

Development of a methodology to assess atmospheric deposition on surface waters

Theme: Water Framework Directive

BO-06-006-004

Problem

For the assessment of the risk to exposure of aquatic organisms to plant protection products (PPP), all relevant pathways of PPP inputs need to be considered. Up to now, PPP loadings due to atmospheric deposition have not been taken into account.

Approach

- A prototype of a tool has been developed to assess the exposure of surface waters due to atmospheric deposition at the local and regional scales. For this tool, the PEARL model that calculates the volatilization of PPP from crops has been coupled to the OPS model for transport of PPP in air
- The coupled PEARL-OPS model was run for the example area of CASCADE. Land use data for this area were taken and a grid of receptor points was defined. Deposition rates of the PPP at the receptor points were calculated. It was assumed that all sugarbeet fields were treated at a rate of 1 kg/ha on 1 May

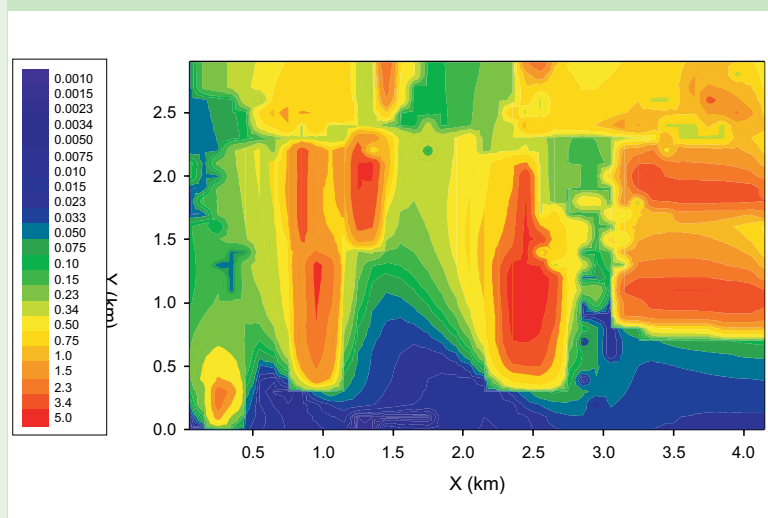


Figure The deposition in the CASCADE example area computed with the coupled PEARL- OPS model. Deposition rates are given on a relative scale.

Results

The results of the example run are shown in the Figure above.

- Highest deposition rates are calculated in the vicinity of the sources
- The deposition decreases with downwind distance from the source area. The rate of decrease depends on the meteorological conditions
- The deposition rate at the receptor points depends on the volatilization rate, the meteorological conditions and the surface characteristics of the target surface

Future use in risk assessment

The tool can be used to assess atmospheric deposition on surface water at a regional scale (tens of km²) in the risk assessment for aquatic organisms to pesticides.



The CASCADE area with the watercourses.

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