



The spatial extent of Arctic river deltas: Version 1.0 of the Arctic river delta data set

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Arctic river deltas are highly dynamic environments at the land-ocean interface and are underlain by permafrost. They are not only affected by fluvial and coastal processes but also by permafrost and thermokarst related processes. Here we present the first version of the Arctic river delta data set, which includes the subaerial extent of 269 deltas. This data set is based on a simple hands-on digitizing approach which will be combined with additional parameters (catchment size, water area coverage) from different remote sensing based products like a pan-arctic digital elevation model [Santoro & Strozzi, 2012] and the global water data set [Pekel et al., 2016] to further characterize Arctic river deltas. We are further analyzing Landsat-based trends of multispectral indices for all Arctic deltas allowing a detailed insight into the dynamics in deltas over the 1999–2014 period, when strong changes in sea ice over the Arctic Ocean started to affect coastal dynamics. Multispectral indices considered include NDVI, NDMI, NDWI, and Tasseled Cap Brightness, Greenness, and Wetness.

In this first version of the data set, Arctic river

deltas cover in total an area of 112 000 km² whereof the two mega deltas (Lena and Mackenzie River delta) already cover 39 % of this area. Medium and small deltas cover an area of 36 500 km² and cover therefore ≈33 % of the entire area covered by Arctic river deltas. This entire delta data set also allows better characterizing and scaling deltaic soil carbon storage in these highly vulnerable permafrost environments in the Arctic.

References

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