

## Topics (T)

## Weather, Climate and Environmental Intelligence (4)

Author: Ms. Rushanka Amrutkar

Environment Agency, United Kingdom, Rushanka.Amrutkar@environment-agency.gov.uk

Mr. Simon Barron

Environment Agency, United Kingdom, simon.barron@environment-agency.gov.uk

Mr. Crispin Hambidge

Environment Agency, United Kingdom, crispin.hambidge@environment-agency.gov.uk

Mr. Ty Hayward

Environment Agency, United Kingdom, Ty.Hayward@environment-agency.gov.uk

Mr. Aaron Mills

Environment Agency, United Kingdom, Aaron.Mills@environment-agency.gov.uk

## AGRICULTURAL REGULATION AND COMPLIANCE - EARTH OBSERVATION IN INTENSIVE FARMING

**Abstract**

Farming regulations are faced with the challenge of balancing the need for affordable food with environmental protection. The industry often resists regulation due to the costs associated with compliance and argues that it does not generate revenue. Traditional regulation methods, such as site visits, are effective but limited by resources. Earth observation and remote sensing technologies have shown potential in identifying farming practices that may breach regulations. By using satellite data for a broad view and ground measurements for a more detailed, localised view, a more comprehensive understanding of the impacts of farming practices can be gained. The Agricultural Regulation and Compliance-Earth Observation (ARC-EO) project aims to use these technologies to detect at-risk agricultural activities and provide farmers with recommendations to increase compliance and protect the environment. A team of experts in remote sensing and earth observation is using these techniques to gather intelligence on agricultural compliance and improve farm inspections. This will assist in shaping policy and regulation by providing clear evidence, making it more effective and efficient. A mapping tool was developed for assessing slurry stores using LIDAR to determine the freeboard heights and calculate slurry volumes, with results recorded in a national database. The case studies included using Sentinel-2 data to detect plastic mulching, map bare fields, and identify risks posed by outdoor pig operations on sensitive receptors. Very High-Resolution data from Worldview 3, Planet SkySat and Jilin-1 satellites were used for spotting risks over virtual catchment walkovers. The findings inform policy decisions and identify local risks. The team is currently analysing outdoor pig farms and their proximity to sensitive areas in the Solent catchment using LIDAR and Sentinel-2 and plans to analyse slurry store risks and map bare fields for targeted inspections. The project's objectives include identifying high-risk farms, targeting inspections, and helping to build a case for future legislation to protect soil and water quality to support the adoption of sustainable farming practices that can help mitigate the impacts of climate change. Our goal is to keep publishing outputs of the team's work, including datasets, available to end users through web mapping applications.