

# **Frontal Precipitation Enhancement Upstream of the Olympic Mountains During the OLYMPEX Field Campaign** BRANDON A. GARCIA, DEANNA A. HENCE, AND ROBERT M. RAUBER Department of Atmospheric Sciences, University of Illinois, Urbana-Champaign, Illinois

## **Motivation and Methodology**

Throughout the world's mountainous terrain, orographic precipitation enhancement significantly increases the total rainfall as well as flooding and mudslide likelihoods. The NASA-NSF OLYMPEX field campaign, a Global Precipitation Mission ground validation project in the Olympic Mountains of Washington State, USA, collected extensive observations detailing the interactions between the mountains and precipitation.

This study seeks to quantify how orographic enhancement changes upstream of the terrain, throughout the different and rapidly evolving flow regimes of frontal boundaries. We hypothesize that the strength and location of orographic enhancement upstream of the mountains is mainly determined by both wind speed and thermodynamic stability.

The National Weather Service Langley Hill WSR-88D PPI scans from 29 October 2015 - 18 November 2015 were visualized with Hovmöller diagrams to better identify regions of precipitation enhancement. Analysis of the propagation speeds (slope of the precipitation features) and reflectivity values also allows for the identification of different types of precipitation features.





- East of a 500 mb slow-moving, digging trough
- Primarily southwesterly flow corresponding to an atmospheric river.





- these diagrams as a function of time.
- how they may have been altered over time.





Contact: bag3@illinois.edu



The SOARS Program - National Science Foundation Grant #1641177