

## RIVM report assesses ecosystem sensitivity to current levels of sulphur deposition in Europe

**Many parts of Europe, particularly in Scandinavia and central Europe, show great sensitivity to present levels of sulphur deposition, a primary component of acid rain. Large areas currently receive high loads of sulphur that continue to contribute to observed damage to forests and surface waters. These are the main findings of a report, Calculation and Mapping of Critical Loads in Europe: Status Report 1993, published by the Coordination Center for Effects of the National Institute of Public Health and Environmental Protection (RIVM) in Bilthoven, the Netherlands.**

A "critical load" is maximum deposition of a pollutant that will not harm a particular ecosystem, which is calculated by measuring or estimating certain physical and chemical properties of an ecosystem. The largest areas of high sensitivity (those with the lowest critical loads) are mainly in northern and central Europe (including Scandinavia, Germany, and part of the United Kingdom).

■ *Figure 1. Exceedance of the critical load of sulphur in 1990 (5 percentile). The map shows the levels of excess sulphur deposition that can lead to ecosystem damage. The map compares the critical load values with sulphur deposition in 1990. Higher values indicate areas where excess deposition is highest.*

In general, southern Europe (parts of Spain, Greece, and the Russian Federation) appears less sensitive.

This information on ecosystem sensitivity can be compared with pollutant deposition data, to identify which areas currently receive pollution levels that exceed the area's critical load. These areas of "exceedance" show where present levels of pollutant deposition increase the risk of damage to ecosystems, thus endangering their sustainability. The greatest excess (more than 2000 equivalents per hectare per year) occurs in the "Black Triangle" region of Germany, the Czech Republic, and Poland, as well as in parts of the United Kingdom. Present sulphur depositions are higher than critical loads in roughly 50 percent of the area surveyed.

These findings are now being used in the Convention on Long-range Transboundary Air Pollution of the United Nations Economic Commission for Europe (UN ECE) to help develop strategies to reduce sulphur emissions in Europe. This information on critical loads and exceedance

is used in computer models, along with information on emissions, meteorology, and deposition patterns, to find the most cost-effective ways to reduce these levels of excess sulphur across Europe. Reducing these exceedances by at least 60 percent is a starting point for the first stage of the new sulphur protocol currently being negotiated in the UN ECE.

The report was produced by RIVM's Coordination Center for Effects, with the participation of many scientists from 20 European countries, as contributions to the work plan for the Convention. The Coordination Center was established at RIVM in 1990 to support the environmental effects-related work conducted under that Convention.

The report also includes a detailed description of the methods and data used to calculate critical loads, and reports from countries participating in the work under the Convention.

Copies of the report are available from the Coordination Center for Effects, RIVM, P.O. Box 1, 3720 BA Bilthoven, the Netherlands.

