



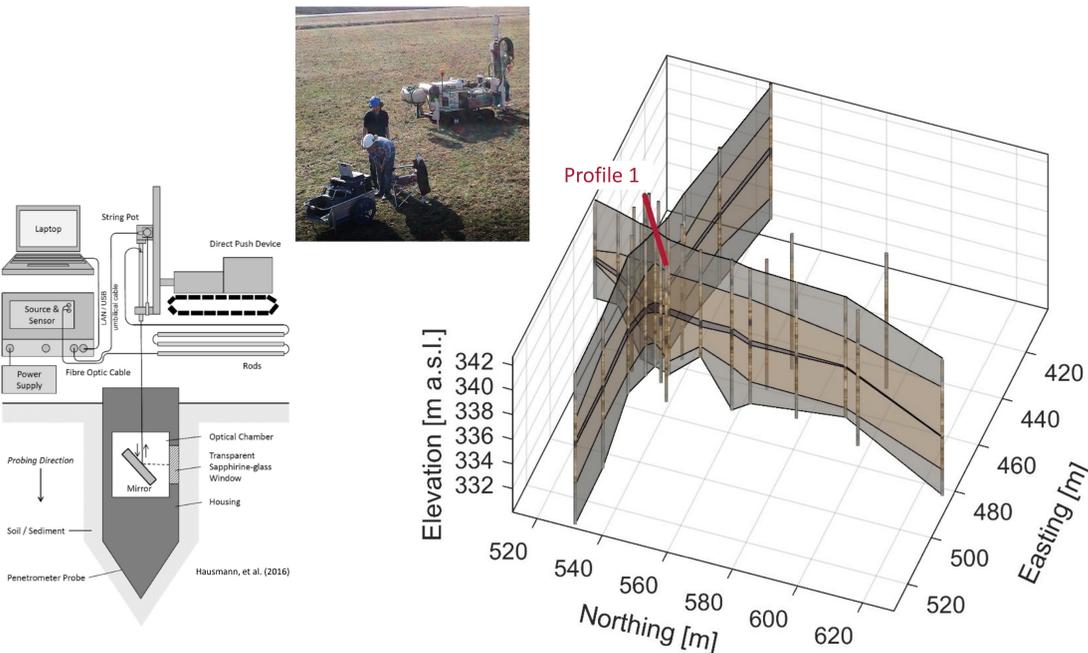
Abstract

Large values of total organic carbon (TOC) mark reducing conditions in soils and sediments and can be depicted by dark sediment colors. Dark zones hence indicate hotspots of biogeochemical turnover and microbial activity.

- We:
- use direct-push color logging to acquire high-resolution in-situ color profiles down to 12 m depth.
 - use a Gaussian mixture model cluster analysis in the CIE L*a*b* color space to identify 3 colorfacies.
 - map these colorfacies over a 165 x 130 m study area and assign site-specific ranges of TOC content.

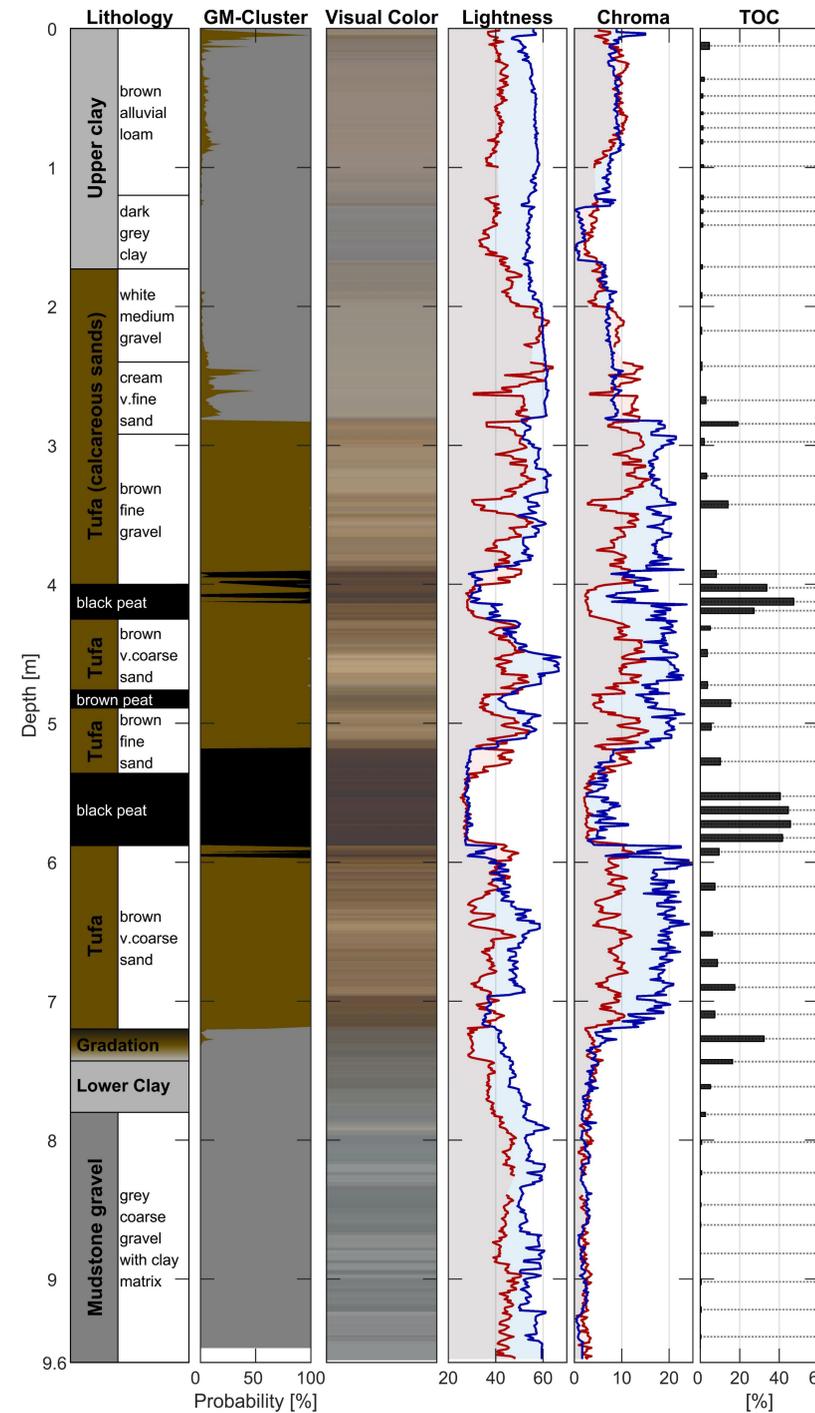
Fieldwork

Direct-push color logging records in-situ profiles of sediment color:



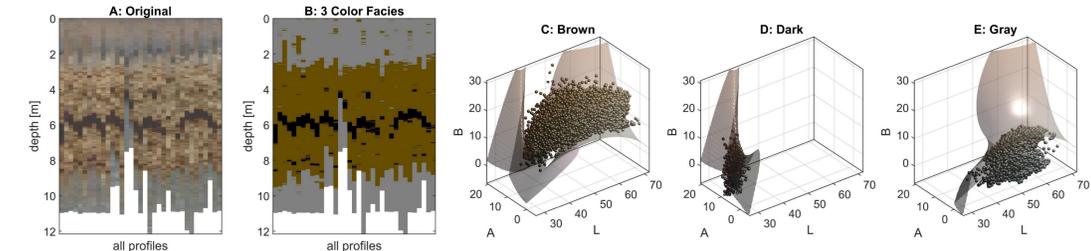
Drill Core vs. In-situ Measurements

Lithology, spectrophotometer color (red) and TOC from a core. In-situ color (blue) and colorfacies clustering from direct-push log:

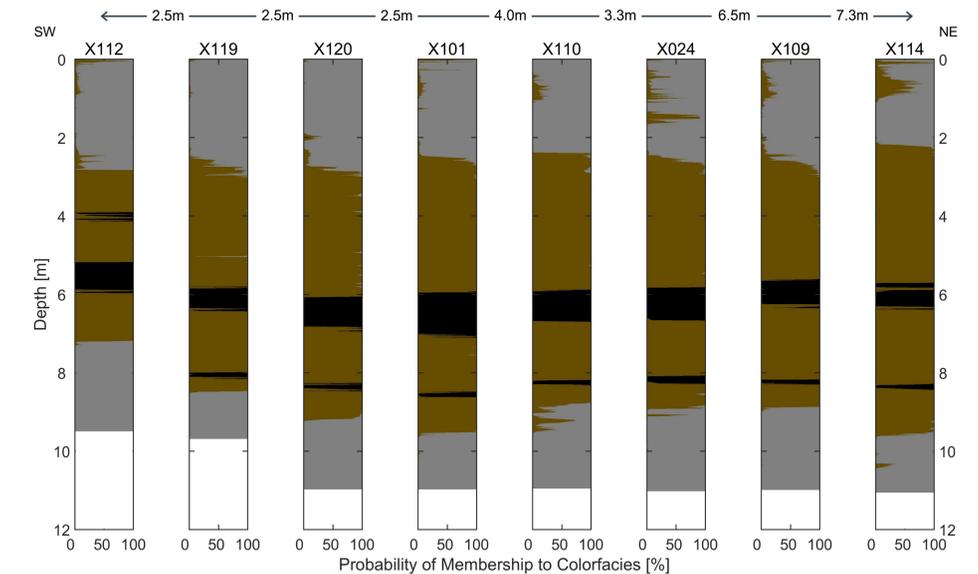


Data Processing

Assign data to one of 3 colorfacies by Gaussian mixture model clustering:



Map spatial colorfacies distribution and membership probability along Profile 1:



Establish site-specific relationships between color and TOC-content: for all color measurements for each colorfacies

