



MINISTRY OF
ENVIRONMENT
ENERGY &
CLIMATE
CHANGE

Secretariat for Water

BATHING WATER QUALITY IN GREECE

Reference year 2010



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INTRODUCTION

Bathing water quality for the year 2010 was monitored in the framework of the *Monitoring Programme of Bathing Water Quality* that was implemented under the supervision of the Special Secretariat of Water of the Ministry of Environment Energy and Climate Change.

The implementation of the 2010 monitoring programme was based on the provisions of the Directive 2006/7/EC concerning the management of bathing water quality and repealing Directive 76/160/EEC, which is incorporated to Greek legislation with the Ministerial Decree 8600/416/E103/2009 (Official Journal of the Greek Government 356B/2009).

The *length of the bathing season* for 2010 was identified from June 1st to October 31st.

The selection of bathing waters included in the monitoring programme was performed by the Special Secretariat of Water in collaboration with the Prefectures and relevant local authorities. The general criteria for the site selection are the number of bathers, locations of general interest (aesthetic, touristic, environmental) as well as locations with increased environmental pressures. The *2010 monitoring programme involves sampling and analysis in 2155 bathing water sites*, from which 48 are newly identified and 6 are located to inland waters (lakes).

The *quality parameters* monitored were selected in accordance to the obligations of the Directive 2006/7/EC and other additional parameters and may be distinguished in two groups: *Microbiological*: "Total coliforms", "Escherichia coli" and "Intestinal enterococci", determined in accordance to the reference methods of analysis of Annex I of the Directive 2006/7/EC and *Physicochemical*: colour, mineral oils, tarry residues, seaweed, jelly-fish and floating material.

The *main constraint* during the implementation of the monitoring programme of 2010 was related to the delay, due to internal anomaly, of the bidding process, thus resulting to inadequate set of monitoring data and specifically the sample required at the month prior to the

beginning of the bathing season, as specified in Annex IV of the Directive 2007/6/EC, and the first month of the bathing season. In recognition of this shortcoming we *increased the sampling and analysis frequency for 2010, to ten samples* so as to obtain a significant number of observations per season, and thus the minimum number of samples required by the Directive 2007/6/EC, i.e. 6 samples.

RESULTS OF BATHING WATER QUALITY FOR 2010

The *bathing water quality assessment* was performed according to the provisions of article 4 and Annex I of the Directive 2006/7/EC on the basis of the set of bathing water quality data compiled for 2010 in relation to that bathing season and the three preceding bathing seasons (i.e. 2007-2009) based upon percentile evaluation of the log10 normal probability density function of microbiological data as prescribed in Annex II.

As a result of the aforementioned analysis and the relevant guidance document¹, bathing waters may be classified to the following categories/classes:

Class	Definition
1	excellent quality
2	good quality
3	sufficient quality
4	poor quality
8	compliant with the mandatory value of the Directive 76/160/EEC for Escherichia coli and the more stringent guide values of Directive for Intestinal enterococci and Escherichia coli
9	compliant with the mandatory value of the Directive 76/160/EEC for Escherichia coli and not compliant with the guide value of the Directive 76/160/EEC for Intestinal enterococci
10	not compliant with the mandatory value of the Directive 76/160/EEC for Escherichia coli

¹ Data Dictionary – "Definition of WISE-BWQ Reporting under Directive 2006/7/EC"

Classes 8, 9 and 10 are result from an evaluation procedure according to the Directive 76/160/EEC which applies mainly to bathing water newly identified or bathing water with inadequate number of samples for the performance of the statistical analysis of Annex II.

From the 2155 bathing waters identified in Greece 2149 correspond to *coastal bathing waters*. As a result of the bathing water quality assessment the main conclusion is related to the *excellent bathing water quality of approximately 95% of coastal bathing waters*. More specifically (also refer to Figure 1 for graphical representation of the results):

- 2034 coastal bathing waters (about 95% of total) are classified as «excellent quality»
- 60 coastal bathing waters are classified as «good quality»
- 6 coastal bathing waters are classified as «sufficient quality»
- no coastal bathing waters were classified as «poor quality»

48 new bathing waters were identified and were incorporated to the 2010 Monitoring Programme. For these bathing waters and one additional for which no adequate number of samples was available, water quality assessment was based on the provisions of the Directive 76/160/EEC. In all cases bathing water assessment was compliant with the mandatory value of the Directive 76/160/EEC for *Escherichia coli* and the more stringent guide values of the Directive for *Intestinal enterococci* and *Escherichia coli*.

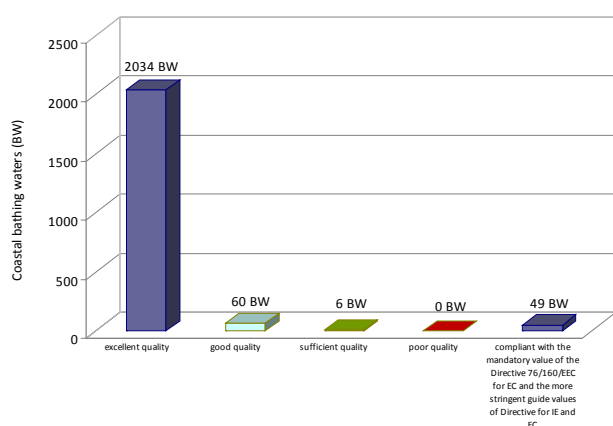


Figure 1: Coastal bathing waters classification (2149 bathing waters) according to Directive 2006/7/EC for 2010

Inland bathing waters are very few as compared to coastal bathing waters, since from 2006 only 6 bathing waters are identified as such. From the results of the 2010 monitoring programme four are classified as «excellent quality» and two were classified as «poor quality».

Concluding, about 95% of bathing waters in Greece are of excellent quality (Figure 2), while only 0.09% present a poor quality, for which adoption of appropriate measures for prevention or reduction of pollution are required.

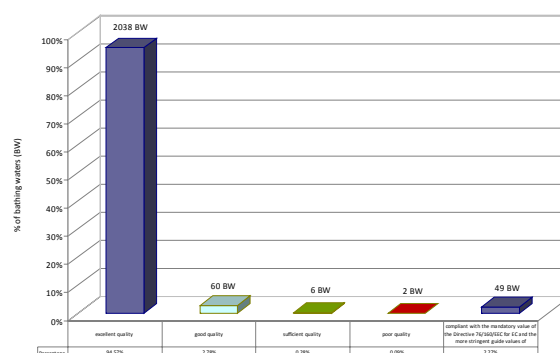


Figure 2: Bathing waters classification according to Directive 2006/7/EC for 2010

DEVELOPMENT OF BATHING WATER QUALITY IN GREECE

The results of the bathing water quality in Greece for the period 1990-2010, according to the evaluation process described in the Directive 76/160/EEC, are presented in the Figure 3.

- The percentage of bathing waters that comply with the guide values (blue line);
- The percentage of bathing waters that comply with the mandatory values (green line);
- The percentage of bathing waters that do not comply with the mandatory values (red line).

From 2001 the percentage of compliance to the mandatory values of Directive 76/160/EEC exceeds 99% and the percentage of compliance to the more stringent guide values exceeds 94%.

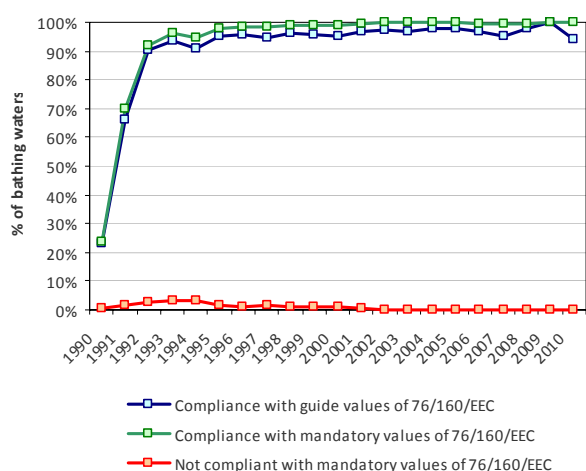


Figure 3: Bathing water quality in Greece for the period 1990-2010

CURRENT & FUTURE ACTIONS

In the process of transition from the Directive 76/160/EEC to the new Directive 2006/7/EC the Ministry

of Environment Energy and Climate Change supervises the preparation of *Bathing profiles* in accordance to article 6 and Annex III of the Directive 2006/7/EC, which will be completed in 2011. A preliminary grouping of monitoring points has resulted to 1350 bathing profiles

The Special Secretariat for Water has proceeded to the bidding of *Bathing Water Quality Monitoring Programme for two bathing seasons 2011-2012* for 2155 bathing waters.

PUBLIC INFORMATION

The results of the bathing waters monitoring programme are being published under the responsibility of the Ministry of Environment Energy and Climate Change, to the *National Environmental Network*, the *European Environment Information and Observation Network* and the *Eye of Earth* communication platform.

Relevant links

Ministry of Environment Energy and Climate Change	www.ypeka.gr
European Commission's bathing water quality website	ec.europa.eu/environment/water/water-bathing/index_en.html
Ministry of Environment Energy and Climate Change - National Environmental Network	amappl1.e-per.gr/
Results for Bathing water quality 2009	iason.minenv.gr/akti/
European Environmental Agency's Bathing water website	www.eea.europa.eu/themes/water/status-and-monitoring/state-of-bathing-water
European Environment Information and Observation Network	cdr.eionet.europa.eu/gr/eu/nbwd
European Environmental Agency – Eye on Earth	eyearth.eu/home.aspx

CLASSIFICATION OF BATHING WATERS REFERENCE YEAR 2010

