European Environment Agency

Bathing water results 2010 – Switzerland

1. Reporting and assessment

This report gives a general overview of bathing water quality in Switzerland during the 2010 bathing season. Switzerland reported parameters under the Directive 2006/7/EC since 2009.

Switzerland reported 381 bathing waters for 11 cantons. *Escherichia coli* was reported for almost all bathing waters (379), while intestinal enterococci was reported for 206 bathing waters in four cantons (Aargau, Schaffhausen, Ticino and Vaud).

Assessment using limit values of *Escherichia coli*

The overall quality assessment for Switzerland is done using limit values of *Escherichia coli* since only 22.8 % of reported bathing waters (87; Schaffhausen, Vaud and Ticino) satisfied the transition period assessment rules (both parameters, sampling frequency criteria). For each bathing water, the maximum concentration of reported samples for *Escherichia coli* is considered. Sampling frequency criteria under the transition period assessment are not taken into the account.

The results are classified in the following categories:

- **Class CI:** Compliant with the mandatory value of the Directive 76/160/EEC for *Escherichia coli*;
- **Class CG:** Compliant with the mandatory value of the Directive 76/160/EEC for *Escherichia coli* and the more stringent guide value for the *Escherichia coli*;
- **Class NC:** Not compliant with the mandatory value of the Directive 76/160/EEC for *Escherichia coli*;
- **Class B:** Banned or closed (temporarily or throughout the season);
- **Class NS:** Not sampled.

Assessment during the transition period

Switzerland also sent historical data with parameters of the Directive 2006/7/EC for 2007 and 2008, but no bathing water satisfied the assessment rules under the Directive 2006/7/EC for the period 2007-2010.

Before the necessary data set for assessment of bathing water quality under the Directive 2006/7/EC is compiled (data for three or four consecutive years) the rules for transition period assessment are applied. This means that the classification of bathing waters is defined on the basis of concentrations of intestinal enterococci and *Escherichia coli* that are reported under the Directive 2006/7/EC. The limit values for the classification are taken from the Directive 76/160/EEC. For the conversion of reported parameters under the Directive 2006/7/EC, Article 13.3 of the Directive 2006/7/EC foresees that the parameter *Escherichia coli*, reported under the Directive 2006/7/EC, is assumed to be equivalent to the parameter faecal coliforms of the Directive 76/160/EEC. The parameter intestinal enterococci reported under the Directive 2006/7/EC is assumed to be equivalent to the parameter faecal streptococci.

The results are classified in the following categories:

- **Class CI:** Compliant with the mandatory value of the Directive 76/160/EEC for *Escherichia coli* and not compliant with the guide values of the Directive 76/160/EEC for *Escherichia coli* or intestinal enterococci;
- **Class CG:** Compliant with the mandatory value of the Directive 76/160/EEC for *Escherichia coli* and the more stringent guide values for the *Escherichia coli* and intestinal enterococci;
- **Class NC:** Not compliant with the mandatory value of the Directive 76/160/EEC for *Escherichia coli*;
- **Class B:** Banned or closed (temporary or throughout the season);
- **Class NF:** Insufficiently sampled;
- **Class NS:** Not sampled.

The new bathing water directive (2006/7/EC) requires Member States to start sampling shortly before the start of the bathing season. It also requires that the interval between sampling should not exceed one month. In some cases these required changes in regard to the old bathing water directive (76/160/EEC) have not yet been implemented, resulting in a late start date of sampling at some sites and/or insufficiently frequent sampling. For that reason two rules in regard to sampling frequency are considered in the assessment of the monitoring results in 2010. By the first rule, 41 days were taken as a maximum difference between two samples (less strict rule), whereas by the second rule the maximum days between two samples considered were 32 days (strict rule). The new directive also requires that the first sample must be taken shortly before the start of a bathing season. However, in the assessment of bathing water quality in 2010, the first sample could be taken not later than 10 days after the start of the bathing season. If this was a case, the second sample should have been taken no later than 41 days after the start of the bathing season when the less strict rules or 32 days when the strict rules are used in the assessment. The bathing water is classified as insufficiently sampled or not sampled when the pre-season sample is missing or when the difference between two consecutive samples is larger than 41 days by the less strict rule or 32 days by the strict rule. In graph results applying the less strict rules are presented.

2. Length of bathing season and number of bathing waters

The season duration varies by cantons. The bathing season started from 1 May to 1 July 2010 and ended from 21 July to 30 September 2010.

A total of 381 inland bathing waters were reported in Switzerland during the 2010 bathing season (69 on rivers; 312 on lakes).

The evolution of the reported number of bathing waters since monitoring of the water quality began under the Directive 2006/7/EC is presented in Table 1. The number of inland bathing waters is stable. It started with 382 in 2009 and decreased to 381 in 2010.

3. Bathing water quality

The results of the bathing water quality in Switzerland for the bathing seasons of 2009 and 2010 are presented in Figure 1. The previous report for the 2009 bathing season is available on the European Commission's bathing water quality website (http://ec.europa.eu/environment/water/water-bathing/index_en.html; Water and Health/Bathing Water/ 2005-2010 reports) and the European Environment Agency's bathing water website (http://www.eea.europa.eu/themes/water/status-and-monitoring/state-of-bathing-water).

The graph shows the classification using limit values for *Escherichia coli* for inland bathing waters (left bars):

- The percentage of bathing waters that comply with the guide value for *Escherichia coli* (class CG, blue bar);
- The percentage of bathing waters that comply with the mandatory value for *Escherichia coli* (class CI, green bar);
- The percentage of bathing waters that do not comply with the mandatory value for *Escherichia coli* (class NC, red bar);
- The percentage of bathing waters that are banned or closed (temporarily or throughout the season) (class B, grey bar).

Table 1a shows the same information in absolute numbers and in percentages for inland bathing waters. The numbers and percentages of not sampled bathing waters are also presented.

The same graph shows the classification during transition period for inland bathing waters (right bars):

- The percentage of bathing waters that comply with the guide values (class CG, blue bar);
- The percentage of bathing waters that comply with the mandatory value for *Escherichia coli* (class CI, green bar);
- The percentage of bathing waters that do not comply with the mandatory value for *Escherichia coli* (class NC, red bar);

- The percentage of bathing waters that are banned or closed (temporarily or throughout the season) (class B, grey bar).

Table 1b shows the same information in absolute numbers and in percentages for inland bathing waters in Switzerland. The numbers and percentages of insufficiently sampled or not sampled bathing waters are also presented.

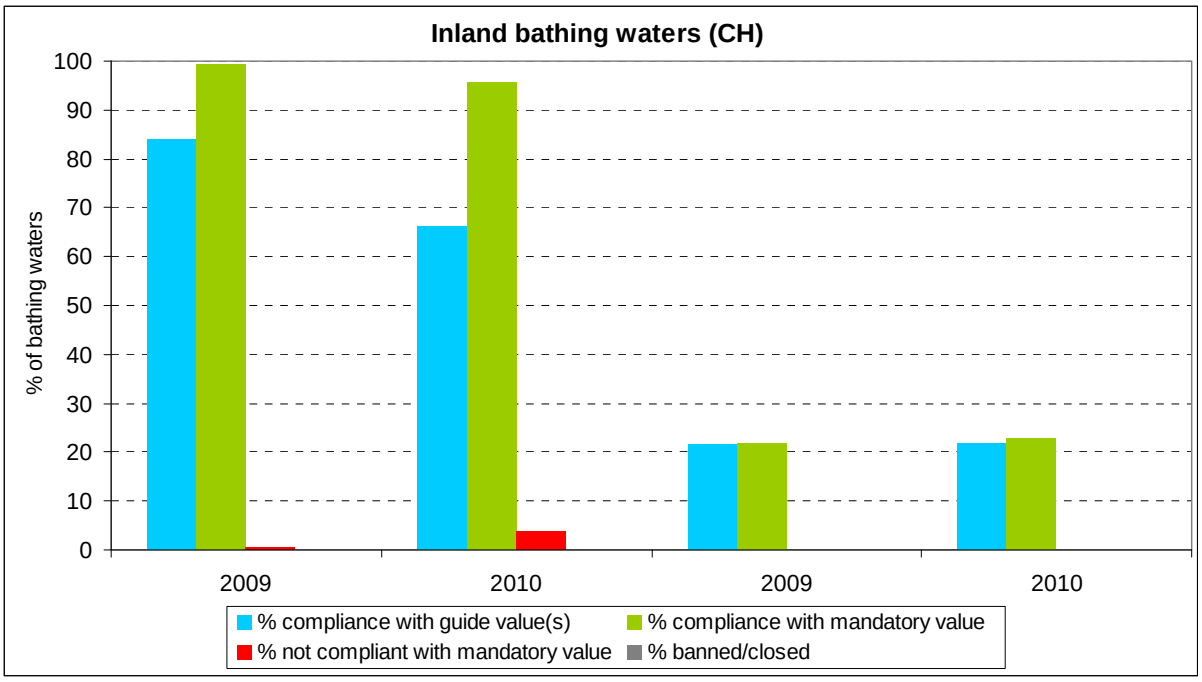
Map 1 shows the location of the reported bathing waters in Switzerland. The map shows the bathing water quality results of assessment using limit values for *Escherichia coli* and transition period assessment applying the less strict rules. The location of the bathing waters is based on the geographic coordinates reported by the Swiss authorities.

As shown in Table 1a, 95.5 % of the inland bathing waters met the mandatory value for *Escherichia coli* in 2010 according to assessment using limit values for *Escherichia coli*. This is a decrease of 4 % compared to the previous year. The rate of compliance with the guide value for *Escherichia coli* decreased from 84 % to 66.1 %. The number of bathing waters non-compliant with the mandatory value for *Escherichia coli* increased from two (0.5 %) to 15 bathing waters (3.9 %). No bathing water had to be closed during the season, the same as in 2009.

As shown in Table 1b, 22.8 % of the inland bathing waters met the mandatory water quality in 2010 according to transition period assessment. This is an increase of 0.8 % compared to the previous year. Some 21.8 % of the bathing waters met the guide values, which is approximately the same (+ 0.1 %) as in the previous year. No bathing water was non-compliant with the mandatory value for *Escherichia coli* and no bathing water had to be closed during the season, the same as in 2009. The reasons for these low percentages are that only three cantons (Schaffhausen, Ticino and Vaud) monitor intestinal enterococci and carry out monitoring with sufficient frequency according to transition period assessment rules in 2010. In 2009, all bathing waters with both parameters and sufficient sampling frequency were reported only by canton Ticino.

In Schaffhausen, three out of eight bathing waters (37.5 %) met the mandatory water quality and one bathing site (12.5 %) met the guide values in 2010. In Ticino, 62 out 86 bathing waters (72.1 %) met the mandatory water quality and 61 bathing waters (70.9 %) met the guide values in 2010. In 2009, 84 out of 85 bathing waters (98.8 %) met the mandatory value for *Escherichia coli* and 83 bathing waters (97.6 %) met the guide values. In Vaud, 22 out of 96 bathing waters (22.9 %) met the mandatory water quality and 21 bathing waters (21.9 %) met the guide values in 2010. Other bathing waters in these cantons were insufficiently sampled.

Figure 1: Results of bathing water quality in Switzerland in 2009 and 2010. Assessment using limit values for *Escherichia coli* (left) and assessment during transition period (right).



Note: For the year 2010 results applying the less strict rules under transition period assessment are presented.

Table 1a: Results of bathing water quality in Switzerland in 2009 and 2010. Assessment using limit values for *Escherichia coli*.

CH												
		Total number of bathing waters	Compliance with guide and mandatory value*		Compliance with mandatory value		Not compliant		Banned/closed temporarily or throughout the season		Not sampled	
			number	%	number	%	number	%	number	%	number	%
Inland bathing waters	2009	382	321	84.0	380	99.5	2	0.5	0	0.0	0	0.0
	2010	381	252	66.1	364	95.5	15	3.9	0	0.0	2	0.5

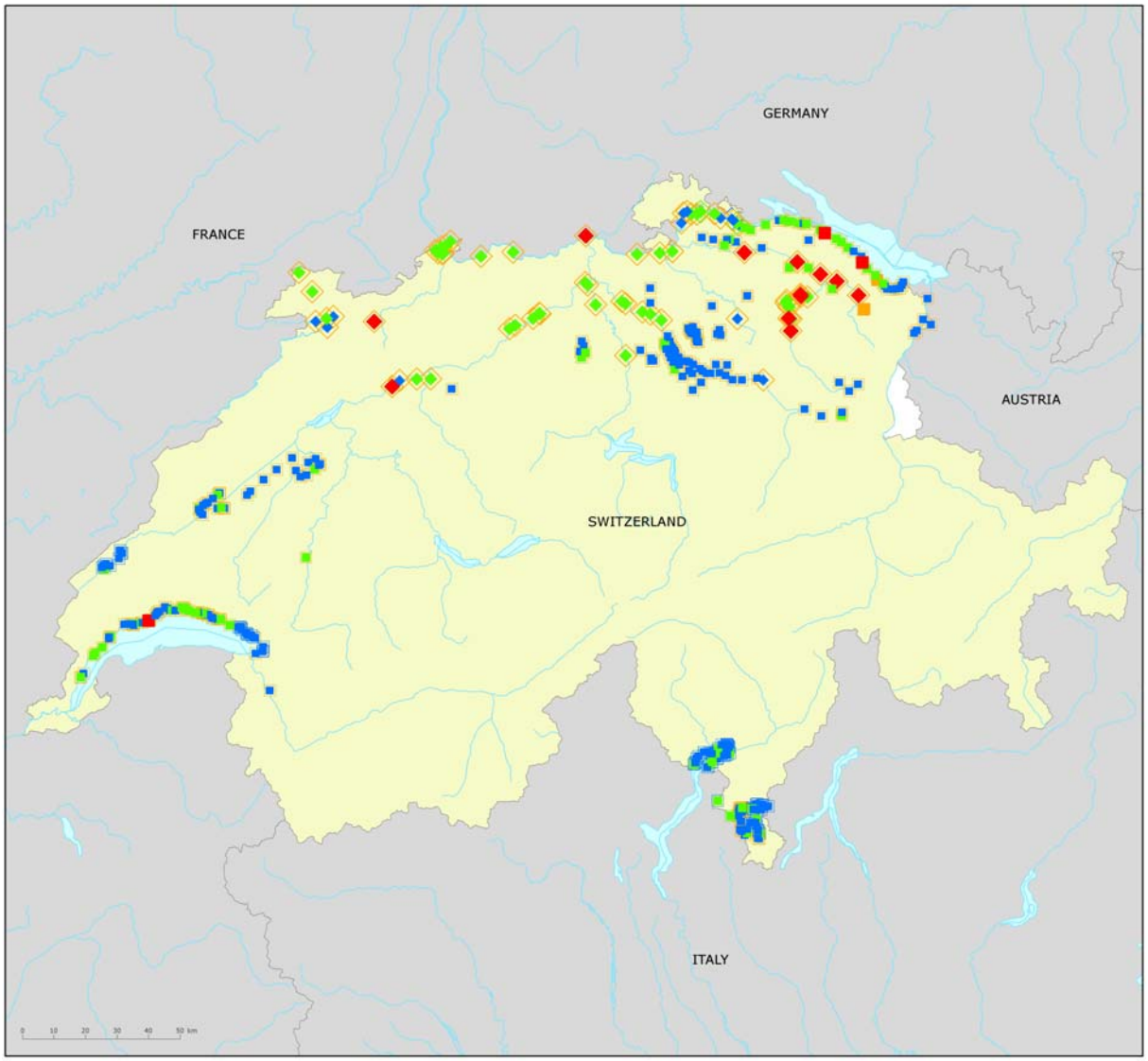
*****Bathing waters which were compliant with the guide value for *Escherichia coli* were also compliant with the mandatory value for *Escherichia coli.*

Table 1b: Results of bathing water quality in Switzerland in 2009 and 2010. Assessment during transition period.

CH												
		Total number of bathing waters	Compliance with guide and mandatory values**		Compliance with mandatory value		Not compliant		Banned/closed temporarily or throughout the season		Insufficiently sampled or not sampled	
			number	%	number	%	number	%	number	%	number	%
Inland bathing waters	2009	382	83	21.7	84	22.0	0	0.0	0	0.0	298	78.0
	2010*	381	83	21.8	87	22.8	0	0.0	0	0.0	294	77.2
	2010	381	22	5.8	25	6.6	0	0.0	0	0.0	356	93.4

*****Less strict rules applied (41 days taken as a maximum difference between two samples for reporting under Directive 2006/7/EC). ******Bathing waters which were compliant with the guide values were also compliant with the mandatory value for *Escherichia coli.*

Map 1: Bathing waters reported during the 2010 bathing season in Switzerland



Bathing water quality

Bathing waters on rivers
- Compliant with guide values
- Compliant with mandatory values
- Closed*
- Insufficiently sampled or not sampled
- Not compliant with mandatory values

Bathing waters on lakes
- Compliant with guide values
- Compliant with mandatory values
- Closed*
- Insufficiently sampled or not sampled
- Not compliant with mandatory values

- No data
- Outside data coverage (data available, not presented on the map)
- Transition period assessment rules

Note: * banned or closed (temporarily or throughout the season)
More data on bathing water quality on: http://www.eea.europa.eu/themes/water/mapviewers/bathing

Source: National boundaries: GISCO; Large rivers and lakes: EEA, WFD Article 3; Bathing waters data and coordinates: Swiss authorities

4. Important information as provided by the Swiss authorities

Responsibilities, laws and regulations

In Switzerland on national level, the areas of public health and water management are managed by two federal authorities, the Federal Office of Public Health (FOPH) and the Federal Office for the Environment (FOEN). While the FOEN is responsible for all aspects of managing and conserving quality and quantity of water resources (ground- and surface waters), the FOPH is concerned with subjects such as epidemics and infectious diseases, hygiene, food safety and drinking water.

In the federal legislation, water quality, quantity and management issues are primarily regulated in the Federal Constitution of the Swiss Confederation of 18 April 1999 (SR 101), the Federal Act of 24 January 1991 on the Protection of Waters (SR 814.20) and the Water Protection Ordinance of 28 October 1998 (SR 814.201). Hygiene and public health issues are dealt with in the Federal Act of 9 October 1992 on Foodstuffs and Utility Articles (SR 817.0) and the corresponding implementing ordinances. Cantonal and communal legislations can supplement the federal legislation. The existing cantonal legislation on water quality and management issues varies considerably.

National recommendations on bathing water quality monitoring

Since the nineteen sixties, efforts have been made in Switzerland to protect the health of bathers by the hygiene assessment of lake and river baths. In 1991, a recommendation for the hygiene assessment of lake and river baths was issued (available in German and French: http://www.bag.admin.ch/themen/lebensmittel/04858/04864/04904/04937/index.html?lang=de). These recommendations largely follow the EU Directive of 1976 (Directive 76/160/EEC).

Monitoring

According to the federal organization and legislation of Switzerland the cantons are responsible for the management of their water resources, including the monitoring and assessment of bathing water quality. Concretely, bathing water quality is monitored and assessed by the cantonal laboratories, in most cases on the basis of the Recommendations of 1991. The focus therefore lies on *E. coli* and *Salmonella*, with a few cantons going beyond this to include other parameters such as intestinal enterococci. The main differences in monitoring between the various cantons therefore occur with regard to monitoring frequencies (and not with regard to monitored parameters). For some reported bathing water sites, samples are taken at three locations (e.g. right, left, centre points of a site).

In canton St. Gallen, the current monitoring program follows a three-year routine. Accordingly, in 2010 a larger selection of bathing water sites was assessed compared to 2009. This explains the large number of "new monitoring sites". Three bathing waters were de-listed in canton Zurich. There was no sampling due to strong turbidity.

Public participation procedure and information to the public

Bathing water sites are identified on the basis of actual bathing practices, as the aim is to provide adequate information to the public. Information on the monitoring results is usually available on the websites of respective cantonal authorities and in certain cases also on-site. Currently, no nation-wide overview on bathing water quality is available.

Links to websites of some cantons with information on bathing water quality are as follows:

- Solothurn: www.lmk.so.ch/badegewaesser
- Basel-Stadt: http://www.kantonslabor-bs.ch/content.cfm?nav=17&content=23&Command=details&year=2010&kat=all&ID=784
- Vaud: http://www.vd.ch/fr/themes/environnement/eau/eau-de-baignade/lac-leman/.

Actions and long-term measures

The chemical and microbiological quality of the water resources in Switzerland is generally good. This is largely attributable to the comprehensive water protection efforts that have been made during the last decades. Around 750 large-scale and 3 500 small-scale sewage treatment plants and 90 000 km

of sewage pipes ensure almost complete coverage for the comprehensive treatment of wastewater. As a result today, bathing water quality is qualified as excellent throughout Switzerland: Most surface waters provide a quality which allows bathing. Exceptions are periods heavy rainfall, when, due to stormwater overflow, bathing is not recommended at sites downstream of wastewater treatment plants. Accordingly in general, there are no particular actions or long-term measures undertaken specifically with regard to bathing water quality management.

Six bathing waters were affected by short term pollution in canton Zurich and Ticino. Replaced sample was not taken. Reasons for short term pollution were reported for two bathing waters in Ticino, i.e. presence of water birds and problem with the sewage pump of the hotel. In the second case, an alarming system was installed. Abnormal situation was reported at one bathing site in Ticino due to cleaning works at the start of the bathing season.

Outlook

In view of the experience acquired over the past few years in the practical implementation of hygiene assessments of lake and river baths, and in view of developments in microbiological methods, it is currently deemed appropriate to formulate the new findings in the form of (updated) recommendations. The existing recommendation of 1991 are planned to be updated on the basis of EU Directive 2006/7/EC. To reach this aim, a working group with representatives of the FOPH, FOEN and the cantonal laboratories is currently elaborating updated recommentations, which shall be tested in the form of a pilot version in selected cantons in 2012.

5. More information on bathing water quality in Europe

Of the more than 21 000 bathing areas monitored throughout the European Union in 2010, two-thirds were in coastal waters and the rest in rivers and lakes. The largest number of coastal bathing waters can be found in Italy, Greece, France, Spain and Denmark, while Germany and France have the highest number of inland bathing waters.

During recent years, including the 2010 bathing season, majority of Member States have adjusted their monitoring programmes to meet the requirements of the new bathing water directive (2006/7/EC). Luxembourg was the first country to report under this Directive in 2007. Cyprus, Denmark, Estonia, Finland, Germany, Hungary, Latvia, Lithuania, Slovakia, Spain and Sweden started to report under the new directive in 2008. Malta and the Netherlands started to report in 2009, while Austria, Belgium - Walloon Region, France, Greece, Italy, Portugal and Slovenia reported under this Directive for the first time in 2010. Historical data of two microbiological parameters, *Eschericia coli* and intestinal enterococci were sent by Sweden (since 2005), Luxembourg and Malta (since 2006), Belgium - Walloon Region, Greece, Hungary and Portugal (since 2007), and France (since 2009). To conclude, 20 Member States and the Walloon Region of Belgium monitored and reported under the new directive (Directive 2006/7/EC) in 2010.

Assessment of the status of all bathing waters in 2010 under the rules of the new directive (Directive 2006/7/EC) is made for Luxembourg, Malta and Hungary. Assessment of the bathing water quality on a country level for the other countries that reported under the new directive has been done using transition rules. Bathing water quality for individual bathing waters having four year set of data can be seen on the interactive maps and data viewer that are described below.

Three non-EU countries, Croatia, Montenegro and Switzerland have reported monitoring results under the new directive. Switzerland sent data on *Eschericia coli* for all bathing waters but only for some data on intestinal enterococci.

Overall in 2010, 92.1 % of Europe's coastal bathing waters and 90.2 % of inland bathing waters met the minimum water quality standards set by the bathing water directives. During recent years there has been a deterioration in bathing water quality but still more than nine in ten bathing waters meet the minimum quality standards. The share of non compliant bathing waters was 1.2 % for coastal bathing waters and 2.8 % for inland bathing waters. The decrease reflects in part year to year variation but also indicates that further work is necessary to ensure that the quality of bathing waters is constantly improved and maintained.

More information on bathing water quality in the European Member States, including the EU summary report, the reports for 27 Member States, Croatia, Montenegro and Switzerland, can be found on the European Commission's bathing water quality website (http://ec.europa.eu/environment/water/water-bathing/index_en.html) and the European Environment Agency's bathing water website (http://www.eea.europa.eu/themes/water/status-and-monitoring/state-of-bathing-water). The reports for the bathing seasons from the 2008 bathing season on have been produced by the Institute for Water of the Republic of Slovenia (IWRS), a partner in the EEA European Topic Centre on Inland, Coastal and Marine Waters (ETC/ICM). Countries have collaborated in the assessment of bathing water quality and supplied additional information when needed.

Interactive information on bathing water quality

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

The WISE map viewer (http://www.eea.europa.eu/themes/water/interactive//bathing) is an online map viewer for visualisation of European spatial water data. It includes a lot of 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 (http://www.eea.europa.eu/themes/water/status-and-monitoring/bathing-water-data-viewer) combines text and graphical visualisation, providing a quick check on locations and statistics on the quality of coastal and freshwater bathing waters. 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 the Google Earth, Google maps or Bing maps.

The Eye On Earth - Water Watch application (http://www.eea.europa.eu/data-and-maps/explore-interactive-maps/eye-on-earth) allows users to zoom in on a given section of the coast, riverbank or lake, both in street map or, where available, bird's eye viewing formats. A 'trafficlight' indicator (red, amber, green) of bathing water quality, based on the official bathing water data, is put alongside the ratings of people who have visited the bathing site, including any comments users wish to make. For historical data Water Watch uses a simplified index of bathing water quality data. The Czech Republic, Estonia, Finland (one municipality), Hungary, Lithuania, Luxembourg, Malta, the Netherlands, Norway (one municipality), Slovenia, Slovakia and England and Wales were also sending near real time information on bathing water quality to the Eye On Earth application. The bathing water quality from Austria, Belgium, Bulgaria, Croatia, Denmark, France, Germany, Ireland, Italy, Poland, Portugal, Spain, Sweden and Scotland and Northern Ireland was also presented on Eye on Earth Water Watch.

National and local information on bathing water quality

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

Information on EU bathing water legislation

EU Member States will have to comply with the stricter and more ambitious requirements laid out in Directive 2006/7/EC by 2015 at the latest. The new legislation requires more effective monitoring and management of bathing waters, greater public participation and improved information dissemination. By March 2011 Member States have to have established bathing water profiles. More on the new legislation can be found on the European Commission's websites and on http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:064:0037:0051:EN:PDF.