

High water was a great research opportunity

LOOKING FOR SAND

The high water in the Maas River last July stirred up the riverbed a lot. PhD researcher Hermjan Barneveld is documenting the deposition of sediment. The summer flooding was a great opportunity for him.

Barneveld studies the sediment balance of the Maas. Which means he calculates the amounts of sand flowing in and out of the river.

That balance has changed a lot over time. ‘Through human intervention, less sediment flows into the river than it could transport,’ explains Barneveld. ‘Dams, for example, slow the current in the river, so less sediment is transported downstream. There is then in fact a shortage of sediment there, lowering the level of the riverbed.’

The original idea was that he would make use of existing measuring data to this end. But then came the high water. ‘It would be a shame to let that opportunity slip,’ says Barneveld. ‘In a river like the Maas, that sediment only moves at high water. That’s when the water has enough power to shift gravel and sand.’

Big holes

The consequences were particularly dramatic for the Grensmaas, the relatively steep stretch of the Maas between Maastricht and Roermond. Barneveld: ‘The river there is five times steeper than downstream. There is no shipping on it because that goes through the Juliana Canal. The river is still fairly



Students travelled along the Maas in August with researcher Hermjan Barneveld, looking for sediment. Photo Roelof Kleis

natural there. At high water, the water rushes past at speeds of two to five metres per second.’

Unlike the rest of the river, the bed of the Grensmaas is made up of gravel. In places, these layers are several metres thick, and in other places no more than a few decimetres. So thin that the water rushing over the bed washed away the gravel and dug deep holes in the older underlying layer of fine sand. ‘Erosion gullies 15 metres deep have formed in about eight places,’ says Barneveld.

That sand and other sediment formed by erosion of the riverbanks was deposited downstream on flooded flood plains. With the help of 13 enthusiastic students, Barneveld travelled along the Maas for two weeks in August, looking for sediment. Equipped with a simple gauge (a PVC tube with markings on it) and an app on a mobile phone, the team documented the sediment layers. Sand samples were collected here and there to identify the composition of the sand. ‘The idea is to use all the data to document the sediment balance of the Maas,’ explains Barneveld. ‘We know that the high water took a lot of sediment with it. But where was that deposited, and how much? And can we determine its origins from its composition? You would expect the sediment upstream to be coarser because it’s heavier, and therefore does not get transported as far. But we saw on our trip that it doesn’t always work like that.’ RK

‘IN A RIVER LIKE THE MAAS, SEDIMENT ONLY MOVES AT HIGH WATER’