In Poland, research on levees is conducted on a small scale. Currently, the AGH University of Science and Technology in Krakow and the companies SWECO Hydrotechniki and ZPPHU Budokop Sp. z o.o. are working together to implement an IT system of Levee Monitoring (ISMOP). The idea of the project is a holistic approach to levees monitoring which supports the activities of state authorities and local governments in the matter of flood protection of the population by providing real-time information on the dynamics and intensity of processes occurring in levees. ISMOP is aimed at gathering data about the processes taking place in the levees, optimizing their transfer, interpretation and analysis with numerical simulations and visualization system of the levees’ condition. The innovation is to use a series of sensors that monitor changes inside levees and to compare them with the results of numerical simulations (mechanical, hydrological and thermal models coupled with each other). This proposed approach will enable the prediction of the levees’ condition with a certain probability of negative processes affecting their structure.

Methods of using the measurement technique for monitoring earth dams and levees will be necessarily different. This is due to different conditions in which they operate. Earth dam piles up water and generally remain under its influence throughout its lifetime. Levee, on the other hand, located at a considerable distance from the river bed is dry most of the year. Its first observation (Temperature, Humidity, Pressure, Precipitation, Wind speed).

The measurements provided by the sensors’ network will be the main element of the integrity and levee’s stability assessment. In addition, the monitoring of levee surface will be carried out and it will be using geodetic network to register displacements and deformations of levees based on classical methods (total stations, possibly GPS). The monitoring also will be using measurements provided by ground radar interferometer (BIS-L). During the experiment infrared camera - FLIR T620 - will be used. On the outer parts of the levee there will be conducted geophysical measurements with the use of geoelectrical tomography. Mechanical and physical parameters, measured by sensors, will be recorded and analyzed in the Monitoring and Modeling Center. The Center, on the basis of the incoming data from sensors and numerical models, will be making an appraisal of risk in the current time. Moreover, it will allow data visualization on synoptic maps (meteorological data) and on models of monitored sections of the levee (data from telemetric network). On the basis of the analysis of the measured parameters group, an alarm signal will be activated, which will inform about the occurrence of an emergency or crisis situation. This fact will be reported in cases such as:

- increase of parameter’s value at the certain time,
- changes of acceptable gradients,
- exceeding of more than one defined level,
- damage of equipment and communication errors (anomalous readings or lack thereof).

Additional measurements to be carried out: Geophysical measurements (Geoelectrical tomography), Geodetic measurements (Ground radar interferometer BIS-L, Satellite SAR interferometer, Classical methods), Thermographic camera, Water levels, Weather observations (Temperature, Humidity, Pressure, Precipitation, Wind speed).