



Anatomy of simultaneous flood peaks at a lowland confluence

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Lowlands are vulnerable to flooding due to their mild topography in often densely populated areas with high social and economic value. Moreover, multiple physical processes coincide in lowland areas, such as those involved in river-sea interactions and in merging of rivers. Simultaneous occurrence of such processes can result in amplifying or attenuating effects on water levels. The aim of this study is to understand the mechanisms behind simultaneous occurrence of flood peak events in the main river and tributaries in delta areas, taking the confluence of the Meuse river with the Dommel/Aa tributary as an example. Especially since the January 1995 flood at this confluence is analyzed as result of the simultaneous occurrence of discharge peaks. This study shows that simultaneous occurrence of flood peak events is common in the lowland area of the Meuse with the tributaries Dommel and Aa, because discharge peaks last long; on average 9 days in the Meuse. A typical lag time of about 3 days between tributaries and main river does not prevent simultaneous occurrence. The simultaneous occurrence of the discharge peaks results in a water level gradient increase in the main river and decrease in the tributaries, which show backwater effects of up to 1.5 meters.