

VERBER

A screening tool to identify surface waters at risk of pesticide contamination

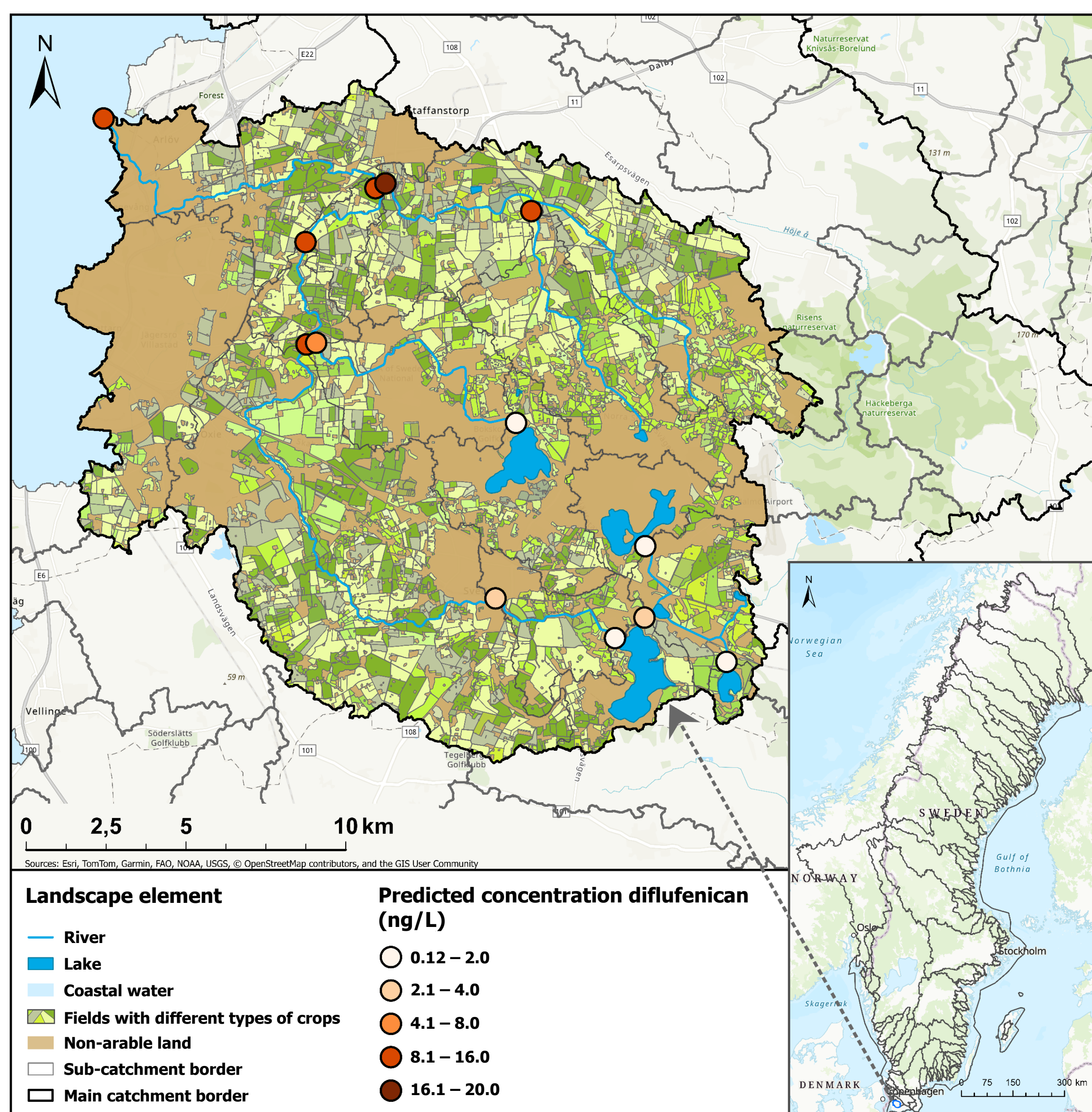


Figure 1. Application example: Average concentrations of diflufenican predicted by VERBER at the outlet (circles) of different sub-catchments of a main catchment in southern Sweden.

WHAT?

VERBER predicts long-term average concentrations of pesticides originating from arable fields at the outlet of Swedish sub-catchments in inter-connected networks of lakes and water-courses. The model is applicable at regional and national scales.

WHY?

To support water authorities by identifying surface waters that are at risk of being affected by pesticide concentrations that constitute chronic toxicity to aquatic organisms or non-compliance with drinking water standards.

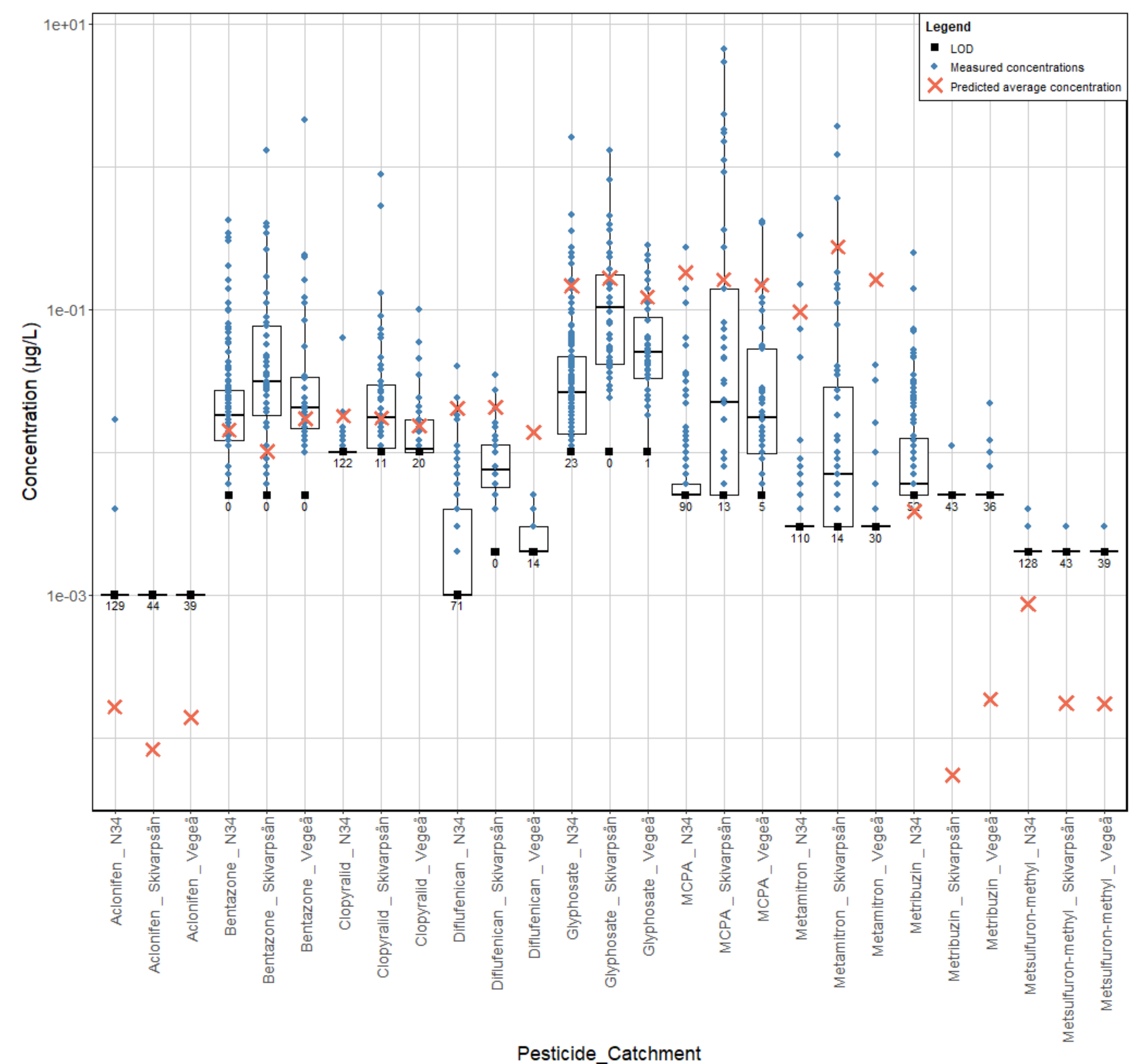


Figure 2. Average concentrations predicted by VERBER (red crosses) and measured concentrations (blue dots and boxplots) of nine different pesticides at three sites in May to October 2018 to 2022. Black squares indicate limits of detection (LOD) and the number written under the square gives the number of measurements below the LOD.

HOW?

The concentration is calculated using a simple mass balance model. Model input includes geographical information on national cropping statistics and catchment hydrological characteristics, pesticide properties and pesticide use statistics. An integrated decision tree, developed through machine learning based on monitoring data, estimates the proportion of applied pesticide that is lost to surface water.

RESULTS

Comparing concentrations predicted by VERBER for nine different active substances with monitoring data showed that the predicted concentrations are generally realistic and sometimes conservative (Fig. 2).

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