

# WATER



## 2.2

Environmental profile of Spain 2012

According to the EU, around three quarters of Europeans consider it is necessary to adopt measures to address Europe's water problems, including droughts, floods and contamination.

At the end of 2012 the EU adopted 'A Blueprint to Safeguard Europe's Water Resources' (COM (2012) 673 final). This plan recognises the improvements made over recent years, but also warns about outstanding issues (including water pollution, abstraction for agriculture and energy production, soil use and the effects of climate change). The plan states that equally it is necessary to protect water resources and improve efficiency in their use.

In Spain, the strategic lines of water policy are based on the fundamental objective of having a high quality water supply with sufficient quantity within the entire national territory, taking into account the entire water cycle that contributes to ecosystem maintenance.

In order to achieve these goals a number of actions are deemed necessary, including investment in supply, sewerage and purification infrastructure, as well as the approval of the National Water Reuse Plan.

Royal Decree-Law 17/2012, of 4 May, on Urgent Environmental Measures, modifies the consolidated text of the Water Law and introduces a series of measures in order to achieve more appropriate water use through efficient, coordinated management in which the guiding principle is unified water basin management. Among other aspects, it regulates groundwater bodies and their good condition.



On this basis, during 2012, river basin management plans for river basin districts, have continued to be drawn up, being the basic instruments for a National Water plan that guarantees both high quality and quantity of supply. As of now, 10 river basin management plans have been approved by Royal Decrees (four in 2012 and six in 2013).

#### KEY MESSAGES

- In Spain there has been a fall in the consumption of the urban water supply, to close to 1998 levels; the consumption per inhabitant also decreased and stood at 144 litres per inhabitant in 2010 compared to 171 litres, as registered in 2004.
- The water reserve during the hydrological year 2011-2012 showed a downward trend. On 30 September the total reserve was 45.5% of overall capacity, smaller than the reserve at the beginning of the hydrological year, and also lower than the average of the five previous years and the average of the last 10 years.
- Both the water reserves in the form of snow and the accumulated contributions during the hydrological year 2011-2012 were lower than the amounts registered in the previous hydrological year and when compared to the average of the last 5 years.
- The autumn and winter at the end of 2011 and start of 2012 were extremely dry, leading to worrying situations in some river basins in the spring of 2012. There have been some hydrological drought episodes in certain river basins in 2012, which were compensated for by stored reserves from previous hydrological years
- Certain farming practices (use of fertilisers and run off from livestock housing) together with liquid urban discharges are sources of nitrate pollution, which is a very serious problem of ground water quality.
- Water abstractions in coastal water bodies can lead to salinisation processes in vulnerable aquifers, affecting the quality of the ground water and the use of this resource.
- In general, an improvement in the degree of organic contamination of river water can be seen, with an increase in the number of stations with less organic pollution measured as BOD5. Nevertheless, for ammonia, there was a slight deterioration in 2012 compared to the previous year.
- In 2012 more than half of the sample points for inland bathing waters registered excellent quality. There was also a decrease in the number of points classified as being of poor quality and an increase in the number of good quality points.

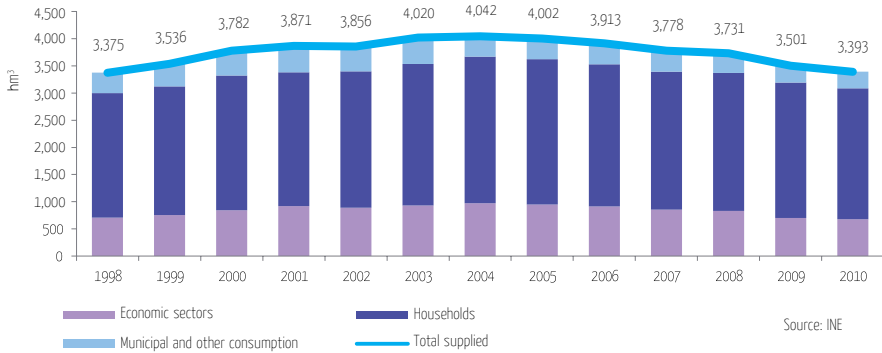
#### INDICATORS

- Water consumption
- Reservoir water levels
- Water reserves in snow cover
- Hydrological drought
- Groundwater nitrate pollution
- Salinisation of groundwater bodies
- Organic pollution of rivers
- Quality of inland bathing water

## Water consumption

*Decrease in the quantity of water distributed through the public supply network*

Breakdown by sector of water distribution by the public supply network



According to a survey on supply and sanitation carried out by Spain's INE (National Statistics Institute), the urban public supply networks distributed 4,581 hm<sup>3</sup> of water in 2010. Around 3,393 hm<sup>3</sup> of these were distributed for consumption. In total households used 71.1% (2,413 hm<sup>3</sup> of drinking water), economic sectors (industry, services and livestock) 19.9% (675 hm<sup>3</sup>), while municipal services were 9% (305 hm<sup>3</sup>).

In 2009 the water distributed for consumption by the same parties and for the same activities was 3,501 hm<sup>3</sup>, meaning 2010 saw a reduction of 3.1%. Spanish households taken as a whole also reduced consumption, with a decrease of 3.2% compared to the previous year.

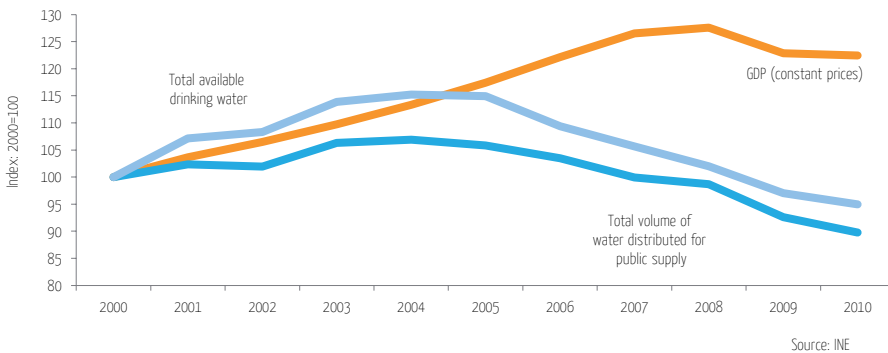
Compared to 2009, the average household consumption fell by 3.3% in 2010 and stood at 144 litres per inhabitant. This data confirms the fall in consumption, a consequence of campaigns to promote saving water and efficient water use and, above all, to improve citizen's awareness. In 2009 consumption stood at 149 l/inhabitant; the consumption data is highly variable among the autonomous communities.

The lowest average water consumption was in the households of the Balearic Islands, with 121 litres per inhabitant per day, and La Rioja and the Basque Country with 122 litres per inhabitant per day.



The comparison of economic growth and water consumption shows how advancing economic growth in Spain has been accompanied by a decrease in the demand for water distributed for public supply and consumption of drinking water. Specifically, between 2000 and 2010, the GDP at constant prices has increased by 22.5%, while the water distributed to guarantee the urban supply has decreased by 10.3%. Likewise, drinking water consumption has declined by 5%.

Comparison between water distributed for public supply and GDP



On the other hand, water used in irrigated agriculture in 2010 (according to the survey on the use of water in the agricultural sector) increased by 16,118 hm<sup>3</sup> and grew 1.3% compared to 2009; in 2009 this grew 3.9% compared to 2008, reaching 15,909 hm<sup>3</sup>.

#### NOTES

- The water distributed includes all the water available in the public distribution network, plus all the losses from the same.

#### SOURCES

- Statistic National Institute. INEbase:
  - Water data: statistics on environment. Environmental statistics concerning water:
    - Survey on the water supply and sewerage. Last published data: 2010 (5 July 2012)
    - Survey on the use of water in the agricultural sector. Last published data: 2010 (27 June 2012)
  - GDP data: INEbase/ Entorno físico y medio ambiente / Estadísticas sobre medio ambiente / Cuentas ambientales/ Cuentas de flujos de materiales. Serie 1995-2010 / Principales indicadores de flujos de materiales

#### FURTHER INFORMATION

- <http://www.ine.es>

## Reservoir water levels

During the hydrological year 2011-2012 total reservoir levels decreased compared to the previous year. On 30 September, the reserve stood at 25,225 hm<sup>3</sup> (45.5% of the total capacity).

Hidrological trend report. Capacity (hm<sup>3</sup>) and reserves (%) in peninsular reservoirs.  
Situation at 30 september 2012

| Watershed                | Total Reservoir capacity | Reserves        | Reserves compared to total capacity (%) |      |      |                |                 |
|--------------------------|--------------------------|-----------------|---|------|------|----------------|-----------------|
|                          | hm <sup>3</sup>          | hm <sup>3</sup> | 2012                                    | 2011 | 2010 | 5-year Average | 10-year Average |
| Atlantic                 | 41,501                   | 19,985          | 48.2                                    | 66.4 | 68.5 | 54.3           | 52.6            |
| Mediterranean            | 13,897                   | 5,240           | 37.7                                    | 50.0 | 59.2 | 45.9           | 42.0            |
| Total (Entire peninsula) | 55,398                   | 25,225          | 45.5                                    | 62.3 | 66.2 | 52.2           | 50.0            |

Source: MAGRAMA

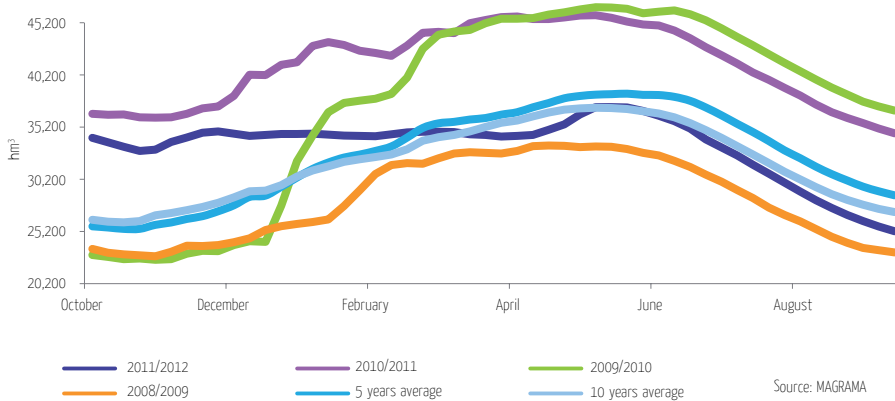
During the hydrological year 2011-2012 water reserves decreased in comparison with previous years. The reserve was above the averages for the last five and 10 years during the first half of the hydrological year (October to March), however it then fell below both the five and 10-year averages. This falling trend in the water reserve has reversed from the beginning of the hydrological year 2012-2013, seeing growth during the first trimester of the year.

The decrease in reserves as a percentage of total capacity has been more pronounced in the Atlantic watershed, falling from 66.4% in 2011 to 48.2% in 2012 (18.2 points), than in the Mediterranean, which fell from 50.0% to 37.7% (12.3 percentage points).

The analysis of the reserve, which is provided in the hydrological bulletin, offers the weekly movement of the reserves, comparing it to the situation of the three previous years and the average situation of the last five and 10 years. The graph below shows the situation described, in which at the end of February the 2012 reserve is lower than the average of the last five and 10 years, and well below that of the reserves in 2010-2011 and 2009-2010. Only the reserves registered in the period 2008-2009 were lower than the ones seen in this last hydrological year.



Peninsular water reserves. Reservoir volume (hm<sup>3</sup>)  
by hydrological year (from 1 October to 30 September of the following year)



## NOTES

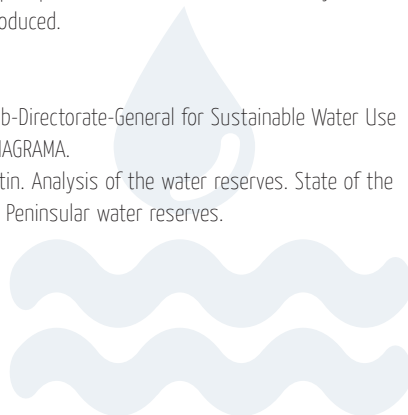
- The hydrological year runs from 1 October to 30 September of the following year.
- MAGRAMA's Hydrological Information Area receives data from the River Basin Authorities as well as other intra-community basin administrations, the State Meteorological Agency and the Electric Network of Spain, and processes that information for its presentation to assist in taking national level decisions with technical, economic and social implications on basin management.
- The aim is to have real time knowledge of water reserves; to monitor, analyse and publish hydrological data providing information on the volume levels in all reservoirs with a capacity higher than 5 hm<sup>3</sup>; to have information on the situation of the use of reserves destined for irrigation and for public supply as well as flow volumes in the main rivers of each basin, precipitation level and the amount of hydroelectric energy stored (calculated) and the amount actually produced.

## SOURCES

- Data provided by the Directorate-General for Water (Sub-Directorate-General for Sustainable Water Use and Planning), State Secretariat for the Environment, MAGRAMA.
- Available on the MAGRAMA web page: hydrological bulletin. Analysis of the water reserves. State of the water reserves and energy available: peninsular totals. Peninsular water reserves.

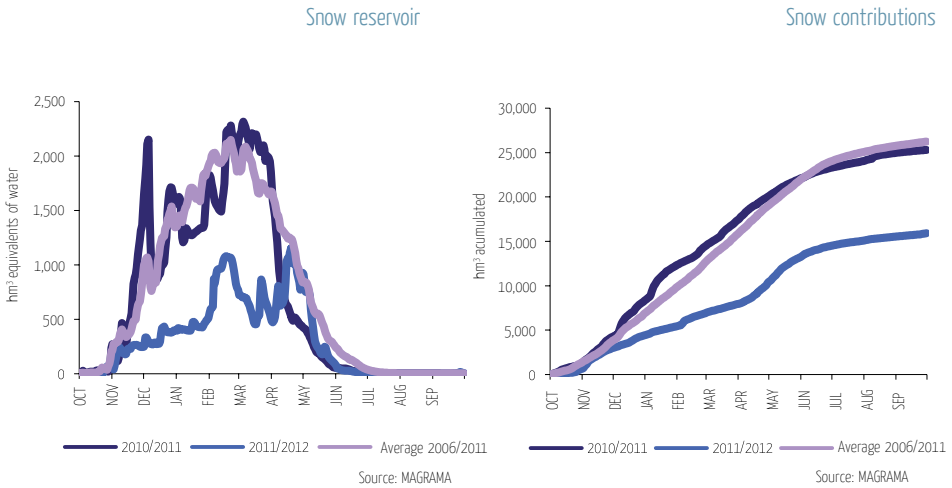
## FURTHER INFORMATION

- <http://www.magrama.es>
- <http://portal.magrama.gob.es/BoleHWeb/>
- <http://www.aemet.es>



## Water reserves in snow cover

*During the hydrological year 2011-2012 the water reserves in the snow cover diminished compared to the previous hydrological year*



The evolution of the water reserve in snow cover (water volume in the form of snow-VAFN) in the hydrological year 2011-2012 in the entire Spanish territory stood at 12,630 hm<sup>3</sup>, equivalent to 66% of the average registered in the five previous years.

The graphs show the lower levels of water reserves as snow when compared with the previous hydrological year, although from the second half of April it can be seen that the 2011-2012 reserves exceeded those of 2010-2011 for the same period. The contributions, by contrast, were always lower both in respect to the previous hydrological year and to the average of the last five years. According to the most recent 'Reports on the evolution of the snow reserve and the contributions in snow holding sub-basins within Spanish territory' of the Program for the Assessment of Water Resources from Snowmelt" (ERHIN), the variation of the modelled surface, the volume of water in the form of snow and the contributions in recent years are as follows:



### Water volume in snow cover and contributions

|            | Modeled surface (km <sup>2</sup> ) | VAFN (hm <sup>3</sup> ) | Contributions (hm <sup>3</sup> ) |
|------------|------------------------------------|-------------------------|----------------------------------|
| 30/06/2011 | 48,386.9                           | 0.3                     | 24,644.2                         |
| 02/06/2012 | 48,386.9                           | 32.8                    | 12,629.7                         |
| 07/04/2013 | 48,664.5                           | 2,654.3                 | 21,281.2                         |

Source: ERHIN Program. MAGRAMA

Understanding these resources has become evermore important and greater efforts are being progressively made in order to be able to quantify the equivalent amount of water held in the form of snow, as well as the water contribution made to rivers from snowmelt. Quantifying these resources is important, not only as part of regular management carried out by basin authorities but also when managing extreme hydrological phenomena, such as droughts or floods for example, in order to minimise the damage produced.

The scope of the study on snow areas is set out in the following table and attached map; it covers the Pyrenees (11,284.1 km<sup>2</sup> of modelled surface), Cantabrian Mountains (19,059.2 km<sup>2</sup>), Central System (16,791.1 km<sup>2</sup>) and Sierra Nevada (1,252.5 km<sup>2</sup>). The entire modelled area covers 48,386.9 km<sup>2</sup> and includes 37 sample points.

| Basin Management Organism | Area currently modelled (km <sup>2</sup> ) | Average height (m) | Number of modelled basins |
|---------------------------|--|--------------------|---------------------------|
|                           |  |                    |                           |
| Ebro Basin                | 12,821.3                                   | 1,390.0            | 16                        |
| Tajo Basin                | 14,939.4                                   | 1,093.0            | 12                        |
| Duero Basin               | 7,243.4                                    | 1,358.0            | 15                        |
| Cantabrian Basin          | 7,217.7                                    | 989.0              | 16                        |
| Miño-Sil Basin            | 4,912.6                                    | 1,188.0            | 11                        |
| Guadalquivir Basin        | 1,252.5                                    | 1,485.0            | 2                         |
| <b>TOTAL</b>              | <b>48,386.9</b>                            |                    | <b>72</b>                 |





#### NOTES

- Since 1983 the Directorate-General for Water has been developing the Assessment of the Water Resources from Snowmelt (ERHIN), which has identified those basins in the Spanish mountains where the presence of snow is hydrologically significant.
- Another indicator of great importance, not only because of the information on the accumulation of snow but because of its contribution to monitoring the evidence of the effects of climate change in Spain, is the indicator, 'Evolution of the Maladeta Glacier'. The interest in glaciers at Spanish latitudes, rather than arising out of an evaluation of the water resources they contain – which is negligible in total - is because of their significance in environmental terms, both as singular examples in danger of extinction and because of their value as important environmental indicators.

#### SOURCES

- Data provided by the Directorate-General for Water (Sub-Directorate-General for Sustainable Water Use and Planning), State Secretariat for the Environment, MAGRAMA.

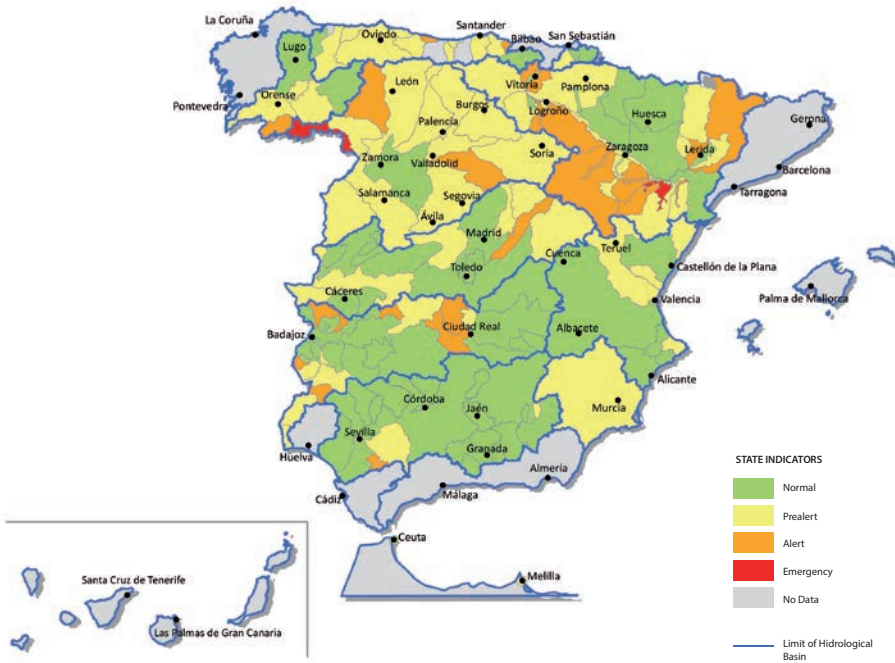
#### FURTHER INFORMATION

- <http://www.magrama.es>
- <http://www.magrama.gob.es/es/WATER/temas/evaluacion-de-los-recursos-hidricos/ERHIN/datos-interes/>

## Hydrological drought

*Despite scarce rainfall in 2012, the hydrological year 2011-2012 inherited a favourable situation that allowed the demands of all the basins to be met*

Hydrological drought monitoring map. December 2012



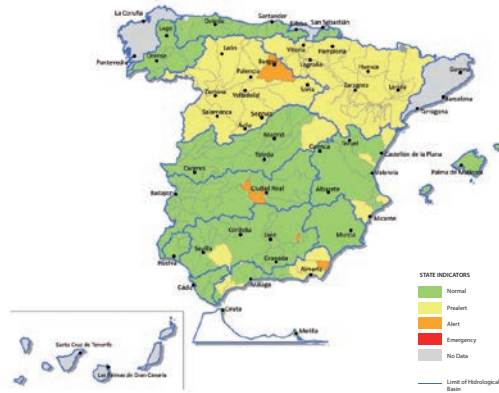
Source: MAGRAMA

2012 saw some difficult moments with several basins experiencing hydrological droughts, although in general these were not as severe as the scarce rainfall might have led us to believe; this is due to the fact that the previous hydrological year (which finished on 30 September 2011), left high levels of water reserves, which in basins with some capacity for multiannual regulation allowed 2012 demands to be met with relative tranquillity. Nevertheless, autumn and winter at the end of 2011 were extremely dry and, during the month of March 2012, the situation in some basins was worrying, especially the Miño-Sil, Duero and Ebro basins, as the map shows, comparing the situation with that at the end of December 2011.

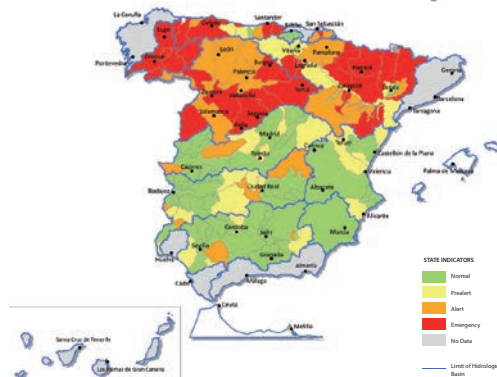


### Hydrological drought monitoring map

31 December 2011



31 March 2012



Source: MAGRAMA

The hydrological year 2011-2012 closed on 30 September having registered a total average precipitation of 484 mm, under 75% of the historic average value of 649 mm. The starting point for the current hydrological year was not, therefore, as favourable as it was for last year, particularly in basins like the Duero and Ebro that had some restrictions during the summer irrigation campaign, which in some areas finished prematurely.

The first trimester of the hydrological year 2012-2013 saw high rainfall, such that by the end of December 2012 the hydrological drought situation had improved significantly. This led to an improvement in the values of the indicators, so that by that date only three minor water resource management systems (two in the Ebro and one in the Duero) were still reporting Emergency indicator values, when two months before the number was up to 20.



### NOTES

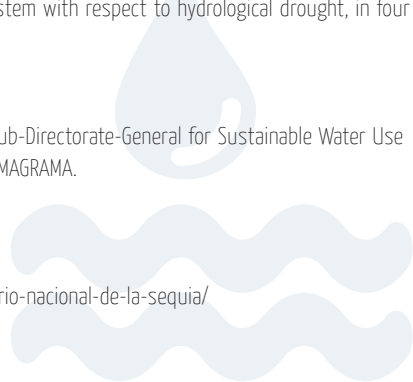
- The main map shows the situation of the drought indicators in the different water resource management systems of the intercommunity basins on 31 December 2012.
- The administrative bodies of the intercommunity basins (those that flow through more than one autonomous community and whose management therefore falls to MAGRAMA), have developed hydrological indicator systems that allow, to a certain extent, to foresee drought situations, assess their severity and take objective and appropriate measures to mitigate their negative effects.
- The hydrological character of these indicators gives them important functionality as an instrument to assist in the decision-making process relative to the management of the water resources of the basin.
- The indicators are an important part of the Special Plans for Drought of each river basin district, which entered into force in March 2007. They are based on the measuring certain hydrological variables at several control points of each system. These values may include: volume stored in reservoirs, natural river inputs at surface gauging stations, aquifers' piezometric levels, rainfall in representative stations, and reserves of stored water in the form of snow in those areas where these are significant in relation to the availability of the resource; or a combination of some of these values. The indicators classify the situation of each water resource management system with respect to hydrological drought, in four categories: normal, pre-alert, alert and emergency.

### SOURCES

- Data provided by the Directorate-General for Water (Sub-Directorate-General for Sustainable Water Use and Planning), State Secretariat for the Environment, MAGRAMA.

### FURTHER INFORMATION

- <http://www.magrama.es>
- <http://www.magrama.gob.es/es/agua/temas/observatorio-nacional-de-la-sequia/>



## Groundwater nitrate pollution

*The excessive use of fertilisers and infiltrations from livestock farming can alter the quality of the ground water*

Percentage of stations with nitrate concentrations over 50 mg/l

| River Basin Districts          | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|--------------------------------|------|------|------|------|------|------|
| Occidental Cantabrian          | 0.0  | 1.9  | 0.0  | 0.0  | 0.0  | 0.0  |
| Oriental Cantabrian            |      | 0.0  |      |      |      |      |
| Inland Basins - Basque Country | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Galicia Coast                  | 0.0  | 0.0  | 0.0  | 2.2  | n/d* | 3.0  |
| Miño-sil                       | 9.1  | 0.0  | 9.1  | 4.7  | 0.0  | 0.0  |
| Segura                         | 26.3 | 26.5 | 18.4 | 9.8  | 23.9 | 23.0 |
| Andalusian Mediterranean Basin | n/d  | n/d  | n/d  | 12.5 | 9.6  | 5.3  |
| Tinto, Odiel y Piedras Basins  | 30.0 | 0.0  | n/d  | 12.7 | 21.4 | 19.1 |
| Guadalete y Barbate Basins     |      |      |      |      | 11.1 | 25.6 |
| Júcar                          | 20.2 | 19.7 | 25.8 | 15.7 | 21.6 | 26.9 |
| Duero                          | 11.3 | 12.5 | 14.6 | 15.9 | 8.0  | 16.2 |
| Tajo                           | 24.1 | 2.7  | 16.7 | 17.1 | 18.5 | 16.9 |
| Guadalquivir                   | 27.5 | 42.5 | 30.3 | 30.9 | n/d  | n/d  |
| Guadiana                       | 30.2 | 26.8 | 28.7 | 33.1 | 36.2 | 31.1 |
| Ebro                           | 20.5 | 57.7 | 15.7 | 33.8 | 23.0 | 19.7 |
| Gran Canaria                   | n/d  | n/d  | n/d  | 35.7 | 30.8 | n/d  |
| Catalonia Internal Basins      | 34.5 | 30.0 | 36.5 | 37.2 | 39.0 | 41.9 |
| Balearic Islands               | n/d  | n/d  | n/d  | 44.7 | 41.5 | n/d  |

\* n/d: no data

Source: MAGRAMA

In general the internal river basin districts in Catalonia together with the Guadiana basin have recorded the majority of sample points with nitrate concentration over 50mg/l. Additionally the Balearic Islands region has high percentages during the years for which there is available data, with there being no information for 2012. The Júcar, Guadalete and Barbate, and Segura basins also show a relatively high percentage, with more than 20% of the sampling points recording concentrations over 50 mg/l.

At the opposite end of the scale, the river basin districts in the north of Spain (Cantabria, Basque Country Inland Basins, the Galician coast and the Miño basin) show samples that are barely contaminated by nitrates.

Directive 2006/118/CE, transposed into Spanish legislation through Royal Decree 1514/2009, establishes the criteria and procedures for the assessment of the chemical status of groundwater as well as providing possible measures for the reduction of groundwater pollutants. Specifically, in assessing chemical status, the legislation establishes, among others, quality rules in relation to nitrates, which set a maximum admissible level of nitrates of 50 mg/l.

Among the main causes of nitrate pollution is the inappropriate application of fertilisers, infiltrations from livestock housing and, to a lesser extent, urban liquid discharges. This kind of pollution is especially worrying in unconfined aquifers, with a thin unsaturated zone.

In 2012, the Autonomous Communities have continued to identify those areas that are vulnerable to nitrate pollution from agriculture, as set out by article 4 of Royal Decree 261/96, of 16 February.

Sampling points with nitrate concentration  $>50$  mg / l N. Year 2012



Source: MAGRAMA

Vulnerable areas to nitrate pollution



Source: MAGRAMA

## NOTES

- Directive 2000/60/CE, which establishes the European framework for action in the field of water policy, includes among its objectives the need to prevent groundwater pollution. In order to meet these objectives, rafts of measures should be established that, among other aspects, include those set out in Directive 91/676/EEC. Furthermore, the at-risk areas established in line with Directive 91/676/CEE are included in the register of Protected Areas under Directive 2000/60/CE.
- At the end of 2012, the peninsular river basin districts were distributed in 10 inter-community river basin districts (one of them, the Eastern Cantabrian, being of mixed character) and five intra-community.
- The remainder of the Spanish river basin districts were: the Balearic Islands (one river basin district), Canary Islands (seven river basin districts, one per island) and Ceuta and Melilla (one river basin in each Community); all of these are intra-community. The control networks, and therefore their management, are a State competence in inter-community basins and an autonomic competence in intra-community basins.

## SOURCES

- Data provided by the Directorate-General for Water. MAGRAMA.

## FURTHER INFORMATION

- <http://www.magrama.es>
- <http://www.eea.europa.eu>

## Salinisation of groundwater bodies

*Salinisation, as consequence of abstractions from coastal aquifers, is one of the problems that most affects the quality of groundwater in these areas*

Sampling points with chloride concentration >1,000 mg / l. Year 2012

| River Basin Districts         | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|-------------------------------|------|------|------|------|------|------|
| Galicia-Coast                 | 0.0  | 0.0  | 0.0  | 0.0  | n/d* | 0.0  |
| Basque Country I.B.           | 0.0  | 0.0  | 14.3 | 0.0  | 6.6  | 0.0  |
| Occidental Cantabrian         | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Oriental Cantabrian           |      |      |      |      |      | 0.0  |
| Guadiana                      | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Guadalquivir                  | 0.0  | 0.0  | 0.0  | 0.0  | n/d  | n/d  |
| Júcar                         | 0.8  | 5.4  | 0.0  | 0.0  | 1.5  | 0.4  |
| Ebro                          | 0.1  | 0.0  | 0.0  | 0.0  | 1.2  | 2.6  |
| Miño-sil                      | n/d  | n/d  | n/d  | 0.0  | 0.0  | 0    |
| Mediterranean- Andalusian B.  | n/d  | n/d  | n/d  | 5.6  | 3.8  | 2.9  |
| Gran Canaria                  | 0.0  | 0.0  | 0.0  | 5.7  | 15.4 | n/d  |
| Tinto, Odiel & Piedras Basins | 0.1  | n/d  | n/d  | 8.5  | 0.0  | 0.0  |
| Guadalete & Barbate Basins    |      |      |      |      | 0.0  | 2.5  |
| Balearic                      | n/d  | n/d  | n/d  | 8.6  | 8.5  | n/d  |
| Catalonia Interior Basins     | 0.2  | 0.1  | 0.1  | 9.5  | 3.9  | 3.9  |
| Segura                        | 18.1 | 46.9 | 22.7 | 37.7 | 12.2 | 17.1 |

\* n/d: no data

Source: MAGRAMA

Together with an increase in nitrate concentrations, the salinisation of aquifers caused by groundwater abstractions in coastal bodies is one of the main problems affecting ground water quality in Spain.

Salt intrusion occurs due to the advance of a salt-water wedge inland, when the freshwater flow towards the sea decreases; this is causing pollution problems in numerous Mediterranean coastal aquifers. It arises as a consequence of inappropriate pumping of coastal aquifers. In addition, intensive agricultural practices using irrigation water return and the reuse of wastewater can contribute to this process. The result is an increase of the chlorine and sodium content modifying ground conductivity.

The Segura river basin district has the greatest proportion of sample points with chloride concentrations above 1,000 mg/l. In 2012, 17.1% of the sample points offered chloride concentration values above 1,000 mg/l. This percentage is higher than the previous year but lower than preceding years.

Sampling points with chloride concentration  $>1,000$  mg / l. Year 2012



#### NOTES

- See the previous indicator notes for 'Nitrate pollution of groundwater'.
- It should be highlighted that the chloride concentration allows the detection of the salinisation phenomenon.
- It should be pointed out that within saline basins and in areas of regional groundwater discharge high chloride content may be found due to entirely natural causes.

#### SOURCES

- Data provided by the Sub-Directorate-General for Integrated Management of the Hydraulic Public Domain. General Directorate for Water. MAGRAMA

#### FURTHER INFORMATION

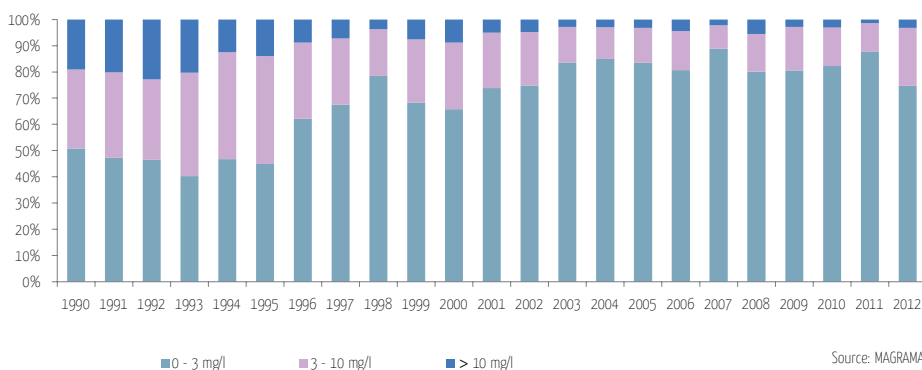
- <http://www.magrama.es>
- <http://www.eea.europa.eu>



## Organic pollution of rivers

*There was a fall in the proportion of sample points registering lower levels of BOD<sub>5</sub> and ammonium concentration, although to a lesser extent for the latter.*

Percentage of monitoring stations by average BOD<sub>5</sub> (mg/l)



The Water Framework Directive (WFD) establishes that the status of surface water will be determined by the worst values of their ecological status and their chemical status. The status of groundwater will be determined by the worst values of their quantitative status and their chemical status.

The WFD's list of the main pollutants (Annex VIII) includes BOD as one of the substances that have an unfavourable influence on the oxygen balance.

In general, over recent years an improvement in the degree of organic pollution of rivers has been noted, with an increase in the number of stations with lower organic pollution and a decrease in the number of stations with higher concentrations.

The year 2011 recorded the lowest percentage of the most polluted sample points (with a BOD<sub>5</sub> concentration over 10 mg O<sub>2</sub>/l). In 2012, on the other hand, an increase was noted in the percentage of these most polluted sample points. Specifically, in 2011 the number of most polluted sample points was 1.36%, while in 2012 this value reached 3.23%, with 40 out of the 1,240 analysed sample points falling into this range.

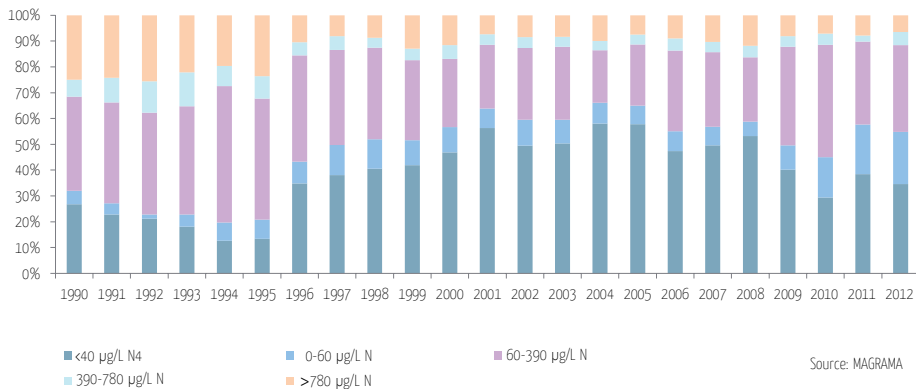
There has also been in 2012 an increase in the proportion of medium quality sample points (with a BOD<sub>5</sub> concentration between 3 and 10 mg O<sub>2</sub>/l), which represented 22.1% of sample points (in 2011 there were 11.05%). On the other hand, the proportion of sample points with lower BOD<sub>5</sub> concentrations fell almost 13 percentage points between 2011 and 2012, decreasing from 87.6% to 74.7% respectively.



Additionally, ammonium (coming mainly from sewerage networks), along with nitrates, increase nitrogen concentration in the water, which contributes to eutrophication.

The ammonium concentration is expressed in  $\mu\text{g/l N}$ . Generally the average annual ammonium values have shown a positive evolution; 2011 also showed an improvement, that bucked the declining trend seen in the period just prior to that year. In 2012 there was once again a reduction in the percentage of stations with lower ammonium concentrations ( $40 \mu\text{g/l N}$ ), passing from 38.4% in 2011 to 34.6%, while the number of stations showing intermediate concentrations increased. The percentage of stations with the highest concentrations ( $780 \mu\text{g/l N}$ ) decreased in 2012, from 7.9% to 6.5%.

Percentage of monitoring stations by average ammonium value ( $\mu\text{g/l}$ )



## NOTES

- BOD is the quantity of oxygen dissolved in water needed for the aerobic bacteria to oxidise all the biodegradable organic matter present in water. Values of  $\text{BOD}_5$  over  $10 \text{ mg O}_2/\text{l}$  are typical of very polluted waters while values below  $3 \text{ mg O}_2/\text{l}$  indicate very low organic pollution.
- The indicator presents the percentage of control stations in which the average  $\text{BOD}_5$  value falls within these three intervals:  $0\text{-}3 \text{ mg O}_2/\text{l}$ ,  $3\text{-}10 \text{ mg O}_2/\text{l}$  and higher than  $10 \text{ mg O}_2/\text{l}$ .
- Another indicator is the percentage of control stations in which ammonium average value falls within these intervals:  $<40 \mu\text{g/L N}$ ,  $40\text{-}60 \mu\text{g/L N}$ ,  $60\text{-}390 \mu\text{g/L N}$ ,  $390\text{-}780 \mu\text{g/L N}$  and  $>780 \mu\text{g/L N}$ .

## SOURCES

- Data provided by the Sub-Directorate-General for Integrated Public Water Resource Management. Directorate-General for Water. MAGRAMA

## FURTHER INFORMATION

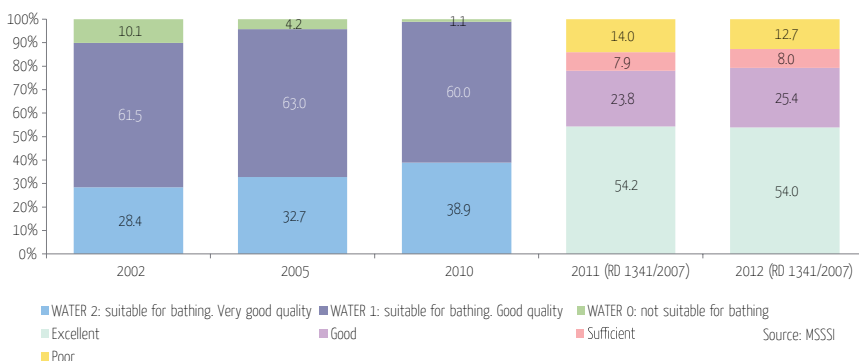
- <http://www.magrama.es>
- <http://www.eea.europa.eu>



## Quality of inland bathing water

*In 2012 there was a decrease in the percentage of inland bathing zone sample points that registered poor quality water*

Quality of inland bathing waters. Percentage of sampling points by category.  
Data from 2011 according RD 341/2007



In 2012 219 inland bathing zones were registered. These included 230 sampling points, although at four of them (1.7%) sampling was not carried out because the zone was closed and bathing was forbidden. Galicia, with 72 sample points (31.3% of the total), Castile-La Mancha with 35 (15.2%), and Castile-Leon with 32 (13.9%), are the autonomous communities that declared the highest number of sample points for inland waters.

The number of notified samplings during 2012 for inland waters was 2,121, the highest number during recent years. In fact, they increased by 6.7% compared to 2011.

Ignoring the four bathing zones that were closed, as well as those sample points that could not be classified out of the total of 230, analysis was actually carried out at 213 sample points. These were classified by quality category as follows:

Inland bathing waters. Year 2012.  
Number of sample points according to their quality category

| Excellent | Good | Sufficient | Poor | Not classified | Total |
|-----------|------|------------|------|----------------|-------|
| 115       | 54   | 17         | 27   | 17             | 230   |

Source: MSSSI



During 2012 the percentage of sample points classified as 'poor' quality decreased and the percentage of those classified in the 'good' category increased from 23.8% in 2011 to 25.4% in 2012. The percentage of those of 'excellent' quality stayed at the levels of the previous year, around 54%; as did the percentage classified as being of 'sufficient' quality.

#### NOTES

- In accordance with the terms of Directive 76/160/CEE, concerning the quality of bathing water, the Ministry of Health, Social Services and Equality submits an Annual Summary Report of Bathing Water Quality in Spain to the European Commission. This describes the key findings of hygiene monitoring of such waters.
- On 15 February 2006, the new Bathing Water Quality Directive (2006/7/EC) was approved. Among other aspects, the Directive modifies the current bathing water classification system, establishing four assessment categories, reducing the number of parameters considered and water quality at each point using a three-year average. This Directive was transposed into Spanish law by Royal Decree 1341/2007.
- Under the new directive, the classification should be performed using data from the current season together with the data for the last three years. The new classification is as follows: poor, sufficient, good and excellent.
- The bathing seasons are those periods during which a large number of bathers are expected, taking into account local customs and the meteorological conditions. In Spain, as an average, the bathing season runs from June to September for inland waters (and from May to the end of September for coastal waters, except for the Canary Islands, where the season includes practically the entire year). For inland waters, the average number of bathing days was 90 (the same number as in 2010 and 2011, and two days less than in 2009), with a maximum of 138 days in Murcia and a minimum of 46 in Navarre.
- During the 2012 bathing season the data covered that year together with the three previous years (2009, 2010 and 2011). This new classification was carried out for the first time in respect of the previous bathing season (2011).

#### SOURCES

- Ministry of Health, Social Services and Equality, 2013. Bathing Water Quality in Spain. 2012. Studies, Reports and Research Collection. Technical General Secretariat.

#### FURTHER INFORMATION

- <http://nayade.msc.es/Splayas/home.html>
- <http://www.msssi.gob.es/profesionales/saludPublica/saludAmbLaboral/home.htm>
- <http://ec.europa.eu>

