

Hydrological Science, Session HS2.3.1

Understanding catchment and hillslope responses: from changing states and non-linearities to emergent behaviours

Thursday, 01 May, 10:30–12:00, Room R11, EGU, Vienna, Austria

Conveners: Daniele Penna, Ilja van Meerveld, Luisa Hopp

10:30– 10:45	<i>Julian Klaus</i> and Laurent Pfister	Physiographic controls on thresholds and non-linearity in rainfall-runoff transformations
10:45– 11:00	<i>Josie Geris</i> , Doerthe Tetzlaff, Jeffrey McDonnell, and Chris Soulsby	Non-linearities and thresholds in water partitioning, storage and release in different ecohydrological units
11:00– 11:15	<i>Michael Stewart</i>	Stream responses as the sum of flow component responses
11:15– 11:30	<i>Jana von Freyberg</i> , Dirk Radny, and Mario Schirmer	Hydrological responses in a pre-alpine head watershed: the role of hillslopes and riparian zones
11:30– 11:45	<i>Marius Floriancic</i> , Maarten Smoorenburg, Michael Margreth, and Felix Naef	Which hillslopes sustain baseflow during low flow conditions? Lessons from winter discharge observations in the alpine Poschiavino catchment, Switzerland
11:45– 12:00	<i>Hilary McMillan</i> and MS Srinivasan	Controls on variability in surface and ground waters in a headwater catchment

Our understanding of runoff generation processes at the hillslope and catchment scale is often hampered by the complexity of hydrological systems due to the interactions of multiple external and internal factors. Annual and seasonal variations in climatic forcing or wetness conditions often lead to changes in hillslopes and catchment states and a switch in the dominant controls on hydrological responses or travel time distributions. Contrasting behaviours are typically found when thresholds and other non-linear effects occur. For instance, differences in wetness conditions may result in changing directions in hysteretic storage/runoff loops or lead to the activation of subsurface flow pathways that dramatically increase streamflow. Efforts to analyse these behaviours and unravel this complexity are critical to develop new concepts and theories that allow a more detailed description of the underlying hydrological processes and a more accurate conceptualization and prediction of hillslope and catchment functioning.

Sources of text, links and images: European Geosciences Union website

