

# ASCAT Coastal Winds over the Patagonia Shelf Standard vs Coastal Processing

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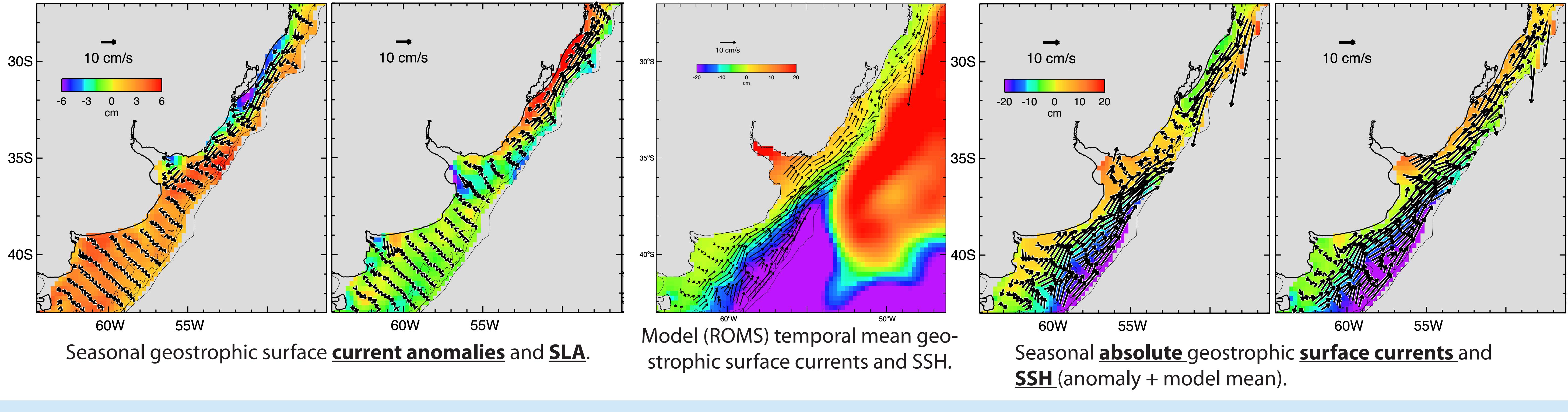
## Summary:

**Question:** Should we use ASCAT “Coastal” processed winds next to the coast of Argentina-Uruguay-Brazil?

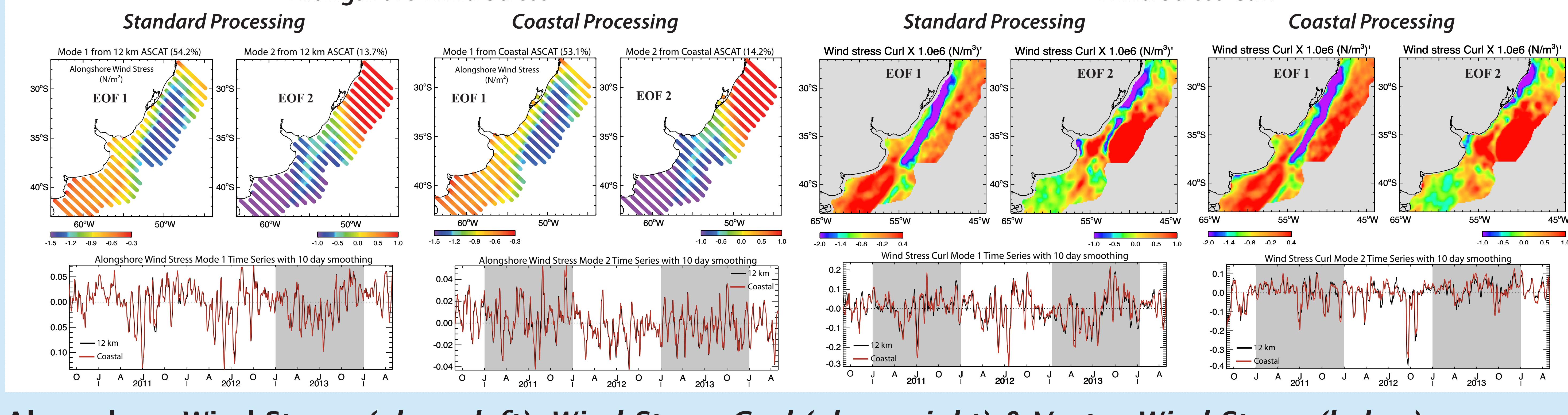
**Answer:** Yes. Compared to “Standard” processing, away from the coast and rain cells, the fields are nearly identical. Next to the coast, gridded (12.5km) “Coastal” winds retrieve several vectors ~20km closer to the coast. This sometimes resolves better the changes in sign and magnitude of the nearshore wind stress and wind stress curl fields. There are still a few errors near land and rain cells, similar to those in standard processing.

## Motivation:

Wind-Driven Seasonal Changes in Currents Over the Shelf are shown below from AVISO altimeter data. Even with the mean currents from a realistic numerical model added back in, currents north of 36°-37°S reverse seasonally.



## What are the realistic coastal wind stress and curl fields that cause this response?

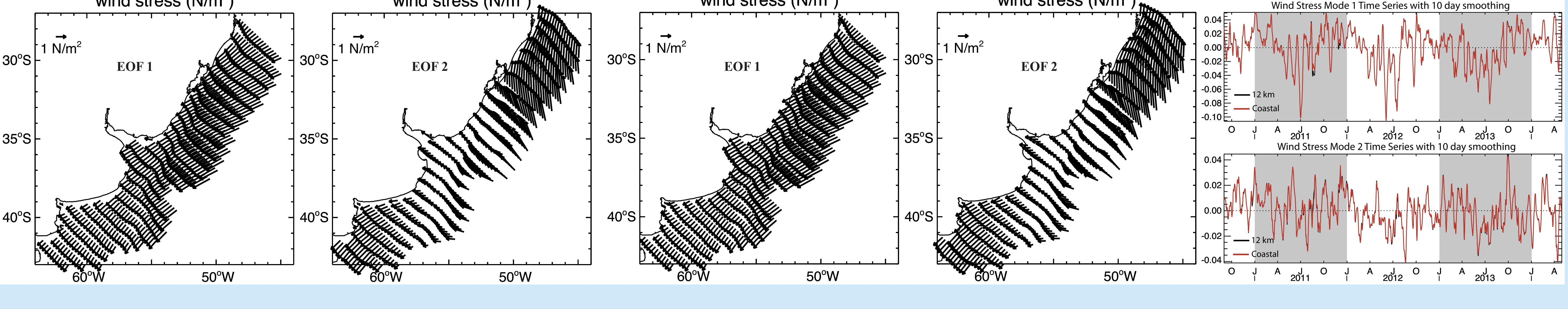


Alongshore Wind Stress (above left), Wind Stress Curl (above right) & Vector Wind Stress (below):  
Nearly identical fields - slight increase in definition of near-coast fields, especially in the bights for  
wind stress curl and in the second EOFs.

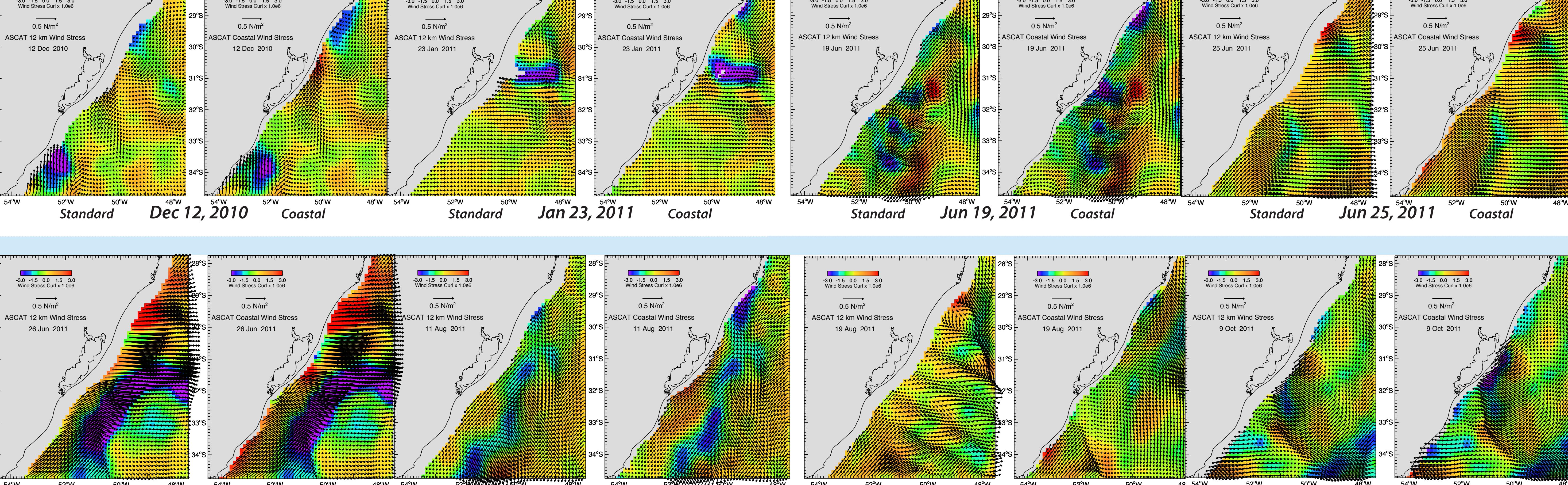
### Characteristics of the wind-forcing:

EOF-1: Seasonal switch from poleward (upwelling-favorable) winds in summer to equatorward (downwelling-favorable) winds in winter. The large band of negative wind stress curl in the north in spring and summer enhances the upwelling (opposite in winter).

EOF-2: Split fields (sign change, typical of 2nd EOFs) in wind stress between the north and the south; a band of decreased wind strength at intermediate distances offshore between 33°-41°S.



Individual Fields of Wind Stress and Curl (Below) Provide the best view of differences in the fields using the two types of processing. The “Coastal” processing gives a more complete picture of the fields next to the coast.



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