist, Oecologia, Trees, GRL, Bio Geochemical Cycles, Rapid Comm. in Mass Spect., Stable Isotopes in Envir. and Health Studies, Plant Biology and others, etc.) Reviewer for **research proposals** for the European Scientific Foundation, Swiss National Research Fund, Deutsche Forschungs-Gemeinschaft etc.

### **Research Interests**

- Carbon and water relations on plant and ecosystem level,
- Vegetation response to changing environments
- Plant response to chronic and acute stress conditions
- Application of stable isotopes in plant physiological, ecosystem and environmental processes
- Tree physiology, its short and long term water and carbon balance

Villigen, Sept, 2017

Rolf TW. Siegwolf

## **Publications since 1984 – Sept, 2017**

Total of peer reviewed ISI publications: 171

Total of book contributions: 13

### **Ten key publications:**

Körner, C; Asshoff, R; Bignucolo, O; Hattenschwiler, S; Keel, SG; Pelaez-Riedl, S; Pepin, S; **Siegwolf, RTW**; Zotz, G. (2005). Carbon flux and growth in mature deciduous forest trees exposed to elevated CO<sub>2</sub>. *SCIENCE*, 309, (5739), pp. 1360-1362

Klein, Tamir, **Siegwolf RTW.**, Körner Ch. (2016). Belowground carbon trade among tall trees in a temperate forest. *Science*, 352 (6283), 342–344. DOI: 10.1126/science.aad6188

Scheidegger Y., M. Saurer, M. Bahn and **Siegwolf RTW\***, (2000). Linking stable oxygen and carbon isotopes with stomatal conductance and photosynthetic capacity: a conceptual model. *Oecologia*, **125** (3): 350-357.

**Siegwolf RTW.**, Matyssek R., Saurer M, Maurer S., Schmutz P., Goerg-Günthardt M., Bucher JB. (2001). Stable isotope analysis reveals differential effects of soil nitrogen and nitrogen dioxide on the water use efficiency of hybrid poplar leaves. *New Phytologist* 149: 233-246.c

Saurer, M., **R. T. W. Siegwolf**, and F. Schweingruber, 2004: Carbon isotope discrimination indicates improving water-use efficiency of trees in northern Eurasia over the last 100 years. *Global Change Biology*, 10, 2109-2120.

Hagedorn F, Joseph J, Peter M, Luster J, Pritsch K, Geppert U, Kerner R, Molinier V, Egli S, Schaub M, Liu JF, Li M, Sever K, Weiler M, **Siegwolf RTW**, Gessler A, Arend M (2016) Recovery of trees from drought depends on belowground sink control. *Nature Plants* 16111, doi: 10.1038/nplants.2016.111

E. E. Pflug, **R. Siegwolf**, N. Buchmann, M. Dobbertin, T.M. Kuster, M.S. Günthardt-Goerg and M. (2015). Growth cessation uncouples isotopic signals in leaves and tree rings of drought-exposed oak trees. *Tree Physiology* 35 (10): 1095-1105; doi:10.1093/treephys/tpv079

Mathieu Lévesque, Matthias Saurer, **Rolf Siegwolf**, Britta Eilmann, Peter Brang, Harald Bugmann, Andreas Rigling (2013). Drought response of five conifer species under contrasting water availability suggests high vulnerability of Norway spruce and European larch. *Global Change Biology* (2013) 19, 3184–3199, doi: 10.1111/gcb.12268

K.T., Rinne, M., Saurer, A.V., Kirilyanov, N.J., Loader, M.V., Bryukhanova, R., Werner and **R.T.W., Siegwolf** (2015). The relationship between needle sugar carbon isotope ratios and tree rings of Siberian larch. *Tree physiology* 35 (10): 1192–1205. doi:10.1093/treephys/tpv096

Michael Bahn, Michael Schmitt, **Rolf T.W. Siegwolf**, Andreas Richter, Nicolas Brüggemann (2009) Does photosynthesis affect grassland soil-respired CO<sub>2</sub> and its carbon isotope composition on a diurnal timescale? *New Phytologist* Vol 182 (2): 451-460