Hydrologic response using a paper towel

Discharge in rivers depends on rainfall events that transmit water through soils and into channels. The pattern of river response to a rainfall event is a hydrograph and it has many characteristic properties that can be illustrated using a paper as an analog for a watershed. By applying rainfall (blue water) to a paper towel, we simulate rainfall falling onto a watershed. Initially, the paper towel soaks up the water and only after several minutes of rainfall does the water drip from the base of the paper towel, which constitutes discharge. Using a scale (with 0.1 g accuracy) positioned below the paper towel, we measure the discharge every 30 seconds and enables students to plot a hydrograph resulting from an in-class "rainfall" event. Discharge proceeds for more than 10 minutes following the cessation of rainfall. In addition, we construct a water balance before and after the event to determine whether we can account for all of the water used in the experiment. This includes the weight of the: paper towel, rainfall bottle, and discharge pan before and after the experiment. Handouts are distributed during the class for students to record the results and make their own plot of the hydrograph.



