

Swedish bathing water quality in 2017



Sweden 

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BWD Report For the Bathing Season 2017

Sweden

The report gives a general overview of information acquired from the reported data, based on provisions of the Bathing Water Directive¹. The reporting process is described below, as well as state and trends of bathing water quality in Sweden.

1. BWD reporting in the season 2017

In the 2017 bathing season, 441 bathing waters have been reported in Sweden. For each bathing water, five groups of parameters have been delivered²:

- *identification data* – including name, location, coastal, inland or transitional type of bathing water and availability to bathers;
- *seasonal data* – including season start and end, national quality classification in the recent season, potential management measures and changes that are likely to affect the classification of the bathing water;
- *monitoring results* – disaggregated numerical values of two microbiological parameters – intestinal enterococci and Escherichia coli (also known as E. coli), recorded at each water sample taken;
- *abnormal situation periods* – periods of an event or combination of events impacting on bathing water quality, during which monitoring calendar may be suspended; reporting is optional;
- *short-term pollution periods* – measurable events of microbiological contamination; reporting is optional.

Bathing waters of Sweden in 2017	
Total reported	441
Coastal	244
Inland	197
Max season period	61 days
	21 Jun to 20 Aug
Samples taken	2131
Share of bathing waters with good or excellent water quality	87 %
Reporting under Directive 2006/7/EC since	2008

The authorities of Sweden report data according to the new BWD (2006/7/EC) since the season 2008.

Altogether, **441 bathing waters** have been reported – 2.0% of all bathing waters in Europe. Two bathing waters have been newly reported in the recent season. 55% of bathing waters in Sweden are of coastal type; the other 45% are inland. **2131 samples** were taken at bathing waters throughout the season – 5 per bathing water on average.

¹ Directive BWD 2006/7/EC, available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:064:0037:0051:EN:PDF>

² See the BWD Data Dictionary for detailed explanations: <http://dd.eionet.europa.eu/datasets/3294#tables>

The maximum bathing season period was from 21 June to 20 August, i.e. 61 days altogether. Season duration varies depending on the bathing water.

Detailed information on bathing waters is available from national portal at <https://badplatsen.havochvatten.se/badplatsen/karta/>.

2. Assessment methodology³

Box 2.1: Change in analytical method affects bathing water classification in Sweden

In the season 2017, bathing water classification for Sweden was affected by the improved sensitivity of the analysis used. In 2017, some of the largest laboratories in Sweden changed methodology and levels of detection of faecal indicator organisms, from 50 colony forming units per 100 ml to 10 or 1, which are also the most used limit of detection (LOD) values through the EU Member States. In Sweden, the face value of samples below the limit of detection is used when calculating summary statistics for classification. Classification relies on an estimate the upper 90th or 95th percentile, calculated using the standard deviation of the set of samples.

When the lower limit of the dataset changed from 50 to 10 or 1 respectively, this led to a larger spread in the data. The standard deviation is a measure of the variability of a set of samples: the greater the apparent variation, the larger the estimate of the standard deviation. Subsequently, the estimate of the 90th or 95th percentile is higher with greater variation. The quality class for approximately 20% of bathing waters in Sweden moved from “excellent” to “good”. The deterioration of bathing water quality is not believed to be the result of increased levels of pollution; instead it is the result of calculation method for bathing quality class as given in Annex I of the Directive, which is now more comparable to the calculation methods in the other EU Member States.

During the bathing season, water samples are taken and analysed for two bacteria, *Escherichia coli* and intestinal enterococci which may indicate the presence of pollution, usually originating in sewage, livestock waste, bird faeces etc. 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 water in the bathing sites concerned.

The monitoring requirements under the Directive are:

- taking a pre-season sample (taken shortly before the start of the bathing season) ⁴;
- a minimum of four samples per season⁵;
- a minimum of one sample per month⁶.

³ The methodology used by the EC and the EEA is described here, while results of assessment by national authorities may differ in individual cases.

⁴ A pre-season sample is taken into a sum of samples per season.

⁵ Three samples are sufficient if the season does not exceed eight weeks or the region is subject to special geographical constraints.

⁶ If, for any reason, it is not possible to take the sample at the scheduled date, a delay of four extra days is allowed. Thus, the interval between two samples should not exceed 31 + 4 days.

If these rules are satisfied, the bathing water is categorised as 'sampling frequency satisfied'. If not all monitoring requirements are fulfilled the bathing water is categorised as 'not enough samples'. 88.7% of bathing waters met the described monitoring requirements set by the Directive, while the rest did not satisfy monitoring requirements for different reasons: being new; having changed environmental conditions that might affect water quality classification; closed; not monitored due to legal issues, physical inaccessibility to the site etc. Table 1 shows the statistics of bathing waters according to monitoring requirements.

Table 1: Bathing waters in 2017 according to compliance with BWD monitoring provisions

	Count	Share of total [%]
BWs with sampling frequency satisfied (and are not new, are not subject to changes or were not closed in 2017) These bathing waters have been monitored according to provisions and have complete dataset from the last assessment period. They have been quality-classified (excellent, good, sufficient, poor).	396	89.8%
BWs with sampling frequency not satisfied (and are not new, are not subject to changes or were not closed in 2017) These bathing waters exist throughout the last assessment period but have not been monitored throughout the period according to provisions for various individual reasons. They may be quality-classified if there is an adequate volume of samples available for credible classification.	35	7.9%
BWs that are new, subject to changes or closed in 2017 These bathing waters do not have complete dataset for the last assessment period because they are new, have been subject to changes (that are likely to affect the classification of the bathing water) or have been closed. They cannot be quality-classified.	10	2.3%
Total number of bathing waters in 2017	441	100%

Bathing waters where sampling frequency was not satisfied can still be quality assessed if at least four samples per season (three samples if the season does not exceed eight weeks or the region is subject to special geographical constraints) are available and equally distributed throughout the season. Assessment of bathing water quality is possible when the bathing water sample dataset is available for four consecutive seasons. Bathing waters are accordingly classified to one of the bathing water quality classes (excellent, good, sufficient, or poor).

The classification is based on pre-defined percentile values for microbiological enumerations, limiting the classes given in Annex I of the Directive. The Directive defines different limit values for coastal and inland waters.

Quality assessment is not possible for all bathing waters. In these cases, they are instead classified as either:

- not enough samples⁷;
- new⁸;

⁷ Not enough samples have been provided throughout the last assessment period (the last four bathing seasons or, when applicable, the period specified in Article 4.2 or 4.4).

⁸ Classification not yet possible because bathing water is newly identified and a complete set of samples is not yet available.

- changes⁹;
- closed¹⁰.

3. Bathing water quality

The results of the bathing water quality in Sweden throughout the past period are presented in Figure 1 (for coastal bathing waters) and Figure 2 (for inland bathing waters). The previous reports are available on the European Commission's bathing water quality website¹¹ and the European Environment Agency's bathing water website¹².

For interpretation of the statistics, also see Box 2.1.

3.1 Coastal bathing waters

In Sweden, 86.5% of all existing coastal bathing waters met at least sufficient water quality standards in 2017. See Appendix 1 for numeric data.

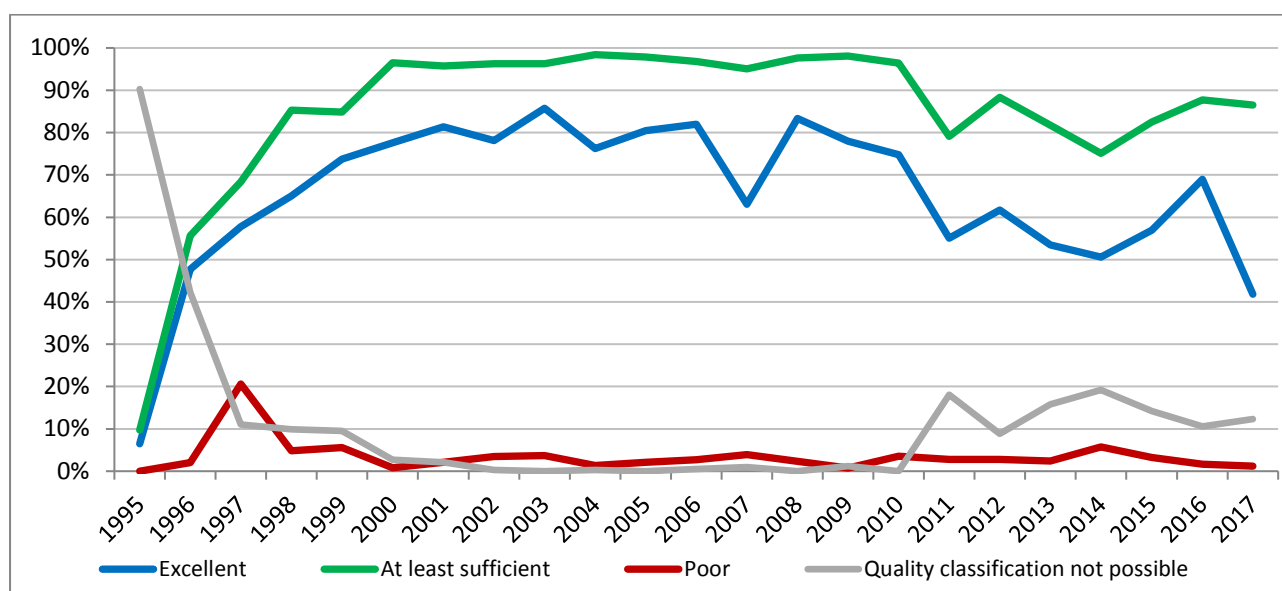


Figure 1: Coastal bathing water quality trend in Sweden. Note: the “At least sufficient” class also includes bathing waters of “Excellent” quality class, the sum of shares is therefore not 100%.

⁹ Classification is not yet possible after changes that are likely to affect the classification of the bathing water.

¹⁰ Bathing water is closed temporarily or throughout the bathing season.

¹¹ http://ec.europa.eu/environment/water/water-bathing/index_en.html

¹² <http://www.eea.europa.eu/themes/water/status-and-monitoring/state-of-bathing-water>

3.2 Inland bathing waters

93.9% of all existing inland bathing waters were of at least sufficient water quality in 2017. See Appendix 1 for numeric data.

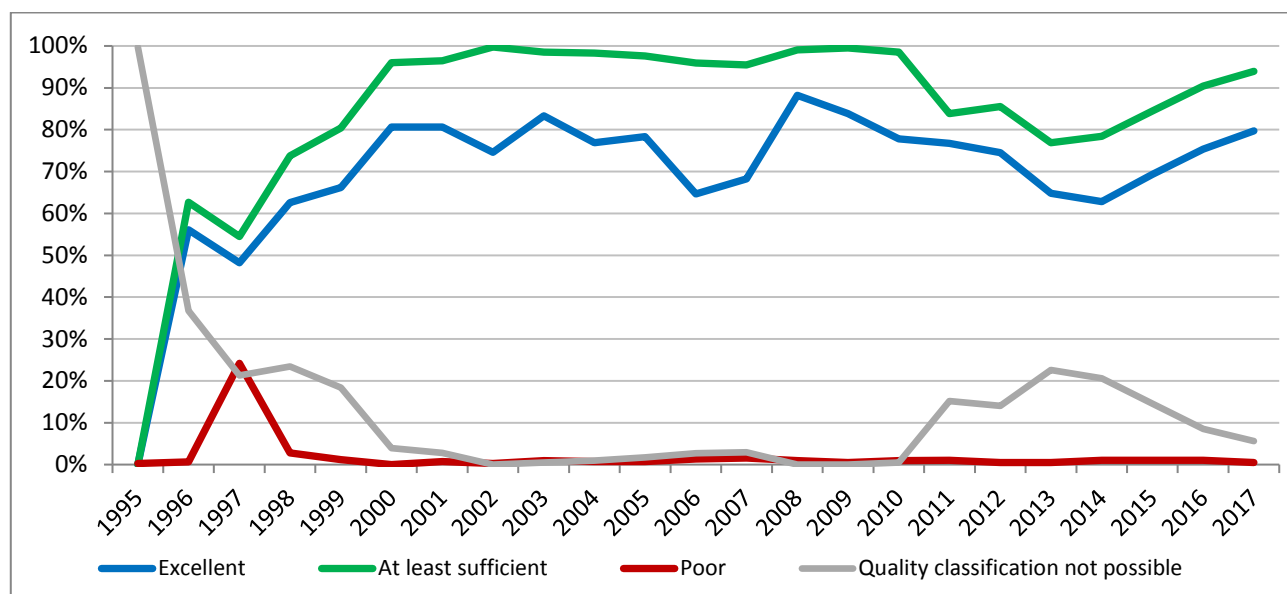


Figure 2: Inland bathing water quality trend in Sweden. Note: the “At least sufficient” class also includes bathing waters of “Excellent” quality class, the sum of shares is therefore not 100%.

4. Information regarding management and other issues

With a long coastline and many lakes, Sweden has many beaches and swimming areas. Swedish Agency for Marine and Water Management (<https://www.havochvatten.se/en/swam/facts--leisure/bathingwater-quality.html>) oversees the regulations and guidelines related to bathing water quality in Sweden.

The Agency, in accordance with the Bathing Water Directive, issues detailed instructions for collecting water samples. In Sweden, areas with more than 200 bathers per day on average are considered as EU bathing sites. Swimming areas with fewer than 200 bathers per day have the option of registering as an EU bathing site. Interactive map (in Swedish) (available at <https://badplatsen.havochvatten.se/badplatsen/karta/#/bath/>) shows the water quality for the swimming areas that are monitored in Sweden. Results of the most recent samplings are shown, and information is updated whenever new test results are received from municipalities. The map also contains data on for example algal blooms, contact information for the responsible municipality, measures undertaken in case of water quality issues, and if there is a current warning against bathing in that area.

Bathing water classifications for Sweden were affected by the improved sensitivity of the analysis used, and the subsequent change in the variation in reported results. A lower level of pollution was reported, resulting in generally lower classifications of bathing waters. Counterintuitively, the improved detection level has led to an apparent worsening of bathing water quality when there is no evidence

that this is a reflection of an actual change in the environment. In 2017, some of the largest laboratories in Sweden changed methodology and levels of detection of faecal indicator organisms, from 50 colony forming units per 100 ml to 10 or 1. In Sweden, the face value of samples below the limit of detection is used when calculating summary statistics for classification. Classification relies on an estimate the upper 90th or 95th percentile, calculated using the standard deviation of the set of samples. When the lower limit of the data set changed from 50 to 10 or 1 respectively, this led to a larger spread in the data. The standard deviation is a measure of the variability of a set of samples. The greater the apparent variation, the larger the estimate of the Standard deviation. Subsequently, the estimate of the 90th or 95th percentile is higher with greater variation. In approximately 20% of bathing waters this change in limit of detection led to class deterioration, as a lower estimate of this percentile is better. The majority of the bathing waters with changed class moved from "Excellent" to "Good". The apparent deterioration of bathing water quality in Sweden is therefore not believed to be the result of increased levels of pollution. It is the result of the use of a conservative calculation method for compliance assessment, coupled with a change in the detection limit in the laboratory analysis of the samples.

5. Bathing water quality assessment presentation in online viewers

The European bathing water legislation focuses on sound management of bathing waters, greater public participation and improved information dissemination. More on the bathing and other water legislation can be found on the European Commission's website: http://ec.europa.eu/environment/water/index_en.htm.

The bathing water section of the Water Information System for Europe (WISE) which is accessible at the EEA bathing water website (<http://www.eea.europa.eu/themes/water/interactive/bathing/state-of-bathing-waters>) allows users to view the bathing water quality at more than 21 000 coastal and inland sites across Europe. The WISE bathing water quality data viewer combines text and graphical visualisation, providing a quick overview of the bathing water's locations and achieved quality. Having access to bathing water information, citizens are encouraged to make full use of it and participate with their comments.

Appendix 1: Results of bathing water quality in Sweden from 2014 to 2017

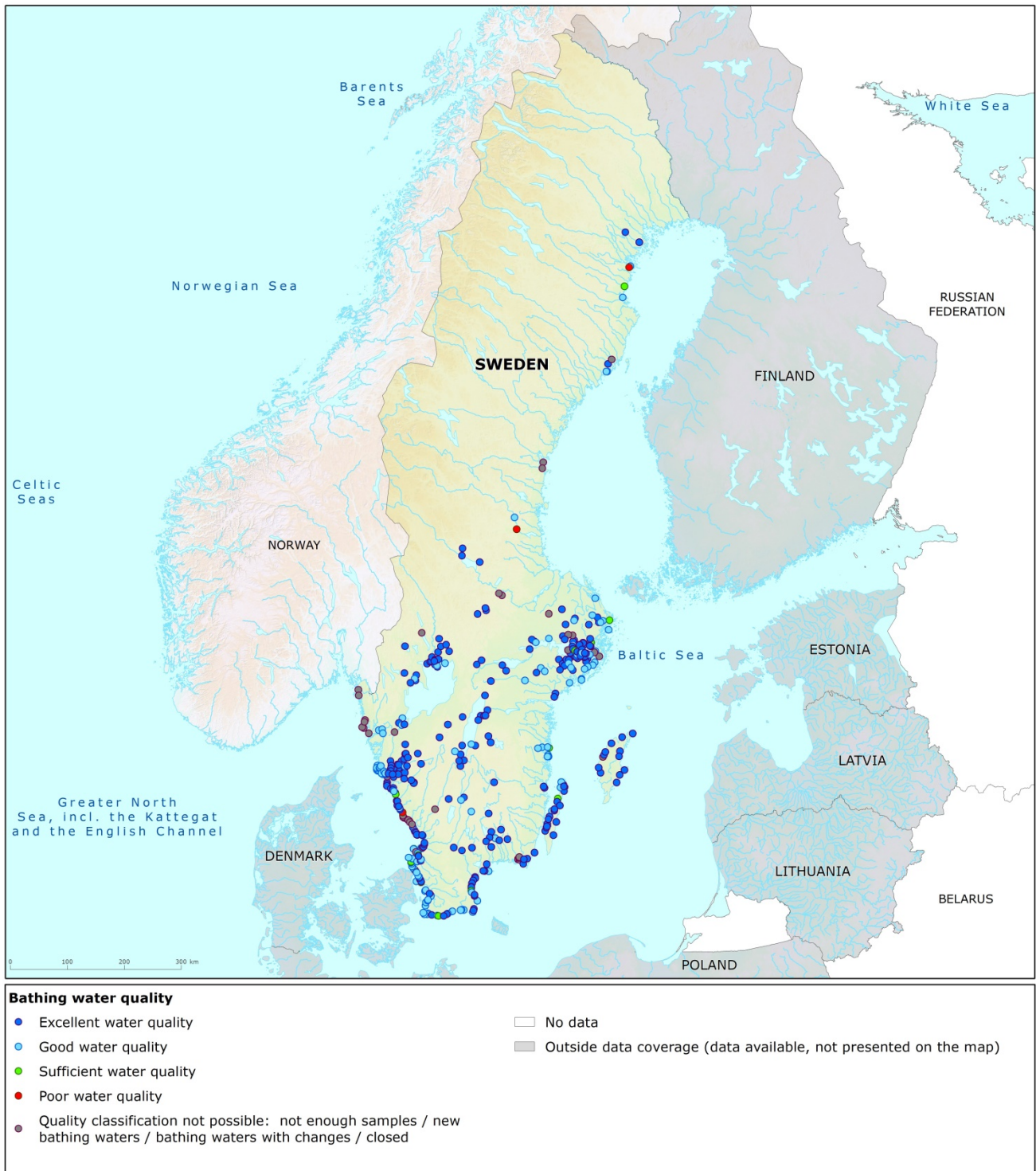
Table 2: Bathing waters in the season 2017 according to quality

		Total number of bathing waters	Excellent quality		At least sufficient quality		Poor quality		Quality classification not possible: not enough samples /new bathing waters/bathing waters subject to changes/closed	
			Count	%	Count	%	Count	%	Count	%
Coastal	2014	245	124	50.6	184	75.1	14	5.7	47	19.2
	2015	246	140	56.9	203	82.5	8	3.3	35	14.2
	2016	245	169	69.0	215	87.8	4	1.6	26	10.6
	2017	244	102	41.8	211	86.5	3	1.2	30	12.3
Inland	2014	199	125	62.8	156	78.4	2	1.0	41	20.6
	2015	199	138	69.3	168	84.4	2	1.0	29	14.6
	2016	199	150	75.4	180	90.5	2	1.0	17	8.5
	2017	197	157	79.7	185	93.9	1	0.5	11	5.6
Total	2014	444	249	56.1	340	76.6	16	3.6	88	19.8
	2015	445	278	62.5	371	83.4	10	2.2	64	14.4
	2016	444	319	71.8	395	89.0	6	1.4	43	9.7
	2017	441	259	58.7	396	89.8	4	0.9	41	9.3

Note: the class "At least sufficient" also includes bathing waters which are of excellent quality, the sum of shares is therefore not 100%.

Appendix 2: Bathing water quality map

Map 1: Bathing waters reported during the 2017 bathing season in Sweden



Source: National boundaries: EEA; Large rivers and lakes: EEA, WFD Article 3; Bathing waters data and coordinates: Swedish authorities; Digital Elevation Model over Europe (EU-DEM): EEA.