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The North Atlantic Oscillation and related topics

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We start with the severe European winter of 1962/63, a winter when the North Atlantic Oscillation (NAO) index was strongly negative with persistent easterly wind anomalies across northern Europe and the British Isles. We then note that the NAO is a manifestation of synoptic Rossby wave breaking. The positive feedback with which synoptic eddies act to maintain the atmospheric jet stream against friction turns out to also be the mechanism by which the equatorial deep jets in the ocean are maintained against dissipation. We were fortunate to be able to demonstrate this in both a simple model set-up that supports deep jets and directly from mooring data on, and on either side of, the equator at 23 W in the Atlantic Ocean. The deep jets offer some potential for prediction over the neighbouring African continent on interannual time scales. This then leads to a brief discussion of the importance of the tropics for prediction on both seasonal and decadal time scales and longer, linking back to the winter of 1962/63. The models we use for prediction not only contain surprisingly large biases but also require the parameterization of unresolved processes and some brief discussion will be given on the representation of mesoscale eddies in ocean models, such as are used in prediction systems and for making future climate projections.