

# Valencia floods: When nature reminds us of the forgotten lessons of the past

*floods, cold drops and DANA: a brief overview of climate amnesia and misconceptions*

*By Enrique Ortega Gironés, Geologist living in Valencia.*

Original published in Spain in [Riadas, gotas frías y DANAs: breve recorrido por la desmemoria y los despropósitos climáticos – www.Entrevistas.com](https://www.entrevistas.com/riadas-gotas-frias-y-danas-breve-recorrido-por-la-desmemoria-y-los-despropósitos-climáticos/)

Translation with permission by Samuel Furfari

*The ravine begins in the Buñol mountains in the direction of Chiva and continues through the municipality of Cheste. It then crosses the plain of Quart next to the Venta del Poyo, then passes through the surroundings of Torrent and Catarroja, before flowing into the Albufera of Valencia. Its deep, wide bed is usually dry, except during flash floods when it flows so furiously that it destroys everything in its path. At Chiva, he surprised the inhabitants at midnight, devastating a considerable number of buildings and scattering over several kilometres the sad remains and corpses of the unfortunate people who could not escape death.*

*The river, which in its greatest floods had never reached the streets of the city, this time flooded the lower part, penetrating the barracks of the Civil Guard, the court and the prisons...*

## The many floods of the past

The two previous paragraphs, which could perfectly describe the recent disaster recorded in the vicinity of Valencia on October 30, 2024, actually correspond to much older episodes. The first of these relates what the illustrious naturalist Antonio José Cavanilles told two and a half centuries ago (1775) about the Barranco del Poyo, the same riverbed that has just taken so many lives. The second corresponds to the description made by Vicente Boix, a chronicler of Valencia, in the flood of San Carlos (so named because it coincides with the feast of Saint Charles Borromeo). This flood took place in November 1864 when the Júcar River overflowed, the same one that, a little more than a century later, devastated the Tous dam and the entire region of La Ribera.



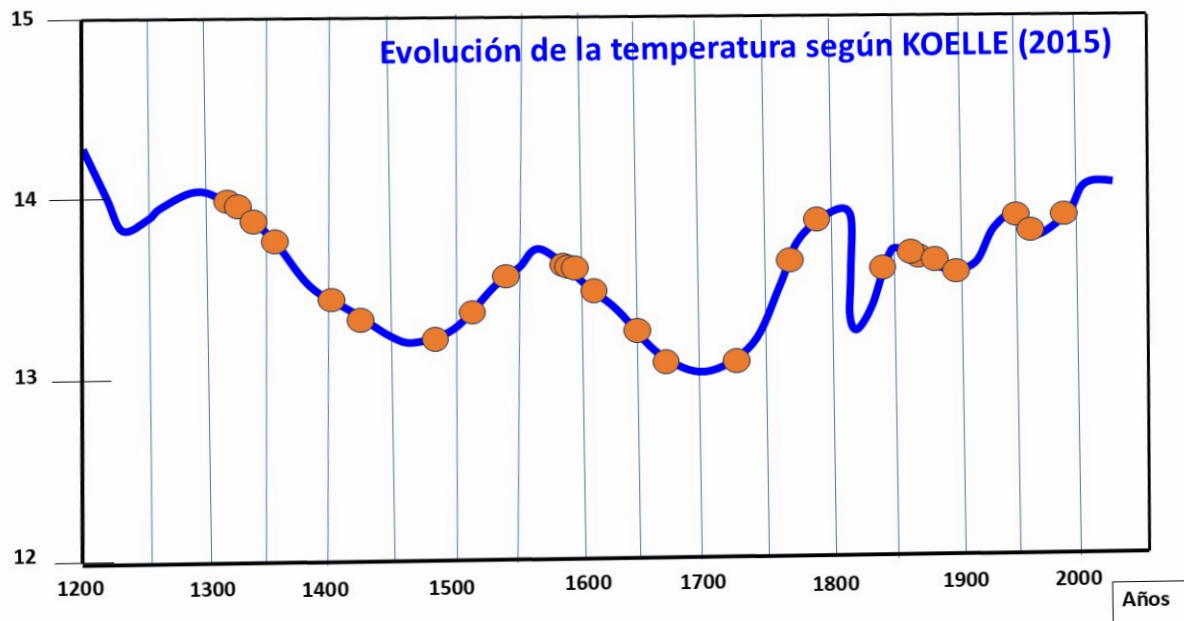
*Sketch from the time illustrating the flooding of the Júcar in 1864 in Alzira*

In reality, these two episodes are just a sample of the many floods that have devastated the Mediterranean coast in general (such as those that have occurred in Barcelona, Málaga or Murcia) and the Valencian region in particular since time immemorial. Between 1321 and today, 27 floods have been recorded in Valencia (including the last one in 2024), with an average interval of about 26 years, or slightly more than three floods per century. The magnitude of many of these episodes has been recorded on plaques or tiles attached to walls in many riverside towns, where a horizontal mark indicates the level of the water.



*Plaque commemorating the water level  
in the streets of Alzira during the flood of San Carlos (1864)*

It is very important to note that most of the flooding that occurred between the 14th and 19th centuries took place during a period of widespread cold known as the Little Ice Age. In the graph in the attached figure, the blue line represents the evolution of temperature from the year 1200 to the present, while the red circles indicate the times when the 27 floods mentioned above occurred. The continuity with which these disasters appear is remarkable, both during periods of rising and falling temperatures, thus seeming to be completely independent of thermal evolution.



*Graphs showing the evolution of temperature and the appearance of floods  
(see explanation in the text)*

The figure shows that there were larger floods during a period when the Earth was cooling. Thus, the historical record indicates that there is no correlation between global warming and a presumed increase in the intensity or frequency of the depressions that cause these floods.

The persistence of these extreme weather events over time suggests that they are part of the region's climatic norm, as evidenced not only by the abundance of historical documents but also by artistic manifestations. An excellent example of this type of testimony is the oil painting 'Amor de madre' (Mother's Love) by the painter Antonio Muñoz Degrain, depicting the dramatic efforts of a mother trying to save her child from the uncontrollable waters of a flood in the orchards of Valencia.





*Mother's Love, oil painting by Muñoz Degrain (1913)  
exhibited at the Museum of Fine Arts in Valencia*

Something similar can be said in the field of literature, where the dramatic consequences of the torrential rains that occasionally arrived each year in early autumn have been described. On some occasions, the weather conditions produced great famines and social problems due to the lack of income from work for agricultural labourers, which even degenerated into revolts, as masterfully described by the illustrious Rafael Comenge in his novels of manners.

In the rural areas of the Ribera del Júcar, periodic autumn flooding of the river, which sometimes got out of control and could end in inundation, was part of the local customs. The author of this article, a direct witness to the last three major floods and a native of Alberic (a town located a few kilometres downstream from the infamous Tous Dam), remembers how his grandmother used to tell him stories from her childhood in another river town, Polinyà del Xúquer. At that time, in the early twentieth century, before the large dams and regulating reservoirs were built, when autumn arrived, it was the night watchman who was responsible for monitoring the river level during the night. And when it reached dangerous levels, he would wake up neighbours to go to the shore to place sandbags and protect the town's homes, even if it were rudimentary, precarious, and temporary.

The reiteration of these situations has led to popular wisdom to record its knowledge of proverbs. Thus, looking at the sky, when the peasants saw that the black clouds surrounded the peaks of the nearby mountains, they said: '*Quan la Murta s'emborrasca i Matamon fa capell, llaurador, pica espart i fes cordell*' ('When the Murta darkens and the Matamon has a hat, peasant, beat the esparto and make rope'). La Murta and Matamón

are two peaks of the reliefs adjacent to the Ribera del Júcar, where the clouds that bring heavy rain usually cling. For this reason, the saying urges farmers to spend time at home weaving esparto ropes, as it will be impossible to go to the field to work.

With the passage of time, at the end of the twentieth century, strong storms were given the descriptive term ‘cold drops’, a nomenclature that has been replaced in recent years by the technical name that is now unfortunately well known to all, DANA or Isolated Depression at High Levels. But in reality, the technification of the name does not affect the nature of the phenomenon: even if a monkey dresses in silk, it is still a monkey, and the DANAs of October or November in the Valencian region are nothing more than the autumn storms of yesteryear.

Returning to current events, official data indicate that the rainfall recorded during this last episode of 2024 was not higher than that recorded in 1982, when the very intense rains took place during continuous 24 hours of deluge. The volume of the flood was not either: 7,500 cubic metres per second in 1982, and only 2,500 in 2024. Moreover, since then, 42 years have passed, far exceeding the average interval between floods mentioned above. Therefore, it is difficult to justify invoking global warming as responsible for the resurgence (both in frequency and intensity) of phenomena that, with the same violence, have been systematically repeated since well before the industrial era and anthropogenic CO<sub>2</sub> emissions into the atmosphere. It is therefore worth asking why, given the experience accumulated over the centuries and the technological capacity to implement preventive or palliative measures, it was not possible to avoid this dramatic catastrophe. As is often the case, it is not due to a single cause, but to the fatal convergence of several factors.

## The causes of the disaster

First of all, we must consider nature itself, the behaviour of our atmosphere, which is extremely complicated and difficult to parameterise in all its details, despite the long statistical series stored and the powerful calculation tools provided by computer development. What happened at the end of October 2024 shows that it is not yet possible to predict the behavior and consequences of a DANA in detail. And this limitation, which is not attributable to any technical error but simply due to the extreme complexity of the process, forces us to reflect on the reliability of climate forecasts. If climate models are not yet able to correctly predict what will happen in the immediate future, how reliable can catastrophic predictions be for the distant future?

Second, the lack of adequate infrastructure. This flood in 2024 has indisputably demonstrated how essential these constructions are to prevent or minimise the devastating effects of floods. Following the disastrous consequences of the flooding of the Turia in 1957, the river was diverted by means of an artificial canal capable of receiving a flow of water equivalent to three times that of the Ebro when it crosses Zaragoza. This canal, whose construction was completed in 1969, was able to divert and conduct the enormous flow of water that had poured into the middle and lower parts of the Turia Basin, thus saving the city of Valencia from certain destruction.

Something similar happened a little further south, in the Magro River, a tributary of the Júcar, where the Forata Reservoir, located upstream of Turís and also completed in 1969, made it possible to cap the flood (it was practically empty at the beginning of the DANA) and to contain 30 cubic hectometers in just 15 hours.



*Forata Reservoir (Júcar Hydrographic Confederation)*

This capacity has made it possible to considerably reduce the impact of the flood on the populations of the lower bank of the Júcar, especially in Algemés, where the consequences would have been terribly dramatic if this dam had not existed.





*Schematic map of the area south of the city of Valencia showing the layout of the main riverbeds: Turia River (black), new Turia River bed (blue), Poyo Bassin (red), Magro River (green) and Júcar River (fuchsia).*

This is precisely what did not happen a little further north, because between the two previously mentioned rivers, between the Turia and the Magro, there is another of those rivers that, although almost always dry, are capable of transforming in a few hours into powerful torrents: the Barranco del Poyo, as Cavanilles described it in the last third of the eighteenth century. Unfortunately, this watercourse does not have a regulatory dam and, despite the fact that its construction has been planned (upstream of Cheste) for a long time, the work has never been carried out. As reality has shown, the consequences of the absence of this critical infrastructure have been tragic.

Thirdly, we must mention the state of the riverbeds. The lack of vegetation clearing activities and the current ban on cutting reed beds (a traditional activity in the orchard consisting of using the canes for agricultural work) have affected the drainage capacity, as the circulation of water is impeded by the plant mass. This situation reduces the speed of the water and its flow, forming blockages due to uprooted vegetation. These obstacles, when overwhelmed by water, collapse and generate waves that move at high speed, with enough force to sweep away everything in their path (including vehicles parked on the streets) and cause the water level to rise quickly. This situation partly explains the difference in mortality between the last two floods. Despite the fact that the rainfall and flow of the flood in 1982 were much higher than in 2024, its mortality

was around 30 deaths, well below the 228 victims (between dead and missing) counted in 2024, as the greater speed of the rising waters prevented many people from having time to get to safety.



*Appearance of vegetation on the banks of the Júcar River during its passage through Alberic*

In addition, the vegetation dragged by the water blocks the arches of the bridges, toppling them in some cases and generating new waves. It should be remembered that bridges are designed to allow the passage of water during the largest floods recorded in the last few hundred years, but not to withstand the horizontal forces of a mass of water, mud and vegetation moving at high speed. In the recent flood of 2024, 26 bridges were destroyed or require repairs to be used.

Fourthly, it is worth mentioning the drastic changes in land use, which, in the most affected areas, in the previously predominantly rural towns of the Huerta Sur, have been transformed into urban areas, into dormitory towns in the metropolitan environment of Valencia. In the towns through which the Barranco del Poyo passes, the essential infrastructure (storm basins, canals or new artificial channels) has not been built to minimise the effects of water avalanches. Nor has attention been paid to the demarcation of flood zones, which are being built on massively and indiscriminately in the immediate vicinity of riverbeds. Even outside urban areas, but also in areas prone to flooding, industrial estates and shopping centres have been established, even going so far as to build underground car parks with a capacity of several thousand vehicles.

Finally, fifthly, as the most important cause of the tragedy, it is worth mentioning the lack of effectiveness of the various government agencies, both in preventive measures and in the management of the crisis, which have failed miserably at all levels and from all angles. Even taking into account the difficulties already mentioned in predicting the behaviour of a cut-off low, it is legitimate to wonder whether the control and warning mechanisms worked properly and whether the population was warned early enough to prevent many deaths. The lack of coordination between the central and regional



governments was evident, confronted from the moment the disaster began to loom, and more concerned with showing the speck in the eye of others than with providing effective solutions. This shameful confrontation has caused astonishment beyond our borders, giving rise to numerous comments in the international press, masterfully summarised in the attached cartoon.



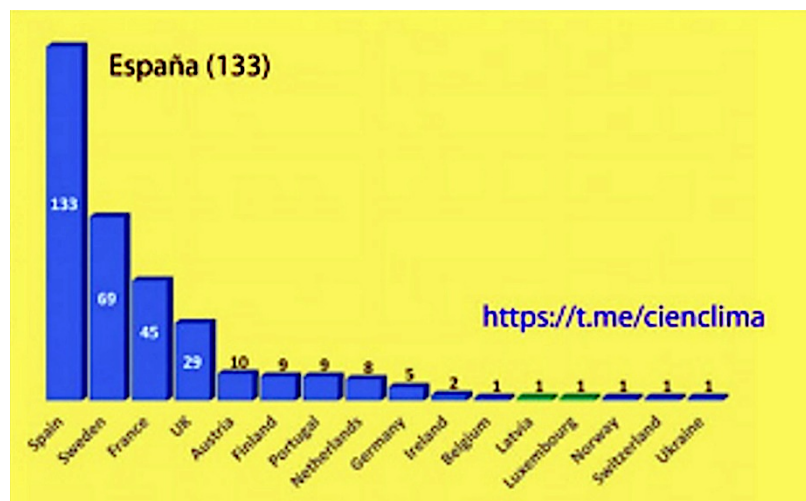
*Cartoon published in the French press by Mahnaz Yazdani (LatAm ARTE)*

But beyond the disastrous management of the moments immediately before and after the flood, we must not lose sight of what happened in the previous decades, what was done or not done and which could have prevented hundreds of deaths and billions of euros in material losses. Despite the existence of numerous studies and maps delimiting the areas at risk, why have the municipalities (with the complacency of the regional and national authorities) authorised construction in flood zones?

On the other hand, a serious and thorough examination of the environmental regulations that restrict the cleaning of riverbeds is essential, at least in the sections close to the Mediterranean coast, where this type of weather phenomenon appears repeatedly and systematically. As detailed earlier, if the riverbeds had been free of branches and other debris, the violence of the flood might have been minimised, thus potentially helping to reduce the number of victims.

Finally, why has the necessary infrastructure not been built if the relevant studies for the award of the works have already been carried out, with the technical and economic capacity for their execution? It is not necessary to be an expert to suggest that, if the dam planned in the Barranco del Poyo in the vicinity of Cheste had been built, the flooding could have been significantly reduced in a similar way to the Forata Reservoir, thus potentially avoiding many misfortunes.

In the days following the disaster, as is often the case in such circumstances, there was a veritable avalanche of information regarding the policy of dams and reservoirs in Spain, and not all the data published is accurate. Thus, for example, it has been claimed that the demolition of reservoirs and dams carried out in recent years has significantly affected the Barranco del Poyo Basin, attributing responsibility to it for the lack of hydraulic infrastructure to reduce the risk of flooding. Although this information is patently false (since no dams have been destroyed in this particular basin), it is nevertheless true that the Ministry of Ecological Transition has been much more interested in removing existing infrastructure than in building new ones. This is evidenced by the fact that our country is a leader in the European Union in the demolition of river barriers, including dams and weirs. According to the report prepared by Dam Removal Progress, in 2021, 108 river barriers were removed in Spain, 133 in 2022 and 95 in 2023 (336 in total), including dams and weirs, far more than what was dismantled by our European neighbours.



*Comparative statistics by country of river barriers demolished in 2023*

In some cases, these actions are justified by the obsolescence or uselessness of certain structures. But in other cases, it seems to be due to an ideological, non-practical obsession similar to that which has been applied to justify the demolition of several coal-fired thermal power plants. In any event, those data would not be relevant to the present case if it were not for the fact that, since 2009, the same ministry has been operating with the specific aim of preventing flooding in the Barranco del Poyo Basin. The situation of this ravine is not exceptional, as throughout the Valencian Community, as in the rest of Spain, there are many hydraulic works that have been waiting to be carried out for 15 years. In other words, the government has focused on the protection of river fauna and flora, relegating the safety of citizens to the background, giving more importance to ideological or political interests than to the legitimate rights of human beings, such as security and the right to life.

However, from a broader time perspective, not all responsibilities can be assigned to the current leadership. The PP national government, which was in power between 2011 and 2018, missed a theoretical window of opportunity to unblock the Barranco del Poyo project by coinciding with an autonomous government of the same party between 2011 and 2015. Today, the two dominant parties are blaming each other for the management of the crisis, trying to overlook the incompetence displayed over the past decades. In reality, all the problems described having a common denominator: both the lack of water infrastructure and the cleaning of riverbeds and the urbanisation of land in inappropriate locations are attributable to political management errors or a lack of control.

## The wrong political priorities

This reflection inevitably leads us to a question about our political system: do we have the right mechanisms to stimulate and facilitate the access of competent individuals to positions of responsibility, so that they can take the right steps at the right time? In our party system, state power entities (including parliaments) have become mere transmitters of decisions adopted by parties, which have constituted themselves into an oligarchy controlling effective sovereignty. When it comes to power, the ruling party allocates and distributes positions of responsibility according to strictly political criteria, regardless of the ability, knowledge, and experience of the individuals chosen.

This practice, which can be considered logical and acceptable to the highest positions in the administration, has extended to very low levels where responsibility should be strictly technical, under the euphemism that these are freely designated positions. This approach allows, as we have seen several times over the past decades, individuals with no experience or knowledge of the sectors they are meant to manage to occupy ministries, secretaries of state, councils, general directorates, or presidencies of large public companies. Meanwhile, the real experts – civil servants who truly understand the problems in depth – are relegated to the role of mere advisers while decisions are made, with honourable exceptions, by inexperienced individuals (and sometimes those lacking even basic knowledge) who tend to favour ideological or political considerations to the detriment of technical issues. Only in this way can it be



understood that deficiencies have accumulated over the years, that urgent decisions are delayed, or that the context of a crisis is used as a political battlefield.

In the autumn of 1982, after the catastrophic flooding of the Júcar and the collapse of the Tous dam, the brilliant humourist Mingote drew a prophetic cartoon in which he predicted the disinterest with which the political class would strive to avoid similar disasters in the future.



*On November 10, 1982, after the disaster of the dam of Tous, the genius Mingote published this cartoon, the caption of which read: 'These disasters only happen every twenty years, so for twenty years, we will not have to think about what we could do to prevent them.'*

Today, 42 years later, we can make the same reflection, with the same pessimism about the future, but with an additional aggravating factor. Indeed, the politicians of four decades ago did not have the brazenness and cynicism to try to hide their incompetence behind the baseless argument of climate change.