

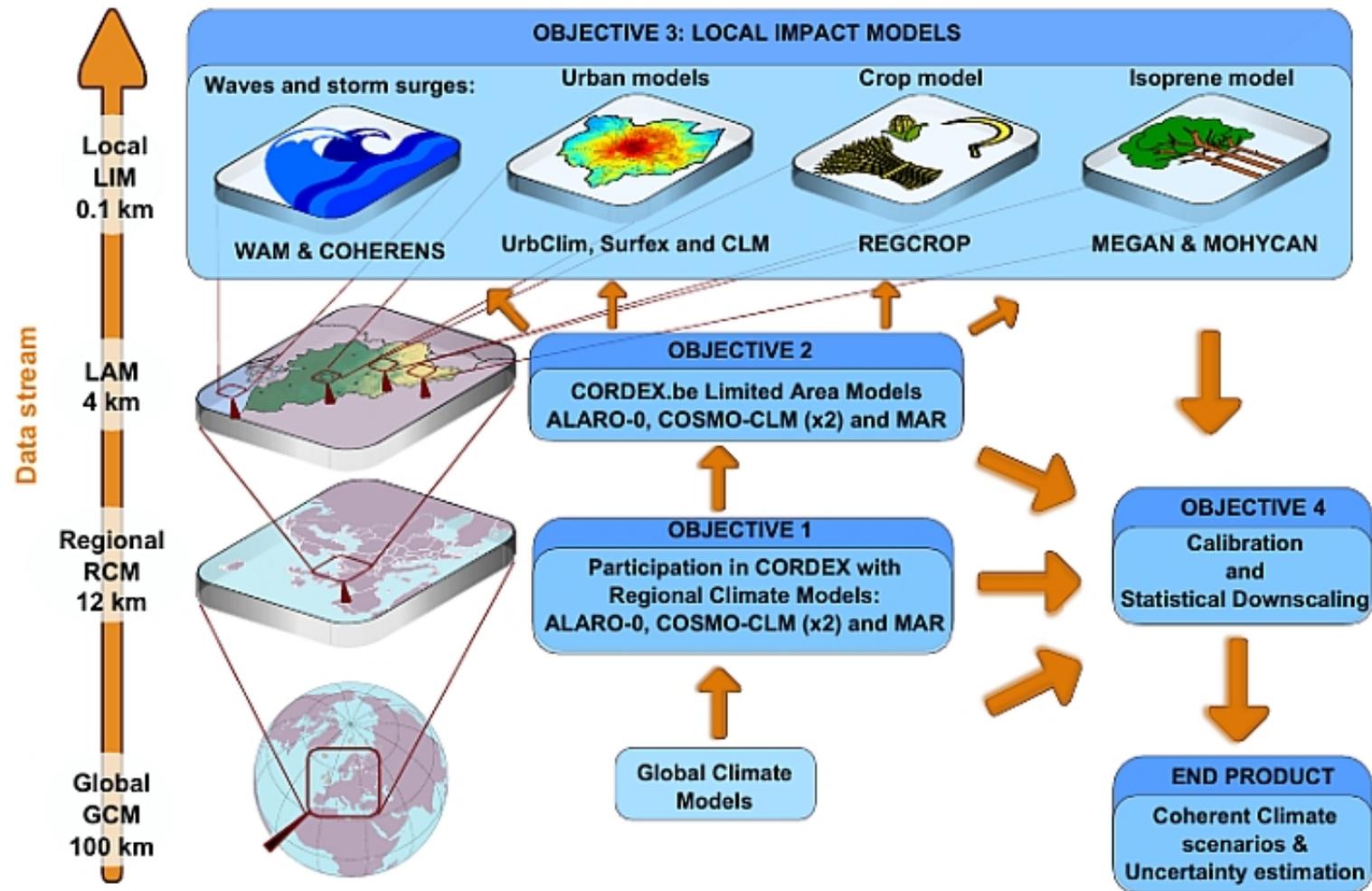
Winter season changes in Belgium: the MAR model contribution to the CORDEX.be project

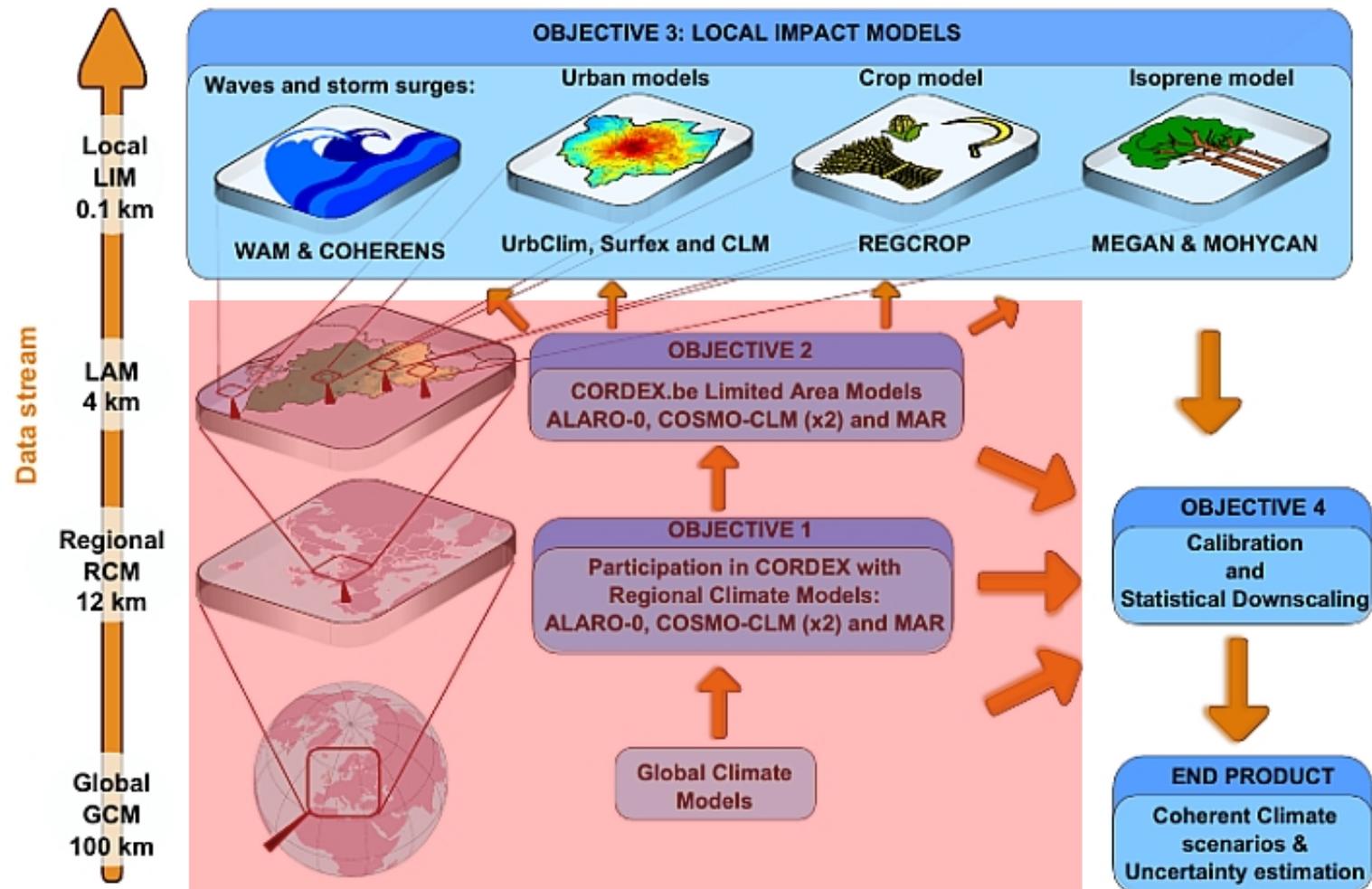
Coraline WYARD, Sébastien DOUTRELOUP, Chloé SCHOLZEN, Xavier FETTWEIS

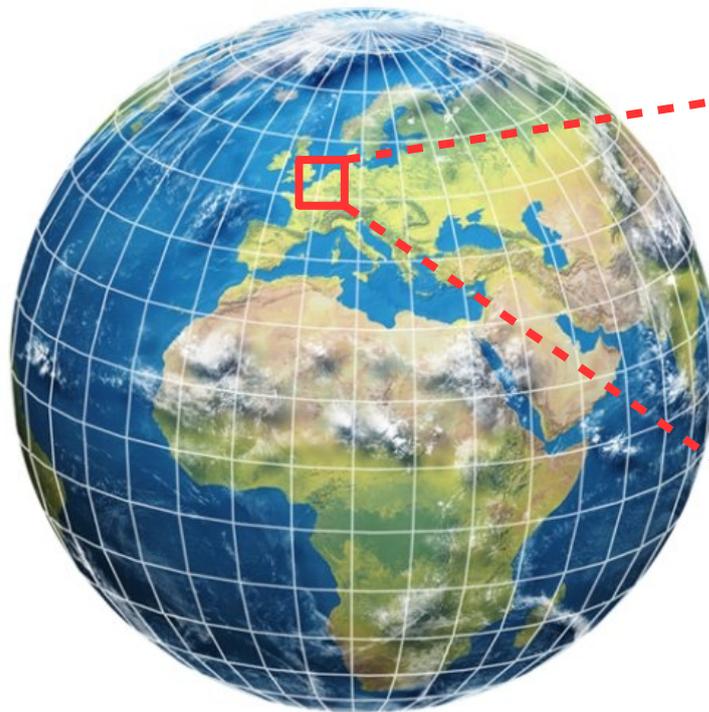
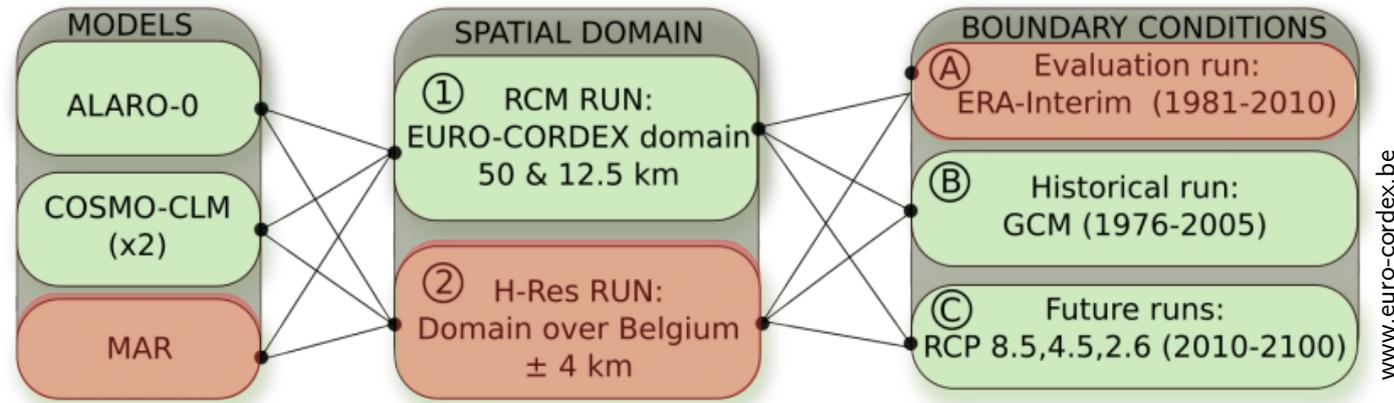
Laboratory of Climatology, ULiège, Liège, Belgium

Contact : Coraline.Wyard@uliege.be

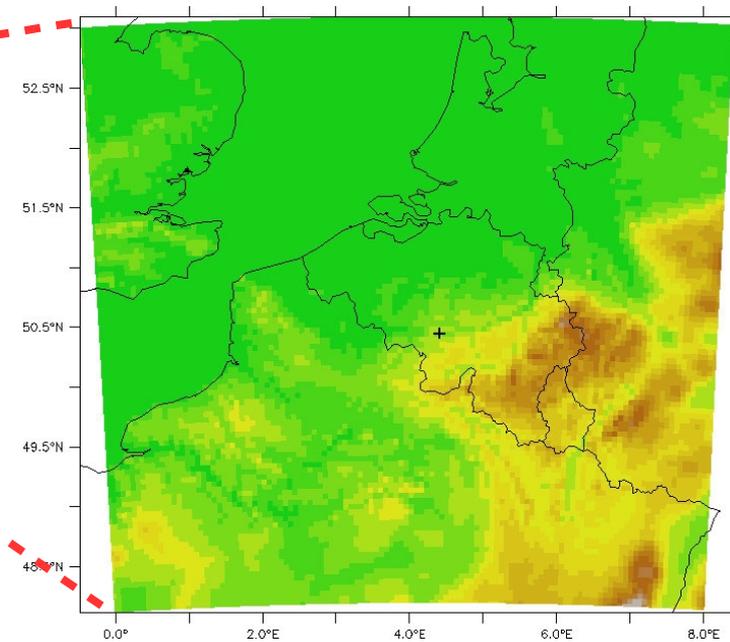




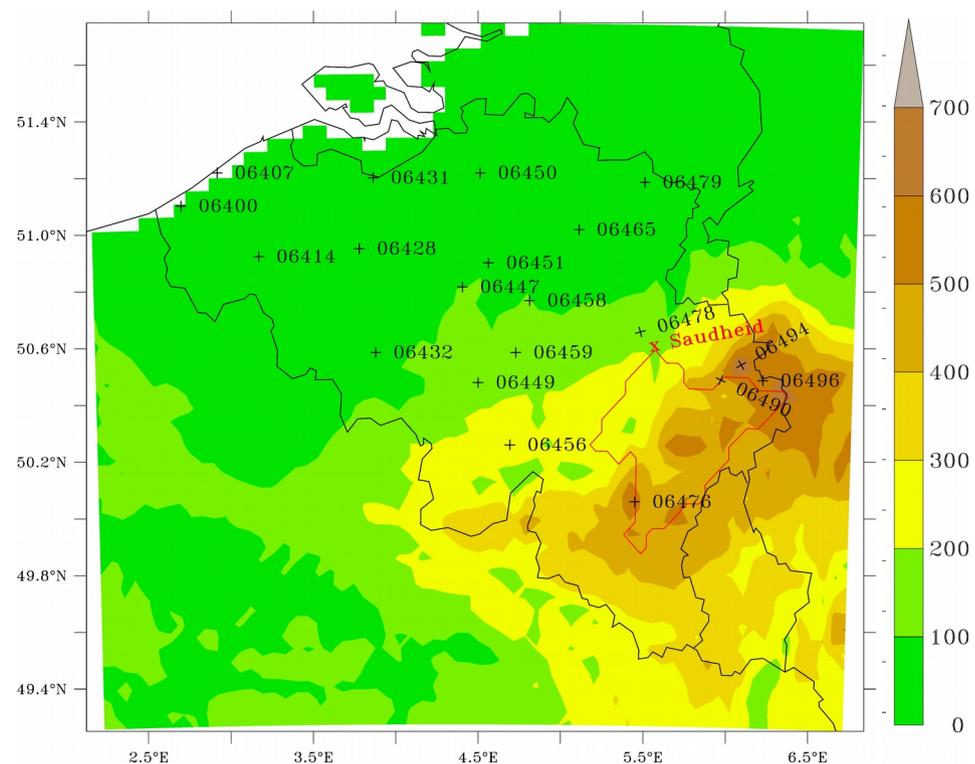




GCM



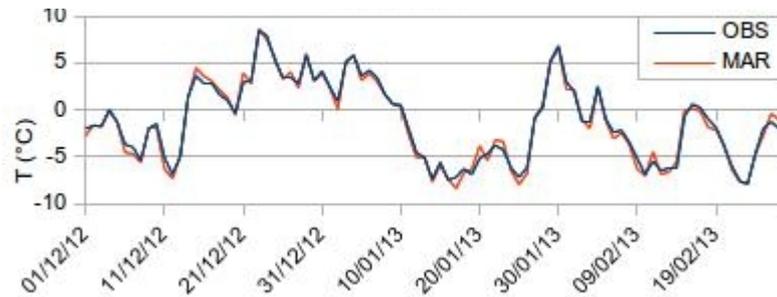
RCM (MAR)



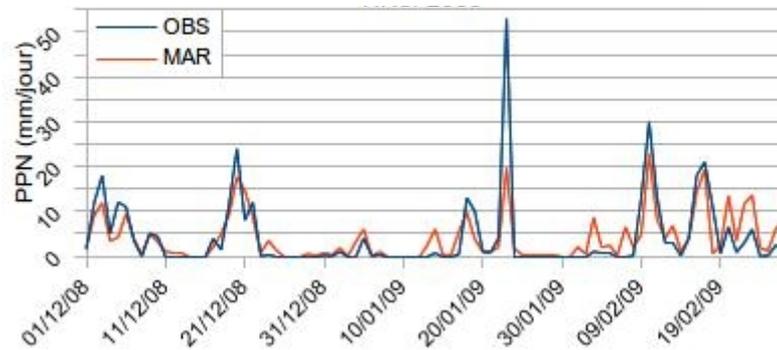
Observations from 20 weather stations of the SYNOP network over 2008-2014 (OGIMET, 2015)

Winter

T(°C)



PPN(mm/day)

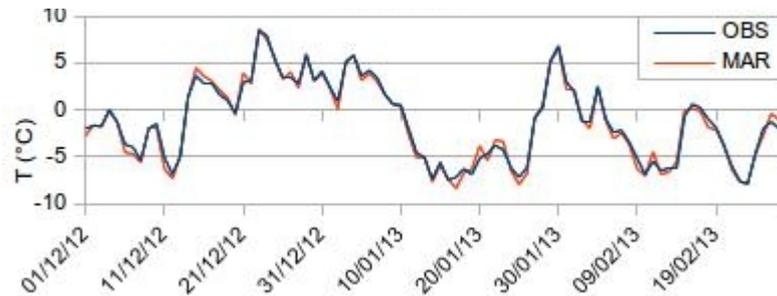


SH (cm)

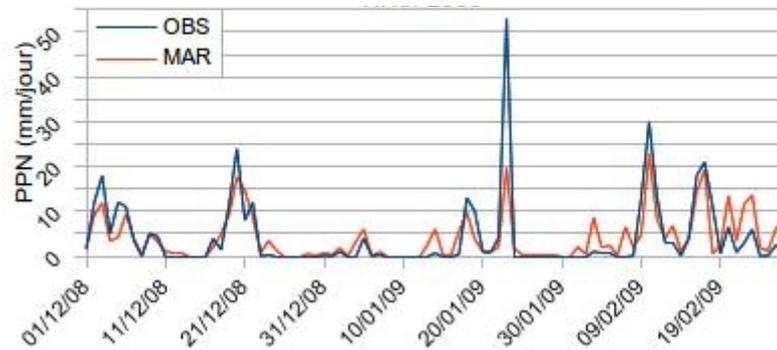


Winter

T(°C)



PPN(mm/day)

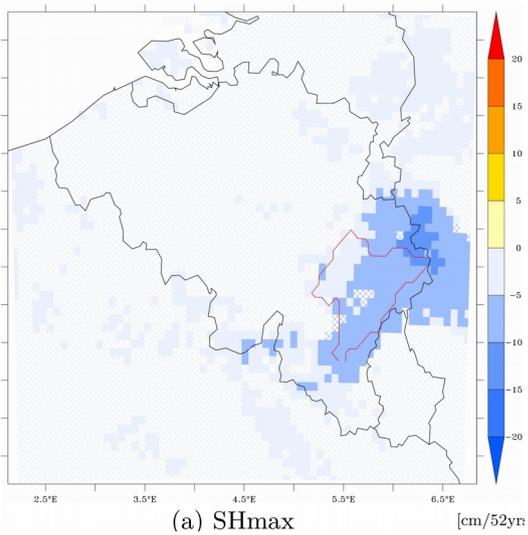


SH (cm)

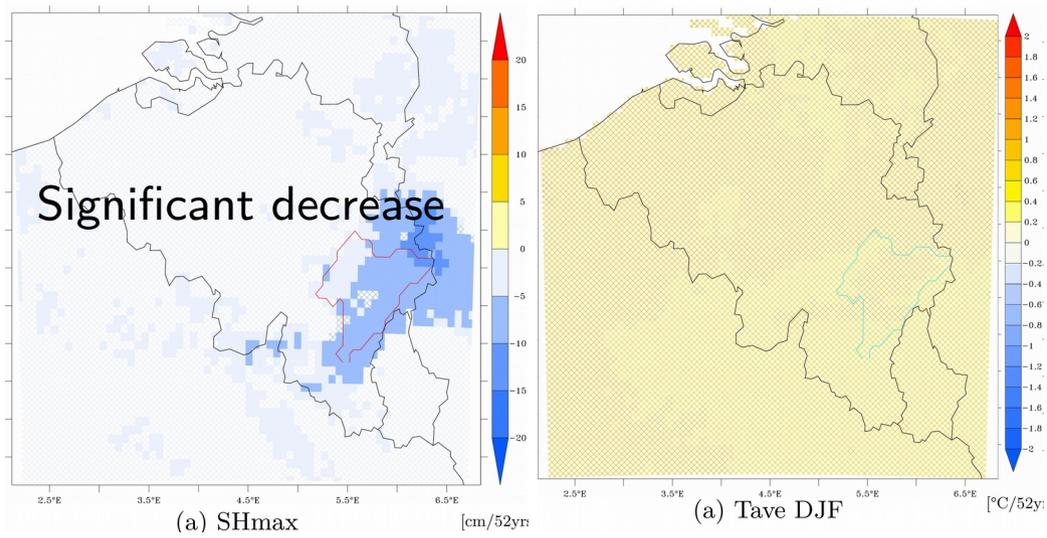


- The winter season is better simulated by MAR
- The winter season variability and especially the seasonal snow cover are poorly documented in Belgium

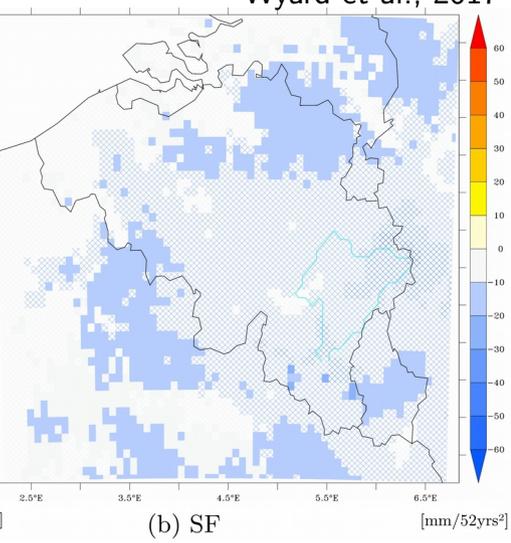
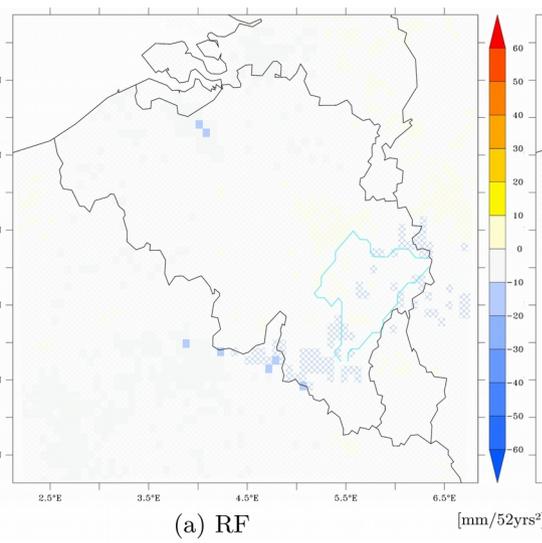
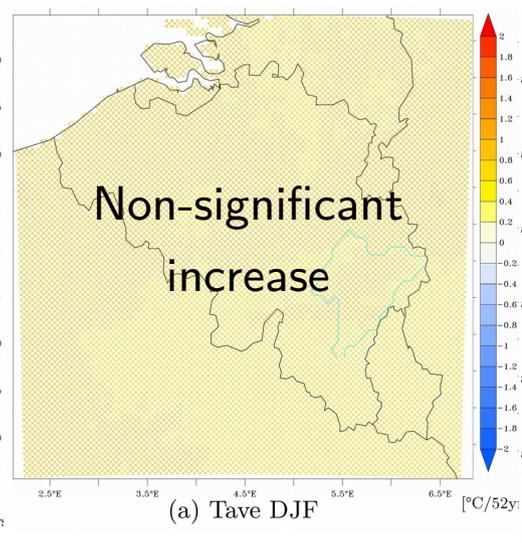
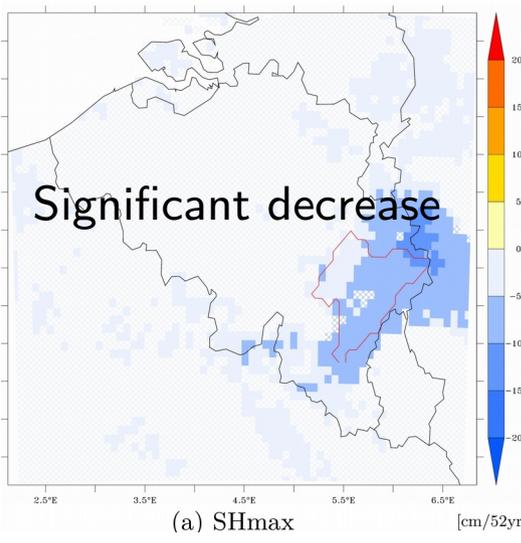
Wyrd et al., 2017



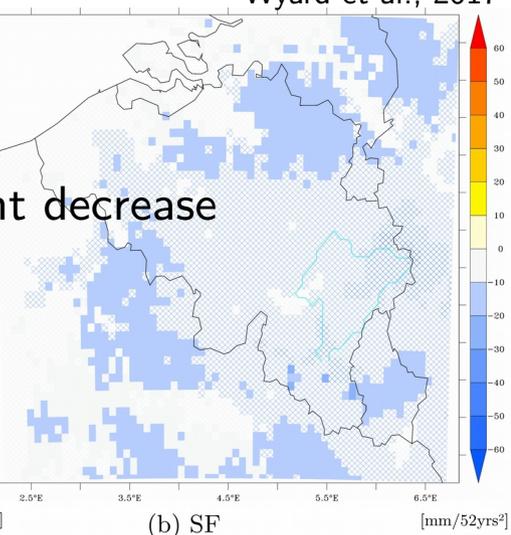
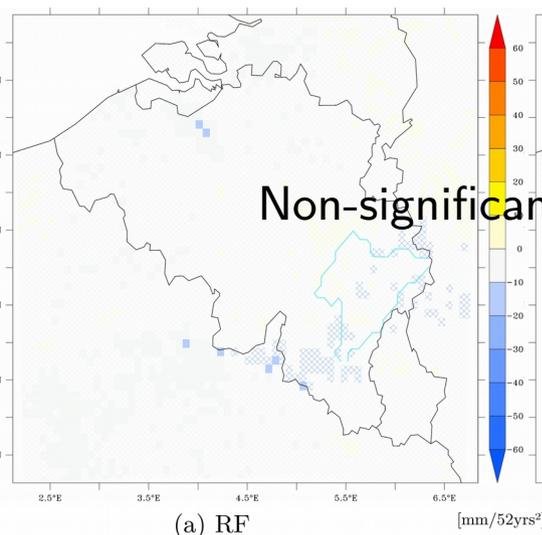
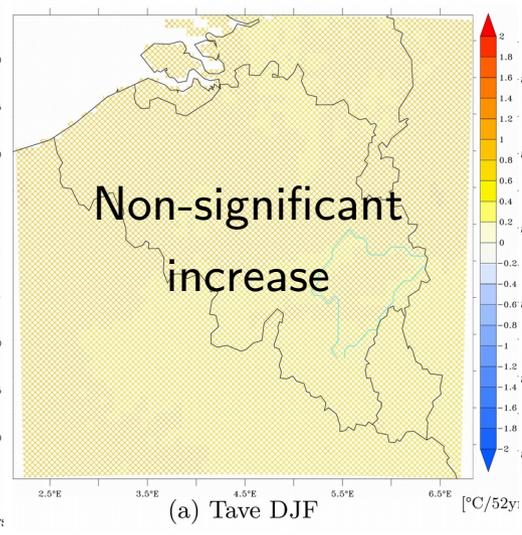
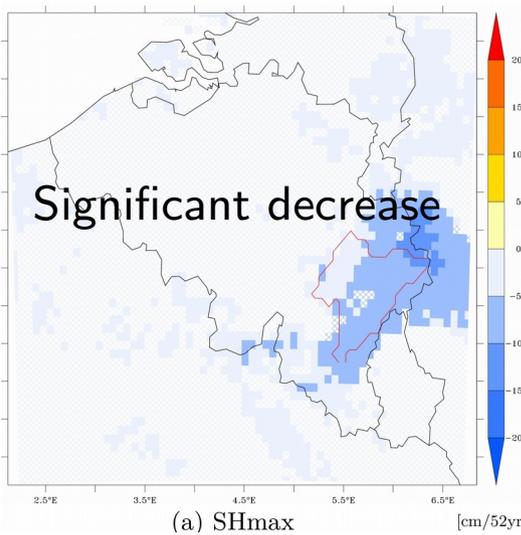
Wyard et al., 2017



Wyrd et al., 2017



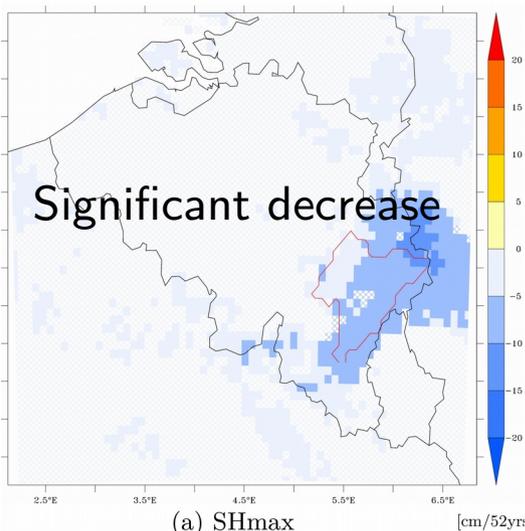
Wyard et al., 2017



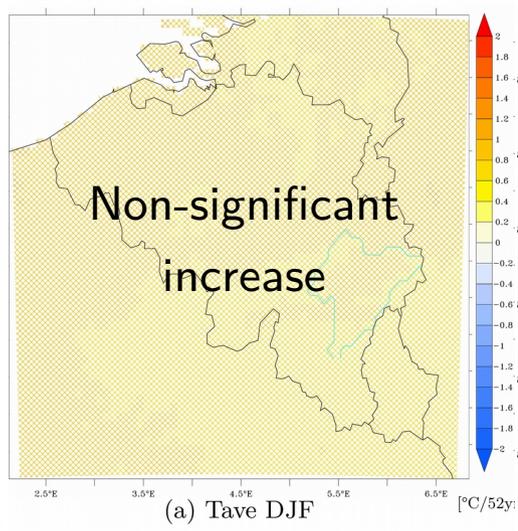
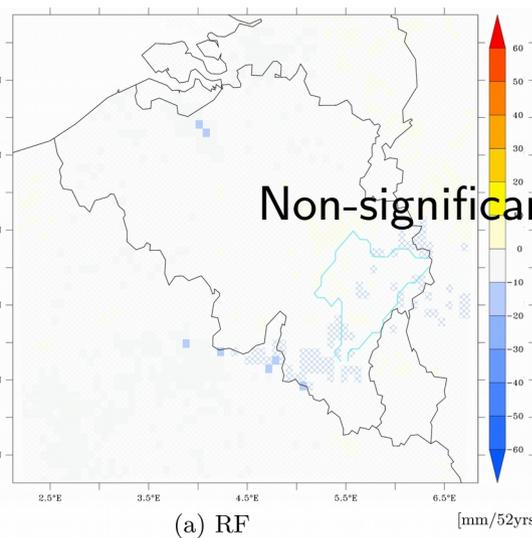
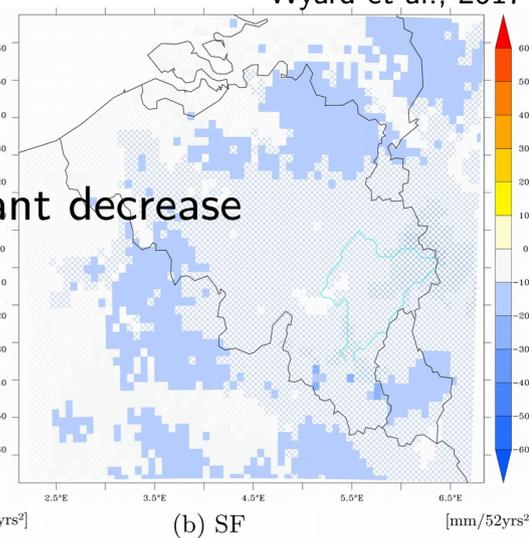
High interannual variability

Trend significance depends on the considered period

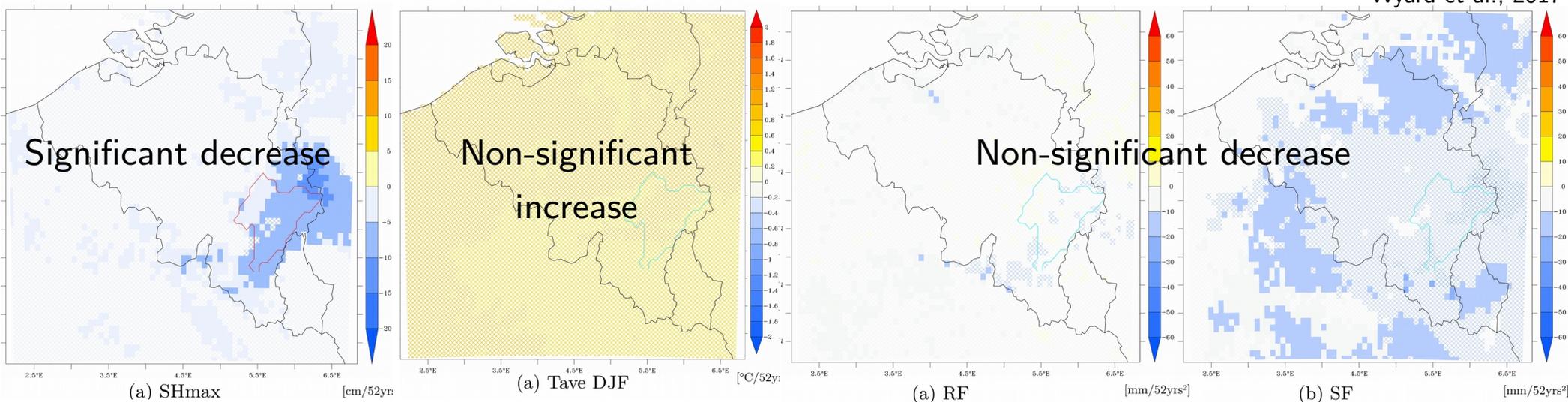
Wyrd et al., 2017



e.g. Birsan and Dumitrescu, 2014

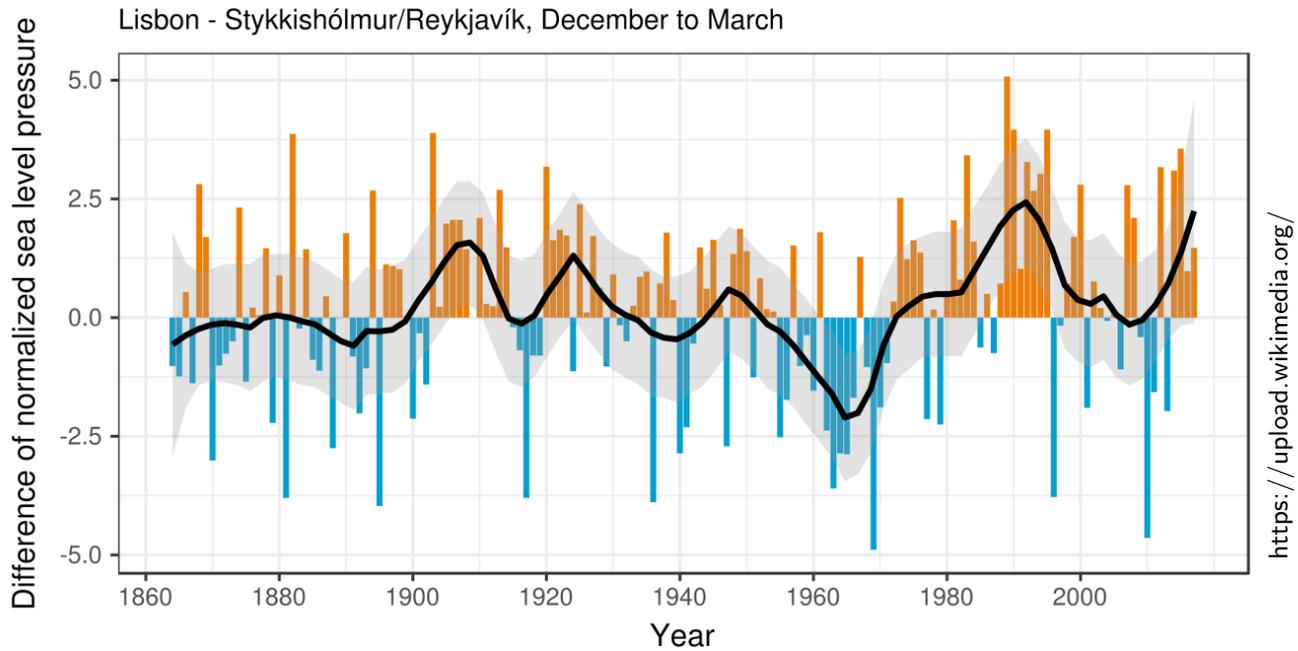
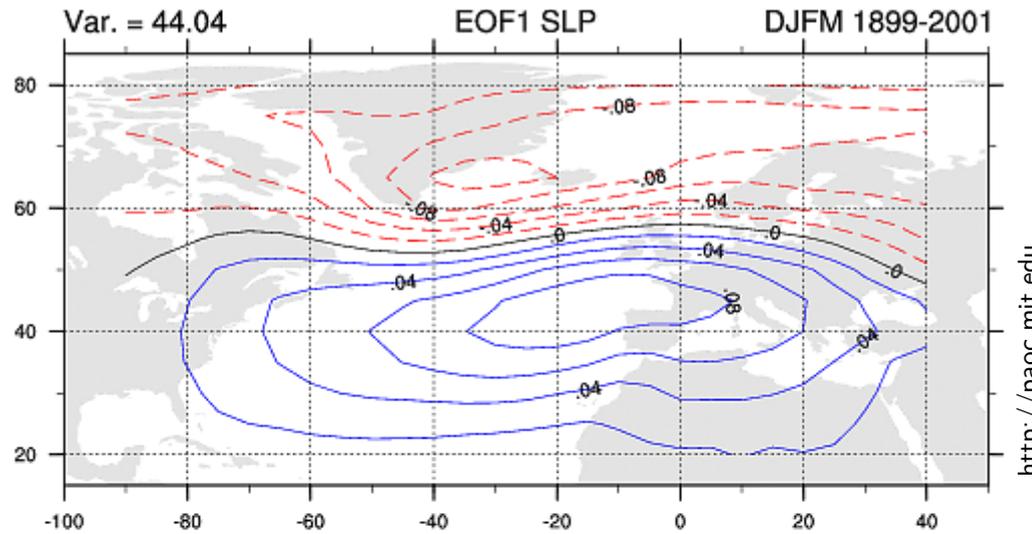
Van de Vyver, 2012
RMI, 2015e.g. De Jongh et al., 2006 ; Ntegeka and Willems, 2008 ;
Willems, 2013 ; RMI, 2015High interannual
variabilityTrend significance depends
on the considered period

Wyard et al., 2017

e.g. *Birsan and Dumitrescu, 2014**Van de Vyver, 2012*
*RMI, 2015*e.g. *De Jongh et al., 2006 ; Ntegeka and Willems, 2008 ;*
*Willems, 2013 ; RMI, 2015*High interannual
variabilityTrend significance depends
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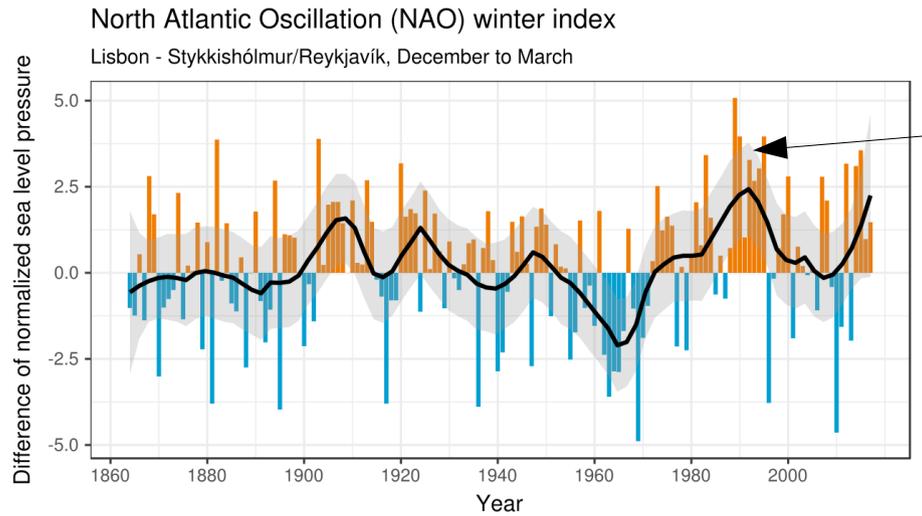
Large-scale/low-frequency oscillations in the atmospheric circulation in winter

North Atlantic Oscillation

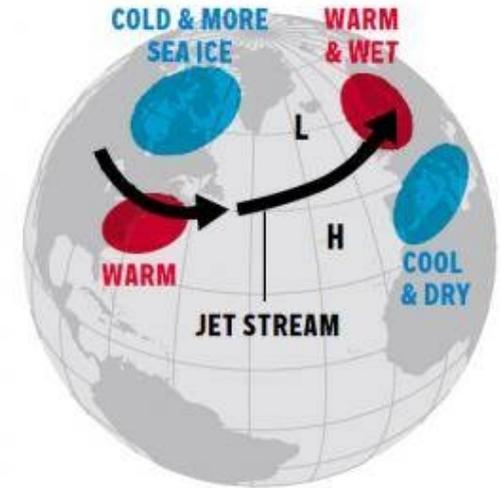


NAO Index Data provided by the Climate Analysis Section, NCAR, Boulder, USA, Hurrell (2003)
Updated regularly. Accessed 2017-10-08

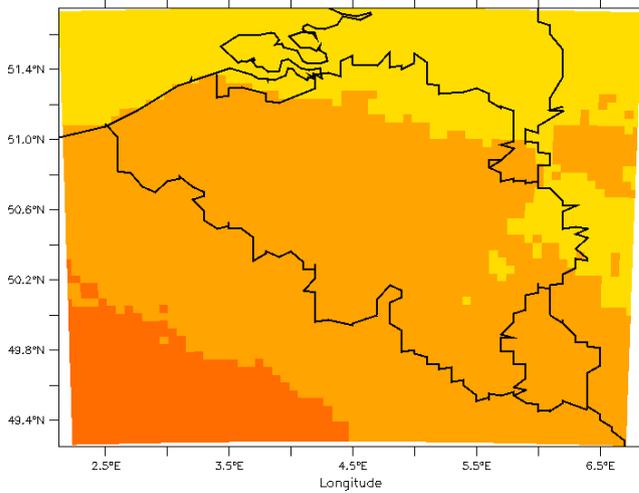
NAO+



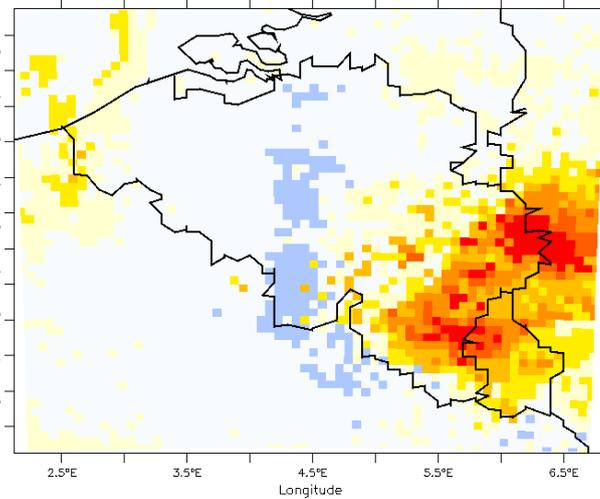
NAO Index Data provided by the Climate Analysis Section, NCAR, Boulder, USA, Hurrell (2003) Updated regularly. Accessed 2017-10-08



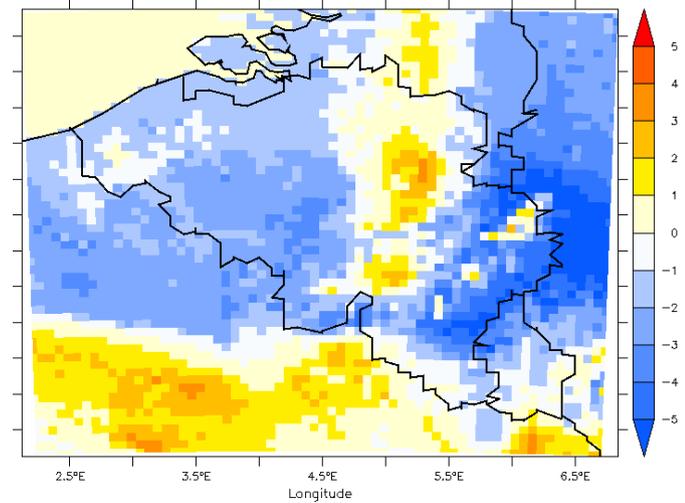
Temperature anomaly (°C)



Rainfall anomaly (mm)



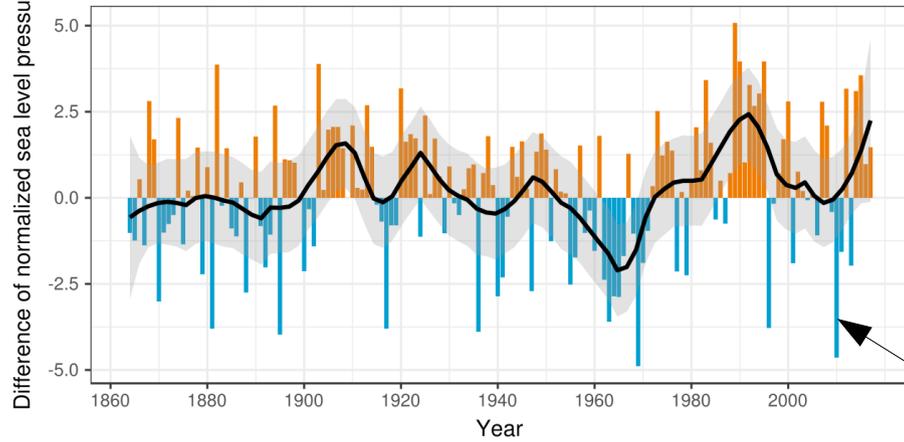
Max. snow height anomaly (cm)



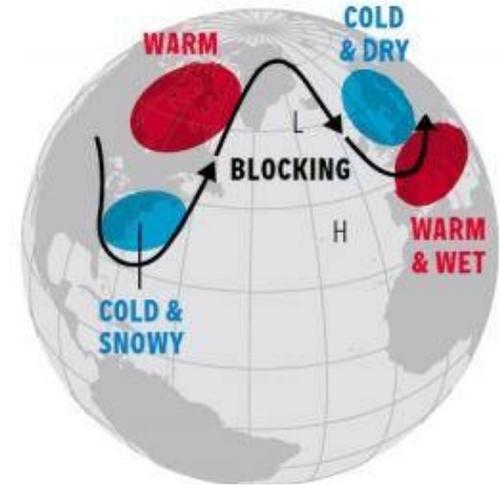
NAO—

North Atlantic Oscillation (NAO) winter index

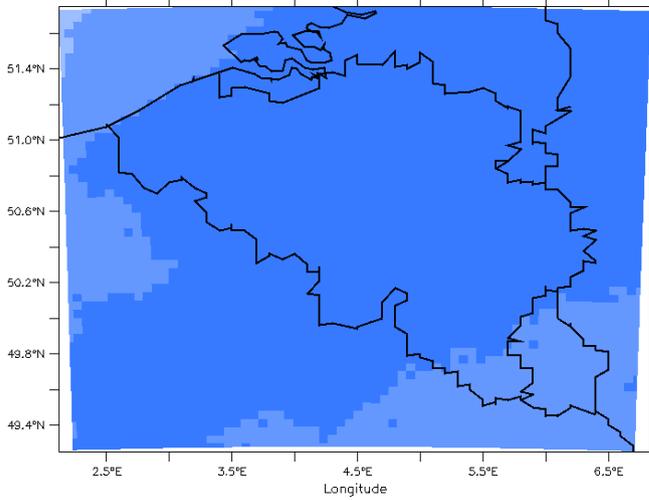
Lisbon - Stykkishólmur/Reykjavík, December to March



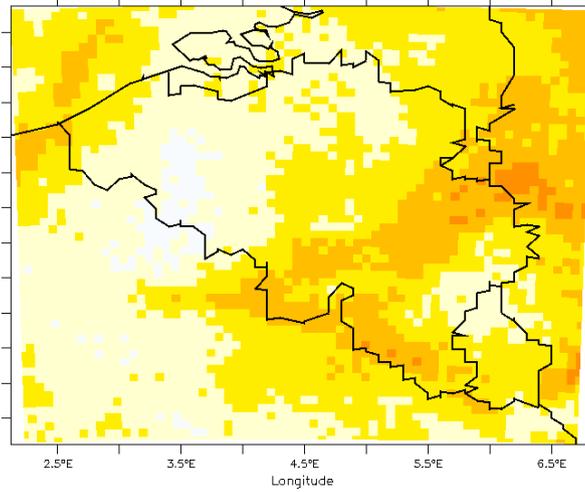
NAO Index Data provided by the Climate Analysis Section, NCAR, Boulder, USA, Hurrell (2003) Updated regularly. Accessed 2017-10-08



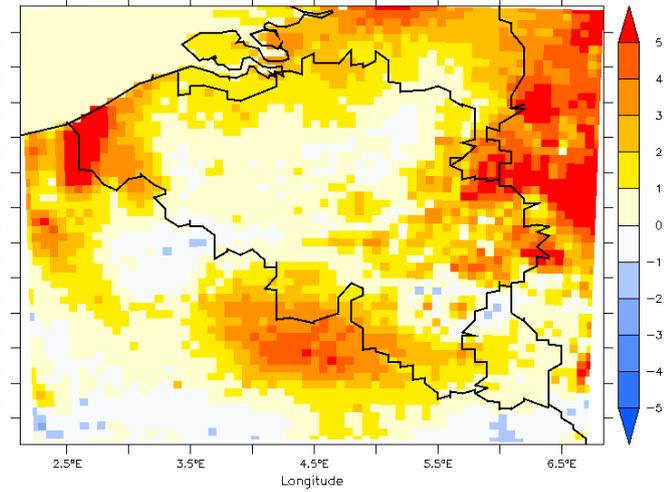
Temperature anomaly (°C)



Snowfall anomaly (mm)



Max. snow height anomaly (cm)



No significant trend in winter in Belgium except in snow accumulation
→ Strong influence of natural large-scale/low-frequency oscillations in the atmospheric circulation in winter such as the North Atlantic Oscillation

More information about this study :

Wyrd, C., C. Scholzen, X. Fettweis, J. Van Campenhout, and L. François (2017), Decrease in climatic conditions favouring floods in the south-east of Belgium over 1959-2010 using the regional climate model MAR, *International Journal of Climatology*, 37(5), 2782–2796, doi:10.1002/joc.4879

More information about CORDEX.be :

www.euro-cordex.be

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