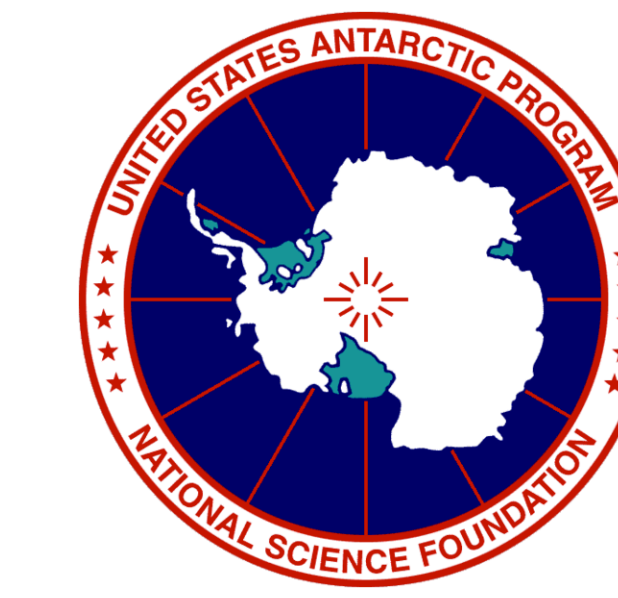


# Alexander Tall Tower!

## Studying the Boundary Layer on the Ross Ice Shelf

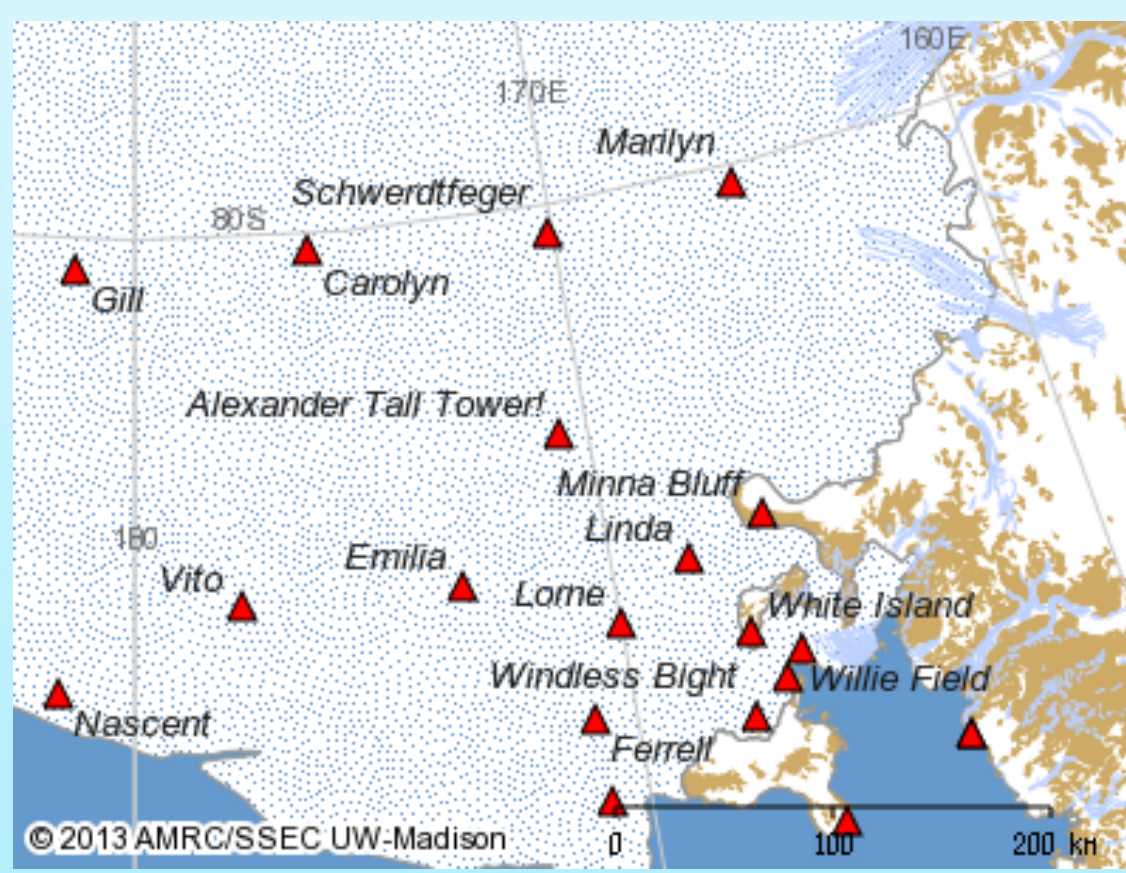
Marian Mateling<sup>1,2</sup>, Matthew Lazzara<sup>1</sup>, Linda Keller<sup>1,2</sup>, Jonathan Thom<sup>1</sup>  
<sup>1</sup>Antarctic Meteorological Research Center, Space Science and Engineering Center  
<sup>2</sup>Department of Atmospheric and Oceanic Sciences, University of Wisconsin-Madison



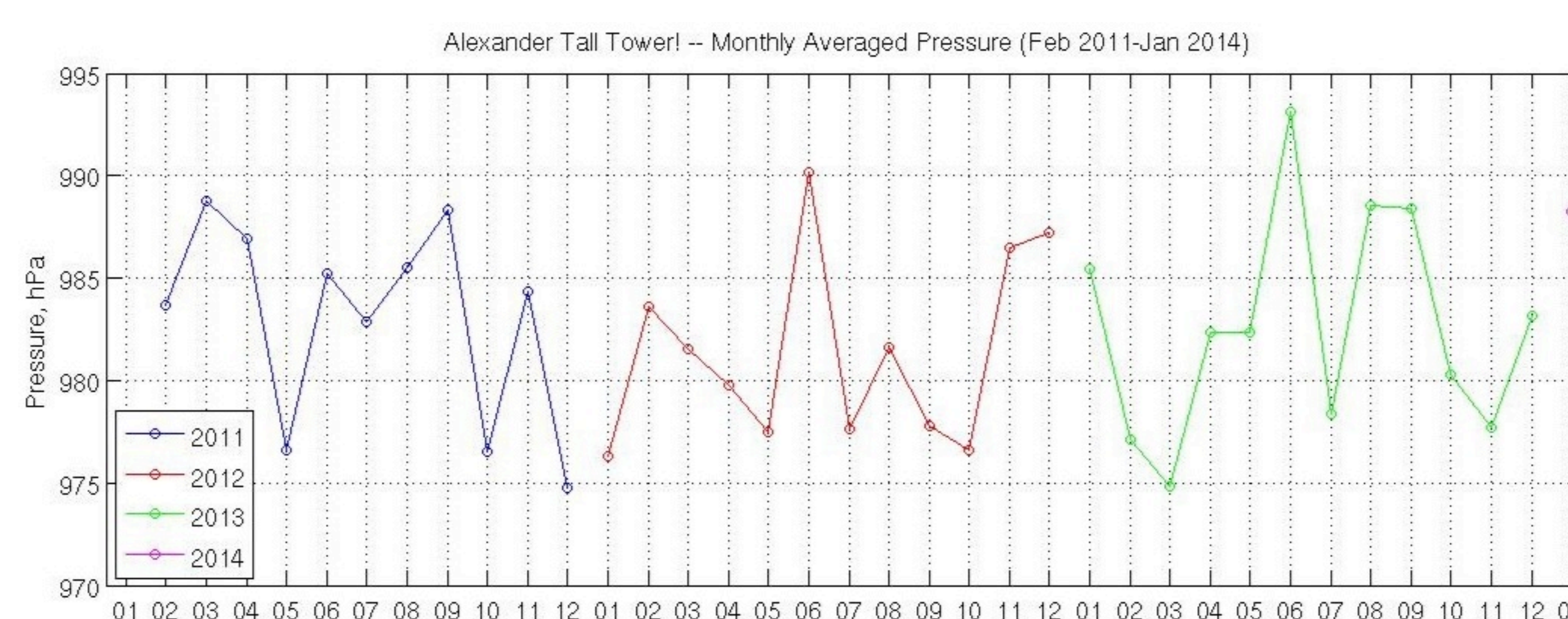
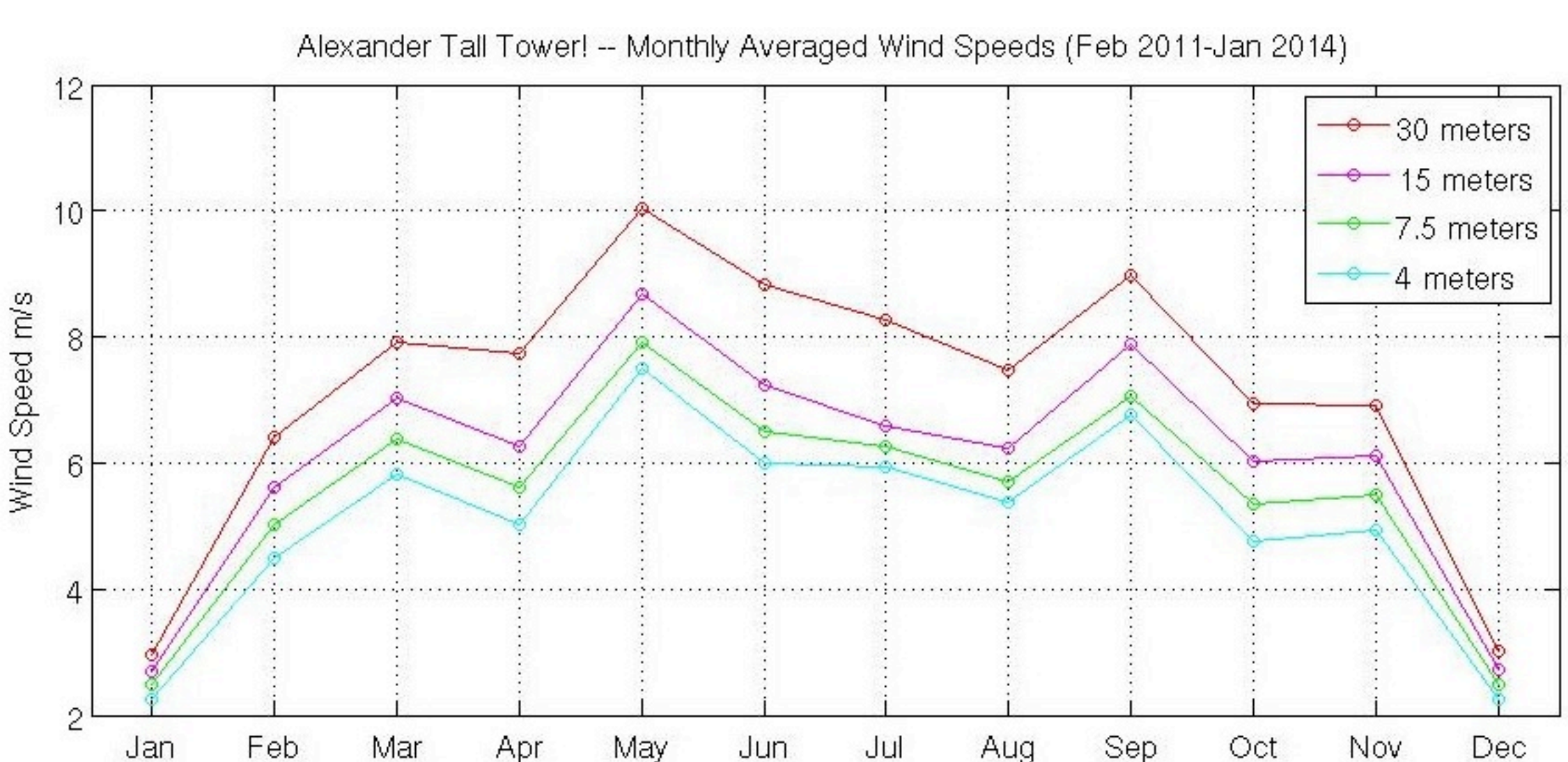
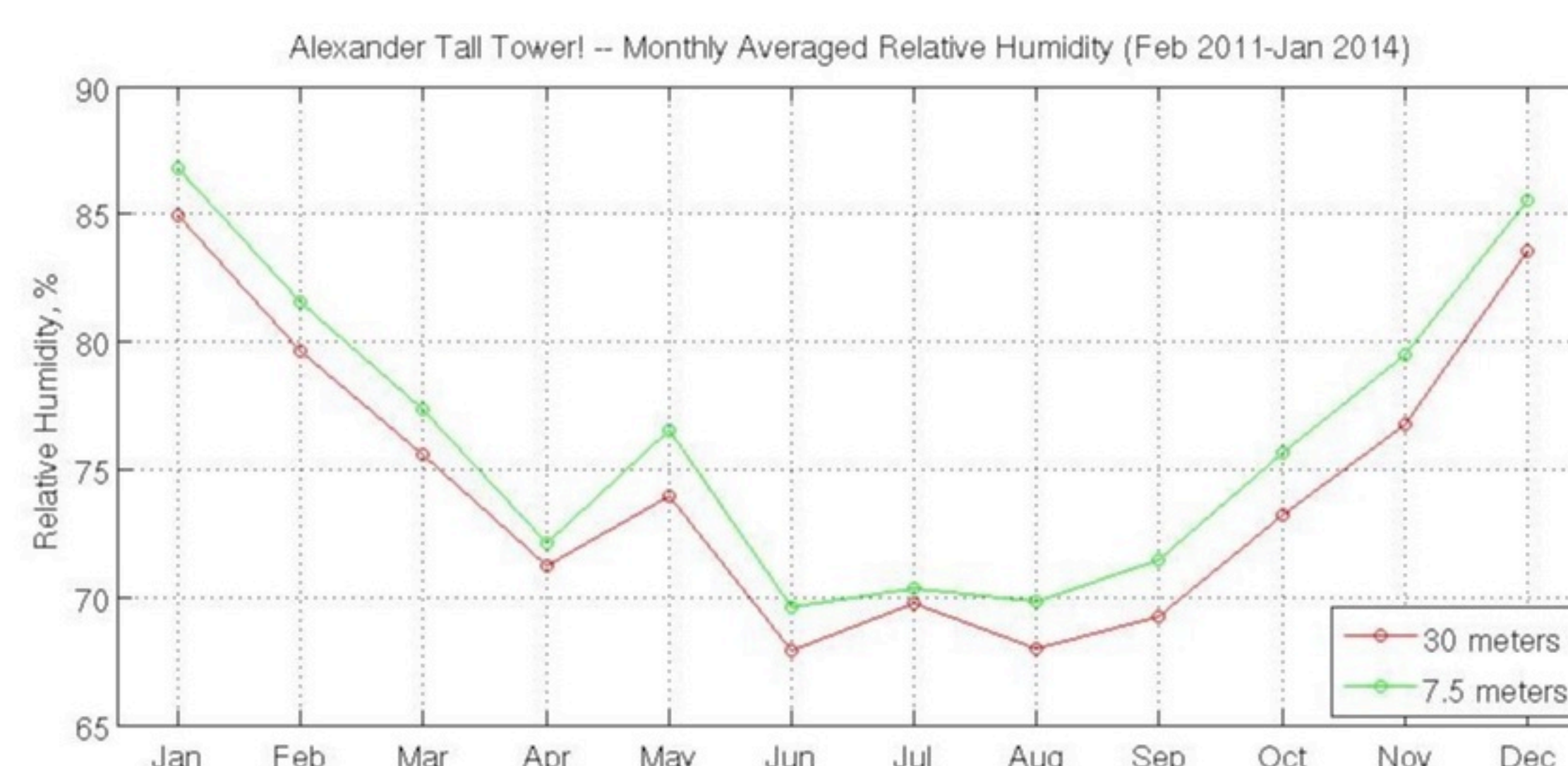
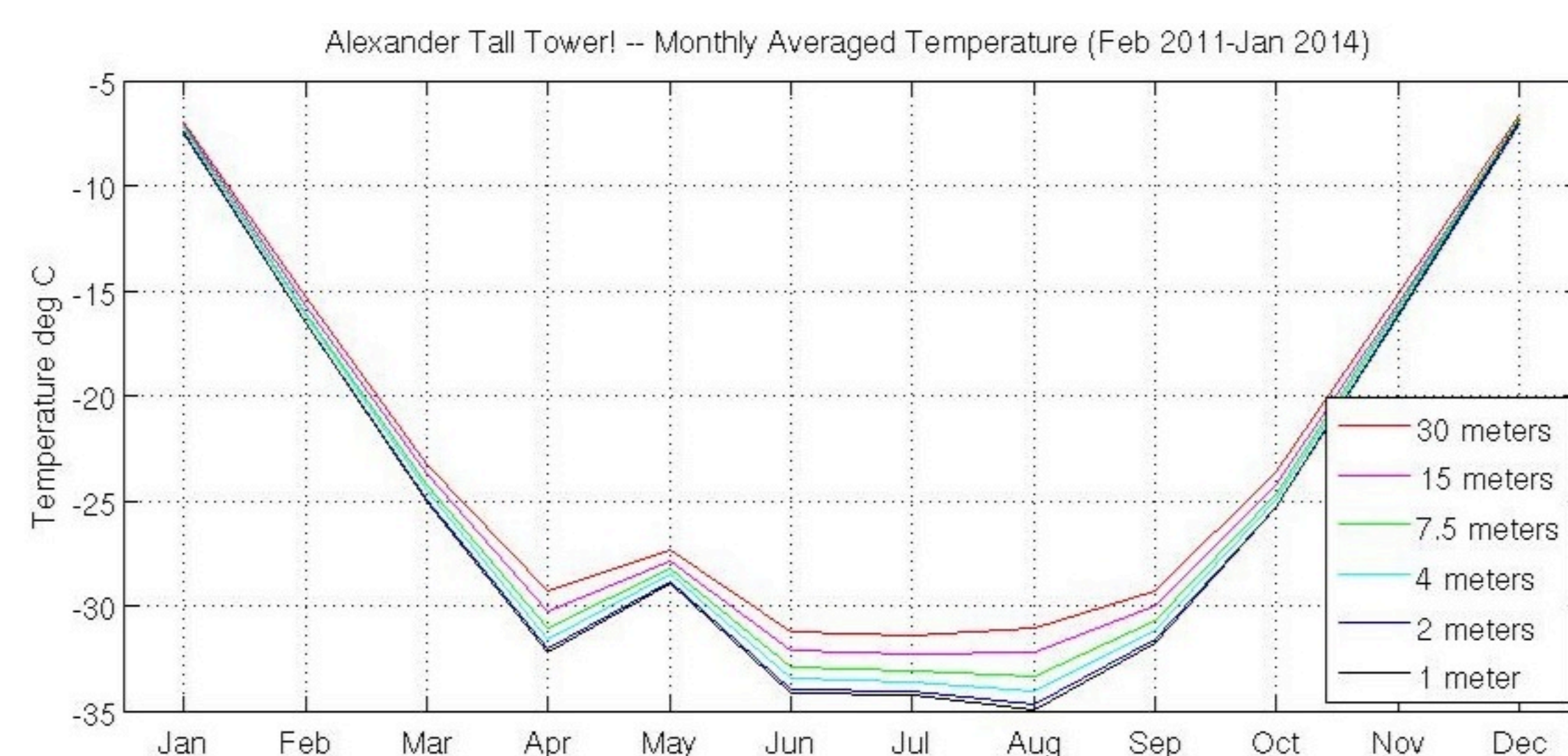
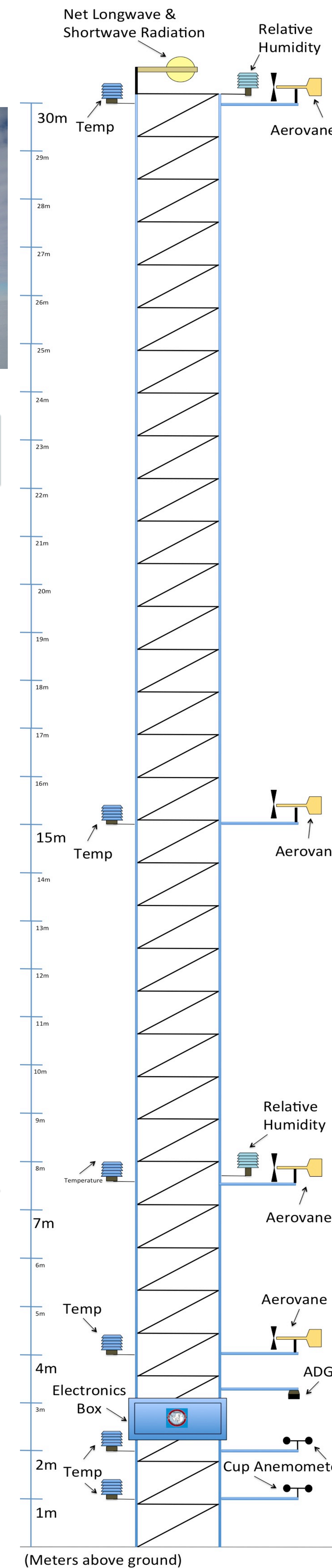
### Abstract:

Due to the harsh weather conditions on the Antarctic continent, observations of the low-level boundary layer must be studied via an automatic means, especially for a year round data collection. Alexander Tall Tower! is an automatic weather station on the Ross Ice Shelf in Antarctica and has been operational since February 2011. At 30 meters tall, this station has six levels of instruments to collect data on environmental conditions including temperature, wind speed and direction, relative humidity, and pressure. Data is collected at 30, 15, 7.5, 4, 2 and 1 meter above the ground, painting a picture of the boundary layer on the Ross Ice Shelf. This study aims to identify trends over a 3-year period to better characterize the lowest portion of the boundary layer over this portion of the Ross Ice Shelf.

Latitude: -79.044° S  
 Longitude: 170.651° E  
 Elevation: 55 meters



AMRC website:  
<http://amrc.ssec.wisc.edu>

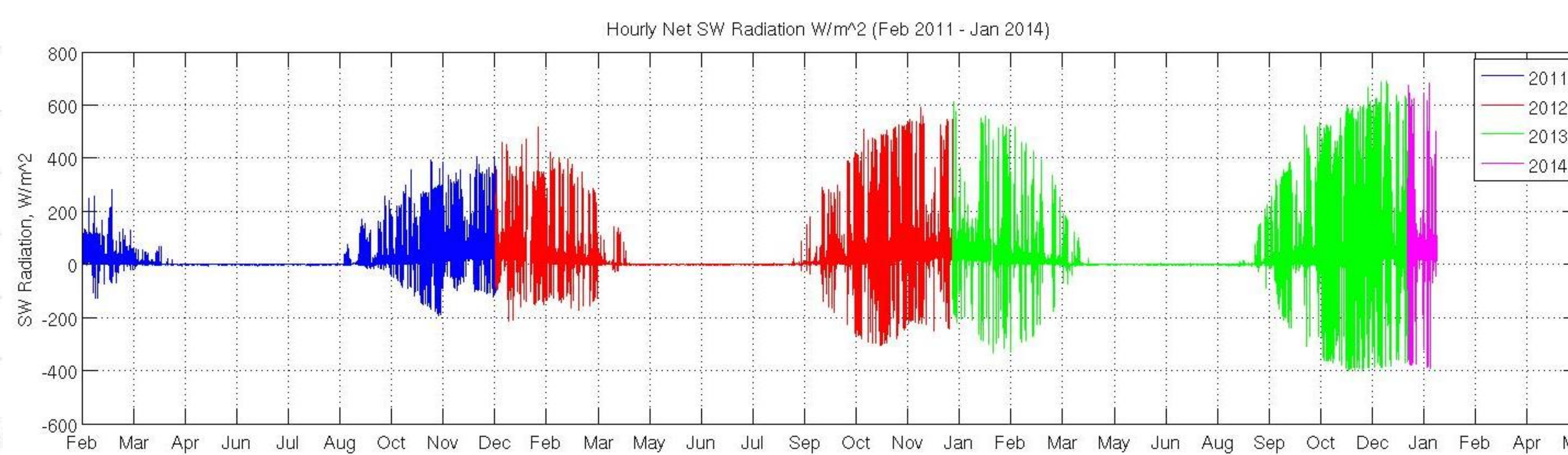
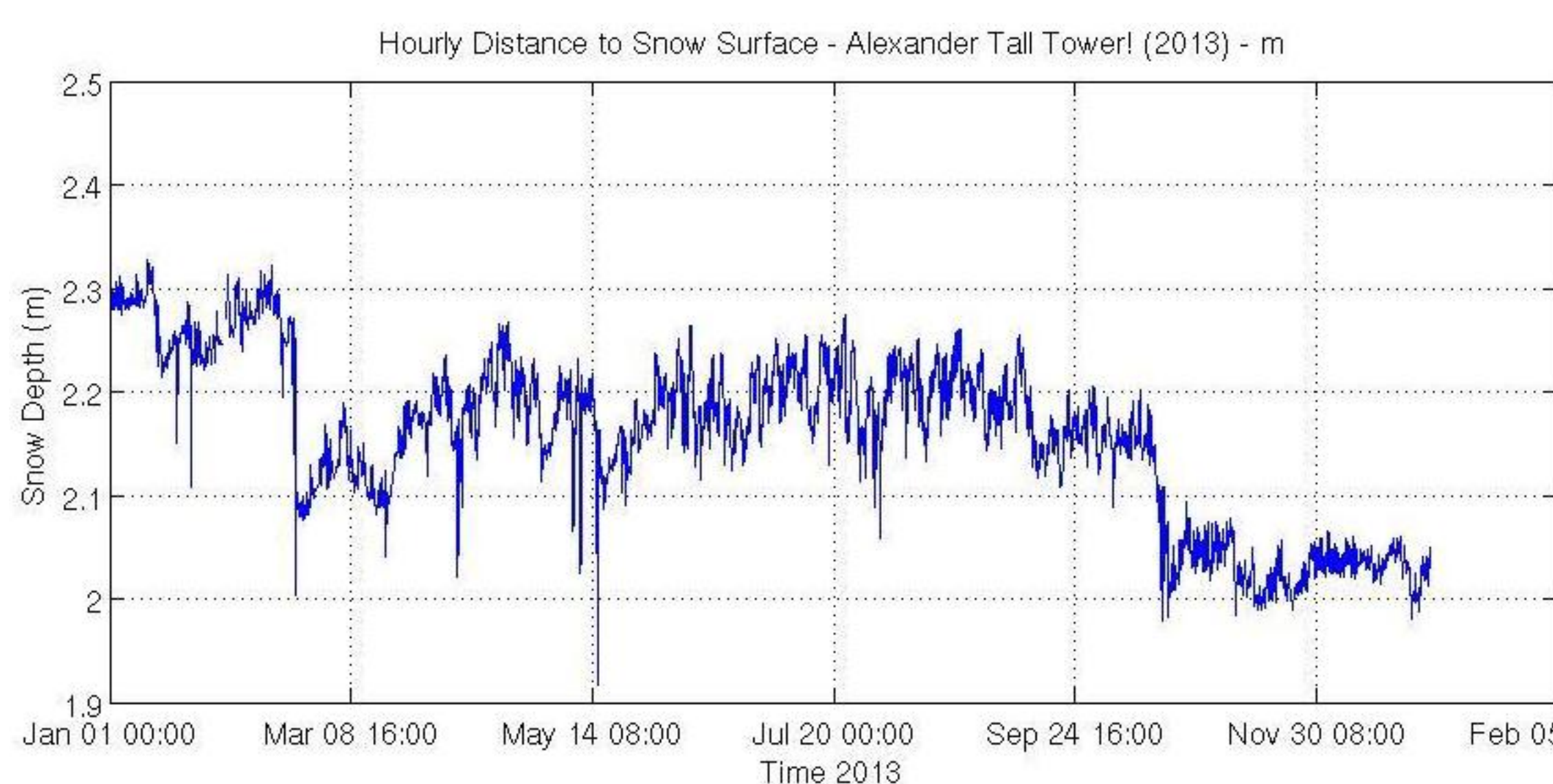
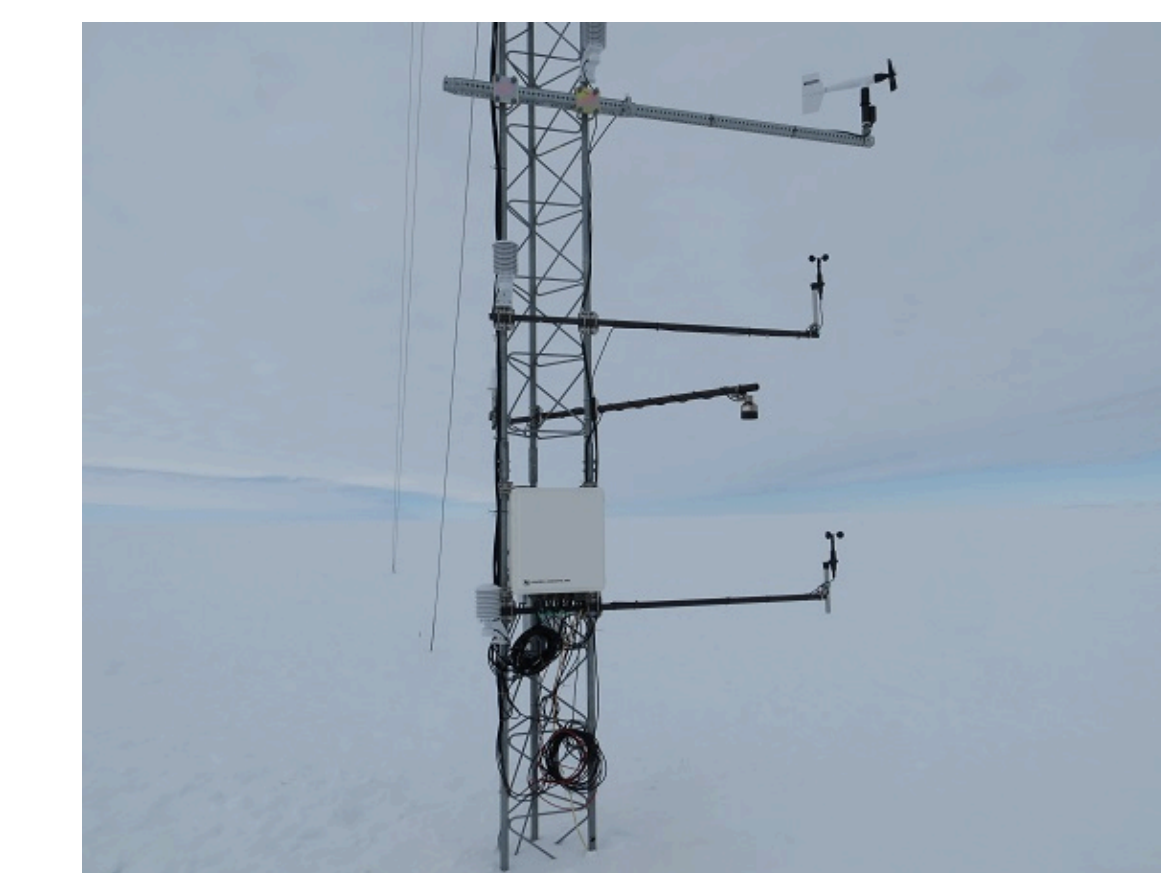


### Preliminary Results:

- ❖ Relative humidity is higher at lower altitudes due to blowing snow near the surface.
- ❖ High wind speeds in May cause mixing, which increases surface temperatures and decreases the lapse rate.
- ❖ Increasing snow depth in 2013.
- ❖ Shortwave radiation increases its range each year, possibly because the instrument gets less level each year.
- ❖ What's next: Longwave radiation

### Note:

- ❖ Wind speeds at 2 meters are not good quality.
- ❖ Snow depth and shortwave radiation data are hourly and instantaneous.



### Acknowledgements:

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