

[Earth and Space Science]

Supporting Information for

[Observations of an extreme atmospheric river storm with a diverse sensor network]

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Figures S1 to S5

Introduction

The supporting information contains five additional figures (Figures S1-S5) to augment discussions in the main text.

12Z 13 Feb 2019 MIMIC-TPW2

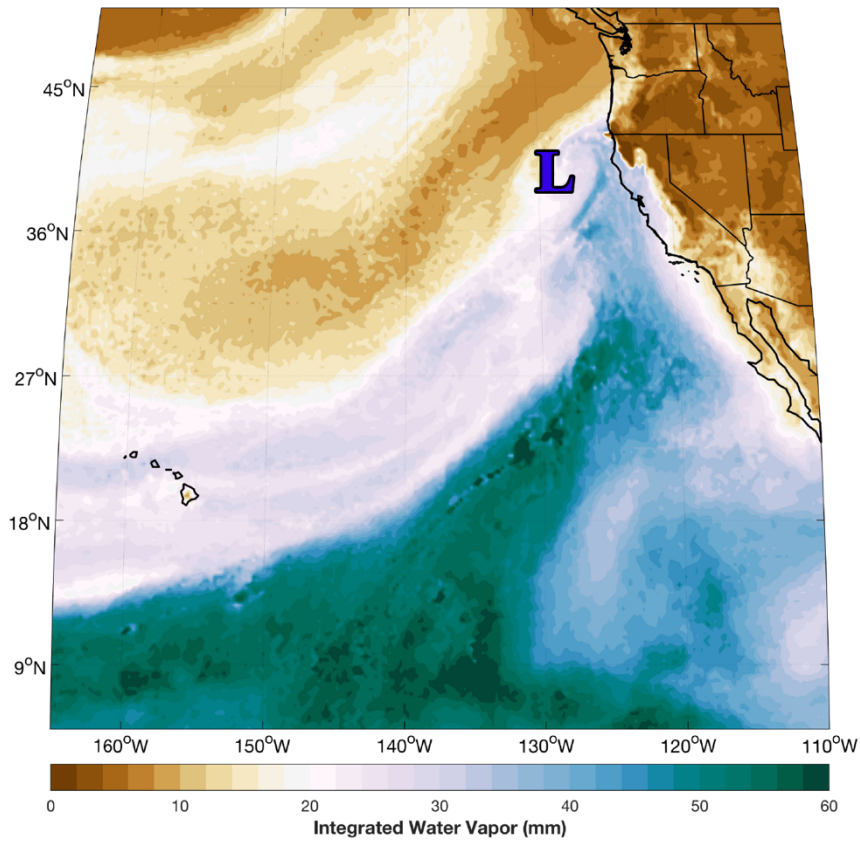


Figure S1: 12Z 13 February 2019 integrated water vapor (IWV) derived from the MIMIC-TPW2 experimental product (Wimmers & Velden, 2010) showing the landfalling atmospheric river with copious moisture. The surface cyclone is evident off the coast of the California/Oregon border and denoted with the blue L.

USSIO: 14:59 UTC 02/14/2019

LCL P= 971 hPa LCL T= 13.5°C SWI= -0 Cape= 0 J IWV = 45.35 mm IVT = 1121.9 kg m⁻¹ s⁻¹ 0°C Height = 3603.11 m

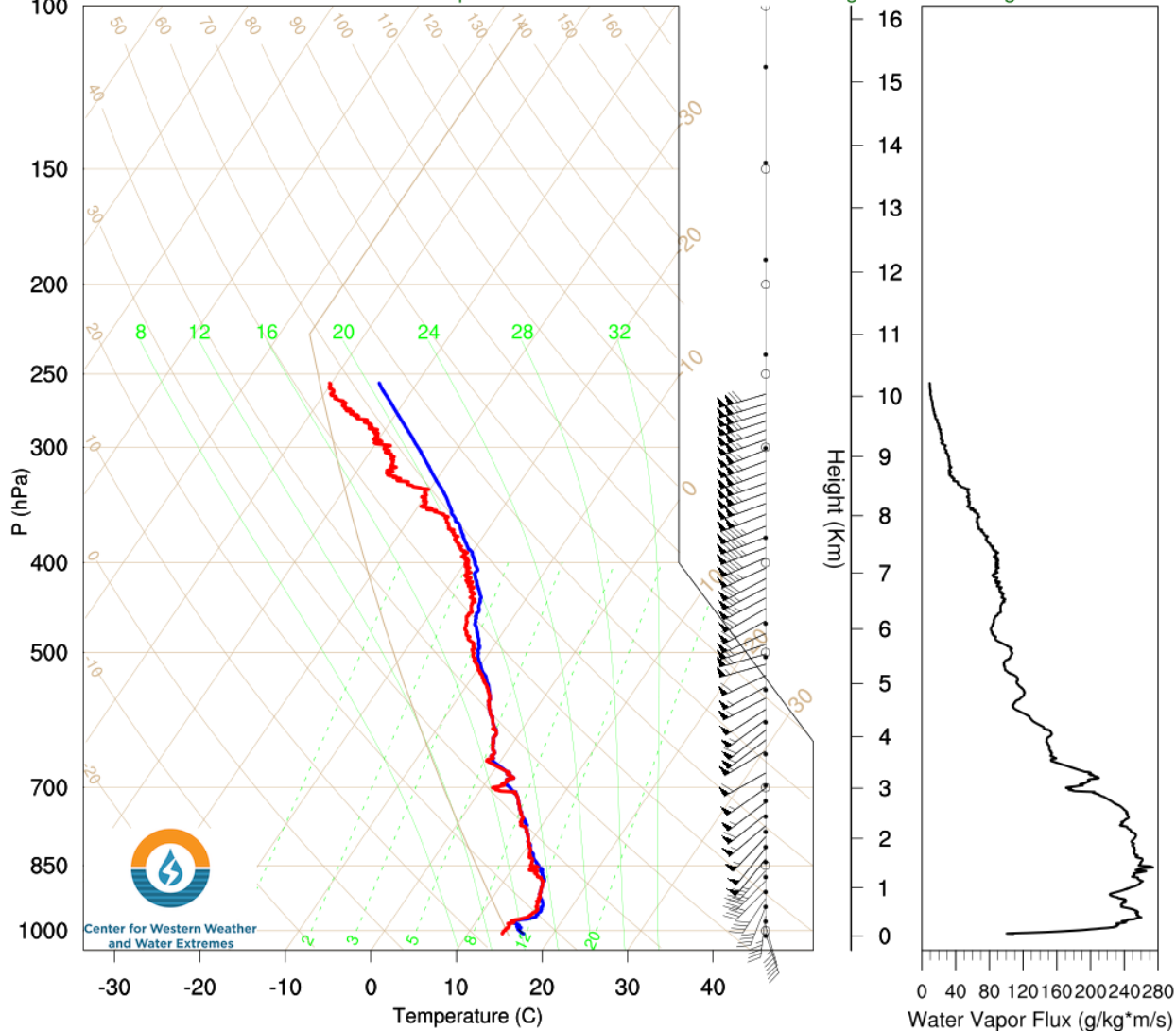


Figure S2: Skew-T plot (left) and water vapor flux plot (right) derived from the 1459Z 14 February 2019 radiosonde launched from the Scripps Pier in La Jolla, CA validating the record cool season precipitable water observation of 42.7 mm at 1200Z 14 February at Miramar, CA. At left, the blue line indicates temperature and the red line indicates dewpoint temperature.

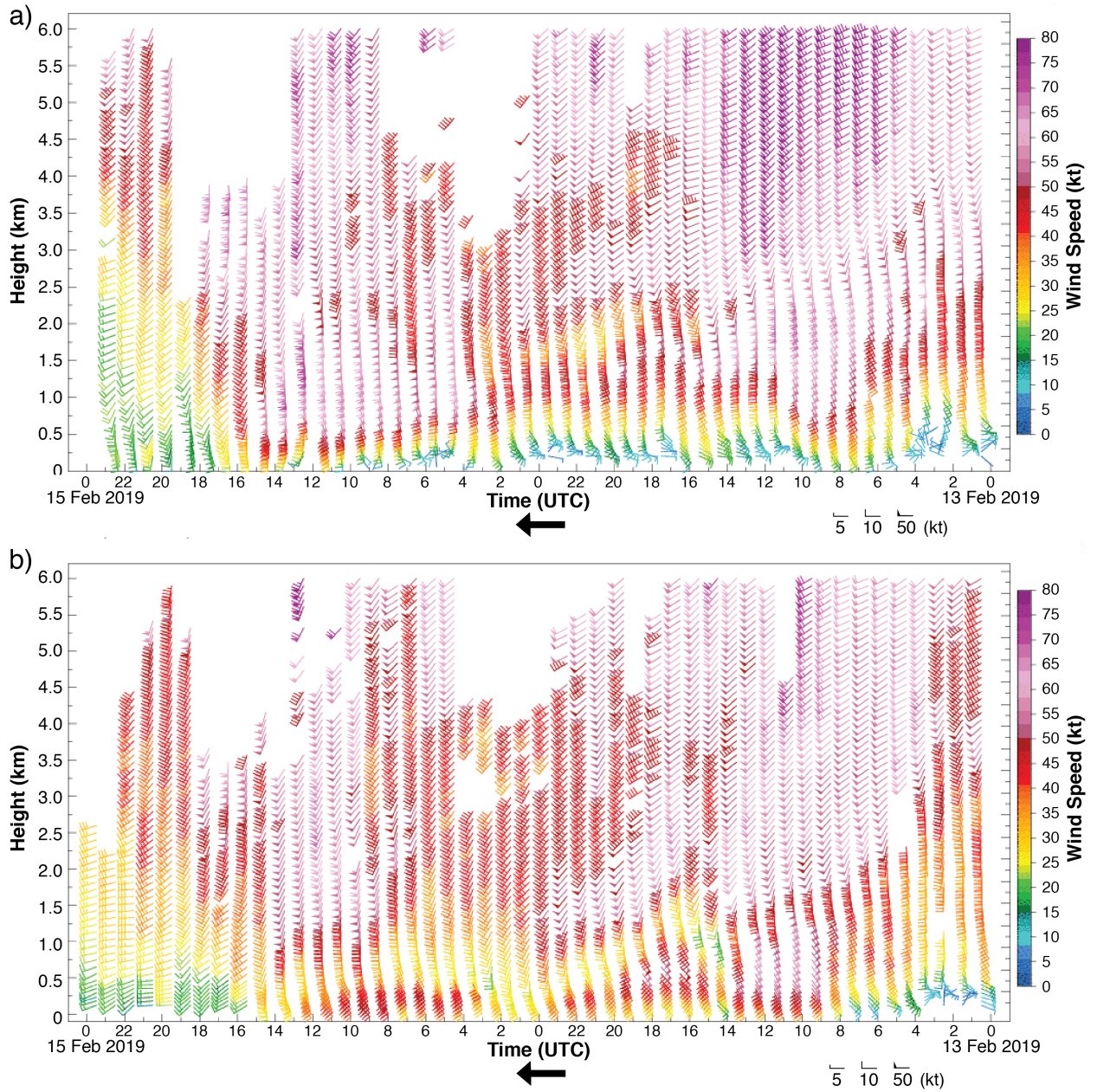
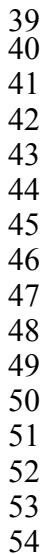


Figure S3: Time-height cross sections of wind speed and direction from 00Z 13 February to 00Z 15 February 2019 at a) Oroville, CA and b) Twitchell Island, CA 915-MHz Doppler wind profilers.



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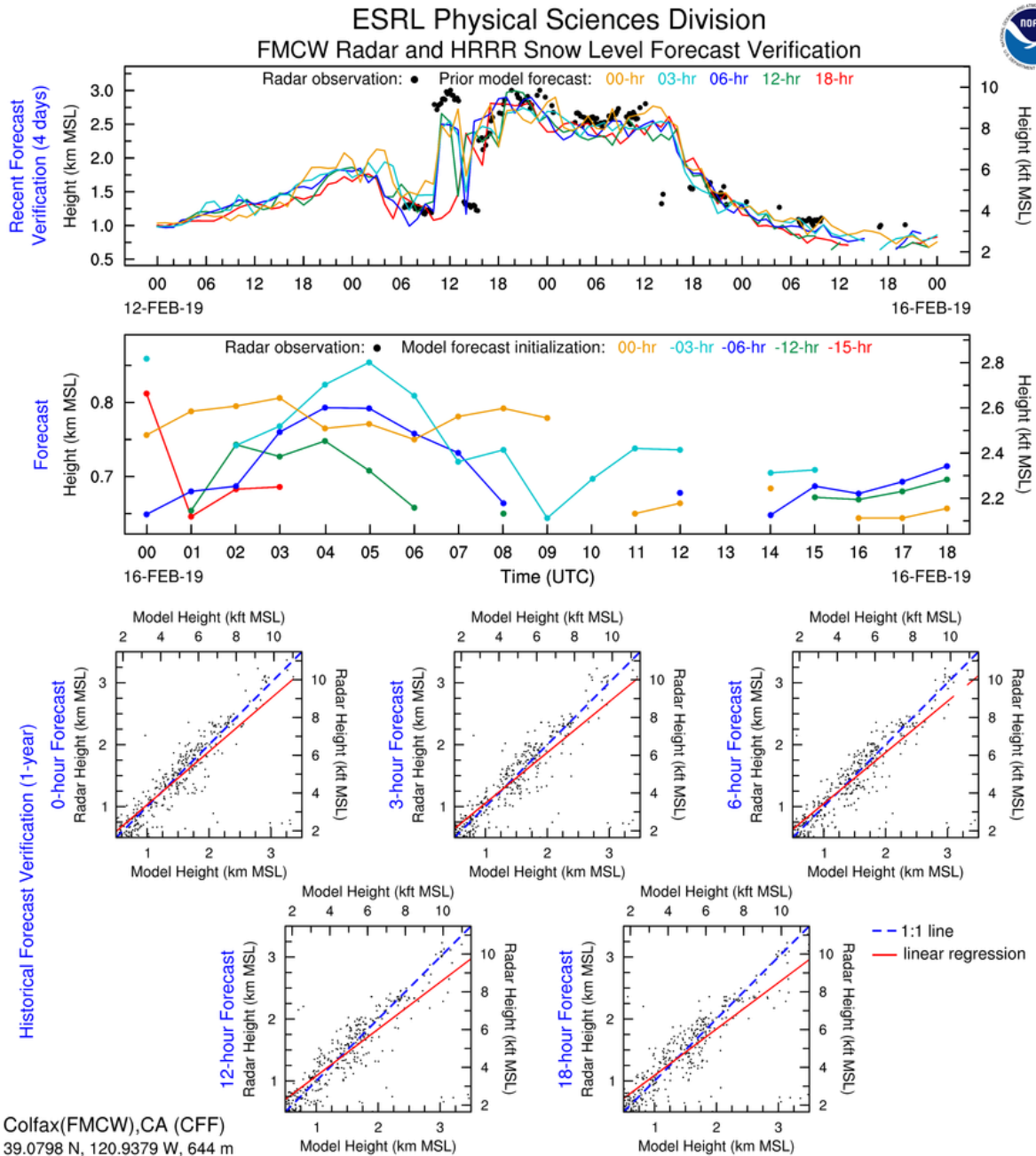


Figure S5: An example of a snow level detection and forecast verification plots for the High-Resolution Rapid Refresh Model for the Colfax FM-CW snow level radar. The top-most panel provides a time series of brightband height (km) from radar observations compared to various initializations from 0-18 hrs, shown by colored lines, of the High Resolution Rapid Refresh Model (HRRR; Benjamin et al., 2017). The middle panel provides a suite of 24 hr forecasts for different HRRR initialization times. The lower panel, composed of five square sub-panels, shows forecast verification for the past one year for varying HRRR initialization times. This information is used by forecasters to understand model performance over the past two days as well as the past year. Note the HRRR underestimated the abrupt snow level rise between 11Z-13Z 13 February 2019.