

Comments on "An Arctic Hurricane over the Bering Sea"

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8 November 1991

Businger and Baik (1991) describe the development of a small intense vortex within a cold unstable cyclonic environment over the Bering Sea on 7 March 1977. In the title to their article and throughout the paper they refer to the small vortex as an *arctic hurricane*. The purpose of this letter is to raise objections to the use of this term in referring to the phenomenon in question. The name is unsuitable for two reasons. First, such systems are not hurricanes according to the standard definition. The writer is not aware of a single case in which surface winds in these systems have exceeded the 33 m s^{-1} speed required of a hurricane. No wonder the authors redefine the threshold for a hurricane to be greater than 25 m s^{-1} . In one case (Shapiro et al. 1987), marginal hurricane-force winds were, however, measured at flight level (300 m). Second, as the authors themselves note in describing a similar phenomenon over the Mediterranean Sea, these systems are not peculiar to the Arctic. Indeed, one was observed off the Virginia coast during IOP 8 of the Experiment on Rapid Intensification of Cyclones in the Atlantic (ERICA).

The authors also cite the symmetric cloud signature and the dominant role of the surface fluxes in the structure and sustenance of the mature storm as reasons for calling them hurricanes. But nearly symmetric cloud signatures may be seen in polar lows that have only weak surface circulations (Rasmussen 1985), whereas an asymmetric pattern was present in the strongest case yet observed (Shapiro et al. 1987).

Evidence is accumulating that surface fluxes are crucial to their development, but the relative importance of antecedent and concurrent fluxes is not known, nor is the role of air-sea interaction instability (Emanuel and Rotunno 1989) (which is believed to be a major

factor in hurricane intensification) well understood. Indeed, the slowness of the development in Businger and Baik's model simulation casts doubt on the relevance of air-sea interaction instability to these systems. It is premature to include surface fluxes as part of the definition of these polar systems despite the unquestioned importance of destabilization of cold air masses by warm seas.

The writer, in describing the phenomenon in question (Reed 1987), used the term "hurricane-like cores." In so doing, he was taking cognizance of the tight pressure gradients known to exist near the low center (e.g., Rasmussen 1985). These enhanced inner gradients distinguished the phenomenon from the larger parent cyclone. There was no intention to suggest, however, that the system itself was a hurricane. Rasmussen (1983), too, has used the term "hurricane" with reference to some polar lows. It is unfortunate that these precedents exist. But it is not too late to stop the spread of an appellation that suggests the presence of hurricanes in the Arctic when the phenomenon under discussion is neither a hurricane nor indigenous to the Arctic.

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