

# FUTURE STORMS

Design a safer future. Quantification of the magnitude of storms expected in the future as a consequence of climate change on a national scale.



## Contact information

**Address:** ETSI Caminos, Canales y Puertos -UPM, c/ Profesor Aranguren, 3, 28040, Madrid

**Website:** [caminos.upm.es](http://caminos.upm.es)

**Email:** [luis.mediero@upm.es](mailto:luis.mediero@upm.es)

## Technological Offers type

[Technological solutions](#)

## Research and innovation areas

- [Climate, Energy and Mobility](#)

## ODS



## Where?

### Hydroinformatics and Water Management

Keywords: | [dam safety](#) | [environment](#) | [floods](#)

#### Brief description of the solution and the added value it delivers

The Future Storm database includes the expected rates of change, as a consequence of climate change, in maximum daily rainfall for return periods of 2, 5, 10, 50, 100, 500 and 1,000 years in mainland Spain, Portugal and the Balearic Islands. It makes it possible to immediately calculate the magnitude of future storms without needing to apply complex methodologies, covering the whole of the national territory and providing the results both visually and numerically. The database has been used by TRAGSATEC under a licence to use, supported by the Sub-directorate for Public Water Resources (*Dominio Público Hidráulico*) of the Ministry for the Ecological Transition and CEDEX's Centre for Hydrographic Studies.

#### Description of the technological basis

Database containing the expected future changes, as a consequence of climate change, in the daily rainfall quantiles in mainland Spain, Portugal and the Balearic Islands.

The database provides quantitative values for changes associated with daily rainfall quantiles for defined return periods, making it possible to determine the law of rainfall frequency to be expected in the future as a consequence of climate change based on the current law of rainfall frequency, as calculated from information recorded by rain gauges.

It can be applied immediately and simply to any location on the Iberian peninsula or in the Balearic Islands.

*'It is a simple and immediate way to calculate the rainfall extremes expected in the future as a consequence of climate change at the national level'*

#### Business needs / application

- We need to know the impact of climate change on flooding, in order to incorporate that information into flood risk management plans, following the Floods Directive and the requirements of the European Union.
- City councils and water supply and sanitation companies need to know the future behaviour of extreme rainfall as a consequence of climate change, in order to provide cities with drainage systems of the right capacity, identify areas likely to be flooded and inform the population, in order to reduce the potential damage.
- Owners of water infrastructure (e.g. dams) need to know how rainfall will behave in the future so that they can reassess their safety, as they may prove less safe than currently considered.

#### Competitive advantages

- It allows the magnitude of future storms, as a consequence of climate change, to be calculated immediately, without needing to apply complex and time-consuming methodologies.
- It quantifies the expected changes in storms objectively, making it easier to apply them in practice.
- It covers the whole of the national territory, being applicable to small-scale studies, such as those relating to basins or municipalities, and large-scale studies, such as nationwide studies or studies relating to hydrographic districts.
- It provides the results visually for interpretation and numerically for further studies.

#### References

- TRAGSATEC. Acquisition of a licence to use the database.
- Supported by the Sub-directorate for Public Water Resources of the Ministry for the Ecological Transition and CEDEX's Centre for Hydrographic Studies.

## **Industrial property**

- Registered database: M-001724/2018.

## **Stage of development**

- Concept
- Research
- **Lab prototype**
- Industrial prototype
- Production

## **Contact**

### **Future Storm database contact**

Luis Mediero Orduña, Carlos Garijo Sarriá, Enrique Soriano Martín

Ingeniería Hidráulica – ETSI Caminos, Canales y Puertos – UPM

e: luis.mediero@upm.es

e: c.garijo@upm.es

e: e.soriano@caminos.upm.es

### **UPM contact**

Innovation and Entrepreneurship Programmes

Technological Innovation Support Centre (CAIT) – UPM

e: innovacion.tecnologica@upm.es