

Bathing Water Directive report 2013

Croatia

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 Croatia.

1. BWD reporting in 2013 season

In 2013 bathing season, 927 bathing waters have been reported in Croatia. For each bathing water, five groups of parameters have been delivered:

- *basic identification data* – including name, location, geographic type of bathing water and availability to bathers;
- *seasonal data* – including season start and end, national quality classification in present season, potential management measures and changes in quality;
- *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 unexpected situations that have, or could reasonably be expected to have, an adverse impact on bathing water quality and on bathers' health; reporting is optional;
- *short-term pollution periods* – identifiable events that adversely affect water quality by faecal contamination; reporting is optional;

Bathing waters of Croatia in 2013	
Total reported	927
Coastal	919
Inland	8
Season period	112 / 106 days
Coastal	1 Jun to 15 Sep
Inland	25 May to 24 Sep
Samples taken	9183
Share of bathing waters with good or excellent water quality	97 %
New BWD implemented in	2009

The authorities of Croatia initiated new BWD (2006/7/EC) reporting in 2009 season. The 2013 season data were delivered to the European Commission by **30 December 2013**, with additional deliveries on 3 January 2014 and 19 February 2014.

Altogether, **927 bathing waters** have been reported – 4.2% of all bathing waters in Europe. Out of all bathing waters in Croatia, eight (0.86%) have been newly identified in 2013 season. No bathing waters have been delisted². 99% of bathing waters in Croatia are of coastal type; the other 1% are inland. **9183 samples** were taken at bathing waters throughout the season – ten per bathing water on average.

¹ Available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:064:0037:0051:EN:PDF>

² Bathing waters which were identified in 2012 season, but not in 2013 season

The bathing season period was from 1 June to 15 September for coastal bathing waters, i.e. 106 days altogether. Inland bathing season period was from 25 May to 24 September, i.e. 112 days. Season duration varies for inland bathing waters.

18 short-term pollution events have been reported at 16 bathing waters.

Detailed information on individual bathing waters is available from national bathing water profiles at http://baltazar.izor.hr/plazepub/kakvoqa?p_jezik=eng.

2. Assessment methodology

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 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.

According to the BWD, the bathing water sample dataset should satisfy the following conditions:

- a minimum of one sample per month³
- a minimum of four samples per season⁴
- a minimum of 16 samples in total⁵
- four consecutive seasons⁶
- a pre-season sample⁷

The monitoring took place at 100% of total identified bathing waters, while 99% of bathing waters satisfied the described sampling frequency rules set by the Directive. Table 1 shows the share of bathing waters that did not satisfy monitoring frequency, as well as corresponding reasons.

Table 1: Number of assessed bathing waters in 2013

Total number of bathing waters in 2013	Bathing waters with sampling frequency satisfied	Bathing waters with sampling frequency not satisfied			
		Insufficiently sampled	Closed	Not sampled	Total
927	920	7	0	0	7

However, in pursue of maximum possible count of bathing waters to be taken into account for statistical purposes, limited number of other bathing waters have been assessed as well. This includes all bathing waters that have set of samples for a competent quality classification, but lack pre-season sample or

³ The interval between two samples should not exceed 31 + 4 days, provided that the next sampling is done according to the monitoring calendar; exception applies for temporarily closed bathing waters

⁴ Three samples if the season does not exceed eight weeks or the region is subject to special geographical constraints

⁵ 12 samples if the season does not exceed eight weeks or the region is subject to special geographical constraints

⁶ The condition does not apply if the bathing water is newly identified or any changes have occurred that are likely to affect the classification

⁷ A pre-season sample is taken into account at total number of samples per season

frequency between sample dates is larger than defined in the directive. However, samples have to be equally distributed throughout the season.

Bathing waters are accordingly classified to one of the BWD quality classes:

- excellent
- good
- sufficient
- poor

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

3. Bathing water quality

The results of the bathing water quality in Croatia for the period of 2010–2013 as reported in the past reporting years and for the bathing season of 2013 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 website⁸ and the European Environment Agency's bathing water website⁹.

3.1 Coastal bathing waters

In Croatia, 98.2% of coastal bathing waters met at least sufficient water quality in 2013. No coastal bathing waters had to be closed during the bathing season. See Appendix 1 for numeric data.

⁸ http://ec.europa.eu/environment/water/water-bathing/index_en.html

⁹ <http://www.eea.europa.eu/themes/water/status-and-monitoring/state-of-bathing-water>

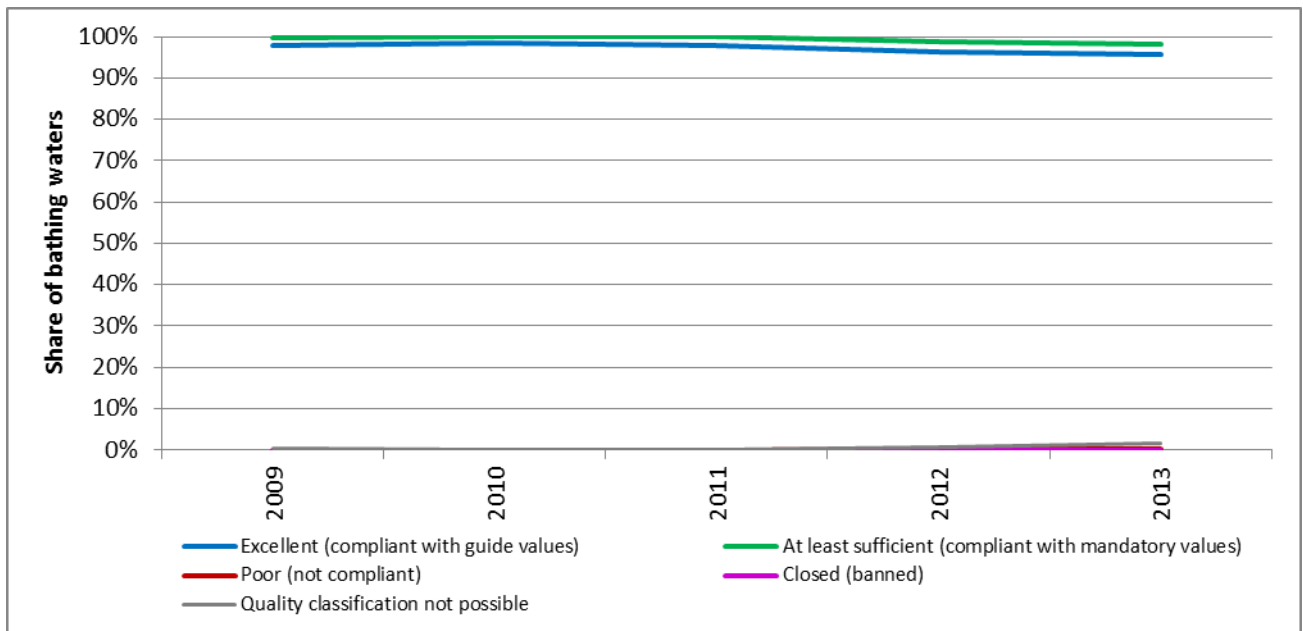


Figure 1: Coastal bathing water quality trend in Croatia. Note: the “At least sufficient” class also includes bathing waters of “Excellent” quality class, the sum of shares is therefore not 100%.

3.2 Inland bathing waters

50.0% of the inland bathing waters met at least sufficient water quality in 2013, while classification was not possible at others. No bathing waters had to be closed during the bathing season. See Appendix 1 for numeric data.

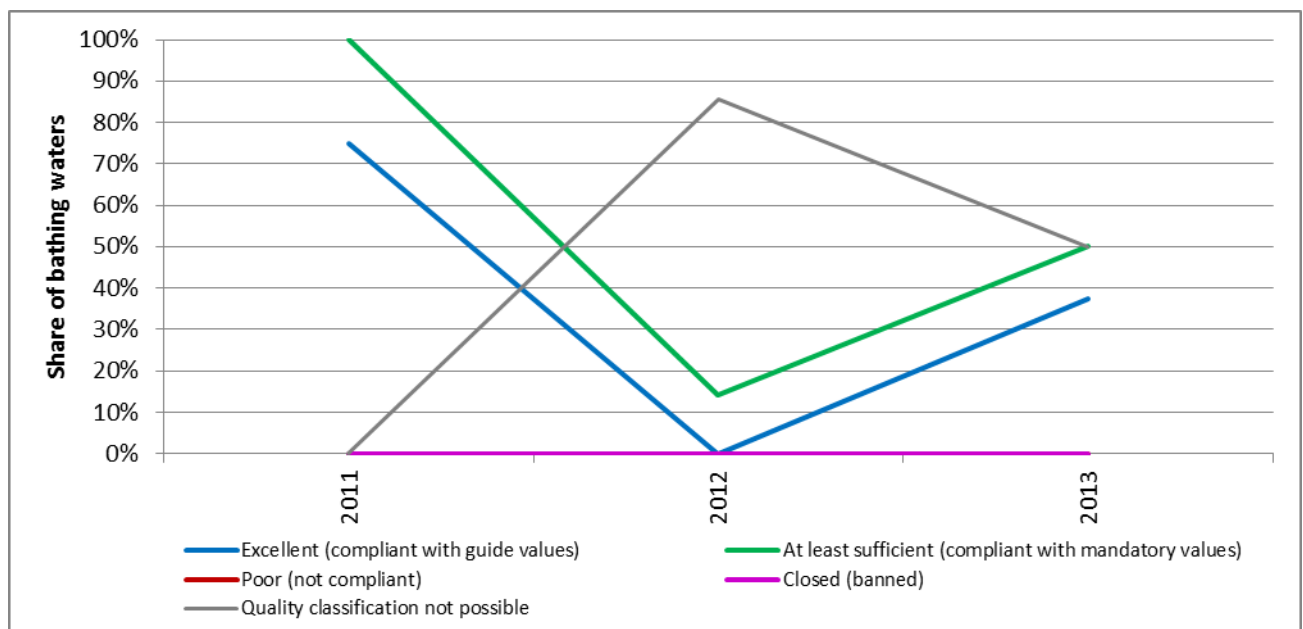


Figure 2: Inland bathing water quality trend in Croatia. Note: the “At least sufficient” class also includes bathing waters of “Excellent” quality class, the sum of shares is therefore not 100%.

4. Information regarding management and other issues

The Adriatic coast of Croatia is 6278 km (including coast of islands). The coastal region covers 22 % of country area but population density is larger than national average, especially so in tourist season. Thus, dense population in summer is an important environmental factor and impacts quality of bathing waters. In individual regions of Croatia, quality of bathing waters has been monitored from 1986 on, while country-level monitoring has been held from 1989 on. In addition to concentrations of bacteria, other bathing water parameters are also monitored: meteorological factors (temperature, wind, rainfall, exceptional weather events), visual pollution (e.g. oil, litter), water temperature, salinity. The monitoring is done by seven regional health agencies. Additional details on bathing water monitoring, management measures and general implementation of the BWD are included in an extensive report produced by the national authorities (in Croatian; http://www.mzoip.hr/doc/More/Izvjesce_more_2013.pdf).

5. Interactive information on bathing water quality in Europe

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 22 000 coastal beaches and inland sites across Europe. Data is aggregated and visualized on national and station level. Detailed information regarding specific bathing site are given in pop-up windows (can be activated with a click on a selected bathing location) and bathing water profiles which can be opened through hyperlinks in pop-up windows.

The data on bathing water quality in 2013 and previous years can also be viewed in WISE bathing water data viewer, an application prepared by TC Vode (<http://bwd.eea.europa.eu/>). 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. Specific bathing water locations can be observed on Google Earth, Google maps or Bing maps.

Appendix 1: Results of bathing water quality in Croatia from 2010 to 2013

		Total	Excellent (compliant with guide values)		At least sufficient (compliant with mandatory values)		Poor (not compliant)		Closed (banned)		Quality classification not possible*	
			No	%	No	%	No	%	No	%	No	%
Coastal	2010	913	900	98.6	913	100.0	0	0.0	0	0.0	0	0.0
	2011	906	886	97.8	906	100.0	0	0.0	0	0.0	0	0.0
	2012	912	876	96.1	902	98.9	3	0.3	0	0.0	7	0.8
	2013	919	877	95.4	902	98.2	3	0.3	0	0.0	14	1.5
Inland	2010	0	0	0	0	0	0	0	0	0	0	0
	2011	4	3	75.0	4	100.0	0	0.0	0	0.0	0	0.0
	2012	7	0	0.0	1	14.3	0	0.0	0	0.0	6	85.7
	2013	8	3	37.5	4	50.0	0	0.0	0	0.0	4	50.0
Total	2010	913	900	98.6	913	100.0	0	0.0	0	0.0	0	0.0
	2011	910	889	97.7	910	100.0	0	0.0	0	0.0	0	0.0
	2012	919	876	95.3	903	98.3	3	0.3	0	0.0	13	1.4
	2013	927	880	94.9	906	97.7	3	0.3	0	0.0	18	1.9

Note: the "At least sufficient" class also includes bathing waters which are of excellent quality, the sum of shares is therefore not 100%. * This includes new bathing waters, bathing waters with changes that affect or could have affected bathing water quality, and bathing waters that do not have enough samples.

Appendix 2: Bathing water quality map

Map 1: Bathing waters reported during the 2013 bathing season in Croatia



Bathing water quality

- Excellent water quality
- Good water quality
- Sufficient water quality
- Poor water quality
- Closed temporarily or throughout the season
- Quality classification not possible: new bathing waters / bathing waters with changes / not enough samples

- No data
- Outside data coverage (data available, not presented on the map)

Source: National boundaries: EEA; Large rivers and lakes: EEA; Bathing waters data and coordinates: Croatian authorities