Adapting the industry to climate change: the role of climate services

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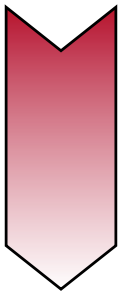
The emergence of climate services

A wide-ranging concept

The need for climate services is relatively new, as adaptation to climate change is still nascent

- A recent multiplication of initiatives, located in a few countries
- WMO Conference stressed the need for climate services (September 2009, Geneva)

What climate services cover



→ Vulgarisation of climate science / information / awareness raising

→ Dissemination of raw climate data

→ Maps / standardised indicators

→ “Sectoral” indicators, still often standardised

→ Tailored climate indicators and studies

The need for climate services: a need for climate indicators

- To date, most indicators used by stakeholders come from external productions
- As a consequence, climate data is scarcely used in adaptation strategies, leading to suboptimal and often similar adaptations to a limited number of climate impacts
- Yet there is a demand for tailored information to better understand a system’s vulnerability, establish priorities, and adapt

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Defining industrial vulnerability with industrials

2006: opportunity and means for "climate services", and leadership of some key climate scientists

Industrial vulnerability has been studied through 5 categories

- Resources availability
- Facilities and infrastructure design
- Demand for goods and services
- Industrial process
- Climate hazards

A 4-step methodology aimed at tailoring the work of climate scientists to the industrial partner

1. Identification and selection of climate vulnerabilities
   - What's the problem?
   - Who are the inner human resources to tackle it?
2. Construction of a relevant climate indicator
   - That answers the industrial's question
   - That is useable by climate scientists (feasibility study)
3. Detailed analysis of the climate indicator
   - Data identification
   - Trends and uncertainties
4. Communication and discussion with the user

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Distric heating case study: indicator

Dalkia: limits to the operation of district heating in Texas. Elsewhere in the future?

- Question : will district heating remain adapted and profitable under climate change?
- Relevant climate indicator for Dalkia: evolution of daily temperature variations
- The indicator has been defined after Dalkia's experience in Texas
- The study covered Europe and China

Chosen climate indicator: the DTR ("Diurnal Temperature Range")

- Difference between the highest and the lowest temperature during 24 hours

$$DTR = T_{max} - T_{min}$$

- More precisely, the indicator was defined as the number of days for which the DTR is unusually higher than its reference value (1961-2000 mean), i.e. the number of days where

$$DTR > DTR_{1961\text{-}2000} + \text{vulnerability threshold}$$

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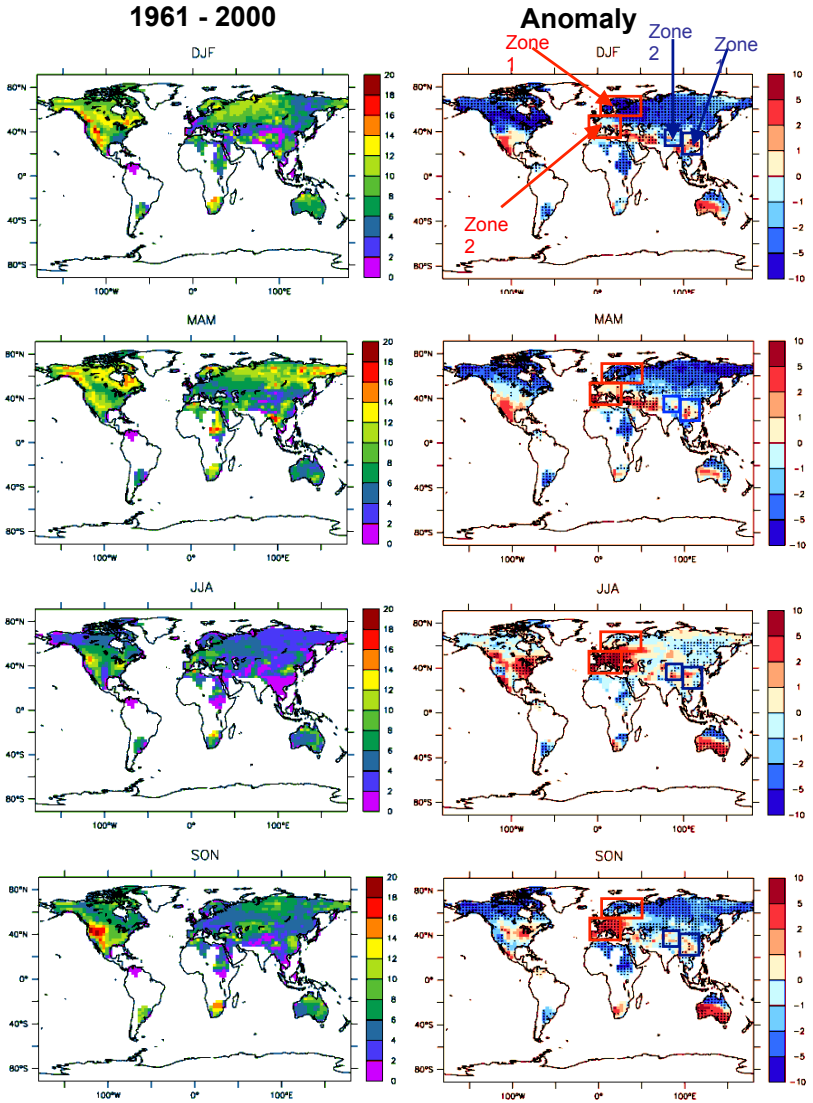
District heating case studies: results



	Spring	Summer	Fall	Winter
Northern Europe	DTR ↓ Out of vulnerability zone (VZ) in 2100	?	DTR ↓ Out of VZ in 2100	DTR ↓ Out of VZ in 2040
Western and eastern Europe	?	DTR ↑ Still <<VZ in 2100	DTR ↑ Still <<ZV in 2100	?
China	?	?	?	?

Annual mean of the indicator for the 1961-2000 period (left column) and its anomaly between the 2071-2100 and 1961-2000 periods (right column). The results are shown in number of days per year. Doted zones show an accordance of more than 80% of the models on the sign of the anomaly.
Source: Déandreis (2010)

Results of the project

Is the methodology workable / duplicable?

Benefits of the methodology:

- The end-users have more capacity and wil to take climate change into account

  → Re-analysis of their activity, through the lens of a changing climate constraint
- Better understanding of what can be done with climate data, and what cannot
- Essential preparation to not-so-distant future challenges

Limits of the project:

- The number of vulnerabilities studied remain too low to be usable
- The complete work is much more intensive
- There is a bias in the identification of vulnerabilities: past experience

There is a real need of upgrading the project to go further

Main lessons and outcomes

It is possible to have climate scientists and industrials work together to define relevant indicators …

… But it is a very intensive work, clearly distinct on that point from other climate services …

… And the result is ambiguous

- There are considerable uncertainties
- There is always a possibility to push the study further, and thus postpone the decision-making phase further
- There is a true challenge to have the information actually used by the industry and overcome the 'fashion' barrier
- It is only one piece of information needed to take a decision, and other pieces often do not have similar treatment

<u>Question</u>: is it always necessary to have precise climate information? How should the limit be defined? Is it possible to adapt using this climate information?

Thank you

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