Some climate indices

METEO-FRANCE Climat HD

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Climate indices

- Temperature
  - Heat waves
  - Heating degrees-day
  - Cooling degrees-day

- Precipitation
  - Daily rainfall amount above 150 mm and 190 mm

- Snow cover
  - Number of days with presence of snow on the ground for in-situ observation
  - Number of days with snow depth above a threshold for in-situ observation
  - Number of days with snow depth above a threshold for a whole mountain massif
  - Snowpack for a whole montain massif

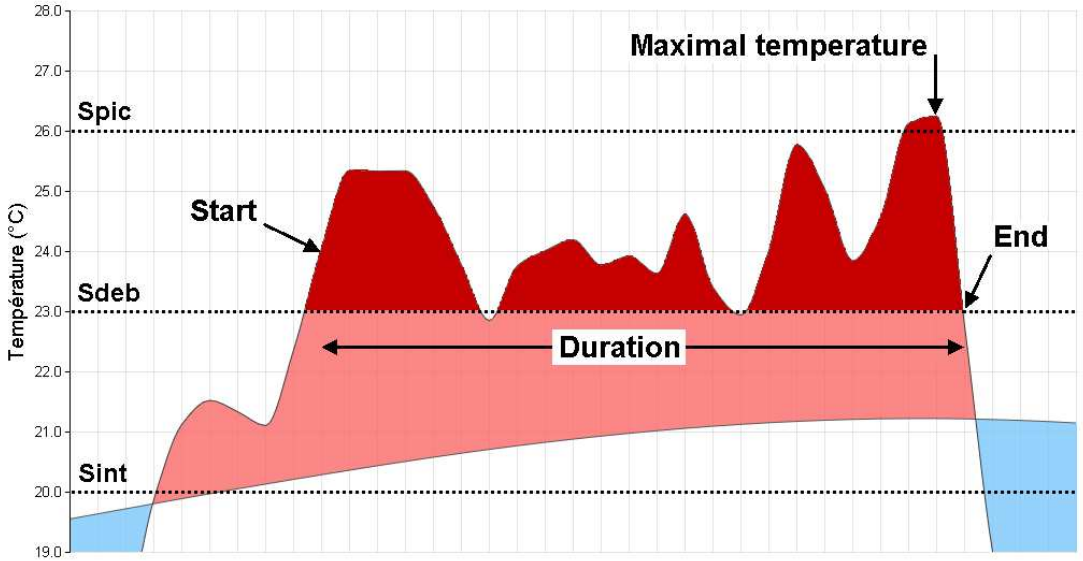
Climate indices ..

- Drought (gridded data from Safran/Isba/Modcou model)
  - Soil wet index (annual cycle)
  - Annual percentage of the surface affected by drought on continental France/french region

Heat waves

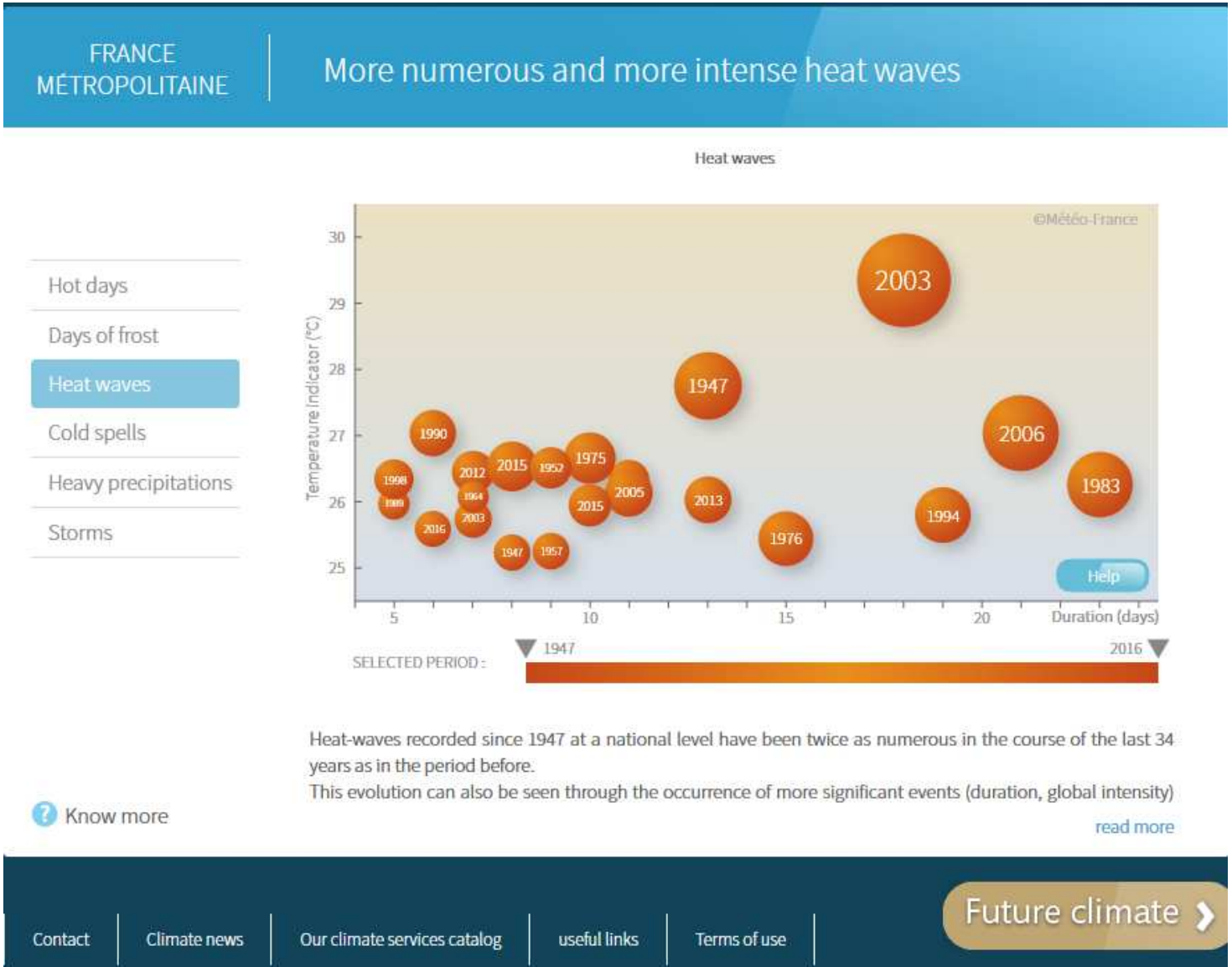
- Complex object :
  - Calculated from time series of temperature (Tm) for in situ data or more global index (all continental France or region)
  - Starting/end date, duration
  - Maximal temperature
  - Global severity calculated on the whole episod

(Spic / Sdeb / Sint) = (Centile 99.5 / Centile 97.5 / Centile 95)



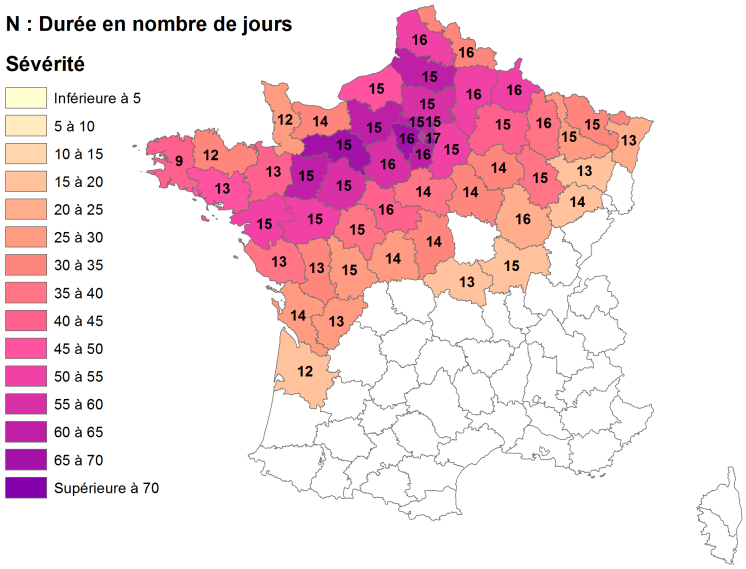
Heat waves with a national approach

- http://www.meteofrance.fr/climat-passe-et-futur/climathd

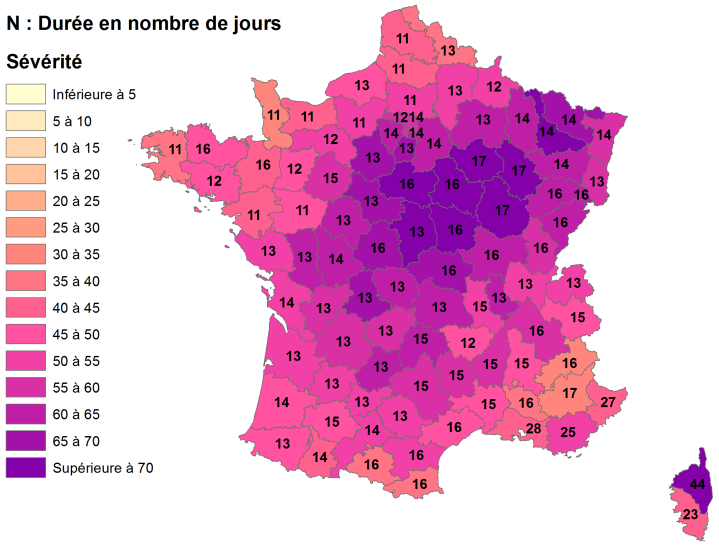


Heat wave on a regional scale

Vague de chaleur du 23 juin au 6 juillet 1976
Sévérité et durée de l'épisode par département

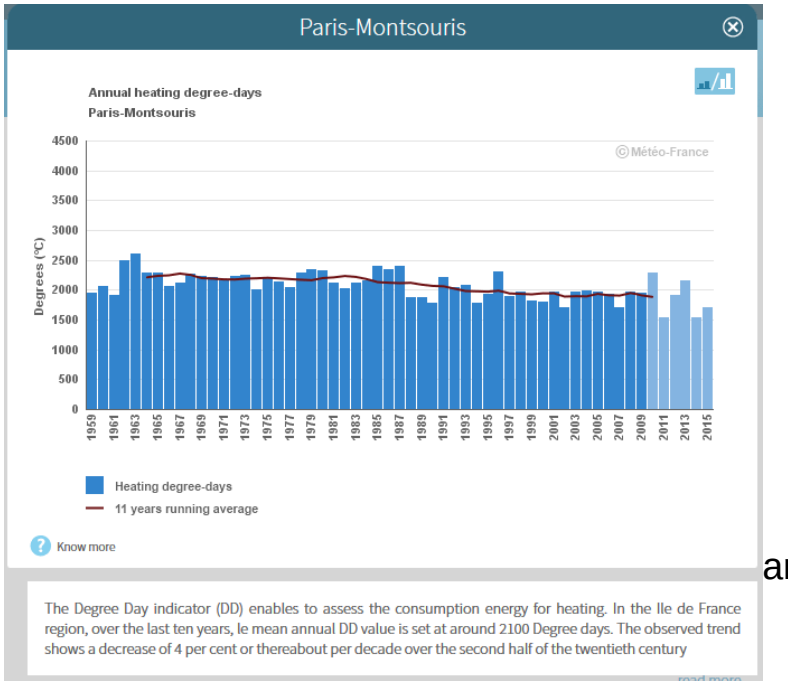


Vague de chaleur du 2 au 17 août 2003
Sévérité et durée de l'épisode par département



Heating degree-days/Cooling degree-days

- Annual/seasonal Indexes for in-situ data
- Heating
  - Threshold : 17°C (17 – TMq) si TMq < 17°
- Cooling
  - Threshold : 18°C (TMq - 18) si TMq 18℃



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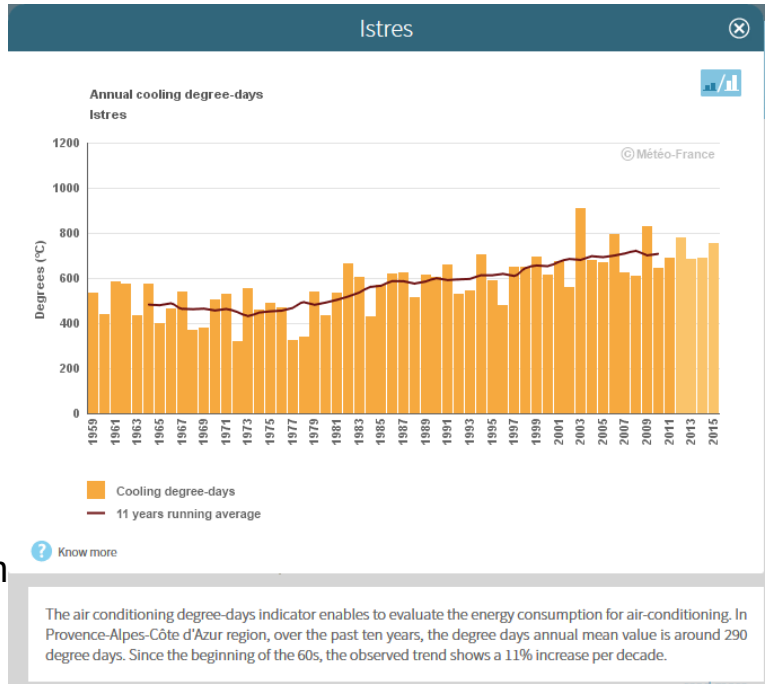

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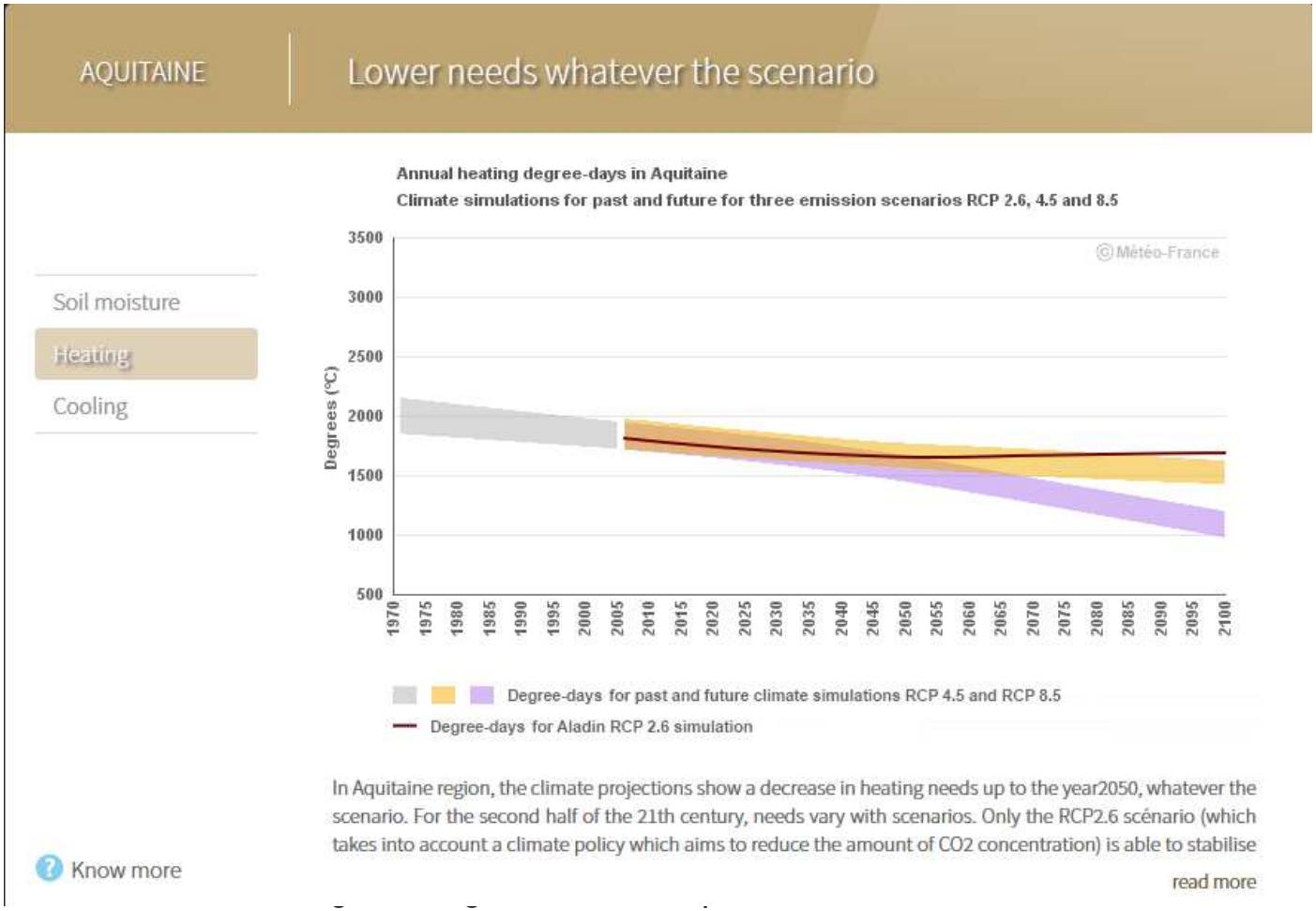
Heating degree-days with climate projections

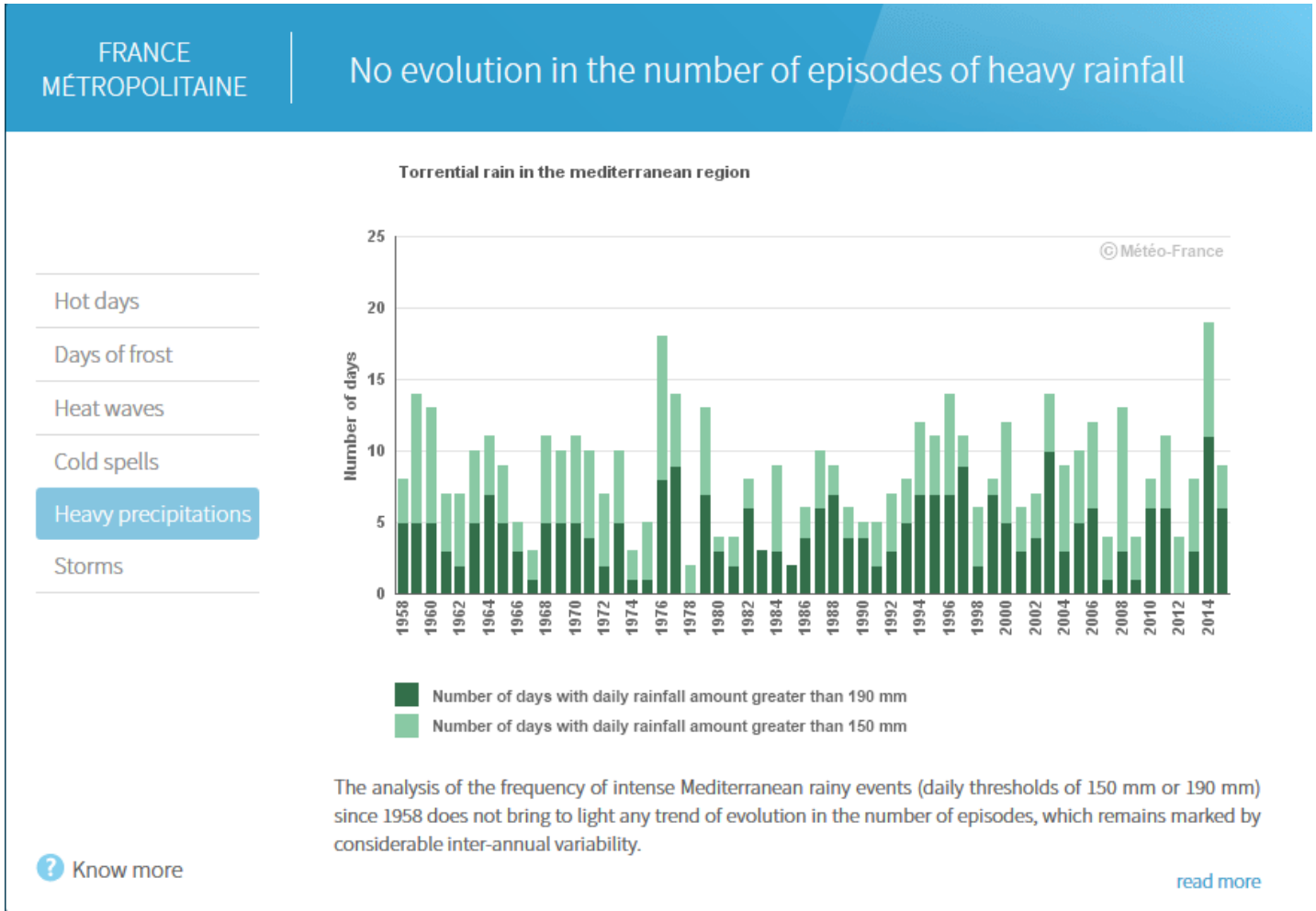
- Calculated with daily temperature, integrated on a french region

  Only grid points with height under 500 meters



Precipitation

- Daily rainfall above threshold : heavy rainfall in the mediterranean region, sout-east of France
  - Collection of 700 observation stations of the Meteo-France network

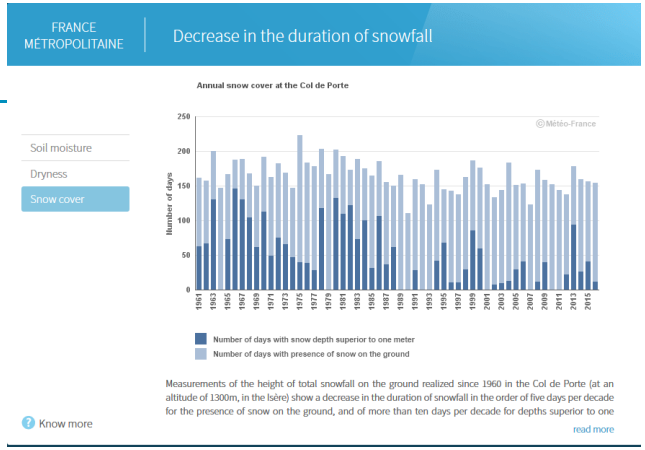


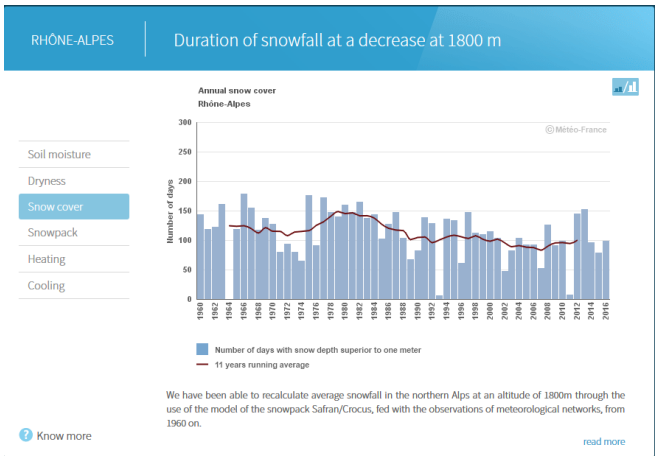
Snow cover

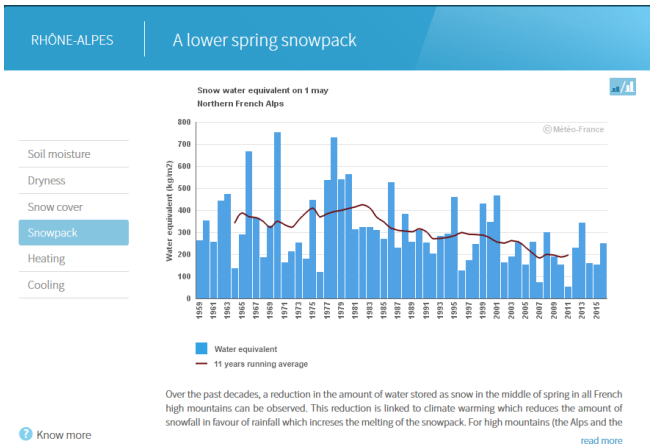
- Number of days with presence of snow on the ground for in-situ observation
  Number of days with snow depth above a threshold for in-situ observation

- Number of days with snow depth above a threshold for a whole mountain massif (gridded data from Safran/Crocus model)

- Snowpack for a whole montain massif (gridded data)







Snow depth from Safran/Crocus model

- Concerning the indicator calculation, we use results obtained at an altitude of 1800 m, averaged for all of the mountain ranges across a given region. The threshold retained for the calculation of the numberof days (in this case a metre) was chosen in function of the average values observed since 1960 across the region’s mountain ranges.

Drought

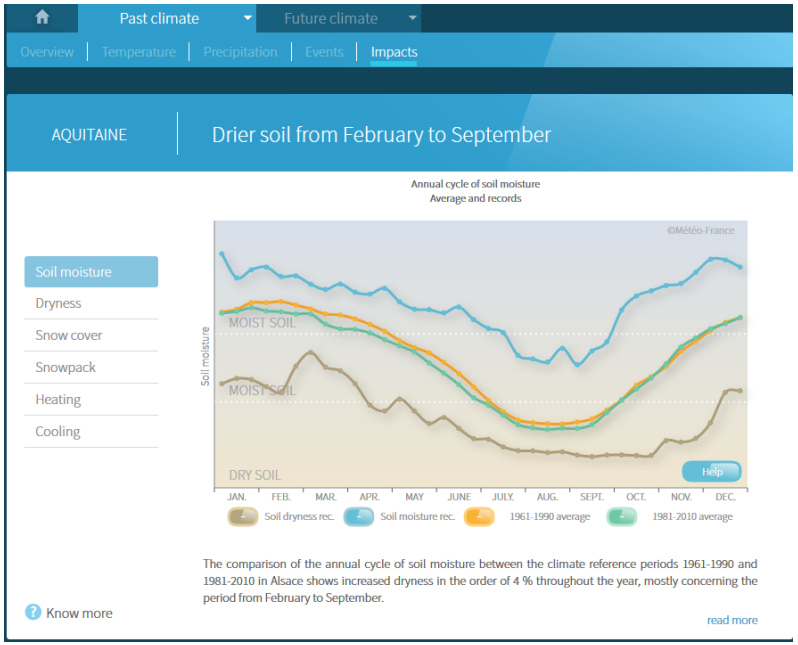
SWI issued from Safran/Isba/Modcou model, gridded data

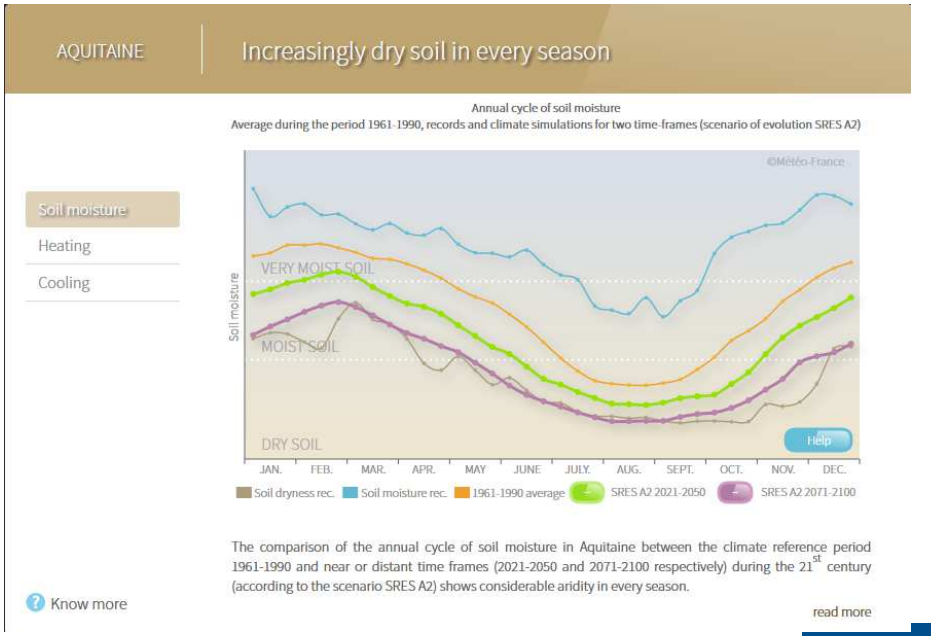
Soil moisture: Soil moisture is expressed through the Soil Wetness Index or SWI representing for a plant the ratio between the water content available in the soil on any given day and its maximum valu

$$SWI = \frac{W - W_{wilt}}{W_{fc} - W_{wilt}}$$

where W is the integrated water content of the soil W_{wilt} the water content at wilting point and W_{fc} the water content of the soil at the field capacity.

The SWI varies mainly between the values 0 (extremely dry soil) and 1 (extremely moist soil). Below 0,5 soil is considered as dry and above 0,8 as very moist.





Portail Services Climatiques : Climat^{HD}

- L'application Climat^{HD} permet de visualiser, à l'aide de graphiques commentés, l'évolution dans le temps de diverses variables et phénomènes aux échelles nationale et régionale. Elle s'appuie sur les séries homogénéisées et les SQR dans sa rubrique sur le climat passé.

Rubrique impacts :
- humidité des sols
- sécheresse
- enneigement …

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