

## Bathing water results 2009 – Sweden

### 1. Introduction

This report gives a general overview of bathing water quality in Sweden for the 2009 bathing season. Sweden started to monitor under the Directive 2006/7/EC in 2005 bathing season, while reported for the first time in 2008 bathing season. Until 2007, samples of intestinal enterococci were monitored only for part of bathing waters.

When a set of samples of intestinal enterococci and *Escherichia coli* for a bathing water for three or four consecutive years is available, the assessment is done according to assessment rules of the Directive 2006/7/EC.

The classification under the Directive 2006/7/EC is the following:

- Excellent quality for both parameters;
- Good quality if both parameters are good or only one is good and the second is excellent;
- Sufficient quality if both parameters are sufficient or only one parameter is sufficient and the second is good or excellent;
- Poor quality if both parameters are poor or only one parameter is poor;
- Temporarily closed or closed throughout the season.

Sweden has 259 coastal and 210 freshwater bathing waters. Assessment of bathing water quality according to assessment rules of the Directive 2006/7/EC is done for 217 (83.8%) reported coastal and 142 (67.6%) reported freshwater bathing waters, because complete samples of intestinal enterococci and *Escherichia coli* for those bathing waters are available (for the period 2006-2009). Since not for all bathing waters in Sweden sets of samples to be used for the assessment under the Directive 2006/7/EC are available, the overall assessment is done under transition period rules.

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 is done. 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:

- 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 CI);
- 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 CG);
- Not compliant with the mandatory value of the Directive 76/160/EEC for *Escherichia coli* (class NC);
- Banned or closed (temporarily or throughout the season) (class B).

For the overall assessment of bathing water quality in Sweden (done under the transition period) the interval between two samples during the bathing season should not be larger than 41 days. The interval is longer than 31 days as defined in the Directive 2006/7/EC, since we are approaching the year 2012 only when the assessment rules will be in full compliance with the rules of this Directive. Furthermore, the first sample that should be taken shortly before the start of the bathing season could be taken even 10 days after the start of the bathing season.

## **2. Length of bathing season and number of bathing waters**

The bathing season started on 21 June 2009, except for 10 bathing waters opened on 15 July, and ended on 15 or 20 August 2009 for coastal bathing waters. Freshwater bathing waters opened on 21 June 2009, except for eight bathing waters opened on 15 July. Most freshwater bathing waters closed on 15 August, while other bathing waters closed on 20 August.

A total of 469 bathing waters were monitored in Sweden during the 2009 bathing season, of which 259 were coastal bathing waters and 210 freshwater bathing waters (five on rivers; 205 on lakes).

Three coastal bathing waters were insufficiently sampled according to assessment during transition period. Two coastal bathing waters and one freshwater bathing water were new according to assessment under the Directive 2006/7/EC. They were classified under transition period rules. 359 out of 469 (76.5%) bathing waters had necessary data set for assessment of bathing water quality under the Directive 2006/7/EC in 2009.

With 469 bathing waters Sweden accounts for about 2.2% of the reported bathing waters of the European Union.

The evolution of the reported number of bathing waters since monitoring of the water quality began under the Directive 76/160/EEC and the Directive 2006/7/EC is presented in Table 1. The number of coastal bathing waters increased since the start of the reporting from 247 in 1995 to 406 in 2007. It decreased significantly afterwards to 258 in 2008. There was one more coastal bathing water in 2009 than in the previous year: two re-opened bathing waters were added to the list and one bathing water was de-listed. The number of freshwater bathing waters increased from 353 in 1995 and fluctuated till 2007 between 398 in 2001 and 525 in 1997. It decreased significantly afterwards to 210 in 2009. There were two less freshwater bathing waters in 2009 than in the previous year: one new bathing water was added to the list, one was re-opened and four bathing waters were de-listed.

### 3. Results of bathing water quality

The results of the bathing water quality in Sweden for the period 1995-2008 as reported in the past reporting years and for the bathing season of 2009 are presented in Figure 1. The previous reports are available on the European Commission's bathing water quality website ([http://ec.europa.eu/environment/water/water-bathing/index\\_en.html](http://ec.europa.eu/environment/water/water-bathing/index_en.html); Water and Health/Bathing Water/2005-2009 reports) and the European Environment Agency's bathing water website (<http://www.eea.europa.eu/themes/water/status-and-monitoring/state-of-bathing-water>; reports for 2008 bathing season).

The graphs show the classification under the Directive 76/160/EEC and during transition period, for coastal and freshwater bathing waters separately from 1995 to 2009:

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

The same graphs show the classification under the Directive 2006/7/EC, for coastal and freshwater bathing waters separately for 2009:

- The percentage of bathing waters that have excellent quality (dark blue bar);
- The percentage of bathing waters that have good quality (light blue bar);
- The percentage of bathing waters that have sufficient quality (green bar);
- The percentage of bathing waters that have poor quality (red bar);
- The percentage of bathing waters that are temporarily closed or closed throughout the season (grey bar).

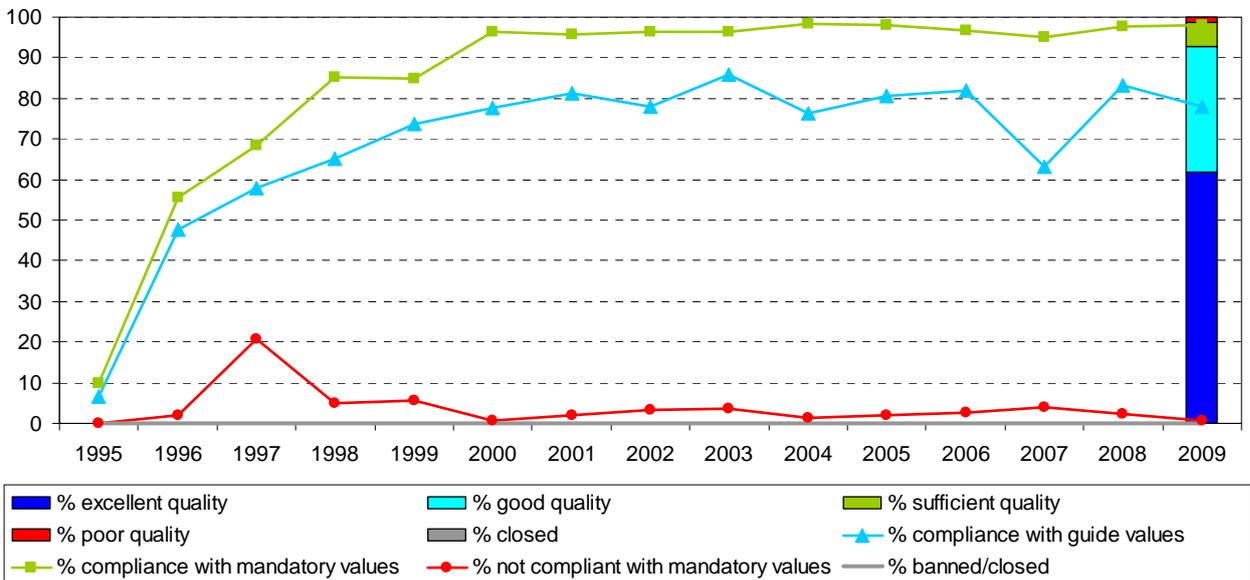
Table 1 shows the same information in absolute numbers and in percentages separately for coastal and freshwater bathing waters from 1995 to 2009. Table 2 shows the bathing water quality results of assessment during transition period for 2009 in Sweden for all bathing waters. Table 3 shows the same information in absolute numbers and in percentages separately for assessed coastal and freshwater bathing waters for 2009. Table 4 shows the bathing water quality results of assessment under Directive 2006/7/EC for 2009 in Sweden for all assessed bathing waters.

Map 1 and Map 2 show the location of the reported bathing waters in Sweden. Map 1 shows the bathing water quality results of overall assessment during transition period. Map 2 shows the bathing water quality results of assessment under Directive 2006/7/EC. The location of the bathing waters is based on the geographic coordinates reported by the Swedish authorities.

**Figure 1: Results of bathing water quality in Sweden from 1995 to 2009**

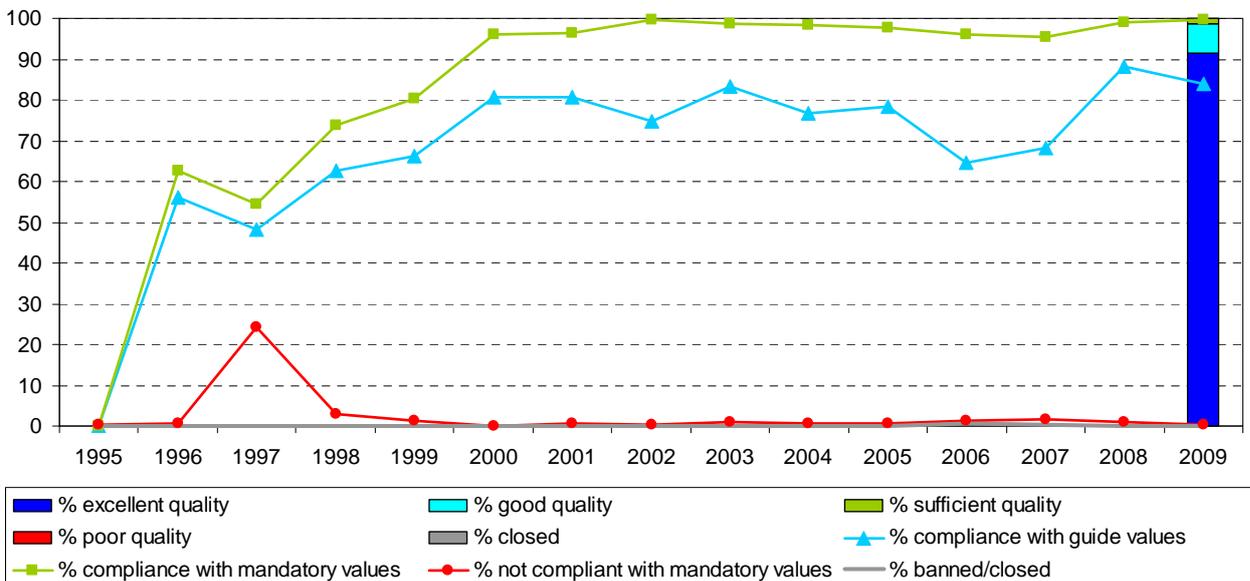
**Coastal bathing waters (SE)**

% of bathing waters



**Freshwater bathing waters (SE)**

% of bathing waters



Note: For 2009, two assessments are shown. The points that are part of three time series (lines) represent assessment results using transition period rules. The bar represents assessment results for 217 coastal and 142 freshwater bathing waters using rules under Directive 2006/7/EC.

**Table 1: Results of bathing water quality in Sweden from 1995 to 2009. Assessment under Directive 76/160/EEC and during transition period.**

SE										
		Total number of bathing waters	Compliance with guide values		Compliance with mandatory values		Not compliant		Banned/closed temporarily or throughout the season	
			Number	%	Number	%	Number	%	Number	%
Coastal bathing waters	1995	247	16	6.5	24	9.7	0	0.0	0	0.0
	1996	388	185	47.7	216	55.7	8	2.1	0	0.0
	1997	398	230	57.8	272	68.3	82	20.6	0	0.0
	1998	375	244	65.1	320	85.3	18	4.8	0	0.0
	1999	377	278	73.7	320	84.9	21	5.6	0	0.0
	2000	370	287	77.6	357	96.5	3	0.8	0	0.0
	2001	376	306	81.4	360	95.7	8	2.1	0	0.0
	2002	379	296	78.1	365	96.3	13	3.4	0	0.0
	2003	379	325	85.8	365	96.3	14	3.7	0	0.0
	2004	379	289	76.3	373	98.4	5	1.3	0	0.0
	2005	379	305	80.5	371	97.9	8	2.1	0	0.0
	2006	405	332	82.0	392	96.8	11	2.7	0	0.0
	2007	406	256	63.1	386	95.1	16	3.9	0	0.0
	2008	258	215	83.3	252	97.7	6	2.3	0	0.0
2009	259	202	78.0	254	98.1	2	0.8	0	0.0	
Freshwater bathing waters	1995	353	0	0.0	0	0.0	1	0.3	0	0.0
	1996	490	275	56.1	307	62.7	3	0.6	0	0.0
	1997	525	253	48.2	286	54.5	127	24.2	0	0.0
	1998	465	291	62.6	343	73.8	13	2.8	0	0.0
	1999	414	274	66.2	333	80.4	5	1.2	0	0.0
	2000	403	325	80.6	387	96.0	0	0.0	0	0.0
	2001	398	321	80.7	384	96.5	3	0.8	0	0.0
	2002	402	300	74.6	401	99.8	1	0.2	0	0.0
	2003	407	339	83.3	401	98.5	4	1.0	0	0.0
	2004	415	319	76.9	408	98.3	3	0.7	0	0.0
	2005	416	326	78.4	406	97.6	3	0.7	0	0.0
	2006	444	287	64.6	426	95.9	6	1.4	3	0.7
	2007	441	301	68.3	421	95.5	7	1.6	2	0.5
2008	212	187	88.2	210	99.1	2	0.9	0	0.0	
2009	210	176	83.8	209	99.5	1	0.5	0	0.0	

Note: Bathing waters which were insufficiently sampled or not sampled according to the Bathing Water Directive or the New Bathing Water Directive were not included in this table. Therefore, in some cases, the sum of the different categories will not be equal to the total number of bathing waters. Bathing waters which were compliant with the guide values were also compliant with the mandatory values for five parameters under the Directive 76/160/EEC (1995-2007) or the mandatory value for *Escherichia coli* (2008, 2009).

**Table 2: Results of bathing water quality for all bathing waters in Sweden in 2009. Assessment during transition period.**

SE										
		Total number of bathing waters	Compliance with guide values		Compliance with mandatory value for <i>Escherichia coli</i>		Not compliant		Banned/closed temporarily or throughout the season	
			Number	%	Number	%	Number	%	Number	%
Bathing waters	2009	469	378	80.6	463	98.7	3	0.6	0	0.0

Note: Bathing waters which were insufficiently sampled according to the New Bathing Water Directive were not included in this table. Therefore, in some cases, the sum of the different categories will not be equal to the total number of bathing waters. Bathing waters which were compliant with the guide values were also compliant with the mandatory value for *Escherichia coli*.

**Table 3: Results of bathing water quality for 83.8% of the coastal and 67.6% of the freshwater bathing waters in Sweden for 2009 (including data from 2006, 2007 and 2008). Assessment under Directive 2006/7/EC(\*).**

SE												
		Number of bathing waters assessed under(*)	Excellent quality		Good quality		Sufficient quality		Poor quality		Closed temporarily or throughout the season	
			Number	%	Number	%	Number	%	Number	%	Number	%
Coastal bathing waters	2009	83.8% out of 259= 217	134	61.8	67	30.9	13	6.0	3	1.4	0	0.0
Freshwater bathing waters	2009	67.6% out of 210= 142	130	91.5	10	7.0	2	1.4	0	0.0	0	0.0

**Table 4: Results of bathing water quality for 76.5% of all bathing waters in Sweden in 2009 (including data from 2006, 2007 and 2008). Assessment under Directive 2006/7/EC(\*).**

SE												
		Number of bathing waters assessed under(*)	Excellent quality		Good quality		Sufficient quality		Poor quality		Closed temporarily or throughout the season	
			Number	%	Number	%	Number	%	Number	%	Number	%
Bathing waters	2009	76.5% out of 469 = 359	264	73.5	77	21.4	15	4.2	3	0.8	0	0.0

## 4. Development of bathing water quality

### Coastal bathing waters

In Sweden, 98.1% of the coastal bathing waters met the mandatory water quality in 2009. This is a slight increase of 0.4% compared to the previous year. The compliance rate with the more stringent guide values, however, decreased from 83.3% to 78%. Two bathing waters (0.8%) were non-compliant with the mandatory value for *Escherichia coli* compared to six (2.3%) in 2008. Since the start of the reporting in 1995, no coastal bathing water had to be closed during the season.

Until 1999, a large number of bathing waters were insufficiently sampled and could therefore not be taken into account in the water quality assessment. This largely explains the low compliance rate in those years. From 2000 onwards more than 95% of the bathing waters were compliant with the mandatory values. Concerning the more stringent guide values there is a stronger fluctuation in the

number of bathing waters that are compliant, although the rate is around 80% of the bathing waters since 2000, with a dip in 2007 (63.1%). This can be explained by the fact that the summer of 2007 was exceptionally rainy for several areas, which also affected the quality of the bathing waters.

If the coastal bathing waters (217) are classified under the Directive 2006/7/EC, 61.8% of the bathing waters had excellent quality, 30.9% of the bathing waters had good quality and 6% of the bathing waters had sufficient quality. Three coastal bathing waters (1.4%) had poor quality.

### **Freshwater bathing waters**

99.5% of the freshwater bathing waters met the mandatory water quality in 2009. This is a slight increase of 0.4% compared to the previous year. The rate of compliance with the guide values, however, decreased by 4.4% and reached 83.8% of the bathing waters. The number of non-compliant bathing waters with the mandatory value for *Escherichia coli* decreased from two (0.9%) to one bathing water (0.5%). No freshwater bathing water had to be closed during the season.

Similar as for the coastal bathing water, until 1999, a large number of bathing waters were insufficiently sampled and could therefore not be taken into account in the water quality assessment. This largely explains the low compliance rate in those years. From 2000 onwards more than 95% of the bathing waters were compliant with the mandatory values, reaching almost 100% in 2002. Since then there has been a slight decrease in the number of compliant bathing waters. Since 2008, the compliance has increased again, reaching close to 100%. A similar evolution can be seen for the number of bathing waters complying with the more stringent guide values, although the fluctuations are more distinct. In 2006 and 2007, the level of complying bathing waters dropped again to a level below 70% after reaching about 80% of the bathing waters in 2000, 2001 and 2003. Since 2008, the compliance rate reached again more than 80% of the bathing waters. Freshwater bathing waters had to be closed only in 2006 and 2007 season (<1%).

If the freshwater bathing waters (142) are classified under the Directive 2006/7/EC, 91.5% of the bathing waters had excellent quality, 7% of the bathing waters had good quality and 1.4% of the bathing waters had sufficient quality. No bathing waters had poor quality.

## **5. General information as provided by the Swedish authorities**

To the 2008 bathing season Sweden implemented into the Swedish legislation the New Bathing Water Directive (2006/7/EC) by Regulation SFS 2008:218 and NFS 2008:8 which is now legally binding. The Swedish implementation of the new Directive was also informed to the Commission before the start of the 2008 bathing season. During the 2008 bathing season the Swedish municipalities sampled their bathing waters according to the Directive 2006/7/EC in order of frequency, parameters etc.

The Member States have been asked to set their own limit for "large bathing water". In Sweden it was decided that large bathing water is a place visited by at least 200 bathers per day. The responsible communities were asked to re-register their EU bathing waters in regard of this. 470 bathing water were registered with motive (>200 bathers/day), control plan and sampled according to the new rules of the new Directive before the 2008 bathing season.

According to the new Directive, Sweden has 469 bathing water areas with a large number of bathers, and these bathing areas has been registered with names, coordinates and control plan before the 2009 bathing season.

The reported bathing areas have been sampled according to the new Directive given that the maximum days allowed between two samplings are 30 days. The majority of the Swedish counties has a bathing season shorter than eight weeks which gives an allowed minimum frequency of three samples per bathing season. Bathing water Sibbarps Kallbadhus (SE044128000000066) was also sampled during winter due to "winter bathers", an activity some Swedes perform, while the official bathing season started on 21 June 2009.

## **The analytical methods allowed in Sweden**

### *Escherichia coli:*

- MPN or Membrane filtration (ISO 9308-3, ISO 9308-1, SS 028167:2 or Colilert®-18/Quanti-Tray®).

### Intestinal enterococci:

- MPN or Membrane filtration (ISO 7899-1, ISO 7899-2 or Enterolert-E®/Quanti-Tray®).

## **De-listing of bathing waters**

Five bathing waters were removed from the list before the 2009 bathing season. Four of these were additional sampling points to other bathing waters. One bathing water was not visited by >200 bathers/day during 2008 and therefore removed. Another five bathing waters were asked to be removed by the communities, but since no quantitative changes were observed, these bathing waters are still listed. Four new bathing waters were registered for the 2009 bathing season. Reasons for de-listing of each bathing water can be obtained from the report of bathing water quality for the 2009 bathing season by the Swedish authorities, file Sweden\_BWQ\_2009\_Annex\_to\_changes ([http://cdr.eionet.europa.eu/se/eu/colpxcea/envsytehg/Sweden\\_BWQ\\_2009\\_Annex\\_to\\_changes.docx/manage\\_document](http://cdr.eionet.europa.eu/se/eu/colpxcea/envsytehg/Sweden_BWQ_2009_Annex_to_changes.docx/manage_document)).

## **Non-complying bathing sites**

None of the Swedish bathing waters have been prohibited for bathing during the 2009 bathing season. At bathing waters that during the 2009 bathing season got the judgement Non Complying the municipalities concerned investigate the possible reasons of the bad quality of the bathing water. This could be due to semi permanent or permanent causes such as leaching wastewater from individual households and municipal wastewater treatment plants. The current measures are site-specific and as cost-efficient as possible for the actual area.

Several beaches have problems with pollution of the beach and bathing area from birds, mainly geese, this problem is difficult to control but many municipalities work with measures to reduce the number of birds at the bathing area.

## **Abnormal situation and short term pollution**

Before the start of the 2009 bathing season two bathing waters were considered to be affected of a dam building. These were Ö:A Öresjön, Hanatorp (SE0A2146300000950) and Ö:A Öresjön, Mos Strand (SE0A2146300000952). The water level was supposed to be lower during the bathing water season. It was decided to take samples during the bathing season according to the Directive 2006/7/EC. During the 2009 bathing season the water level was about one meter lower than usual at the bathing water sites. However none of the samples showed an enhanced degree of indicator bacteria *Escherichia coli* or intestinal enterococci during the bathing season. In addition, five bathing waters were affected by short term pollution.

## **Information to the public**

The bathing data for the season are reported to the website "Badplatsen", where the public can consult the latest quality assessments. It is also possible to search for previous years' assessments. This website can be accessed via the home page of the Swedish EPA or of the Swedish Institute for Infectious Disease Control (<http://badplatsen.smittskyddsinstitutet.se>).

## **Waste water treatment**

Most Swedish households are connected to a sewage treatment plant. The majority of such plants has both a chemical and biological treatment stage, but do not generally perform disinfection.

## **Treatment of diffuse pollution sources**

Considerable efforts are made to monitor the maintenance of private cesspools and to ensure that an increasing number of them are connected to a treatment plant. Sweden historically used to have a

large number of wetland areas, which played an important part in reducing nutrient and bacteria loads to nearby watercourses. Many of these wetlands have been drained, in the post war decades but now new ones are being established in some parts of the country in order to reduce pollution from non-point sources. Several bathing areas have problems with pollution caused by birds, mainly geese, a source of contamination, which can be difficult to control.

## **6. More information on bathing water quality in the European Union**

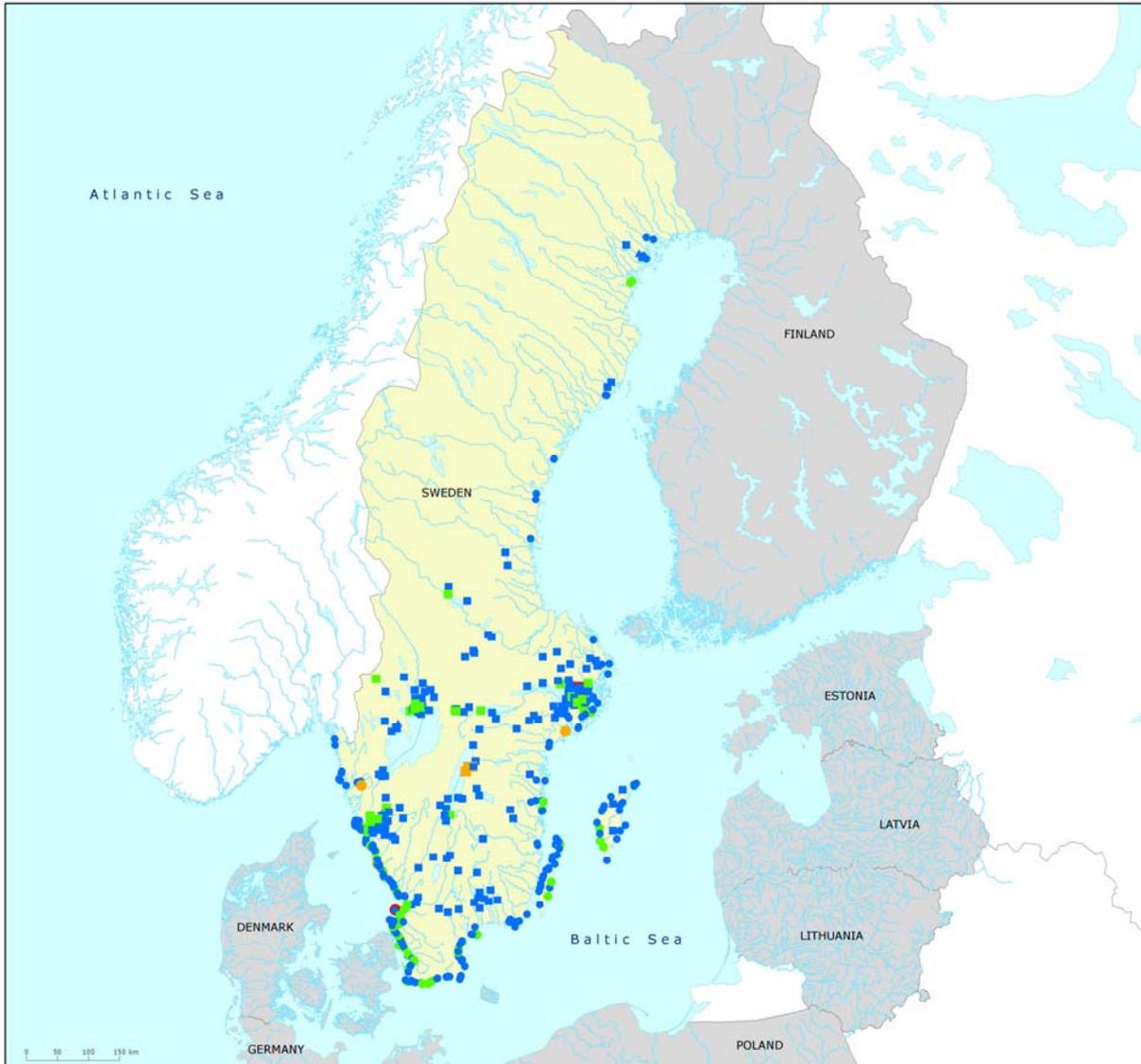
More information on bathing water quality in the European Member States, including the EU summary report, the reports for 27 Member States, Croatia and Switzerland, can be found on the European Commission's bathing water quality website ([http://ec.europa.eu/environment/water/water-bathing/index\\_en.html](http://ec.europa.eu/environment/water/water-bathing/index_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 of 2008 and 2009 have been produced by the Institute for Water of the Republic of Slovenia (IWRS), a partner in the EEA European Topic Centre on Water (ETC/W). Countries have collaborated in the assessment of bathing water quality and supplied additional information when needed.

By 2015, Member States will have to comply with the stricter and more ambitious requirements laid out in the New Bathing Water Directive (Directive 2006/7/EC). This Directive requires more effective monitoring and management of bathing waters, greater public participation and improved information. More information on the new Directive can be found on the bathing water quality website and on <http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:064:0037:0051:EN:PDF>.

Cyprus, Denmark, Estonia, Finland, Germany, Hungary, Latvia, Lithuania, Slovakia, Spain and Sweden started to report according to more stringent new requirements in 2008 bathing season. Malta and the Netherlands started to report in 2009 bathing season under the new requirements. Sweden and Malta also sent data for three previous bathing seasons under the new requirements. Luxembourg started to monitor under the new requirements in 2006 bathing season, while reported for the first time in 2007 bathing season.

WISE - Water Information System for Europe ([www.water.europa.eu](http://www.water.europa.eu)) is a gateway to all water related information. Among other water related data, information on individual bathing water quality can be found in the WISE map viewer and WISE Bathing Water Quality data viewer through interactive maps and graphs (<http://www.eea.europa.eu/themes/water/status-and-monitoring/state-of-bathing-water>).

**Map 1: Bathing waters reported during the 2009 bathing season in Sweden**



Bathing water quality			No data
<b>Bathing waters on rivers</b>	<b>Bathing waters on lakes</b>	<b>Coastal/transitional bathing waters</b>	<b>Outside data coverage (data available, not presented on the map)</b>
▲ Compliant with guide values	■ Compliant with guide values	● Compliant with guide values	□ No data
▲ Compliant with mandatory values	■ Compliant with mandatory values	● Compliant with mandatory values	■ Outside data coverage (data available, not presented on the map)
▲ Closed*	■ Closed*	● Closed*	
▲ Insufficiently sampled or not sampled	■ Insufficiently sampled or not sampled	● Insufficiently sampled or not sampled	
▲ Not compliant with mandatory values	■ Not compliant with mandatory values	● Not compliant with mandatory values	

**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: Swedish authorities

**Map 2: Bathing waters reported during the 2009 bathing season in Sweden**

