



# Work of a SETAC Group to Develop the Scientific Basis for Guidance for Regulatory Ground Water Monitoring: Vulnerability Assessment

Benedict Miles, BASF; Jutta Agert, Bayer; Nicole Baran, BRGM; Ludovic Loiseau, Syngenta; Anton Poot, CTGB

The SETAC Environmental Monitoring Advisory Group on Groundwater (EMAG GW) is currently developing a scientific basis for guidance on how to perform ground water monitoring studies to be used in a regulatory context in the EU.

Integral to both the design and the evaluation of such studies is the question of groundwater vulnerability to leaching, whether at the scale of individual groundwater monitoring sites, or at wider regional or national spatial scales

The EMAG GW document addresses

- concepts of groundwater leaching vulnerability
- spatial analysis and modelling approaches for mapping vulnerability
  - for identifying potential monitoring locations and
  - for setting monitoring data into context (what do the data represent?)
- monitoring site characterisation and interpretation of monitoring data

Conducting Ground Water Monitoring Studies in Europe

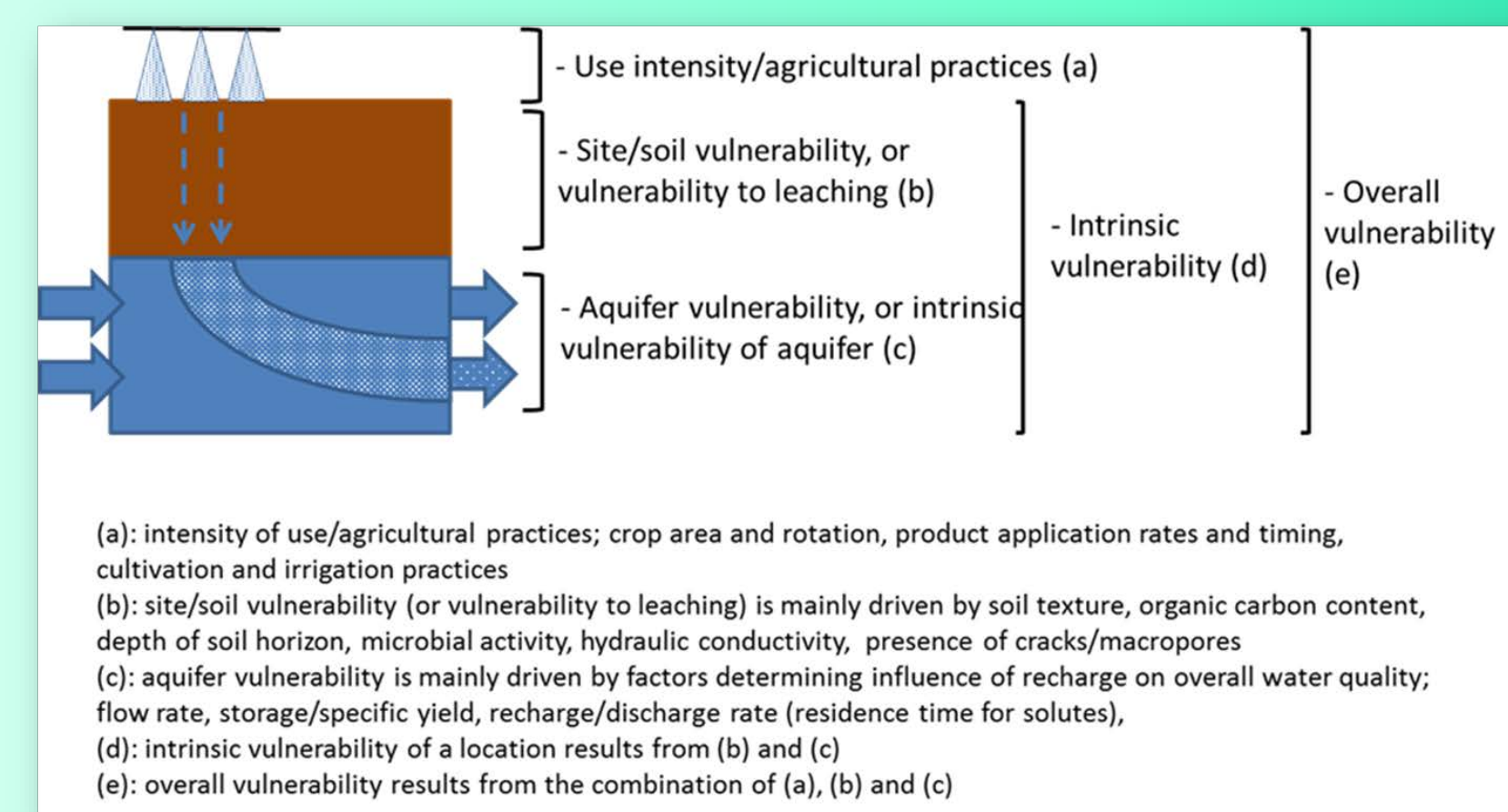
Report of the Society of Environmental Toxicology and Chemistry Environmental Monitoring Advisory Group of Pesticides-Subgroup Ground Water (SETAC EMAG-Pest GW)

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Contributors: Anne Louise Cleming, Jutta Agert, Nicole Baran, Arnaud Boin, Elvire Capri, Florian Hagler, Russell L. Jones, William Koening, Ton van der Linden, Dirk Liss, Ludovic Loiseau, Benedict Miles, Laurent Monnoir, Andy Nieuwenhuis, Laura Padovan, Anton Poot, Graham Reeves, Stefan Reichenberger, Annette Rosenboom, Robin Sur, Václav Tóth, Uta Ulrich

## Vulnerability concepts:

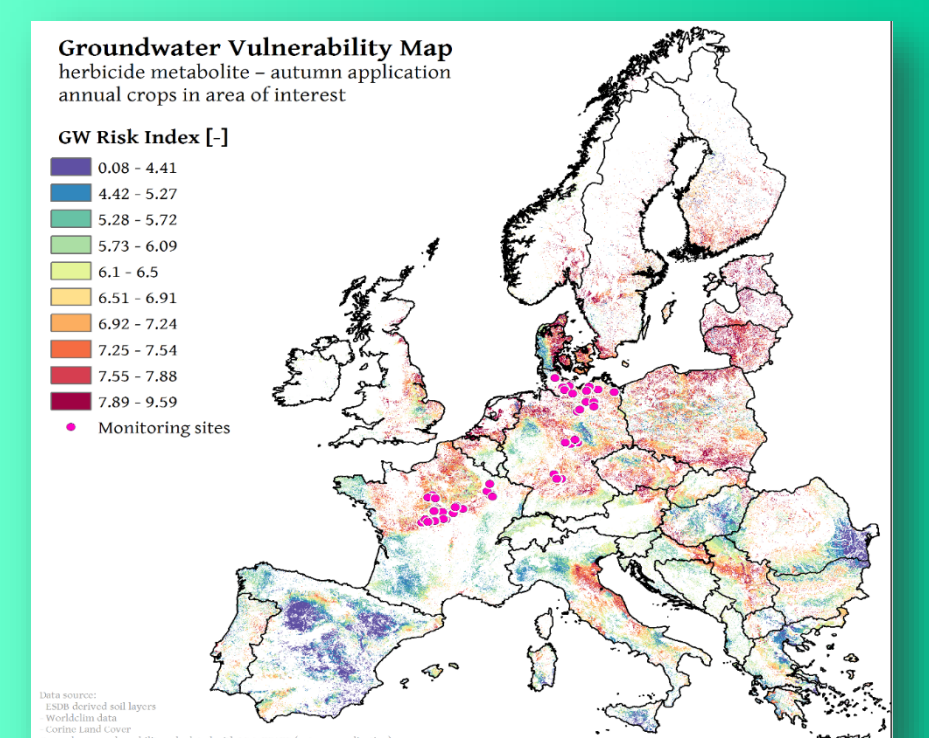
*Intrinsic or environmental vulnerability*: natural conditions that determine vulnerability of an aquifer to leaching of a solute  
*Specific vulnerability*: the non-environmental factors



The overall vulnerability is the combination of both aspects, which need to be considered when looking at vulnerability in the context of groundwater monitoring for pesticides

## Vulnerability mapping:

- Environmental conditions determining leaching are spatially variable.
- Therefore geospatial analyses can be used to identify areas where environmental conditions provide more or less protection against leaching to groundwater.
- Such an analysis can be used to create a vulnerability map showing areas where an active substance or metabolite is more or less likely to leach to ground water compared to other areas.
- Analyses can inform study design and/or interpretation, e.g.
  - where are the most appropriate areas to locate monitoring sites?
  - how does the leaching vulnerability at monitoring sites where data are available compare to other areas?
- Possible analysis approaches include index methods, spatially distributed process-based models and metamodells



## Monitoring site characterisation:

To understand relevance and representativity of monitoring data, information about the monitoring sites themselves – *characterisation* – is needed. Generally, the better the characterisation of the site, the higher the level of confidence in the monitoring data.

Characterisation has two main aspects

- Assessment of intrinsic, specific and overall vulnerability (see above)
- Establishing a connectivity between the sampling point and treated fields; can the sampled water be linked hydrologically to infiltration from treated fields?

