

Geochemical Reactivity and Risk Assessment: From Scientific Data to Policy Applications

Invited Speaker: Dr. Paul Römkens, Alterra – Wageningen UR, Alterra, the Netherlands

Abstract: Risks of contaminants in soils are only marginally related to total levels in soil. Most risk assessment tools used at present, are based on the total level. This often leads to erroneous assessment of, for example, exposure to people (in case of urban gardens) or quality of ground- and drinking water. Especially for policy making the acceptance of the concept of availability in risk assessment is rather difficult. This is partly due to the assumed greater need for knowledge but also the lack of data on a regional or national scale that offers insight in background levels of both total and available levels of contaminants in soil. To bridge the gap between geochemical data and knowledge on one hand and the desire to improve risk assessment and soil policy on the other both local and regional data are needed that describe the reactivity of contaminants. Recently the Dutch Geochemical Atlas was released, a compilation of nationwide data on total, reactive and available levels of contaminants (metals) in soils. Commonly such books contain maps of various scale levels most often representing total levels of an array of elements. Although useful for geochemists, this of-

fers limited information for policy makers who are in need of more realistic assessments of actual risks of contaminants in, for example urban areas. In densely populated areas like the Netherlands, the soil quality is affected by a myriad of activities ranging from industrial emissions, traffic, waste management and historical sources of pollution. Examples of the latter include the use of city waste in near urban areas to improve soil quality and to keep the land sufficiently dry. In such soils, elevated levels of lead or copper occur which may or may not pose a risk for grazing cattle depending on the actual uptake by crops. In, or near urban areas in the Netherlands more and more allotments are being created that allow people to grow their own vegetables and fruit. Often, however such soils are not clean and contain elevated levels of lead, mercury, copper and other elements. Such examples show that both a more accurate assessment of the actual availability of contaminants in soil as well as an improved insight in the regional distribution is desirable in order to improve national, regional or local soil policy.

The Geochemical Atlas of the Netherlands aims to provide both insight in the variability of a large array of metals and metalloids in the top- and subsoil of major Dutch soil types and give insight in the actual availability of such elements. In this presentation and an adjacent poster, examples of the Atlas and its applications will be shown.

Short Curriculum Vitae: Dr. Paul Römkens obtained a PhD degree in soil chemistry at the University of

Groningen in 1998. He is currently a Senior Research Scientist at the Department of Soil Science ALTErrA, Wageningen UR. His research interests include the derivation of soil quality standards in relation to risks of heavy metals in soils, food safety, risk assessment of heavy metal contaminated soils, active soil management, scenario analysis of heavy metals in relation to land use, and phytoremediation.