



## **Experiences from coordinated national-level landslide and flood forecasting in Norway**

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While flood forecasting at national level is quite well established and operational in many countries worldwide, landslide forecasting at national level is still seldom. Examples of coordinated flood and landslide forecasting are even rarer. Most of the time flood and landslide forecasters work separately (investigating, defining thresholds, and developing models) and most of the time without communication with each other.

One example of coordinated operational early warning systems (EWS) for flooding and shallow landslides is found at the Norwegian Water Resources and Energy Directorate (NVE) in Norway. In this presentation we give an introduction to the two separate but tightly collaborative EWSs and to the coordination of these.

The two EWSs are being operated from the same office, every day using similar hydro-meteorological prognosis and hydrological models. Prognosis and model outputs on e.g. discharge, snow melt, soil water content and exceeded landslide thresholds are evaluated in a web based decision-making tool (xgeo.no). The experts performing forecasts are hydrologists, geologists and physical geographers. A similar warning scale, based on colors (green, yellow, orange and red) is used for both EWSs, however thresholds for flood and landslide warning levels are defined differently. Also warning areas may not necessary be the same for both hazards and depending on the specific meteorological event, duration of the warning periods can differ.

We present how knowledge, models and tools, but also human and economic resources are being shared between the two EWSs. Moreover, we discuss challenges faced in the communication of warning messages using recent flood and landslide events as examples.