

Bathing water results 2009 – Greece

1. Introduction

This report gives a general overview of bathing water quality in Greece during the 2009 bathing season.

Greece reported eight parameters under the Directive 76/160/EEC (1 Total coliforms, 2 Faecal coliforms, 3 Faecal streptococci, 7 Colour, 8 Mineral oils, 9 Surface-active substances reacting with methylene blue, 10 Phenols (phenol indices), 13 Tarry residues and floating materials).

The parameters to be taken into account for assessment according to the assessment rules of the Directive 76/160/EEC are microbiological (1 Total coliforms, 2 Faecal coliforms) and physico-chemical (8 Mineral oils, 9 Surface-active substances reacting with methylene blue, 10 Phenols (phenol indices)).

The bathing waters are classified in the following categories:

- Compliant with mandatory values of the Directive for the five parameters (class CI);
- Compliant with mandatory and more stringent guide values of the Directive for the five parameters (class CG);
- Not compliant with mandatory values of the Directive for the five parameters (class NC);
- Banned or closed (temporarily or throughout the season) (class B).

2. Length of bathing season and number of bathing waters

For all bathing waters the bathing season lasted five months, from 1 June to 31 October 2009.

A total of 2 107 bathing waters were reported in Greece during the 2009 bathing season, of which 2 101 were coastal bathing waters and six freshwater bathing waters on lakes. One coastal bathing water was not monitored and 830 bathing waters (828 coastal and two freshwater) were sampled only part of the season with three samples taken for majority of them. The reason was delay in the start of monitoring. 597 bathing waters (593 coastal and four freshwater) were monitored with reduced frequency according to the Directive 76/160/EEC. Greece has very few rivers or lakes suitable or in preference for bathing compared to the high number of coastal bathing areas.

With 2 107 bathing waters Greece accounts for about 9.8% 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 is presented in Table 1. Remarkably is the increase in number of coastal bathing waters since the start of the reporting from 683 in 1990 to 2 101 in 2009. In 2009, 12 new bathing waters were added to the list compared to the previous year. The number of freshwater bathing waters increased from four since 1992 to six in 2006. It remained the same afterwards.

3. Results of bathing water quality

The results of the bathing water quality in Greece for the period 1990-2008 as reported in the past reporting years and for the season of 2009 are presented in Figure 1a and Figure 1b. 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; 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, for coastal and freshwater bathing waters separately:

- 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).

In Figure 1a, the results of bathing water quality are presented for all reported bathing waters at the beginning of the 2009 bathing season (2 107 bathing waters).

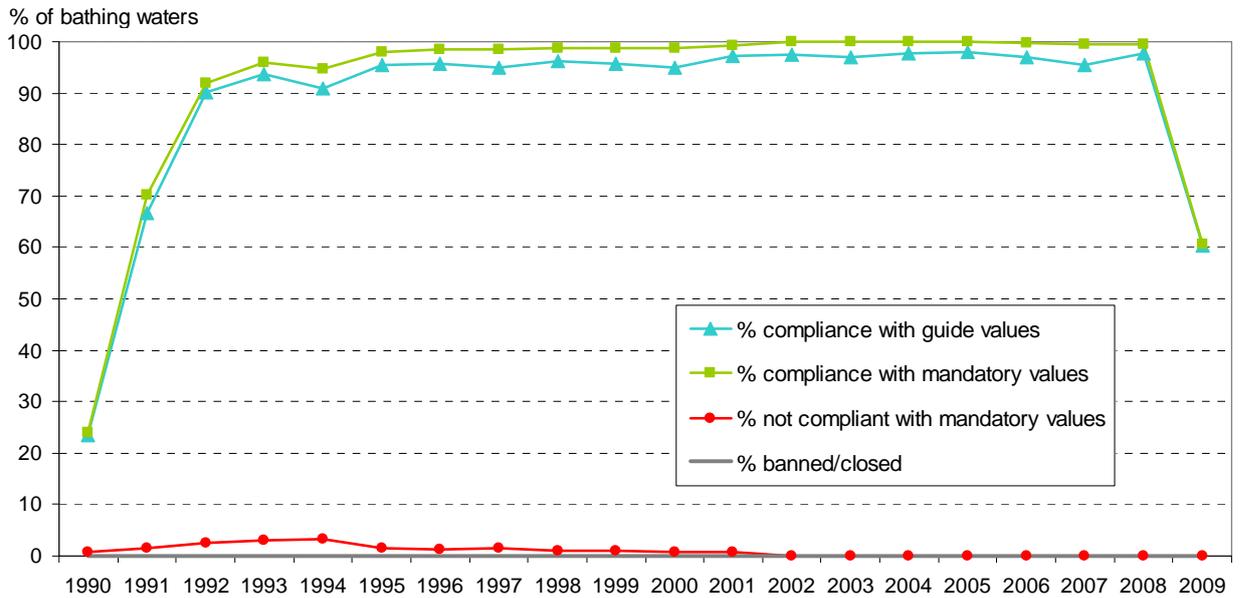
In Figure 1b, the results of bathing water quality are presented for 1 277 bathing waters. 830 incompletely sampled bathing waters are not included in overall assessment.

Table 1 shows the same information in absolute numbers and in percentages, separately for coastal and freshwater bathing waters. Table 2 shows the bathing water quality results for 2009 season in Greece for all bathing waters.

Map 1 shows the location of the reported bathing waters in Greece. The location of the bathing waters is based on the geographic coordinates reported by the Greek authorities.

Figure 1a: Results of bathing water quality in Greece from 1990 to 2009

Coastal bathing waters (GR)



Freshwater bathing waters (GR)

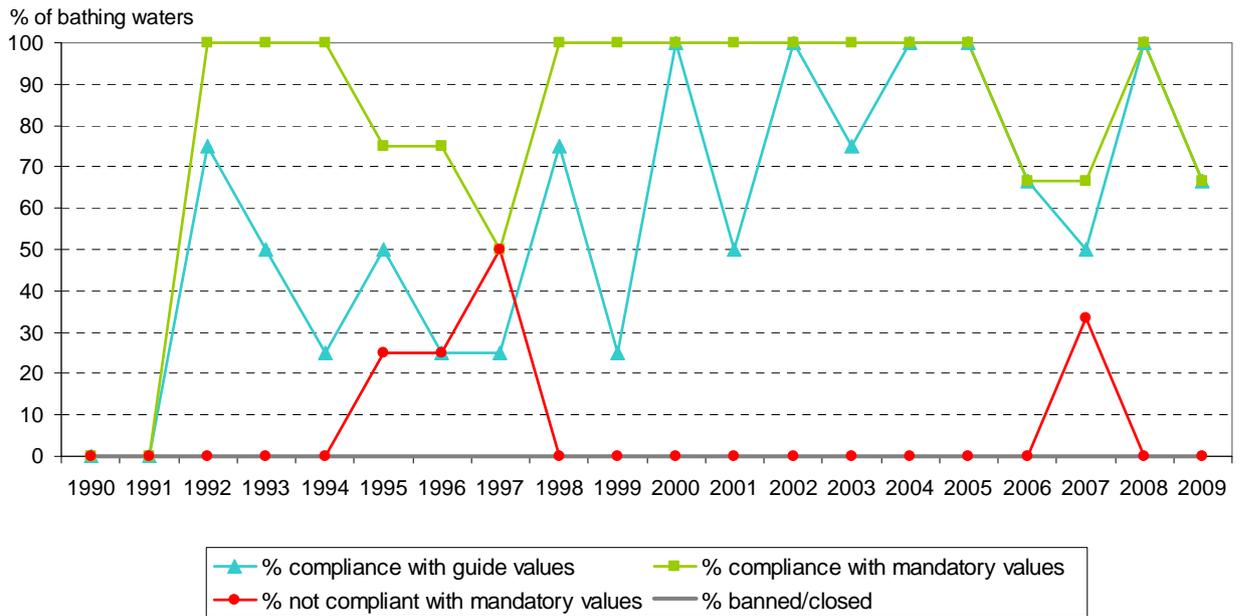
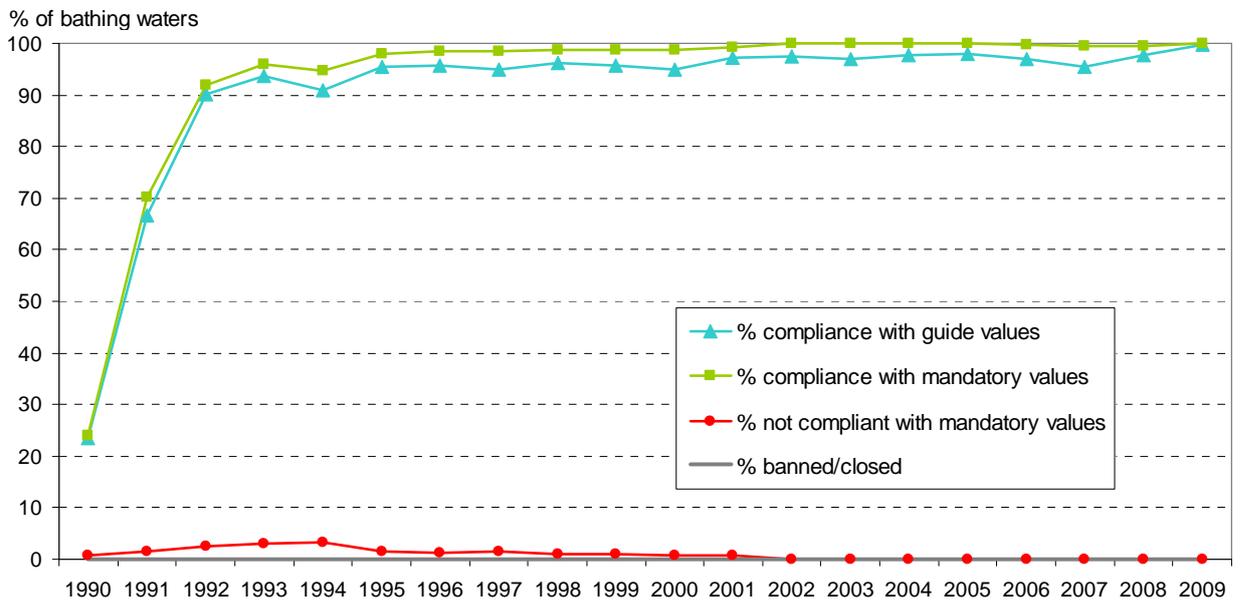


Figure 1b: Results of bathing water quality in Greece from 1990 to 2009. Incompletely sampled bathing waters are not considered in this figure.

Coastal bathing waters (GR)



Freshwater bathing waters (GR)

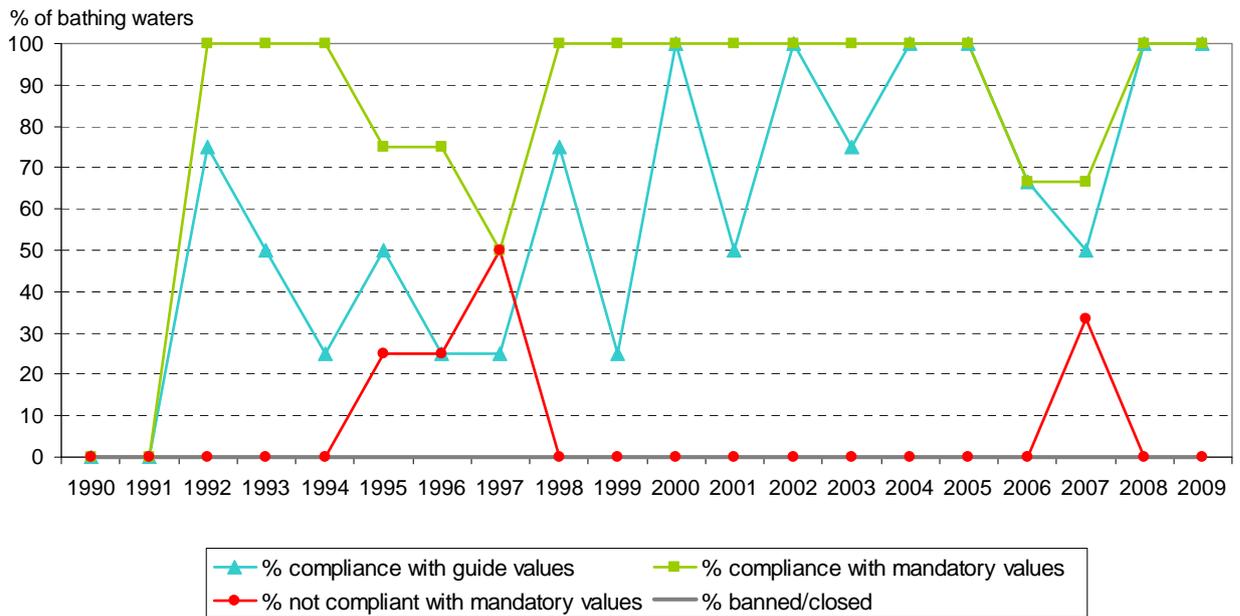


Table 1: Results of bathing water quality in Greece from 1990 to 2009

GR										
		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	1990	683	161	23.6	164	24.0	5	0.7	0	0.0
	1991	1096	731	66.7	770	70.3	16	1.5	0	0.0
	1992	1203	1086	90.3	1105	91.9	31	2.6	0	0.0
	1993	1250	1170	93.6	1201	96.1	39	3.1	0	0.0
	1994	1281	1165	90.9	1214	94.8	43	3.4	0	0.0
	1995	1526	1458	95.5	1494	97.9	25	1.6	0	0.0
	1996	1690	1619	95.8	1666	98.6	20	1.2	0	0.0
	1997	1701	1616	95.0	1674	98.4	24	1.4	0	0.0
	1998	1733	1666	96.1	1710	98.7	17	1.0	0	0.0
	1999	1816	1740	95.8	1795	98.8	17	0.9	0	0.0
	2000	1858	1765	95.0	1835	98.8	16	0.9	0	0.0
	2001	1887	1833	97.1	1875	99.4	12	0.6	0	0.0
	2002	1914	1866	97.5	1912	99.9	2	0.1	0	0.0
	2003	1933	1876	97.1	1931	99.9	2	0.1	0	0.0
	2004	1965	1918	97.6	1964	99.9	1	0.1	0	0.0
	2005	2006	1967	98.1	2005	100.0	1	0.0	0	0.0
	2006	2047	1983	96.9	2040	99.7	0	0.0	0	0.0
	2007	2049	1957	95.5	2039	99.5	0	0.0	0	0.0
	2008*	2089	2040	97.7	2079	99.5	2	0.1	0	0.0
	2009 (1)	2101	1270	60.4	1272	60.5	0	0.0	0	0.0
2009 (2)	1273	1270	99.8	1272	99.9	0	0.0	0	0.0	
Freshwater bathing waters	1990	6	0	0.0	0	0.0	0	0.0	0	0.0
	1991	6	0	0.0	0	0.0	0	0.0	0	0.0
	1992	4	3	75.0	4	100.0	0	0.0	0	0.0
	1993	4	2	50.0	4	100.0	0	0.0	0	0.0
	1994	4	1	25.0	4	100.0	0	0.0	0	0.0
	1995	4	2	50.0	3	75.0	1	25.0	0	0.0
	1996	4	1	25.0	3	75.0	1	25.0	0	0.0
	1997	4	1	25.0	2	50.0	2	50.0	0	0.0
	1998	4	3	75.0	4	100.0	0	0.0	0	0.0
	1999	4	1	25.0	4	100.0	0	0.0	0	0.0
	2000	4	4	100.0	4	100.0	0	0.0	0	0.0
	2001	4	2	50.0	4	100.0	0	0.0	0	0.0
	2002	4	4	100.0	4	100.0	0	0.0	0	0.0
	2003	4	3	75.0	4	100.0	0	0.0	0	0.0
	2004	4	4	100.0	4	100.0	0	0.0	0	0.0
	2005	4	4	100.0	4	100.0	0	0.0	0	0.0
	2006	6	4	66.7	4	66.7	0	0.0	0	0.0
	2007	6	3	50.0	4	66.7	2	33.3	0	0.0
	2008	6	6	100.0	6	100.0	0	0.0	0	0.0
	2009 (1)	6	4	66.7	4	66.7	0	0.0	0	0.0
2009 (2)	4	4	100.0	4	100.0	0	0.0	0	0.0	

Note: Bathing waters which were insufficiently sampled or incompletely sampled or not sampled according to the 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.

* : Changes after official report for 2008 bathing season.

(1) : The results of bathing water quality are presented for all reported coastal (2 101) and freshwater bathing waters (six).

(2) : The results of bathing water quality are presented for 1 273 coastal and four freshwater bathing waters (828 incompletely sampled coastal and two incompletely sampled freshwater bathing waters are not included in overall assessment) - taken into account in assessment on the EU level - EU report.

Table 2: Results of bathing water quality for all bathing waters in Greece in 2009

GR										
		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	%
Bathing waters	2009 (1)	2107	1274	60.5	1276	60.6	0	0.0	0	0.0
	2009 (2)	1277	1274	99.8	1276	99.9	0	0.0	0	0.0

Note: Bathing waters which were incompletely sampled or not sampled according to the Bathing Water Directive were not included in this table. Therefore the sum of the different categories is not equal to the total number of bathing waters. Bathing waters which were compliant with the guide values were also compliant with the mandatory values.

(1) : The results of bathing water quality are presented for all reported bathing waters (2 107).

(2) : The results of bathing water quality are presented for 1 277 bathing waters (830 incompletely sampled bathing waters are not included in overall assessment) - taken into account in assessment on the EU level - EU report.

4. Development of bathing water quality

Coastal bathing waters

As shown in Figure 1a, 60.5% of the coastal bathing waters met the mandatory values in 2009. This is a high decrease of 39% compared to the previous year. The rate of compliance with the more stringent guide values also decreased from 97.7% to 60.4%. The reduction of the compliance rate in 2009 is due to a high number of incompletely sampled coastal bathing waters (828). If these bathing waters are not included in overall assessment (Figure 1b), 99.9% of the coastal bathing waters met the mandatory values in 2009. This is a slight increase of 0.4% compared to the previous year. The rate of compliance with the guide values was 99.8%, which is an increase of 2.1%. No bathing waters were not-compliant with the mandatory values compared to two (0.1%) in 2008. Since the start of the reporting in 1990, no coastal bathing water had to be closed during the season.

The compliance rate was low for the coastal bathing waters in the early 90's. As shown in Figure 1a, the compliance with mandatory and even guide values was always higher than 90% since 1992. The mandatory water quality was met in 98% of the bathing waters since 1996 and since 2001 in over 99% of the bathing waters. It took Greece till the 2002 bathing season to reach a level of non-compliant freshwater bathing waters below 0.5%.

Freshwater bathing waters

As shown in Figure 1a, 66.7% of the freshwater bathing waters were in compliance with the mandatory values and the more stringent guide values in 2009. This is a decrease of two bathing waters (33.3%) compared to the previous year, when all six bathing waters were in compliance. If two incompletely sampled freshwater bathing waters are not included in overall assessment (Figure 1b), 100% of the freshwater bathing waters were in compliance with the mandatory values and the guide values in 2009. Since the start of the reporting in 1990, no freshwater bathing water had to be closed during the season.

Because of the low number of reported freshwater bathing waters, the compliance rate is fluctuating largely from year to year.

5. General information as provided by the Greek authorities

Monitoring and results

The bathing water quality in Greece was monitored during the 2009 bathing season within the framework of a program conducted by the Ministry for the Environment, Physical Planning and Public Works, in compliance with the 76/160/EEC Directive.

The Greek authorities reported the list of bathing waters before the start of the 2009 bathing season. During the 2009 bathing season, 12 new sampling points were added to those of the previous year.

The Greek authorities informed the European Commission that the official monitoring programme started after 1 July 2009. Due to unforeseen delays in the commissioning of the program a full set of data at the required frequency was obtained for only 593 out of the 2 100 coastal points. From the remaining points, the number of samples taken were either less than the minimum number (6-7) which is considered to be adequate for bathing areas where the water quality was in compliance with the mandatory values during the previous two years or lacked the desired frequency. Due to the abovementioned reasons freshwater bathing areas were not sampled at the required frequency by the Directive in 2009. Therefore, a strict compliance assessment (in full accordance with the provisions of the Directive) is limited to the fully tested 593 points. Despite the organizational problems which prevented the full implementation of the monitoring program, the results obtained for 2009 confirm the excellent quality of the coastal bathing waters in Greece. 100% (593) of the areas complied with the mandatory values and 99.9% (592) of the areas complied with the guide values. Regarding the remaining 1 507 coastal sampling, only two samples were found to exceed the mandatory values.

Analytical methods

During 2009 the microbiological parameters "total coliforms" (1), "faecal coliforms" (2) and "faecal streptococci" (3) were measured according to the methods described in the Directive 76/160/EEC. Either the "Membrane Filter Method" or the "Multiple-Tube Fermentation Technique for members of the Coliforms Groups" were used for analytical purposes. With respect to the physicochemical parameters 7 (colour), 8 (mineral oils), 9 (surface-active substances), 10 (phenols) and 13 (floating materials), these were assessed by visual inspection.

Public information

During the 2009 bathing season, as in previous years, the Ministry informed the public about the monitoring results and contributed in raising public awareness on environmental issues. The citizens are in a position to contact the Ministry for detailed information or complaints.

More specifically the following steps were undertaken:

- The results of the fortnightly analyses of bathing waters during the 2009 bathing period were available via the Internet site: <http://iason.minenv.gr>. Managers of all beaches awarded with the 2008 Blue Flag Award were able to print them and then present them at a discrete site on each beach.
- Information on the situation of bathing areas is also made available via the Internet (www.edpp.gr and <http://iason.minenv.gr/akti>).
- The Ministry responded by phone or by post to all requests from citizens or tourists regarding information on the bathing water quality.

Treatment of waste water

With respect to the implementation of the 91/271/EEC Directive concerning urban wastewater, a large number of WWTP's have been constructed or are under construction.

The agglomerations of A and B priority (with equivalent populations above 10 000 discharging in sensitive areas and 15 000 respectively) located in coastal areas are almost fully served by waste water treatment plants (WWTPs), most of them involving advanced treatment, thus contributing to the improvement of bathing water quality of these areas.

More specifically, six large cities with p.e. of more than 150 000 inhabitants (Athens, Thessaloniki,

Metamorphosis, Patra, Iraklio and Volos) and forty-four other agglomerations of priority A and B discharging their effluents in coastal areas are served by WWTPs. Furthermore, the operation of the WWTP of Megara was commissioned in September 2009.

Regarding sewerage networks, the sewerage systems of the agglomerations Litochoro (S. Pieria), Lefkimmi and Megara were completed in 2009. In the case of the agglomeration of Elefsina-Aspropyrgos the WWTP and the corresponding sewerage system are under construction and the project is anticipated to be completed by the end of 2010.

Treatment of diffuse sources of pollution

For the purposes of the Nitrates Directive (91/676/EEC), seven vulnerable zones have been designated:

- 1) Area of Thessaloniki – Kilkis;
- 2) Area of Strymonas river;
- 3) Area of Arta Preveza;
- 4) Area of Thessalia;
- 5) Area of Pinios river;
- 6) Area of Argolida;
- 7) Area of Kopaida.

Action programmes have been undertaken for each one of these zones, which are expected to contribute in a positive way to the bathing waters' quality of the following gulfs: Thermaikos, Stymonikos, Amvrakikos, Pagasitikos, Kouroutas, Argolikos and North Evoikos.

The report by the Greek authorities in regard to bathing water quality in Greece for 2009 bathing season can be obtained from

http://cdr.eionet.europa.eu/gr/eu/bathing/envsznkg/2009_BW_report_GR.doc.

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) 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) 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 Greece

