

European bathing water quality in 2012

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Foreword

Europe has a wide diversity of beautiful beaches and bathing areas, and every year millions of Europeans spend their weekends at their local beaches or their holidays cooling down by the water. As this year's bathing season approaches, many citizens have a keen interest in the quality of bathing waters. The European Environment Agency (EEA) and the European Commission are therefore pleased to present this year's bathing water report, which will help Europeans make informed choices about the bathing sites they visit.

The efforts of the European Union to ensure clean and healthy bathing waters started with the first Bathing Water Directive in 1975. This was followed by a new bathing water directive in 2006, which updated the measures of the 1975 legislation and simplified its management and surveillance methods. This new directive also provides for better and earlier public information about bathing water quality. In the 2012 bathing season, all EU Member States, as well as Croatia and Switzerland followed the monitoring, and reporting requirements of the new bathing water directive.

The overall message of this report is that in 2012 bathing waters in Europe remained at the high level of quality reached in prior seasons. Up to 94 % of bathing waters met the minimum water quality standards set by the EU directives. The percentage of bathing waters with excellent quality stayed at the same level as in 2011, reaching 78.3 %. The share of non-compliant bathing waters was 1.9 %.

We all want to know the quality of our local bathing area. Importantly the 'Water Information System for Europe' (WISE) and the WaterWatch web application on the EEA's Eye on Earth website gives people this critical information. On the website, people can check bathing water quality at the 22 000 coastal

beaches and freshwater bathing sites across Europe. The data can be viewed on an interactive map, sorted for a selected country or region, and compared with data from previous years.

The two-way flow of this information will allow citizens to become more actively involved in the protection of their environment and help protect and improve Europe's bathing areas. We will also be listening to citizens' concerns about the quality of beaches, compiling their observations of marine litter.

In addition to needing good quality water for bathing, we also need clean unpolluted water for our ecosystems and our domestic and industrial water uses. Having excellent bathing water quality does not necessarily imply that the water quality is good enough for our ecosystems. We need to manage our water resources well in order to sustain human and economic development and improve the essential functions of our water ecosystems. This can be achieved with more integrated and sustainable water resource management, as presented in the Commission's 'Blueprint to safeguard Europe's water resources'. Good management of our water resources also means fully implementing the Water Framework Directive, with the aim of achieving 'good status' for all water bodies by 2015.

We encourage readers to make full use of all the information sources presented in this publication.

We wish you a good summer!

Janez Potočnik
European Commissioner for the Environment

Jacqueline McGlade
Executive Director, European Environment Agency

Executive summary

Every year, millions of Europeans take advantage of the continent's wonderful selection of beaches, rivers, and lakes for a relaxing holiday or a day out. It is vitally important that they know the quality of the water they are swimming in, and that they do not jeopardise their health. The European Environment Agency (EEA) and the European Commission hope that this year's bathing water report will encourage Europeans to enjoy bathing areas near them, and assist them in planning their trips further afield.

This report provides a comprehensive synopsis of the quality of bathing waters in the Member States of the European Union in the 2012 bathing season. It thereby gives an indication of the areas where the quality of bathing is expected to be good if not excellent during 2013. The report also shows the evolution of bathing water quality from 1990 to 2012.

Of the more than 22 000 bathing areas monitored throughout Europe in 2012, more than two thirds were in coastal waters and the rest were in rivers and lakes. In the 2012 bathing season, the monitoring of bathing sites has been adjusted to the provisions in the EU's new bathing water directive (Directive 2006/7/EC). The sampling of water quality in most of the bathing water sites meets the frequency standards (this involves a pre-season sample of the water quality, followed up by monthly samples thereafter).

As regards assessment, the provisions in the new bathing water directive have been applied in 19 European countries (18 Member States and Croatia). This involved taking data from four years of monitoring to make the 2012 assessment. For the remaining ten countries, the 2012 assessment has been carried out under a set of transitional rules that do not yet meet all the requirements of the new directive using the results from the 2012 monitoring.

In 2012, the quality of 94 % of all bathing waters met at least the minimum 'mandatory' level (corresponding to a rating of sufficient quality under

the new directive). Bathing water quality increased by 1.8 percentage points compared with results from 2011, and increased by 2.5 percentage points compared to 2010. There has also been a marked decline compared with 2011 in the number of bathing waters that were closed or that prohibited bathing.

In 2012, 95.3 % of coastal bathing waters in the EU-27 achieved the minimum quality standards requested by the EU directives — an increase of 2.0 % compared with 2011. The share of coastal bathing waters with excellent quality (or complying with the guide values) in 2012 reached 81.2 % (an increase of 0.9 % from 2011).

The percentage of inland bathing waters with excellent quality is 72 % in 2012, a 1.6 % increase from 2011. In 2012, 91 % of inland bathing waters in the European Union had good or sufficient quality. This is a 1.0 % point increase from 2011. Only 2.3 % of inland bathing waters in the EU did not satisfy the minimum quality level. This is 0.1 % decrease from the previous year, continuing the slow but steady reduction in the percentage of poor quality bathing waters.

Five countries had all their bathing waters classified as compliant with at least mandatory values (i.e. no poor quality bathing sites were found): Cyprus, Luxembourg, Malta, Slovenia and Romania.

Ten countries reached compliance levels with excellent quality (or complying with the guide values) that were above the EU average (78.3 %): Cyprus (100 %), Luxembourg (100 %), Malta (96.6 %), Croatia (95.3 %), Greece (93.3 %), Germany (88.1 %), Portugal (86.7 %), Italy (85.1 %), Finland (83.4%) and Spain (82.8 %). However, some of these countries also had some non-compliant bathing waters.

The highest rates of non-compliant or poor bathing waters were found in Belgium (13.0 %), the Netherlands (6.5 %), the United Kingdom (5.7 %), Spain (3.8 %) and Denmark (3.1 %).

1 Europeans demand safe bathing waters

Diving into refreshing waters is one of the pleasures of summer for millions across Europe, and as temperatures rise, thoughts turn to the beach. But choosing between the many thousands of lakes, rivers and beaches across the continent can be difficult. This report aims to help all bathers find high quality bathing water across their region.

Since 2009, the European Environment Agency (EEA) and its European Topic Centre on Inland, Coastal and Marine Waters have annually been



Photo: © Peter Kristensen

preparing a report on the quality of coastal and inland bathing areas. This report provides a comprehensive synopsis of the quality of bathing waters in the Member States of the European Union — and also in Croatia and Switzerland — in the 2012 bathing season. It thereby gives an indication of the areas where the quality of bathing is expected to be good during 2013. It also shows the evolution of bathing water quality from 1990 to 2012.

The period during which bathers can be expected in bathing areas depends largely on local bathing rules and weather conditions. A bathing season can also vary within a Member State. In many European countries the bathing season usually runs from the end of May until the end of September.

The first European bathing water legislation, in the form of the Bathing Water Directive ⁽¹⁾ was adopted in 1975 and came into force in 1976. Its main objectives were to safeguard public health and protect the aquatic environment in coastal and inland areas from pollution. Swimming pools and waters for therapeutic purposes were not covered by this directive.

New European legislation on bathing waters (the 'new' Bathing Water Directive) was adopted in 2006 ⁽²⁾, and will be fully in force by end of 2014. This 'new' directive updates the measures of the 1975 legislation and simplifies its management and surveillance methods. It provides for more, better and earlier public information about bathing water quality. It also requires the creation of bathing water profiles, which describe bathing waters, and any potential impacts and threats to their water quality. These serve both as sources of information for citizens and as a management tool for the responsible authorities.

⁽¹⁾ Council Directive 76/160/EEC of 8 December 1975 concerning the quality of bathing water.

⁽²⁾ Directive 2006/7/EC of the European Parliament and of the Council of 15 February 2006 concerning the management of bathing water quality and repealing Directive 76/160/EEC.

2 EU bathing water legislation and its implementation in 2012

In the 2012 bathing season, the monitoring of bathing sites has been adjusted in order to comply with the provisions in the EU's new bathing water directive (Directive 2006/7/EC). Countries identified national bathing waters, defined the length of the bathing season, and established a monitoring calendar for each bathing water site before the start of bathing season. They ensured that the analysis of bathing water quality took place in accordance with the reference methods specified in the directive.

2.1 Monitoring of bathing water quality

During the bathing season, samples from the coastal and inland bathing waters are taken and analysed. The laboratories count the number of certain types of bacteria, which may indicate the presence of pollution, usually originating in sewage or livestock waste. The results of the analysis are used to assess the quality of the bathing waters concerned and to provide information to the public on the quality of the water in the bathing sites concerned. The local results are usually compiled at national level and sent to the EEA.

A monitoring calendar has to be established for every bathing water site before the start of the season. The monitoring calendar sets fixed dates for the collection of samples. Additional samples may be taken, such as those collected to confirm water quality after heavy rain or those collected on the basis of warnings from users.

European countries have identified 22 184 bathing waters in 2012, out of which 20 930 are in the 27 EU Member States. Croatia and Switzerland have also monitored and reported on the quality of their bathing waters. A total of 26 countries reported inland bathing sites on lakes and rivers. There were no inland bathing waters reported in Cyprus, Malta and Romania. Less than 10 inland bathing water sites were reported in each of Bulgaria, Greece, Ireland and Croatia.

The number of bathing water sites monitored by EU Member States in 1990 was 7 539 (in seven

Member States), and in 1991 the figure was 15 075 (in 12 Member States). In the last five years, the number of bathing water sites that have been monitored has ranged between 20 600 and 21 500 (Figure 2.1). In 2012, the 27 EU Member States reported 20 930 bathing waters, of which more than two thirds (69 %) were coastal bathing waters. More than a quarter of all bathing water sites are located in Italy (5 509) and 16 % (3 322) are in France.

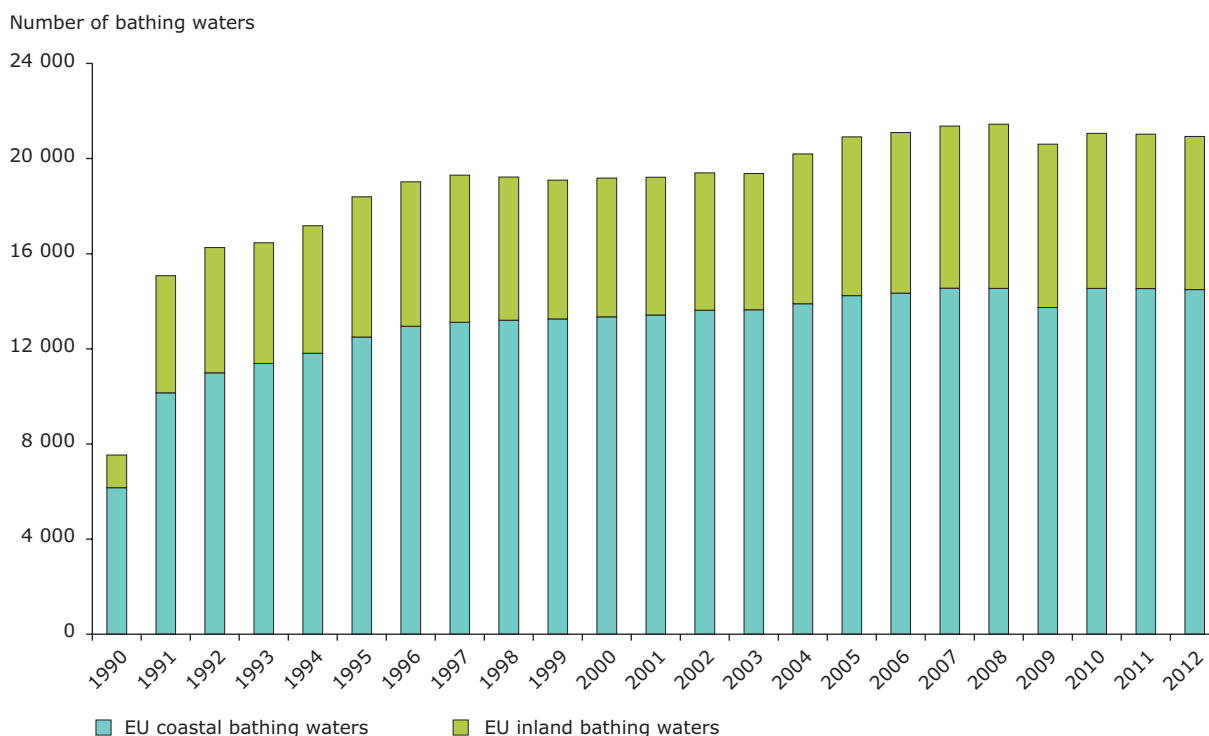
Almost half of all EU coastal bathing water sites are located in Italy (34 %) and Greece (15 %), and half of inland bathing water sites are in Germany (30 %) and France (20 %).

2.2 Assessment of bathing water quality

Member States are obliged to provide the results of their samples to the European Commission before 31 December of the same year that they took the samples. Before the start of the bathing water season the following year, the Commission, together with the European Environment Agency, publishes a Europe-wide report on the result. The information on the quality of European bathing waters in this report is based on an assessment of the data reported by countries in 2012.

All countries monitor and report the measured values of concentrations in their bathing waters of two microbiological parameters — intestinal enterococci and *Escherichia coli* (also known as *E. coli*). The assessment of bathing water quality under the new directive makes use of the values of these two parameters obtained in four consecutive years. In 2012, for instance, data from 2009 to 2012 are used. The new directive also requires that bathing water is sampled before the start of the bathing season (and that this sample be included in the assessment) and that further sampling is done at least once per month during the course of the bathing season. The assessment methodology for bathing water quality in the 2012 season is further described in Box 2.1. For the 2012 season, bathing water quality has been assessed under the new

Figure 2.1 Total number of bathing waters reported in the European Union since 1990



Source: WISE bathing water quality database (data from annual reports by EU Member States).

Box 2.1 Assessment methodology for bathing water quality in the 2012 season

Assessment during the transition period

Assessing bathing water quality under the new bathing water directive requires a data set spanning four consecutive years. While those data are being compiled, the rules for the transition period are applied. This means that the classification of bathing waters is defined on the basis of concentrations of intestinal enterococci and *Escherichia coli* reported under Directive 2006/7/EC in year 2012 only. The parameter intestinal enterococci is evaluated according to the guide value (the highest standard, corresponding to a rating that would classify a water body as having 'excellent' quality) for the faecal streptococci parameter given in Directive 76/160/EEC. The parameter *Escherichia coli* is evaluated according to the mandatory and guide values for the parameter faecal coliforms given in Directive 76/160/EEC. The results are classified in the following three categories: Compliant with the mandatory value (CI); compliant with the stricter guide values (CG); or not compliant with the mandatory value (NC) of the Directive 76/160/EEC.

Assessment under the new bathing water directive (2006/7/EC)

When four consecutive years of samples of intestinal enterococci and *Escherichia coli* for bathing water are available, the assessment is done according to assessment rules of the new bathing water directive. The directive requires a sample to be taken shortly before the start of the bathing season, and states that the minimum number of samples taken per bathing season is four (if the bathing season is less than eight weeks long, then three samples are sufficient). Sampling dates are to be distributed throughout the bathing season, with the interval between sampling dates never exceeding one month.

The EEA has checked that these requirements for a pre-season sample and monthly samples thereafter have been met for all bathing waters for the 2012 season. Where these requirements have not been met, the bathing water has been classified as 'insufficiently sampled'.

Bathing waters that meet the sample frequency standard are classified as 'excellent', 'good', 'sufficient' or 'poor' quality. Some bathing waters cannot be classified according to their quality but are instead classified as 'closed (temporarily or throughout the bathing season)', 'new' (classification not yet possible), or 'changes' (classification not yet possible after changes).

bathing water directive in 19 European countries, including Croatia. Bathing water quality in the other ten countries has been assessed under a set of transitional rules, since the full set of data sampled according to the rules new directive going back four years is not yet available for these countries.

Table 2.1 shows the number of bathing waters identified in each European country and the number of bathing waters permanently closed (for which a permanent prohibition has been issued). In the 2012 season, the EU Member States have identified 137 new bathing water sites, and permanently closed 214 bathing water sites. Croatia and Switzerland reported 15 new bathing water sites.

Table 2.1 Number of identified bathing waters in Europe in 2012 by countries, and assessment method for bathing water quality in the 2012 season

Country	Assessment method in 2012	Number of bathing waters identified in 2012	Number of <i>newly</i> identified bathing waters	Number of permanently closed bathing waters (identified in 2011, but not in 2012)
AT (Austria)	Transition	266	2	3
BE (Belgium)	New	123	0	0
BG (Bulgaria)	Transition	93	0	0
CY (Cyprus)	New	112	0	1
CZ (Czech Republic)	New	160	1	26
DE (Germany)	New	2 295	11	28
DK (Denmark)	New	1 090	6	46
EE (Estonia)	New	54	1	2
ES (Spain)	New	2 156	11	7
FI (Finland)	New	320	0	5
FR (France)	Transition	3 322	24	15
GR (Greece)	New	2 155	0	0
HU (Hungary)	New	232	2	3
IE (Ireland)	Transition	136	1	1
IT (Italy)	Transition	5 509	19	26
LT (Lithuania)	New	114	5	5
LU (Luxembourg)	New	11	0	9
LV (Latvia)	New	46	0	0
MT (Malta)	New	87	0	0
NL (Netherlands)	New	696	14	8
PL (Poland)	Transition	221	12	26
PT (Portugal)	New	526	11	0
RO (Romania)	Transition	49	0	0
SE (Sweden)	New	448	3	0
SI (Slovenia)	Transition	47	0	0
SK (Slovakia)	New	33	0	1
UK (United Kingdom)	Transition	629	14	2
EU		20 930	137	214
CH (Switzerland)	Transition	335	5	0
HR (Croatia)	New	919	10	0
Europe		22 184	152	214

Note: 'New' indicates assessment under Directive 2006/7/EC. 'Transition.' indicates assessment under the transition period rules.

Source: EEA.

3 Bathing water quality and trends in the 2012 season

3.1 Overall bathing water quality in the European Union

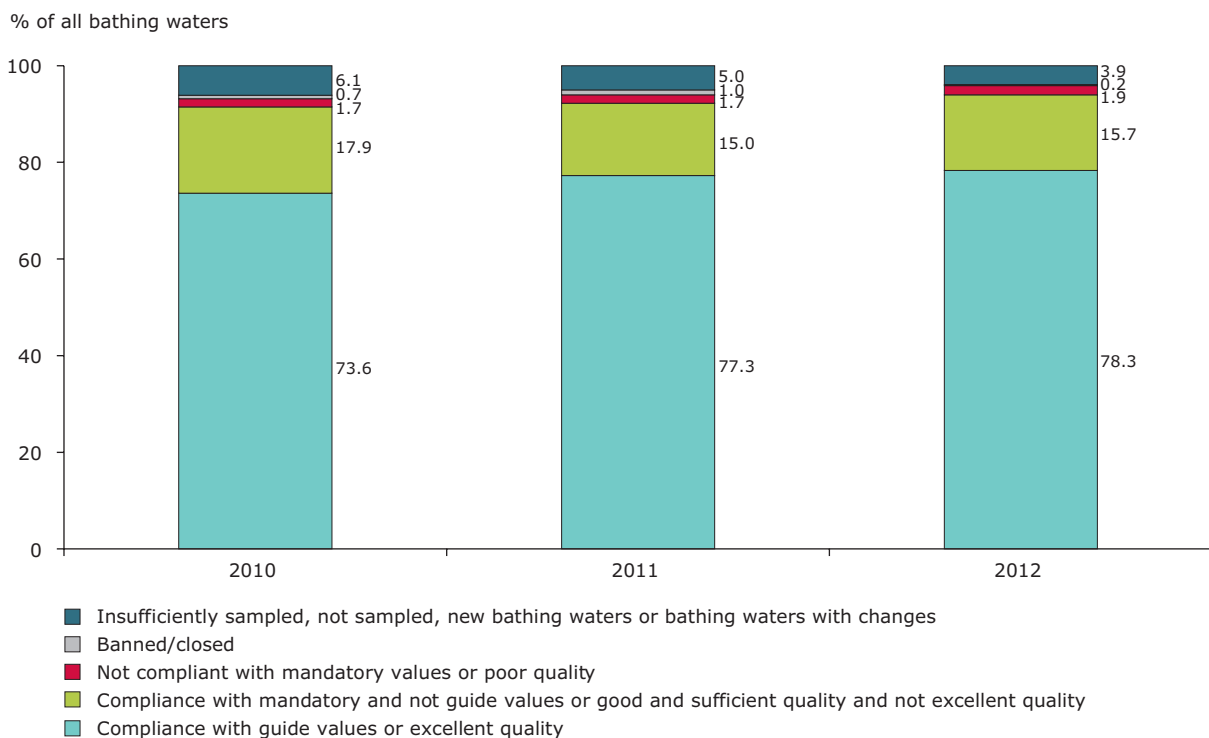
In 2012, the quality of 94 % of all bathing waters in the EU met the minimum water quality standards set by the Bathing Water Directives (Figure 3.1). Bathing water quality increased by 1.8 percentage points compared with results from 2011, and increased by 2.5 percentage points compared to 2010. The proportion of bathing waters with excellent quality (or complying with the most strict 'guide' values) increased by one percentage point compared to 2011, reaching 78.3 %.

The share of non-compliant bathing waters or waters with poor water quality in 2012 was 1.9 %, which represented a 0.2 percentage point increase from

2011. In 2012, 40 bathing waters were banned or closed (0.2 %), a significant drop in the number and share of banned waters from 2011 when 207 bathing waters were banned. The reasons a bathing water site would be closed or classed as having poor quality, are typically pollution due to heavy rain or public construction works close to the bathing water site (for more explanation of the causes of pollution and poor quality, see Chapter 5).

In 2012, it was not possible to classify the status of 3.9 % of bathing waters either because of insufficiently sampled waters, not sampled bathing waters, new bathing waters or bathing waters with changes. This represented a 1.1 percentage point decrease from 2011.

Figure 3.1 Bathing water quality in the European Union in the 2010, 2011, and 2012 bathing seasons



Source: WISE bathing water quality database (data from annual reports by EU Member States).

3.2 Coastal bathing water quality in the European Union in 2012

In 2012, 95.3 % of all coastal waters in the EU achieved the minimum quality standards established by the EU directives (Figure 3.2). This was an increase of 2.0 percentage points compared to 2011. The share of bathing waters with excellent quality (or complying with the guide values) in 2012 reached 81.2 % (an increase of 0.9 percentage points from 2011).

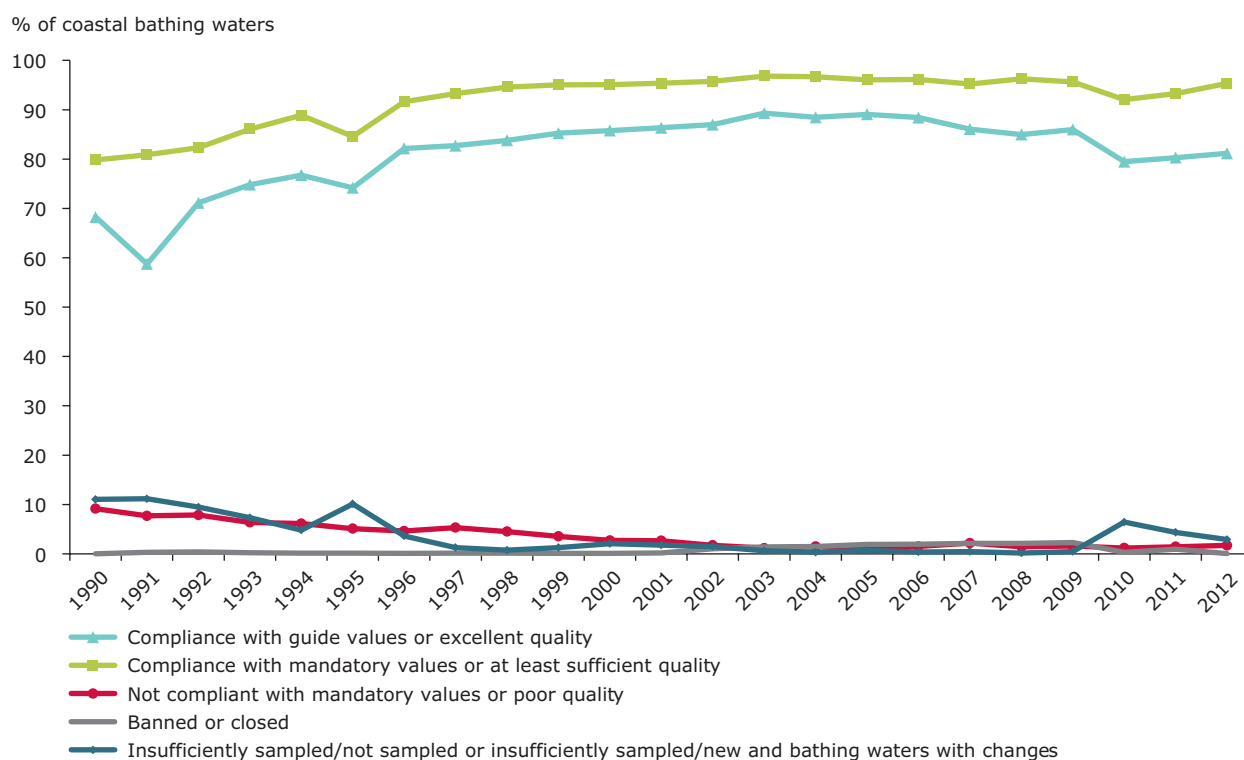
In 2012, EU Member States reported 249 coastal bathing waters (1.7 %) with poor quality or not in compliance with mandatory values, an increase of 0.3 percentage points compared with 2011. This year-on-year increase goes against the longer-term trend, which has been a steady decline in the share of coastal bathing waters that do not comply with bathing water directives: for example, the share of non-compliant bathing waters in 1990 was 9.2 %. Eight coastal bathing water sites were closed or banned in 2012, which is significantly fewer than in

2011, when 139 coastal bathing waters were closed or banned.

It was not possible to classify the status of the remaining 421 coastal bathing waters (which represents 2.9 % of all coastal bathing waters), because they were insufficiently sampled, not sampled, or were newly opened and could not yet be assessed under the new directive due to changes. This presented a 1.4 percentage points decrease from 2011, when 4.3 % of all coastal bathing waters could not be classified.

Compliance with so-called 'mandatory' values (those waters meeting the 'sufficient' standard) increased steadily between 1990 and 2000, but has remained quite stable since then. Compliance with so-called 'guide' values (those waters meeting the 'excellent' standard — a more strict standard than the mandatory value) was also on an increasing path from 1990 to 2000, before reaching a plateau. It then dropped below 80 % in 2010 and has since remained stable (Figure 3.2).

Figure 3.2 Percentage of coastal bathing waters in the European Union per compliance category or quality class



Source: WISE bathing water quality database (data from annual reports by EU Member States).

3.3 Inland bathing water quality in the European Union

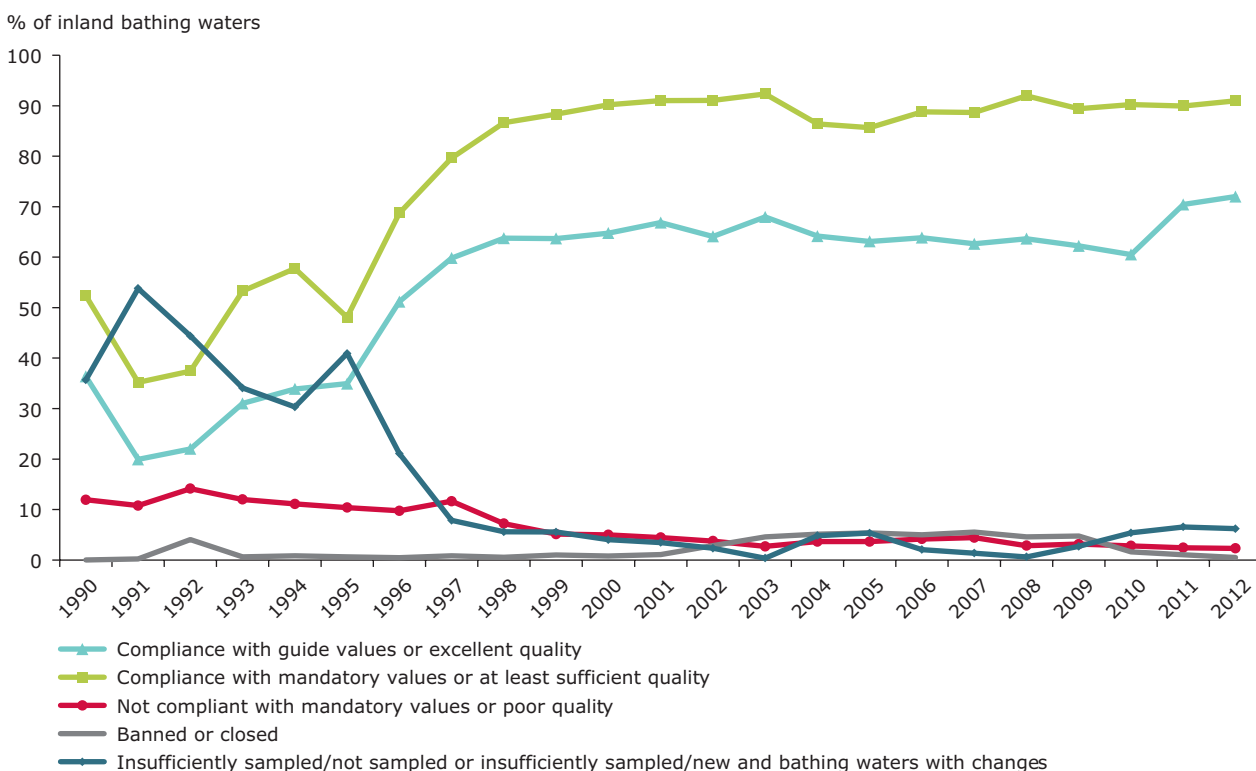
The percentage of inland bathing waters with excellent quality was 72.0 % in 2012 (Figure 3.3). This is 1.6 percentage point increase in comparison to the 2011 bathing season. In 2012, 91 % of inland bathing waters in the European Union had good or sufficient quality. This is a one percentage point increase from 2011.

Only 2.3 % of inland bathing waters in the EU did not satisfy the minimum quality level. This is 0.1 % decrease from the previous year, continuing the slow but steady reduction in the percentage of poor

quality bathing waters. The share of banned or closed bathing waters for 2012 was 0.5 % and is also smaller in comparison with 2011 by 0.5 percentage points, following the steady trend of 2010–2012 period.

Out of 6 436 inland bathing waters, it was not possible to classify the status for 399 (6.2 %) as they were insufficiently sampled, not sampled, newly opened or not yet assessed due to changes. This is an decrease of 0.4 percentage points from the previous year, and stopping a trend that began in 2009 of an increasing share of bathing waters whose status could not be classified.

Figure 3.3 Percentage of inland bathing waters in the European Union per compliance category or quality class



Source: WISE bathing water quality database (data from annual reports by EU Member States).

3.4 Bathing water quality by country in the 2012 season

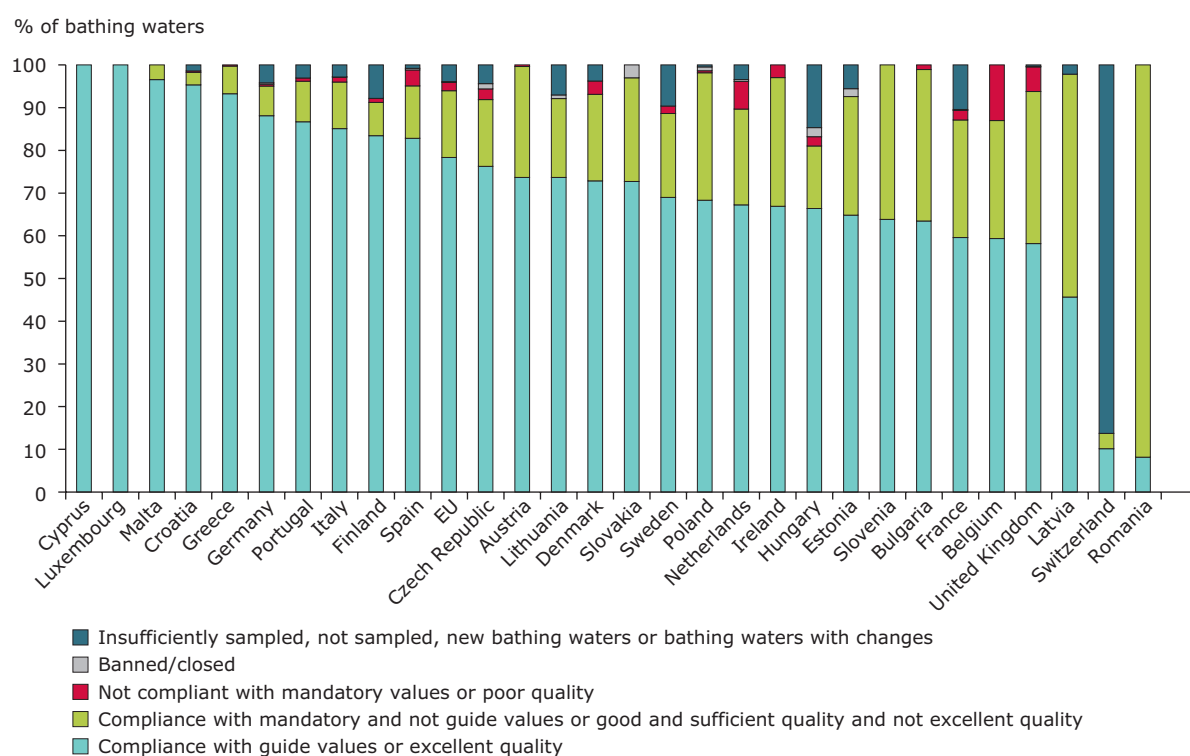
European bathing water quality results for each country in the 2012 bathing season are shown in Figure 3.4. Five countries had all their bathing waters classified as compliant with at least mandatory values (i.e. no poor quality bathing sites were found): Cyprus, Luxembourg, Malta, Slovenia and Romania. Ten countries reached compliance levels with excellent quality or guide values (i.e. the percentage of bathing water sites with 'excellent' quality bathing water) above the EU average of 78.3 %. They were: Cyprus (100 %), Luxembourg (100 %), Malta (96.6 %), Croatia (95.3 %), Greece (93.3 %), Germany (88.1 %), Portugal (86.7 %), Italy (85.1 %), Finland (83.4%) and Spain (82.8 %).

However, some of these countries also had some non-compliant bathing waters.

The highest rates of non-compliant bathing waters (i.e. waters classed as having 'poor' quality) have been found in Belgium (13.0 %), the Netherlands (6.5 %), the United Kingdom (5.7 %), Spain (3.8 %), and Denmark (3.1 %).

The largest share of insufficiently sampled bathing waters, not sampled bathing waters, new bathing waters or bathing waters with changes — and thus the countries whose results are less comprehensive — is to be found in Switzerland (86.3 %), Hungary (14.7 %), France (10.4 %), Sweden (9.6 %) and Finland (7.8 %).

Figure 3.4 Bathing water quality results in 2012 for the 27 EU Member States and other countries with bathing water quality results



Source: WISE bathing water quality database (data from annual reports by reporting countries).

4 Information on bathing water quality to public

This report sets out the results and trends in bathing water quality in 2012. More information on bathing water quality in EU Member States — including the reports for the 27 EU Member States as well as Croatia and Switzerland — can be found on the European Environment Agency's bathing water website ⁽³⁾.

4.1 Interactive information on bathing water quality — WISE and Eye on Earth

The bathing water section of the Water Information System for Europe (WISE), which is accessible at the EEA bathing water website ⁽³⁾, allows users to view the bathing water quality at more than 22 000 coastal beaches and inland sites across Europe. Users can check bathing water quality on an interactive map, download data for a selected country or region, and make comparisons with previous years.

The WISE map viewer is an online map viewer for visualising European spatial water data. It includes many interactive layers, allowing water themes to be visualised at different scales. Broad resolutions display the aggregated data by Member State. At finer resolutions, the locations of monitoring stations are displayed.

The WISE bathing water quality data viewer combines text and graphical visualisation, providing a quick overview of the locations of

coastal and inland bathing waters, as well as statistics on their quality. It also documents how bathing waters have changed throughout Europe in recent years, and provides a full summary of Europe's bathing water quality. Users can search information at three spatial levels — country, region and province — and observe specific bathing water locations on Google Earth, Google maps or Bing maps.

The Eye on Earth — WaterWatch application ⁽⁴⁾ allows users to zoom in on a section of coast, riverbank or lake, both in street map or, where available, bird's eye viewing formats (Figure 4.1). A 'traffic-light' indicator (red, amber, green) of bathing water quality, based on the official bathing water data, is displayed. Throughout 2013, the Eye on Earth application will be updated with online bathing water quality results, providing an indication of the current quality.

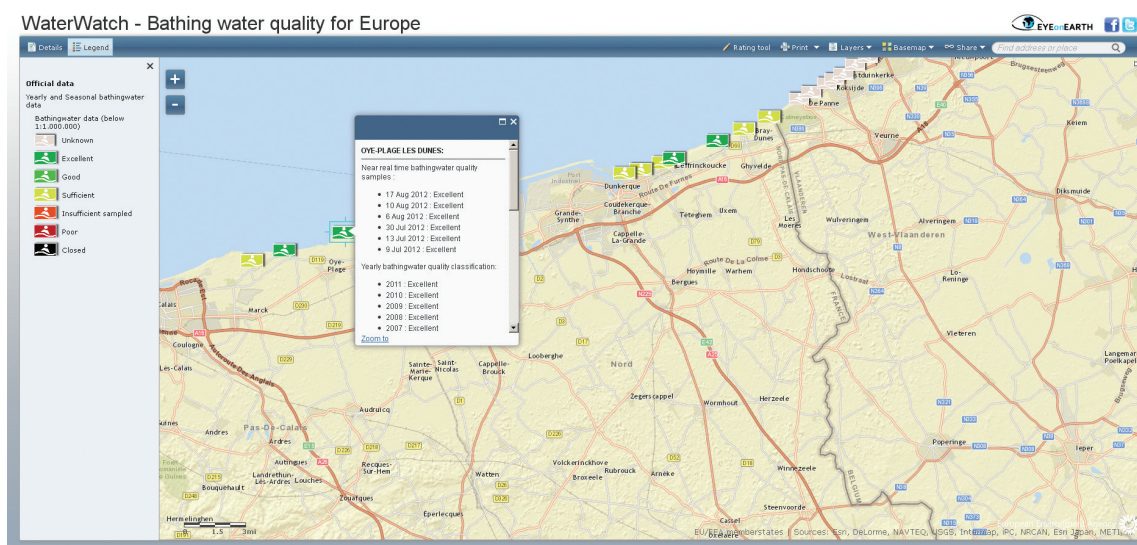
In order to make information to the public more effective, all countries have national or local web portals with detailed information for each bathing water site. Websites generally include a map search function and public access to the monitoring results both in real time and for previous seasons.

Citizens now have access to more bathing water information than ever, giving them the tools to become more actively involved in protecting the environment and helping to improve Europe's bathing areas.

⁽³⁾ <http://www.eea.europa.eu/themes/water/status-and-monitoring/state-of-bathing-water>.

⁽⁴⁾ <http://eyeonearth.org/map/waterwatch>.

Figure 4.1 The Eye on Earth – WaterWatch application



Box 4.1 The EEA's Marine LitterWatch – engaging European citizens in tackling beach litter

Marine litter is recognised worldwide as a growing emergent pressure on the coastal and marine environment. It has trans-boundary impacts on wildlife and habitats, as well as on health and safety and other human activities (accidents caused by floating litter, the cost of beach clean-ups etc). This recognition has recently led to the Rio+20 international commitment of achieving significant reductions in marine litter by 2025. The EU is part of that commitment. Work is under way with stakeholders to define an overall quantitative reduction target and further prevention and reduction measures.

In addition to these efforts, EU Member States are also currently implementing the Marine Strategy Framework Directive (MSFD). The MSFD obliges Member States to implement measures to achieve or maintain good environmental status of the marine environment by 2020. Reducing marine litter is considered one of the criteria of good environmental status. However, implementing this part of the MSFD will be challenging, as at this stage, there is insufficient data to assess the problem of marine litter properly. Furthermore, the task of monitoring marine litter for MSFD purposes in the overall MSFD monitoring context will be quite demanding on Member States. This is due to the increase in monitoring requirements stipulated by the directive, which will create challenges on the staffing and financial resources of Member States. This monitoring work will highlight the need for innovative and cost-efficient monitoring methods and tools. To help in this monitoring, the EEA has developed a new citizen-science-based application on its Eye on Earth website. This application, Marine LitterWatch, aims to help fill knowledge gaps on beach litter with new data that satisfies the technical requirements of the MSFD purposes. There are three main aims behind Marine LitterWatch. Firstly, it aims to get citizens to engage with the issue of beach litter and to collect beach litter data fit for MSFD purposes. Secondly, it aims to harness the power of citizen science, providing a tool for citizens to submit data on beach litter that they monitor. Thirdly, it aims to raise awareness at all levels of governance and encourage governments to make use of the marine litter data collected by their own citizens. Marine LitterWatch is under development and will be available to all European citizens later this year.

For more information on the project, please go to <http://www.eea.europa.eu/marine-litter>.

5 Bathing water quality and pollution

5.1 Controlling pollution in Europe's water

Many human activities result in water pollutants. The main sources of these pollutants are discharge from urban wastewater treatment, overflows of sewage systems, industrial effluent, and discharges from farming. During the last century, increased population growth led to increased wastewater production from urban areas and industry, resulting in a marked increase in water pollution. Many years of investment in the sewage system combined with better wastewater treatment have led to Europe's bathing waters being much cleaner today than they were 30 years ago, when large quantities of untreated or partially treated urban and industrial wastewater were discharged into bathing water areas.

This process of improvement has partly been driven by the Urban Waste Water Treatment Directive (UWWTD) ⁽⁵⁾, which aims to protect the environment from the adverse effects of discharges of urban wastewater and biodegradable industrial wastewater. The UWWTD requires Member States to ensure that such water is collected and adequately treated. Full implementation of the UWWTD is a prerequisite for meeting the environmental objectives set out in the EU Bathing Water Directives, the Water Framework Directive ⁽⁶⁾, and the Marine Strategy Framework Directive ⁽⁷⁾.

The UWWTD requires wastewater from all agglomerations of more than 2 000 people to be collected and treated. Its implementation has led to an increasing proportion of the EU's population being served by wastewater treatment works via

a sewer network. While considerable progress has been made in implementing the UWWTD, full compliance is yet to be achieved. Shortcomings include inadequate treatment levels in wastewater treatment plants in some cities. More information on the implementation of the Urban Waste Water Directive is available in the 6th Commission report on the implementation of the Urban Waste Water Treatment Directive ⁽⁸⁾.

Clear downward trends in pollutants commonly present in urban and industrial wastewater are evident in most of Europe's surface waters. Organic matter, measured as biochemical oxygen demand (BOD) and total ammonium, are key indicators of pollution by oxygen-consuming substances. Severe organic pollution may lead to rapid de-oxygenation of river water, a high concentration of ammonia, and the disappearance of fish and aquatic invertebrates. Mainly due to the implementation of secondary biological wastewater treatment under the UWWTD Directive (91/271/EEC), concentrations of BOD and total ammonium decreased in European rivers in the period from 1992 to 2010 (Figure 5.1).

Also during the last 20 years, the concentration of phosphorus has been markedly reduced in rivers and lakes. This has resulted in fewer algae blooms. Average phosphate concentrations in European rivers have fallen by more than half between 1992 and 2010 (a 54 % decrease, see Figure 5.1). The decrease in phosphorus concentrations reflects both improvement in wastewater treatment and a reduction in the amount of phosphorus contained in detergents.

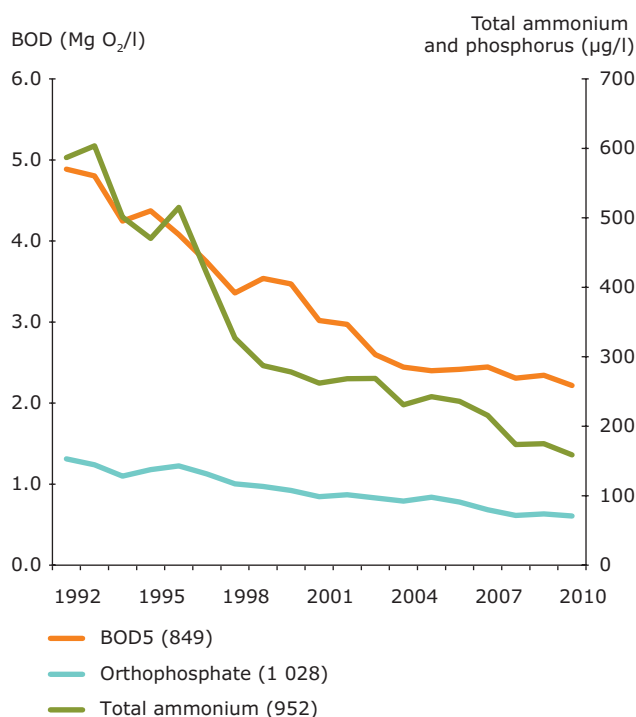
⁽⁵⁾ Council Directive 91/271/EEC of 21 May 1991 concerning urban waste-water treatment.

⁽⁶⁾ Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy.

⁽⁷⁾ Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008. establishing a framework for community action in the field of marine environmental policy.

⁽⁸⁾ http://ec.europa.eu/environment/water/water-urbanwaste/implementation/implementationreports_en.htm.

Figure 5.1 BOD5, total ammonium and orthophosphate concentrations in rivers between 1992 and 2010



Source: EEA Core set indicators, oxygen consuming substances in rivers (CSI 019 ⁽⁹⁾) and Nutrients in freshwater (CSI 020 ⁽¹⁰⁾).

5.2 Major sources of bathing water pollution

Clean unpolluted water is essential for our ecosystems and the various human uses of water. Pollutants in many of Europe's surface waters have had detrimental effects on aquatic ecosystems and resulted in the loss of aquatic flora and fauna. These pollutants are also a cause of concern for public health. Pollution of water takes many forms, but one of the most prevalent is faecal contamination from sewage and animals. Faecal contamination makes water aesthetically unpleasant and unsafe for recreational activities such as swimming.

The major sources of pollution responsible for faecal bacteria in bathing waters are:

- **Pollution from sewage** — bacteria from sewage can enter our waters as a result of system failures or overflows from sewage works. Insufficiently treated wastewater of this sort finding its way into freshwaters and the sea continues to be a pollution problem at some beaches.
- **Water draining from farms and farmland** — poorly stored slurry or manure from livestock can wash into streams, resulting in the pollution of downstream bathing waters. Scattered houses with misconnected drains and poorly located or poorly maintained septic tanks can also be the cause of pollution.
- **Animals and birds on or near beaches** — bathing water can be affected by dog, bird and other animal faeces as it often contains high levels of bacteria. Crowded beaches with many swimmers may also result in poor quality.

The pollution from farmlands and from sewage increases during heavy rains, washing more pollution into the rivers and seas and overflowing sewage systems.

⁽⁹⁾ <http://www.eea.europa.eu/data-and-maps/indicators/oxygen-consuming-substances-in-rivers/oxygen-consuming-substances-in-rivers-5>.

⁽¹⁰⁾ <http://www.eea.europa.eu/data-and-maps/indicators/nutrients-in-freshwater/nutrients-in-freshwater-assessment-published-3>.

5.3 Short-term pollution

Existing wastewater collection systems (sewerage) are often 'combined' in that they receive foul sewage from homes and commercial premises, as well as surface water following rainfall. After periods of heavy rain, a mixture of surface water and foul sewage can be discharged to the environment via combined sewer overflows (CSOs), and may impact bathing water quality and affect human health. Where short-term pollution occurs at bathing water sites, the new Bathing Water Directive requires that management measures (such as warnings, bathing prohibitions or stopping the pollution) be implemented. These measures are intended to prevent bathers' exposure, and to prevent, reduce or eliminate the causes of pollution. Information on short-term pollution should be made available to the public at the bathing site and in the media. In the event of short-term pollution, one additional water sample must be taken to confirm that the incident has ended.

Despite national efforts to reduce and eliminate pollution, problems of poor water quality can persist. Affected bathing waters must always be closed to eliminate the hazard to bathers' health.

5.4 Management measures implemented during the 2012 season

Management measures are primarily implemented at those bathing waters that have only sufficient or poor water quality. In the case of bathing waters with several years of poor quality, it is imperative that the sources of pollution be assessed. Bathing waters that are classified as 'poor' for five consecutive years must receive a permanent bathing prohibition or permanent advice against bathing. However, there is no obligation for a Member State to wait five consecutive years to place such a permanent prohibition; they can place a prohibition

earlier than this if they wish. Once a permanent prohibition has been placed on a body of bathing water, no obligation remains as regards monitoring or assessment since the site is not considered to be a bathing water site any longer. In 2012, there were 10 bathing waters permanently closed during the bathing season due to poor quality in 2011.

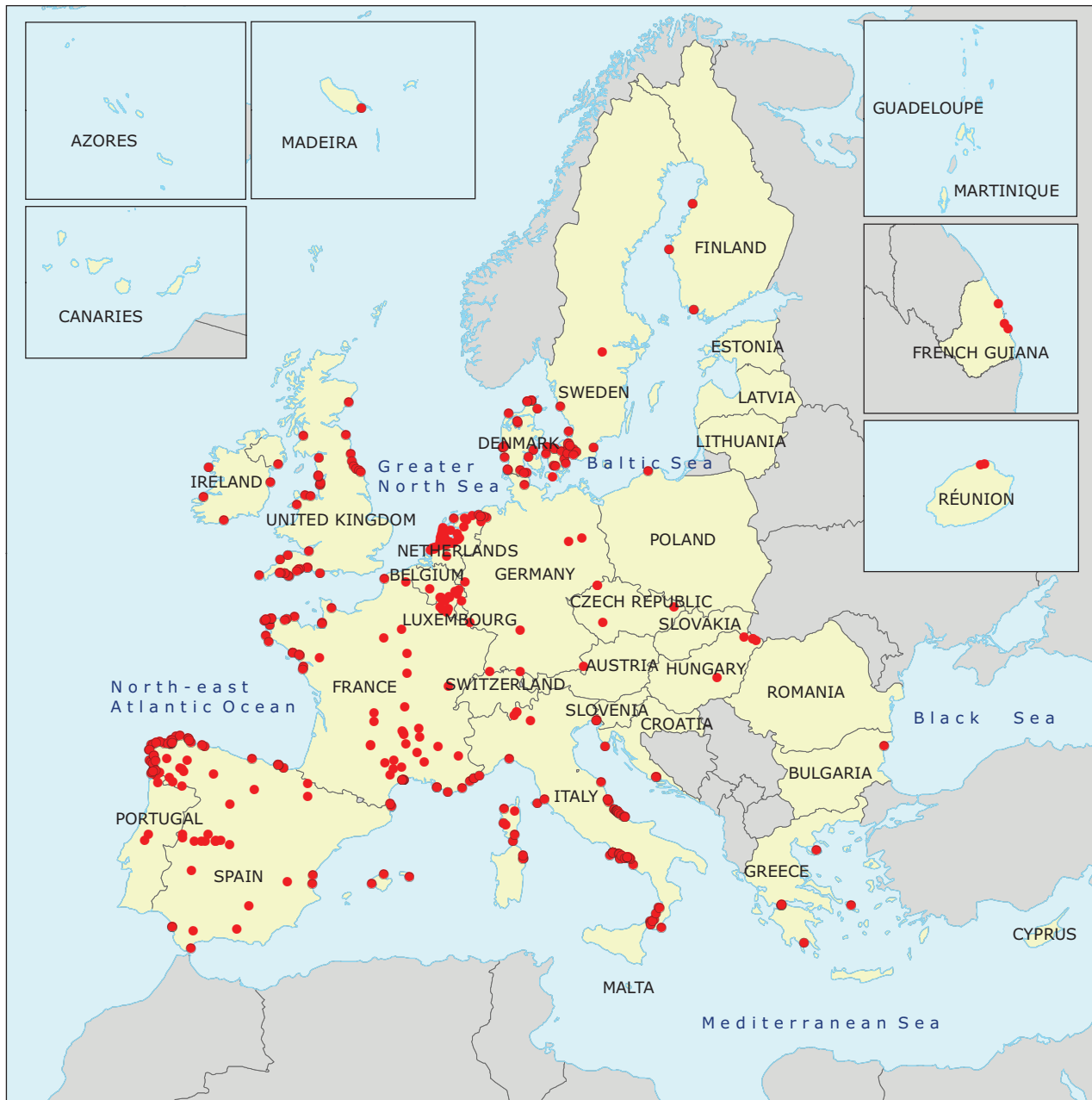
In the bathing water profiles, that should be available for all bathing waters the pollution from sewage, storm water overflows and nearby farmlands is described. Based on the characterisation of pollution sources, the local authorities should implement remedying measures.

As reported, 194 bathing waters that were not compliant or classed as poor in 2011 received a better quality classification in 2012. This represents 53 % of all poor/non-compliant bathing waters in 2011, a significant improvement.

On the other hand, the number of bathing waters with poor status remains essentially the same. In 2011 and 2012, 368 and 398 bathing water sites in the EU respectively were classified as poor (see Map 5.1). In the text box below (Box 5.1), there are some examples of bathing waters with poor quality, and descriptions of some of the actions that were taken to improve their quality. Box 5.1 also shows good examples of how Ireland managed unforeseen events at their bathing water sites and informed the public about these events.

At some bathing waters, the causes of poor quality are not known in detail. To examine the causes of pollution, some municipalities responsible for the management of bathing waters have launched special studies. One example is Stevns Municipality in Denmark, where a study is being conducted to investigate bacteria levels of the water under normal (dry weather) and extreme rain periods. It is estimated that an overflow of sewage from a wastewater treatment plant nearby may be affecting bathing water quality.

Map 5.1 Bathing water locations with poor quality or non-compliant in 2012



Bathing waters with poor quality or not in compliance with mandatory values in EU Member States and other countries with results

- Coastal bathing waters
- Inland bathing waters
- EU Member States and other countries with results

Source: National boundaries: EEA; bathing water data and coordinates: reporting countries' authorities.

Box 5.1 Four Irish non-compliant bathing water sites

Meteorological data shows that in 2012 Ireland experienced its wettest summer for many years, with most areas experiencing between two and three times the normal average summer rainfall (this average was based on thirty years of rainfall records). These weather impacts in 2012 resulted in a number of instances of poor bathing water quality. In total, four bathing water sites were assessed as being non-compliant with mandatory values for the 2012 season. The Irish authorities explained the reasons for non compliance for each of these bathing water sites.

Rush, South Beach in the northwestern Irish Sea (IEEABWC020_0000_0300): Elevated microbiological counts were observed on 31 July 2012. Warning/information notices to advise the public were posted at the bathing water area, and all relevant authorities were informed. Management measures included investigations of the sewer network in the vicinity of the bathing water site, both manually and by telemetry, together with monitoring of surface waters in the vicinity of the bathing water. This monitoring identified discharges of untreated sewage from a temporary wastewater treatment plant as a potential impact source. Follow-up samples showed that the water quality had improved and was in compliance with guide values (implying an 'excellent' status for the bathing site).

Ballyheigue in the outer Tralee Bay (IESHBWC040_0000_0100): A pollution event occurred on 30 July 2012 resulting in uncharacteristic breaches of regulatory standards for both E.Coli and Intestinal Enterococci. Management measures undertaken by Kerry County Council included the erection of a warning notice at the beach advising that due to extreme weather there might be a short-term pollution event at the beach. A follow-up sample on 1 August showed that the pollution incident had ended. No clear cause for this incident was found, and no further management measures are planned at this time.

Fountainstown in the outer Cork Harbour (IESWBWC050_0000_0100): A pollution event occurred on 5th June 2012 resulting in the suspension of the monitoring calendar. A similar event occurred on 7 August 2012, although the monitoring calendar was not suspended in this instance. Very heavy rainfall was implicated in both events with a resultant lowering of salinity. While no definitive causes were identified, diffuse agricultural runoff from grazing and / or land-spreading of animal manures is suspected as being the principal cause of these events. In response to these events, warning and information notices to advise the public were posted at the bathing water area, and all relevant authorities were informed. Follow-up samples were also subsequently taken. Management measures currently in progress include the licencing of caravan parks at bathing areas, and stream risk surveys in adjacent inland catchment areas.

Clifden Beach in Clifden Bay (IEWEBWT270_0100_0100): This beach was temporarily closed for the entire duration of the bathing season due to unprecedented and continued poor water quality. The principal source of pollution at this bathing water site is a nearby waste water treatment plant, and periodic exceedances of the regulatory standards are not uncommon. Approval has been obtained from the Department of Environment, Heritage and Local Government for the construction of a new public wastewater treatment plant, and the Irish Environmental Protection Authority issued a licence for this plant to operate in 2011. Substantive remediation works have been undertaken on the old wastewater treatment plant, and a caretaker has been appointed. Private commercial wastewater treatment plants, operating under Local Authority discharge licences, are inspected on an annual basis and enforcement action is taken where required.

Source: National annual report from Ireland for the 2012 season to the European Commission.

5.5 The Blueprint to safeguard Europe's waters

EU Member States will have to comply with the stricter and more ambitious requirements laid out in the new Bathing Water Directive by end of 2014 at the latest. The new legislation requires more effective monitoring and management of bathing waters and improved information dissemination.

The quality of bathing waters is essential not only for the health of the bathers but also for the overall

health of our coastal and inland water ecosystems. All efforts to improve the quality of bathing waters should therefore also be seen in the context of the good ecological and environmental status aimed for in the Water and Marine Framework Directives, which must also be fully implemented by 2015.

The best way to achieve these improvements in water quality is to create a more integrated and sustainable approach to water resource management. Such an approach is presented in the Commission's 'Blueprint to safeguard

Europe's water resources', which also calls for full implementation of the Water Framework Directive, in order that all water bodies can achieve 'good status' by 2015.

2012 was the European year of water. A series of policy reviews, namely the first review of the implementation of the Water Framework Directive; the review of the water scarcity and drought policy; and the review of the climate change adaptation and vulnerability policy with respect to water, led to the publication of the Blueprint by the Commission in November 2012 ⁽¹¹⁾.

To support this policy process, the European Environment Agency presented throughout the year 2012 a series of reports to assess both the state of Europe's waters and the future challenges for water policy. All together, these reports helped to build a comprehensive knowledge-base to assist policymakers in preserving and improving European waters.

The EEA report *European waters — assessment of status and pressures* ⁽¹²⁾ is based on an assessment of the Water Framework Directive River Basin Management Plans (RBMPs) reported from 2009 to 2012 by Member States. The information in the RBMPs, together with other related sources

of information, was analysed to establish an assessment of the status of Europe's waters and the pressures affecting them. The results provide a baseline for assessing trends in status and pressures in subsequent river basin management planning cycles.

Throughout the EU, information on more than 125 000 surface water bodies has been reported; 82 % of these are river water bodies. Overall, more than half of the water bodies in Europe are reported to be in less than good ecological status. The pressures reported to affect surface water bodies the most are pollution from diffuse sources (in particular from agriculture, which causes nutrient enrichment), and hydromorphological pressures (changes to the natural shape of water bodies, for example by river straightening) resulting in altered habitats.

A large proportion of water bodies — particularly in regions with intensive agriculture and high population density — have poor ecological status and are affected by pollution pressures. This situation calls for an increased focus on achieving good water quality and ecological status. Current reporting under the EU Water Framework Directive shows that a substantial proportion of Europe's freshwaters are at risk of not achieving the aim of 'good status' by 2015.



Photo: © Peter Kristensen

⁽¹¹⁾ http://ec.europa.eu/environment/water/blueprint/index_en.htm.

⁽¹²⁾ <http://www.eea.europa.eu/publications/european-waters-assessment-2012>.

Annex 1 Bathing water quality results in 2012

All bathing waters	Assessment type	Total number of bathing waters	Compliance with guide values or excellent quality		Compliance with mandatory and not guide values or good and sufficient quality		Non-complying or poor		Banned or closed		Insufficiently sampled or not sampled/new bathing waters /bathing waters with changes	
			Number	%	Number	%	Number	%	Number	%	Number	%
AT (Austria)	Transition	266	196	73.7	69	25.9	1	0.4	0	0.0	0	0.0
BE (Belgium)	New	123	73	59.3	34	27.6	16	13.0	0	0.0	0	0.0
BG (Bulgaria)	Transition	93	59	63.4	33	35.5	1	1.1	0	0.0	0	0.0
CY (Cyprus)	New	112	112	100.0	0	0.0	0	0.0	0	0.0	0	0.0
CZ (Czech Republic)	New	160	122	76.3	25	15.6	4	2.5	2	1.3	7	4.4
DE (Germany)	New	2 295	2 022	88.1	159	6.9	10	0.4	8	0.3	96	4.2
DK (Denmark)	New	1 090	794	72.8	221	20.3	34	3.1	0	0.0	41	3.8
EE (Estonia)	New	54	35	64.8	15	27.8	0	0.0	1	1.9	3	5.6
ES (Spain)	New	2 156	1 786	82.8	264	12.2	81	3.8	8	0.4	17	0.8
FI (Finland)	New	320	267	83.4	25	7.8	3	0.9	0	0.0	25	7.8
FR (France)	Transition	3 322	1 979	59.6	915	27.5	74	2.2	7	0.2	347	10.4
GR (Greece)	New	2 155	2 010	93.3	139	6.5	6	0.3	0	0.0	0	0.0
HU (Hungary)	New	232	154	66.4	34	14.7	5	2.2	5	2.2	34	14.7
IE (Ireland)	Transition	136	91	66.9	41	30.1	4	2.9	0	0.0	0	0.0
IT (Italy)	Transition	5 509	4 688	85.1	600	10.9	65	1.2	1	0.0	155	2.8
LT (Lithuania)	New	114	84	73.7	21	18.4	0	0.0	1	0.9	8	7.0
LU (Luxembourg)	New	11	11	100.0	0	0.0	0	0.0	0	0.0	0	0.0
LV (Latvia)	New	46	21	45.7	24	52.2	0	0.0	0	0.0	1	2.2
MT (Malta)	New	87	84	96.6	3	3.4	0	0.0	0	0.0	0	0.0
NL (Netherlands)	New	696	468	67.2	156	22.4	45	6.5	3	0.4	24	3.4
PL (Poland)	Transition	221	151	68.3	66	29.9	1	0.5	2	0.9	1	0.5
PT (Portugal)	New	526	456	86.7	50	9.5	4	0.8	0	0.0	16	3.0
RO (Romania)	Transition	49	4	8.2	45	91.8	0	0.0	0	0.0	0	0.0
SE (Sweden)	New	448	309	69.0	88	19.6	8	1.8	0	0.0	43	9.6
SI (Slovenia)	Transition	47	30	63.8	17	36.2	0	0.0	0	0.0	0	0.0
SK (Slovakia)	New	33	24	72.7	8	24.2	0	0.0	1	3.0	0	0.0
UK (United Kingdom)	Transition	629	366	58.2	224	35.6	36	5.7	1	0.2	2	0.3
EU		20 930	16 396	78.3	3 276	15.7	398	1.9	40	0.2	820	3.9
CH (Switzerland)	Transition	335	34	10.1	12	3.6	0	0.0	0	0.0	289	86.3
HR (Croatia)	New	919	876	95.3	27	2.9	3	0.3	0	0.0	13	1.4
Europe		22 184	17 306	78.0	3 315	14.9	401	1.8	40	0.2	1 122	5.1

Note: 'New' indicates assessment under Directive 2006/7/EC. 'Transition' indicates assessment under the transition period rules.
More data on bathing water quality are available at <http://www.eea.europa.eu/themes/water/interactive/bathing>.

Source: EEA.

Annex 2 Coastal bathing water quality results in 2012

Coastal bathing waters	Assessment type	Total number of bathing waters	Compliance with guide values or excellent quality		Compliance with mandatory and not guide values or good and sufficient quality		Non-complying or poor		Banned or closed		Insufficiently sampled or not sampled/new bathing waters /bathing waters with changes	
			Number	%	Number	%	Number	%	Number	%	Number	%
BE (Belgium)	New	42	22	52.4	20	47.6	0	0.0	0	0.0	0	0.0
BG (Bulgaria)	Transition	89	55	61.8	33	37.1	1	1.1	0	0.0	0	0.0
CY (Cyprus)	New	112	112	100.0	0	0.0	0	0.0	0	0.0	0	0.0
DE (Germany)	New	366	291	79.5	66	18.0	3	0.8	0	0.0	6	1.6
DK (Denmark)	New	973	690	70.9	217	22.3	33	3.4	0	0.0	33	3.4
EE (Estonia)	New	27	11	40.7	12	44.4	0	0.0	1	3.7	3	11.1
ES (Spain)	New	1 926	1 680	87.2	183	9.5	49	2.5	3	0.2	11	0.6
FI (Finland)	New	83	58	69.9	14	16.9	3	3.6	0	0.0	8	9.6
FR (France)	Transition	2 034	1 348	66.3	424	20.8	40	2.0	1	0.0	221	10.9
GR (Greece)	New	2 149	2 008	93.4	135	6.3	6	0.3	0	0.0	0	0.0
IE (Ireland)	Transition	127	84	66.1	39	30.7	4	3.1	0	0.0	0	0.0
IT (Italy)	Transition	4 880	4 213	86.3	499	10.2	61	1.3	1	0.0	106	2.2
LT (Lithuania)	New	16	13	81.3	3	18.8	0	0.0	0	0.0	0	0.0
LV (Latvia)	New	32	12	37.5	20	62.5	0	0.0	0	0.0	0	0.0
MT (Malta)	New	87	84	96.6	3	3.4	0	0.0	0	0.0	0	0.0
NL (Netherlands)	New	91	71	78.0	12	13.2	4	4.4	1	1.1	3	3.3
PL (Poland)	Transition	88	65	73.9	22	25.0	1	1.1	0	0.0	0	0.0
PT (Portugal)	New	437	401	91.8	26	5.9	1	0.2	0	0.0	9	2.1
RO (Romania)	Transition	49	4	8.2	45	91.8	0	0.0	0	0.0	0	0.0
SE (Sweden)	New	248	156	62.9	66	26.6	7	2.8	0	0.0	19	7.7
SI (Slovenia)	Transition	21	21	100.0	0	0.0	0	0.0	0	0.0	0	0.0
UK (United Kingdom)	Transition	617	363	58.8	215	34.8	36	5.8	1	0.2	2	0.3
EU		14 494	11 762	81.2	2 054	14.2	249	1.7	8	0.1	421	2.9
HR (Croatia)	New	912	876	96.1	26	2.9	3	0.3	0	0.0	7	0.8
Europe		15 406	12 638	82.0	2 080	13.5	252	1.6	8	0.1	428	2.8

Note: 'New' indicates assessment under Directive 2006/7/EC. 'Transition' indicates assessment under the transition period rules.

More data on bathing water quality are available at <http://www.eea.europa.eu/themes/water/interactive/bathing>.

Source: EEA.

Annex 3 Inland bathing water quality results in 2012

Inland	Assessment type	Total number of bathing waters	Compliance with guide values or excellent quality		Compliance with mandatory and not guide values or good and sufficient quality		Non-complying or poor		Banned or closed		Insufficiently sampled or not sampled/new bathing waters /bathing waters with changes	
			Number	%	Number	%	Number	%	Number	%	Number	%
AT (Austria)	Transition	266	196	73.7	69	25.9	1	0.4	0	0.0	0	0.0
BE (Belgium)	New	81	51	63.0	14	17.3	16	19.8	0	0.0	0	0.0
BG (Bulgaria)	Transition	4	4	100.0	0	0.0	0	0.0	0	0.0	0	0.0
CZ (Czech Republic)	New	160	122	76.3	25	15.6	4	2.5	2	1.3	7	4.4
DE (Germany)	New	1 929	1 731	89.7	93	4.8	7	0.4	8	0.4	90	4.7
DK (Denmark)	New	117	104	88.9	4	3.4	1	0.9	0	0.0	8	6.8
EE (Estonia)	New	27	24	88.9	3	11.1	0	0.0	0	0.0	0	0.0
ES (Spain)	New	230	106	46.1	81	35.2	32	13.9	5	2.2	6	2.6
FI (Finland)	New	237	209	88.2	11	4.6	0	0.0	0	0.0	17	7.2
FR (France)	Transition	1 288	631	49.0	491	38.1	34	2.6	6	0.5	126	9.8
GR (Greece)	New	6	2	33.3	4	66.7	0	0.0	0	0.0	0	0.0
HU (Hungary)	New	232	154	66.4	34	14.7	5	2.2	5	2.2	34	14.7
IE (Ireland)	Transition	9	7	77.8	2	22.2	0	0.0	0	0.0	0	0.0
IT (Italy)	Transition	629	475	75.5	101	16.1	4	0.6	0	0.0	49	7.8
LT (Lithuania)	New	98	71	72.4	18	18.4	0	0.0	1	1.0	8	8.2
LU (Luxembourg)	New	11	11	100.0	0	0.0	0	0.0	0	0.0	0	0.0
LV (Latvia)	New	14	9	64.3	4	28.6	0	0.0	0	0.0	1	7.1
NL (Netherlands)	New	605	397	65.6	144	23.8	41	6.8	2	0.3	21	3.5
PL (Poland)	Transition	133	86	64.7	44	33.1	0	0.0	2	1.5	1	0.8
PT (Portugal)	New	89	55	61.8	24	27.0	3	3.4	0	0.0	7	7.9
SE (Sweden)	New	200	153	76.5	22	11.0	1	0.5	0	0.0	24	12.0
SI (Slovenia)	Transition	26	9	34.6	17	65.4	0	0.0	0	0.0	0	0.0
SK (Slovakia)	New	33	24	72.7	8	24.2	0	0.0	1	3.0	0	0.0
UK (United Kingdom)	Transition	12	3	25.0	9	75.0	0	0.0	0	0.0	0	0.0
EU		6 436	4 634	72.0	1 222	19.0	149	2.3	32	0.5	399	6.2
CH (Switzerland)	Transition	335	34	10.1	12	3.6	0	0.0	0	0.0	289	86.3
HR (Croatia)	New	7	0	0.0	1	14.3	0	0.0	0	0.0	6	85.7
Europe		6 778	4 668	68.9	1 235	18.2	149	2.2	32	0.5	694	10.2

Note: 'New' indicates assessment under Directive 2006/7/EC. 'Transition' indicates assessment under the transition period rules. More data on bathing water quality are available at <http://www.eea.europa.eu/themes/water/interactive/bathing>.

Source: EEA.

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European bathing water quality in 2012

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