



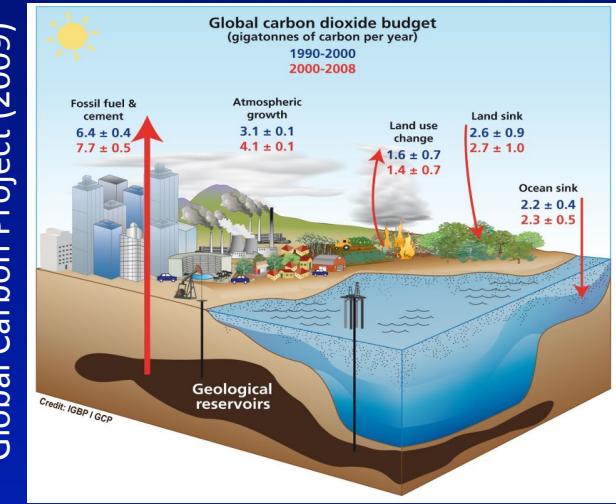
More than just CO₂: The carbon balance of a temperate mountain grassland



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Motivation



„Other“ carbon fluxes

$$\text{NECB} = \frac{dC}{dt} = -\text{NEE} + F_{\text{CO}} + F_{\text{CH}_4} + F_{\text{VOC}} + F_{\text{DIC}} + F_{\text{DOC}} + F_{\text{PC}}$$

(Chapin et al., 2006)

- Terrestrial biosphere absorbs ≈25% of anthropogenic CO₂
- Magnitude of terrestrial sink is highly uncertain
- Better understanding of „other“ carbon fluxes
- Non-CO₂ gases are directly/indirectly radiatively active

LTER sites Neustift

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Anmelden

Route berechnen Meine Orte

Moscone Center, San Francisco, Kalifornien, US
Neustift im Stubaital, Österreich

Ziel hinzufügen - Optionen anzeigen

ROUTE BERECHNEN

Wir konnten keine Route zwischen 747 Howard Street, San Francisco, CA 94103, Vereinigte Staaten und Neustift im Stubaital, Österreich berechnen.

Anzeige - Warum diese Anzeige?

Neustift im Stubaital
Hotels in Neustift im Stubaital.
Schnell und sicher online buchen.
www.booking.com/Neustift-Im-Stubaital

Hier könnte Ihre Anzeige stehen »

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Maps Labs - Hilfe

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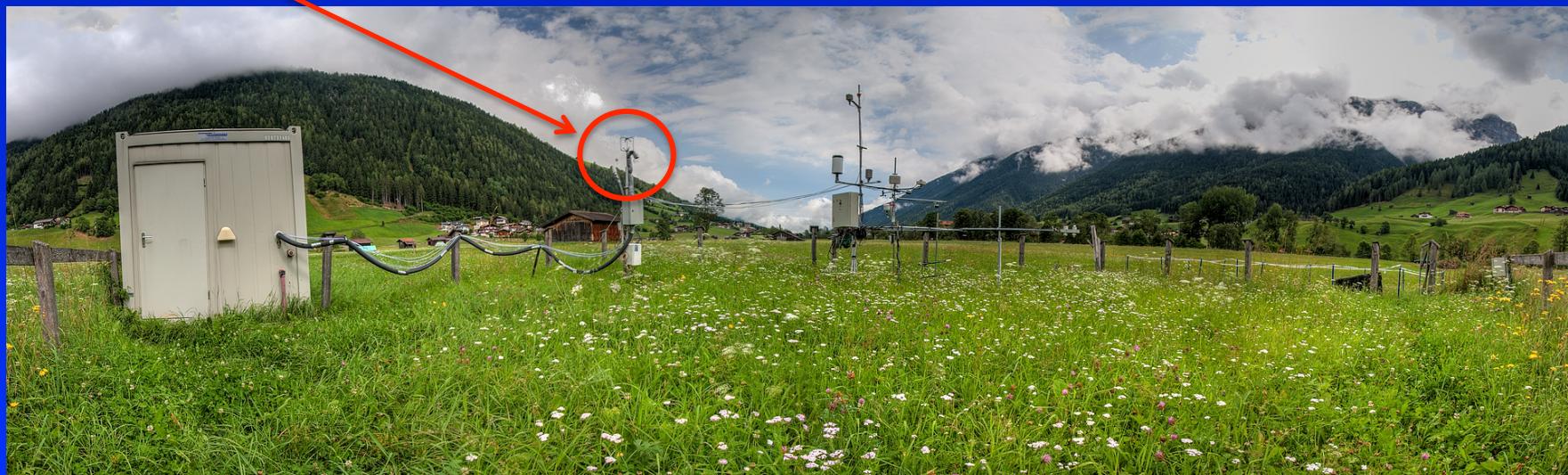
2000 km
2000 Meile/n

Grafiken © 2012 NASA, TerraMetrics, Kartendaten ©2012 MapLink, Tele Atlas

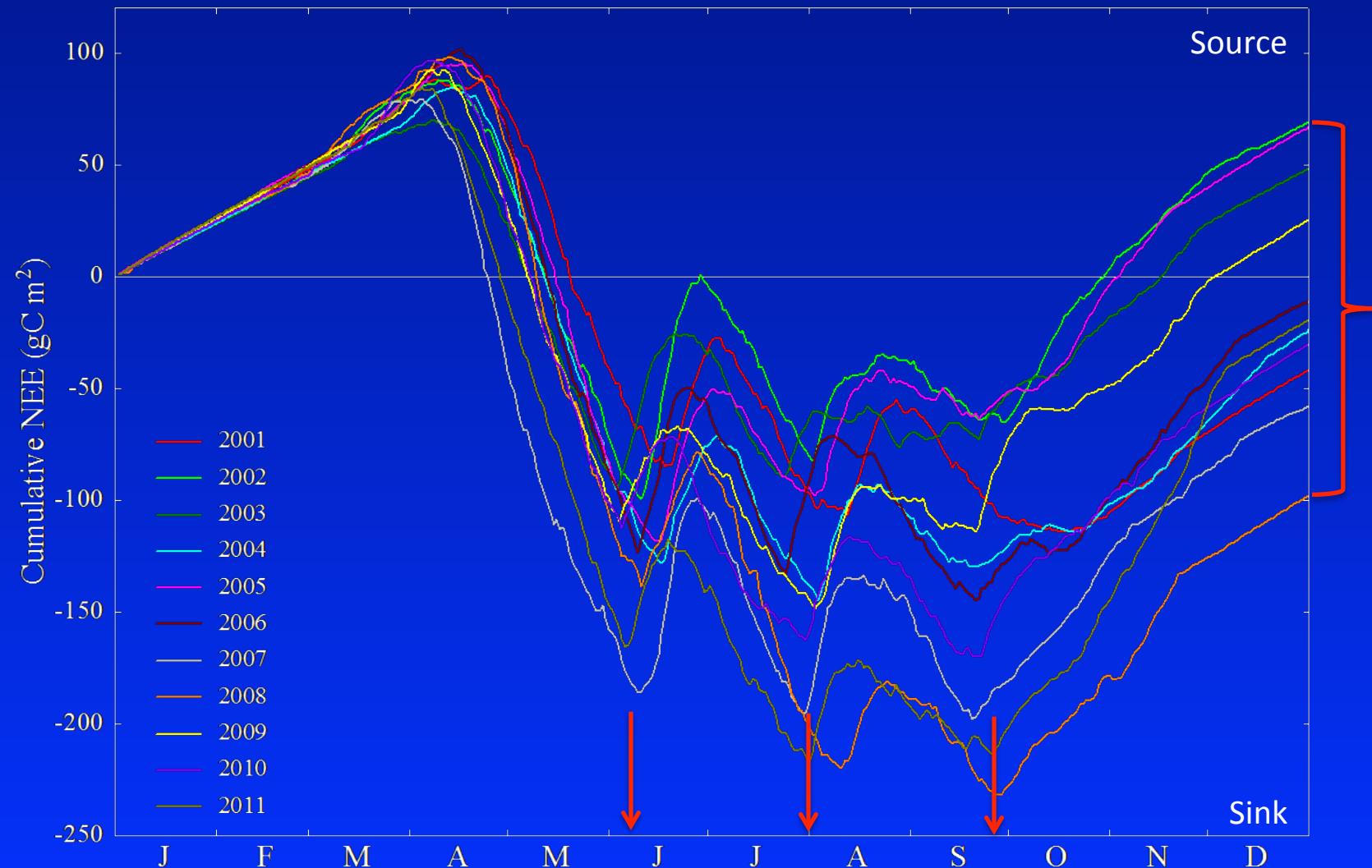
C-cycle measurements

Eddy covariance

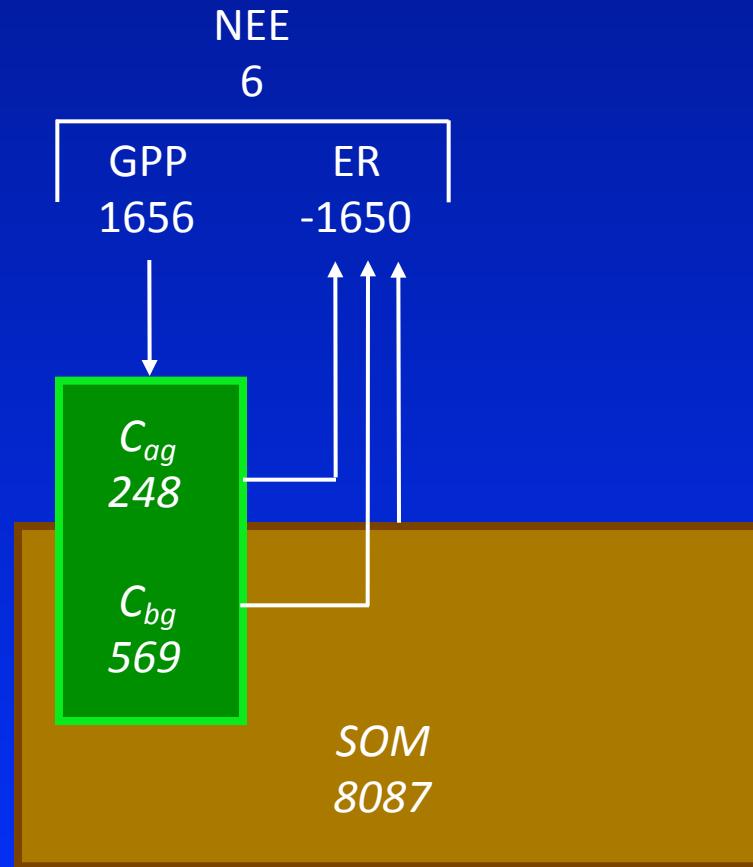
C-compound	Time frame	Instrumentation
CO ₂	2001-ongoing	Li-6262/Li-7000
CH ₄	2010-ongoing	cwQCL Aerodyne
VOC	2008-2009, 2011-2012	PTR-MS/PTR-TOF
Particulate C	2001-ongoing	Elemental analyser



Net ecosystem CO₂ exchange (NEE)

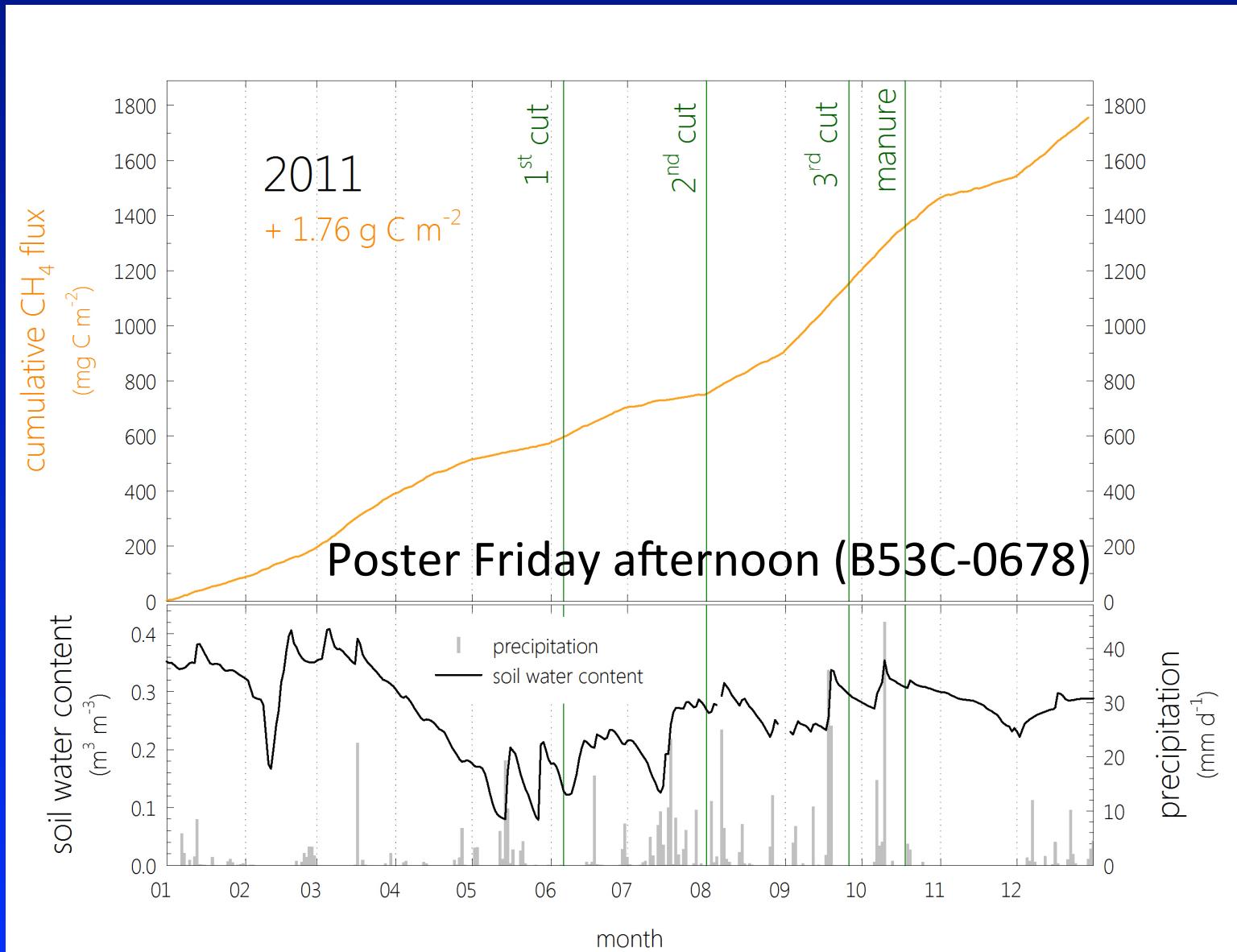


The net ecosystem CO₂ balance: I

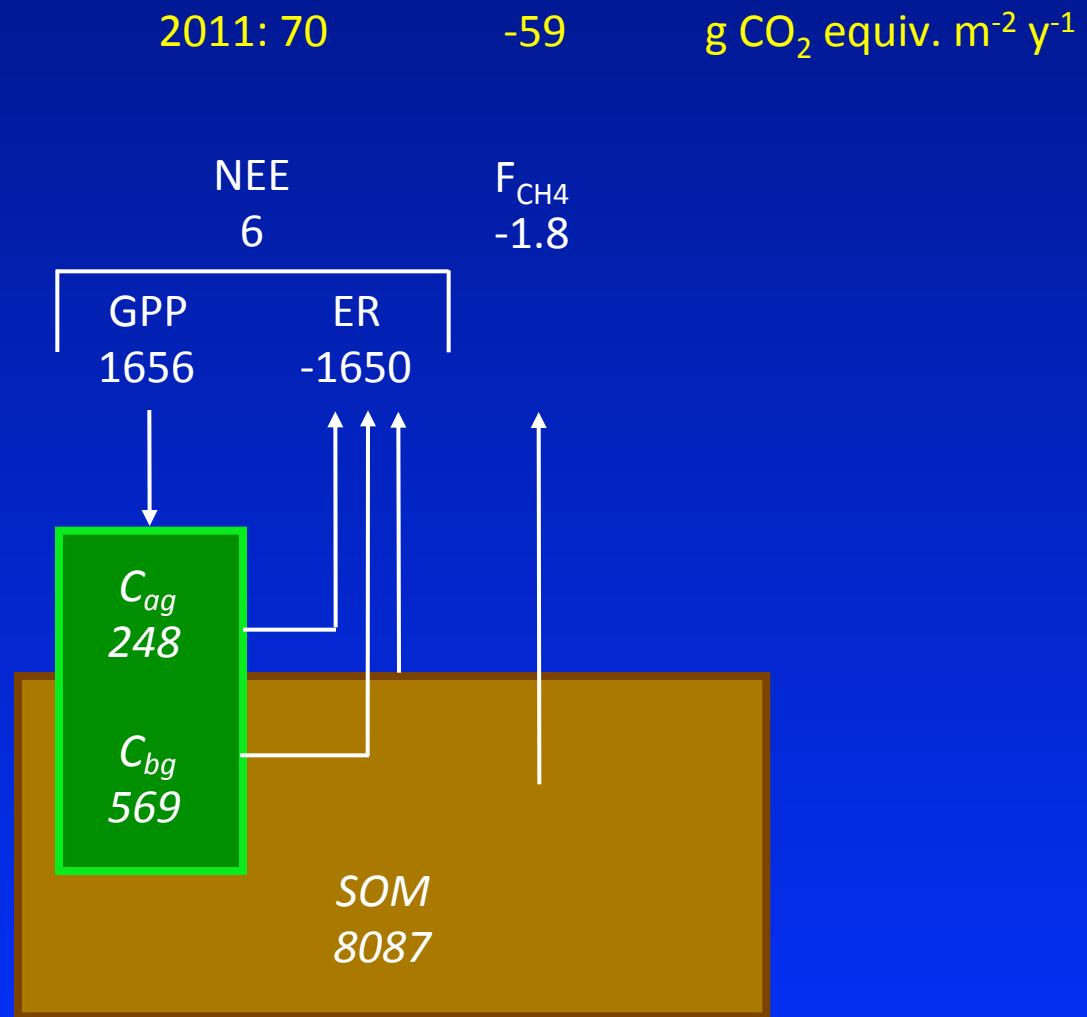


Units: pools (gC m⁻²) and fluxes (gC m⁻² y⁻¹)

Methane (CH_4) exchange

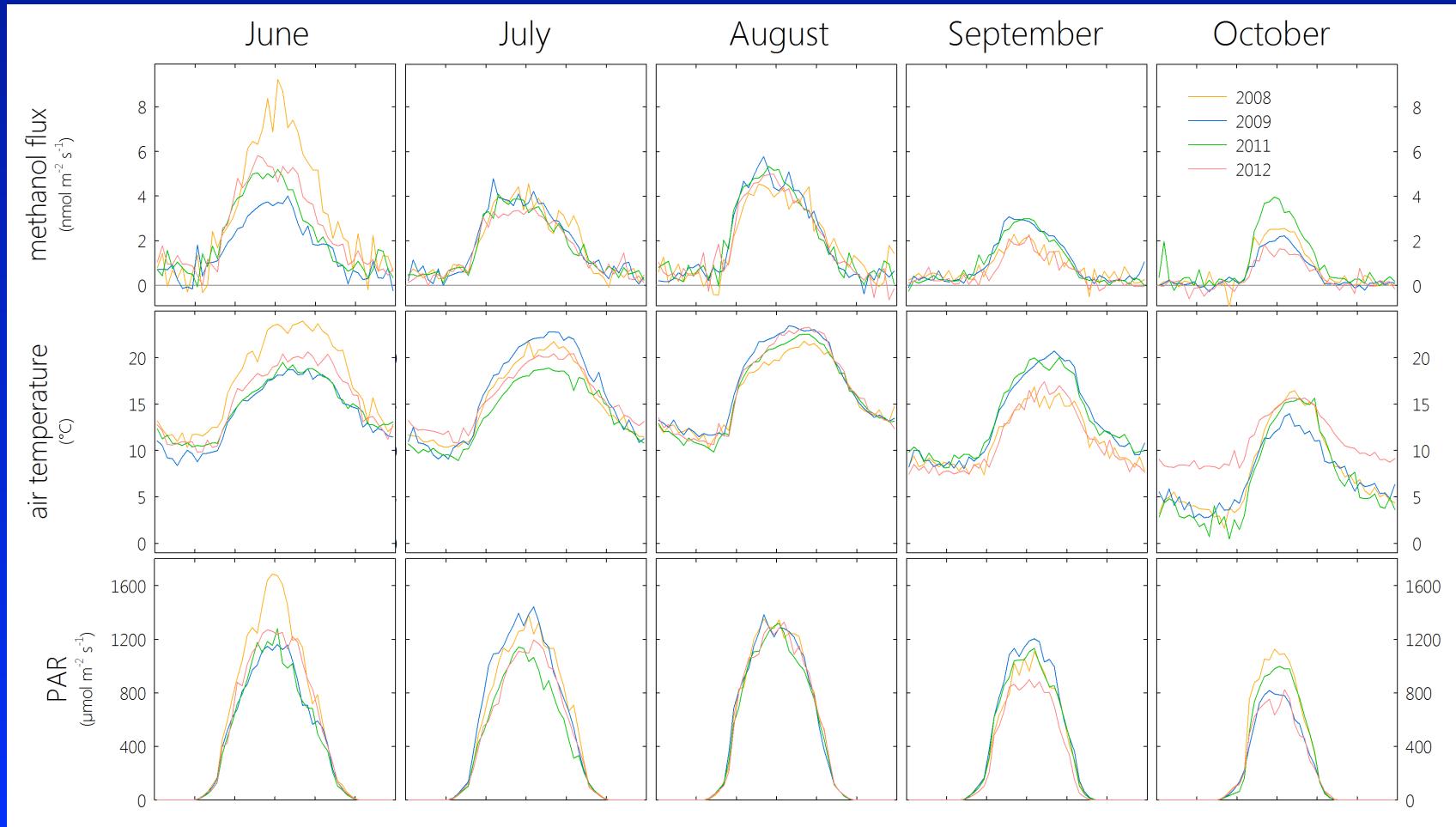


The net ecosystem CO₂ balance: II

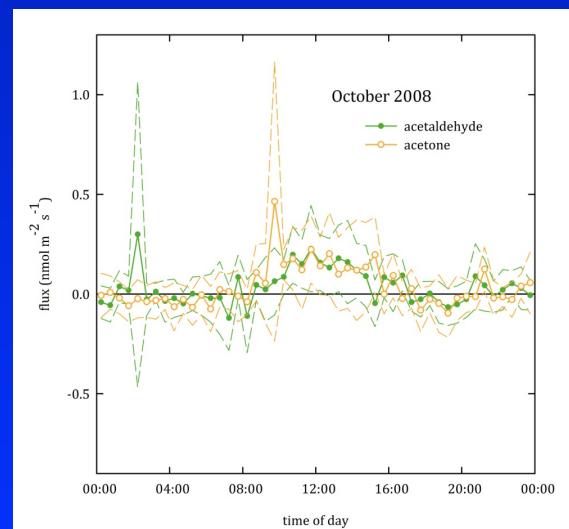
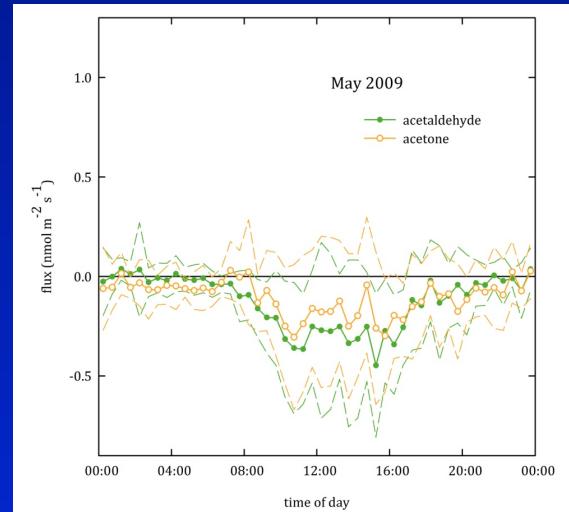
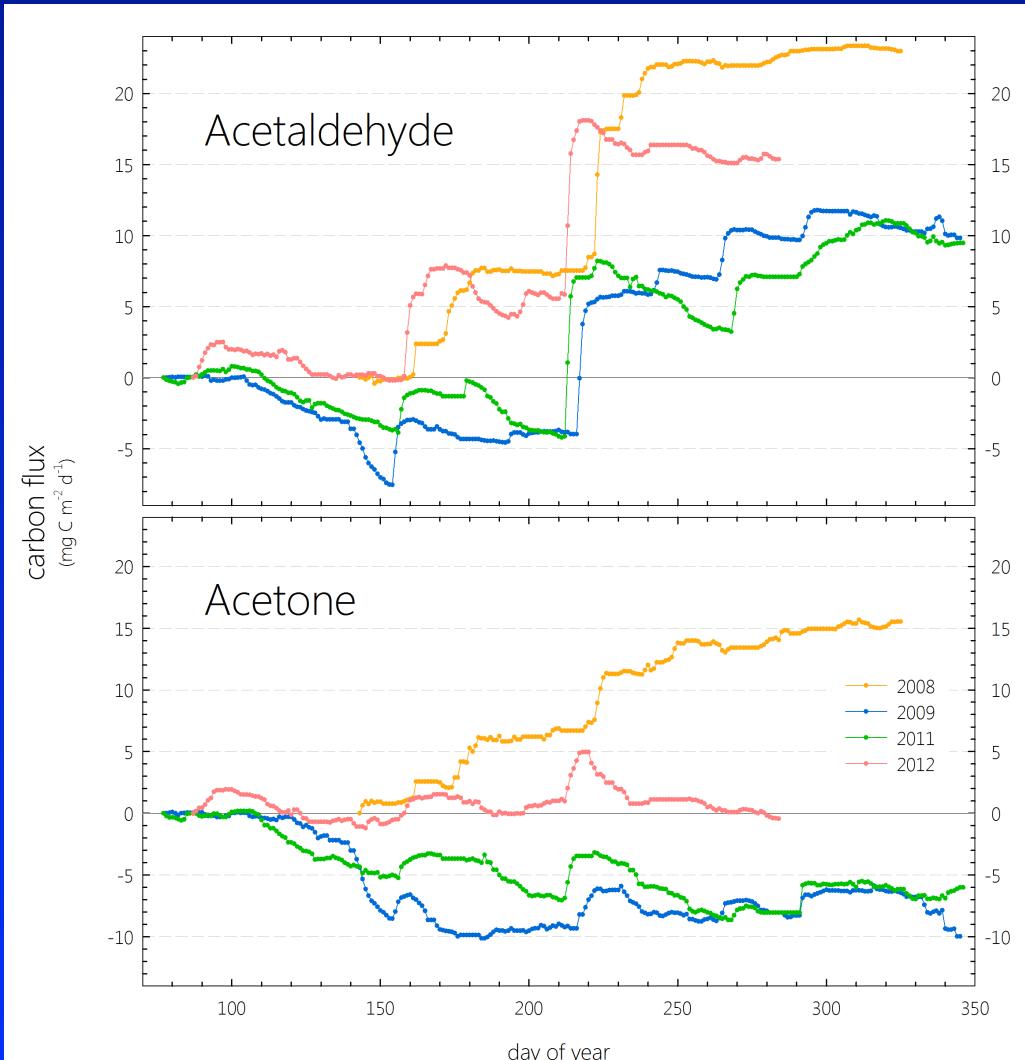


Units: pools (gC m⁻²) and fluxes (gC m⁻² y⁻¹)

BVOC: Methanol (CH_4O) exchange

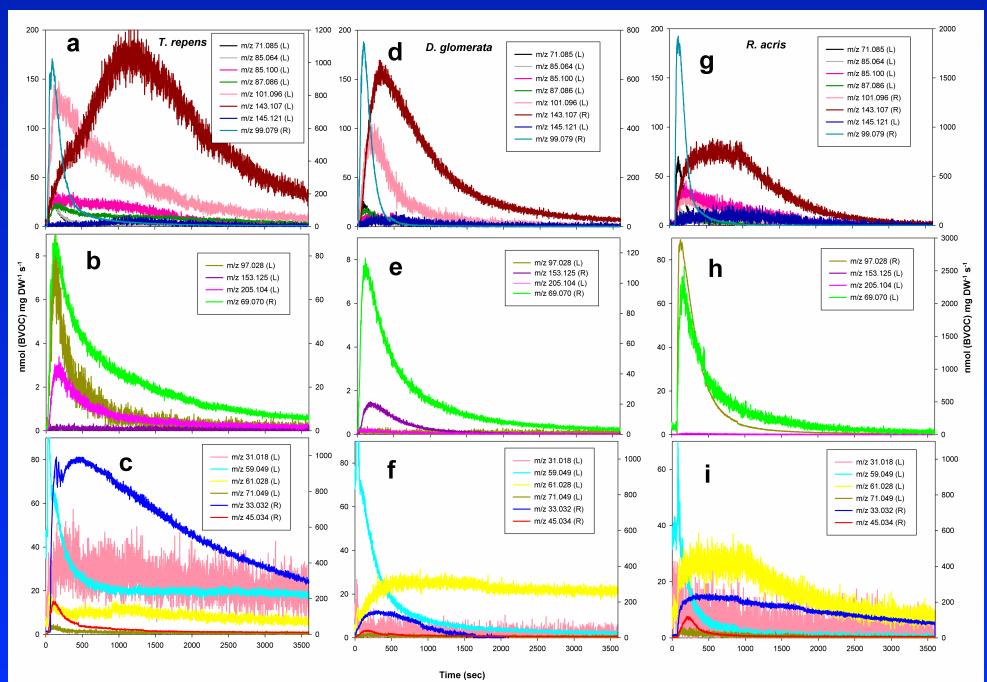
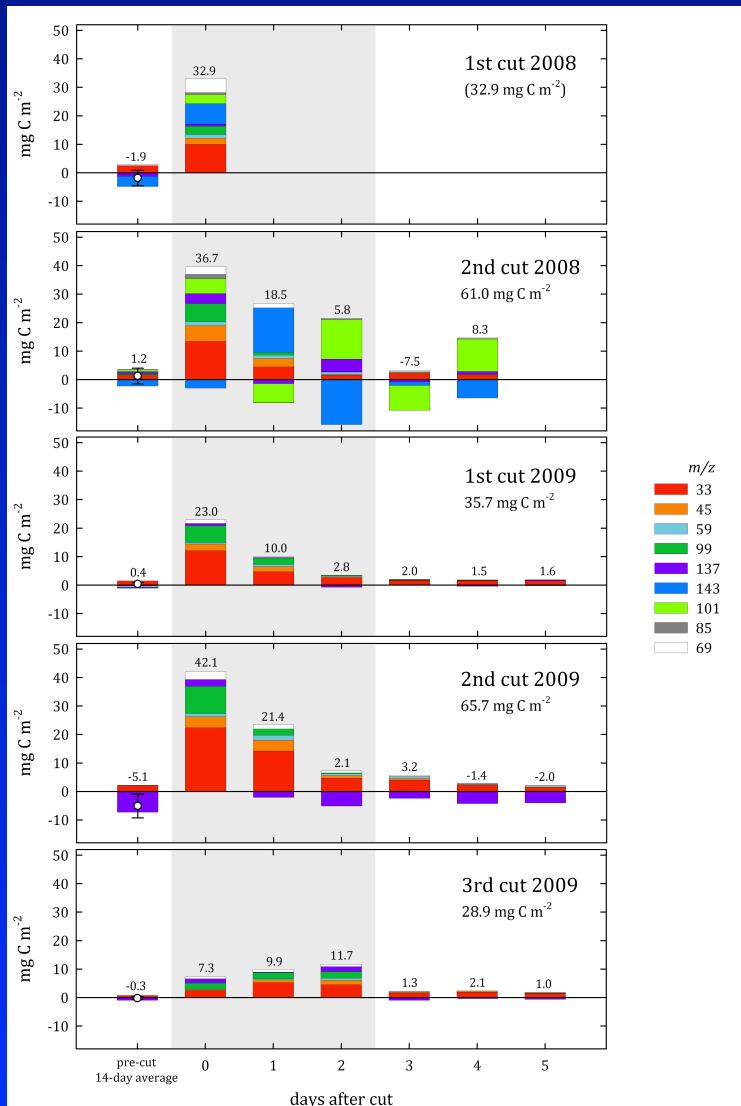
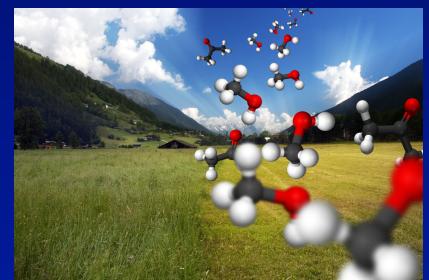


BVOC: Acetaldehyde (C_2H_4O) and Acetone (C_3H_6O) exchange

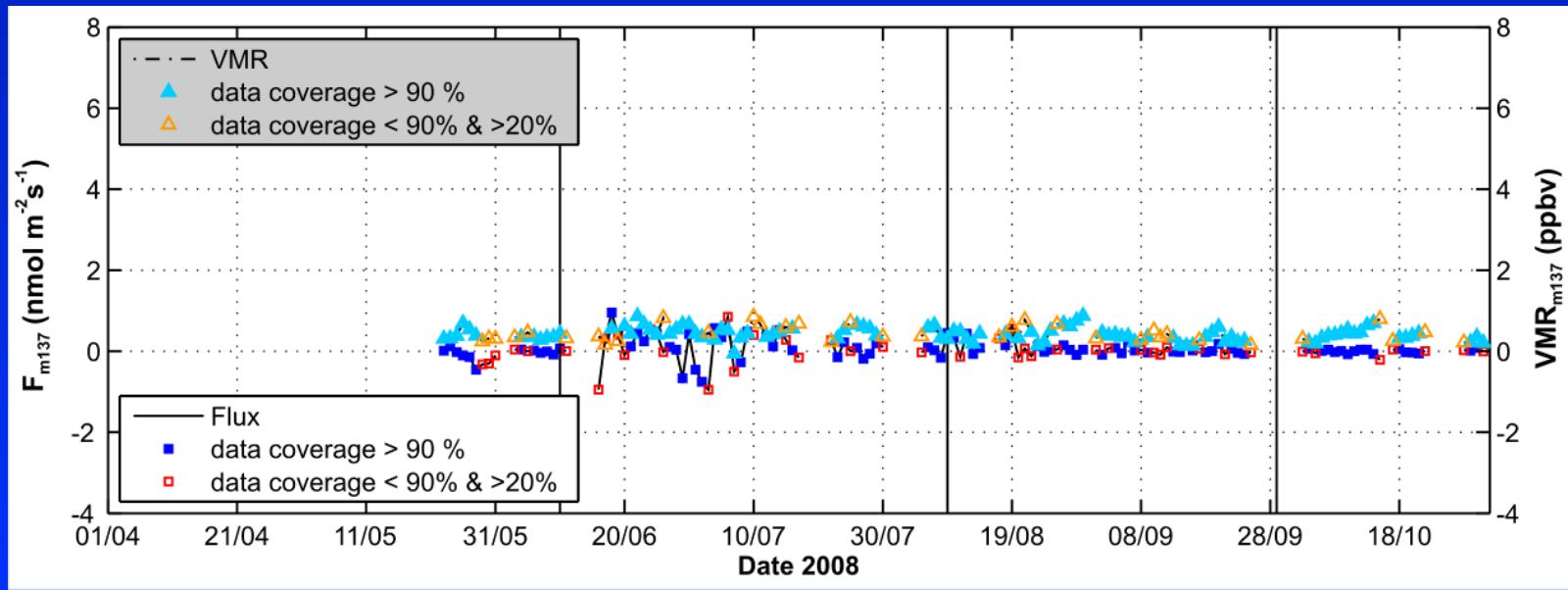


Results

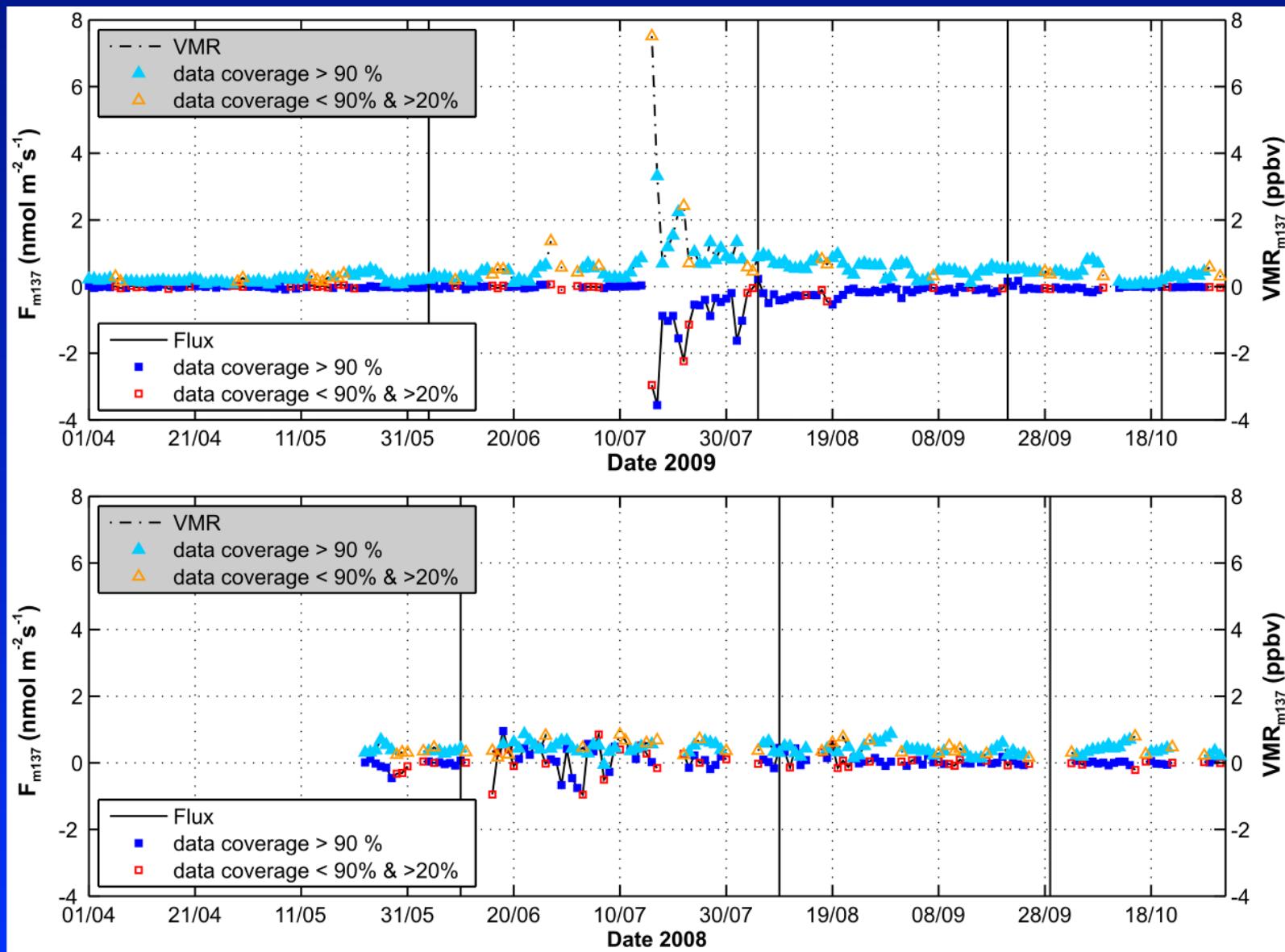
BVOC: fluxes during/after harvesting



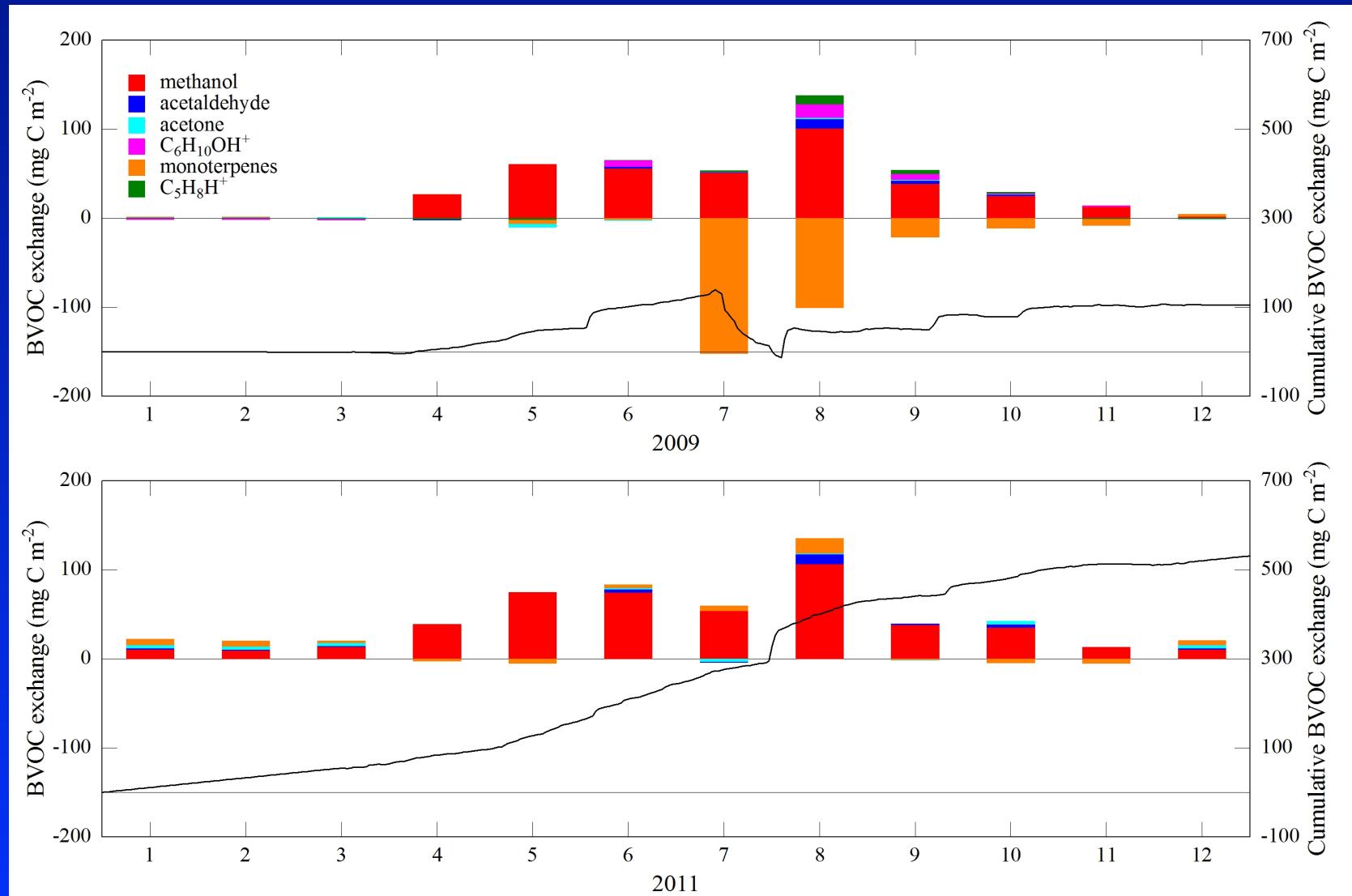
BVOC: Monoterpene ($C_{10} H_{16}$) deposition



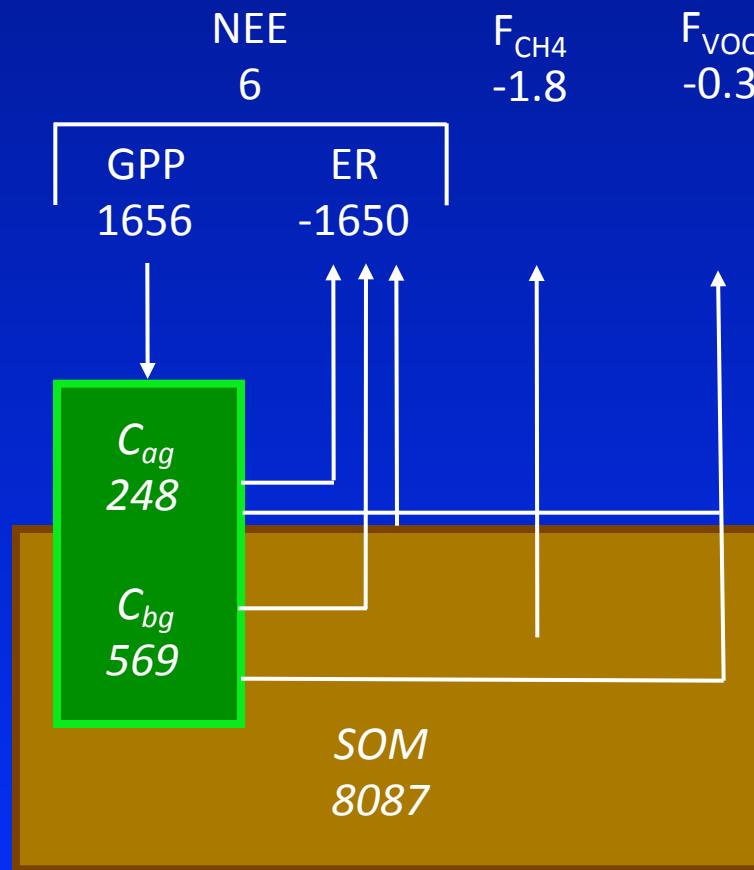
BVOC: Monoterpene ($C_{10} H_{16}$) deposition



BVOC: summary

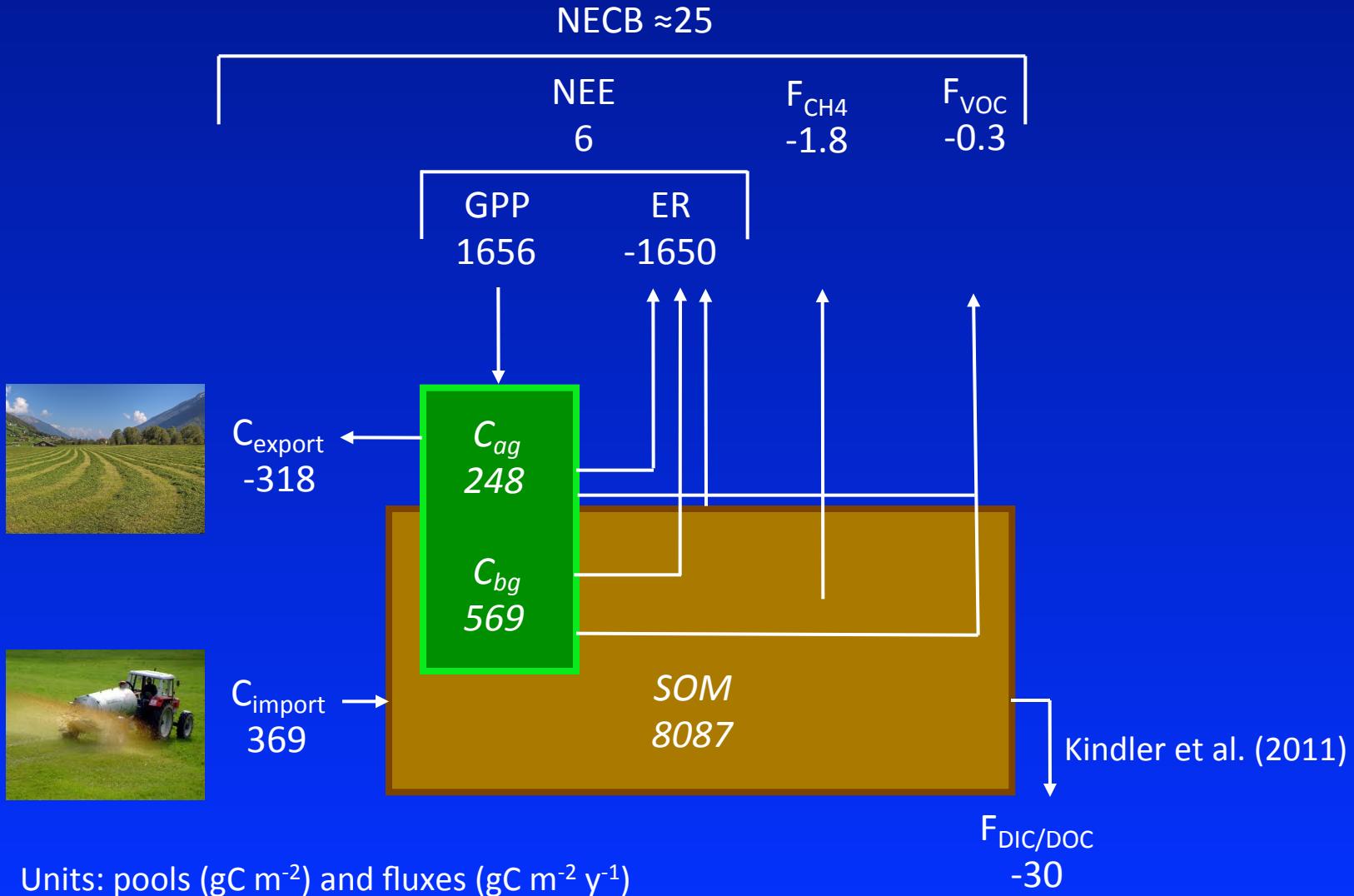


The net ecosystem CO₂ balance: III



Units: pools (gC m⁻²) and fluxes (gC m⁻² y⁻¹)

The net ecosystem CO₂ balance: IV



Summary and Conclusion

- Largest component carbon fluxes are GPP and ER, followed by carbon export/imports associated with management. In particular carbon imports bear considerable uncertainties and thus deserve further attention (in managed ecosystems).
- CH_4 and VOC exchange amounts to ca. 7 and 1% of the NECB. CH_4 fluxes appear to negate a significant part of the negative radiative forcing of the CO_2 uptake. VOC, mostly oxygenated compounds, fluxes matter for atmospheric chemistry.

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ongoing project **BVOC fluxes**

In this project we take a closer look at
"Fluxes of biogenic oxygenated
volatile organic compounds
between mountain grassland
ecosystems and the atmosphere"

Click here for more information





NEWS

02 DECEMBER 2012

**Meet us @ AGU Fall Meeting 2012
in San Francisco, CA**

We have one oral and three poster presentations at this year's AGU Fall Meeting, namely:

Thursday, 06 Dec | 2:25 PM - 2:40 PM | ORAL PRESENTATION
More than just CO₂: The carbon balance of a temperate mountain grassland (Invited)
Room 2002 (Moscone West) | id: B43J-04

Thursday, 06 Dec | POSTER

New Publications

Wohlfahrt et al. (2012), Carbonyl sulfide (COS) as a tracer for canopy photosynthesis, transpiration and stomatal conductance: potential and limitations.

Wohlfahrt et al. (2012), Chapter 13: Eddy covariance measurements over grasslands. In: Eddy Covariance: A practical guide to measurements and data analysis.

Hörtnagl, L. et al. (2011), Biotic, abiotic, and management controls on methanol exchange above a temperate mountain grassland.
[\[OPEN ACCESS\]](#)

