

National Statistics for River Water Quality - forthcoming changes

Due to changes in the way in which river water quality is assessed in the UK, this will be the last year for which the river water quality indicator will be based on the General Quality Assessment (GQA) monitoring process. A different approach to monitoring has been introduced across the UK, and a new indicator will be introduced to replace the current one.

The following Q & A briefing explains the reasons underlying the forthcoming changes, what the differences will be, and how the results will be presented differently in future.

Q Why are we changing the monitoring process underlying the results?

A Under new EU legislation, the UK is required to implement what is called the "Water Framework Directive". This has been introduced across the EU in order to provide a consistent approach to managing and monitoring environmental water quality across all Member States.

Q What is the Water Framework Directive?

A A new European Water Policy has been introduced across the EU, with the aim of getting polluted waters clean across all Member States, and ensuring that clean waters are kept clean. The Water Framework Directive, adopted in 2000, will be the operational tool underlying this policy, and will set the objectives for water protection for the future. This Directive is the most substantial piece of water legislation from the EC to date, and has been introduced in response to increasing demand by citizens and environmental organisations for cleaner rivers and lakes, groundwater and coastal beaches. This demand is one of the main reasons why the Commission has made water protection one of the priorities of its work.

The Directive requires that all inland and coastal water bodies reach at least "good" status by 2015 – subject to certain exemptions, which allow alternative objectives to be set in cases where it is technically unfeasible or disproportionately expensive to achieve good status. It is doing this by establishing a "river basin planning" process, based on a "river basin district" structure, within which demanding environmental objectives have been set, including ecological targets for surface waters. The monitoring process also covers a wider range of quality measures than before.

Within each river basin district, the Directive requires that a "river basin management plan" is established and updated every six years. The Directive therefore sets a framework which should provide substantial benefits for the long term sustainable management of water.

Within the UK, it is expected that the Water Framework Directive will:

- improve inland and coastal waters, and reduce diffuse pollution in urban and rural areas, especially through better land management;
- drive wiser, sustainable use of water as a natural resource; and
- create better habitats for wildlife that lives in and around water

The Directive came into force on 22nd December 2000. In accordance with the agreed implementation timetable, monitoring under the Directive commenced on 22nd December 2006.

Q *So what will be different for the UK?*

A As a result of the Water Framework Directive, the way in which river water quality is assessed is in a transitional phase. The introduction of a “river basin” approach will mean that the regional spread of rivers being monitored will change, so that “catchment areas” are now used as the basis for managing and monitoring. A river “catchment” is effectively a hierarchy of watercourses dependent on each other, and a “river basin” considers these as a whole. There will also be a greater focus on the “ecological” status of rivers, as opposed to the current separate focus on chemistry and biology.

In addition, the UK will be required to achieve “good” status for all water bodies by 2015, subject to certain exemptions as previously mentioned. What “good” status actually means is that it will meet a defined standard which has been agreed based on an EU-wide calibration exercise.

Q *What monitoring system has been used up to now, and what was actually monitored?*

A River water quality in the UK is monitored using a sampling approach. It is not feasible to sample every single stretch of river, and so a sample of rivers at specific locations is selected which is deemed to be representative of all rivers.

Up to now, the selection of sites included in the sample has been based on the regional breakdown which has historically been applied across the UK – this ensured that the sample of rivers selected for inclusion in the indicator was such that it incorporated a geographical spread of sampled sites across the UK, so that all regions were roughly equally represented.

In terms of the actual water quality “testing” being undertaken, monitoring of river water quality within the UK is a devolved matter, and consequently different methodologies are used in England, Wales, Scotland and Northern Ireland.

In England, Wales and Northern Ireland, river water quality has been monitored since 1990 under the General Quality Assessment (GQA) monitoring programme, although this ceased in Northern Ireland in 2006.

GQA monitoring covers both the biological and the chemical aspects of water quality, as well as looking at the presence of nutrients.

Historically under the GQA system, three measurements are used for chemical quality classification: biochemical oxygen demand (BOD), dissolved oxygen and ammonia. All three measurements continue to be monitored in Wales, but since 2007 biochemical oxygen demand has not been monitored in England because it was not viewed as a useful indicator except in the poorest quality rivers and therefore has little effect overall..

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.

It is, however, generally considered that biological testing provides a fuller picture of the health of rivers and canals. Biological grading under the GQA system is based on monitoring what are called “macro-invertebrates” (i.e. tiny animals) 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.

In Scotland, from 1996 to 2006, an overall classification has been used combining chemical, biological, nutrient and aesthetic quality, although with iron and pH also being included in the chemical monitoring alongside the three GQA measurements used elsewhere. This has resulted in a single measure being derived for water quality. 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.

Following the introduction of the EU’s Water Framework Directive (WFD), Scotland and Northern Ireland have focused their attention on the large changes in monitoring networks and reporting required for compliance with this. Therefore the latest data available for the current indicator are for 2006, but it is intended to develop new indicators for all countries incorporating the new networks for next year’s publication.

Q *What is the new monitoring system, and what are the key changes?*

A 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.

Q How do the results differ under the new monitoring system?

- A 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.

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.

Q *Will it be possible to make direct comparisons between results from the old and new monitoring systems?*

- A Other than in Scotland and Northern Ireland, monitoring continued using the GQA network, although with a reduced number of sites in England. This is the final year in which GQA results will be published. This is in

order to free up resources to enable the implementation of WFD monitoring.

The WFD reporting timescales are such that we hope to present a meaningful UK indicator of results from the WFD network during 2010; however, because of the many differences between the GQA and WFD monitoring systems, it is thought a direct comparison between the old and new monitoring systems will not be possible.

Further analysis will try to understand the impact of the change to WFD monitoring by investigating observed changes in the indicators, establishing which changes are simply due to the change in methodology and which represent a genuine change in water quality over time.

Once these changes are understood and sufficient results are available a new indicator will replace the existing indicator, with an aim to publish in 2010

Q *The full UK results are currently a combination of England, Wales, Scotland and Northern Ireland. Does the WFD impact on all these countries in the same way, and has a common approach been agreed in respect of how the changes will be addressed?*

A Water quality is a devolved issue. Historically, different approaches to monitoring exist: for example, Scotland had a different monitoring system to the rest of the UK

In respect of the monitoring programme required by the WFD from now on, through the UK Technical Advisory Group (UKTAG), a common approach to monitoring water bodies has been agreed by all the UK agencies. A classification report has been jointly developed and is now available. This is the first time that a common approach to monitoring and classification of the aquatic environment has been developed for the UK.

UKTAG consists of experts from the UK conservation and environment agencies (EA, SEPA and NIEA) and the Department of Environment and Local Government for the Republic of Ireland, and was established in 2001 to provide co-ordinated advice on technical aspects of the implementation of the WFD.

Q *Where can I find out more about the Water Framework Directive?*

A Further details can be found on the [Defra website](#).

In respect of England & Wales, the [Environment Agency](#) website also provides more information.

For Scotland, further information can be found on the [Scottish Environment Protection Agency](#) website.

For Northern Ireland, further detail can be found on the [Environment & Heritage Service Northern Ireland](#) website.

The [UKTAG](#) website also provides further information on monitoring and classification.