



Using Copernicus High Resolution Layer Imperviousness Density to monitor soil sealing in agricultural areas (SDG 2: Zero Hunger)

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Many countries have goals and strategies to reduce soil sealing of agricultural land to preserve food production capacity. This is essential in relation to Sustainable Development Goal 2: Zero Hunger. To monitor progress, reliable data are needed to quantify soil sealing and changes over time. We examined the potential of the Copernicus High Resolution Layer Imperviousness Density (HRL IMD) to assess soil sealing in agricultural areas in Poland and Norway.

We quantified the accuracy and reliability of the products Imperviousness Classified Change (IMCC) for the period 2015-2018 and Imperviousness degree (IMD) for the reference year 2018. We found a very high overall accuracy of IMCC 2015-2018 in both Poland and Norway. However, this was mainly due to the dominance of area with no change. When we focused on the small areas where change does occur, we found low user accuracy, with an overestimation of soil sealing. The producer accuracy was generally much higher, meaning that real cases of soil sealing were captured. This is a much better result than if IMCC had under-estimated soil sealing. It suggests that IMCC can play a valuable role in detecting soil sealing, by highlighting areas where soil sealing may have occurred, allowing the user to carry out a further control of this much smaller area, without having to assess the great expanse of unchanged area.

We conclude that the datasets provide useful information for Europe. They are standardised and comparable across countries, which can enable comparison of the effects of policies intended to prevent soil sealing of agricultural land. We advise caution in using older versions of the change data. In particular, it is advisable to merge the closely related classes "1: new cover" and "11: increased cover" and the same for "2: loss of cover" and "12: decreased cover". These distinctions are not reliable, but the general information about increase or decrease is much better. The transition to finer resolution (10 x 10 m) in the newer datasets represents a great improvement and will make the change data more reliable and useful in future versions.