

## SUMMARY

# SECURITY CHALLENGES OF WATER STRESS IN SOUTHERN EUROPE

November 2024





The Defence and Climate Observatory, launched in December 2016, aims to study climate-related security and defence issues.

It is coordinated by IRIS as part of the contract carried out on behalf of the French Ministry of Defence's Directorate General for International Relations and Strategy (DGRIS). The Observatory's multi-disciplinary team includes researchers specializing in international relations, security, defence, migration, energy, economics, climatology and health. It is directed by Julia Tasse and François Gemenne.

The Observatory has initiated numerous collaborations with European partners (Netherlands, Luxembourg) and international partners (Australia, United States, India), international NGOs and national and international public bodies. These initiatives have strengthened cooperation on climate issues and their security implications.

The Climate and Defence Observatory produces reports and notes, organises restricted seminars and conferences open to the public, and hosts the podcast "On the climate front".

[www.defenseclimat.fr/en](http://www.defenseclimat.fr/en)

The Ministry of Defence regularly calls upon private research institutes for outsourced studies, using a geographical or sectoral approach to complement its external expertise. These contractual relationships are part of the development of the defence foresight approach, which, as emphasised in the latest White Paper on Defence and National Security, *"must be able to draw on independent, multidisciplinary and original strategic thinking, integrating university research as well as specialised institutes"*.

Many of these studies are made public and available on the Ministry of Defence website. In the case of a study published in part, the Directorate General for International Relations and Strategy may be contacted for further information.

**DISCLAIMER: The Directorate General for International Relations and Strategy or the organisation leading the study cannot be held responsible for the statements made in the studies and observatories, nor do they reflect an official position of the Ministry of Defence.**

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This note assesses how water stress, a growing phenomenon defined by high tension on water resources caused by an imbalance between water supply and demand, can be exacerbated by climate change and human activities, and affect societies in southern Europe and the French armed forces when conducting their missions. This note is divided in three sections: an analysis of the societal consequences of water stress in southern Europe and the potential associated conflicts (I), a study of the operational and organizational challenges that water stress generates for the French armed forces and their European partners (II), and finally, three foresight scenarios to 2050, with recommendations for the Ministry of the Armed Forces (III).

## I. WATER STRESS AND HUMAN SOCIETIES IN SOUTHERN EUROPE

The note presents **the consequences of climate change on southern Europe's water cycle**, as well as the factors leading to a growing scarcity of available fresh water. The analysis of scarcity factors is set against a backdrop of mismatches between demand and supply. Over the past fifty years, demand for water has been rising steadily in southern Europe, especially due to **population growth, urbanization, the development of agriculture and the energy industry**. However, **European public policies are often ill-adapted to the situation**, leading to an intensification of water stress.

In southern Europe, **water stress is having an impact on public health and economic activities**. It **increases the risk of diseases** linked to the consumption of contaminated water and poor hygiene, while favoring the spread of vector-borne diseases. From an economic point of view, it is worth **highlighting the vulnerability of the agricultural sector, which suffers increased crop losses due to droughts**. In addition, water stress can **affect energy production and increase costs**. These disruptions, coupled with the damage to infrastructure caused by disruptions to the water cycle, **can lead to economic contraction**.

Finally, water and water stress hold the potential for conflicts. **Although conventional inter-state wars are unlikely to be triggered by water stress in southern Europe**, the resource **can nevertheless be instrumentalized** by states in times of tension. On a local scale, **water stress can also lead to disputes over the appropriation, management or use of water**. The survey carried out by the Observatory as part of this report shows an increase in the frequency and intensity of this type of conflict in southern Europe between 2000 and 2024.

## II. SECURITY AND DEFENSE ISSUES RELATED TO WATER STRESS IN SOUTHERN EUROPE

For the French armed forces, the challenges posed by water stress are threefold: (1) **Military bases on French territory will have to cope with increasing variations in water availability.** Moreover, the integration of these risks by the armed forces is consubstantial with the water situation in each region. (2) The training and deployment conditions of the armed forces will also be affected by **a qualitative and quantitative reduction in water resources, against a backdrop of rising demand for water for human consumption.** (3) Lastly, the increasing number of water crises exposes the armed forces to the risk of capacity constraints, particularly for humanitarian assistance and disaster relief operations (HADR).

The extent to which the armed forces have integrated water-related issues varies between overseas operations and domestic activities. **In the former case, water management is already well developed,** thanks to the experience acquired in French military projection zones. **At domestic level, the armed forces play a key role in responding to water crises** (droughts, floods, fires). But the sustainability of certain solutions needs to be reassessed in the light of climate and hydrological projections. **A more holistic approach is currently being structured** around the ministerial water strategy published in 2023. Implementing this strategy will nevertheless be a major challenge.

Finally, at the European level, **Spain, Portugal, Italy and France have adopted structural and holistic military strategies to reduce water consumption.** Other countries, such as Slovenia, have adopted a **technocentric, reactive approach to such issues.** Although the Greek army was the initiator of the main European military cooperation project on water management in military bases, the Smart Blue Water Camp project, the country's military seems to be little involved in water management. While cooperation is frequent in water governance, it is rarer in the military field, particularly in the context of overseas operations, where the **desire to maintain logistical autonomy prevails.**

### III. FORESIGHT AND RECOMMENDATIONS

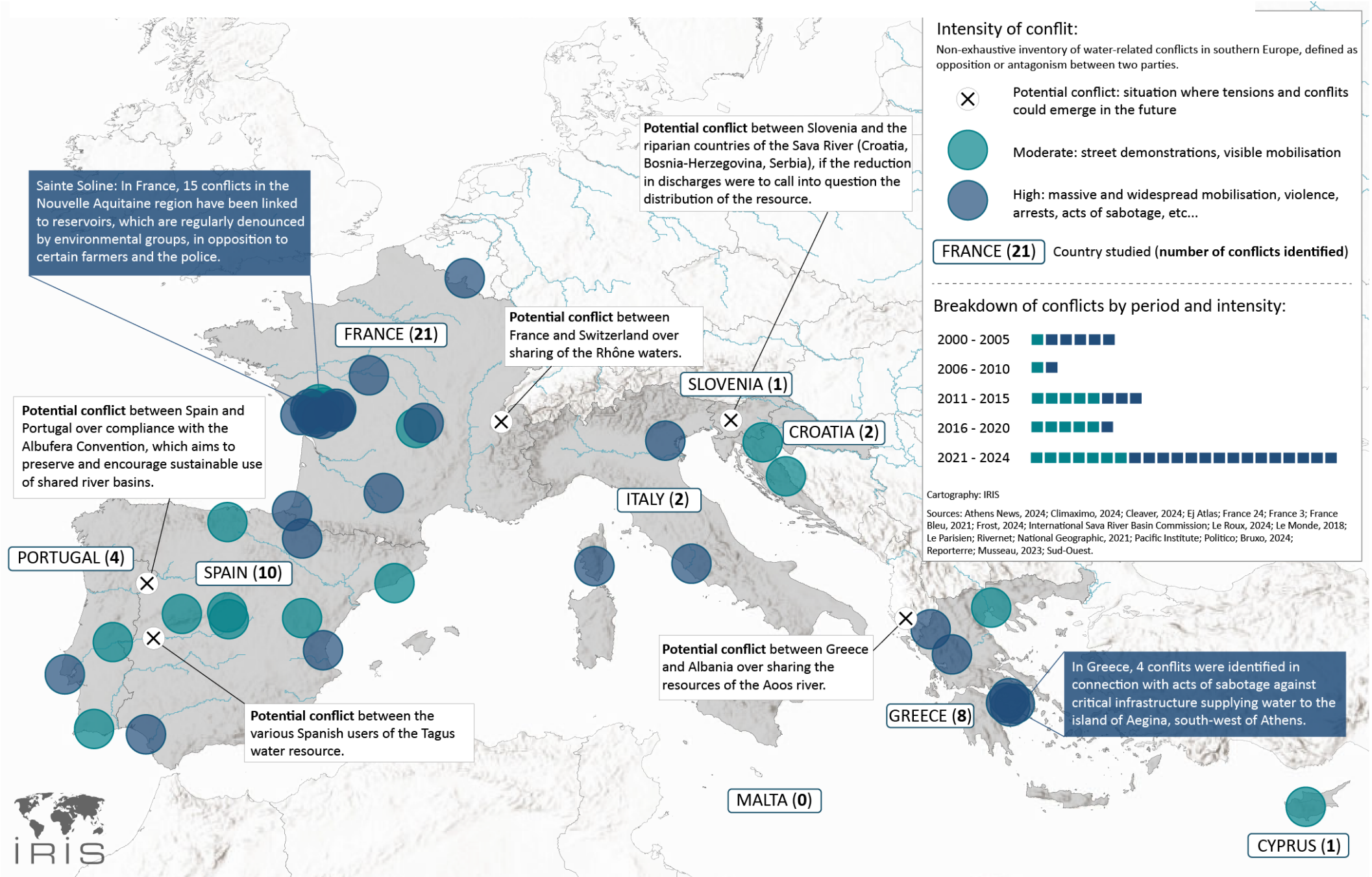
#### *Foresight scenarios*

Scenario	Crisis-causing factors and geopolitical situation in the region	Geopolitical consequences, consequences for France and impact on French forces
<b>2035 – Conflicts over water resources uses in France</b>	Significant increase in water stress in southern Europe and rising tensions over the use of freshwater resources, particularly between farmers practicing intensive agriculture and those adopting more environmentally friendly practices.	The role of the French armed forces is questioned, as is their legitimacy and actions in the fight against climate change. Public opinion demands a public assessment of the Ministry's "water footprint".
<b>2046 – Extreme consecutive events of excess and shortage of water in mainland France</b>	Intensification and increase of chronic and acute water crises in France. Ill-adapted water management policies lead to increased competition between users for a resource becoming scarce. Economic contraction imposes severe budgetary austerity on armies.	Major material damage to military infrastructure. Loss of credibility in France's ability to respond to extreme weather events. Questioning of France's leadership in European defense. Opposition from public opinion, which perceives the armed forces as a climate enemy.
<b>2045 – Instrumentalization of Corsica's water crisis by a foreign power</b>	Drinking water shortage and drought alert in Corsica. Resurgence of nationalist movements. Social protest, attribution of responsibility for the water crisis to mainland France. Anger fueled by Russian disinformation strategies, and instrumentalized by foreign powers.	Cyberattack on a water treatment plant supplying Calvi and the Raffalli military base. Mobilization of the French security forces, further antagonizing the population. Local discourse denouncing France and its army as a colonial power. Comments echoed by other countries, questioning France's legitimacy in Corsica and on the international stage.

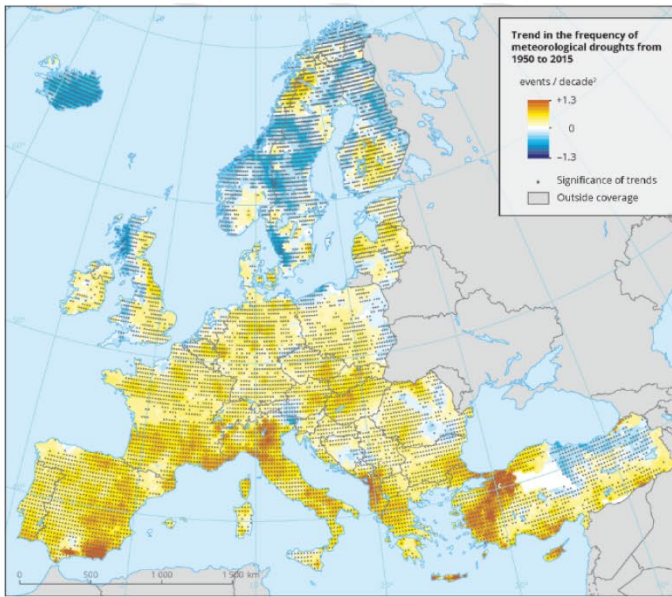
#### *Recommendations*

<b>1</b>	<b>Collect and analyze data to better understand the water requirements on French military bases.</b>
<b>2</b>	<b>Implement actions to reduce the "water footprint" on a facility scale.</b>
<b>3</b>	<b>Strengthen the Ministry's cooperation with water management stakeholders at local, national and European level.</b>
<b>4</b>	<b>Adopt a resilient and comprehensive approach to anticipating the risks and threats associated with water stress for the Ministry of the Armed Forces.</b>

# Appendix 1. Map of water-related conflicts in southern Europe between 2000 and 2024



**Figure 5 - Trends in meteorological drought frequency in Europe for the 1950-2015 period**



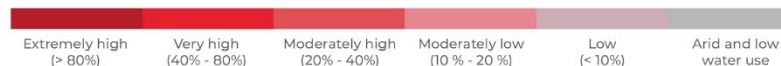
Source : European Environment Agency, 18 March 2020

We are also witnessing an **increase in the recurrence of droughts**, caused by higher temperatures, more rapid **evaporation of water** and lower groundwater flows and levels. A drought is an unusual and temporary shortage of available water due to a lack of rainfall and increased evaporation (because of high temperatures). It differs from water scarcity, which is the structural lack of fresh water throughout the year due to over-consumption of water. In Europe, climate projections estimate that 30% of land areas will be drought-stricken by 2100 (Habets, 2024). The models agree on an increase in the recurrence and duration of droughts in Europe, particularly meteorological droughts. These droughts correspond to prolonged shortfalls in rainfall measured against seasonal norms. With an increase in global average temperature of 3°C, corresponding to RCP4.5, these droughts would be twice as frequent. The most severe droughts will be in the Mediterranean and Atlantic regions of Europe. In addition, this increase in frequency and intensity would lead to an **increase in the length and severity of the fire season, particularly in southern Europe**. Fighting forest fires involves intensive use of water resources, which illustrates the complexity of resource availability.

**Figure 8 - Countries affected by water stress in Europe**



Level of water stress



The 25 countries facing extremely high water stress each year are (in order of vulnerability): Bahrain, Republic of Cyprus, Kuwait, Lebanon, Oman, Qatar, United Arab Emirates, Saudi Arabia, Israel, Egypt, Libya, Yemen, Botswana, Iran, Kingdom of Jordan, Chile, San Marino, Belgium, Greece, Tunisia, Namibia, South Africa, Iraq, India and Syria. Three European countries are on this list, and two are Mediterranean.

Source : World Resources Institute, 2023

These mutually reinforcing phenomena are leading to a **reduction in available freshwater resources, a decline in aquatic biodiversity and are fuelling water stress**. As a result, 25 countries, most of which are located around the Mediterranean and in the Middle East, and which are home to a quarter of the world's population (WRI, 2023), face extremely high water stress each year, as they regularly use more than 80% of their available water reserves, mainly for activities such as irrigation, livestock farming, industry and domestic needs. Consequently, even a short-term drought exposes these regions to serious threats to human health and safety (WRI, 2023). For the Middle East and North Africa, this means that 100% of the population will be living in conditions of severe water stress by 2050. The European Mediterranean area is also largely affected by this phenomenon, particularly Malta, Cyprus, Portugal, Spain, Italy and Greece.



# ANALYSIS OF SECURITY AND DEFENCE ISSUES RELATED TO CLIMATE CHANGE

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