

Interactive comment on “Macromolecular composition of terrestrial and marine organic matter in sediments across the East Siberian Arctic Shelf” by Robert B. Sparkes et al.

Anonymous Referee #2

Received and published: 11 September 2016

Comments on Manuscript tc-2016-143,

Macromolecular composition of terrestrial and marine organic matter in sediments across the East Siberian Arctic Shelf

by R. B. Sparkes et al.

This is an interesting and well written paper that fits perfectly into the scope of the inter-journal Special issue “ Climate–carbon–cryosphere interactions in the East Siberian Arctic Ocean: past, present and future” in “The Cryosphere”.

The work is based on an analysis of more than 40 sediment samples from onshore (6) and off-shore (36) sites across the East Siberian Arctic Shelf (ESAS), acquired during

C1

the ISSS-08 expedition. The authors use pyrolysis gas chromatography mass spectrometry (py-GCMS) to investigate, across the ESAS, all major groups of macromolecular composition of terrestrial and marine organic matter in sediments, rather than only the solvent ones. Nine compound groups are identified and linked to particular groups of terrestrial and marine macromolecular materials. Based on the abundance of Phenols and Pyridins in sediment samples along a river-shelf transect, the authors propose a novel index (the PPRI index, Phenol-Pyridine Ratio Index) for estimating the input of terrestrial (dominant: phenol) and marine (dominant: pyridin) macromolecular organic carbon in offshore sediments. In addition, minor compound groups occurring in samples across the ESAS are analysed and their spatial distribution is discussed. Principal Component Analysis is shown to be a valuable tool for understanding the pattern of transition from terrestrial organic carbon to marine organic carbon dominated compositions across the ESAS. The data, analysis and conclusions presented in the manuscript are convincing, and I recommend publication of the manuscript.

Interactive comment on The Cryosphere Discuss., doi:10.5194/tc-2016-143, 2016.

C2