

# Toolik Data Report for 2015

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The following 2015 summary plots give an overview of the data collected at the Toolik Lake meteorological station. There was also a major communications upgrade that is not demonstrated by these plots. We installed a direct ethernet connection to the data logger at the tower in addition to an upgraded radio system.

Figure 1: Daily average, maximum and minimum temperatures followed expected seasonal patterns.

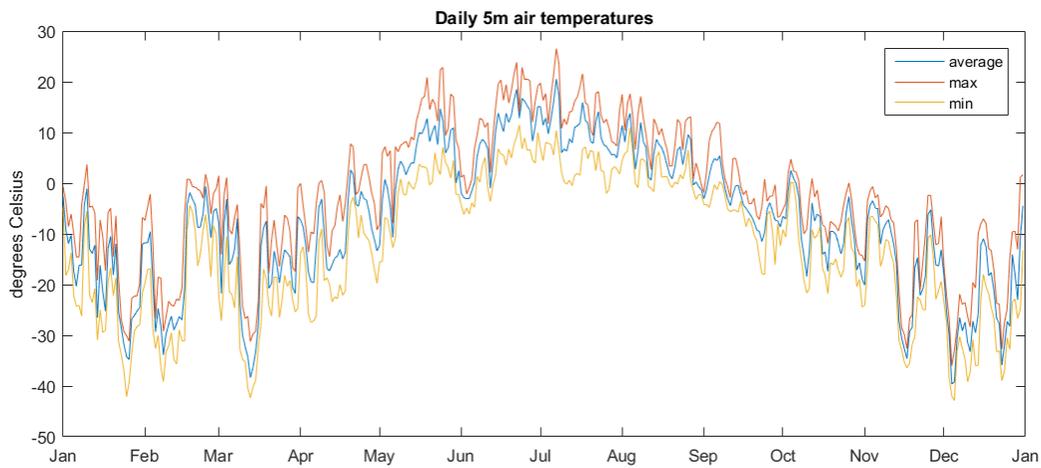


Figure 2: Hourly temperature agreement between the 3 and 5m sensors provides validation for both sensors.

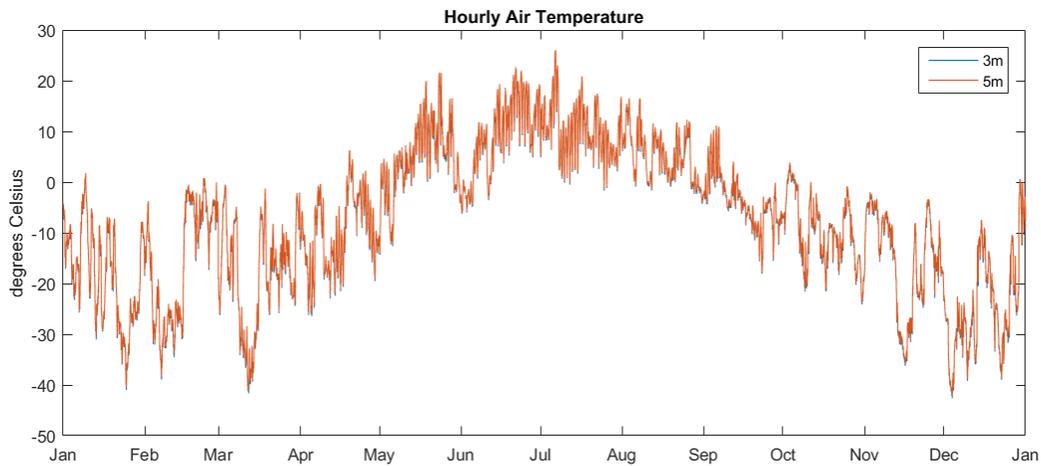


Figure 3: Similar agreement is found between 3 and 5m relative humidity sensors.

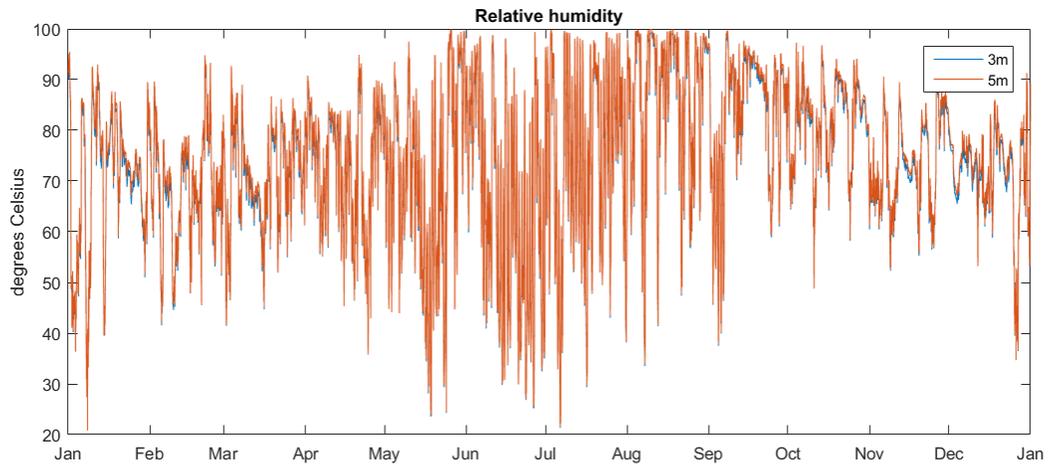


Figure 4: The Barometer started reporting values inconsistent with neighboring sites in late september. This is most likely due to an ice blockage. The inconsistent values have been replaced with NAN.

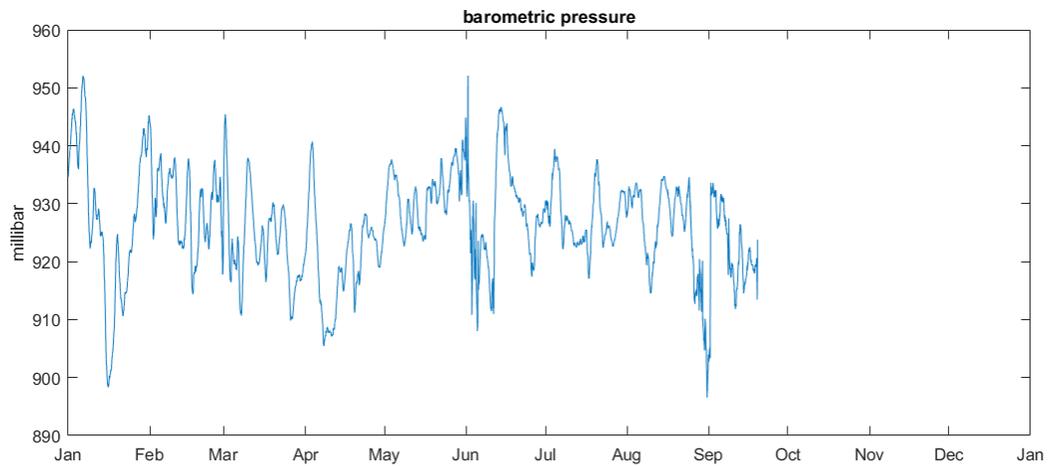


Figure 5: Installing two new wind sensors was one of the major upgrades to the meteorological station in 2015. Before the upgrade, the met one wind speed sensor worked but the wind direction sensor was faulty. On June 2<sup>nd</sup>, R.M. Young 5103 and 5106 sensors were both installed at 5m, providing redundant wind speed and direction data. They agree closely, in addition to agreeing with spot checks on the wind sensors installed on winter quarters. The 5103 had some brief outages in september for unknown reasons, and will be monitored closely. Because of the redundancy, this does not pose a threat to continuous wind data. During winter the sensors are affected by rime ice that leads to the inability of the propellers to spin at low wind speeds. Unfortunately, rime can only build up when there is very little wind, so it is difficult to know if they are reporting low or zero wind speeds due to ice or actual conditions. A note in the metadata warns of this issue.

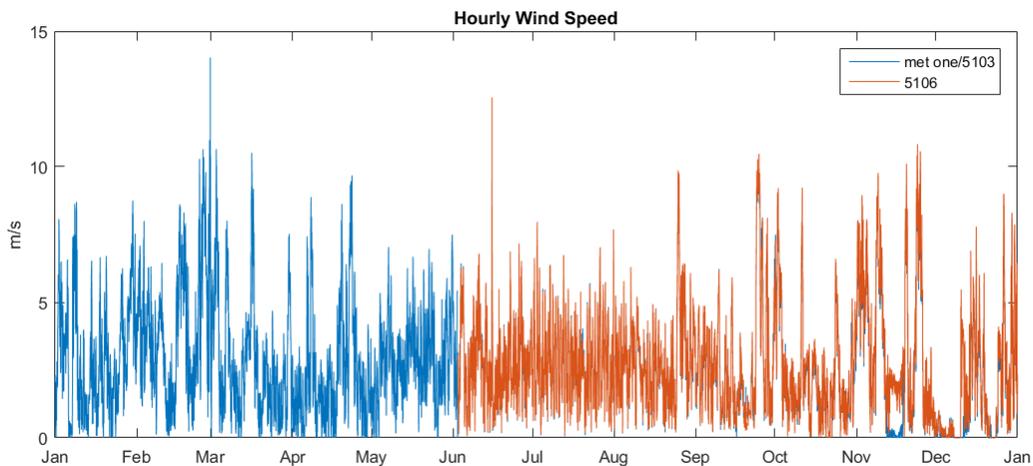


Figure 6

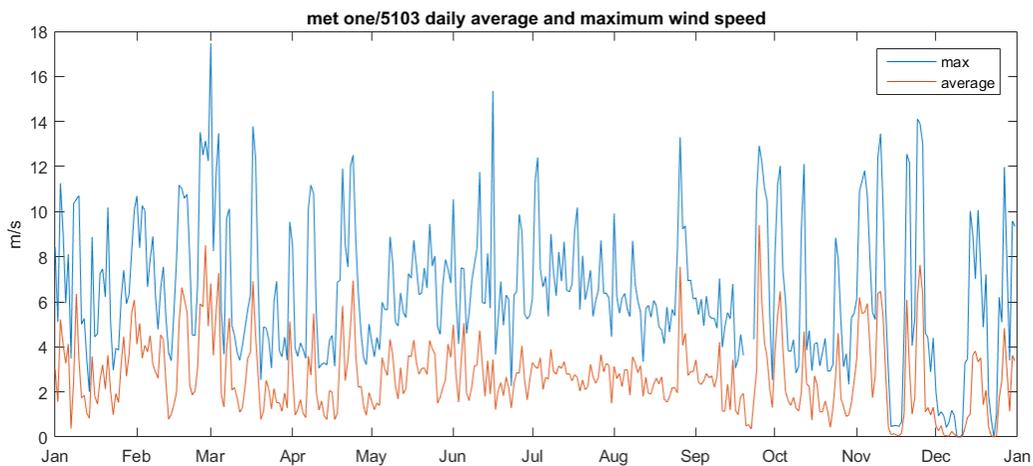


Figure 7: The four components of net radiation measured by the CNR4 show long and short wave incoming and outgoing radiation. The drastic dip in outgoing shortwave radiation marks the snow free season.

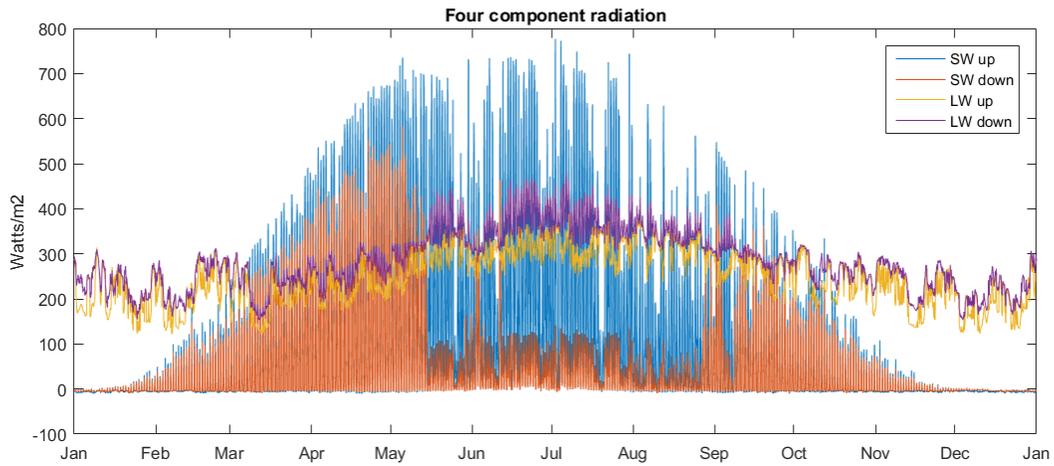


Figure 8

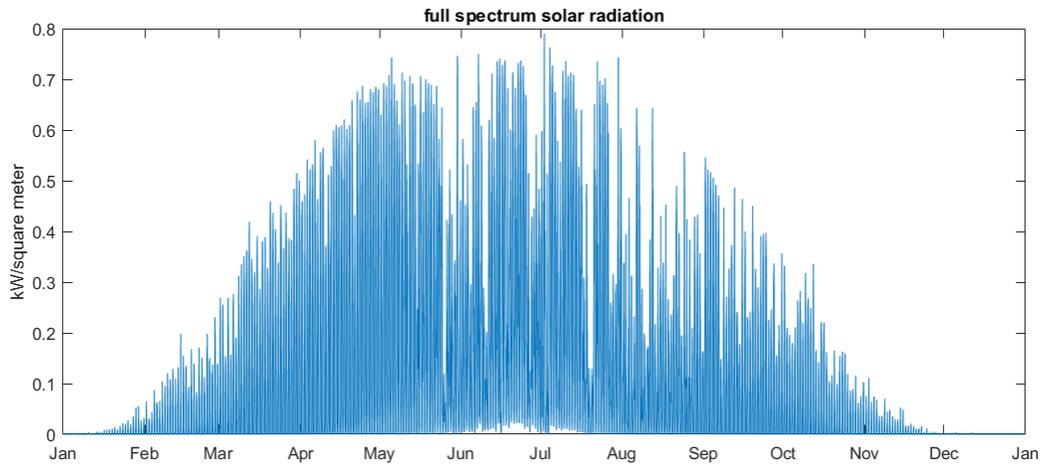


Figure 9: PAR closely follows the trends of total incoming radiation.

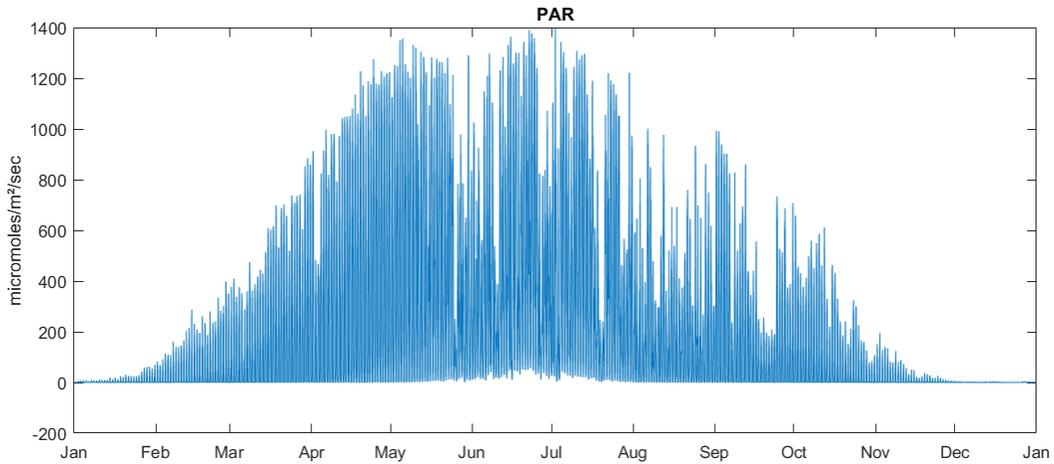


Figure 10: Underwater PAR in Toolik Lake made a drastic jump after ice off. There were a few times when the sensor reported erroneous data, they have been replaced with NAN. Checking on the sensor will be a priority this summer.

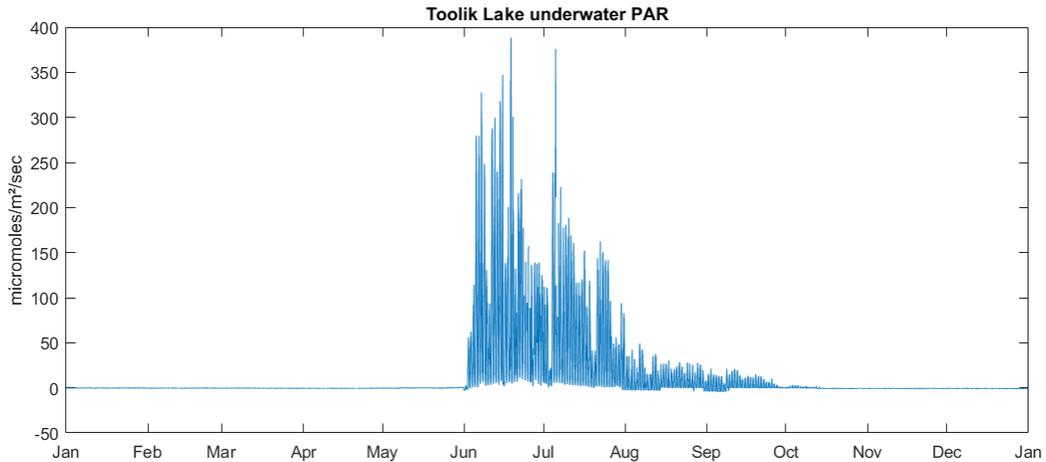


Figure 11

