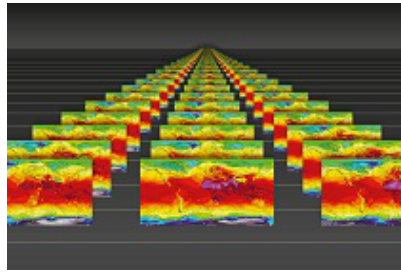


Workshop on Predictability, dynamics and applications research using the TIGGE and S2S ensembles



Contribution ID: 42

Type: **Oral presentation**

A flood alert system for Switzerland based on integrated water vapor fluxes

Thursday, 4 April 2019 12:45 (15 minutes)

Floods in the Alpine region can be destructive and lead to large losses. Many rivers and lakes in Switzerland, however, are regulated and flood damage can therefore be mitigated through an optimal management of lake levels and runoff. To support planning and prevention, high-quality forecasts of atmospheric flood precursors extending beyond short-range predictions are expected to be useful. One such flood precursor is the integrated vapor transport (IVT), which has been shown to be causally related to flooding in the Alpine region when transport is perpendicular to the main orography. We therefore develop a flood alert system based on medium-range forecasts of IVT.

We present the verification of probabilistic medium-range forecasts of IVT and precipitation by the European Centre for Medium-Range Forecasts (ECMWF) Integrated Forecasting System (IFS). Based on 20 years of reforecasts, we show that both regular and extreme IVT is better predictable than precipitation and IVT predictions are skillful out to day eight. As the direction of IVT is of central importance for flood risk in Switzerland, we develop an index summarizing probabilistic information on both direction and magnitude of the IVT. Together with compact visualizations this forms the basis of an operational flood alert system extending beyond the range of traditional weather forecasts using only atmospheric flood precursors.

Primary authors: Dr MAHLSTEIN, Irina (Oeschger Centre for Climate Change Research and Institute of Geography, University of Bern, Switzerland); BHEND, Jonas (MeteoSwiss); Dr SPIRIG, Christoph (Federal Office of Meteorology and Climatology MeteoSwiss, Zurich, Switzerland); Dr LINIGER, Mark (Federal Office of Meteorology and Climatology MeteoSwiss, Zurich, Switzerland); Prof. MARTIUS, Olivia (Oeschger Centre for Climate Change Research and Institute of Geography, University of Bern, Switzerland)

Presenter: BHEND, Jonas (MeteoSwiss)

Session Classification: Application studies

Track Classification: Workshop on Predictability, dynamics and applications research using the TIGGE and S2S ensembles