Geophysical Research Abstracts,
Vol. 11, EGU2009-6190, 2009
EGU General Assembly 2009

Effects of climate change on the mobilization of diffuse substances from agricultural systems

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Changes in the climate of temperate regions are likely to lead to increased losses of diffuse substances transferred from agricultural land to surface and ground waters e.g. sediment, carbon, nitrogen, pathogens and phosphorus. As part of a UK based science-policy initiative Integrating Water and Agricultural Management (IWAM) we have developed a framework for assessing climate change impacts on the mobilization of diffuse substances from UK agricultural land. We have reviewed the literature and provided an expert assessment of the influence of predicted changes in temperature and precipitation on detachment and solubilisation processes. We have chosen three model farm systems (MFSs; arable, lowland dairy and upland sheep). In our assessment we have found that lowland dairy is potentially the most sensitive to the predicted climate changes (2020). The projected increase in winter precipitation and all year round rainfall intensity are likely to be the largest climatic drivers for significant increases in detachment and solubilisation. An important part of our assessment was to identify the scientific gaps and uncertainties around climate change and diffuse substance mobilization and to facilitate improved recommendations for policies related to sustainable land and water management.