

Five-Year Drought Continues in Spain*

Antonio Mestre Barceló
National Institute of Meteorology, Ciudad Universitaria
Madrid, Spain

Spain is now facing its fifth consecutive year of severe drought. This event, which began in 1990, affects most of the country, with the exception of the north coast regions. The most affected regions are Andalucía, Extremadura, and Castilla-la Mancha, all of them located in the southern half of Spain. In some climatological stations of these areas, the five-year agricultural period from 1 September 1990 to 31 August 1995 is the driest quinquennium of this century. Mean percentage departures from normal rainfall exceed -20% in the southern half of the country and in some isolated areas of the Duero and Ebro basins. In some areas of the southwest, the deficit reaches values close to 40% (Andalucía, Extremadura). Most of the climatological stations of the southern half of Spain have recorded three or more years with rainfall in the 0-20 percentile range during this five-year period. Some areas of the southern coast, such as Málaga, are also included in this category.

In 1994-95 (1 September to 31 August), the drought event reached its maximum coverage and intensity, with percentage departures from normal greater than -25% and an areal coverage that represents two-thirds of Spain. The most severe drought conditions have been observed in the southwest part of the country, where the total rainfall has fallen below 50% of its normal value (well below the 10 percentile value).

By analyzing the seasonal distribution of the rainfall during 1990-95, the following observations can be made:

1. Rainfall deficit was, in general terms, concentrated in the winter and spring seasons (from December to June).
2. Seasonal rainfall in autumn (September to December) was normal or above average, whereas summer rainfall behavior was fairly irregular.

This long dry spell has caused a hydrologic drought that primarily affects the main Spanish fluvial basins located in the southern half of the country. The last available data at the national level (5 September 1995) indicate that the water storage represents only 27.5% of the total reservoir capacity (below the historical minimum percentage). Major interannual dams of five fluvial basins (Guadiana, Guadalquivir, Sur, Júcar, and Segura) are at critical levels (less than 10% of their maximum capacity). The main consequences of this prolonged hydrologic deficit include the following:

- Depletion of the aquifers, causing important environmental problems in wetlands areas. In coastal areas of southeast Spain, sea water intrusion problems have arisen.
- Shortages in water supply to numerous towns, affecting 20% of the total population.
- Serious losses and injuries in forestry, cropping, and pastoral sectors. Cereal crops, vines, and olive trees in particular have been affected. In the southern part of the country, the amount of irrigated land has been drastically reduced since 1993. Rural industry sectors have been hardest hit by this long dry spell.
- Higher forest fire risk than normal, due to the persistence of hot and dry weather conditions during the last few summers, especially in 1994, when more than 150,000 hectares burned in the Spanish Mediterranean regions in just one week (3-10 July).

The Spanish government has undertaken a set of emergency measures to cope with the situation, including the approval of extraordinary credits to carry out urgently needed infrastructure works such as new desalination plants, connections between water storage systems, and new hydrogeologic exploitation. Support and assistance measures for drought-affected producers have also been adopted, such as subsidies on debt interest and a moratorium on social security fees payment. Other measures have been adopted by national, regional, and local authorities to promote water consumption savings.