

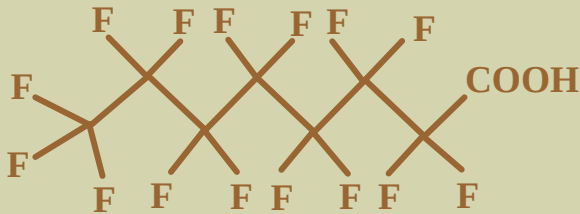
Is it possible to describe the behaviour of per- and polyfluoroalkyl substances (PFAS) and biodegradable precursors using the MACRO model? – Approach and preliminary results.



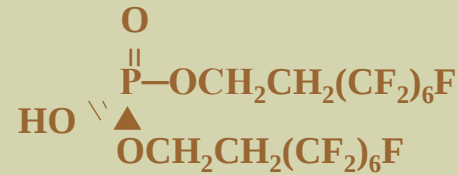
First of all: What are PFAS?

PFAS
*Per- and
polyfluoroalkyl
substances*

A common structure
can look like this:



A lot of configurations
are possible!



Some PFAS show
no degradation

PFAA
perfluoroalkyl acids

can degrade into

Some PFAS show
degradation

precursors



PBT effect proven for some PFAS
persistent, bioaccumulative, toxic

Where can I find PFAS?

firefighting foams



*production of
non-sticking coatings*



pesticides



outdoor fabrics



*production of
semiconductors*



skiwax



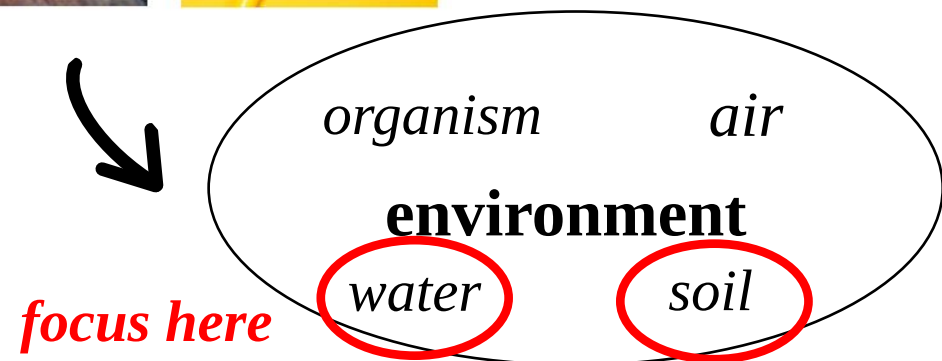
carpets



paper industry



cosmetics



What is my research about?

soil-column study with
PFAA and precursor



lysimeter with
precursor



Photo: Fraunhofer IME

simulation
studies



1D-model MACRO
physically based leaching model



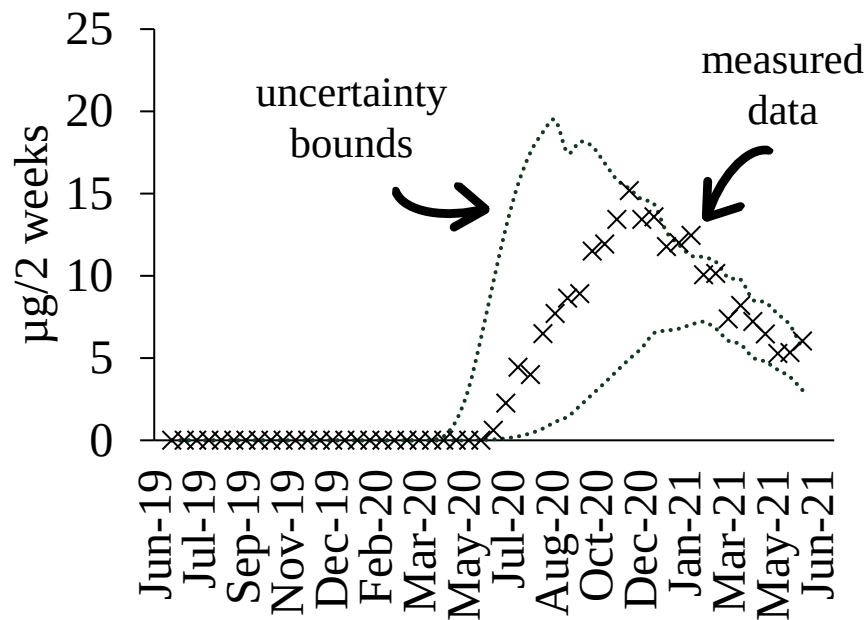
non-extractable residues

Special: We described NER
formation using 1st order
degradation!

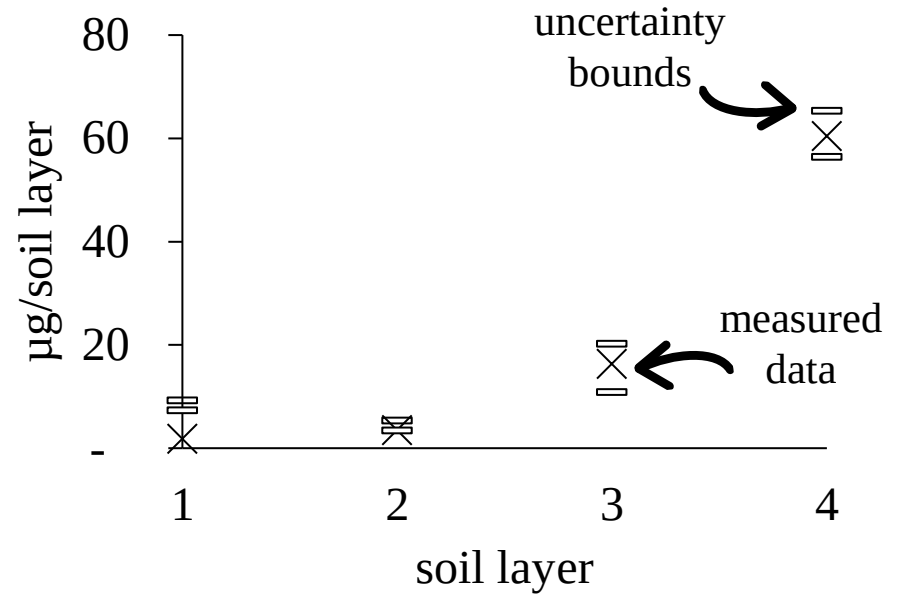
Is it possible to describe the behaviour of PFAA using the MACRO model?

Yes.

PFAA simulation example (PFNA)



Percolate



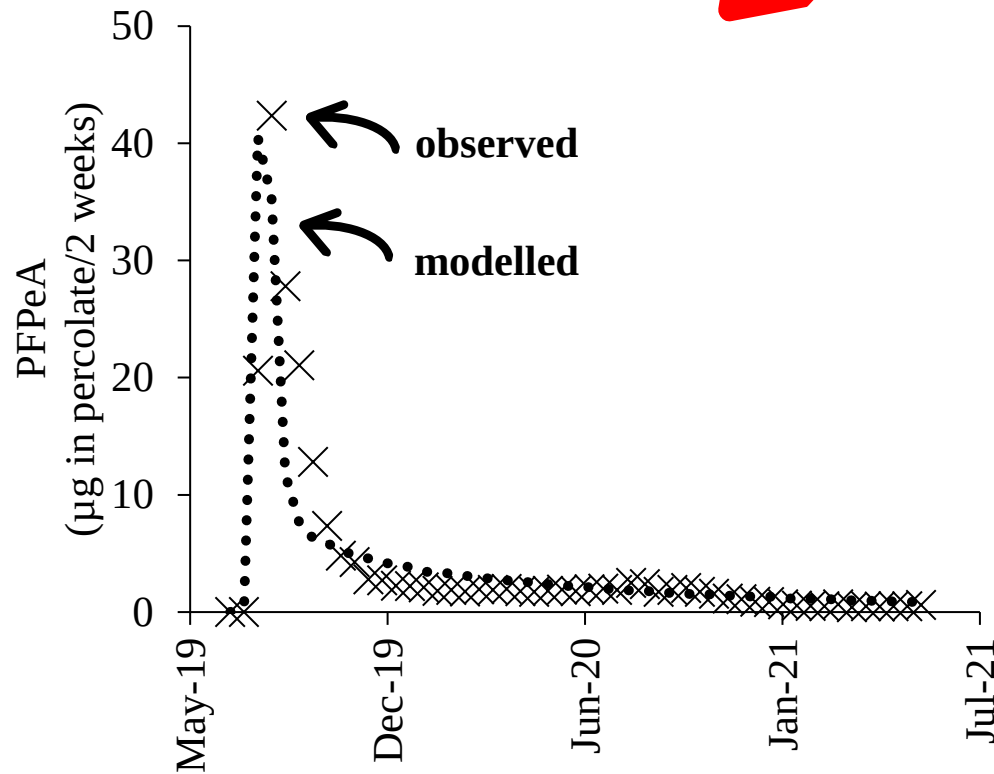
Soil

And what about precursors?

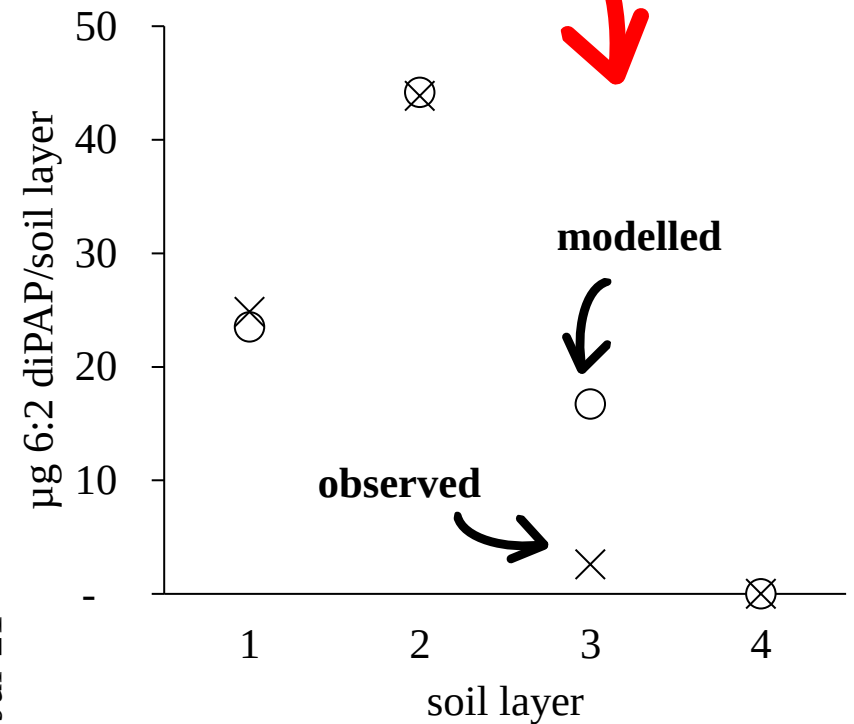
Yes.

Transformation product (PFPeA) of a precursor (6:2 diPAP)

simulation example



negligible mass in soil

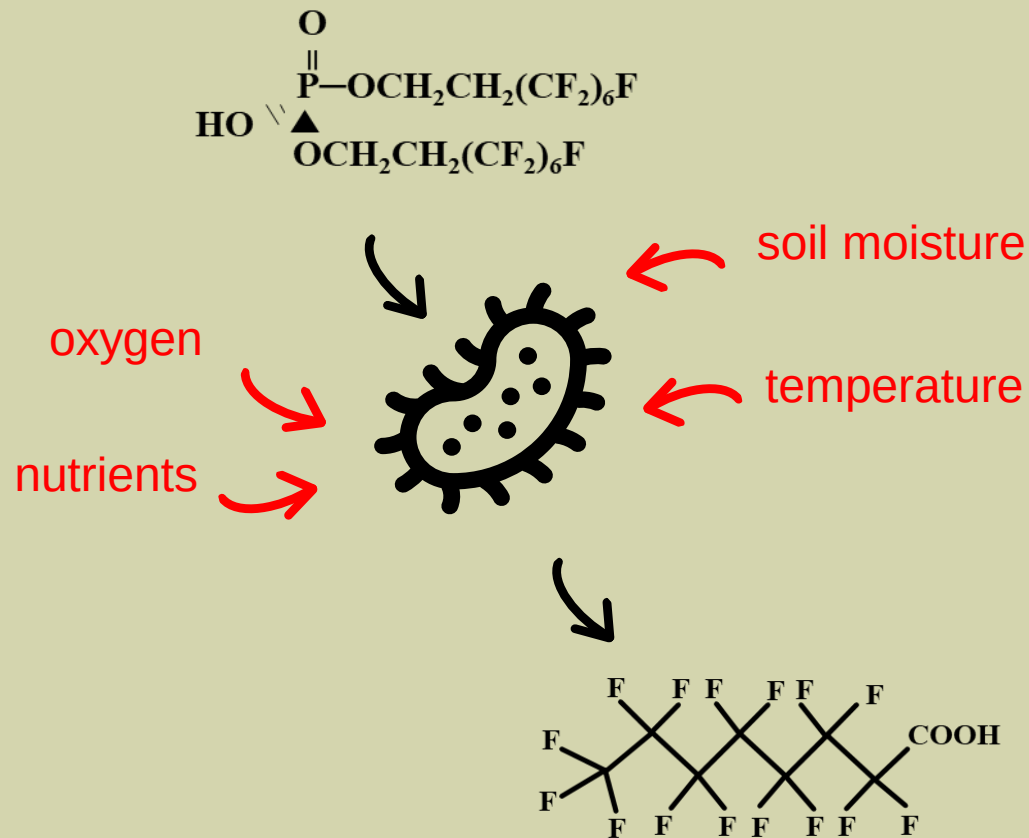


no mass in soil

Are there still research gaps?

Yes.

For example:



Thanks to the state of Baden-Württemberg for the BWPLUS funding program and funding our project PROSPeCT