



© D. Ausserhofer/MPI-M

Prof. Dr. Jochem Marotzke
Max-Planck-Institut für Meteorologie
Hamburg

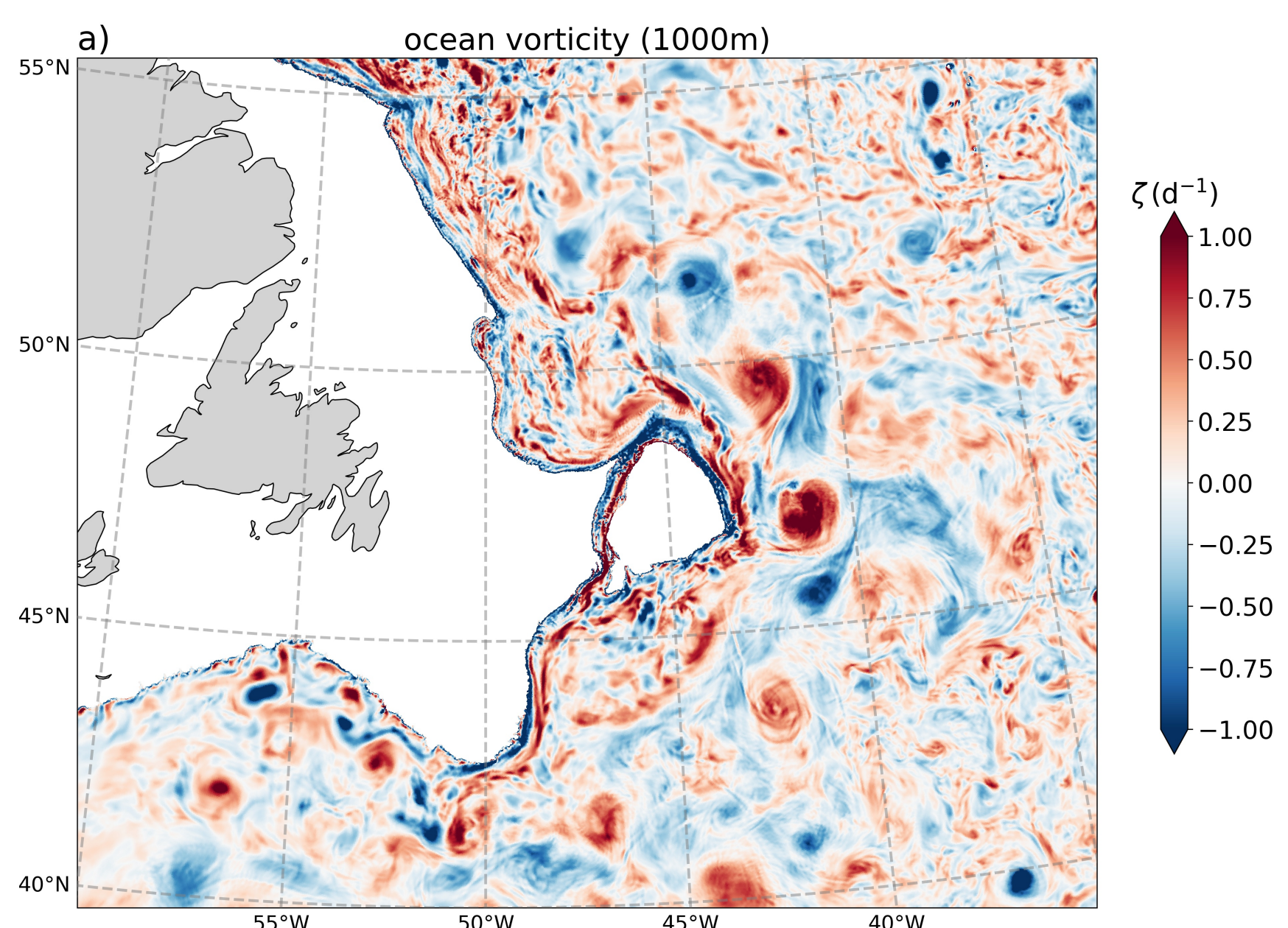
Stability of the Atlantic Circulation

physikalisches

Mo. 12.1.26
16:00 Uhr
Ort: H34

The Atlantic overturning circulation, which includes the Gulf Stream, contributes substantially to the mild climate of western and northern Europe but still massively puzzles researchers. The overturning circulation might collapse abruptly in a warmer climate, but the probability of such a collapse cannot currently be estimated reliably.

Research on the stability of the overturning circulation began as early as 1961 but did not pick up speed until 1986, and continuous observations did not begin until 2004, at 26.5°N. Based on these observations, I will characterize the complexity of the overturning circulation. Through the latest report of the Intergovernmental Panel on Climate Change (IPCC), I will illustrate the deep uncertainty that characterizes our current understanding of the overturning circulation. I argue that modern high-resolution simulations with climate models, in conjunction with new observations, offer a way out of this dilemma. I will show examples of these simulations and also how theoretical concepts can help us understand observations and these simulations.



Curl of horizontal flow at 1000 m depth in an ultra-high-resolution simulation with a global climate model. This region off Newfoundland is critical for the north-south connectivity of the Atlantic circulation. © MPI-M