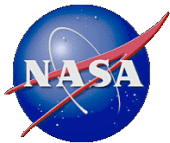




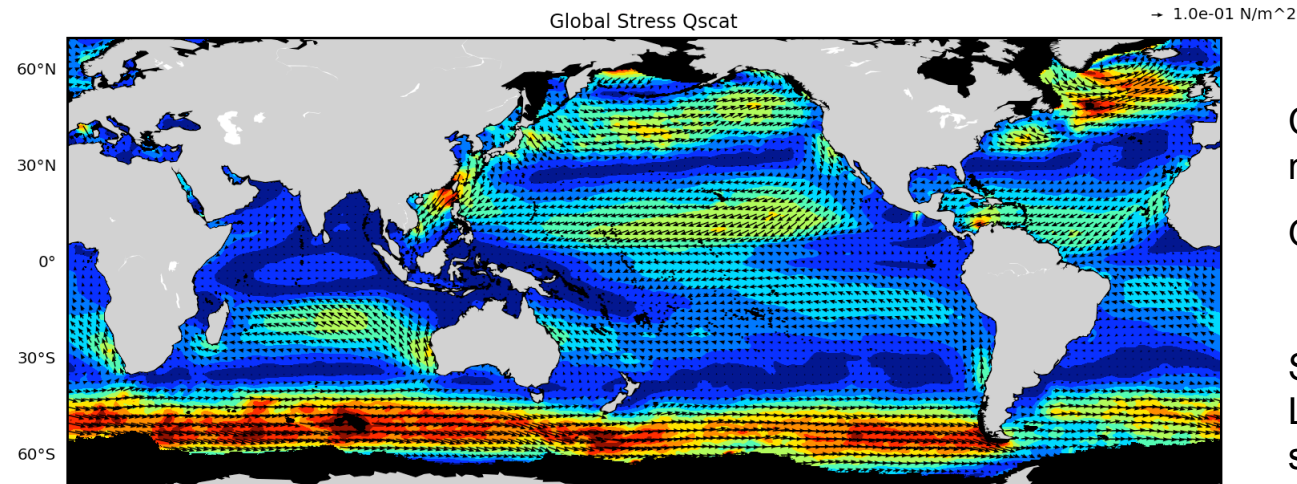
Cross-Validating QuikSCAT and Ascat

OVWST Seattle Meeting

**E. Rodriguez, S. Hristova-Veleva, B. Styles, S. Dunbar
Jet Propulsion Laboratory
California Institute of Technology**



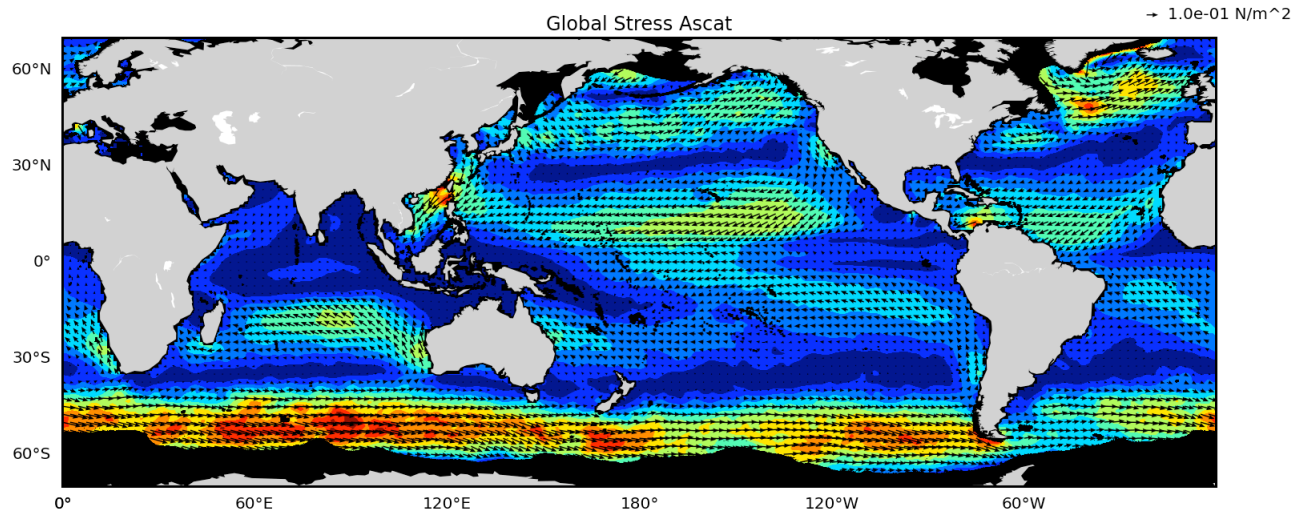
“Naïve” QuikSCAT & Ascet “Climatology” Stress



Climatologies based on 7 month average:

October '07 to May '08

Stresses calculated from L2 wind products and the same drag coefficient

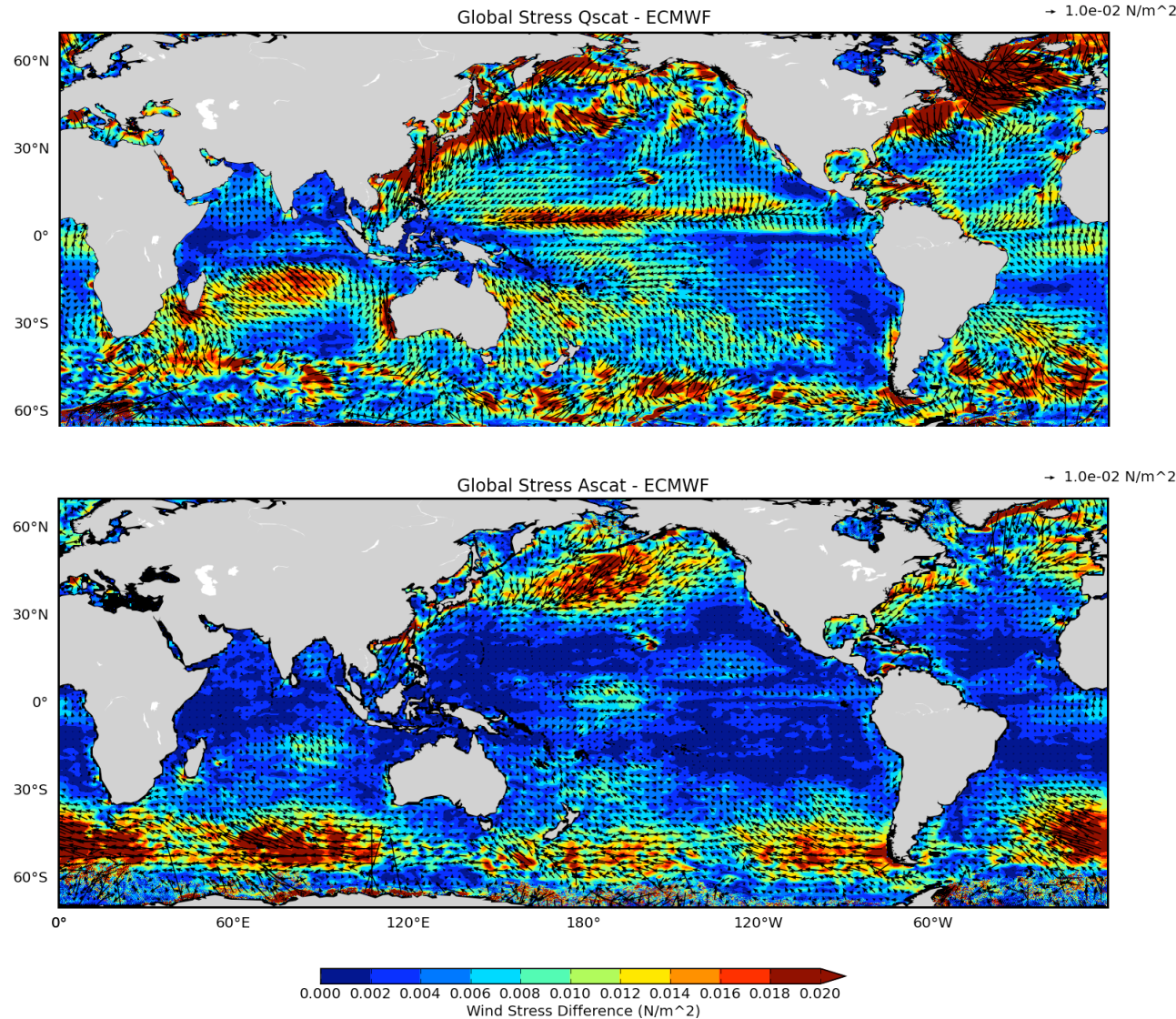


The overall pattern is similar, but differences exist.

However, most of these differences are due to diurnal variability, since they are also present in ECMWF



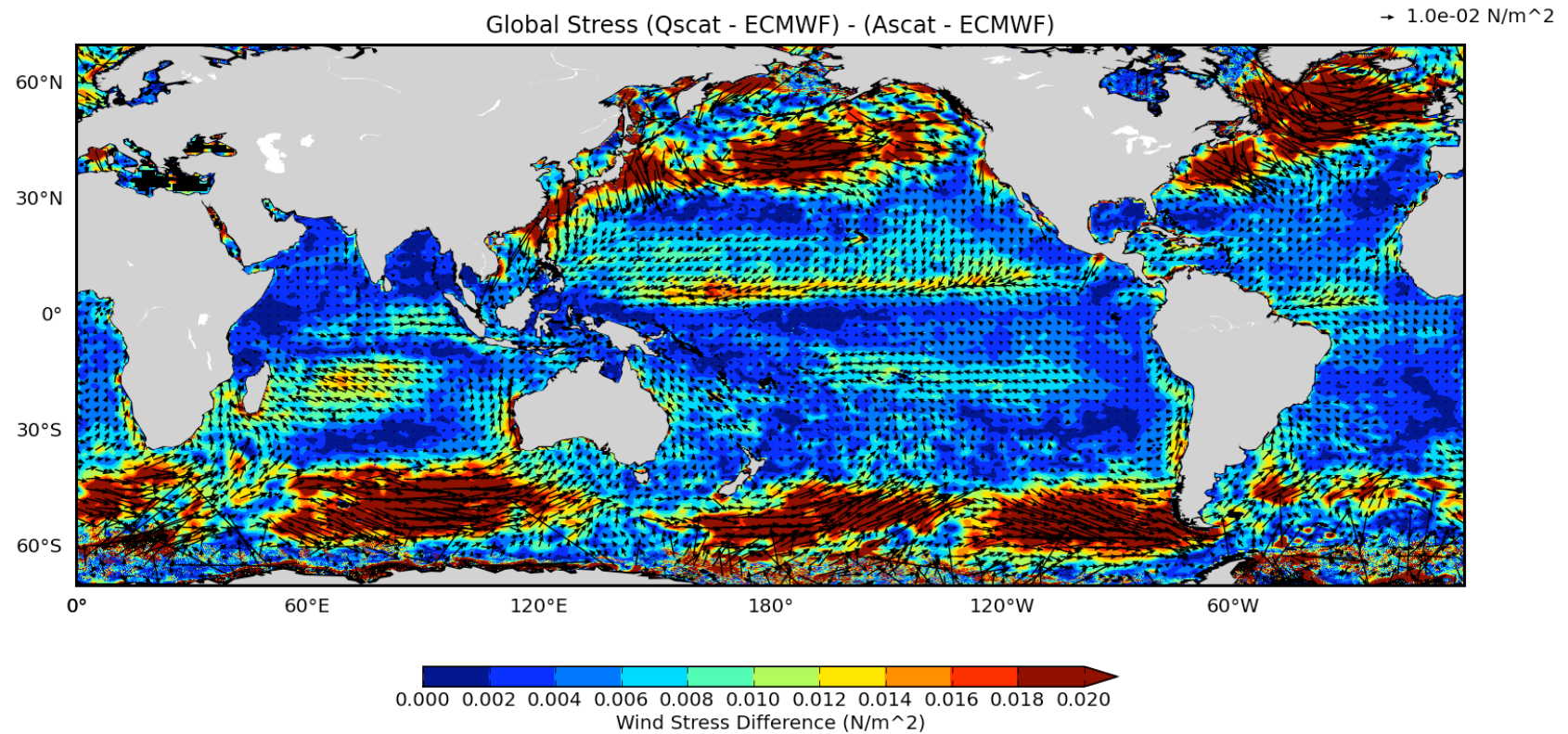
“Naïve” QuikSCAT & Ascet “Climatology” Stress Differences from ECMWF



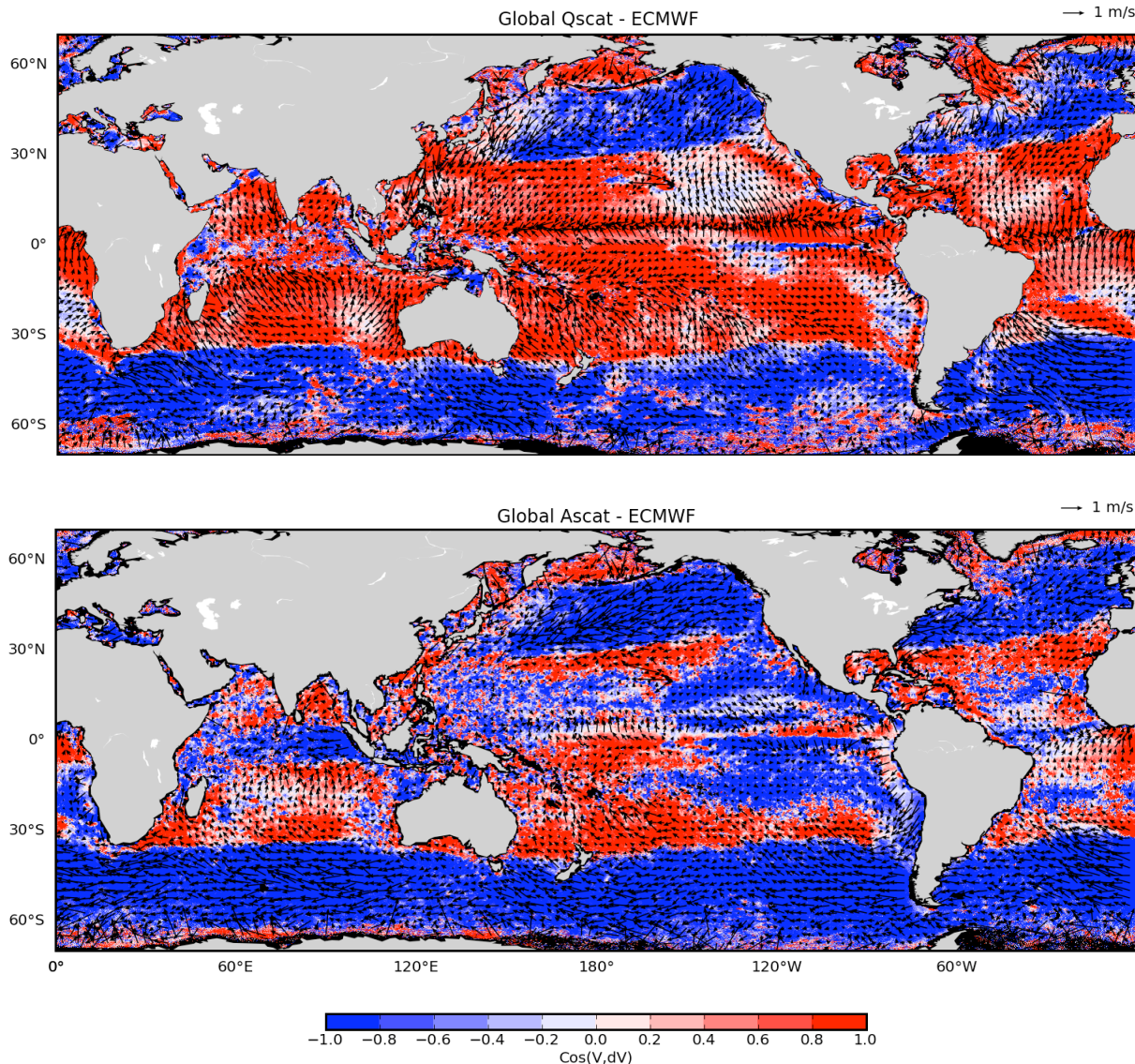
Removing ECMWF field at the time of collection removes diurnal variability captured by ECMWF

Some unmodeled diurnal variability may remain!

“Naïve” QuikSCAT & Ascat “Climatology” Stress Differences



How are differences with ECMWF aligned?



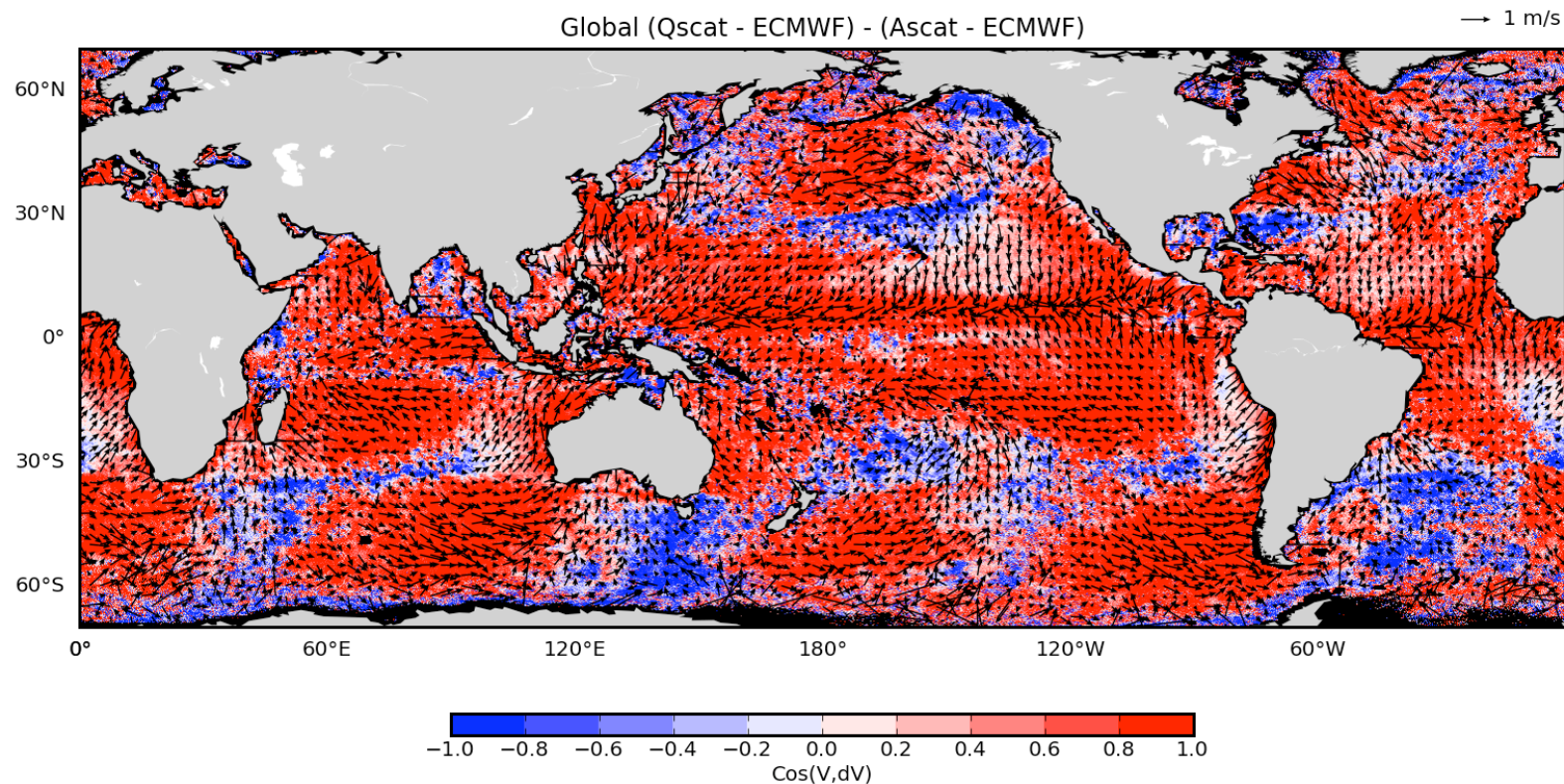
Colors represent cosine of the angle between the difference and the mean wind.

Red: corrections is in the same sense as the wind.

Blue: correction is opposite the wind

White: correction turns the wind

How are differences between Ascat & QuikSCAT aligned?



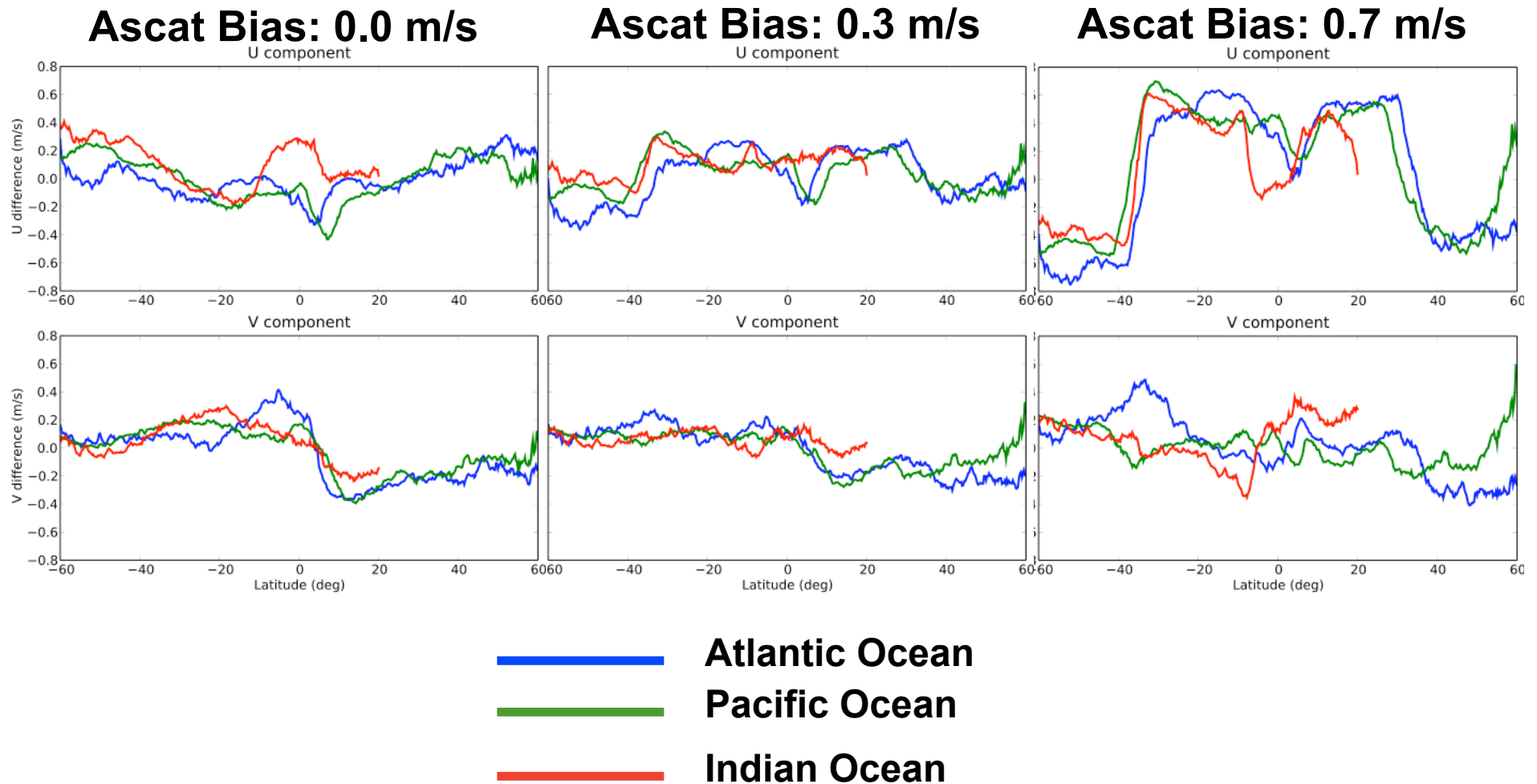
The relative difference between Ascat and QuikSCAT is generally in the same direction, but QuikSCAT is stronger than Ascat

A relative speed bias is a possibility...

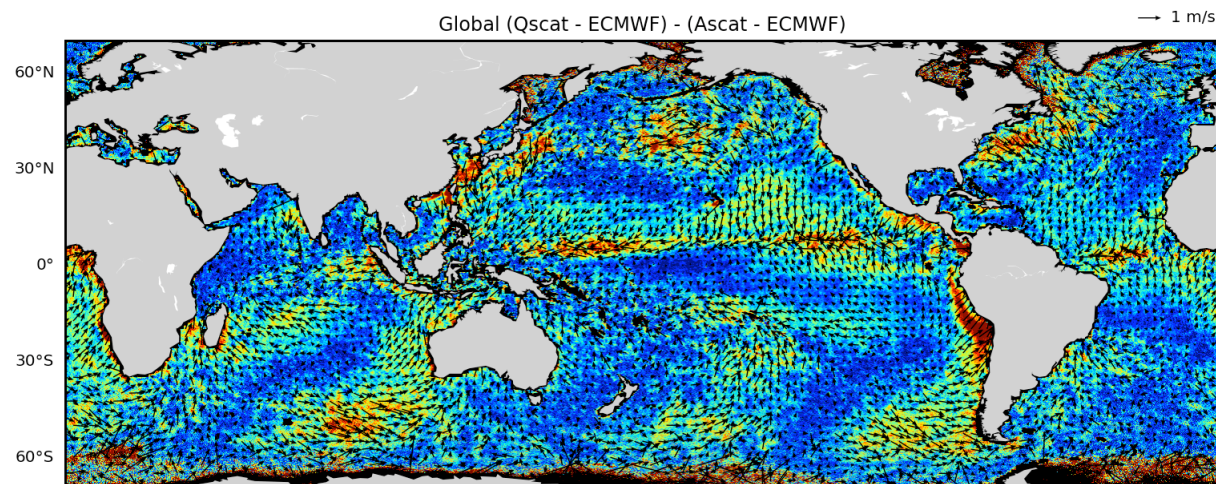
- QuikSCAT nominally measures neutral winds (but needs further investigation...)
- Portabella and Stoffelen* suggest that, to a good approximation, neutral 10m winds can be obtained by adding a bias ($\sim 0.2\text{m/s}$) to the Ascet wind product
- Can this fix observed differences?

*Portabella, M., and A. Stoffelen, "On scatterometer ocean stress", JAOT, early online release, doi: 10.1175/2008JTECHO578.1

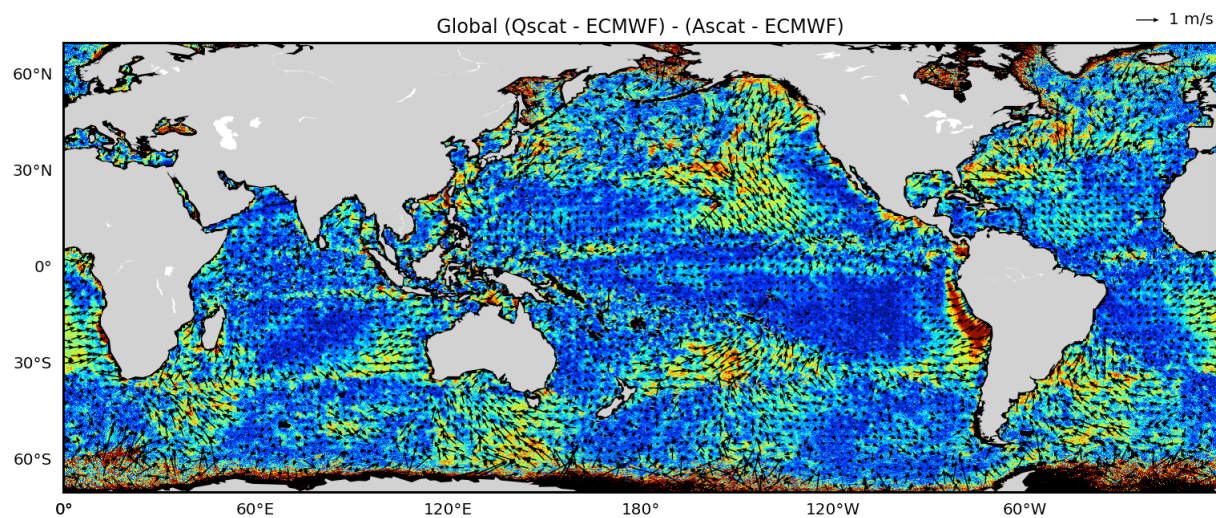
(Qscat-ECMWF) - (Ascat-ECMWF) Zonal Average



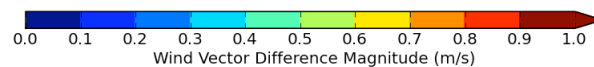
Global QuikSCAT-ASCAT Wind Differences

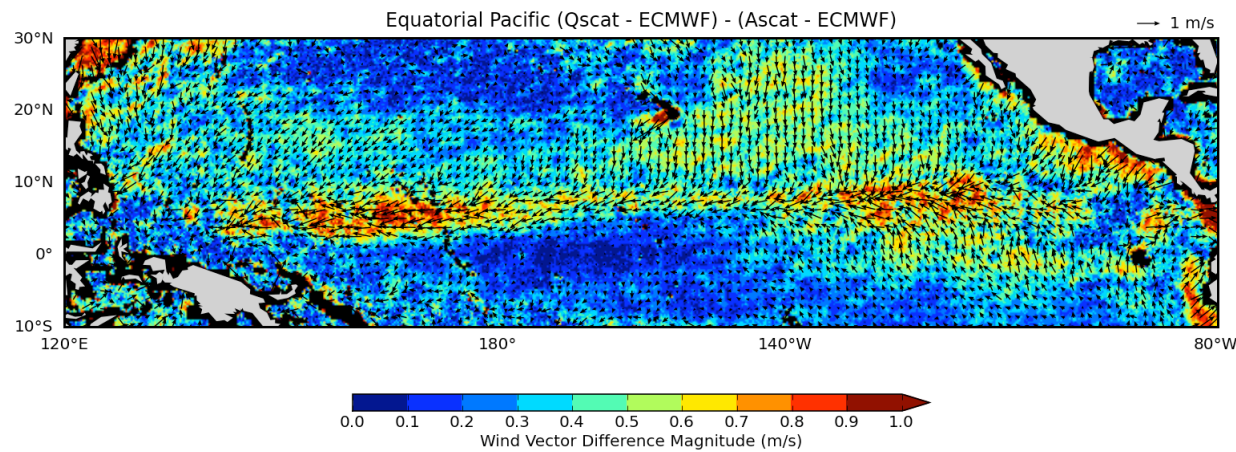


Ascat Bias: 0.0 m/s

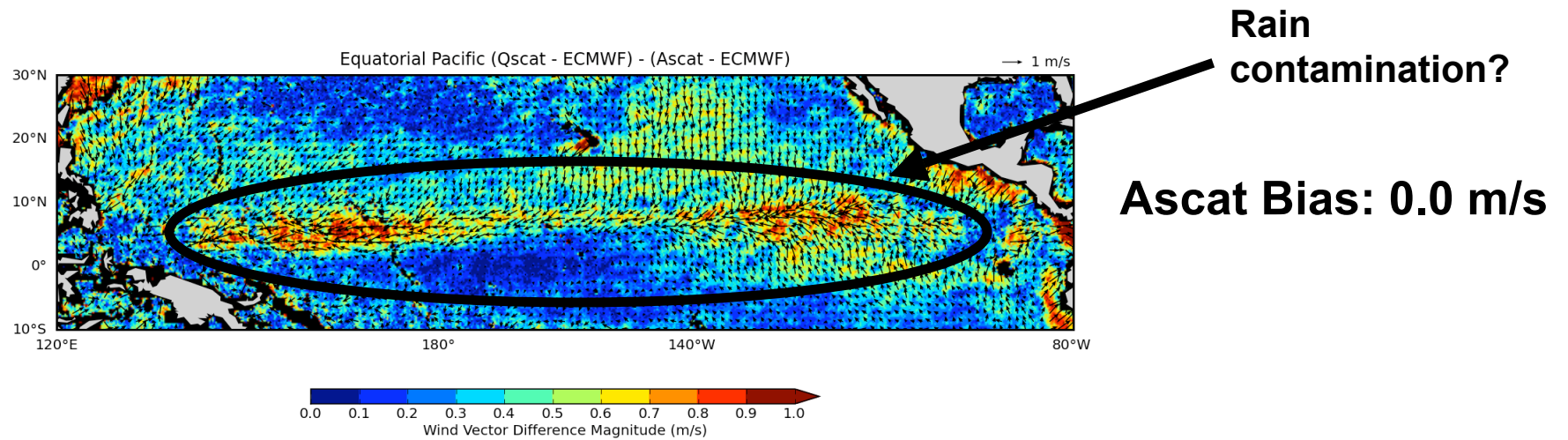


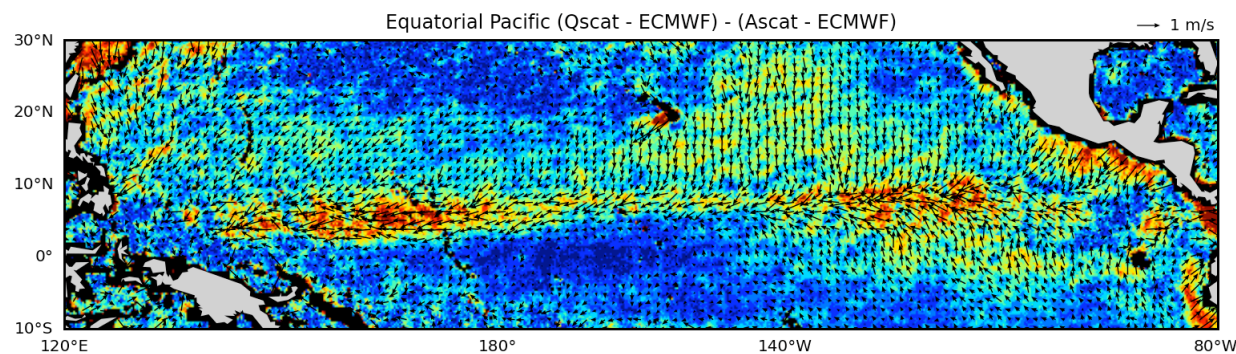
Ascat Bias: 0.3 m/s



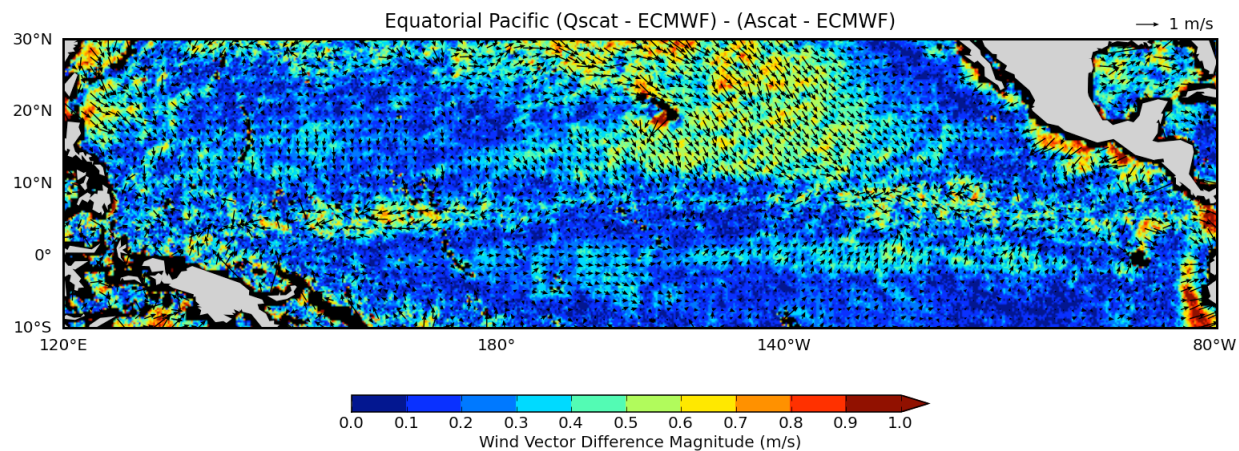


Ascat Bias: 0.0 m/s

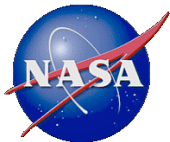




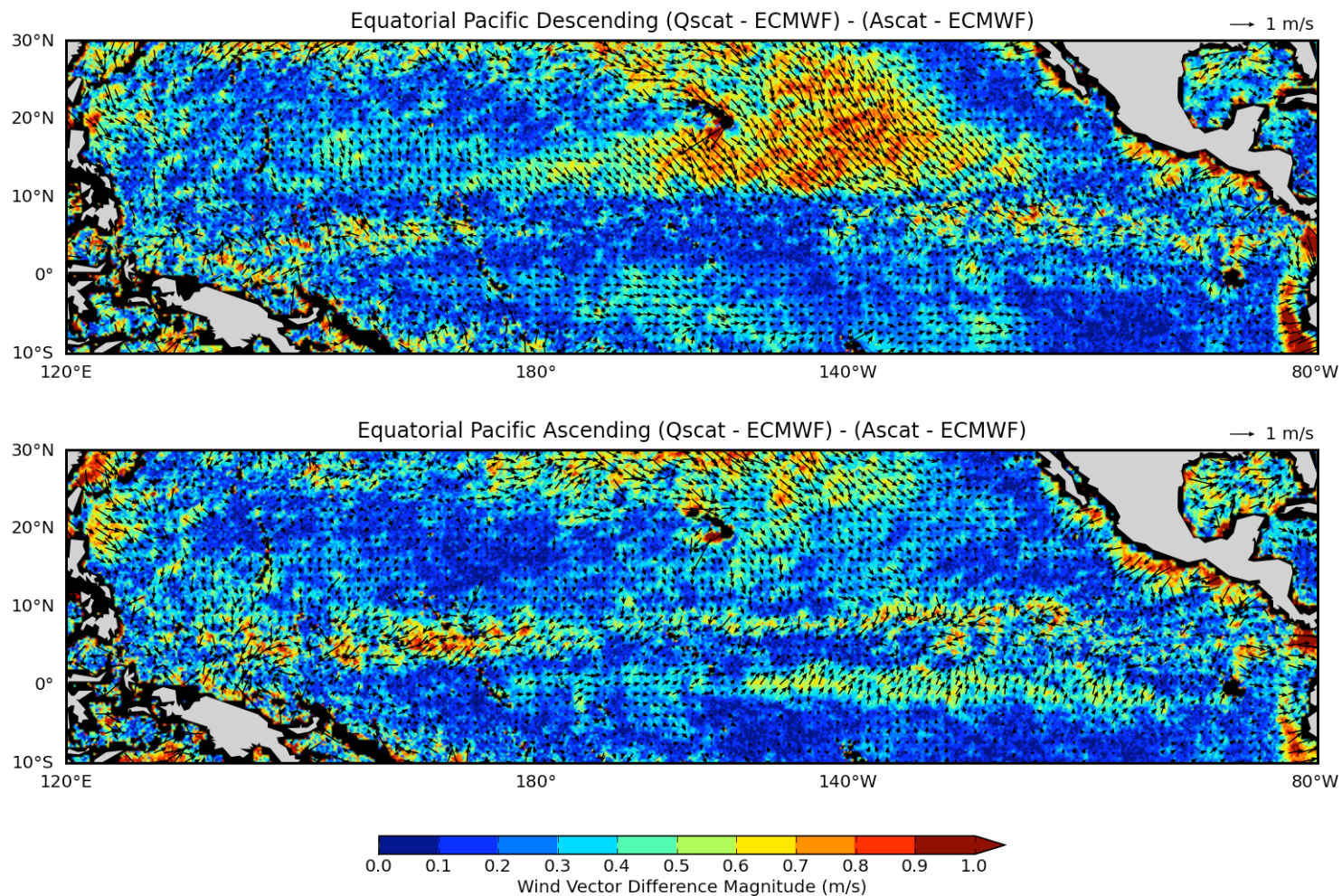
Ascat Bias: 0.0 m/s



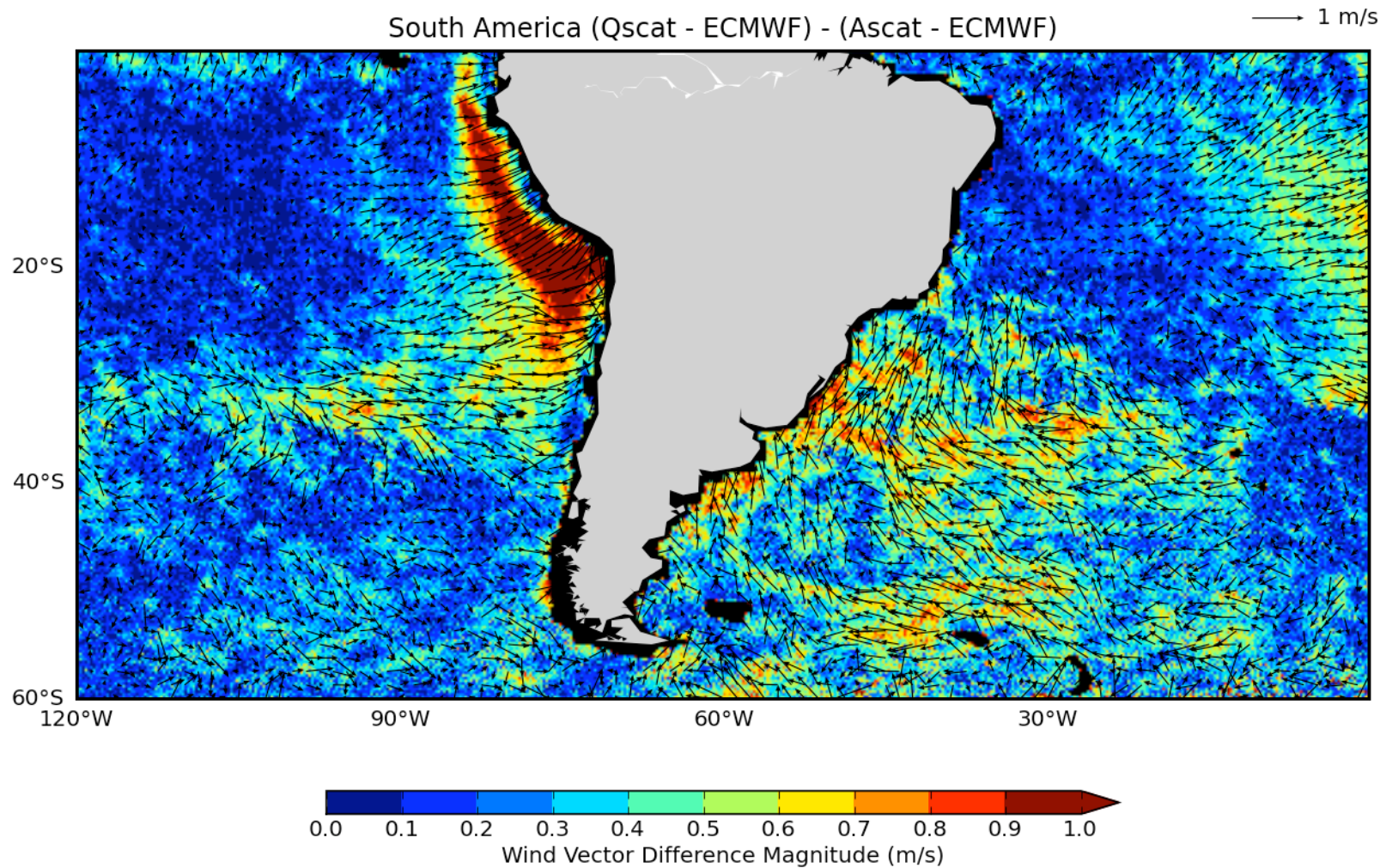
Ascat Bias: 0.3 m/s

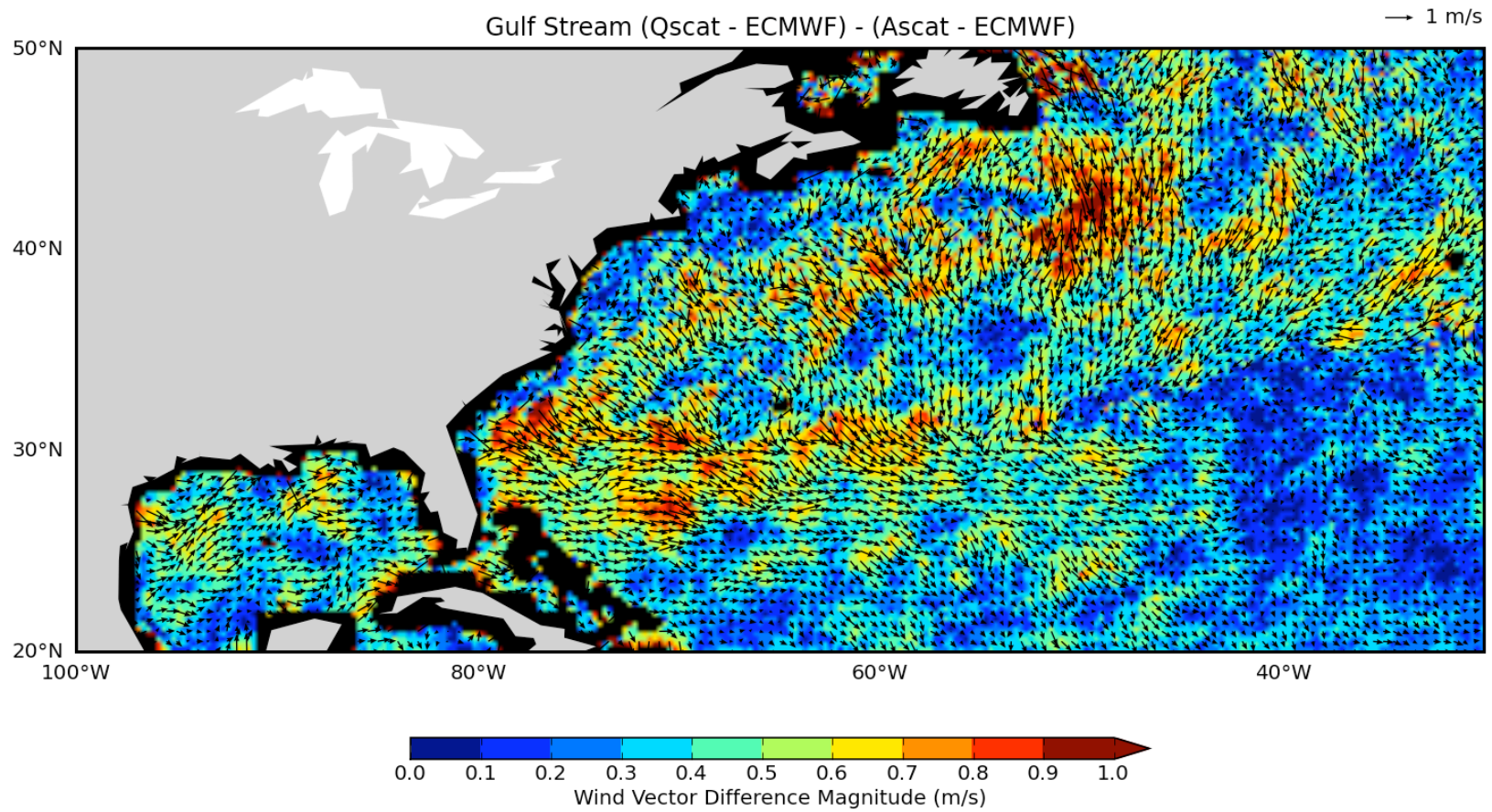


Residual Unmodeled Diurnal Variability?



What's up with Western South America?

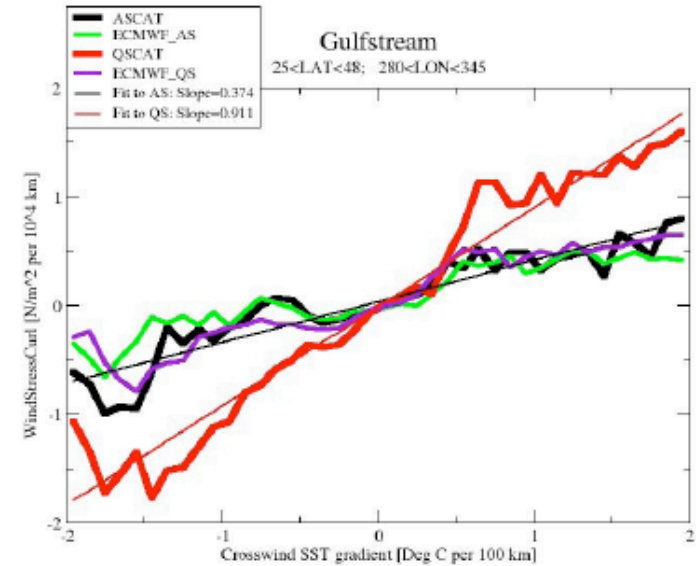
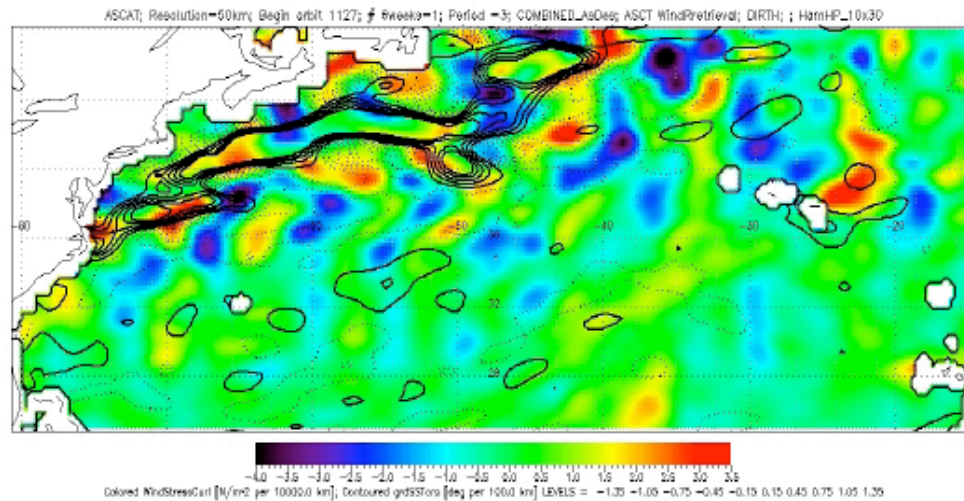




SST Front Wind Modulation Gulf Stream

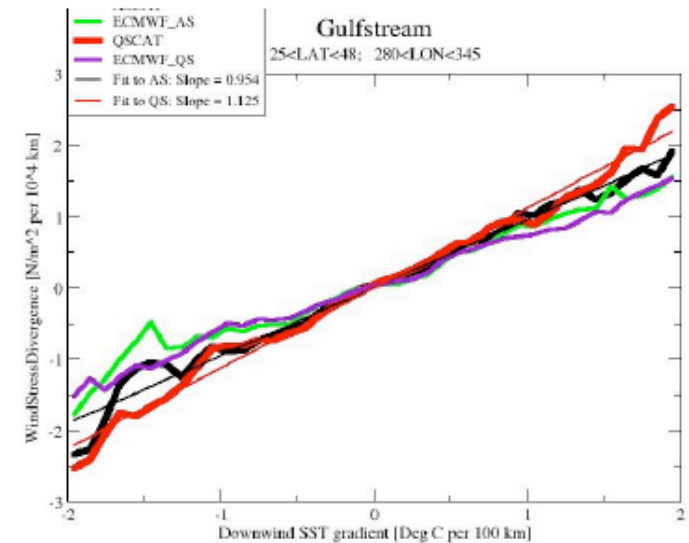
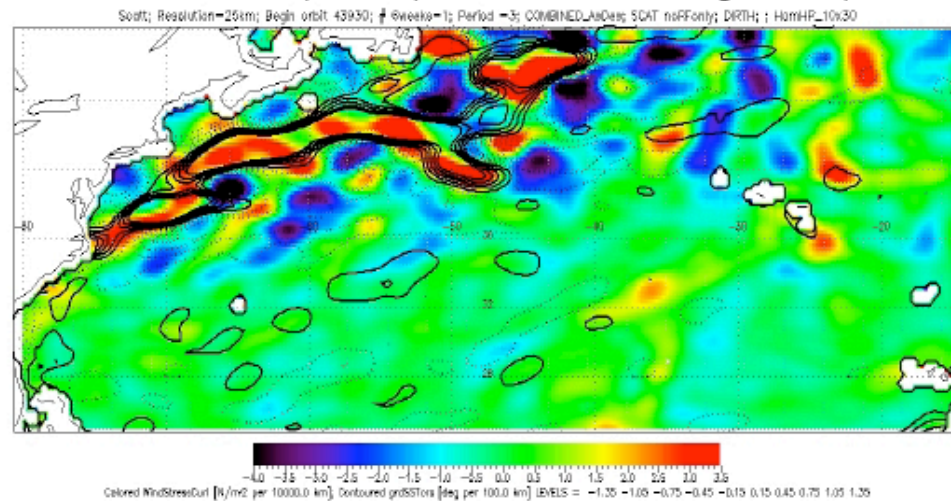
ASCAT

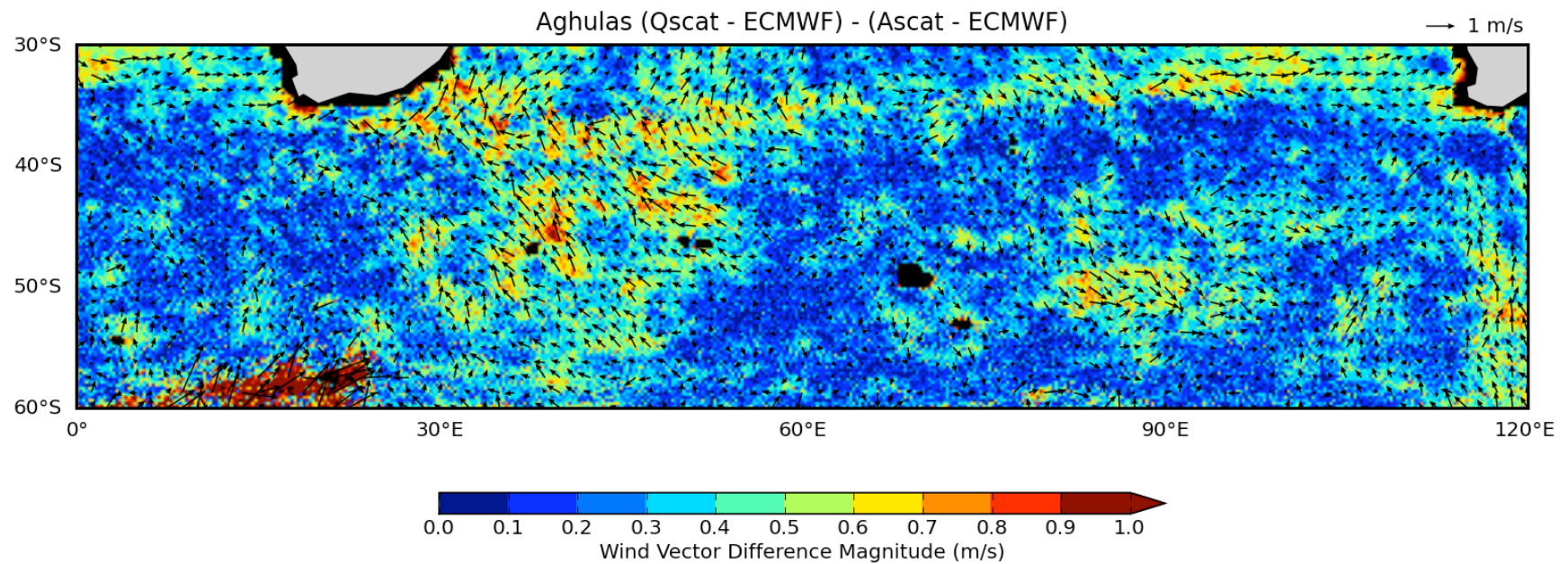
High Pass Wind Stress Curl (colored) and Crosswind SST gradient (contoured)



QuikSCAT

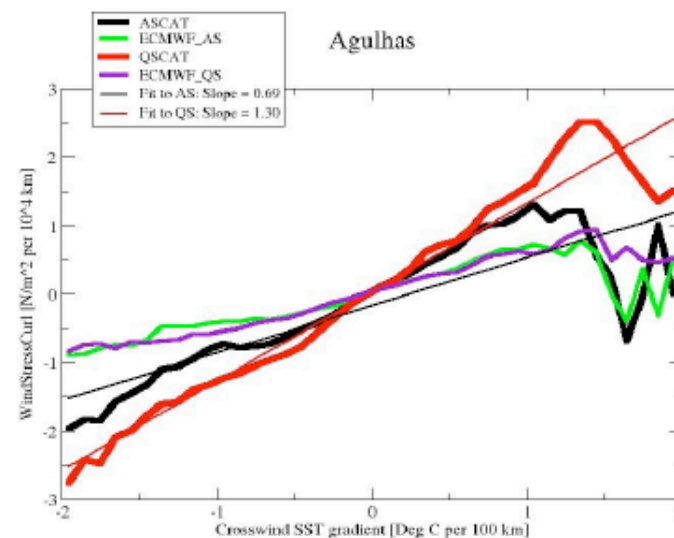
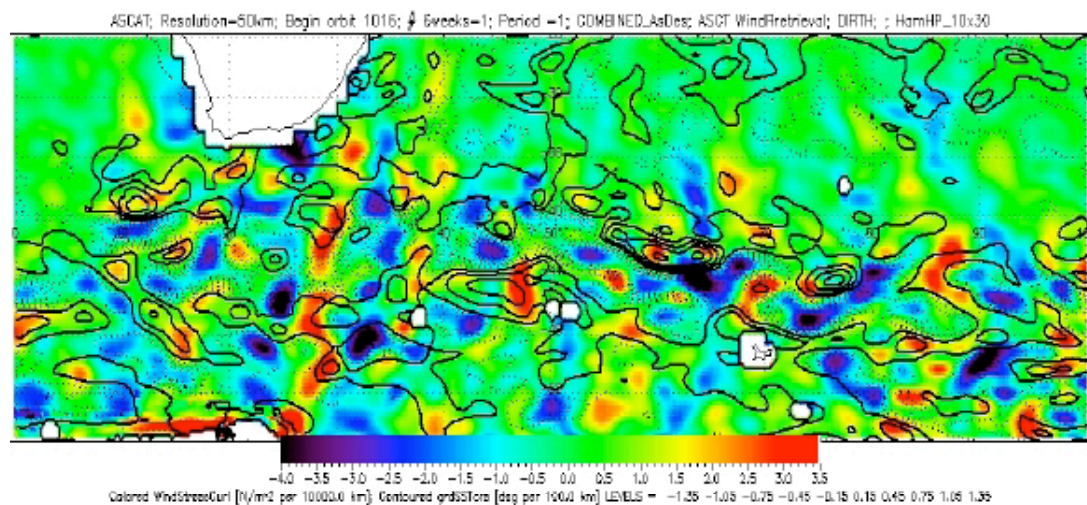
High Pass Wind Stress Curl (colored) and Crosswind SST gradient (contoured)





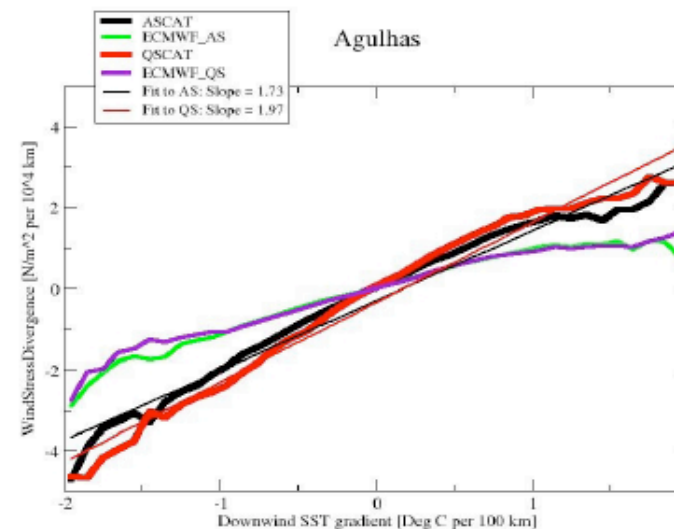
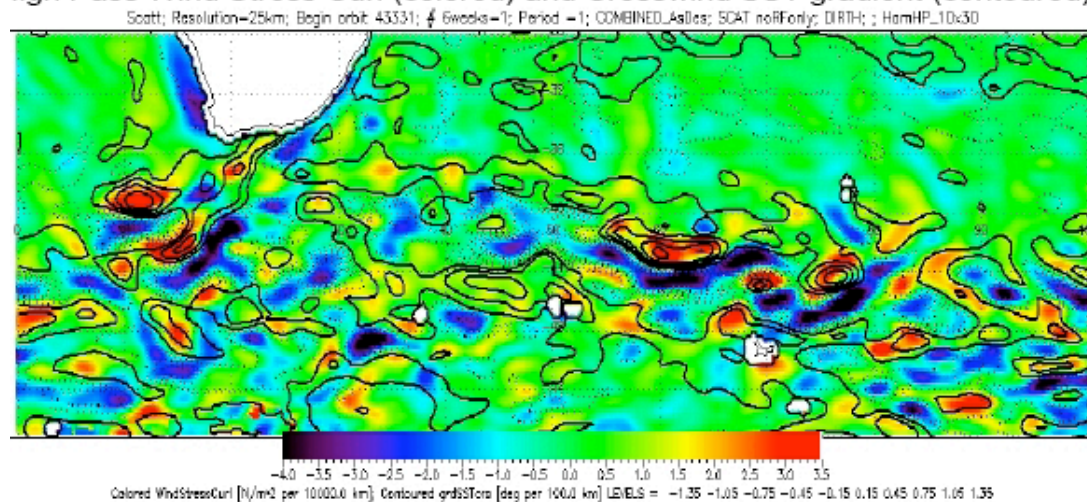
ASCAT

High Pass Wind Stress Curl (colored) and Crosswind SST gradient (contoured)



QuikSCAT

High Pass Wind Stress Curl (colored) and Crosswind SST gradient (contoured)



- QuikSCAT and ASCAT agree better with each other than with ECMWF
 - This is confirmed by correlations of coincident data
- In order to get a consistent data set, the right quantities must be compared
 - Neutral winds or stress
- A simple relative speed bias correction significantly improves the agreement between QuikSCAT and ASCAT climatologies
 - The correction is close to the Portabella Stoffelen 0.2 m/s
 - Does QuikSCAT also need a correction?
- Residual geographically correlated differences remain
 - Source not yet fully understood
 - SST may play a role
- **Extreme care must be taken when comparing ocean models driven by QuikSCAT, ASCAT, or ECMWF!**