Integration of Local Conditions in Risk Assessment

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Introduction
This presentation focuses on the driving factors of potential exposure (exposure settings, landscape, processes and use) and presents a variation of exposure on regional, watershed and field scales. Higher tier modelling will be presented that reflects refined modelling to develop label language that may include label restrictions and/or mitigation practices such as drift buffers and vegetative filter strips. The presentation will also include examples of using spatial analysis to characterize potential exposure including proximity of the crop to different sized water bodies or the field having buffers.

Results
Driving factors for ecological exposure resulting from the use of a pesticide are soils, weather, crop, landscape, agronomic practices and pesticide use patterns. Runoff, erosion and drift are the dominant sources of off-target concentrations in surface water. On a regional scale, not all soils are homogeneous and weather is extremely variable. For example, in the United States, if the same product was used on corn in California, Illinois and Mississippi with the same application rates, the predicted concentrations in surface water calculated with PRZM/EXAMS models can be quite variable (Figure 1 graph). This variation can be attributed to weather and soil. In this case, there may be a label restriction based on the region.

![Map of the United States showing seasonal rainfall and predicted peak exposure concentrations in surface water](image)

Figure 1. Seasonal rainfall in the United States (location of USEPA PRZM/EXAMS model corn scenarios in solid circles, CA, IL, MS, highlighted with a circle) and predicted peak exposure concentrations in surface water.

Higher tier modelling of best management practices (BMPs) may be needed to assure safe use of the pesticide. Watershed modelling using PRZM/RIVWQ was performed with best management practices of not applying within 100 m of a water body, leaving a trash layer after harvest, combined reduced application rate and dry season application, dry season application, vegetative filter strip, reduced tillage, reduced application rate and slope restriction. Figure 2 shows the 12-year average reduction in mass loadings to surface waters across the watershed compared to the baseline simulation without BMPs. Figure 3 shows some of the BMPs on a field scale.
Figure 2. 12-year average reduction in mass loading to surface waters (total mass) in a watershed with BMPs

Figure 3. Example of BMPs in a field

On a field scale, there are websites where farmers can input the coordinates of their field and find out if their field is in a restricted area based on soils (www.arpinfo.com). Additionally, there are websites with field-scale restrictions based on the likely presence of endangered species in the field and/or receiving waters (www.epa.gov/espp/bulletins.htm and www.preserve.org).