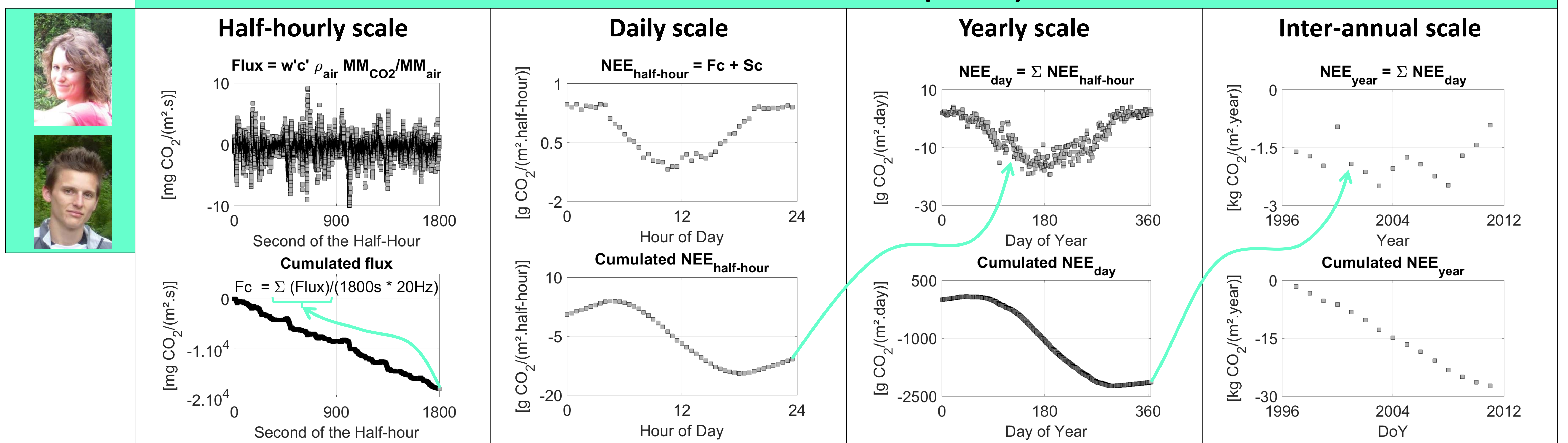


The ICOS Vielsalm Terrestrial Observatory: Long term greenhouse gas flux measurements

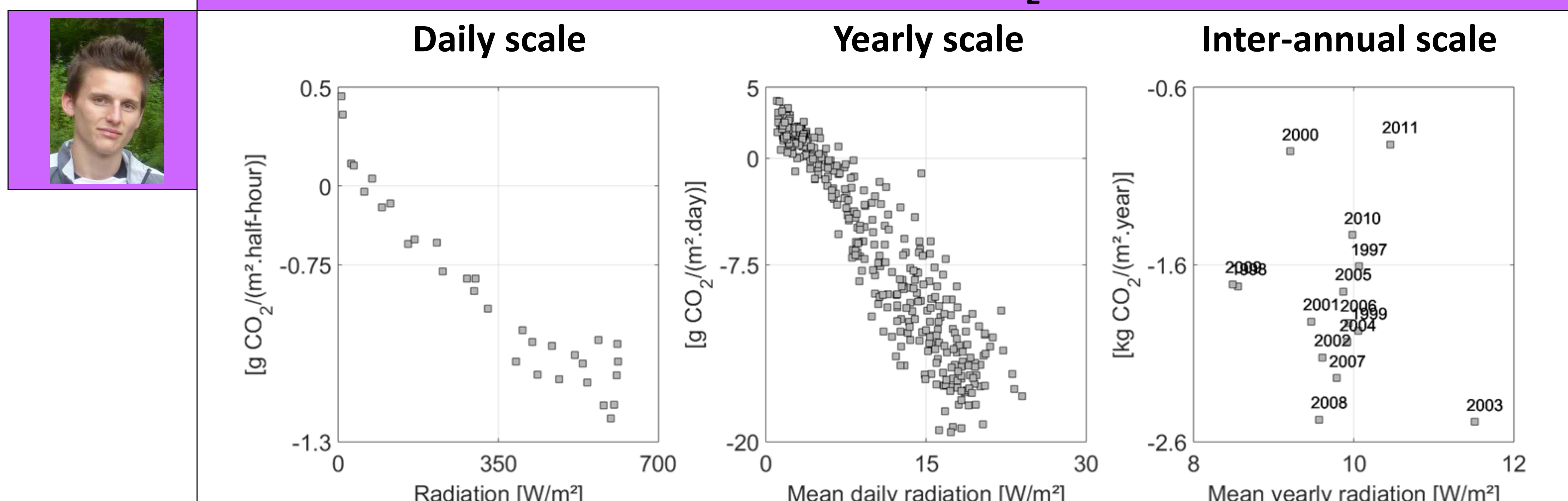
Who are we?	What are we doing?	Why?
<p>Anne De Ligne ICOS Wallonia Station Manager anne.deligne@ulg.ac.be</p>	<p>→ Long term and high precision measurements of climate variables and greenhouse gas (CO₂ and H₂O) fluxes.</p>	<p>→ To provide data from Wallonia to the scientific community in order to study the climate change.</p>
<p>Quentin Hurdebise Research assistant quentin.hurdebise@ulg.ac.be</p>	<p>→ Analysis of the data from the Vielsalm Terrestrial Observatory (VTO), an ICOS site located in a mixed forest.</p>	<p>→ To understand the interannual variability of greenhouse gas fluxes of a temperate forest.</p>

What are the data available?	How to access data?	Site management																																						
<p>Vielsalm Terrestrial Observatory</p> <table border="1"> <thead> <tr> <th>N°</th> <th>Variable</th> </tr> </thead> <tbody> <tr><td>1</td><td>Wind velocity (u, v, w)</td></tr> <tr><td>2</td><td>Concentration of CO₂ (c) and H₂O (q)</td></tr> <tr><td>3</td><td>Solar radiation</td></tr> <tr><td>3b</td><td>Solar radiation (bis)</td></tr> <tr><td>5</td><td>Photosynthetic Photon Flux Density</td></tr> <tr><td>5b</td><td>Reflected Photosynthetic Photon Flux Density</td></tr> <tr><td>6</td><td>CO₂ concentration</td></tr> <tr><td>7</td><td>Precipitation</td></tr> <tr><td>7b</td><td>Precipitation (bis)</td></tr> <tr><td>8</td><td>Air temperature, Air humidity</td></tr> <tr><td>10</td><td>Atmospheric pressure</td></tr> <tr><td>12</td><td>Soil temperature</td></tr> <tr><td>13</td><td>Soil moisture</td></tr> <tr><td>12b - 13b</td><td>Soil temperature and moisture</td></tr> <tr><td>14</td><td>Soil Heat Flux</td></tr> <tr><td>15</td><td>Water table depth</td></tr> <tr><td>16</td><td>Snow depth</td></tr> <tr><td>17</td><td>Canopy temperature</td></tr> </tbody> </table>	N°	Variable	1	Wind velocity (u, v, w)	2	Concentration of CO ₂ (c) and H ₂ O (q)	3	Solar radiation	3b	Solar radiation (bis)	5	Photosynthetic Photon Flux Density	5b	Reflected Photosynthetic Photon Flux Density	6	CO ₂ concentration	7	Precipitation	7b	Precipitation (bis)	8	Air temperature, Air humidity	10	Atmospheric pressure	12	Soil temperature	13	Soil moisture	12b - 13b	Soil temperature and moisture	14	Soil Heat Flux	15	Water table depth	16	Snow depth	17	Canopy temperature	<p>→ http://www.europe-fluxdata.eu/anne.deligne@ulg.ac.be</p> <p>How do we obtain CO₂ net flux?</p> <p>→ NEE = CO₂ Net Ecosystem Exchange = Fc + Sc (each half-hour)</p> <p>→ Fc = CO₂ turbulent flux (proportional to the covariance $\overline{w'c'}$), exchange of CO₂ with the air above the sensors</p> <p>→ Sc = CO₂ storage below the sensors (proportional to the concentration of CO₂ in the profile)</p> <p>→ Convention: NEE = GPP + TER = photosynthesis (<0) + respiration (>0)</p>	<p>Principal Investigator (PI) Caroline Vincke (UCL) caroline.vincke@uclouvain.ac.be</p> <p>Fluxes and meteorological measurements manager Anne De Ligne (ULg) anne.deligne@ulg.ac.be</p> <p>Fluxes and meteorological measurements technician Henri Chopin (ULg) h.chopin@ulg.ac.be</p> <p>Biomass measurements manager Tanguy Manise (ULg-UCL) tanguy.manise@ulg.ac.be tanguy.manise@uclouvain.ac.be</p> <p>Biomass measurements technician Thibaut Thyryon thibaut.thyryon@uclouvain.be</p>
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What do NEE and cumulated NEE temporal dynamics look like?



What are the relations between CO₂ flux and radiation?



What can we learn from CO₂ flux?

- The VTO is a carbon sink every year, but there is interannual variability.
- At daily and yearly scale, the radiation is the main driving variable.
- At interannual scale, the driving variables are different.
- Long term study is required to analyse interannual variability.
- Flux dynamic differs between beech and coniferous (not presented).

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