working draft

EEA Core Set of Indicators - CSI 005

Exposure of ecosystems to acidification, eutrophication and ozone

May 2005 assessment

About this document
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If you would like to see further background information about this indicator, you can see the published specification at:
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European Environment Agency

Key policy question: What is the progress towards the targets for reducing the exposure of ecosystems to acidification, eutrophication and ozone?

Key message:

- **Eutrophication** has declined gently since 1980. However, only limited further improvement is expected by 2010 with current plans.
- There have been clear reductions in **acidification** of Europe's environment since 1980, but with some tailing off in that improvement beyond 2000. Continued attention to the matter is necessary to ensure targets are achieved.
- Most agricultural crops are exposed to **ozone** levels exceeding the EU long term objective and a significant fraction is exposed to levels above the target value. The effect-related concentrations tend to increase.

Acidification:

There have been substantial reductions in areas subjected to deposition of excess acidity since 1980 (see figure "Title: EU25 and European-wide Ecosystem damage area (average accumulated critical load exceedance) "). Current data, however, makes it difficult to assess the quantitative improvements since 1990 (these being the standards established in Directive 2001/81/EC) as acidification status in this baseyear (1990) remains to be estimated using the latest critical loads and deposition calculation methodology.

The progress on a country basis indicates that already by 2000 all except six countries had less than 50% of their ecosystem areas in exceedance of acidity critical loads. Further substantial progress is anticipated for virtually all countries in the period 2000-2010. It is also the case that the current status in the countries of the EU25 remains poorer than that in the broader European continent.

Evaluating progress in achieving the NECD acidification 50% reduction target is hampered not only by recently revised modelled deposition estimates and the lack of updated 1990 data, but by the changes in critical load assessments completed by countries themselves since negotiation of the Directive. Difficulties in managing 'double counting' (areas containing critical loads for more than one ecosystem type) exist for more than one country.

Eutrophication:

Eutrophication shows less progress(Figure "Title: EU25 and European-wide Ecosystem damage area (average accumulated critical load exceedance) "). There have been restricted improvements at the European level since 1980, and very little further improvement is expected in individual countries between 2000 and 2010. The broader European continent continues to have a lesser problem than the countries of the EU25.

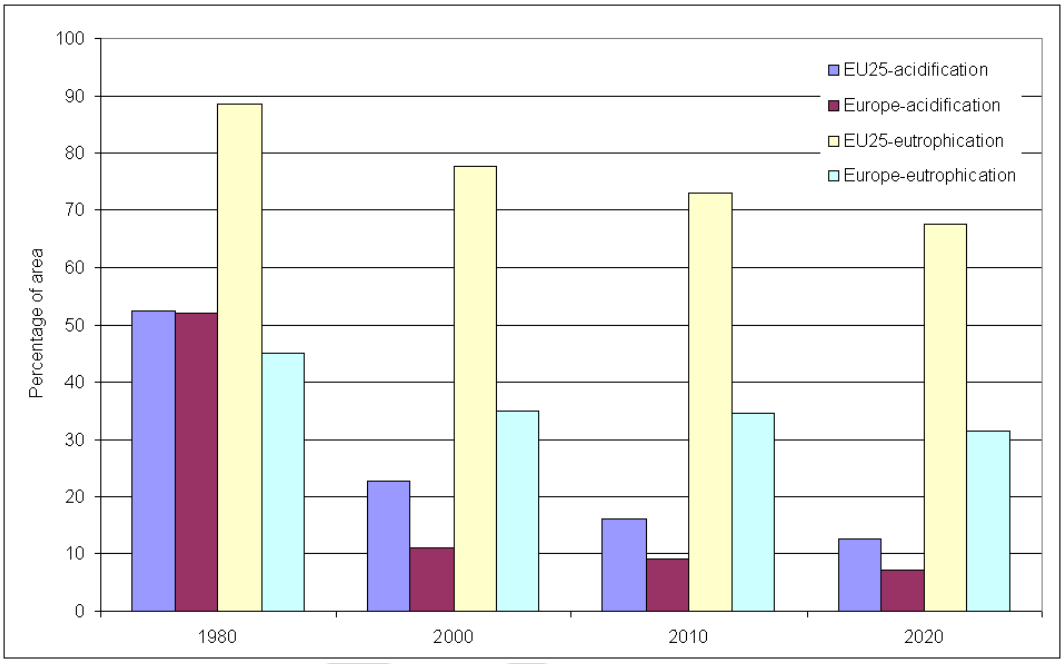
Ozone:

There is a substantial fraction of the arable area in EEA-31^{+}countries[(2)](in 2002, about 38% of a total area of 133 million ha) where the target value is exceeded (Figure " Exceedances of the target values have notably observed in Southern and central and eastern Europe (Map "Exposure above AOT40

target values for vegetation around rural ozone stations, 2002 "). The long-term objective is met in less than 9% of the total arable area, mainly in the UK, Ireland and the northern part of Scandinavia.

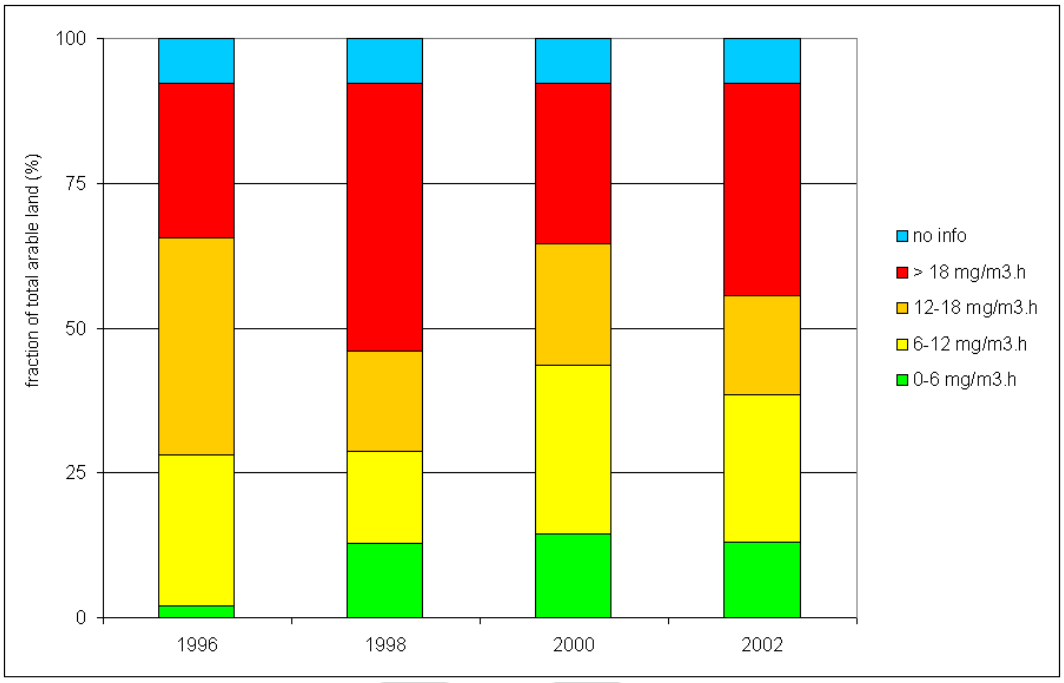
(2)Due to missing information Bulgaria, Cyprus and Turkey are not included in the analyses; Switzerland is included.

Fig. 1: EU25 and European-wide Ecosystem damage area (average accumulated critical load exceedance)



Data source: UNECE - Coordination Center for Effects
Note: Data source of deposition-data used to calculate exceedances: EMEP/MSC-W

Fig. 2: Exposure of crops to ozone (exposure expressed as AOT40 in (mg/m3).h) in EEA-countries

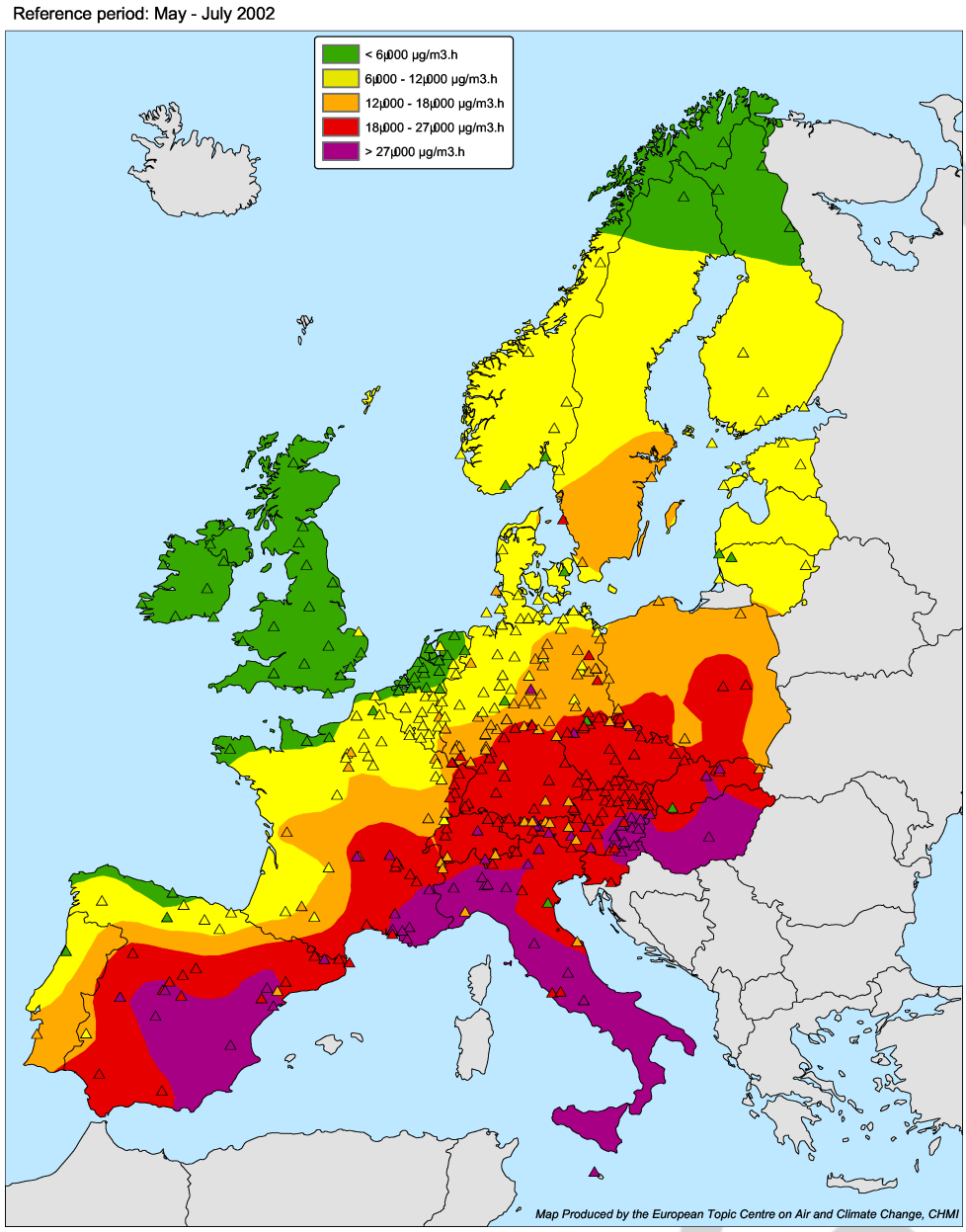


Data source: Air quality database Airbase (ETC/ACC)

Note: The target value for protection of vegetation is 18 (mg/m3).h while the long-term objective is set to 6 (mg/m3).h

The fraction labelled with "no information " refers to areas in Greece, Iceland, Norway, Sweden, Estonia, Lithuania, Latvia, Malta, Romania, and Slovenia for which either no ozone data from rural background stations or no detailed land cover data is available. The countries Bulgaria, Cyprus, and Turkey are not included.

Fig. 3: Exposure above AOT40 target values for vegetation around rural ozone stations, 2002



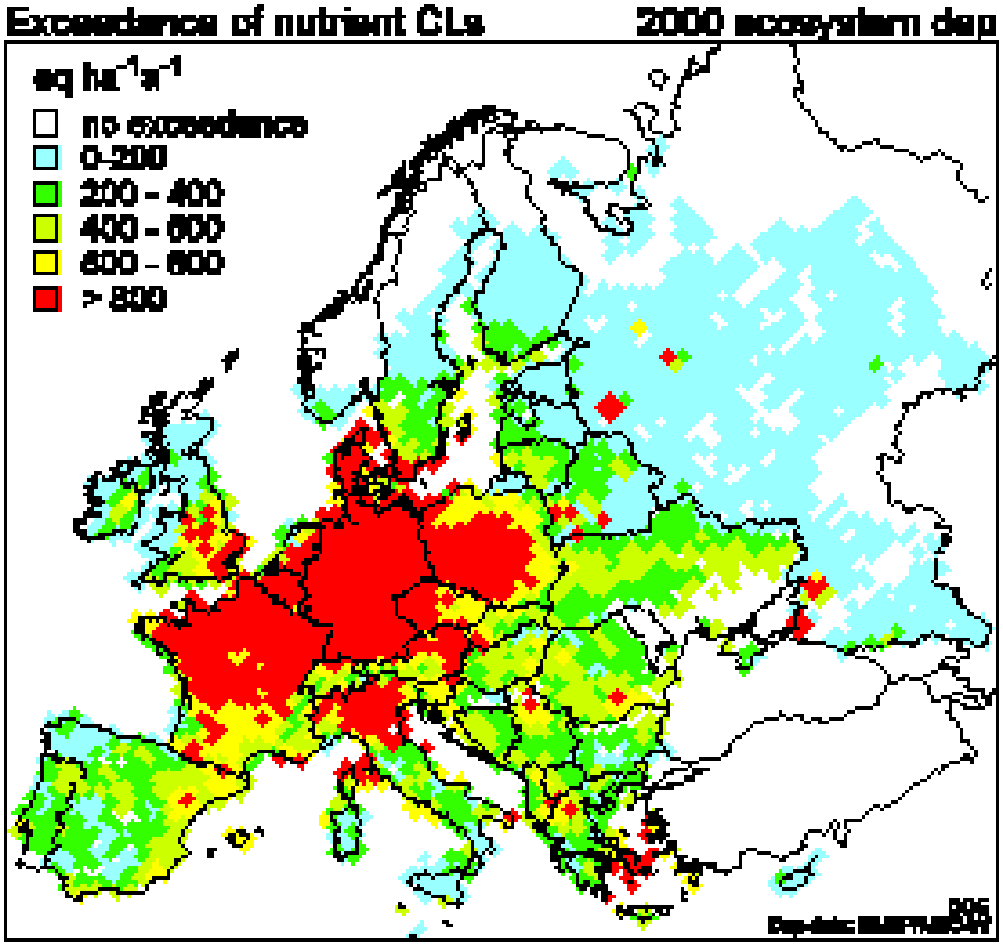
Data source: ETC/ACC
Note: Reference period: May - July 2002. (Kriging interpolation around rural stations).

Specific policy question: Which areas of Europe and which country-wise area totals remain most affected by acidification and eutrophication?

The maps show the spatial distribution over Europe - as additional illustration to the key message - on acidification and eutrophication.

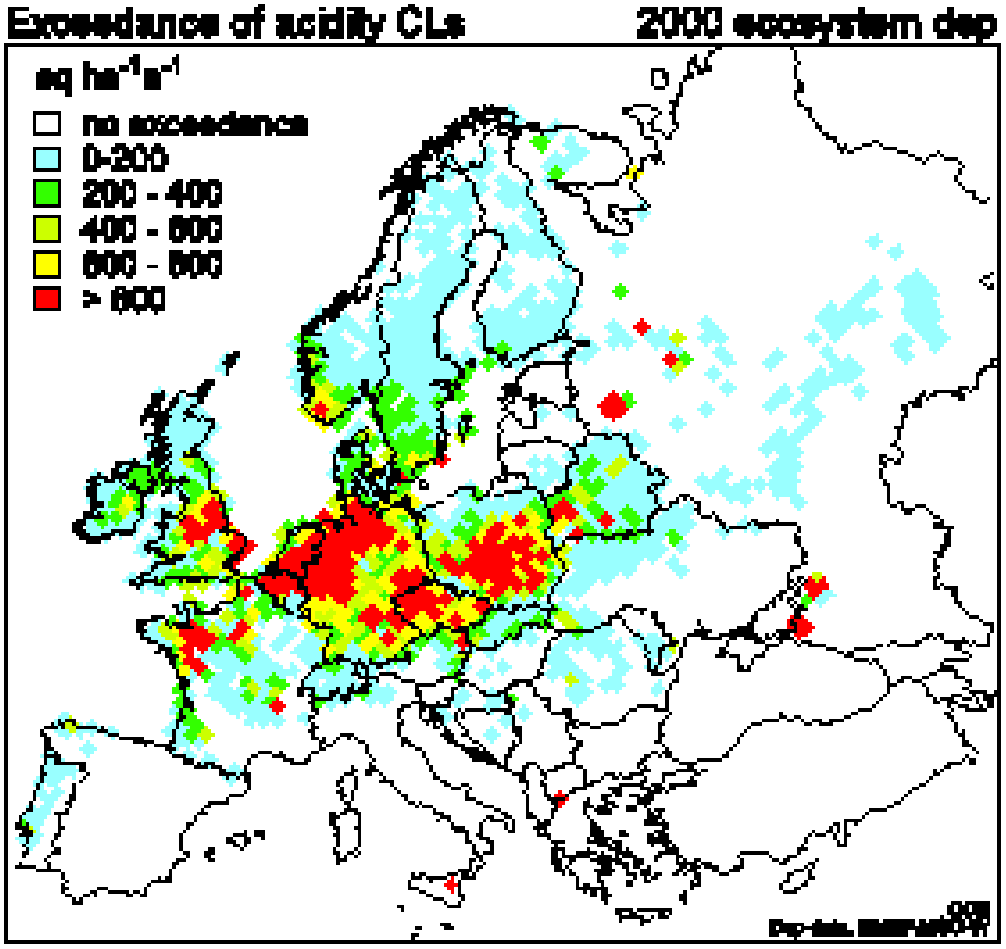
The country-wise barcharts show - as additional illustration to the key message - the progress made and to be expected in each European country.

Fig. 4: Geography of exceedance of the critical loads for eutrophication in 2000 (as Average Accumulated Exceedances)



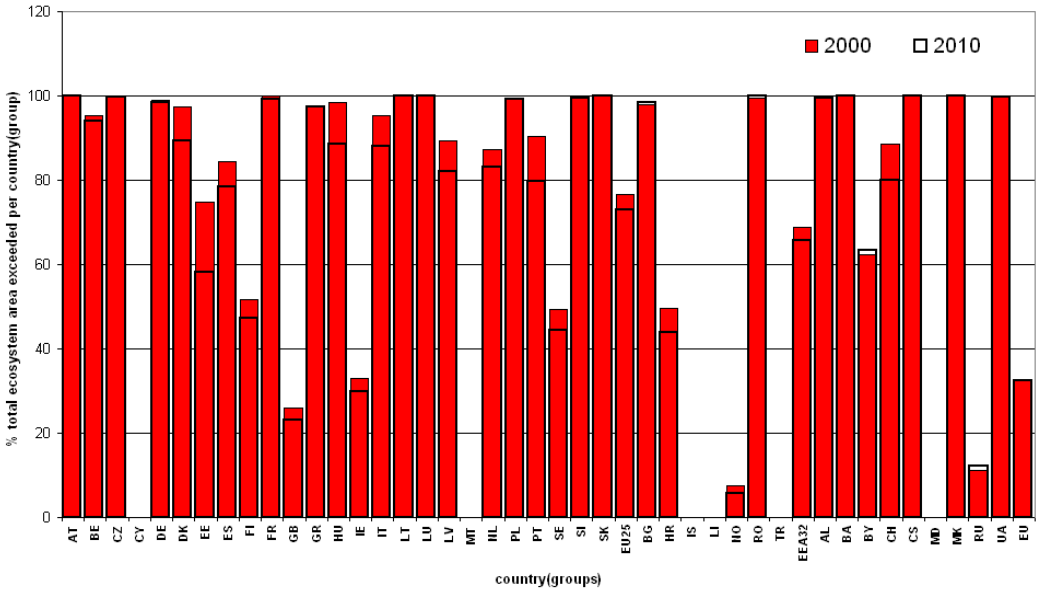
Data source: UNECE - Coordination Center for Effects; Deposition-data: EMEP/MSC-W
Note: Distribution of the magnitude of average accumulated exceedance of the critical loads for eutrophication in 2000.

Fig. 5: Geography of exceedance of the critical loads for acidity in 2000 (as Average Accumulated Exceedances)



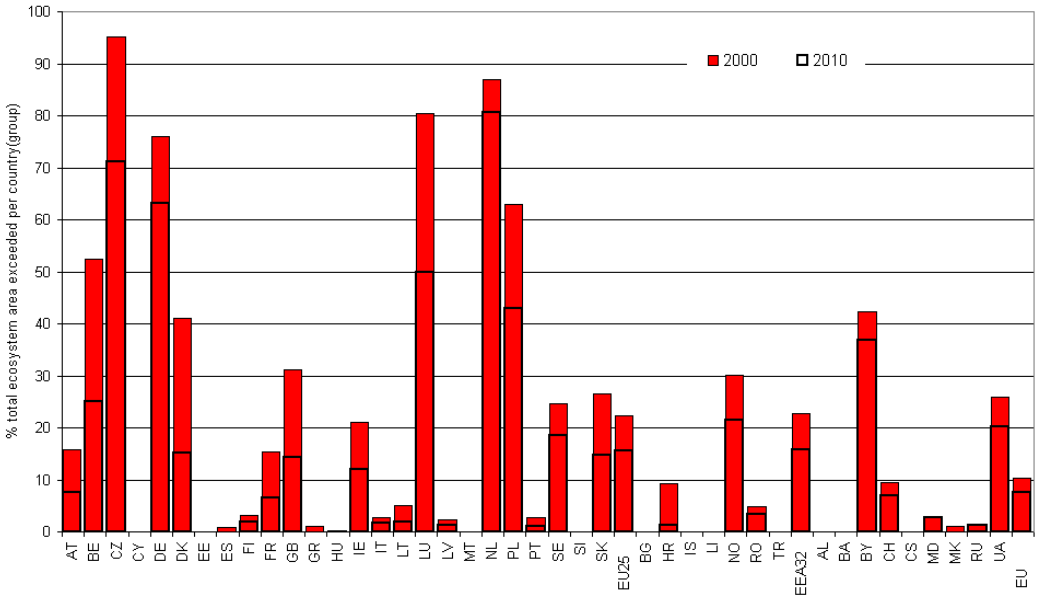
Data source: UNECE - Coordination Center for Effects; Deposition-data: EMEP/MSC-W
Note: Distribution of the magnitude of average accumulated exceedance of the critical loads for acidity in 2000.

Fig. 6: Country-wise ecosystem damage area for eutrophication, 2000 - 2010



Data source: UNECE - Coordination Center for Effects

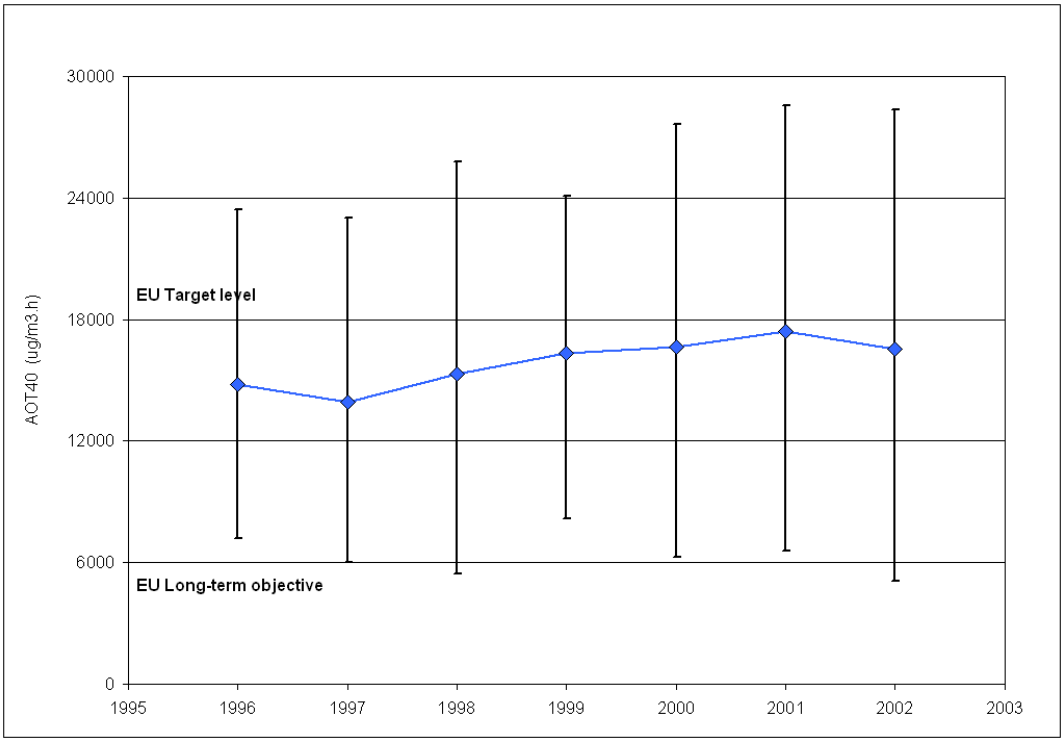
Fig. 7: Country-wise ecosystem damage for acidity 2000 - 2010



Data source: UNECE - Coordination Center for Effects

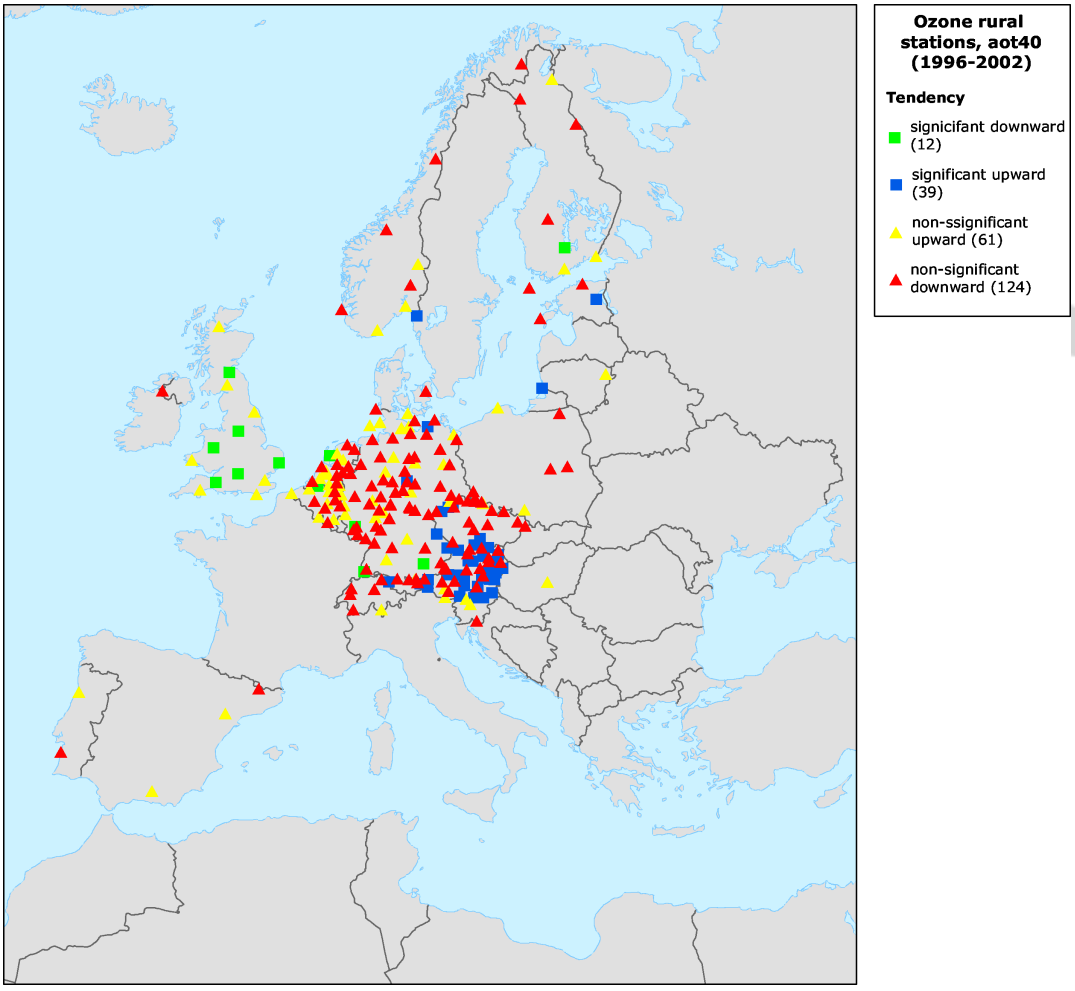
Specific policy question: Which areas of Europe remain most affected by ozone?

Fig. 8: Annual variation in the ozone AOT40 value (May-July)



Data source: Airbase (ETC/ACC)
Note: Average values over all rural stations which reported data over at least six years in the period 1996-2002. The ends of bars indicate the 90th and 10th percentile values.

Fig. 9: Qualitative indication of trends in AOT40 values (May-July) at rural stations



Data source: Airbase (ETC/ACC)
Note: Legend classes:
sign down = signicifant downward tendency
sign up = significant upward tendency
n.s. up = non-ssignificant upward tendency
n.s. down = non-significant downward tendency.