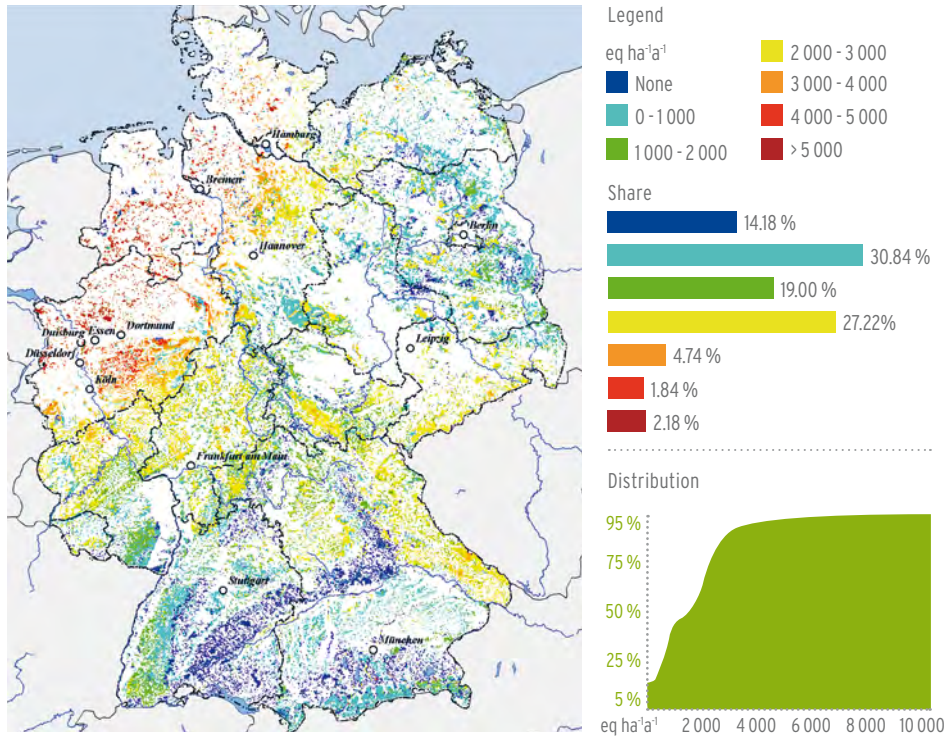


# CRITICAL LOADS FOR ACIDIFICATION

## EXCEEDANCE OF CRITICAL LOADS FOR ACIDITY 2004



Source: Federal Environment Agency: Nationale Umsetzung UNECE Luftreinhaltekonvention. Research Project 204 63 252, Final report 2008; Federal Institute for Geosciences and Natural Resources (BGR), Hannover 2008

The acidification of ecosystems is caused by the atmospheric input of sulphur and nitrogen-containing air pollution leading to negative effects in ecosystems. The input results in a decline of the pH value and the loss of nutrients. Long-term acid stress results in a reduced vitality of the plants and

in an increased susceptibility to natural stress factors. Ecosystem functions such as water filtering may be carried out only on a limited scale. Due to altered soil and nutrient conditions plant species depending on neutral soil conditions are displaced by acidophilic species. This results in a decline



of plant species diversity and thus indirectly also in a decline of animal species diversity. Yet, the fauna is also directly affected by acidification: Ecologically irreplaceable earth-worms living in mineral soils may no longer exist in acidified soils because aluminium, which is toxic for them, is released at pH values below 4.

To assess the pollution of ecosystems due to the deposition of acidifying air pollutants so-called critical loads for acidification are derived. These critical loads indicate the input of acidifying air pollutants which the ecosystem may tolerate in the long term without any harmful effects. To this end acid producing soil processes are compared with acid consuming and buffering processes in a mass balance. The

input of acidifying sulphur and nitrogen compounds from combustion processes has been distinctly reduced during the past twenty years. However, a comparison of air pollutant deposition and the critical loads for acidification shows that critical loads are still exceeded on a large part of the area of sensitive ecosystems in Germany. Currently, especially depositions of ammonium nitrogen from agricultural sources are responsible for acidification effects in sensitive ecosystems. The highest exceedances of critical loads are found in the northern German lowlands. As in these regions critical loads for eutrophication are also exceeded the most economically and ecologically efficient ammonia reduction measures should be implemented consistently, especially in livestock farming.