



Project title: INVENT

Filling the gaps of modelling of the soil carbon cycling through better forest litter input data

The 7th ICP Forests scientific conference

Riga, Latvia 15.05.2018

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About the project



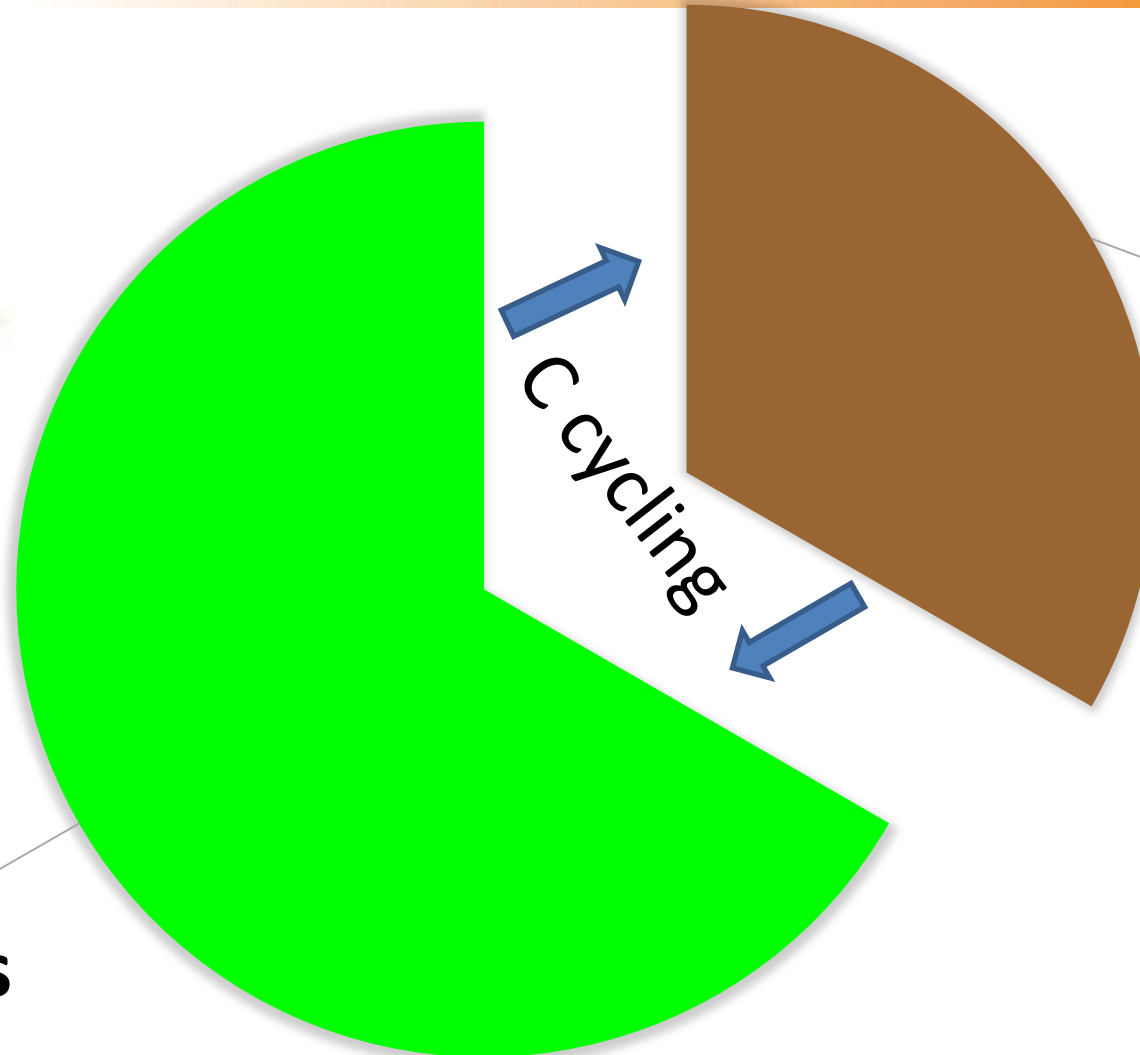
- General aim of the whole project is to reduce uncertainties in GHG reporting
- One of the tasks – to create litter database for soil carbon modelling

Forest mineral soils in GHG inventory



Emissions accounted
very detailed

**Carbon in
tree biomass
in forests**



**Carbon in
Forest
mineral soils**

Emissions are **POORLY**
accounted, in many cases
accounted as 0 emissions

Modelling of soil carbon cycling



Yasso

Climate

Litterfall

Soil C

Soil properties

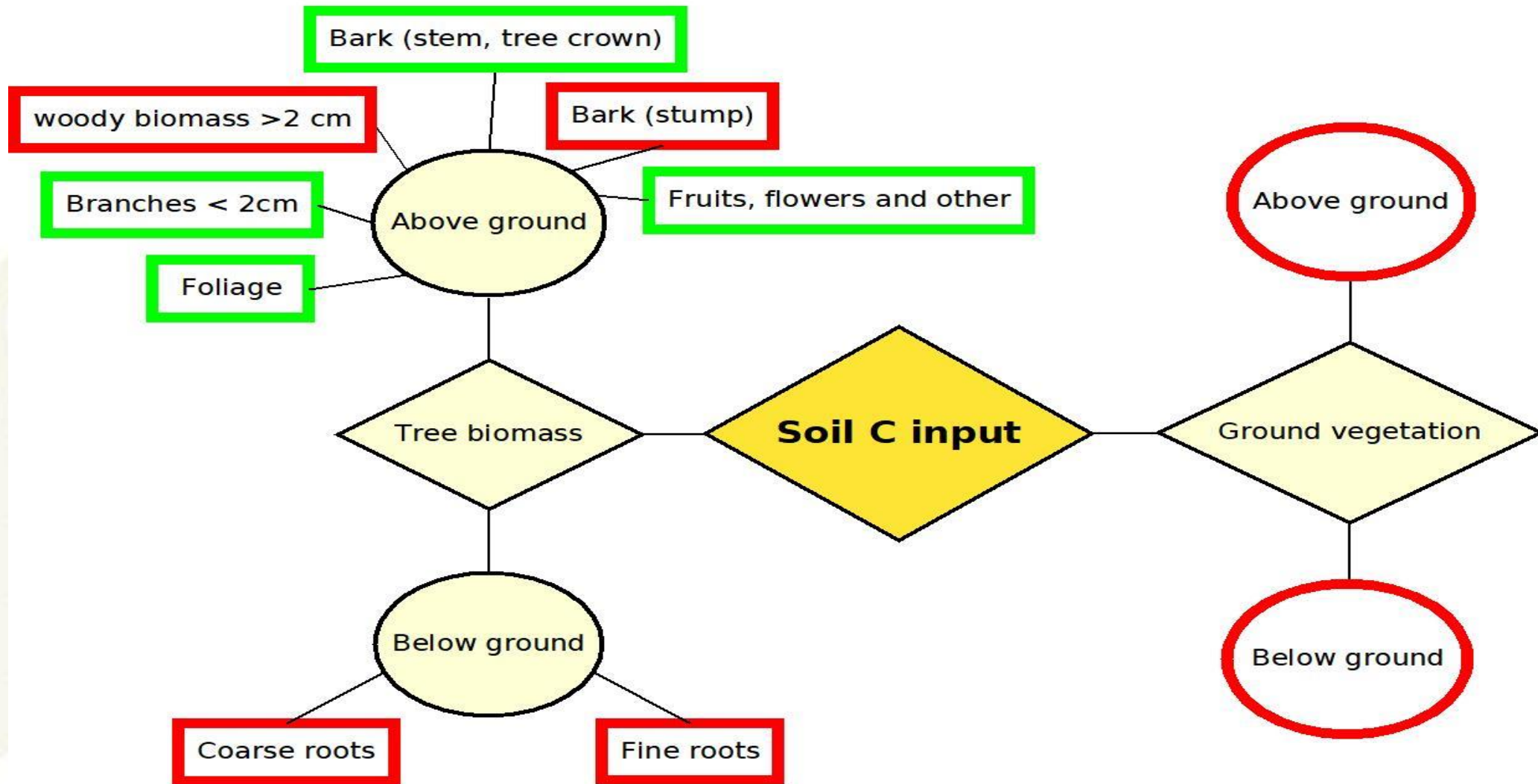
Soil water



Covered by ICP forests Level II monitoring sample plots



Literature analysis or other sources



How accurate are we able to model litterfall???

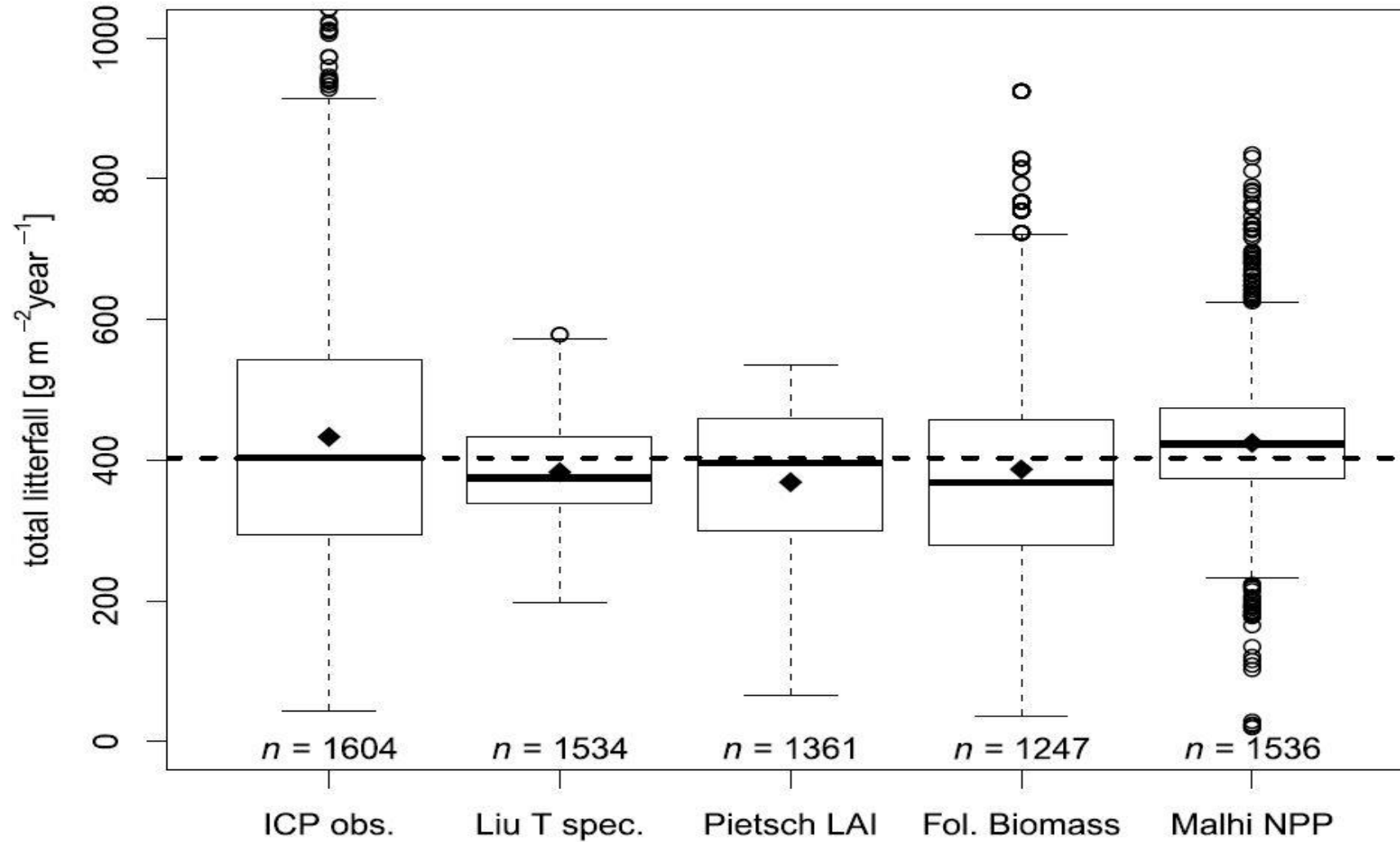


	Tree Above ground litterfall	Tree below ground litterfall	Ground vegetation
Mean large scale (e.g. Europe) litterfall rates	● ● ● ● ○	○ ● ● ○ ○ ○	○ ● ○ ○ ○ ○
Small scale (e.g. Plot, specie level) litterfall rates	○ ● ○ ○ ○	○ ● ○ ○ ○ ○	○ ● ○ ○ ○ ○

● ● ● ● ● Excellent! No need for further improvement

○ ○ ○ ○ ○ No data on this

Tree above ground litterfall rates in Europe, compared with modelled results

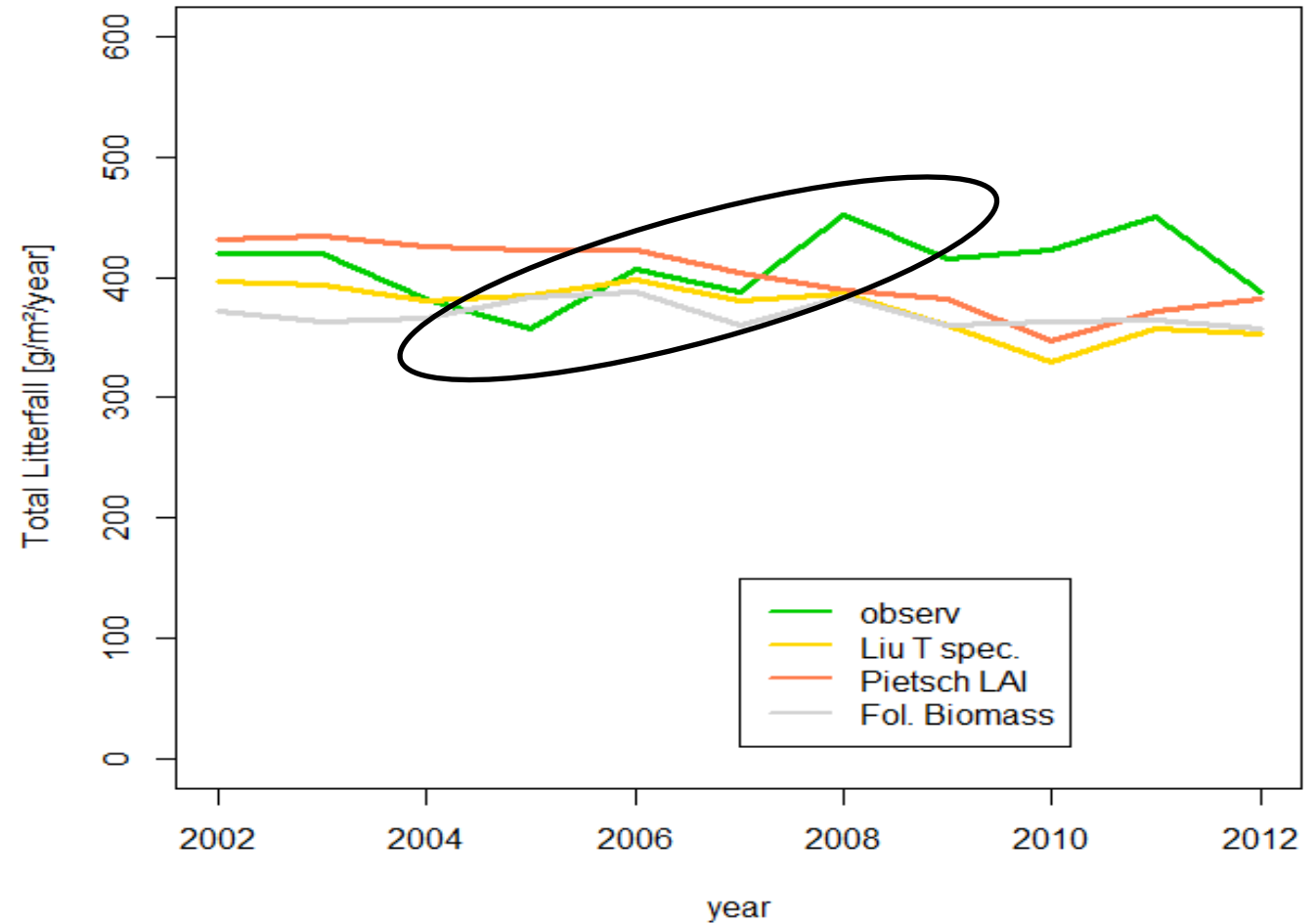


Author: Neumann et al., 2018

Temporal litterfall rate from tree above ground biomass



Modelling of mean litterfall rates seems to be quite accurate for Europe, but the temporal trends are different from trends of observed values.



Author: Neumann et al., 2018 (from supporting information)

Impact on GHG reporting



- If the modelled litterfall trends are different from observed trends, it may result in wrong soil carbon change estimates, especially in short term.
 - Not so important on large scale (European) and long term.
 - More important in short term and in detailed spatial scale.

Literfall from tree above ground biomass – what can we improve?




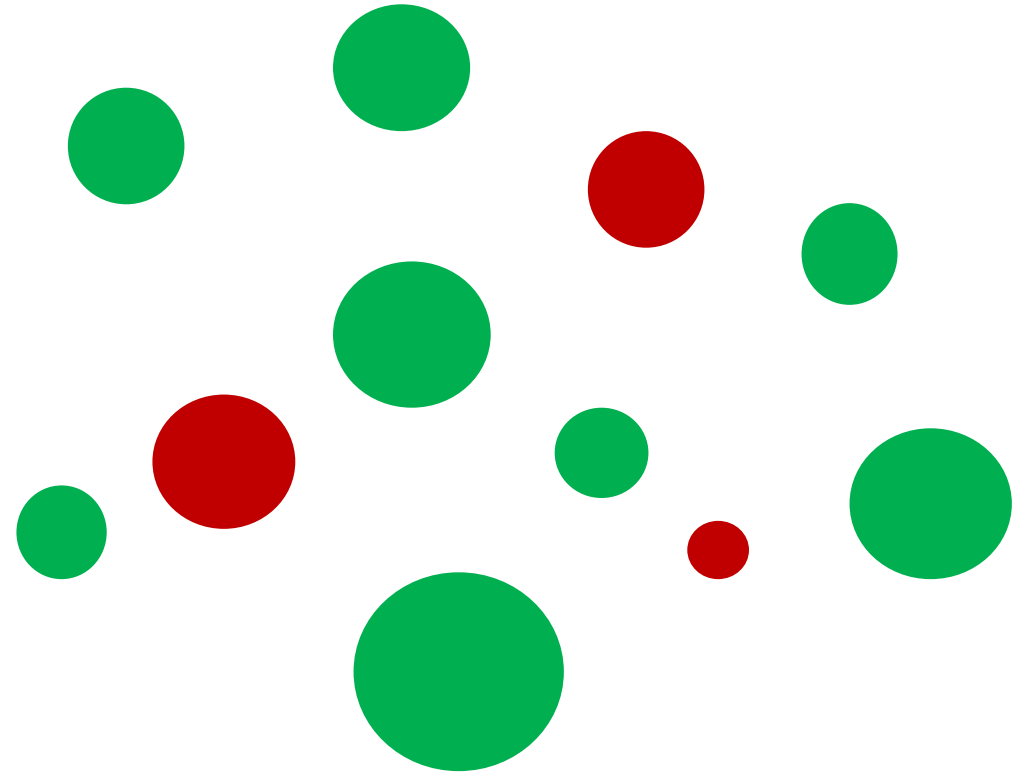
- Species specific parameters
- Small scale Regional parameters
- Data on tree increment
- Single tree modelling ???
- Data about dead/live tree???
- other

Single tree modelling



It may partly capture variation of litterfall rates
and increase accuracy on single plot level

-  Living tree
-  Dead tree

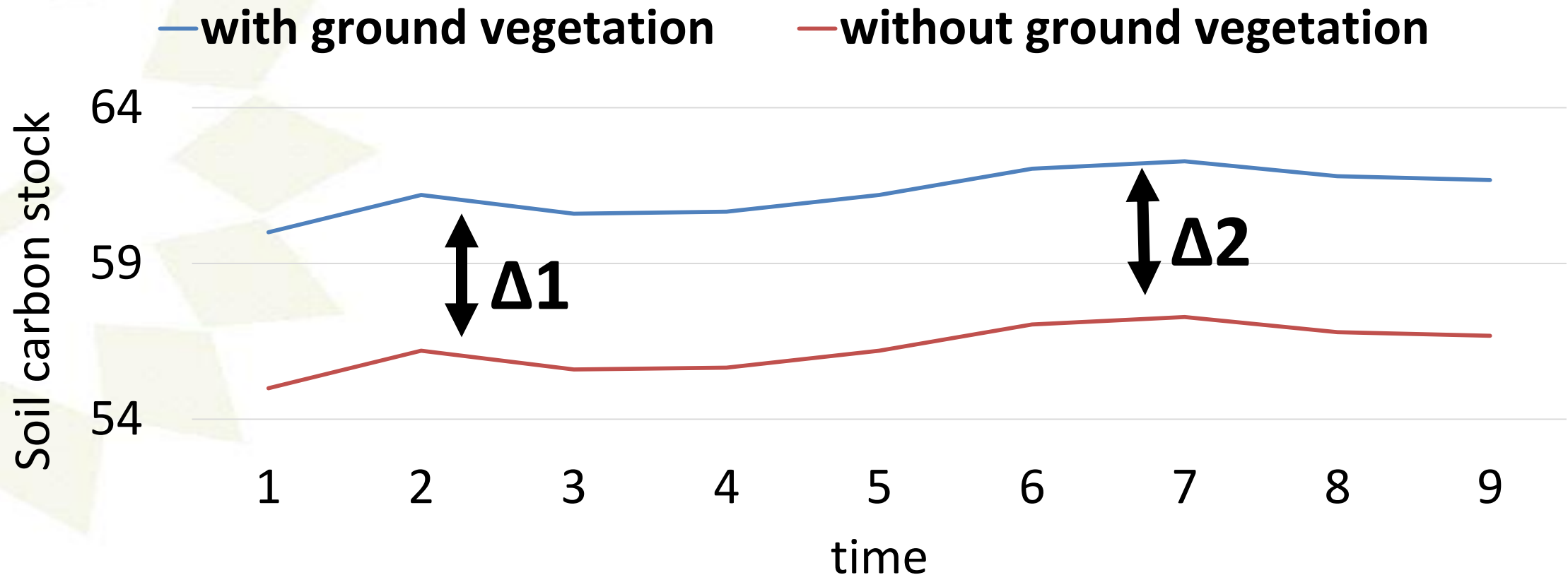


Tree below ground and ground vegetation litterfall – what can we improve?



- Literature review on those litter sources.
- Testing/creating the models ???
- To understand the impact (sensitivity analysis???) of those litter fractions in modelling.
- «Literature library» for other scientists.
- **Do we have enough data on this???**

Possible impacts of less studied litterfall fractions??



If $\Delta 1 \sim \Delta 2$???

Seeking for cooperation



- Data sets on any fraction of litterfall (published or unpublished)
 - Tree above ground litterfall (already available from level 2 plots, but it cant be too much data)
 - Tree below ground litterfall ???
 - Ground vegetation litterfall – any datasets would be welcomed
- Comments or suggestions!?



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