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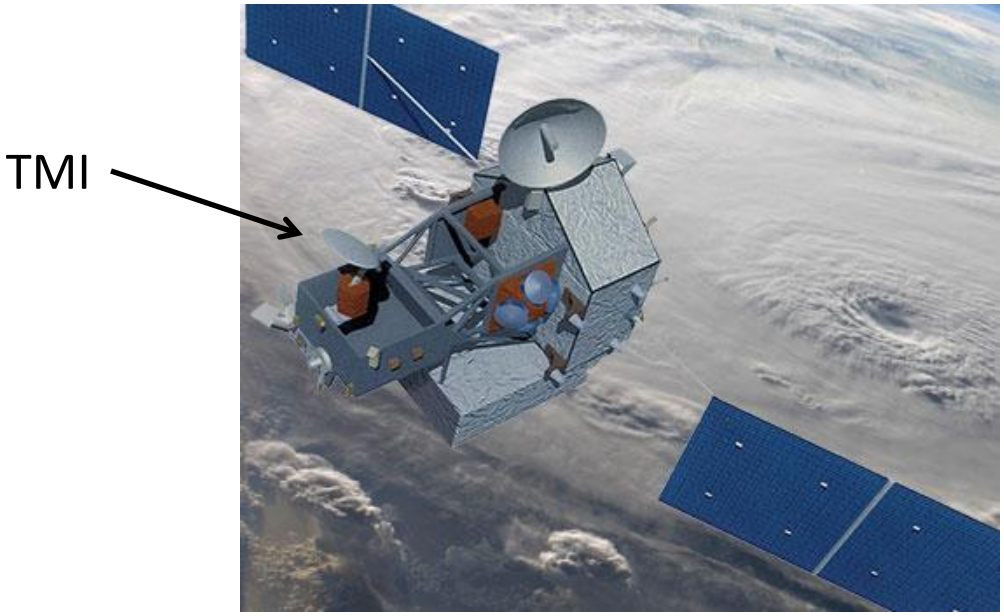
A 17-Year Climate Record of Diurnal Winds Derived from the TRMM Microwave Imager

Frank Wentz and Lucrezia Ricciardulli
Remote Sensing Systems



1997-2015 R.I.P.

IOVWST Annual Meeting
Portland, Oregon
May 19-21, 2015

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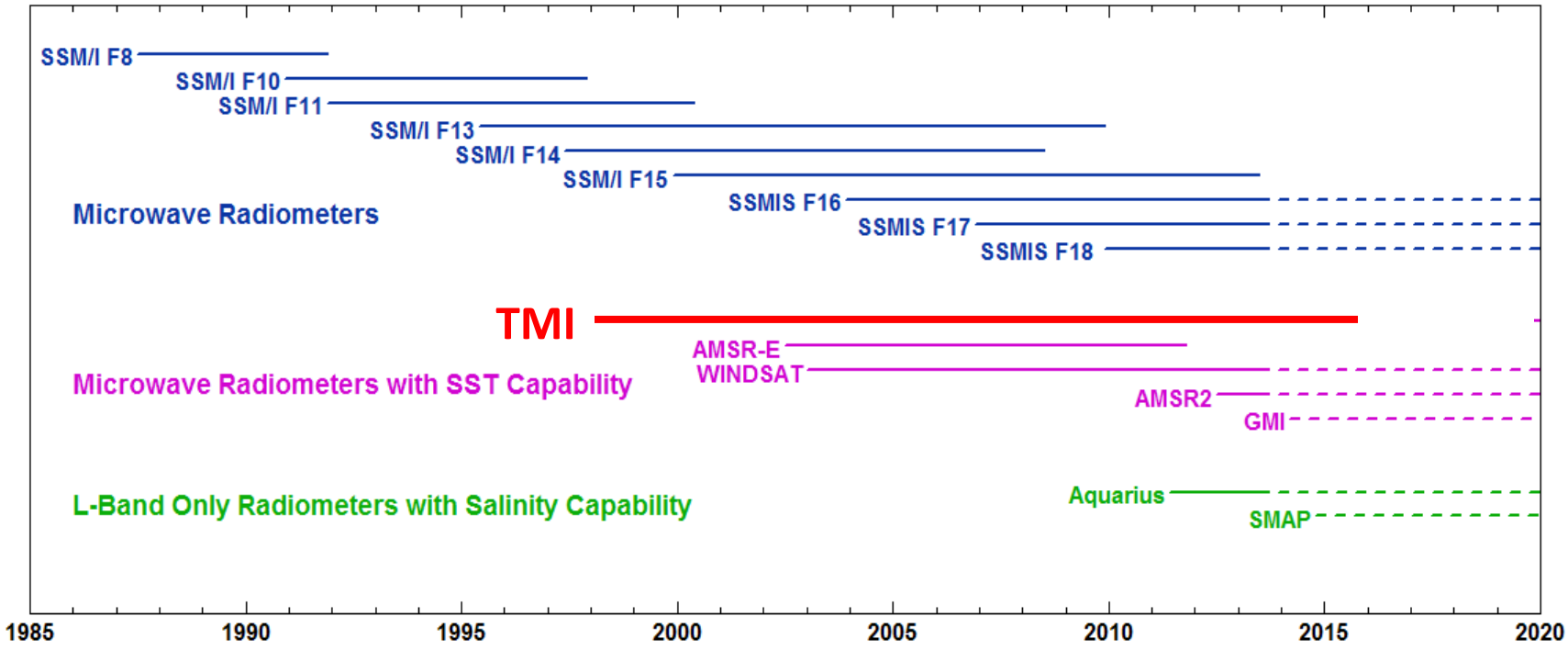
Satellite MW Radiometers as a Wind Speed Calibration Reference for Scatterometers



TMI: 1 Hour Co-location with All other Satellites

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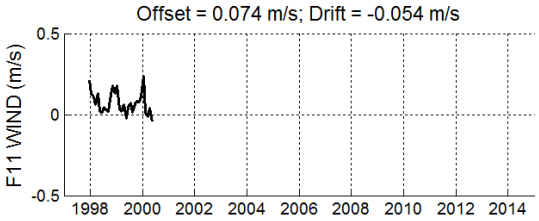
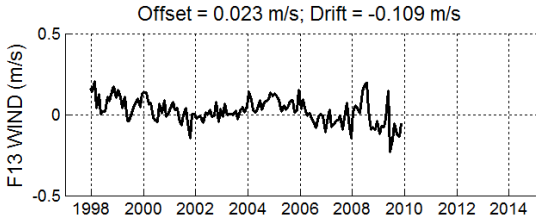
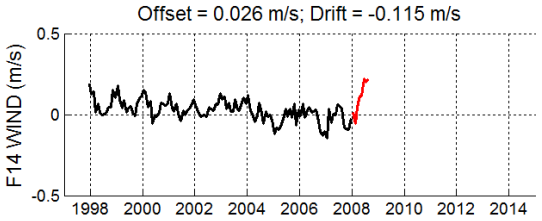
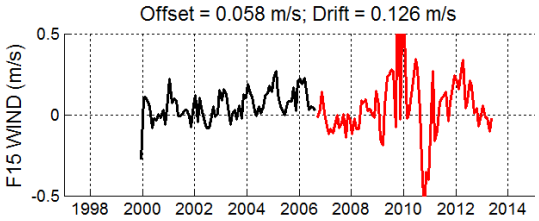
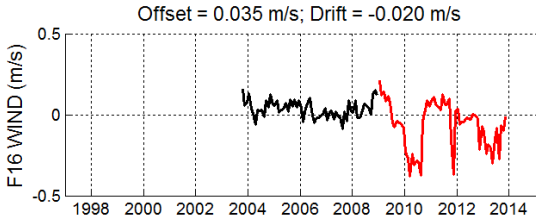
TMI Is Stable to Better than 0.1 m/s over 17 Years

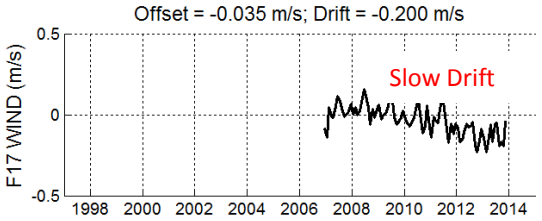


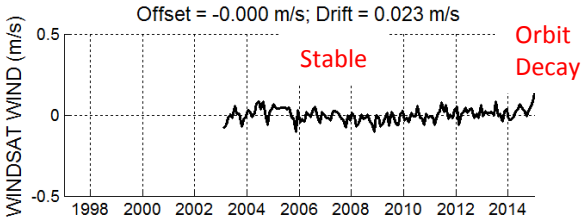


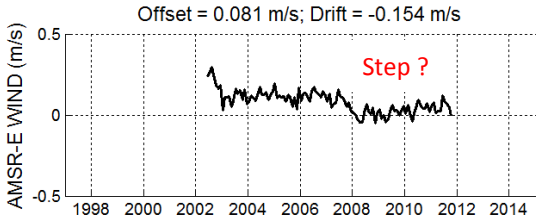


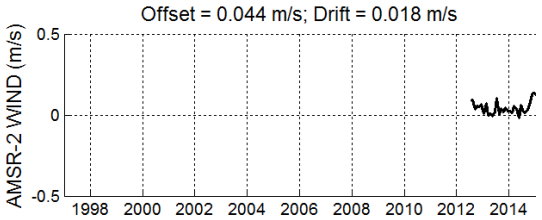


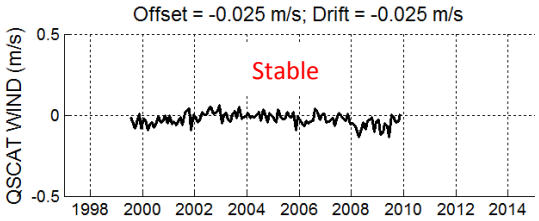


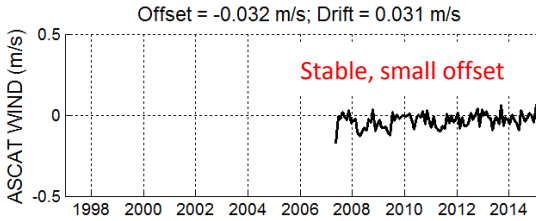












Wentz, F.J., Journal of Climate, 2015, accepted pending minor revision.

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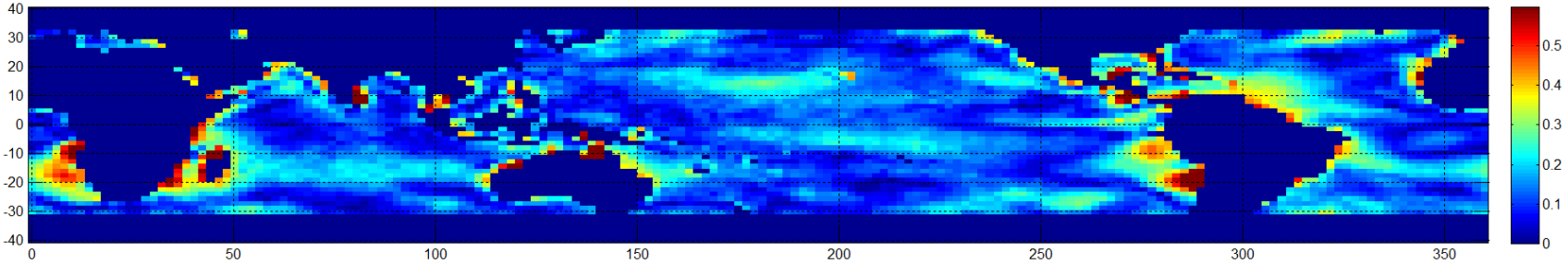
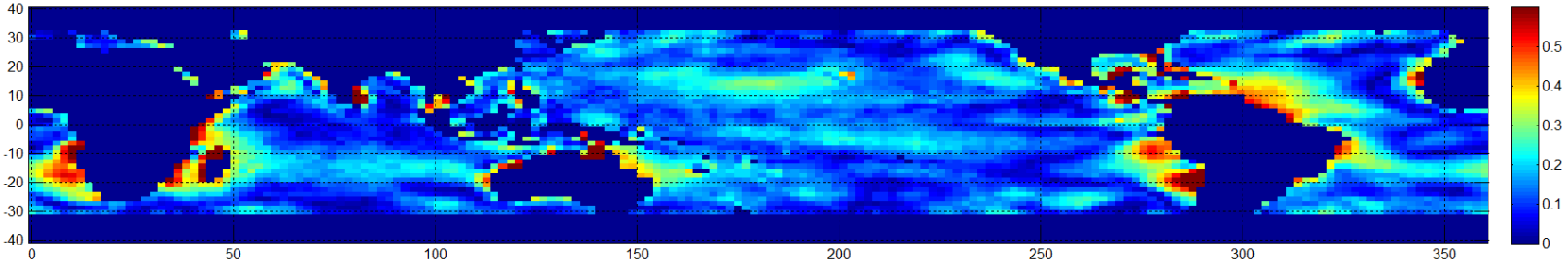
TMI Samples the 24-hour Diurnal Cycle every 40 Days
Data are available, come get it!



Diurnal Amplitude: TMI Low Frequency Algorithm, 1998-2014 (m/s)



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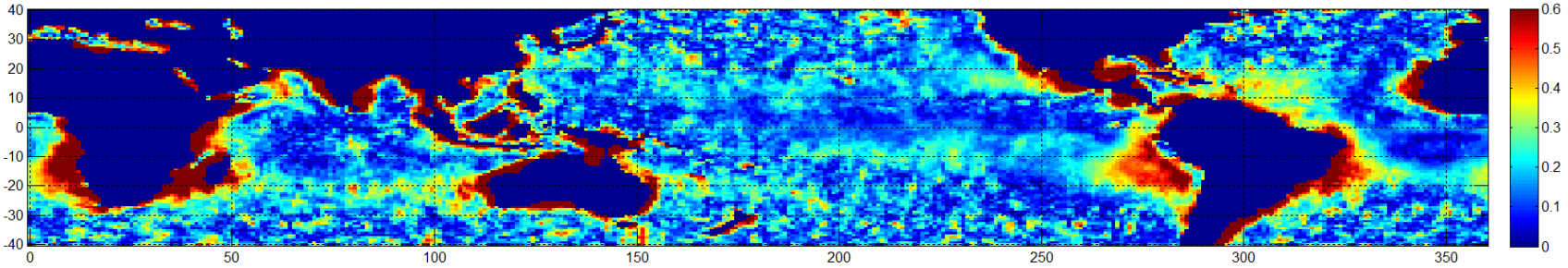

ASCAT & QuikScat Combination 2007-2011 (m/s)

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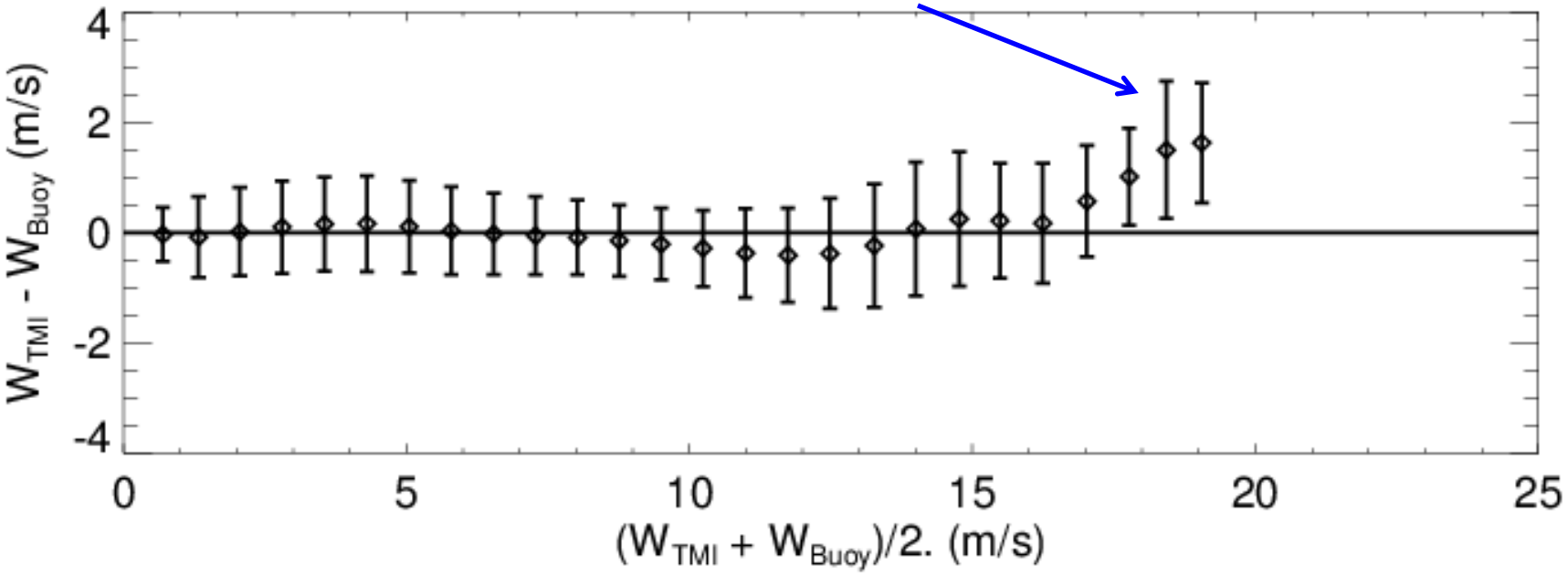
TMI Winds Unbiased Relative to Buoys up to 15 m/s.

Buoys are our Absolute Calibration Reference

258,642 Collocations over 14 years
Bias is -0.03 m/s
Standard deviation is 0.77 m/s

By Design: Satellite vs. buoy Bias at High Winds



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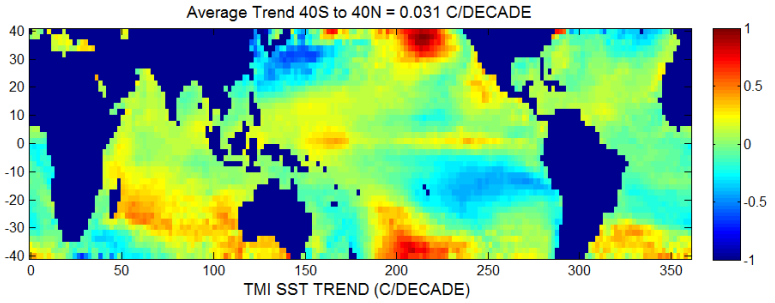
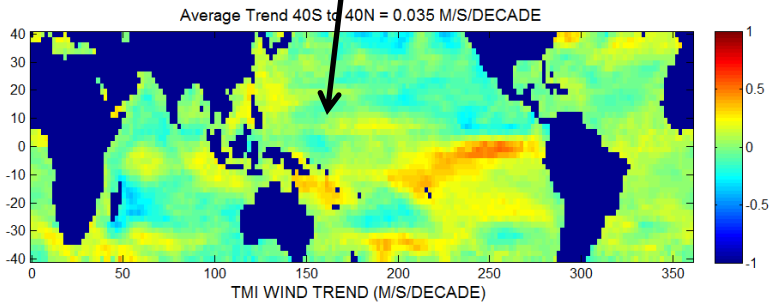
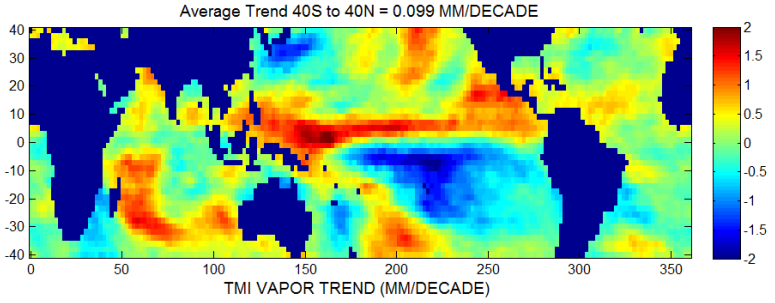
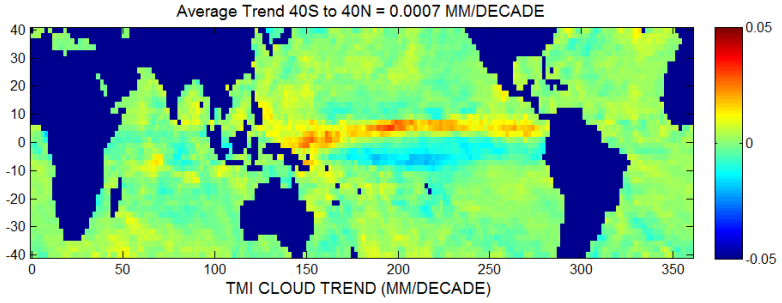
Climate Change from 1997 to 2015
SST, Wind, Vapor, Cloud, and Rain

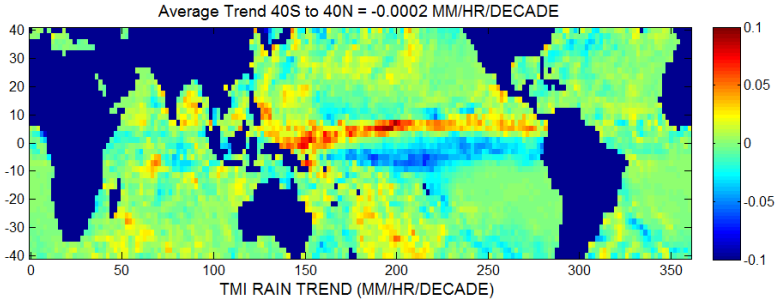
Intensification of Winds
Gone for this Time period











Wentz, F.J., Journal of Climate, 2015, accepted pending minor revision.

Summary and Conclusions

- RSS OVW Climate Records are tied to satellite MW radiometers wind speeds
- TMI is a very dependable and useful backbone the for satellite MW radiometers
- TMI winds are unbiased relative to buoys up to 15 m/s.
- Stability appears to be better than 0.1 m/s over 17 Years
- TMI samples the complete 24-hour diurnal cycle every 40 days
- Diurnal information on SST, Wind, Vapor, Cloud, and Rain
- TMI Directly Observes our changing climate from 1997 to 2015 at a very high precession