

Precipitation, Moisture Sources and Transport Pathways associated with Summertime North Atlantic
Deep Cyclones
egusphere-2025-1752

This paper aims to evaluate the moisture sources for summertime extratropical cyclones. It employs a Lagrangian back trajectory method to determine the sources and sinks of moisture for parcels that result in precipitation at the centre of cyclones. The authors have done a good job of addressing the comments I made on the original submission. There are, however, a couple of remaining points that should be addressed before publication.

1. Line 112: The authors state that 'ARs are capable of feeding multiple WCBs from individual cyclones. This is not correct. As shown nicely by the authors in figure 11, and described on lines 662, the cyclone-relative wind vectors point away from the cyclone centre indicating that the moisture within the AR is travelling slower than the cyclone itself. Therefore, the AR cannot feed moisture into the WCB 'because the winds still have no northerly component' (line 666)
2. Line 383-7, figure 8, lines 555-565: The weighted mean source distance is proportional to the ETC propagation speed. I.e. Early in the ETC lifecycle, when they are moving fastest, the weighted mean source distance is large, and later in the ETC lifecycle, when they slow down, the weighted mean source distance is small. Thus the 'moisture sources move closer to the cyclone centre' as the ETCs reach maturity (fig 8) because the ETCs transport moisture polewards at a slower speed over the same time period, so it moves a shorter distance from its origin. This is also why 'despite greater source distances observed during the intensification phase, the residence time remains relatively constant' (line 610). It would be good for the authors to link up these ideas from different parts of the paper to illustrate nicely that the weighted mean source distance is proportional to the speed at which the ETC is moving.