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RIVER WATER QUALITY INDICATOR FOR SUSTAINABLE DEVELOPMENT - 2009 ANNUAL RESULTS

The river water quality indicator is one of the 68 indicators of Sustainable Development. It separately measures biological and chemical river water quality on an annual basis and the indicator for each represents the proportion of river water, in terms of river length, which is considered to be of "good" quality.

Headline results

In England:

- 73 per cent of the English rivers surveyed were of good biological quality in 2009. This is a slight increase on 72 per cent in 2008, although there has been little change in recent years.
- 80 per cent of English rivers were of good chemical quality, an increase from 79 per cent in 2008, and the fifth consecutive year of increase.

In Wales:

- Biological quality of the surveyed sites is largely unchanged, with a slight decrease from 88 per cent in 2008 to 87 per cent in 2009. There has been little change since 2007.
- 95 per cent of river length was of good chemical quality in 2009, and has maintained this level since 2005.

Background: river water quality assessments

- For England, Wales and Northern Ireland, results are based on the General Quality Assessment ([GQA](#)) classification, providing separate measures for chemical and biological water quality. Chemical water quality is assessed on dissolved oxygen, ammonia, and [biochemical oxygen demand \(BOD\)](#). In England, BOD ceased to be included from 2007, because it was not viewed as a useful indicator except in the poorest quality rivers and therefore has little effect overall. Biological quality is based on numbers of [macro-invertebrates](#).
- Results for Scotland are based on the [Digitised River Network \(DRN\)](#) and give one overall classification, combining chemical, biological, nutrient and aesthetic quality. Results are presented in the biological and chemical water quality sections below, but direct comparisons with the other countries should be treated with caution due to differences in methodology.
- Following the introduction of the EU's [Water Framework Directive \(WFD\)](#), Scotland and Northern Ireland have focused their attention on the changes in monitoring networks and reporting required for compliance with this. Therefore the latest data available for the indicator are for 2006, but it is intended to develop new indicators incorporating the new networks for all countries for publication next year. Historical data are presented here for information. Also for this reason, the UK level estimate presented is not produced this year.
- For England from 2007, a reduced GQA network was used to focus attention on monitoring for the Water Framework Directive. Results from previous years have been re-calculated using the new methodology but trends are largely unchanged. For Wales, the full GQA network continued to be used.
- As 2009 is the last year for which GQA results are available for England, a new long-term indicator is under development. See 'About the river water quality indicators' below.
- Historical data for England and Wales have been revisited and have been subject to very minor corrections. There will therefore be small differences between historical data in these results and previous annual reports, although trends are unaffected.

Full results

Biological river water quality

In England:

- 73 per cent of river length was of good biological quality in 2009.
- The rivers surveyed have shown little change in recent years, although 2009 is the highest since records began and compares to 63 per cent good quality in 1990.

In Wales:

- 87 per cent of river length was of good biological quality in 2009.
- The biological quality of the rivers surveyed has decreased slightly from 88 percent in 2008, although there has been little change since 2007. Before this, the biological quality of the rivers had shown a particularly large improvement in 2007.

In Northern Ireland:

- In 2006, 54 per cent of river length monitored was of good biological quality.
- There was considerable year-on-year variation and no clear trend since 2000.
- With the introduction of the new network, the length of rivers monitored increased greatly between 1995 and 2000.

In Scotland:

- 88 per cent of monitored river lengths were of good quality in 2006.
- Changes in river length allocations and the extent of monitoring between 1990 and 2005 mean that it is difficult to draw conclusions about longer term Scottish trends, although there has been little change since 2000.

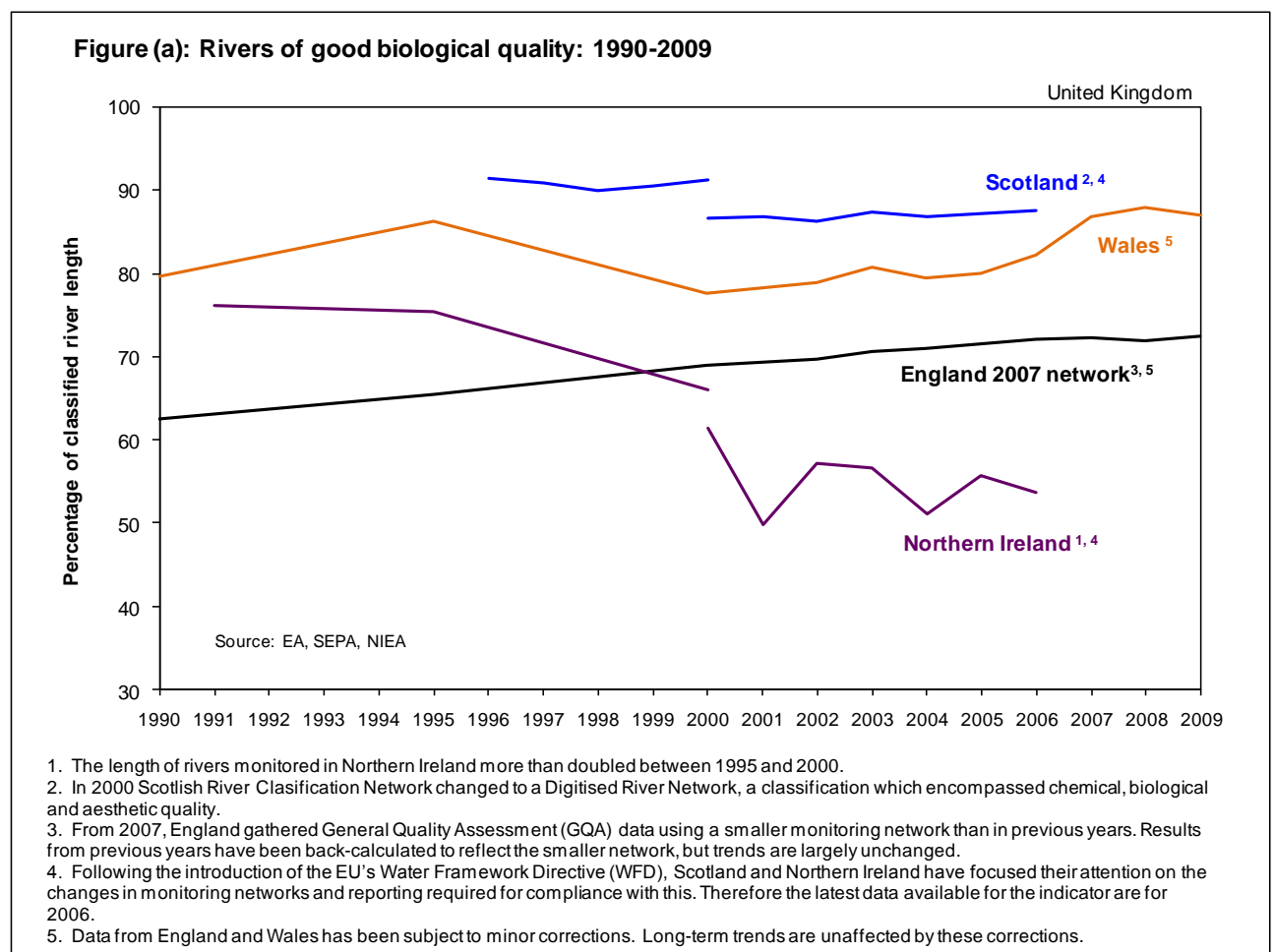


Table A: Biological river water quality Percentage of total river length that is of 'good' quality¹				
Year	England⁶	Wales⁶	N. Ireland²	Scotland³
1990 ⁴	62.6	79.7	76.1	..
1995	65.6	86.3	75.4	..
2000 ²	69.1	77.6	66.1	86.7
2000 ²			61.5	
2001	..	..	49.9	86.9
2002	69.8	78.9	57.3	86.2
2003	70.6	80.7	56.6	87.5
2004	71.1	79.4	51.1	86.8
2005	71.5	80.0	55.7	87.3
2006	72.1	82.2	53.8	87.6
2007 ⁵	72.3	86.9	..	..
2008 ⁵	72.0	88.0	..	..
2009 ⁵	72.5	87.1	..	..

Source: Environment Agency, SEPA, NIEA

Notes:

¹ See Appendix I

² The river length monitored in Northern Ireland more than doubled between 1995 and 2000. Results for 2000 are shown on both bases for comparison, with the older network first.

³ Data for Scotland are a combined measure of chemical, biological, nutrient and aesthetic quality (see Appendix I).

⁴ 1991 in Northern Ireland

⁵ Following the introduction of the EU's Water Framework Directive (WFD), Scotland and Northern Ireland have focused their attention on the changes in monitoring networks and reporting required for compliance with this. Therefore the latest data available for the indicator are for 2006

⁶ Data from England and Wales has been subject to very minor corrections. There will therefore be small differences between historical biological data in these results and previous annual reports, although trends are unaffected.

Chemical river water quality

In England

- 80 per cent of river length was of good chemical quality in 2009. This is the highest since records began.
- Chemical quality has increased every year since 2005. Between 2001 and 2004 there was a decrease, but since 1990 there has been an overall improvement from 55 per cent of river length.

In Wales

- 95 per cent of river length was of good chemical quality in 2009.
- Chemical river water quality has changed little in recent years, but has been consistently over 90 per cent since the mid-1990s.

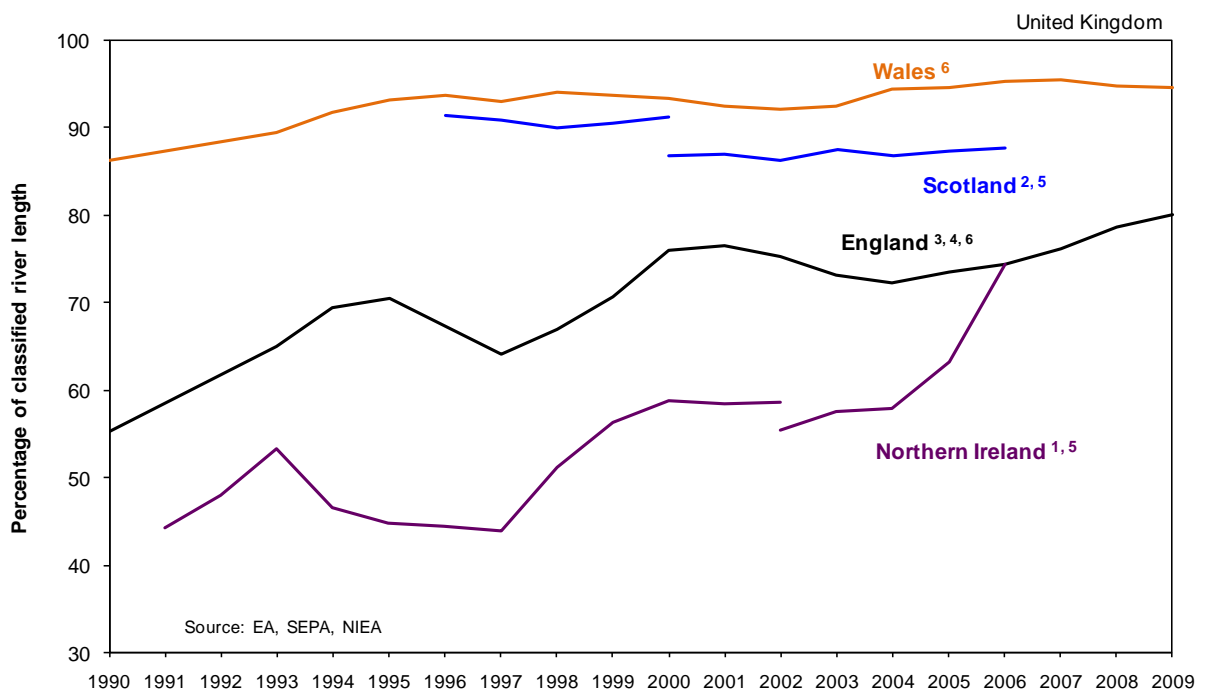
In Northern Ireland

- There are no figures for chemical river quality from 2007 onward because Northern Ireland is focusing on monitoring for the EU Water Framework Directive.
- 74 per cent of river length was of good chemical quality in 2006, a considerable increase from 63 per cent in 2005.
- With the introduction of the new network, the length of rivers monitored increased greatly between 1991 and 1994, and again between 2001 and 2002.

In Scotland

- As with Northern Ireland, there are no figures for chemical water quality from 2007 onward due to attention being focused on monitoring for the Water Framework Directive.
- 88 per cent of river length was of good quality in 2006.
- Chemical water quality has remained largely unchanged 2000, although 2006 represents the highest water quality observed during this time.
- Changes in river length allocations and the extent of monitoring between 1990 and 2005 mean that it is difficult to draw conclusions about longer term Scottish trends.

Figure (b): Rivers of good chemical quality: 1990-2009



1. The length of rivers chemically classified in Northern Ireland increased by about 40 per cent between 1991 and 1994, and by a further 100 per cent (compared with the 1991 network) between 2001 and 2002. For 2002 figures are shown for both networks, the older network first.
2. In 2000 Scottish River Classification Network changed to a Digitised River Network, a classification which encompassed chemical, biological and aesthetic quality.
3. From 2007, England gathered General Quality Assessment (GQA) data using a smaller monitoring network than in previous years. Results from previous years have been back-calculated to reflect the smaller network, but trends are largely unchanged.
4. From 2007, Biochemical Oxygen Demand (BOD) ceased to be monitored in England for the purposes of assessing chemical water quality.
5. Following the introduction of the EU's Water Framework Directive (WFD), Scotland and Northern Ireland have focused their attention on the changes in monitoring networks and reporting required for compliance with this. Therefore the latest data available for the indicator are for 2006.
6. Data from England and Wales has been subject to minor corrections. Long-term trends are unaffected by these corrections.

Table B: Chemical river water quality
Percentage of total river length that is of 'good' quality¹

Year	England ⁶	Wales ⁶	N. Ireland ²	Scotland ³
1990 ⁴	55.2	86.3	44.3	..
1995	70.5	93.2	44.7	..
2000	75.9	93.4	58.8	86.7
2001	76.5	92.5	58.4	86.9
2002 ²	75.3	92.2	58.6	86.2
2002 ²			55.4	
2003	73.1	92.5	57.6	87.5
2004	72.2	94.4	57.9	86.8
2005	73.4	94.7	63.1	87.3
2006	74.4	95.3	74.3	87.6
2007 ⁵	76.1	95.5	..	..
2008 ⁵	78.5	94.8	..	..
2009 ⁵	80.0	94.7	..	..

Source: Environment Agency, SEPA, NIEA

Notes:

¹ See Appendix I

² The length of rivers chemically classified in Northern Ireland increased by about 40 per cent between 1991 and 1994, and by a further 100 per cent (compared with the 1991 network) between 2001 and 2002. For 2002 figures are shown for both networks, the older network first.

³ Data for Scotland are a combined measure of chemical, biological, nutrient and aesthetic quality (see Appendix I).

⁴ 1991 in Northern Ireland

⁵ Following the introduction of the EU's Water Framework Directive (WFD), Scotland and Northern Ireland have focused their attention on the changes in monitoring networks and reporting required for compliance with this. Therefore the latest data available for the indicator are for 2006.

⁶ Data from England and Wales has been subject to minor corrections. There will therefore be small differences between historical biological data in these results and previous annual reports. Long-term trends are unaffected by these corrections.

Further information: About river water quality indicators

The river water quality indicator is one of [68 Sustainable Development Indicators](#).

After publishing the 2006 results, the environment agencies in Scotland ([SEPA](#)) and Northern Ireland ([NIEA](#)) ceased monitoring for this indicator to focus resources on monitoring for the [Water Framework Directive](#) (see below). There are therefore no data from Scotland or Northern Ireland from 2007 onwards.

In England and Wales GQA continued in parallel with WFD monitoring.

Impact of the Water Framework Directive

- New monitoring schemes are now in place which allow the UK, through its separate environmental agencies, to monitor and assess river water quality in accordance with the EU's [Water Framework Directive \(WFD\)](#), which was adopted by all Member States in 2000.
- Under this Directive, a “river basin” approach has been introduced to monitoring, in place of the previous regional approach, and greater emphasis has been placed on “ecological” objectives. The assessment under the WFD is therefore referred to as [Good Ecological Status \(GES\)](#). A target has been set, with all rivers required to be of “good” quality by 2015, although subject to certain exemptions.
- In 2008, 25 per cent of rivers in England and 29 per cent in Wales had achieved GES. 2009 results will be published by the Environment Agency in October.
- 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 Sustainable Development 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.

Future changes to the long term indicator

- 2009 is the final year for GQA monitoring for England, with the focus now being on the WFD. This means that a new long-term measure is required, drawing on the monitoring undertaken for the WFD. 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.

Appendix I - Notes

1. The river water quality indicator is one of the 68 indicators of Sustainable Development. All 68 indicators are published online in [Measuring Progress: Sustainable Development Indicators 2010](#).

2. To find out more about UK water quality policy, please visit [Defra's Water Quality website](#).

3. Historical data from the Environment Agency for England and Wales have been subject to minor revisions.

4. More detailed results and descriptions of the current monitoring methods and river networks are available as follows:

[Environment Agency for England and Wales research pages](#)

[Scottish Environmental Protection Agency \(SEPA\) water pages](#)

[Northern Ireland Environment Agency \(NIEA\) water management pages](#)

5. Chemical data from rolling three-year sampling windows are presented to reduce the bias which might be caused by unusual weather conditions in any one year. In Scotland, from 1996-2006, an overall classification ([Digitised River Network](#)) was used combining chemical, biological, nutrient and aesthetic quality. The Scottish classification system and criteria for determining which river lengths should be monitored are different from the other countries. Comparisons between Scotland and other countries should therefore be treated with caution.

6. Historically in England, Wales and Northern Ireland, three measurements were used for chemical quality classification: biochemical oxygen demand, dissolved oxygen and ammonia. However, biochemical oxygen demand ceased to be monitored in England from 2007. Therefore the backdated chemical quality data using the smaller 2007 monitoring network does not consider biochemical oxygen demand.

7. Biological testing provides a fuller picture of the health of rivers and canals. Biological grading is based on monitoring tiny animals (called macro-invertebrates) living in or on the river bed. Species groups recorded at a site are compared with those which would be expected to be present in the absence of pollution, allowing for the different environmental characteristics in different parts of the country.

8. In Scotland, iron and pH were also included in chemical monitoring in addition to the other three measurements. Biological (ecological) grading was similar to that used in the other countries. The final allocation of the quality class assigned to a river stretch is based on the lowest class determined from chemical, biological, aesthetic and toxicity assessments available for the associated monitoring point.

9. For this indicator 'Good' in England, Wales and Northern Ireland is taken as corresponding to GQA classes A and B. For Scotland, 'Good' is taken as corresponding to Scottish Classes A1 and A2 plus unclassified river stretches. Unclassified river stretches

are mostly located in rural upland catchments, and have been increasingly brought within the scope of monitoring since 2000.

Glossary

- **Biochemical Oxygen Demand (BOD):** A measure of the organic quality of water, obtained by determining the amount of dissolved oxygen needed by aerobic biological organisms to break down organic material present in a given water sample at a certain temperature over a specific time period.
- **Digitised River Network (DRN):** The river network in Scotland that has been monitored since 2000. Further details on the DRN can be found on [SEPA's science and research website](#).
- **General Quality Assessment (GQA):** A system of assessing river water quality over time. Quality is assessed in terms of chemistry, biology and nutrient levels. Rivers are graded "Good", "Fair", "Poor" or "Bad".
- **Good Ecological Status (GES):** A risk-based assessment method arising from the Water Framework Directive (WFD). A water body is considered to have "good ecological status" if it satisfies criteria (e.g. pollutant levels, river level) set out by the WFD. The variables that need to be measured in order to obtain Good Ecological Status may change over time.
- **Macro-invertebrates:** Tiny animals that can be seen with the naked eye. We know which kinds of macro-invertebrates are sensitive to which kinds of pollution. Therefore, we can use the presence and quantity of different kinds of macro-invertebrate as an indicator of biological water quality.
- **Water Framework Directive (WFD):** The European Union's WFD aims to make polluted water clean again and to keep clean waters in that state. It works at the level of river basins, which can cross administrative boundaries. For more information, see the [European Commission Water](#) pages.

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