Christian-Albrechts-Universität zu Kiel

Spatio-temporal dynamic soil compaction risk assessment

Michael Kuhwald, Katja Augustin and Rainer Duttmann

Objectives:

Soil compaction by field traffic is one of the main threats to agricultural soils. To mitigate undesirable effects of field traffic, it is important to know where, when and to what extent soil compaction may occur. This study shows a new approach to model soil compaction risk at different scales. developed SaSCiA-model (Spatially explicit Soil The **Compaction risk Assessment)** combines

Structure of the SaSCiA-model:



(i) soil, weather, crop type and machinery information, (ii) a soil moisture model and (iii) soil compaction models to compute daily maps of soil compaction risk.

The model was applied at field and regional scale in northern Germany. At field scale, field traffic and soil moisture were measured to generate spatially highresolution input parameter. At regional scale, open access soil and weather data were used; present crop type was derived by satellite data (Landsat 8, Sentinel-2A).

Modelled soil compaction risk with SaSCiA:

SaSCiA at field scale:

Sowing of winter wheat 2016 Depth: 20 cm

Sowing of winter wheat 2016 Depth: 40 cm

Harvest of winter wheat 2017







ter leav 2 nfal

5000

25 50 75 m

50 75 m 25

Harvest of winter wheat 2017



Sowing

kuhwald@geographie.uni-kiel.de augustin@geographie.uni-kiel.de duttmann@geographie.uni-kiel.de

Kiel University (Germany) Department of Geography, Division of Physical Geography Landscape Ecology and Geoinformation Science

