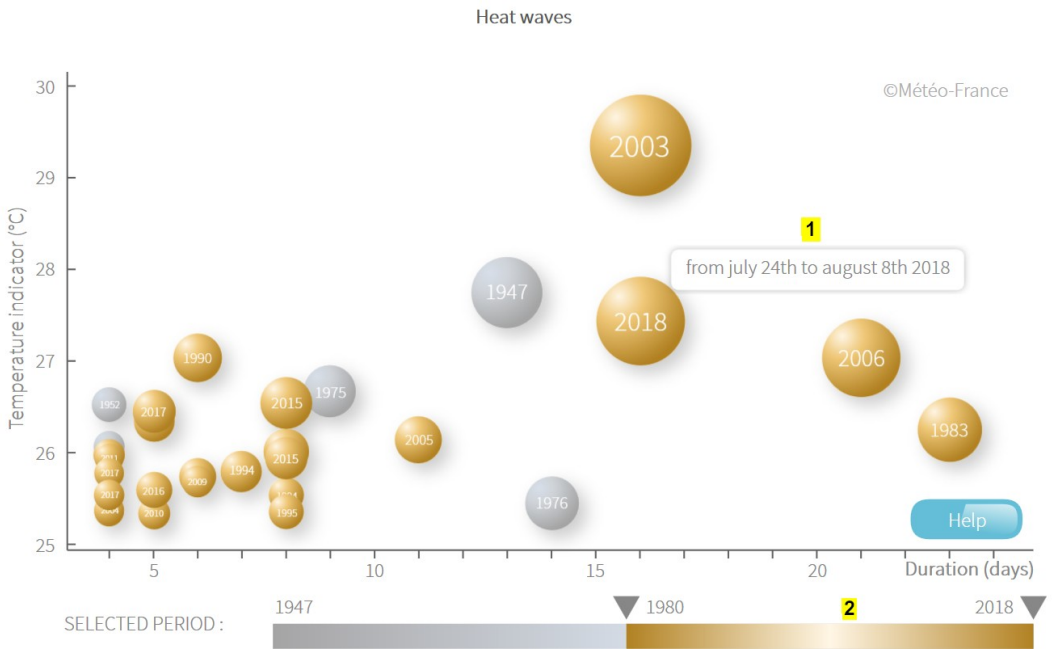
Evolution of heat waves
Past climate – metropolitan France

1. Graph reading aid



This graph presents heat waves identified in metropolitan France since 1947.

Each episode is represented by a circle. Its position and its size indicate the characteristics of the heat wave :

- The horizontal position indicates the length (in days) of the episode.
- The vertical position indicates the intensity of the heat wave : it is the maximum value of the daily national thermal indicator reached during the episode.
- Size indicates the severity of the heat wave : it is proportional to the heat accumulated during the episode

The year is shown in each circle and the precise dates of the heat wave appear when the mouse passes over them (1).

The selection bar (2) is used to highlight heat waves in yellow during a given period (by 1980-2018).

Note : only the heat waves which are longer than or equal to 4 days are represented.

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2. Definitions

Daily average temperature :

- Daily minimum temperature (TNq) = minimum temperature observed between J-1 at 18:00 UTC and J at 18:00 UTC
- Daily maximum temperature (TXq) = maximum temperature observed between J at 06:00 UTC and J+1 at 06:00 UTC
- Daily average temperature (TMq) = (TNq + TXq)/2

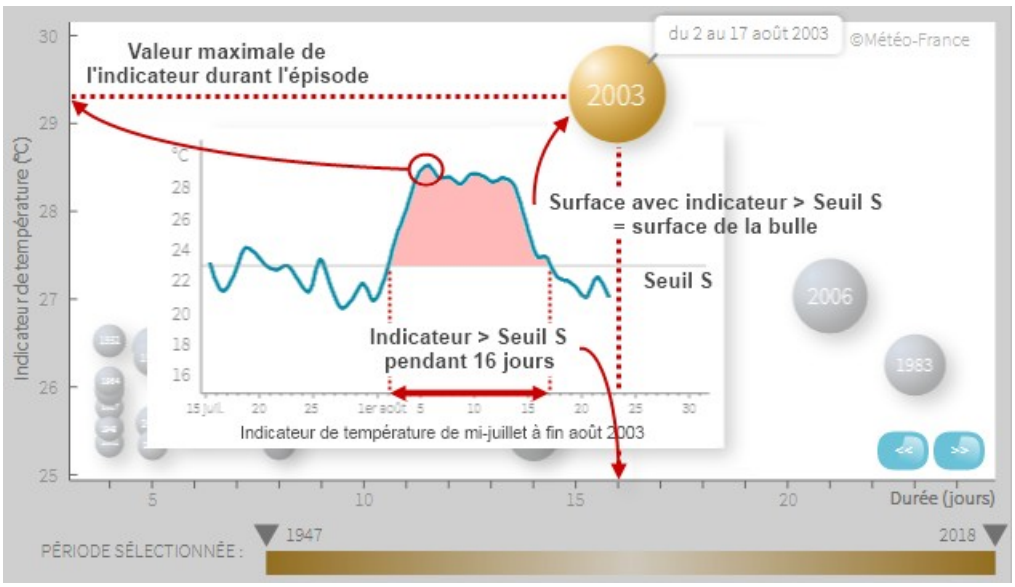
3. Data and methods

National thermal indicator :

The national thermal indicator is defined as the average of daily measurements of the average air temperature at 30 weather stations distributed in a balanced way over the metropolitan territory and selected from the work on homogenization.

Heat waves are identified from the national thermal indicator over the period 1947 to the present. Several criteria, based on the annual statistical distribution (calculated over the period 1981-2010), are applied :

- An episode is detected when a daily value of the thermal indicator reaches or exceeds the 99.5 percentile.
- The episode includes days adjacent to the day(s) previously detected for which :
  - the daily thermal indicator does not permanently fall below the 97.5 percentile (referred to as the S threshold in the figure below). By durably means three days or more.
  - the daily temperature indicator does not fall below the 95.0 percentile.
- The magnitude of the episode corresponds to the intensity integrated over the duration of the episode.



4. References

Climate change and heat waves on meteofrance.fr :
http://www.meteofrance.fr/climat-passe-et-futur/changement-climatique/impacts-du-changement-climatique-sur-les-phenomenes-hydrometeorologiques/changement-climatique-et-canicules

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