

Streams in forested headwater catchments: Drivers of brownification

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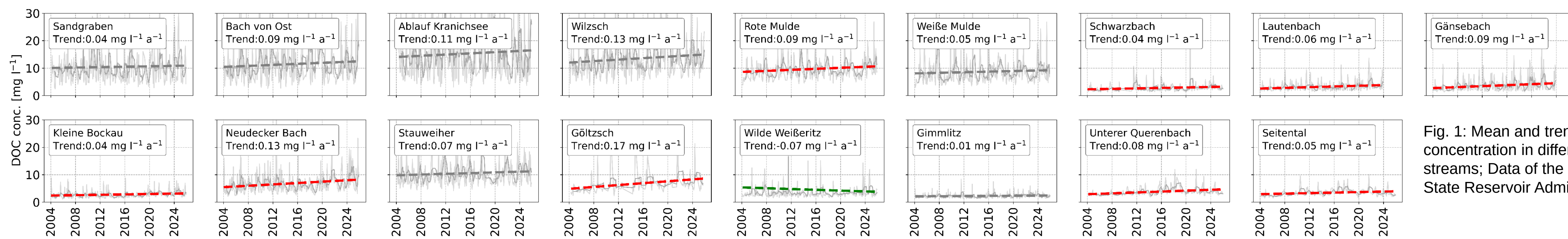


Fig. 1: Mean and trend of DOC concentration in different streams; Data of the Saxon State Reservoir Administration

How did DOC concentrations and loads develop in different surface waters over the past 20 years?

→ Trends are described using linear regression models

How are DOC trends connected to landscape properties, i.e. **soil type** and **peatland properties**?

→ General drivers were identified by landscape properties in all catchments using Pearsons r

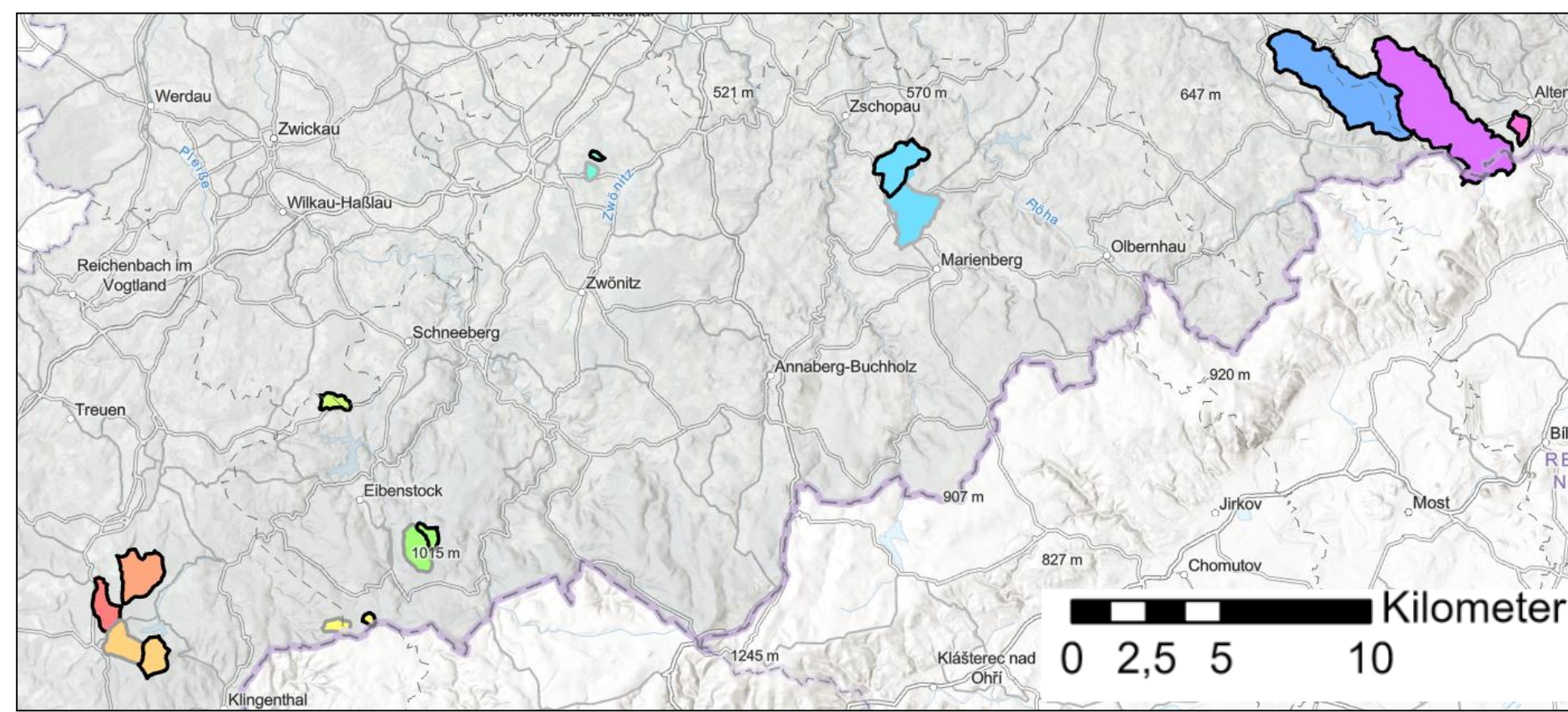
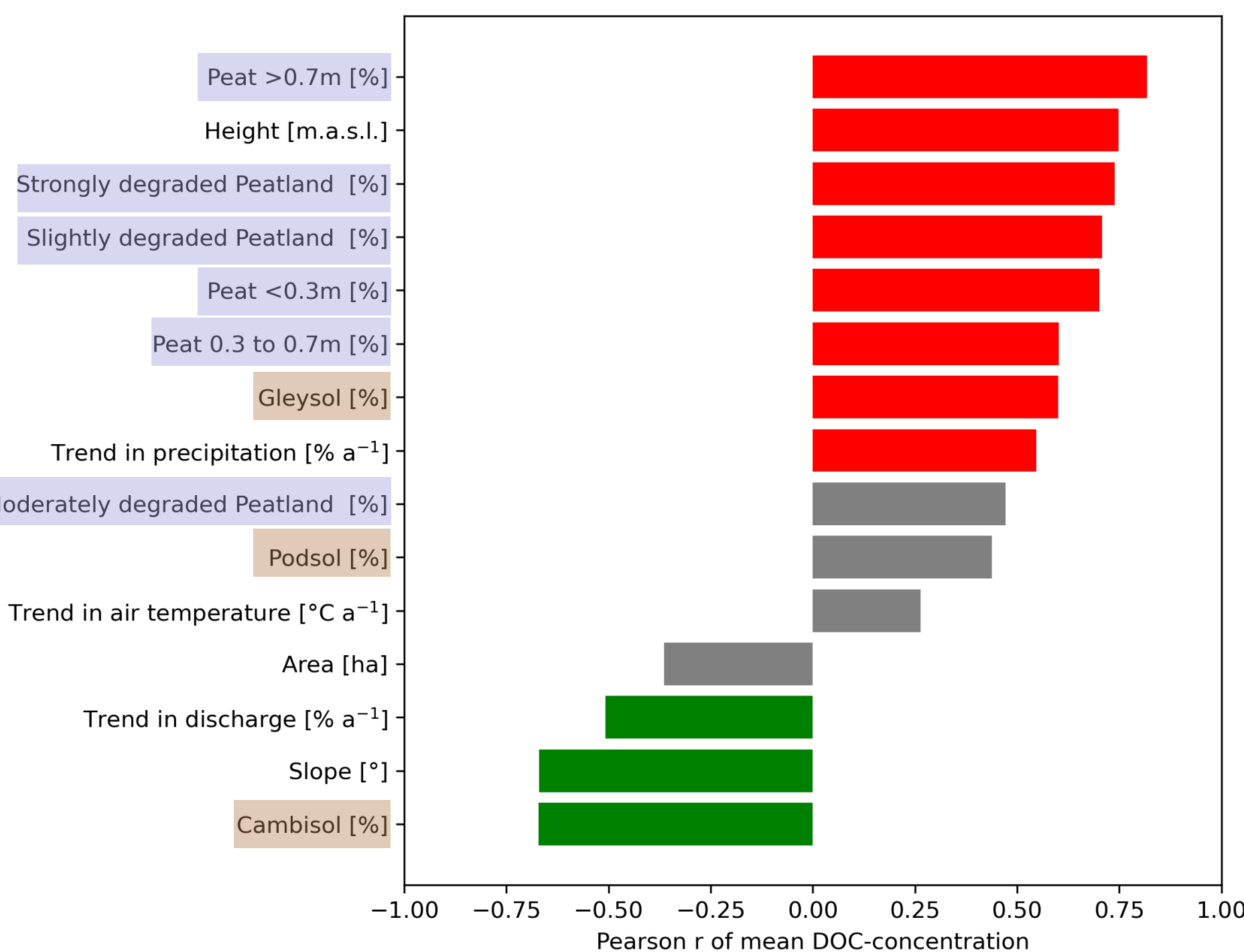
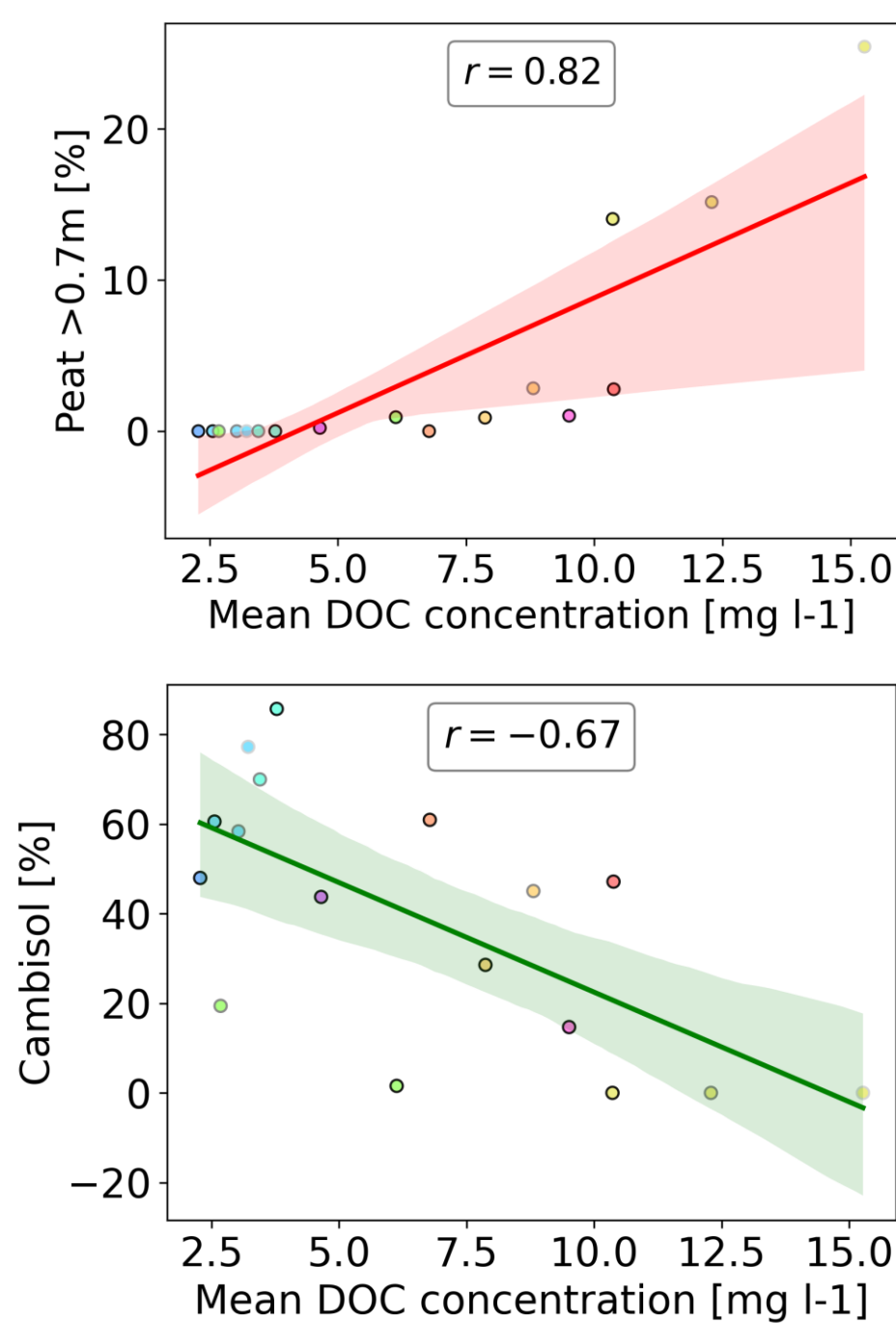


Fig. 2: Trend of DOC load in different streams; Data of the Saxon State Reservoir Administration

Drivers of Brownification:

DOC concentration

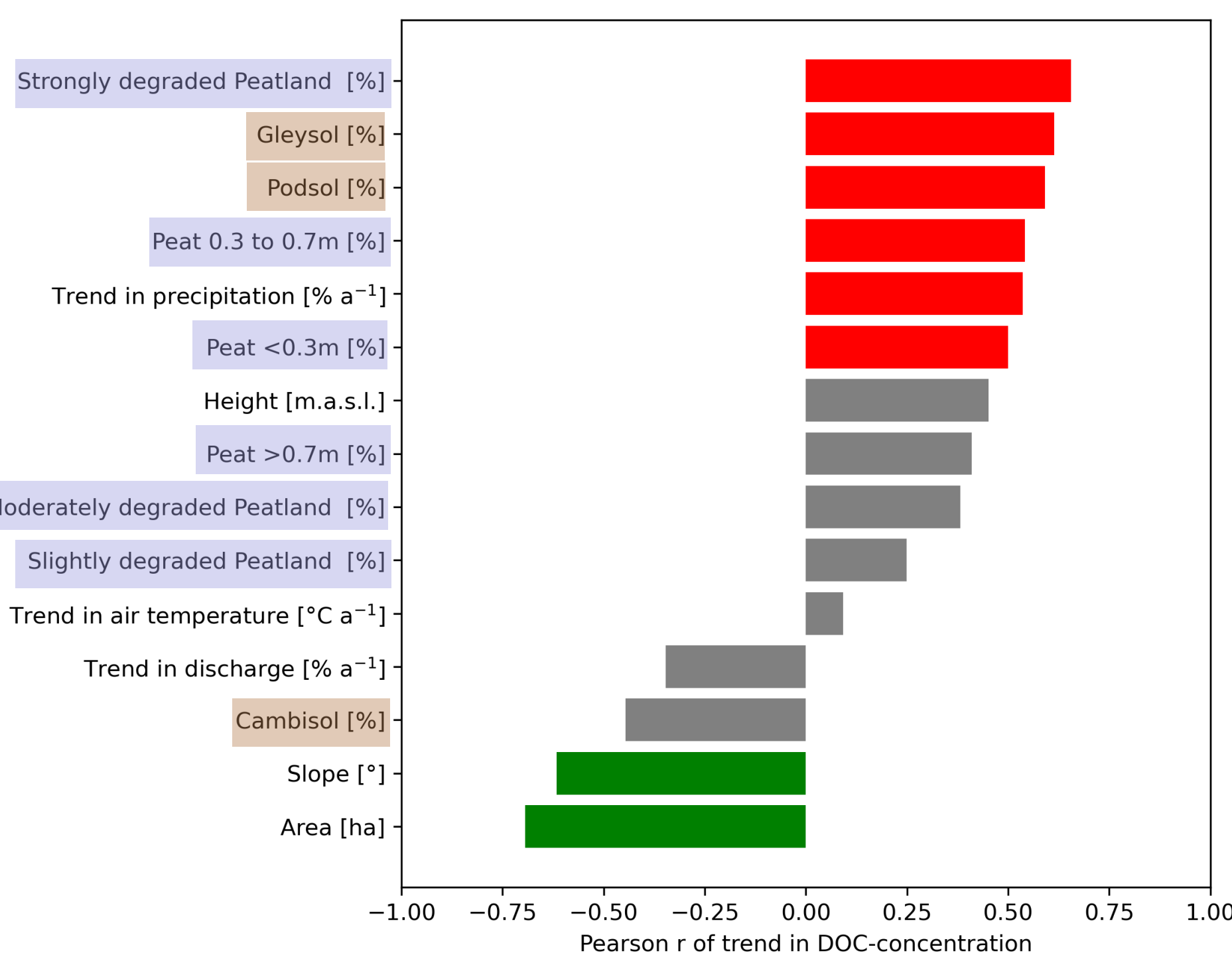
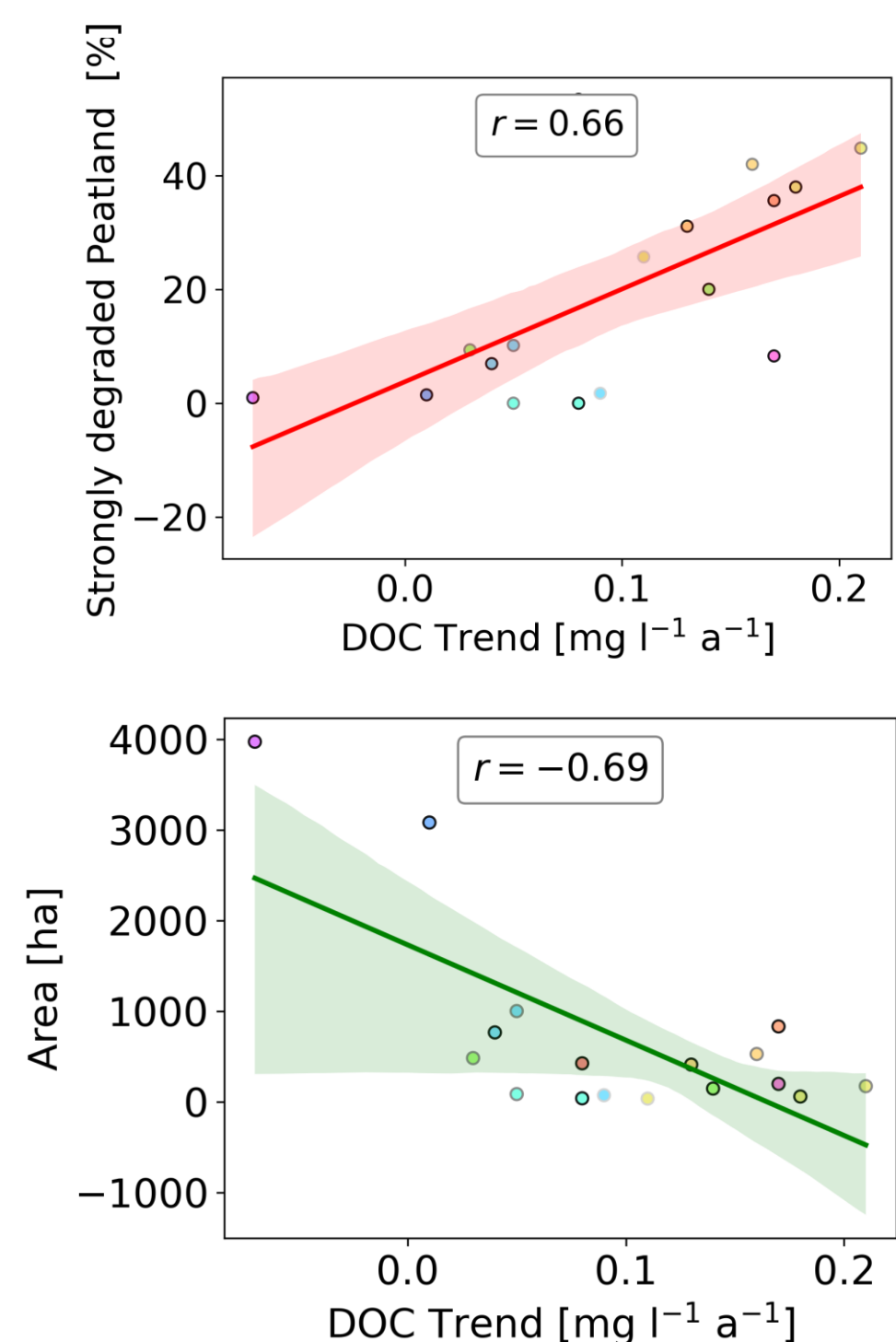


Highest DOC concentrations in catchments with high amounts of **deep peat soils**, high elevation and precipitation

Lower DOC concentrations in steep catchments with **Cambisols**

High DOC concentrations appear in areas with a high percentage of organic-rich (peaty) soils.

Trend in DOC concentration

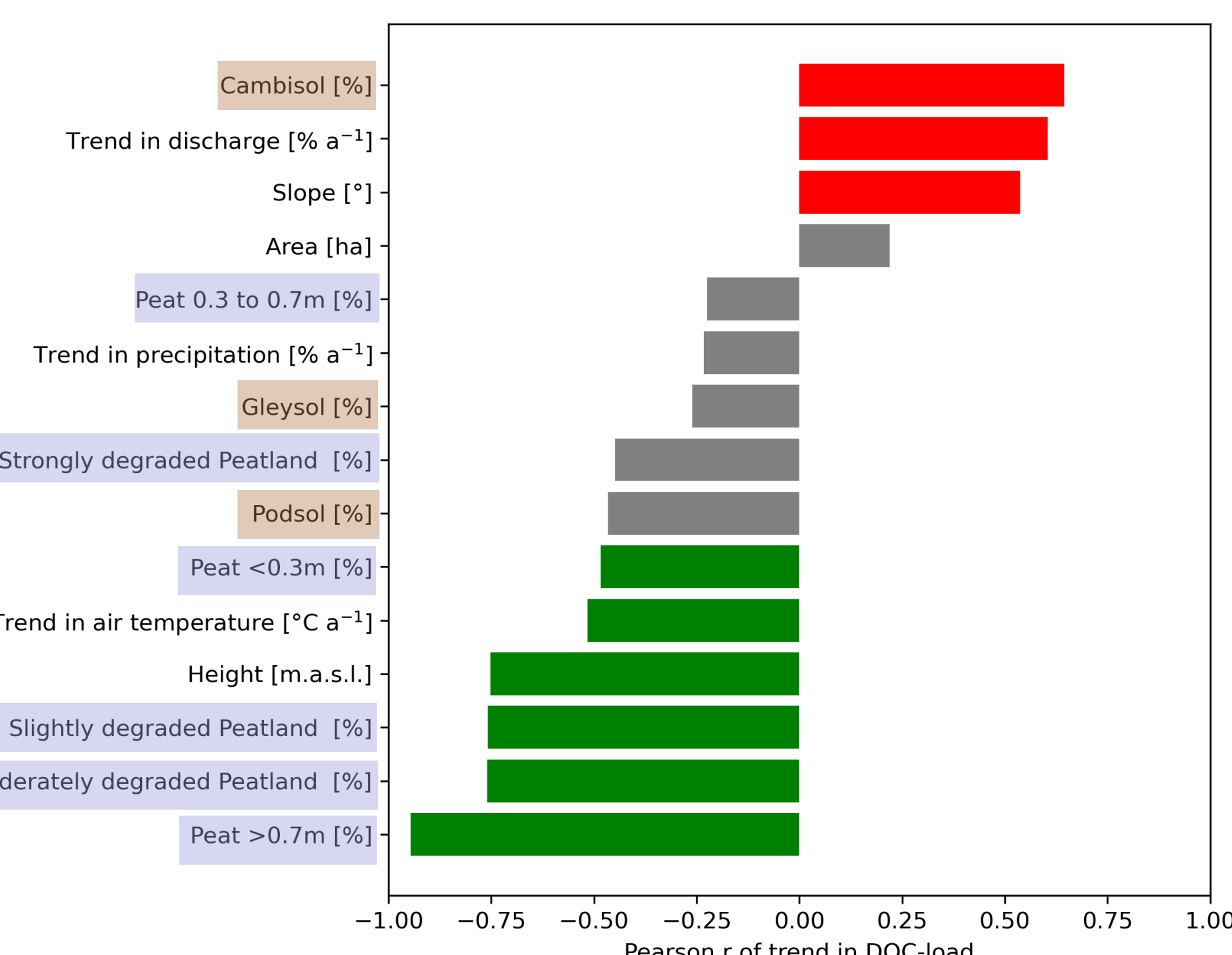
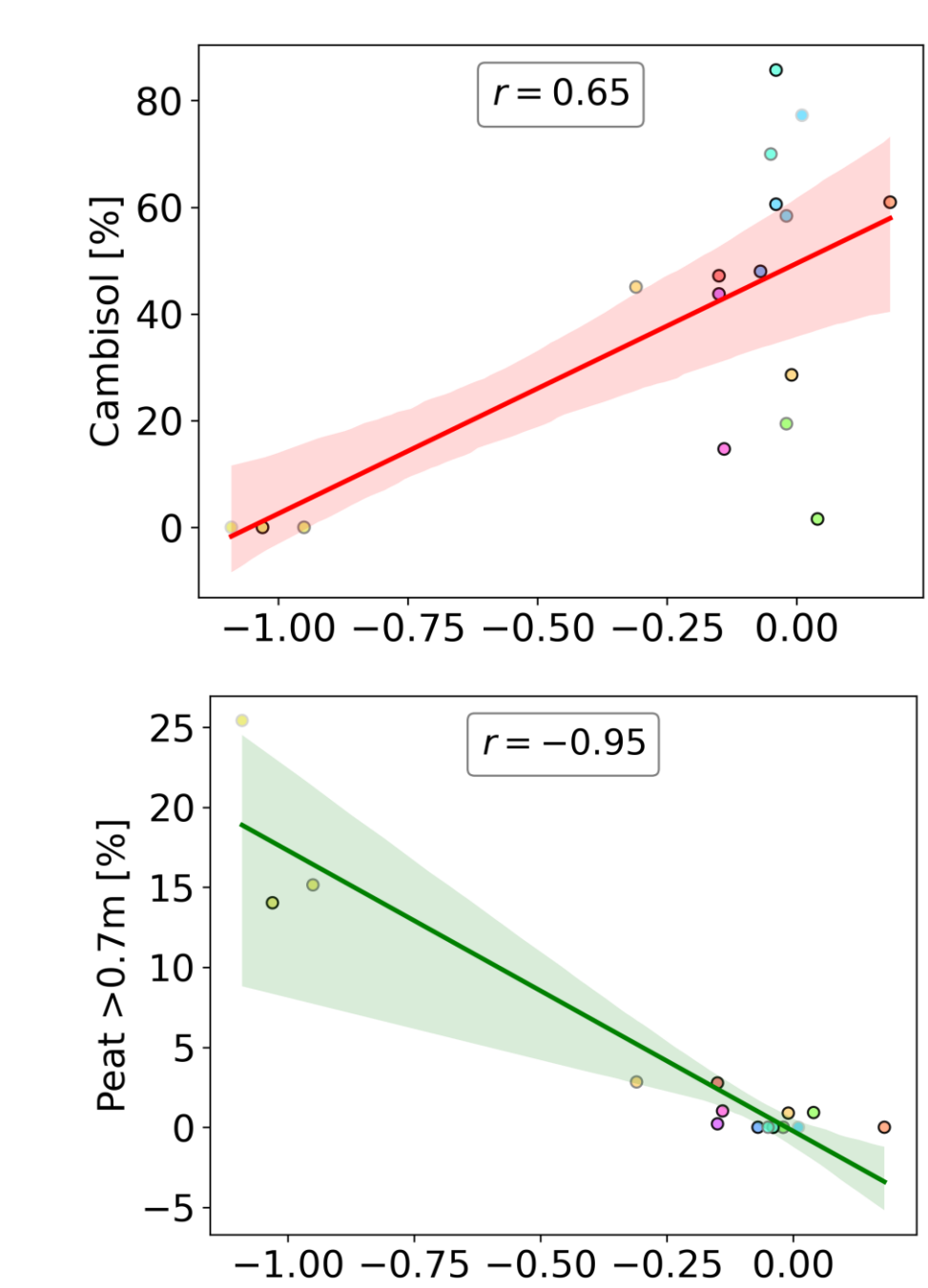


Positive DOC trends in areas with strongly **degraded peat soils** and **Podsols** or **Gleysols**

Less positive DOC trends in steep catchments with **Cambisols**

DOC trends are positive in most catchments. Degraded peat soils and soils with low adsorption capacity are linked to strongest trends.

Trend in DOC load



Less negative DOC load trends in steeper and **Cambisol-rich** catchments

More negative DOC load trends in areas which are more strongly affected by discharge decline (i.e. **peatlands** and **wet soils**)

Decreasing DOC loads are mainly connected to reduced discharge.

Fig. 3: Pearson r value of the linear regression of DOC concentration, trend and load, resp., for different catchment properties; left charts show selected properties with highest r values; right charts show r values for all analysed landscape properties; red bars illustrate significant positive correlation, green bars significant negative correlation, grey bars no significant correlation

We thank the State Reservoir Administration Saxony for the water quality and quantity data as well as the Forest Administration Saxony for data of the soil properties of the of the surface water reservoirs.