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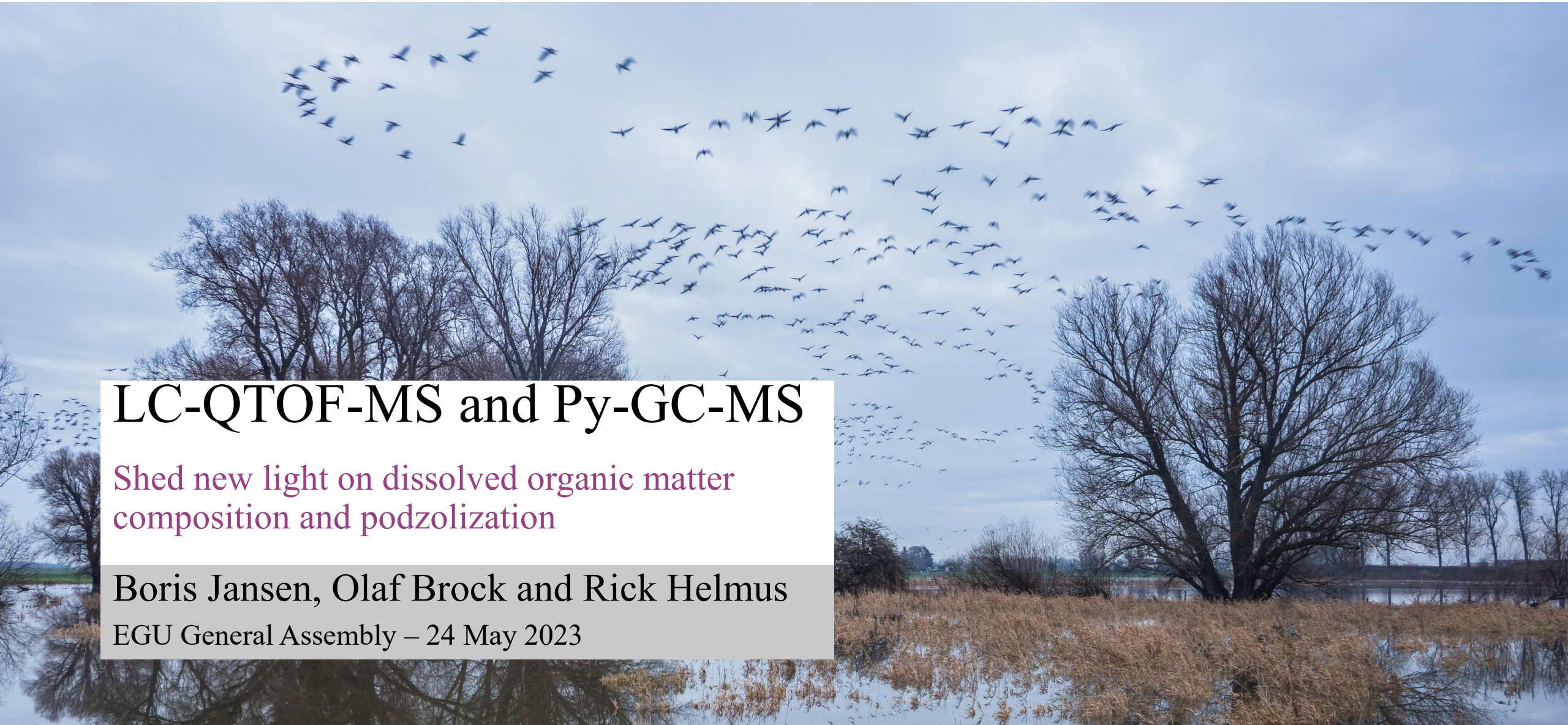

LC-QTOF-MS and Py-GC-MS

Shed new light on dissolved organic matter composition and podzolization

Boris Jansen, Olaf Brock and Rick Helmus

EGU General Assembly – 24 May 2023

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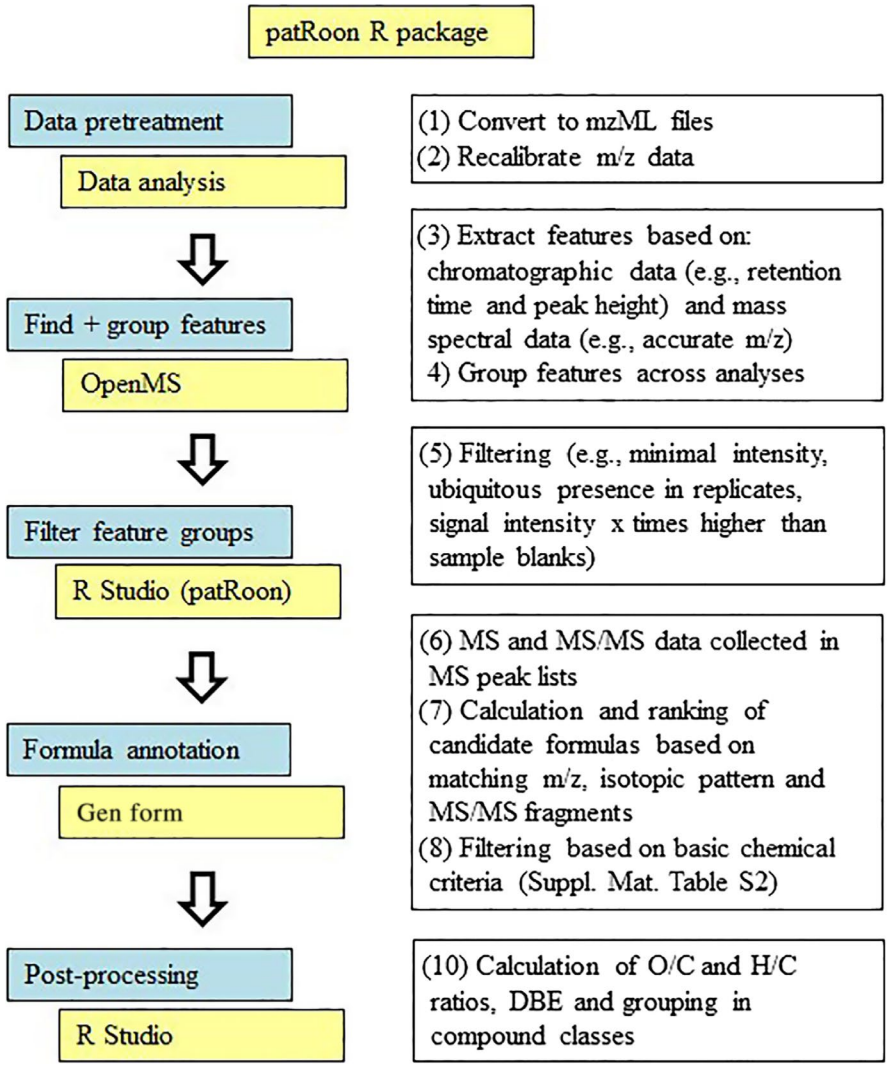
Advanced analytical techniques and data interpretation

- Techniques like LC-QTOF-MS and Py-GC-MS allow detailed molecular characterization of (dissolved) soil organic matter.
- This warrants increasingly advanced data processing to make sense of the results.
- Here we show 2 examples of the potential of the combination of analysis and data interpretation.



Helmus et al., 2021, J. Cheminformatics, 13

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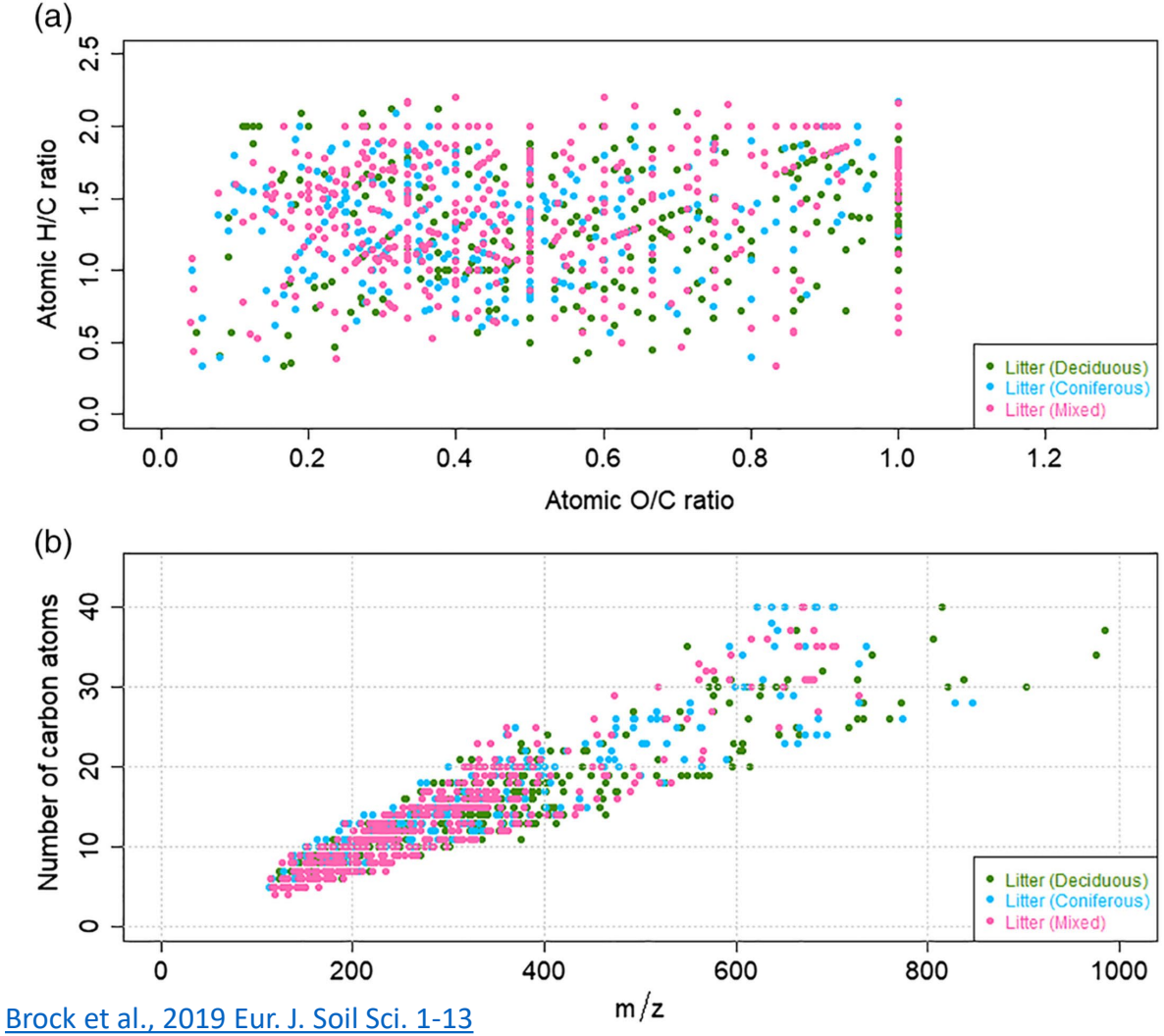
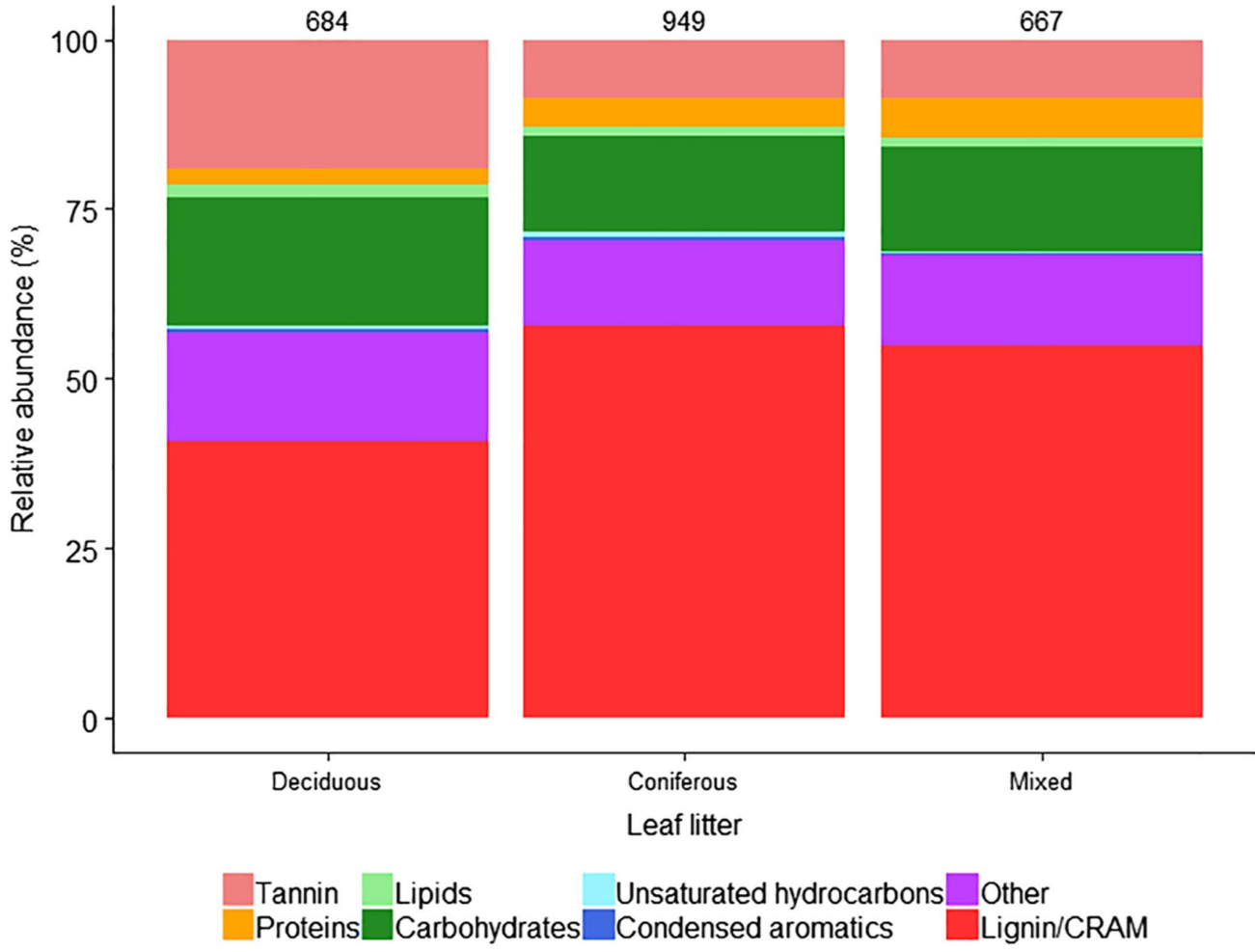
LC-QTOF-MS finds 650-950 compounds in leaf litter extracts





Brock et al., 2019 Eur. J. Soil Sci. 1-13

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Py-GC-MS: Δ molecular composition upon podzolization

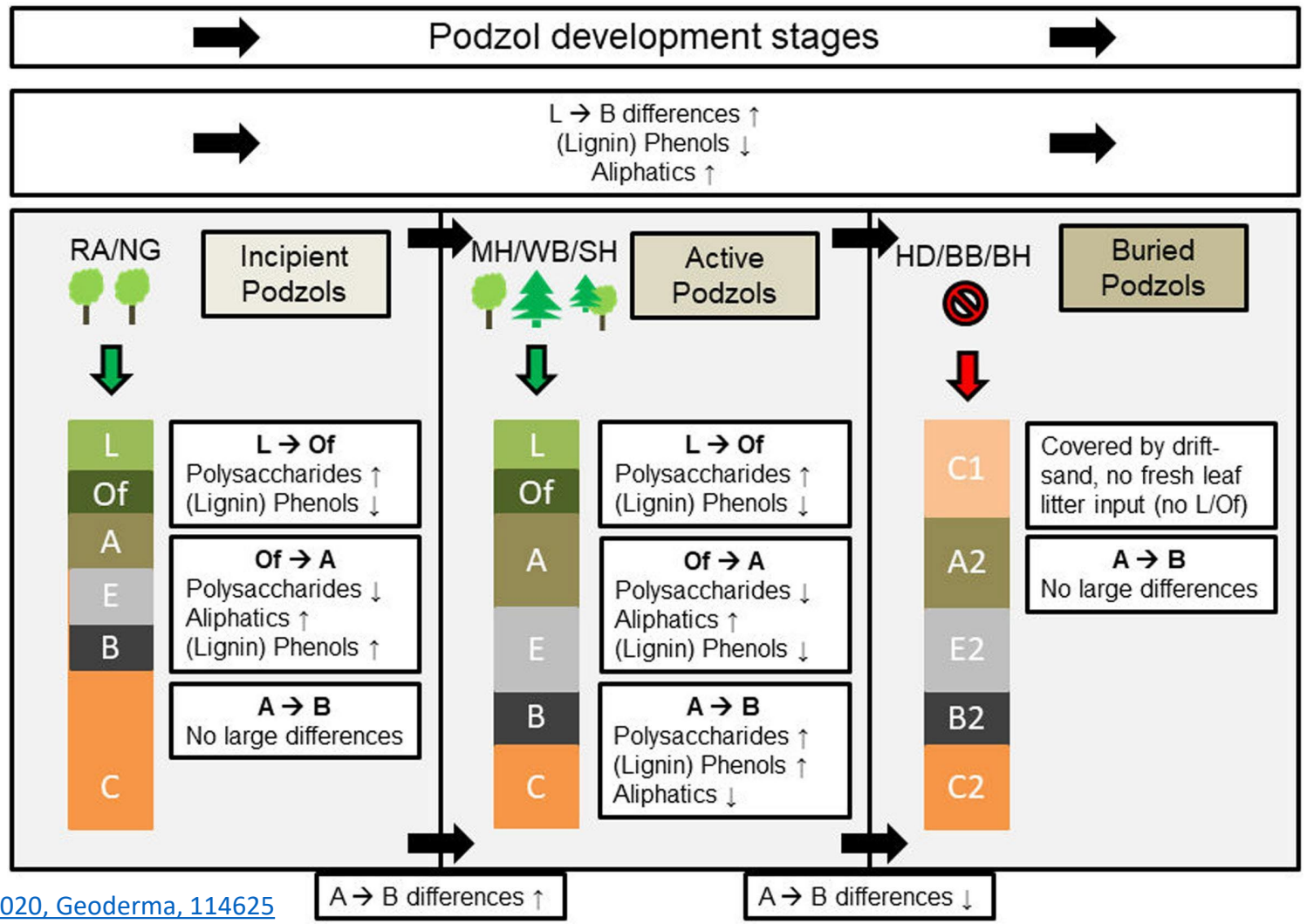

Photo: ISRIC World Soil Reference Collection

Brock et al., 2020, Geoderma, 114625

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Future application & development

- Further unraveling soil C cycling
- Tracing SOM input in a paleo-ecological or geo-archaeological context
- Applying SOM dynamics as an engineering tool
- …etc.

Video: molecular SOM dynamics used to repair leaking dyke systems. Credits: TU-Delft.