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## **Earth, Water and Pesticides - Understanding pesticide transport in the agricultural landscape from land to water**

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Modern agriculture depends largely on the use of chemical pesticides to minimize damage to sensitive crops from plant pests, fungi and weeds to secure harvest. Ideally pesticides should kill the target organisms as efficiently and quickly as possible and then disappear, without side effects on non-target organisms. However, this is not always the case. Pesticides tend to be more or less persistent in the environment and can be transported away from the field. Monitoring results show they can end up in nearby rivers or to groundwater. The application of pesticides on arable fields can thus have negative implications for the environment, such as pesticide levels exceeding regulatory limits in the aquatic environment and in drinking water resources.

Research and monitoring activities have shown that losses of pesticides to streams vary widely both in time and space. In my talk, I will present an overview of recent research on pesticide transport in the agricultural landscape – from field to water. I will identify knowledge gaps and discuss how improved understanding can support development of rational mitigation strategies that minimize adverse environmental impacts.

One way forward is combining lab and field work, with focus on investigation of the spatial distribution of runoff, leaching and critical source areas (“hot spots”) in the landscape. There is a need to quantify the various transport pathways (e.g. surface runoff, drainage) for both dissolved and sediment bound fractions. Moreover, such knowledge is also important when simulating the impact of future climate change, since climate in general affects numerous soil processes that in turn impact pesticide fate and behaviour.

This research can be seen as one way to support a sustainable use of pesticides and to increase agricultural production of food and bioenergy for a growing population and at the same time preserve biodiversity in the surrounding environment.