

Soil is an important part of many ecosystems. Given the slow rate at which soil-forming processes take place, it can be assumed that their effects can only be seen. The situation is different in the case of phenomena causing soil destruction. One of these is water erosion, which in 2010 caused losses of hundreds of megatons of soil in the European Union. This shows how important thorough understanding of the mechanisms governing these phenomena is.

The first stage of water erosion is the splash phenomenon. As a result of splash, soil particles are detached from the surface and transferred over a short distance. The material displaced in this way becomes susceptible to further movements caused by subsequent stages of erosion, such as surface run-off.

The splash was studied in the context of many different factors, including both precipitation parameters (energy and precipitation intensity) and soil parameters (e.g. particle size distribution, moisture content, compaction, and hydrophobicity). One of the aspects of the phenomenon requiring further analysis is its relationship with temperature. Therefore, the aim of this project will be to determine the impact of soil temperature on the splash phenomenon as well as the change of soil susceptibility to erosion related to this process.

The project will be realized with the use of a calibrated set of high-speed cameras and a surface scanner. The first part of the measurement equipment will facilitate analysis of the phenomenon above the soil surface. The number and size of particles and the dynamics of the phenomenon will be determined. The scanner, being the second part of the measuring equipment, will be used to determine the dimensions of the crater formed after the impact of liquid drops and, consequently, the susceptibility of soils to deformation. The samples used in the measurements will be prepared at three different temperatures (5, 20, and 40°C) from six soils susceptible to water erosion. The planned variants will include different soil moisture content.

The data obtained during the project can be a valuable source of information on the development of soil susceptibility to erosion in relation to temperature changes related to the seasons. They will also facilitate predictions of how the soil and soils-related processes will change in the context of climate change.