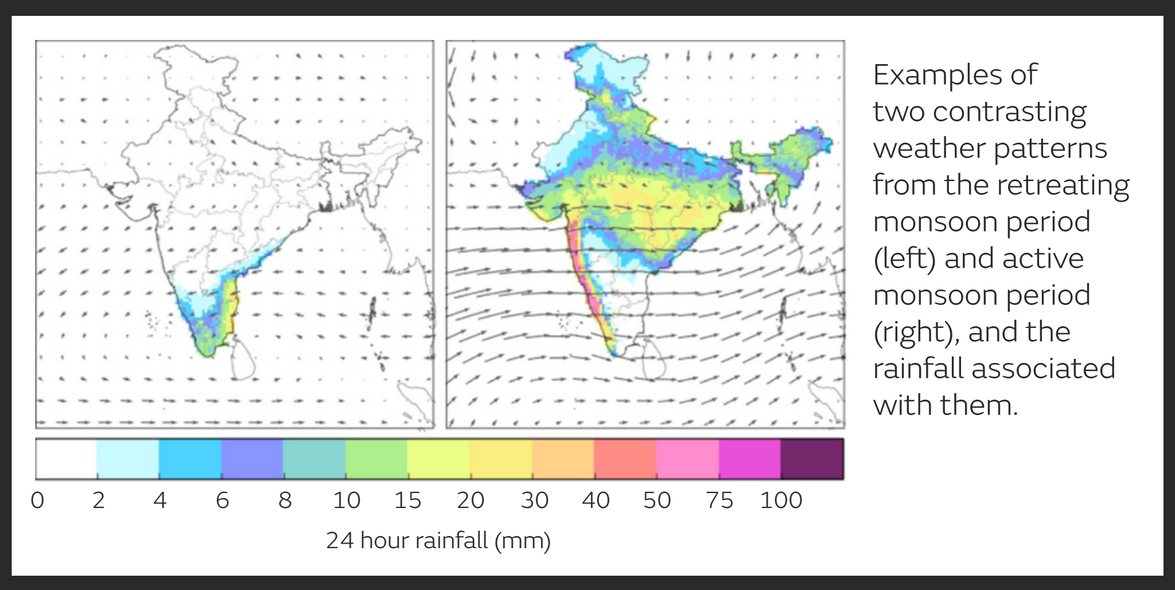
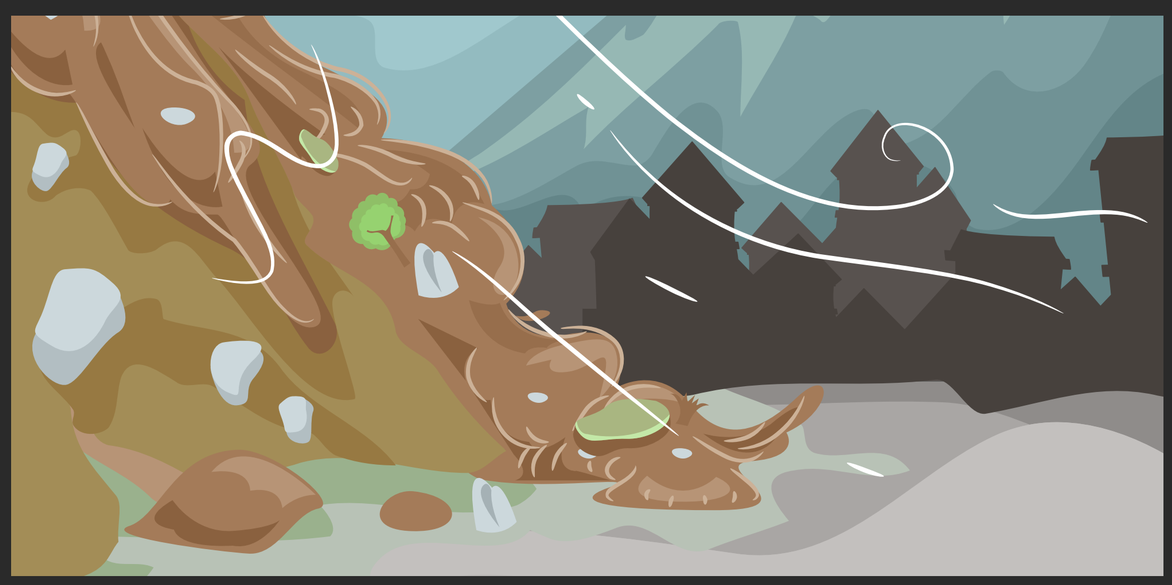
New global tool to help predict flood periods

The South Asian summer monsoon directly affects the lives of around one billion people, providing 80% of the yearly rainfall to South Asia[1]. Variations in the strength of the monsoon from year to year can therefore have significant impacts on lives and livelihoods.

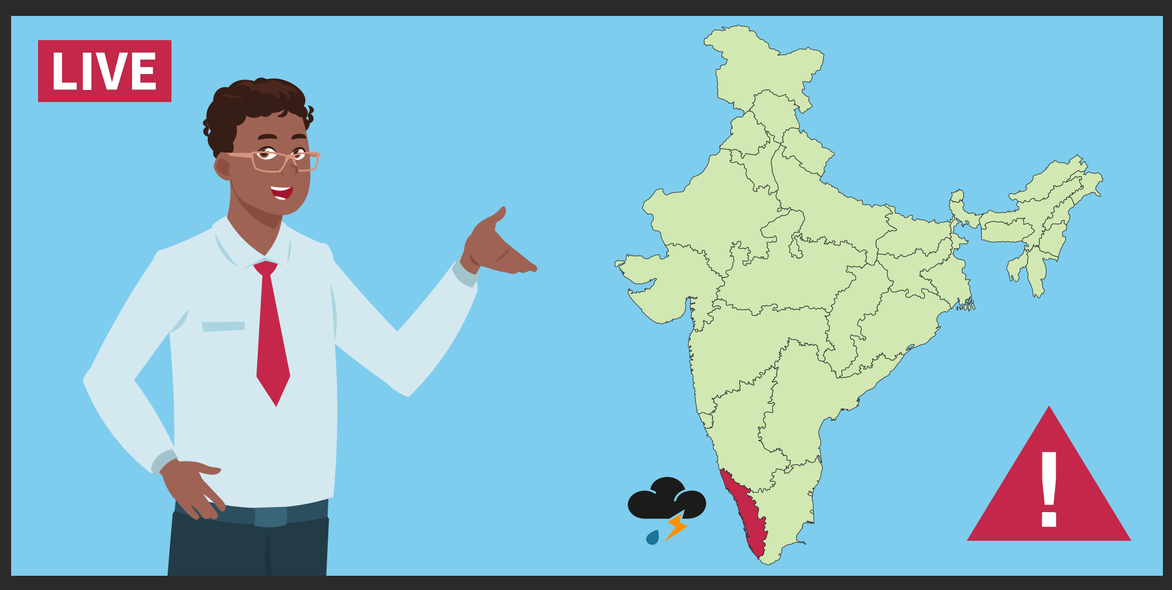


Examples of two contrasting weather patterns from the retreating monsoon period (left) and active monsoon period (right), and the rainfall associated with them.

The WCSSP India project has identified a set of weather patterns which represent all the main periods of the Indian climate throughout the year, such as the active or retreating monsoon period. A weather pattern stays for two to three days on average, before transitioning to another.[2]



Each weather pattern is associated with different amounts of rainfall and therefore particular hazards such as flooding or landslides. These patterns can therefore be used to identify, for example, the most flood-prone periods within the active monsoon period. When links between weather patterns and their impacts on specific industries such as agriculture, energy or transport have been identified, these can be used to interpret the output of medium to long-range weather forecasts and predict future impact scenarios.



For example, the tool showed 10 days in advance that a weather pattern associated with flooding was most likely over Kerala, a period which then led to the devastating Kerala floods of August 2018. It also highlighted conditions susceptible to flooding 10 days ahead of flooding in Mumbai in September 2019. This tool can be used to provide earlier forecast guidance on potential future impacts and therefore lead to earlier and more accurate warnings. This allows Government, policy makers and citizens more time to act and reduce the impacts of such events.

The WCSSP programme is also exploring the use of this tool to benefit other regions around the world such as Southeast Asia and Brazil. Under the Newton Fund through the WCSSP programme, the Met Office is working collaboratively with global partners to develop tools and techniques and apply them to benefit multiple projects and programmes, to support the delivery of global development impact.

WCSSP India is a collaborative initiative between the Met Office – supported by the UK Government's Newton Fund - and the Indian Ministry of Earth Sciences (MoES) and is part of the Weather and Climate Science for Service Partnership Programme.

The WCSSP programme is developing a global network of partnerships that help build weather and climate science and innovation capacity to support long term sustainable growth, economic development and social welfare.

SUSTAINABLE DEVELOPMENT GOALS

17 PARTNERSHIPS FOR THE GOALS

[1] Turner et al. 2012. Climate change and the South Asian summer monsoon. Nature Climate Change. Doi:10.1038/NCLIMATE1495
[2] Neal et al., 2019, 'Deriving optimal weather pattern definitions for the representation of precipitation variability over India', Int. J. of Clim. (RMS), doi.org/10.1002/joc.6215