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Digital soil mapping as a basis for climatically oriented agriculture a thematic on the territory of the national crop testing fields of the Republic of Tatarstan, Russia

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Abstract

© Published under licence by IOP Publishing Ltd. The concept of climate-optimized agriculture (COA) of the UN FAO implies the transformation of agriculture techniques in conditions of changing climate. It is important to implement a timely transition to the concept of COA and sustainable development of soil resources, accurate digital maps of spatial distribution of soils and soil properties are needed. Digital mapping of soil humus content was carried out on the territory of the national crop testing fields (NCTF) of the Republic of Tatarstan (Russian Federation) and the accuracy of the maps obtained was estimated.

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References

[1] Climate-Smart Agriculture http://www.fao.org/climate-smart-agriculture/ru/ - ref-separator -

[2] 2013 Climate smart agriculture (Food and Agriculture Organization of the United Nations) 570

[3] Russia looks to smart technologies for the future of agroecology and farming. http://www.fao.org/partnerships/container/news-article/ru/c/881418/ - ref-separator -

[4] Minasny B and McBratney A B 2016 Digital soil mapping: A brief history and some lessons Geoderma 264 301-311

[5] Mc Bratney A B, Mendonça S M L and Minasny B 2003 On digital soil mapping Geoderma 117 3-52

[6] Masticki S E and Shitikov V K 2014 Statistical analysis and data visualization using R (Moscow: DMK-Press) 496 In Russian

[7] James G, Witten D, Hastie T and Tibshirani R 2013 An introduction to Statistical Learning with Applications in R (New York Heidelberg Dordrecht London: Springer) 440

[8] Conrad O, Bechtel B, Bock M, Dietrich H, Fischer E, Gerlitz L, Wehberg J, Wichmann V and Boehner J 2015 System for Automated Geoscientific Analyses (SAGA) Geosci. Model Dev. 2.1.4 1991-2007

[9] R Core Team. R: A Language and Environment for Statistical Computing 2016 (Austria: R Foundation for Statistical Computing) http://www.R-project.org/ - ref-separator -

[10] Pebesma E J 2004 Multivariable geostatistics in S: the gstat package Computers & Geosciences 30 683-691

[11] QGIS Development Team QGIS Geographic Information System 2016 Open Source Geospatial Foundation Project http://qgis.osgeo.org - ref-separator -

[12] Cambardella C, Moorman T, Novak J, Parkin T, Karlen D, Turco R and Konopka A 1994 Field-Scale Variability of Soil Properties in Central Iowa Soils Soil Sci. Soc. Am. J. 58 1501-1511

[13] Sahabiev I A and Ryazanov S S 2015 Investigation of the spatial variability of soil properties using the geostatistical approach Russian Journal of applied ecology 2 32-37 In Russian

[14] Li J and Heap A D 2011 A review of comparative studies of spatial interpolation methods in environmental sciences: Performance and impact factors Ecological Informatics 6 228-241

[15] Ryazanov S S and Sahabiev I A 2016 Comparison of terrain-based drift models to improve the quality of soil predictive mapping at a field scale Tomsk State University Journal of Biology 4 21-33

[16] Nussbaum M, Spiess K, Baltensweiler A, Grob U, Keller A, Greiner L, Schaepman M E and Papritz A 2017 Evaluation of digital soil mapping approaches with large sets of environmental covariates SOIL Discuss.

[17] Song X D, Brus D J, Liu F, Li D C, Zhao Y G, Yang J L and Zhang C L 2016 Mapping soil organic carbon content by geographically weighted regression: A case study in the Heihe River Basin, China Geoderma 261 1-22