Observatory monitoring framework – indicator data sheet

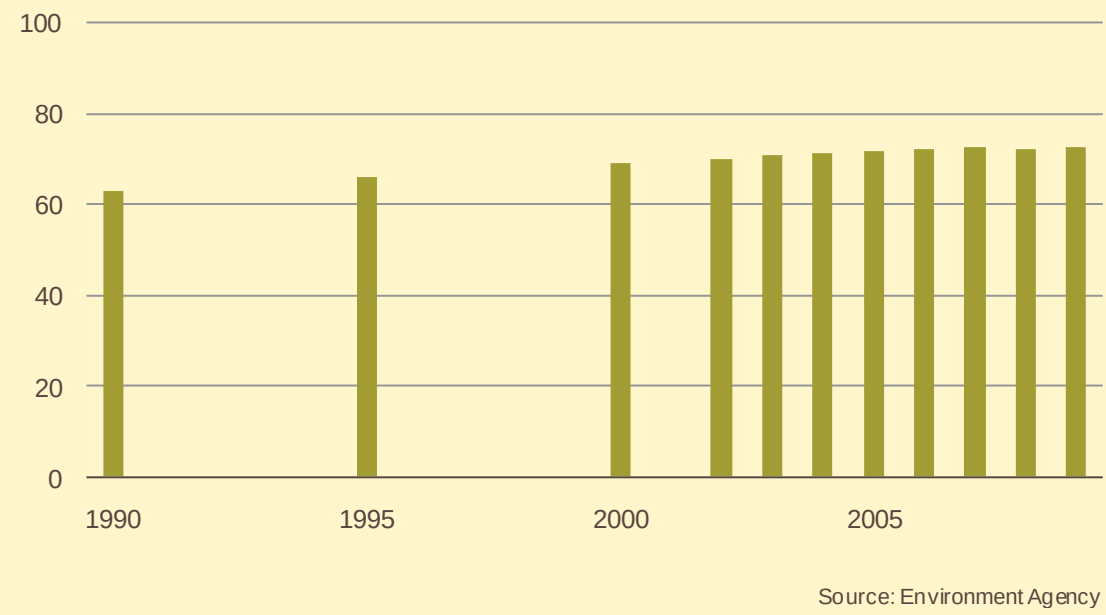
Environmental impact: Water

Indicator DA1: Biological quality of rivers

The EU Water Framework Directive has resulted in the need to change the way in which surface water quality is monitored and reported. It is not currently possible to produce an indicator of water quality that is consistent across the countries of the UK or provides a long-term indicator of change. Defra, the Environment Agency for England and Wales, the Scottish Environment Protection Agency and the Department of the Environment for Northern Ireland are considering reporting options and methodologies. This indicator will be updated once a new methodology has been established. Further details can be found in the accompanying fact sheet.

The biological quality of rivers is a guide to the level of pollution present in the water. This indicator (using a General Quality Assessment (GQA) scheme) shows the proportion of river lengths of good biological quality in England which support diverse aquatic macro-invertebrates and which are likely to also support a complementary length of flora and fauna. The GQA reporting system for river water quality ended in 2009.

DA1 Percentage of total river length of good biological quality in England



Source: Environment Agency

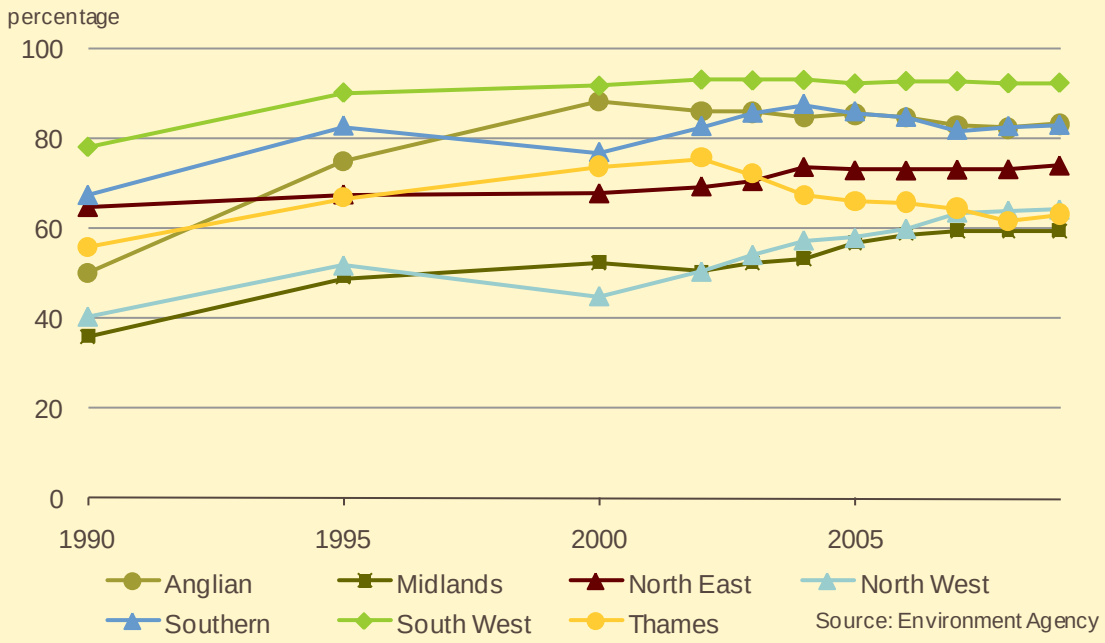
- Between 1990 and 2009, the percentage of total river length in England which was of good biological quality has risen from 63% to 73%.

Regional data

- The biological quality has improved in all regions when compared to 1990. However, there have been gradual declines in the Anglian region (since 2000), Thames region (since 2002) and in the Southern region (since 2004), although there have been improvements in the Southern region in 2008 and in each of these 3 regions in 2009.

- The South West region continues to have the highest percentage of river length of good biological quality with over 92% in 2009. The Midlands Region had the lowest proportion with just under 60%.

DA1a Percentage of total river length of good biological quality in English regions



This indicator was updated in September 2010. This indicator will be updated once a new methodology has been established.

Further information and contact

Background information can be found in the accompanying fact sheet.

This is also a Biodiversity Strategy indicator.

For queries or information on this indicator contact Defra's Observatory team on +44 (0) 1904 455229 or email Observatory@defra.gsi.gov.uk

Observatory monitoring framework – indicator fact sheet

Environmental impact: Water

Indicator DA1: Biological quality of rivers

Indicator	Biological quality of rivers
Data	Percentage of total river length of good biological quality
Geographic coverage	England and Environment Agency Regions
Years	1990, 1995, 2000, 2002 - 2009
Source	Environment Agency
Origin of data	Environment Agency
Updates	This indicator will be updated annually. This indicator will be updated once a new methodology has been established.
Background	The biological quality of rivers, as determined by the composition of invertebrate communities is a guide to the level of pollution present in the water. Assemblages of macro-invertebrates are the most widely used organisms for biological assessment of waters because they are present in water throughout the year, they require a range of different conditions and they respond differently to a range of conditions and pollutants in water. Macro-invertebrates may become established where conditions are favourable or they may move away, perish or fail to colonise in unsuitable habitat. Agriculture, whilst important, is not the only contributor to pollution in surface waters. CAP reform may have resulted in changes to crop choices or management, types and numbers of livestock and management systems which could influence water quality. However, it is difficult to attribute change to a specific cause due to other policy initiatives running concurrently. The Pesticides Voluntary Initiative and Nitrate Vulnerable Zones are already in place. Forthcoming action under the Catchment Sensitive Farming programme aimed at progressing the requirements of the Water Framework Directive, plus uptake of relevant options under Environmental Stewardship, are also likely to contribute to an improvement in water quality, potentially masking any effects of CAP reform.
Statistical & methodological information	The biological quality of rivers is determined through analysis of the number and diversity of aquatic invertebrates in samples of river water, based on known relationships between invertebrate community species composition and water quality. The method relies on a procedure called “River Invertebrate Prediction and Classification System” (RIVPACS), which compares observed data with standards, allowing for the physical characteristics of the river concerned. The general quality assessment (GQA) has six grades, labelled A to F. “Good biological river quality” as shown in this indicator corresponds to Grades A and B. Complete national surveys were carried out in 1990, 1995 and 2002. From 2002, one third of sites are sampled each year so that every site is sampled every three years. The indicator is based on a three year rolling average.

Measures of water quality have been reviewed as part of the implementation of the EU Water Framework Directive (WFD). New monitoring procedures (a 'river basin' monitoring approach) were implemented in 2008; the results are significantly different from the GQA results presented here.

The main differences are:

Under the WFD river basin monitoring approach, the way in which the sample of rivers used is selected has changed, since the sample needs to ensure adequate representation across all river basin districts. Further analysis is required to establish whether robust estimates can be made for Government Office Regions – however, if this is the case, at the same time it should improve our ability to report results by river basin district.

The actual monitoring process has also changed, with the separating out of what will be called "surveillance" monitoring and "operational" monitoring. The former will effectively be the ongoing monitoring at agreed sites, and it will be this which will form the basis of the reported results. In addition, "operational" monitoring will be carried out at sites identified as warranting closer and more frequent monitoring.

The assessment used under the WFD is called "Good Ecological Status" (GES). GES monitoring is risk based and focuses on where there is likely to be a problem, meaning that the figure is derived from the poorest sites. The classification also operates on a „one out all out" principle, where the poorest of the many elements measured drives the overall result. This stringent approach is designed to look at the impact of all pressures, deal with the biggest issues, and drive progress towards GES for all rivers.

The GES results are significantly different from the GQA results presented here and comparisons between the two should be treated with caution. WFD monitoring is risk based and focuses on where there is likely to be a problem, meaning that the figure is derived from the poorest sites. The classification also operates on a „one out all out" principle, where the poorest of the many elements measured drives the overall result. This stringent approach is designed to look at the impact of all pressures, deal with the biggest issues, and drive progress towards GES for all rivers.

The Observatory indicator has a different focus. It is a long-term measure of river water quality, and uses a consistent set of representative monitoring sites and measurements to ensure changes over time are accurately reflected.

It is intended that a common indicator will be developed for the UK, incorporating the new WFD monitoring network and allowing an aggregated UK comparison. This will likely focus on a subset of water quality parameters that have been monitored historically and will continue to be in the future, and will use a consistent pool of monitoring sites (known as "surveillance" sites). This will ensure that a consistent, long-term picture of river water quality is retained.

Further information

This is also an Environment and wildlife statistics indicator:
http://www.defra.gov.uk/statistics/environment/inland-water/

Information on RIVPACS can be found at:
http://www.ceh.ac.uk/products/software/RIVPACS.html

Information on National Statistics for River Water Quality can be found at:
http://www.defra.gov.uk/statistics/files/exp-note-changes.pdf and
http://www.defra.gov.uk/statistics/files/rwq-ind-sus-2009-resultsv2.pdf