



Canadian Meteorological and Oceanographic Society
Société canadienne de météorologie et d'océanographie

CMOS Halifax Centre Talk

A Case Study of Downstream Baroclinic Development over the North Pacific Ocean

Speaker: Dr. Rick Danielson

Wednesday, November 9, 2005 at 3:00 pm

Queen Square, 15th floor boardroom, Dartmouth, NS.

Abstract: There is growing evidence that the development of cyclones and anticyclones in the midlatitudes can be attributed in part to the propagation of a wave packet. It follows that the paradigm of severe marine weather being caused by a single upper-level trough can often be generalized to involve an entire series of troughs and ridges. The propagation of eddy energy and wave activity in a wave packet is examined in this case study. Both diagnoses reveal the consistent picture of a wave packet that first evolves in conjunction with a western North Pacific cyclone, and then impacts another cyclone in the eastern North Pacific. We focus on the development of the eastern cyclone by performing numerical simulations in which the amplitude of a trough/ridge couplet far upstream over Siberia is perturbed. The absence of this feature initially, followed by the lack of a downstream developing wavetrain, results in a quantifiable weakening of the eastern surface cyclone. Some perspective on the role of wave packets in other cases is also given.

Biography: Rick Danielson is a post-doctoral researcher in the Oceanography Department at Dalhousie. He graduated from Queen's (Math Engineering) and spent a couple of years teaching English in Japan. He completed MSc (1996) and Phd (2003) degrees at McGill on the topics of growth rates of, and environmental influences on, North Pacific cyclones. He is currently working part-time at Queen Square with Drs. Hal Ritchie and Mike Dowd on surface marine wind retrieval using Radarsat-1 data.

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