Back to Basics –
Paleoproxies for peat decomposition and their relationship to the biogeochemical cycling of trace elements

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Peat decomposition

Acrotelm
Living moss layer  Litter deposition layer

Catotelm
Peat layer →
Three proxies – one story?

Bulk density

Light transmission (Humification)

C/N-ratio
Scientific objective

- Do bulk density, light transmission and C/N-ratio record the same information regarding the degree of decomposition?

- Do paleoproxies for peat decomposition show the same trends within one peat bog or is there a spatial variation?

- How do these three proxies relate to and potentially affect the interpretation of other geochemical data?
Store mosse, Sweden

1.3 km
Background info

- **Fieldwork**
  - November 2008

- **3 Wardenaar cores**
  - ~75cm in length
  - ~500 years (\(^{14}\)C-dating)

- **Geochemical analysis**
  - Bulk density
  - Light transmission
  - Tot-C/N
  - WD-XRF & tot-Hg

- **Radiometric analysis**
  - \(^{7}\)Be, \(^{241}\)Am, \(^{137}\)Cs & \(^{210}\)Pb
Change point analysis

Output from change point analysis of C/N-ratio in SM 1
Change point analysis

Paleoproxies with Change points from SM 1
Principal Component Analysis

SM 1, 2 and 3 based on XRF data
(Proxies plotted as passive variables)
Conclusions

- Decomposition is not fully captured by any one proxy
- Proxies respond to and record different stages of the decomposition process
- A within bog spatial variation is evident among all cores
- General trend → "Sister" variables
Take-home message

When studying the decomposition pattern of peat bogs, a multi-proxy & multi-core approach should be used - 

Get back to basics and put the ”Fun” back in ”Fundamentals”
Thanks for your attention!

Questions?

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