

EGU2020-18772

<https://doi.org/10.5194/egusphere-egu2020-18772>

EGU General Assembly 2020

© Author(s) 2020. This work is distributed under the Creative Commons Attribution 4.0 License.



DAMSAT: An operational system for tailings dam monitoring by bringing together remote sensing, meteorological and on-site observations with site metadata

Marta Roca, **Eleanor Ainscoe**, Gregor Petkovsek, Mark Wetton, Ye Liu, Mark Davison, and Alberto Riera

HR Wallingford, Flood and Water management, Wallingford, United Kingdom of Great Britain and Northern Ireland
(mrt@hrwallingford.com)

Tailings dams and storage facilities store toxic mine waste and effluent. Failure of a tailings storage facility can cause dramatic local ecosystem damage, water contamination and, if a tailings dam fails, loss of life due to inundation of the downstream area. The failure rate of tailings dams is known to be significantly greater than that of conventional water retention dams, but monitoring all tailings dams and storage facilities through frequent site visits could be an expensive and resource-demanding task.

Monitoring tools based on remote sensing and internet of things (IoT) sensors have the potential to reduce the risk from tailings storage failures by enabling the organisations responsible to conduct some monitoring remotely, and hence direct their resources for detailed monitoring more efficiently.

We present an overview of DAMSAT (Dam Monitoring from SATellites), an operational tool for monitoring tailings dams, tailings deposit areas and water dams. The tool consists of several different modules. Radar and optical satellite remote sensing data, and in situ internet of things (IoT) sensors are used to monitor surface movement and indicators of pollution at tailings storage sites. Meteorological forecasts are coupled to hydrological models in order to forecast changes in water level at the dams. DAMSAT presents the monitoring information together with risk information from hazard, consequence and evacuation models of possible dam failures in one integrated platform. The project is a partnership between UK and Peruvian organisations. This approach, alongside proactive user engagement activities and user requirements analysis, is designed to ensure that the system is developed with the needs of the user community in mind.