New approaches to decadal predictions on the regional scale
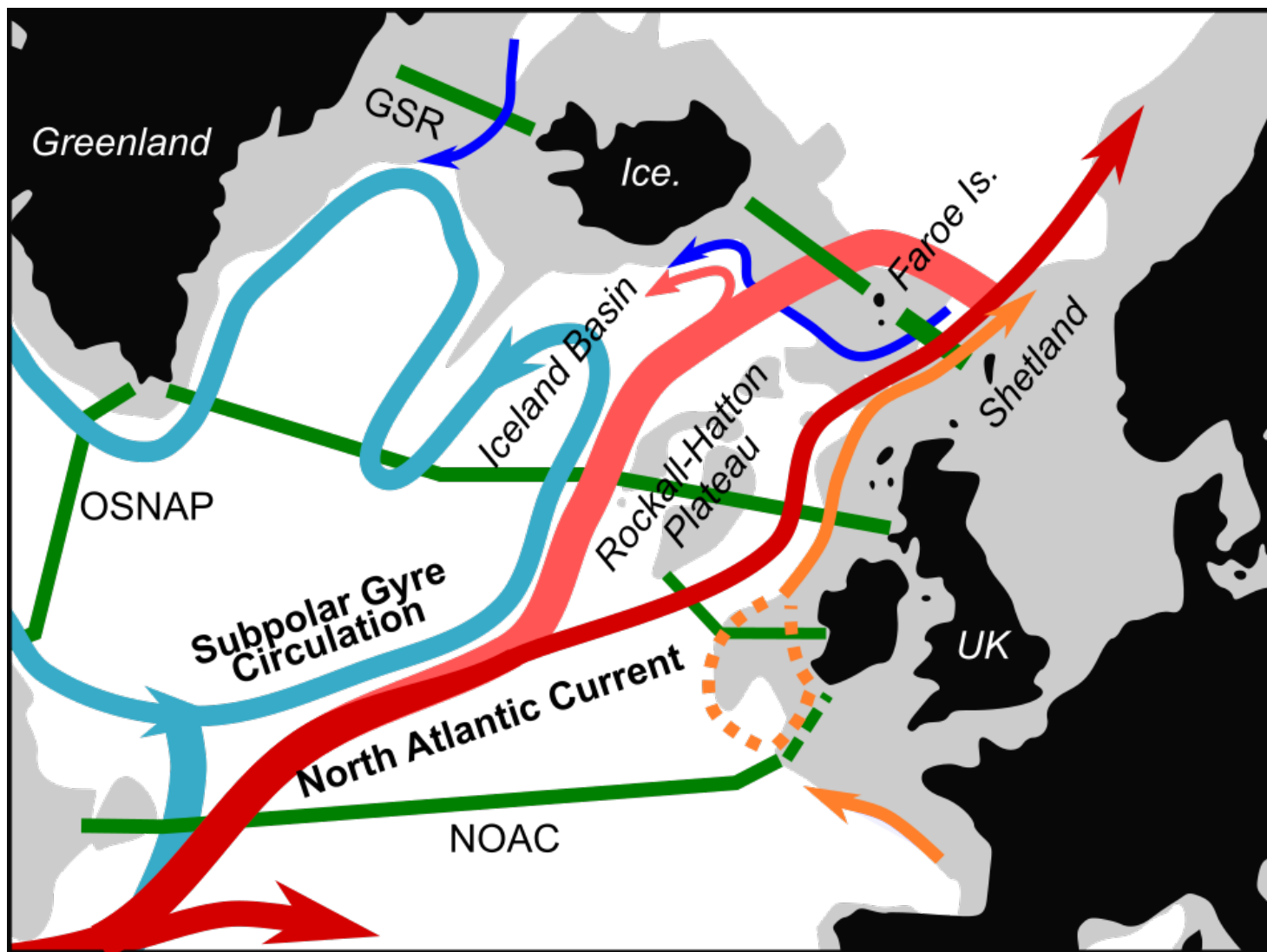
Gerard McCarthy, André Düsterhus*
Catherine O'Beirne, Stephen Ogungbenro, Samuel T. Diabat,
Levke Caesar, Maeve C. Upton, Niamh Cahill, and Andrew C. Parnell

andre.duesterhus@mu.ie

EGU
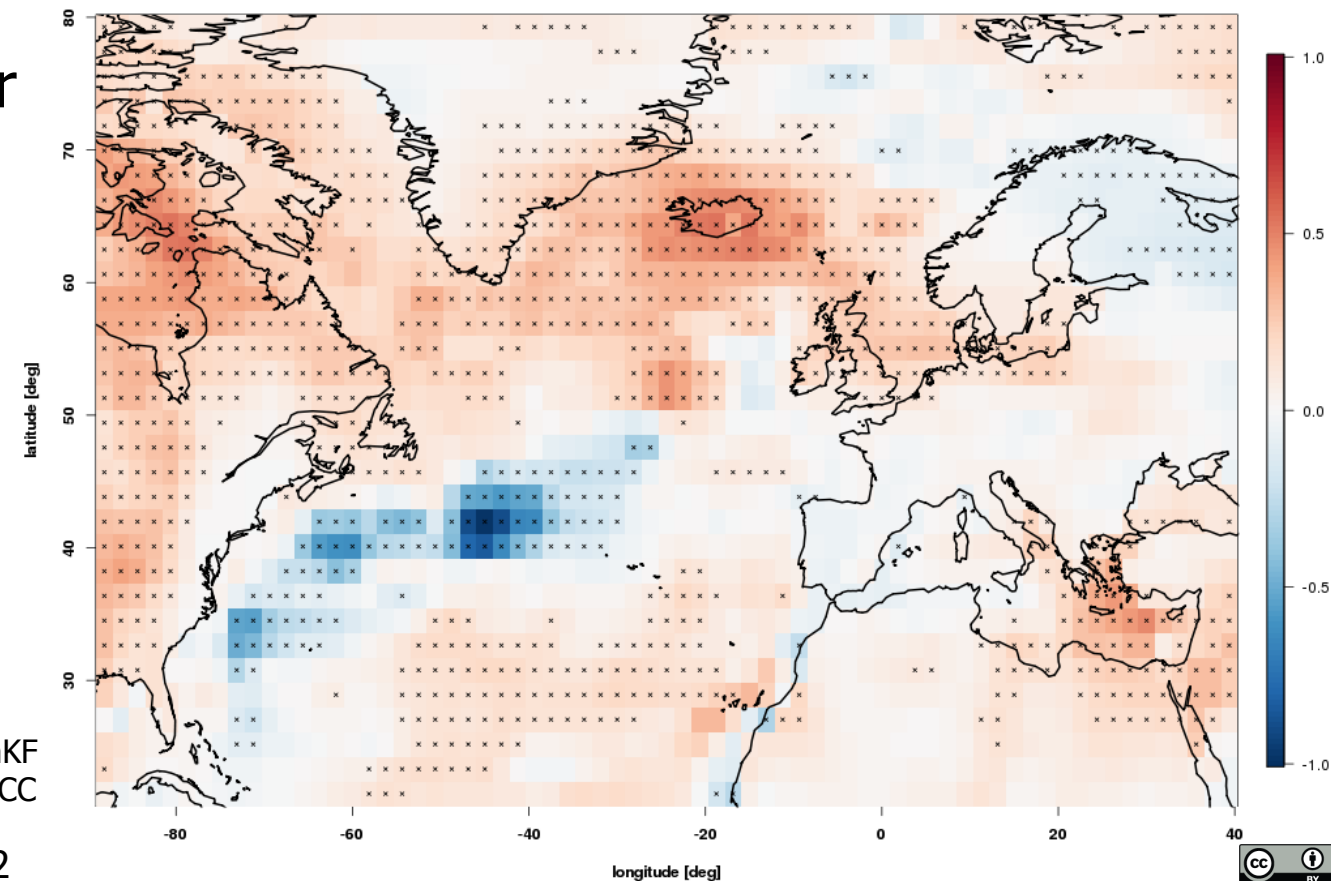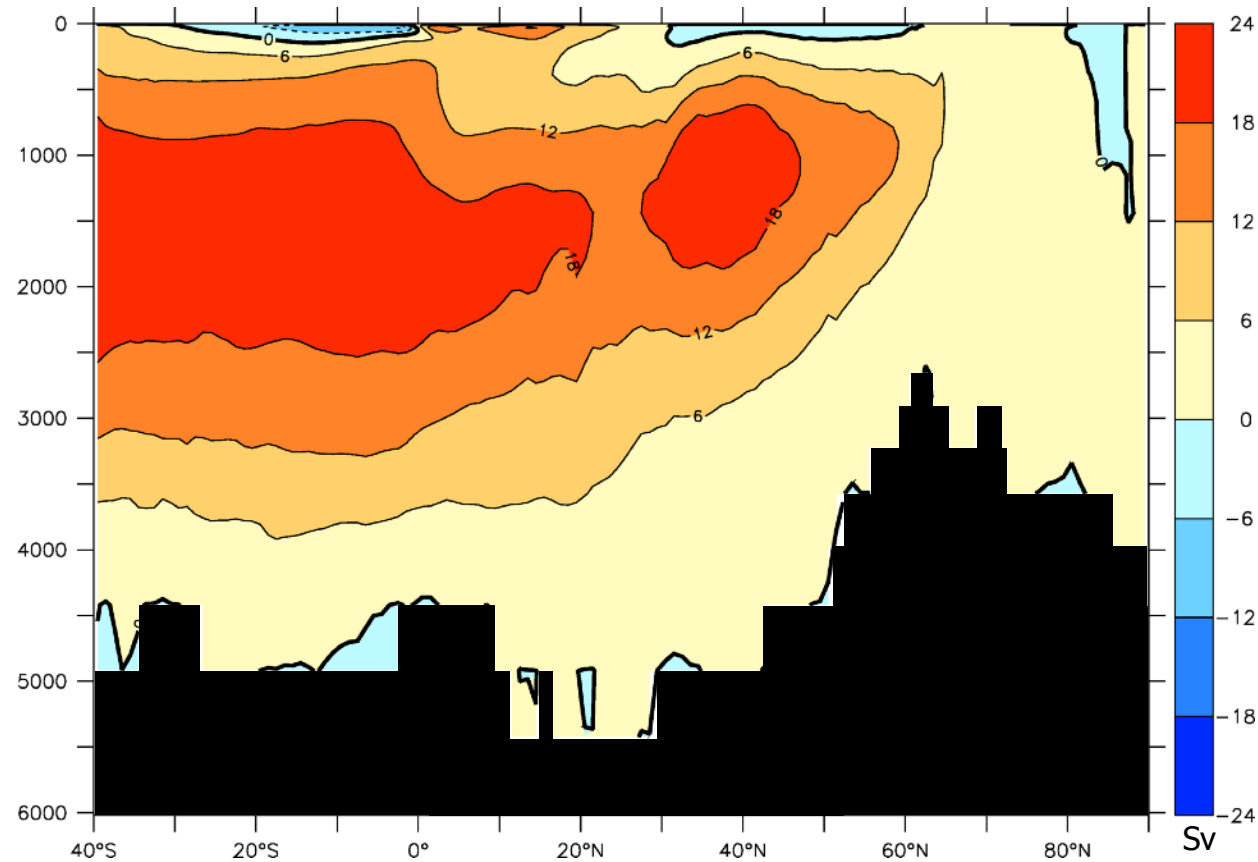**May 2020**

Climate of Ireland is heavily influenced by the North Atlantic.

Decadal prediction skill can be observed over the North Atlantic, but is sparse on the European continent.
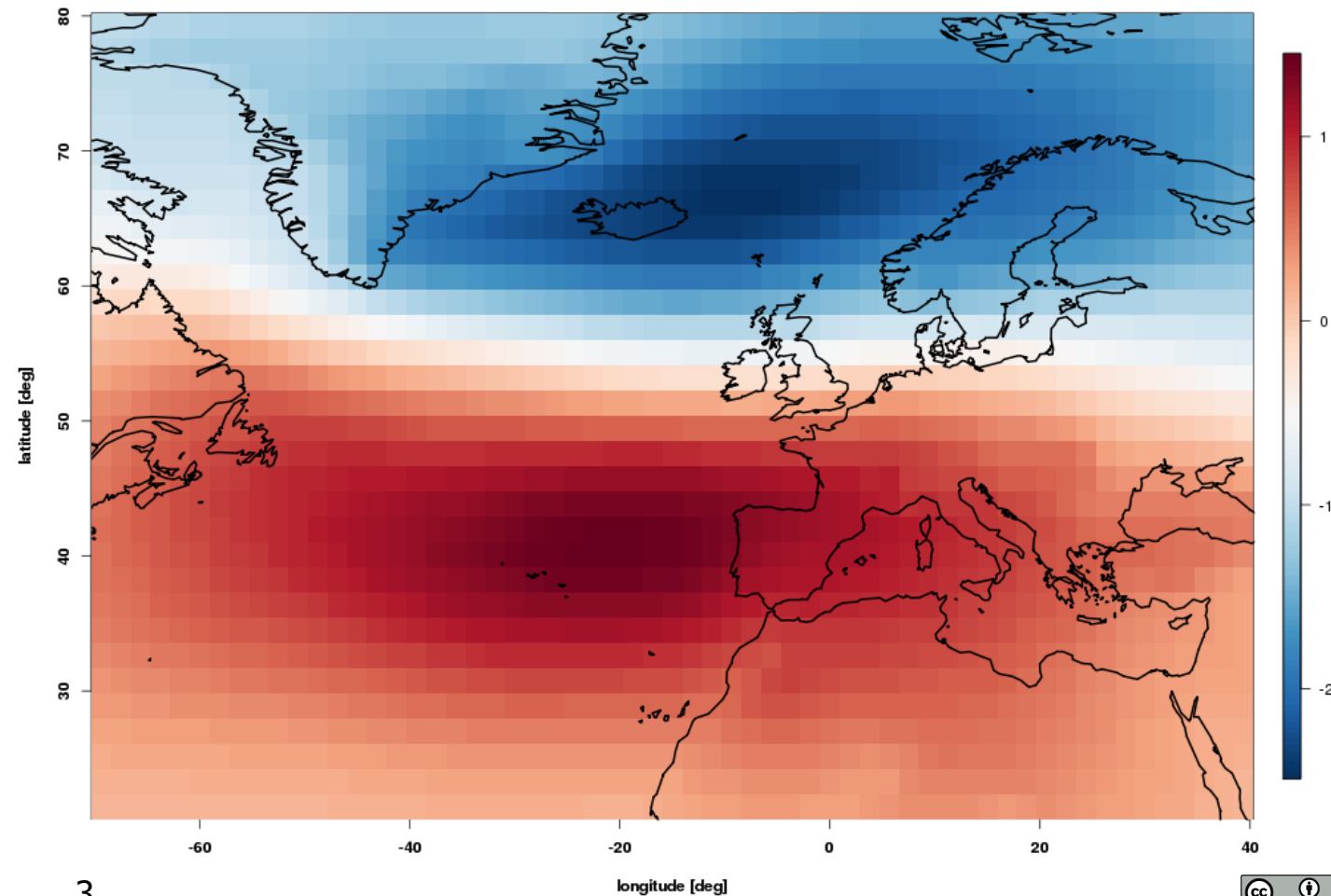

Difference of ACC of the surface temperature of the MPI-ESM-LR with EnKF assimilation (Brune & Baehr 2020) with a lead time of 2-5 years to the ACC of the historical simulation.

2

North Atlantic stream function in the assimilation run of the MPI-ESM-LR with EnKF assimilation (Brune & Baehr 2020).
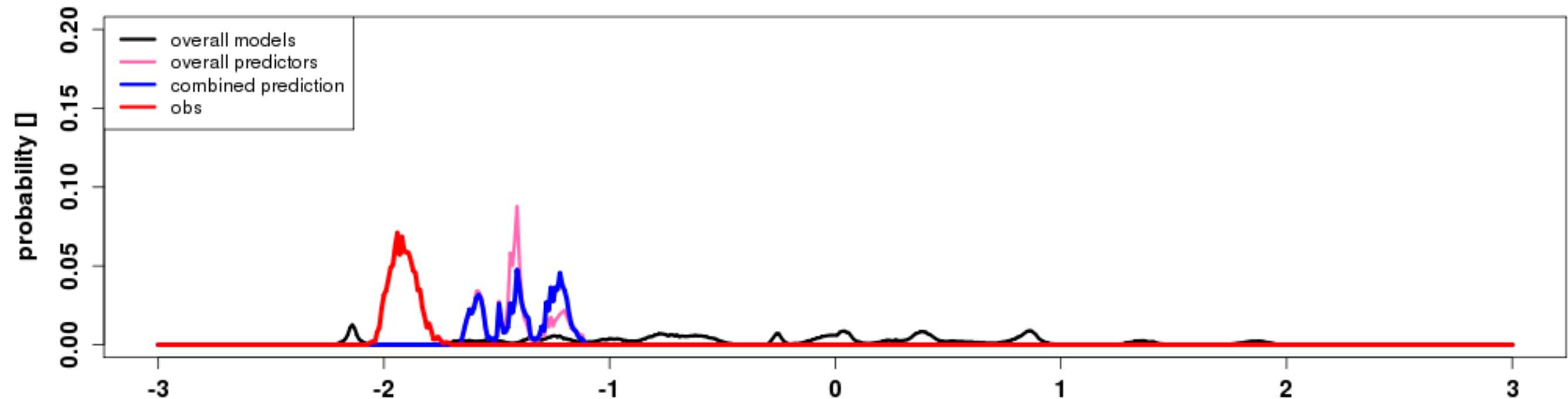
To make use of this potential predictability we analyse prediction skill in the North Atlantic and connect it to atmosphere and costal waters.

Key is the understanding of the physical connection between AMOC (above) and NAO (right).

First EOF of the North Atlantic DJF SLP of the ERA Interim

3

By post-processing of model predictions we will analyse the potential of models to predict climate on the regional scale. By connecting statistics and physics, models and observations we work on a better understanding on the future climate impact on Irish land and coasts.

Merging of statistical and dynamical predictions by Düsterhus 2020. Probability distributions gained from ensemble members (black) and statistical predictors (pink) are merged to form a combined prediction (blue) and compared to observations (red) for the seasonal prediction of winter NAO. It has been shown that this post-processing procedure offers advantages for predictions in many settings.

Final aim will be to use those predictions to gain more information on impacts on coastal areas and their assets on future time-scales from seasons to decades.

Atlantic Ocean and Irish Shelf variability

Irish sea-level change and Atlantic context

Decadal predictability of managing an uncertain future