**The reviewer comments are in black and our responses are given below in blue.**

This paper presents an observational study of the genesis of Typhoon Nuri during a recent field experiment (TCS-08) in the western North Pacific. The genesis is interpreted in terms of the 'marsupial' hypothesis proposed in a recent paper in ACP by Dunkerton et al. and shows that the genesis of Nuri was consistent with this hypothesis. The idea is that, relative to the translating tropical wave disturbance within which the storm forms, there is a region of closed circulation. This region provides a largely protected environment, allowing the air within it to steadily moisten, thereby providing conditions that are conducive to the development of sustained deep convection. The paper is interesting, well written and complements the earlier study of Dunkerton et al. I think it could be strengthened even more by a more complete description of the effects that vertical shear on the radial and vertical extent of the "moisture pouch" during the evolution of the pre-Nuri disturbance. In particular, it would be interesting to know how large and how deep the authors consider that the pouch needs to be before genesis becomes likely.

To address the reviewer's question, we first employ GFS FNL data to estimate the vertical depth of the wave pouch during Typhoon Nuri's genesis sequence. We then discuss the physical implications of our findings on the pouch's resiliency. For this exercise, the depth of the pouch (i.e., vertical extent) is defined as the upper-most level at which the area-averaged[1] Okubo-Weiss (OW) remains positive. These data are plotted as vertical extent vs. time in Figure C1. The three phases of the tropical cyclogenesis sequence described in section 3 are delimited by thick black lines. During the early evolution period (12Z 7 August – 00Z 10 August), the pouch exhibited a trend of increasing vertical depth over time. After 12Z 10 August, when the wave propagated through the hostile environment, there was a decline in the average vertical extent of the pouch. When the wave emerged from these hostile conditions (00Z 15 August) there was a rapid increase in the vertical extent of the pouch through the troposphere. These data suggest that the hostile conditions encountered by the pre-Nuri wave were not favorable for building a coherent circulation throughout the depth of the troposphere. For reasons suggested in our reply to J. Molinari's comments, an increase in the vertical depth of the wave pouch is considered a favorable condition for genesis. Such an increase appears to have occurred in the Typhoon Nuri case.

Recall that differences in the horizontal dimension of wave pouches for different cyclogenesis cases were examined in DMW09. Those authors showed that for the 55 Atlantic and East Pacific cases studied, the median pouch size was 25 ERA-40 grid points at the 850 hPa level and 39 ERA-40 grid points at the 600 hPa level. Among the 55 storms, the gyre size ranged from one to greater than 200 ERA-40 grid points. Their analysis indicated that there was no critical "pouch size" for genesis to occur. In the case of Typhoon Nuri, the size of the wave pouch varied over time. This is most evident during the period in which the pouch moved through the hostile environment (12Z 10 August – 00Z 15 August). On 10 August, the pouch was approximately 10 degrees longitude (Fig. 5); on 12 August a closed circulation (moving with the parent wave) was not discernable; and on 15 August the pouch was 8 degrees longitude. While the

deformation induced by the impinging vertical wind shear potentially affected the horizontal size of the pre-Nuri pouch during this period, the evidence does not suggest a critical size at which genesis was more likely to occur. The critical aspect was the ability of the pre-Nuri pouch to maintain a coherent closed circulation over a sufficiently deep layer and protect the proto-vortex within.

Nuri provides an illustrative picture of these concepts. In a conducive environment, the vertical extent of the pouch was able to extend upward in response to consistent convection. In ambient vertical shear this process was retarded, yet, the low-level moisture remained protected within the pouch. Once the vertical shear weakened for an extended period of time, the pouch extended upwards again and likely contributed to protecting the middle levels and containing the moisture lofted by deep convection.

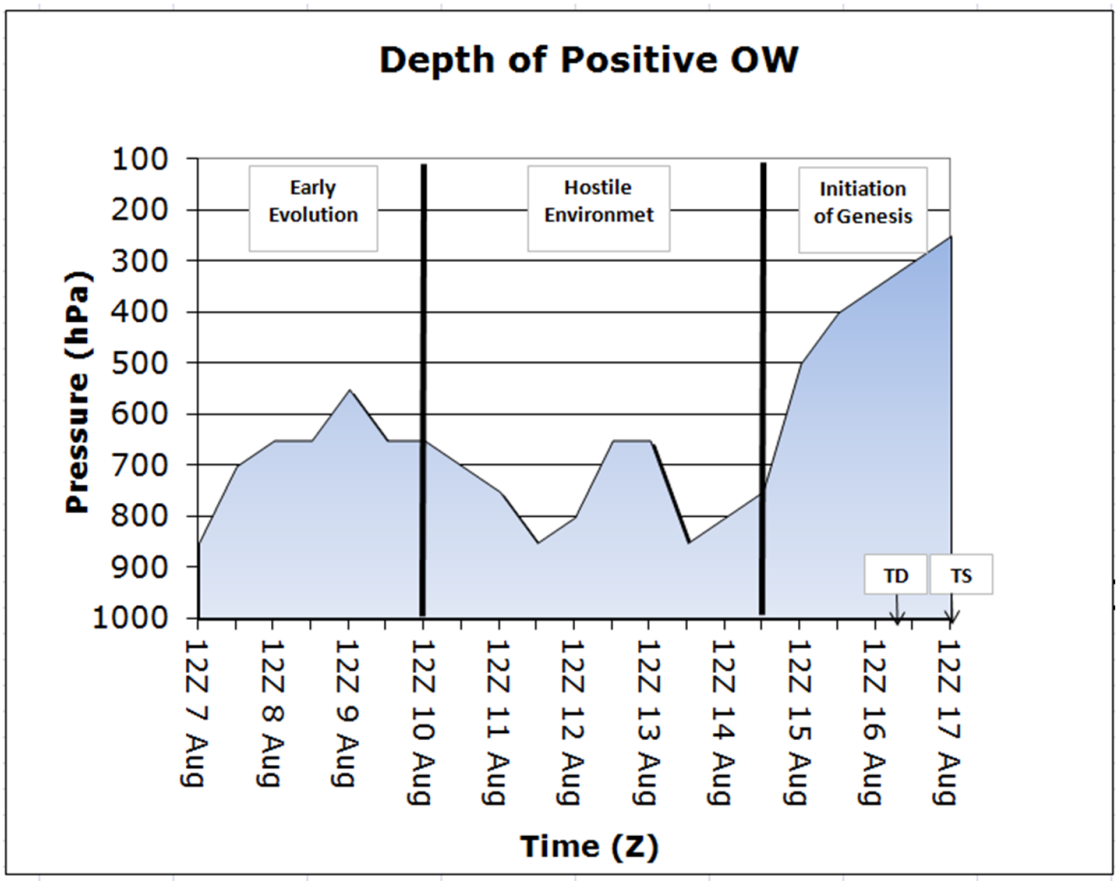


Figure C1. Time series of depth of area-averaged positive OW (shaded) over time using the GFS FNL. The OW was averaged over a 3°x3° box centered on and moving with the sweet spot. The depth of positive OW is considered an estimate of the vertical depth of the pouch. The thick black lines delimit key time periods in Typhoon Nuri's evolution.

1.Area-averaging was performed in a 3°x3° box surrounding the sweet spot and moving with the wave

1. What, exactly, are “diabatically amplified eddies”?

DMW09 define diabatic activation as:

"A term introduced in this paper to describe how a propagating Rossby-like wave (e.g., easterly wave) is maintained or amplified by a diabatic Rossby vortex within. Without diabatic activation, such a wave exists as a dynamical feature in the lower troposphere, whose signature may be seen in low cloud or deep-layer water vapor, but with deep moist convection that is either absent or poorly organized."

These ideas were not evaluated fully in this paper because the data employed were not conducive to analysis on the sub-synoptic scales. Whether the mesoscale circulations noted are on the meso-α scale or on smaller meso-gamma (VHT) scales, will be examined further in the second part of this paper. This companion study will include also an examination of diabatic activation.

What is wrong with the conventional term “ocean heat content”?

The definitions are very similar, the main difference is that oceanic heat content is defined without a specific reference depth for integration, while oceanic HHC uses D(26C) as a reference depth. Although we would not expect to see any significant difference in the heating pattern among the two parameters, the chart of oceanic HHC we used adequately illustrates the points we're trying to make, thus its inclusion.

The idea of Kelvin’s cat’s eyes will be familiar to many readers in the context of two dimensional flows. However the concept as it applies to a vertically-sheared flow may not be.

A comment to this effect has been added in the revised manuscript.