

# **Oceanic Feedback and Acceleration of Climate Variability**

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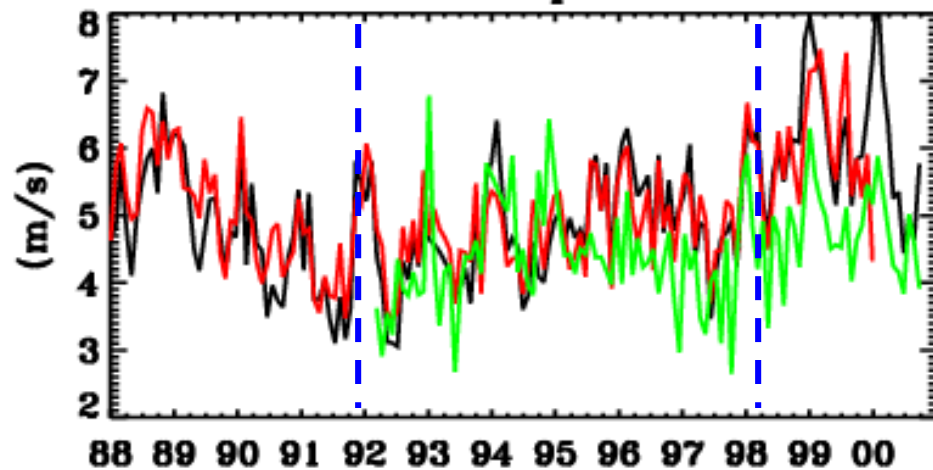
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## **Objectives:**

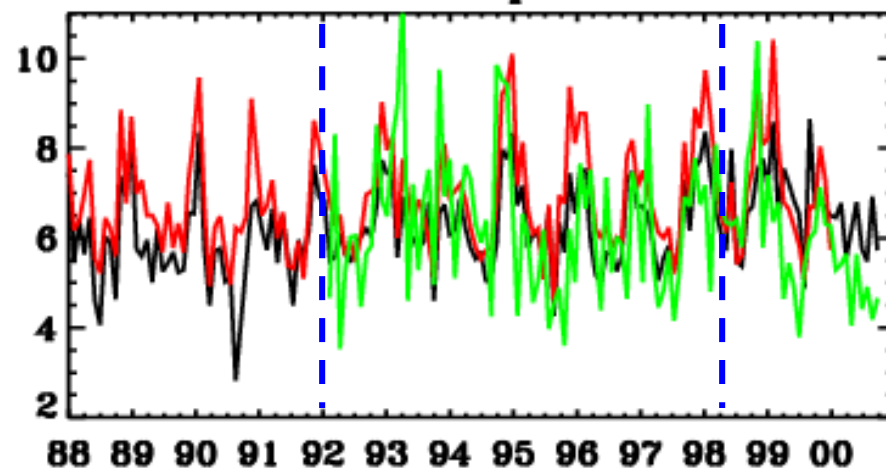
**Use long time series of wind/stress by QuikSCAT**

- 1. to link regional climate changes into a global scenario**
- 2. to study persistent atmospheric imprints by the ocean across ocean fronts**
- 3. to study oceanic influence on global energy and water cycles**

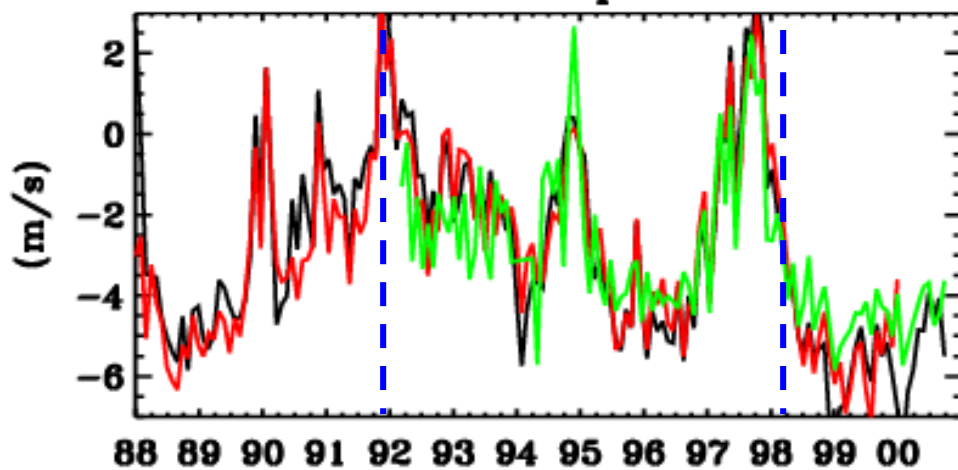
(165E-170W, 8S-2N)  
Wind Speed



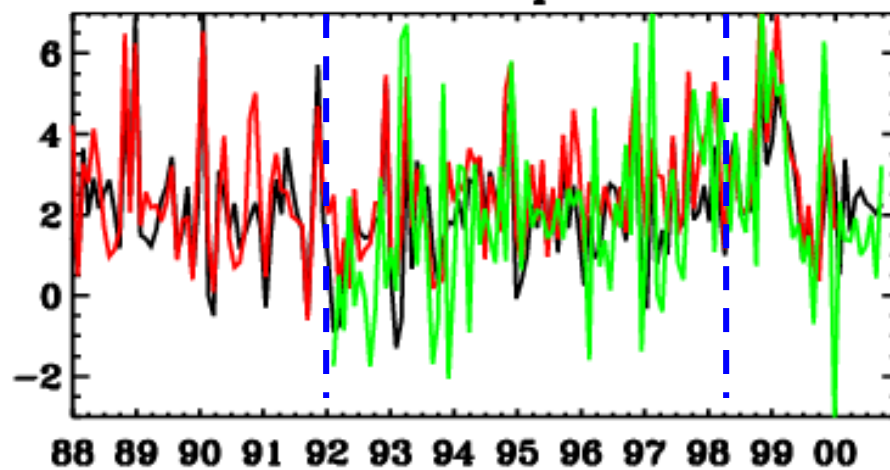
(140W-125W, 35N-50N)  
Wind Speed



Zonal Component



Zonal Component



TAO

SSMI

ERS

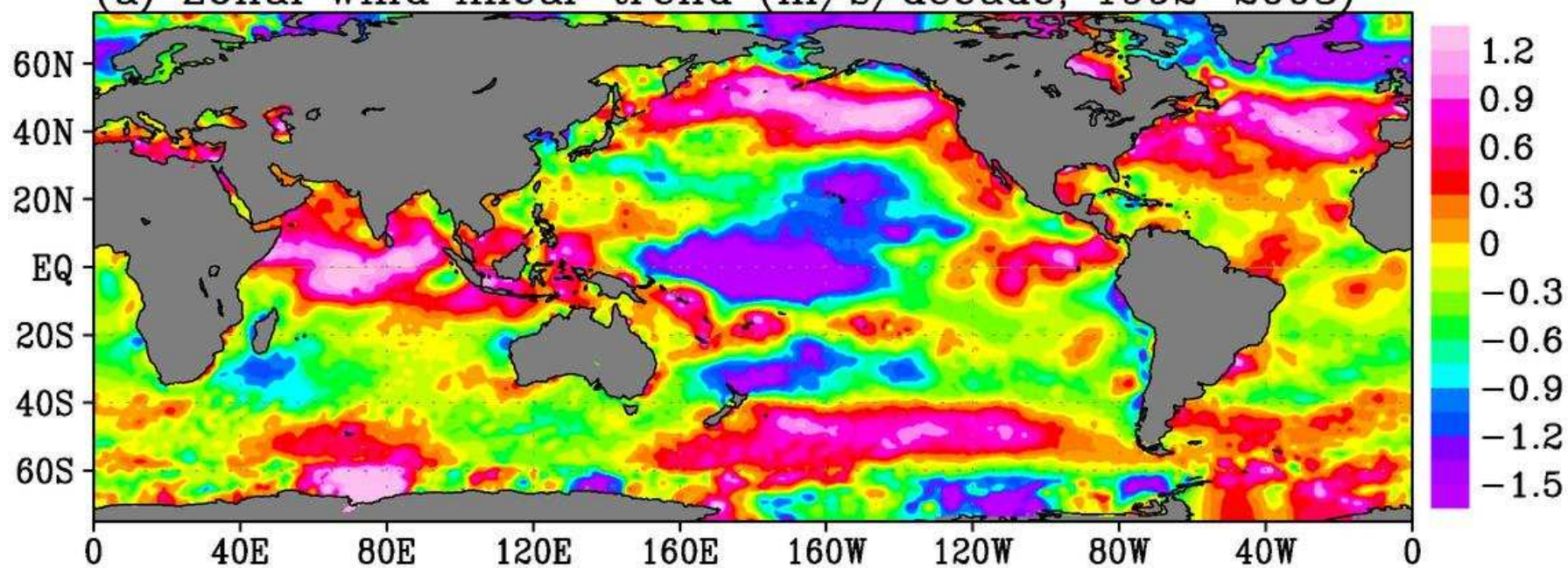
NSBC

SSMI

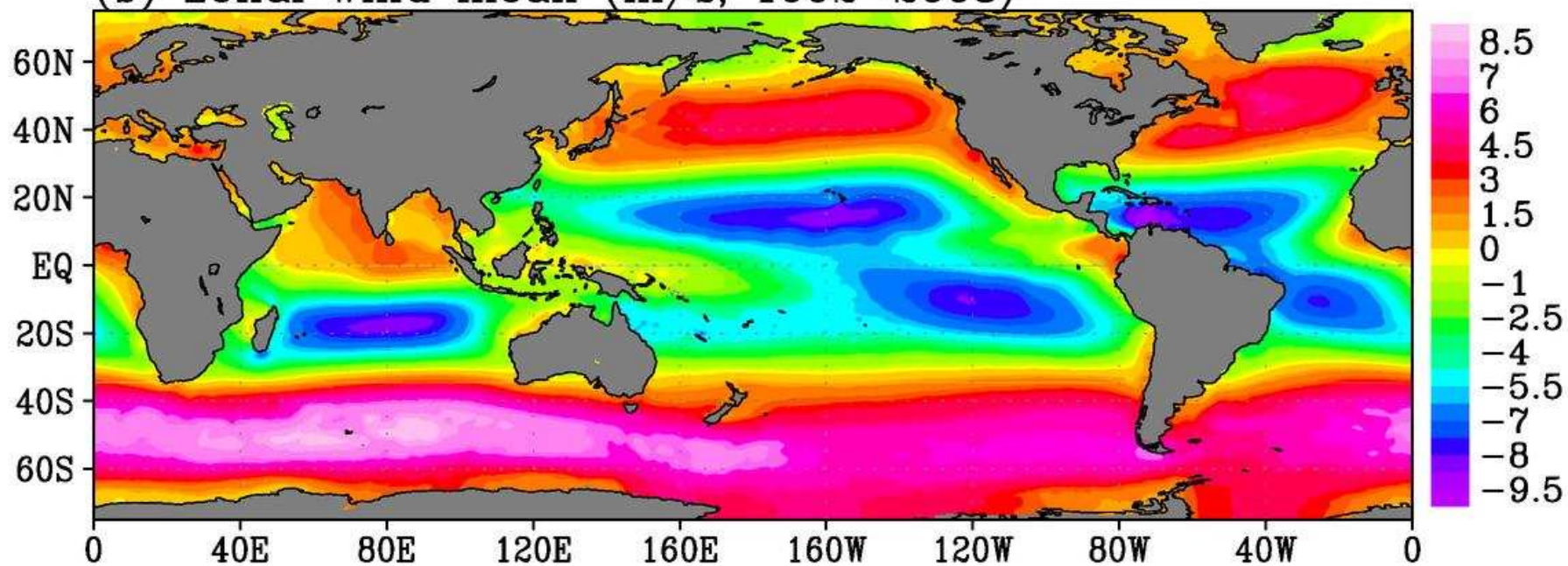
ERS

30 days averaged

(a) Zonal wind linear trend (m/s/decade, 1992–2003)

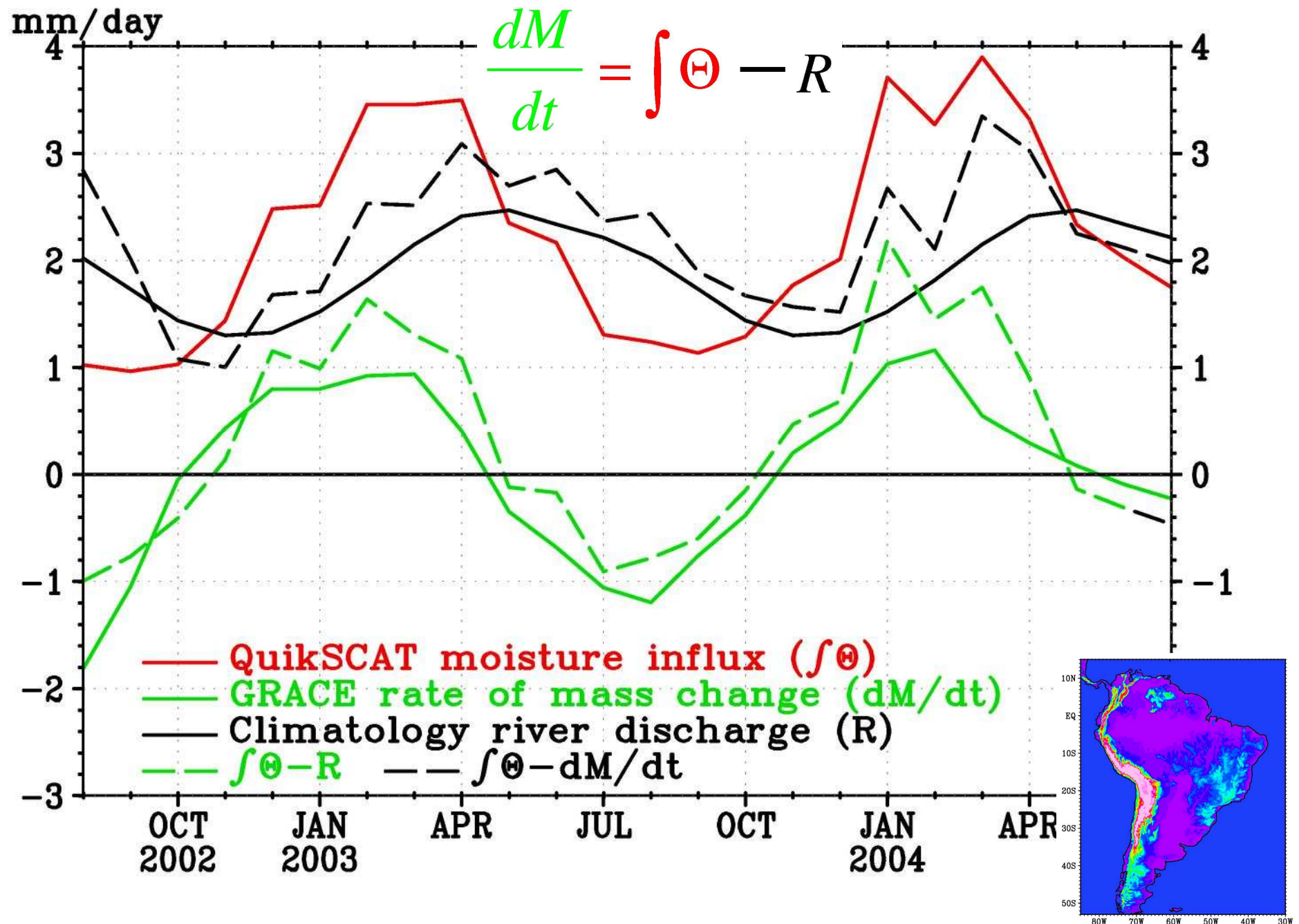


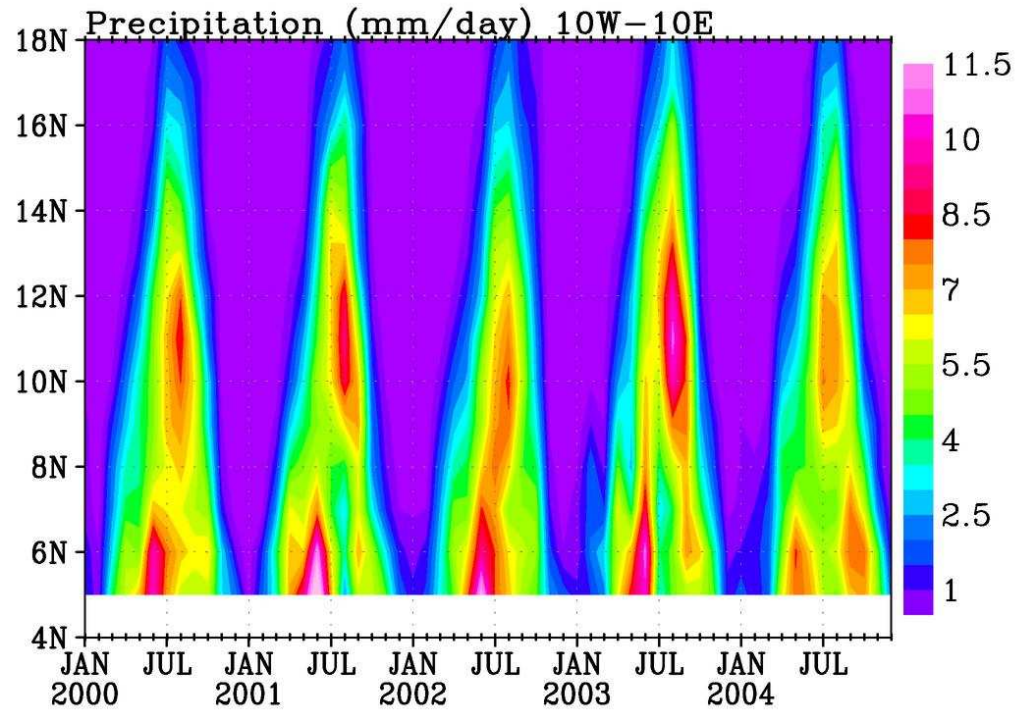
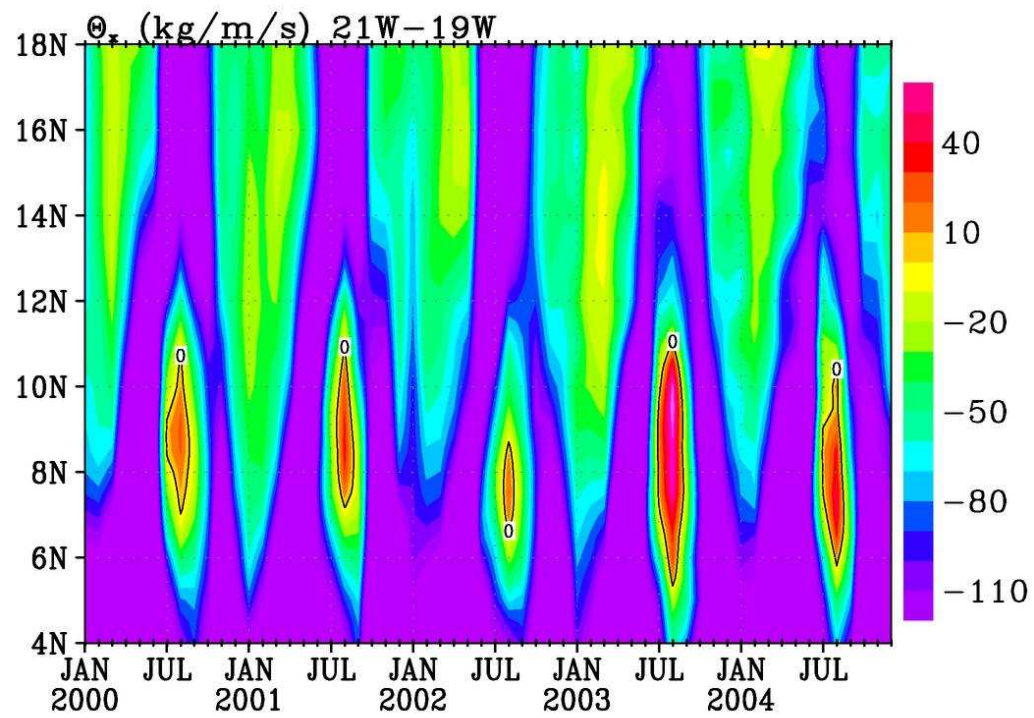
(b) Zonal wind mean (m/s, 1992–2003)



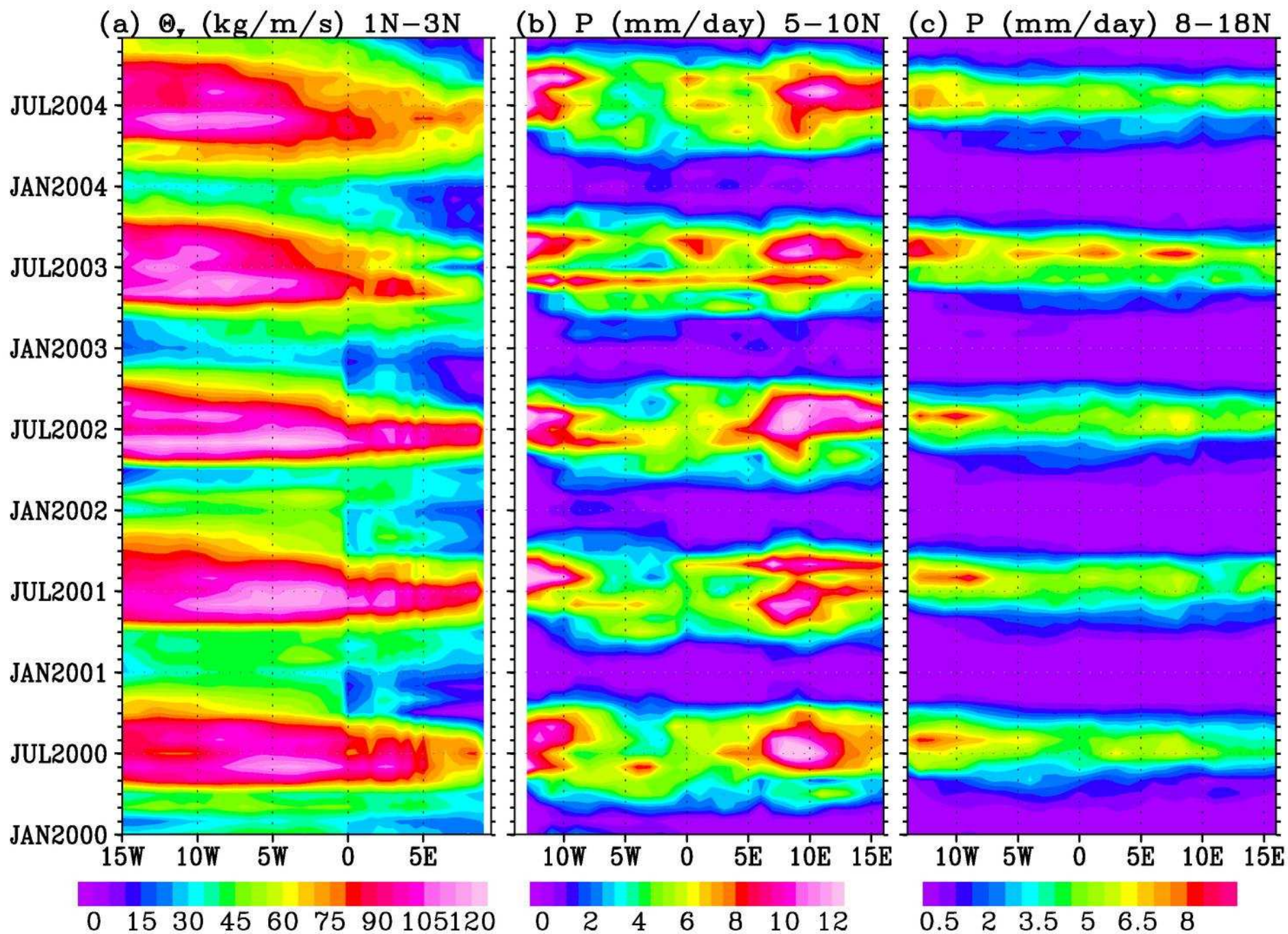


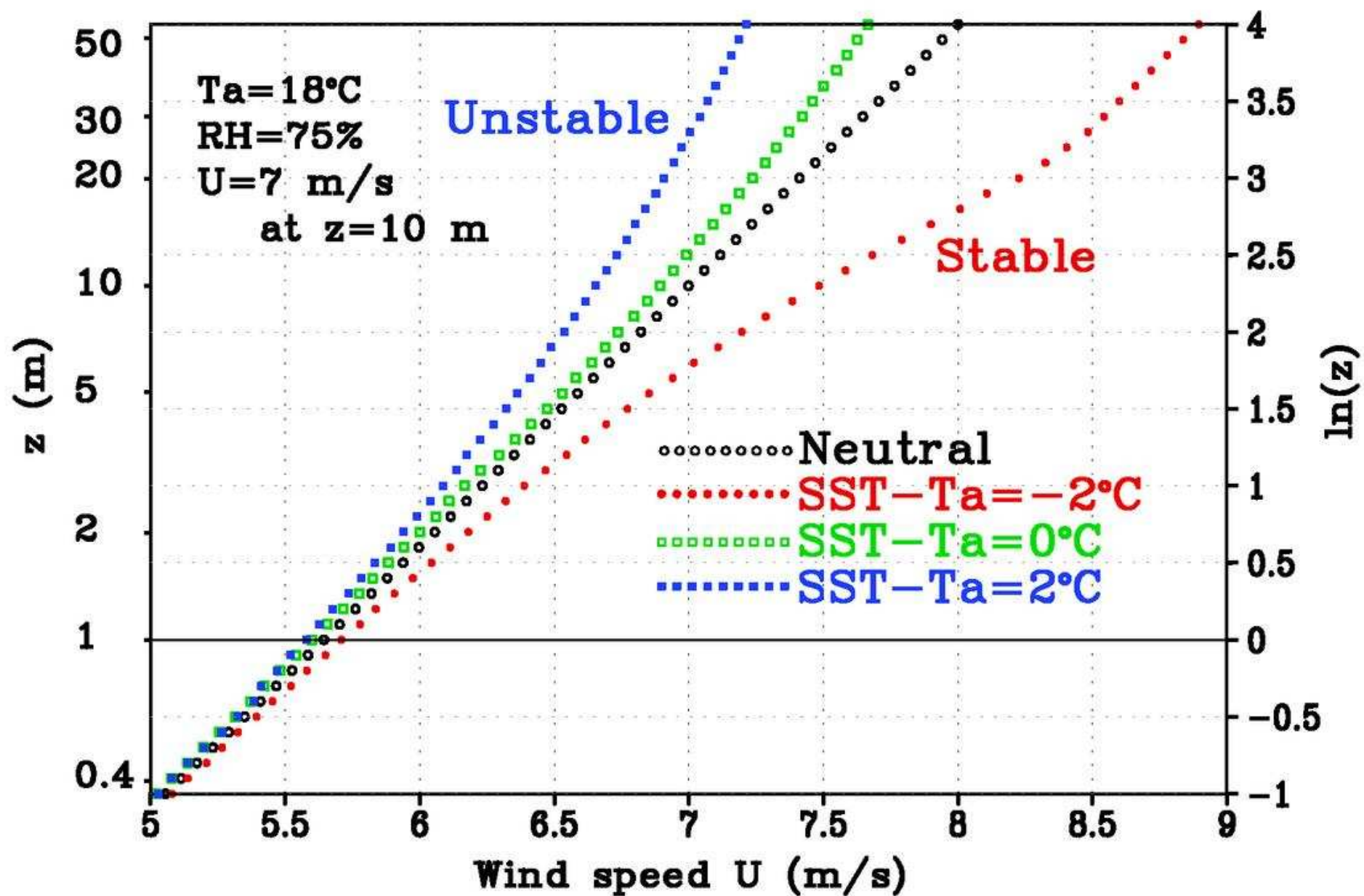
# Ocean's Influence on Water Balance of South America





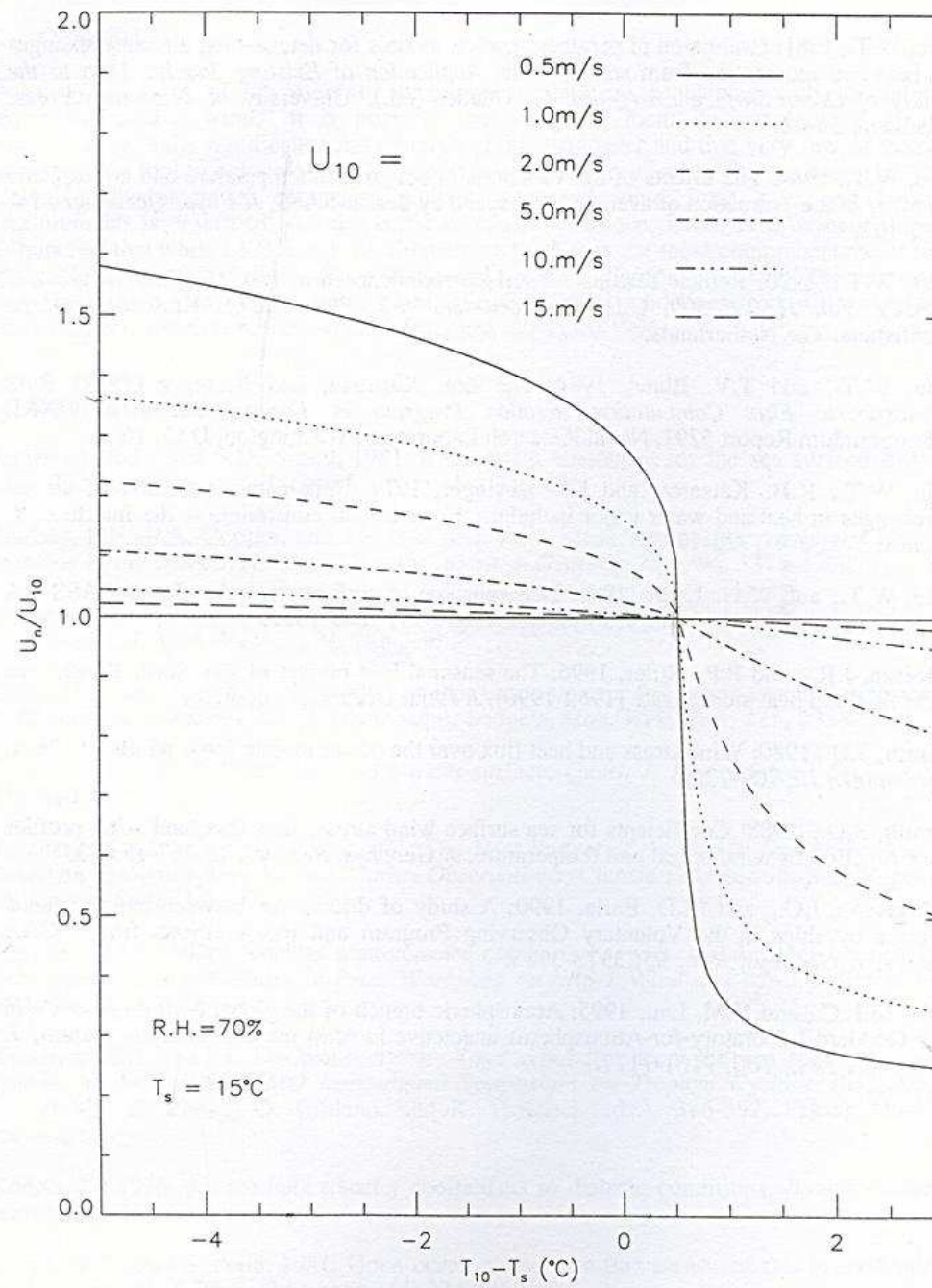






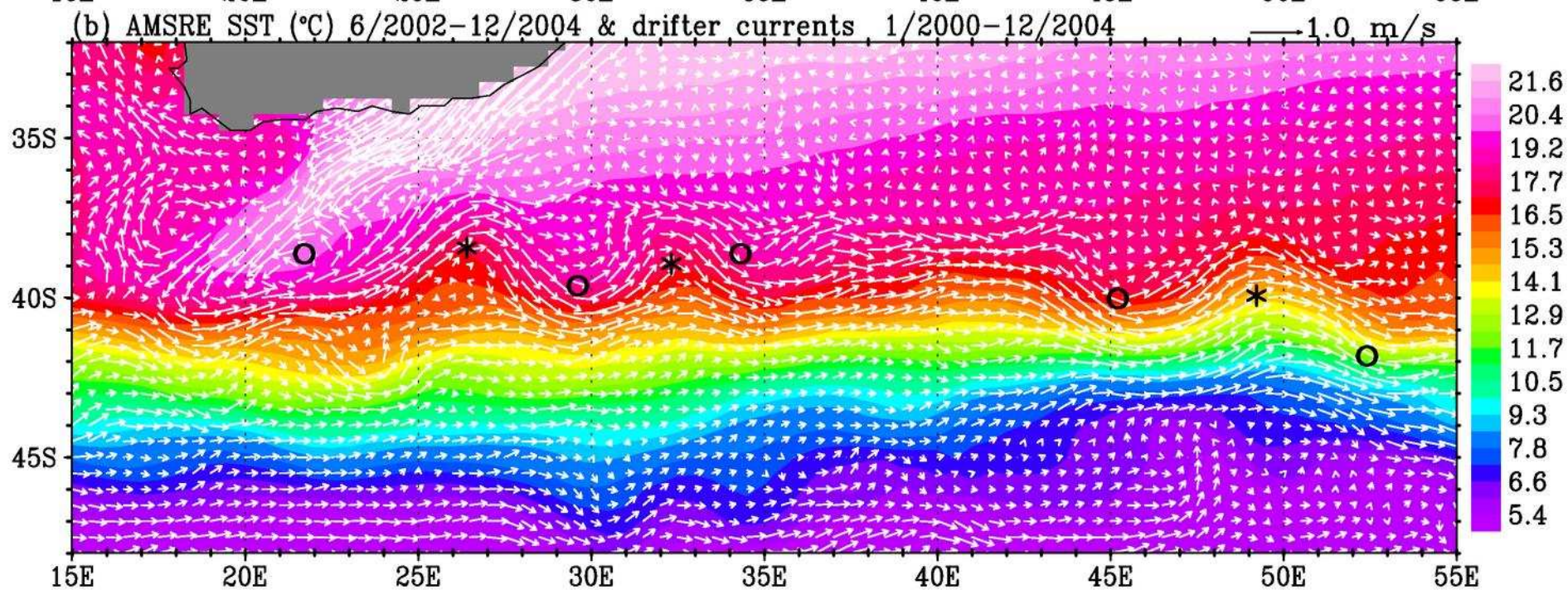
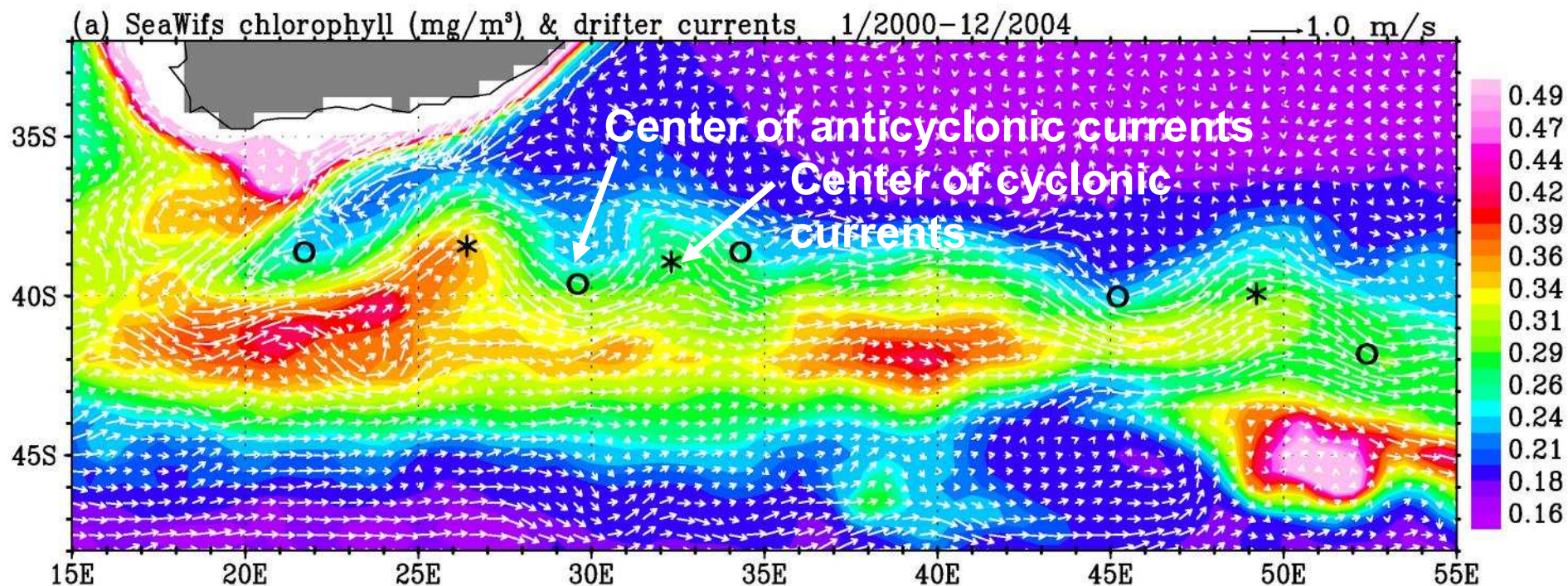
$$\frac{u - u_s}{u_*} = 2.5 \left( \ln \frac{z}{z_0} - \psi_u \right) = \frac{1}{\sqrt{C_D}}$$



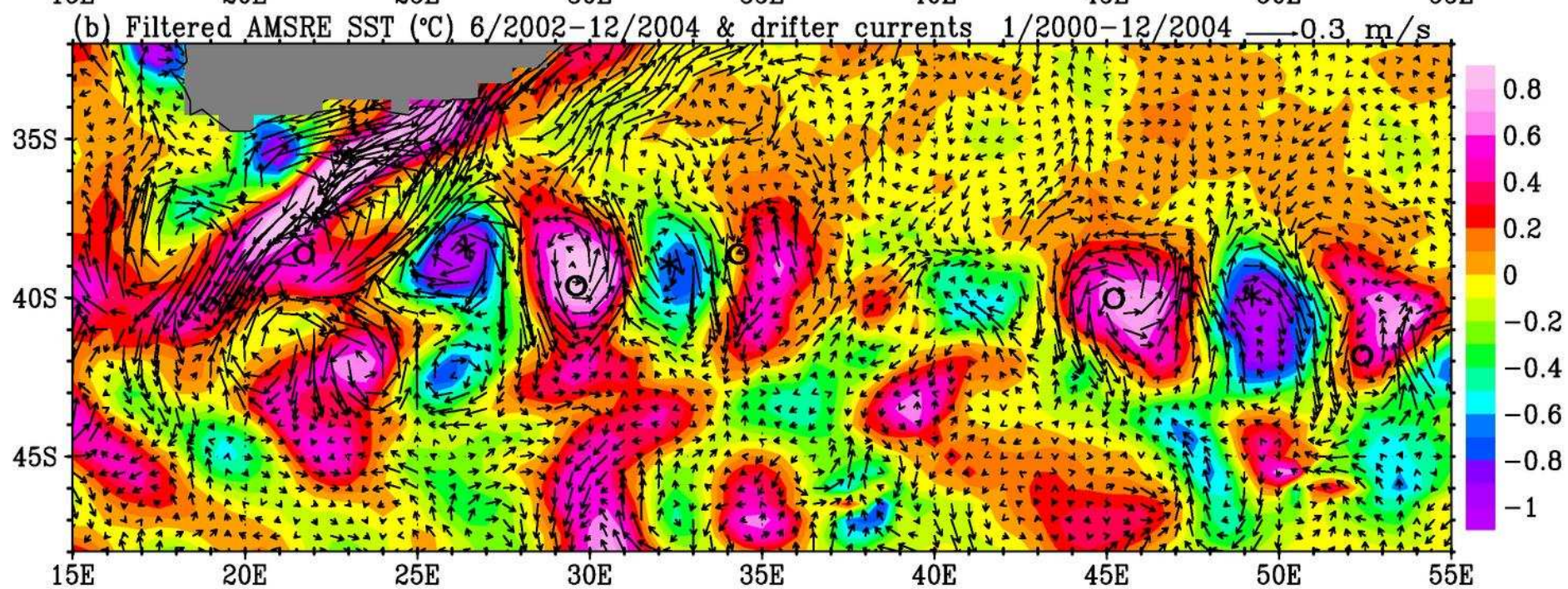
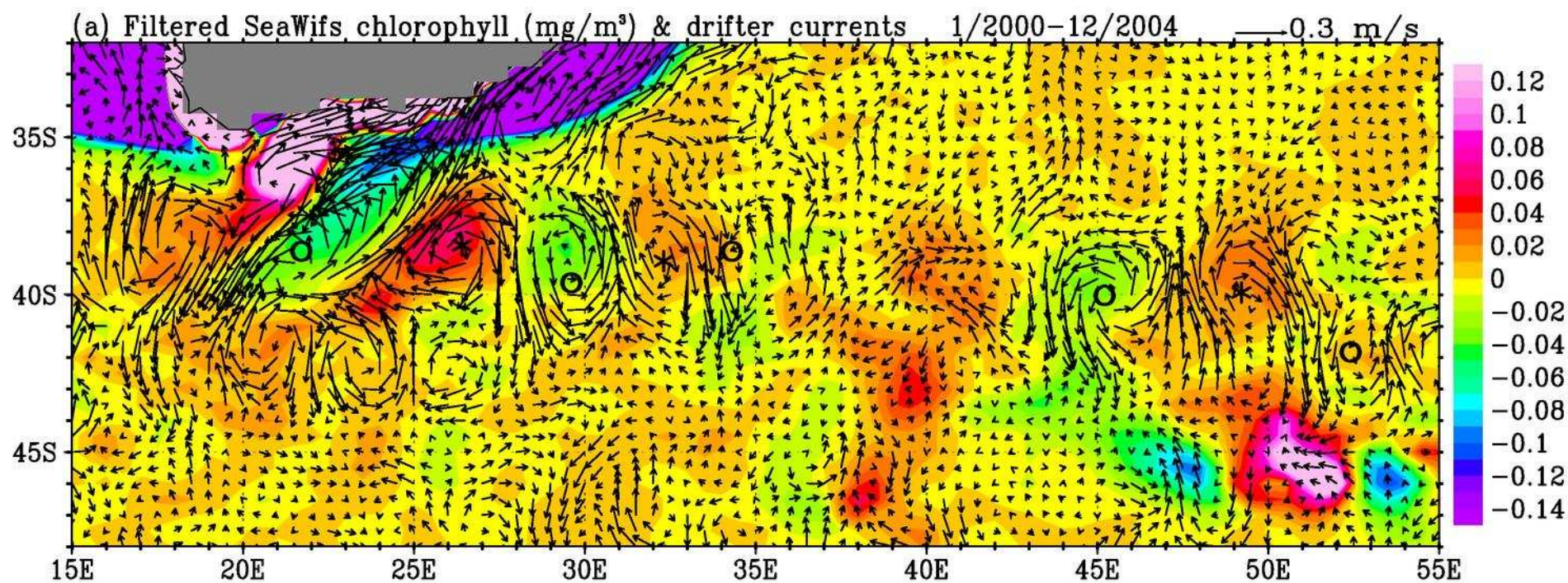


**Liu and Tang, 1996: Equivalent neutral wind. JPL Publication 96-17.**

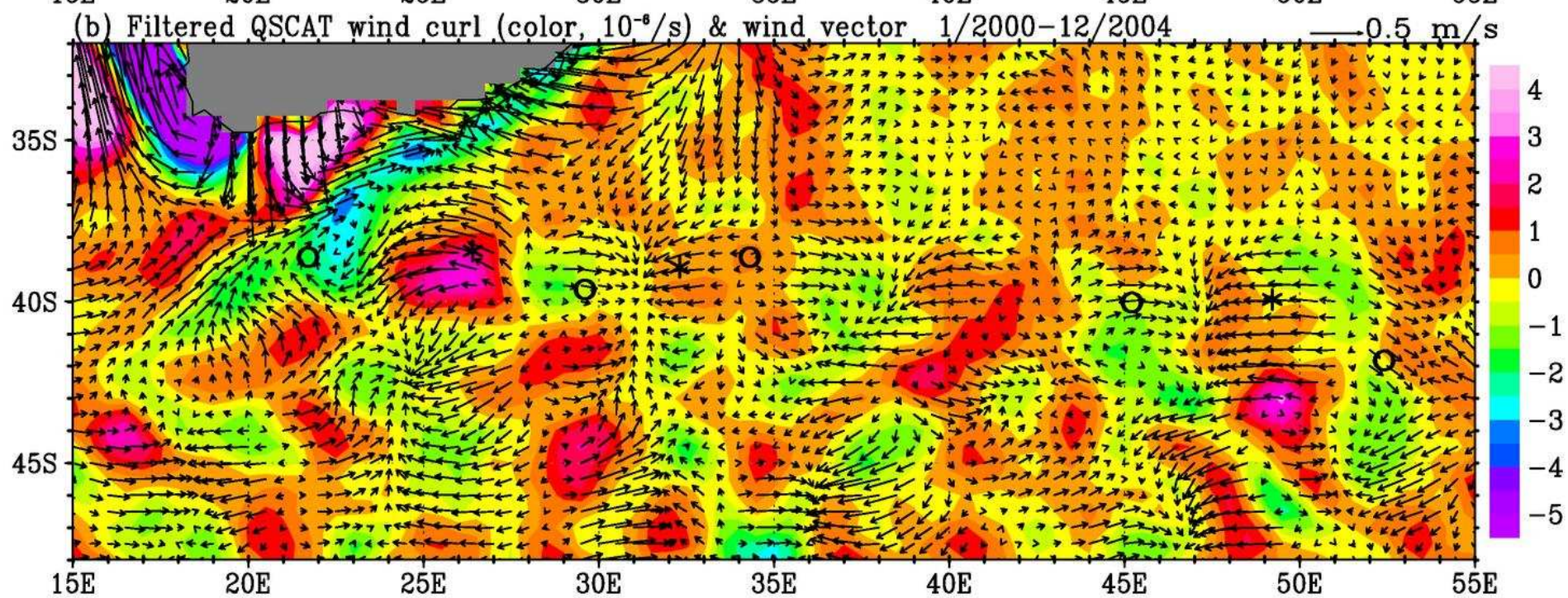
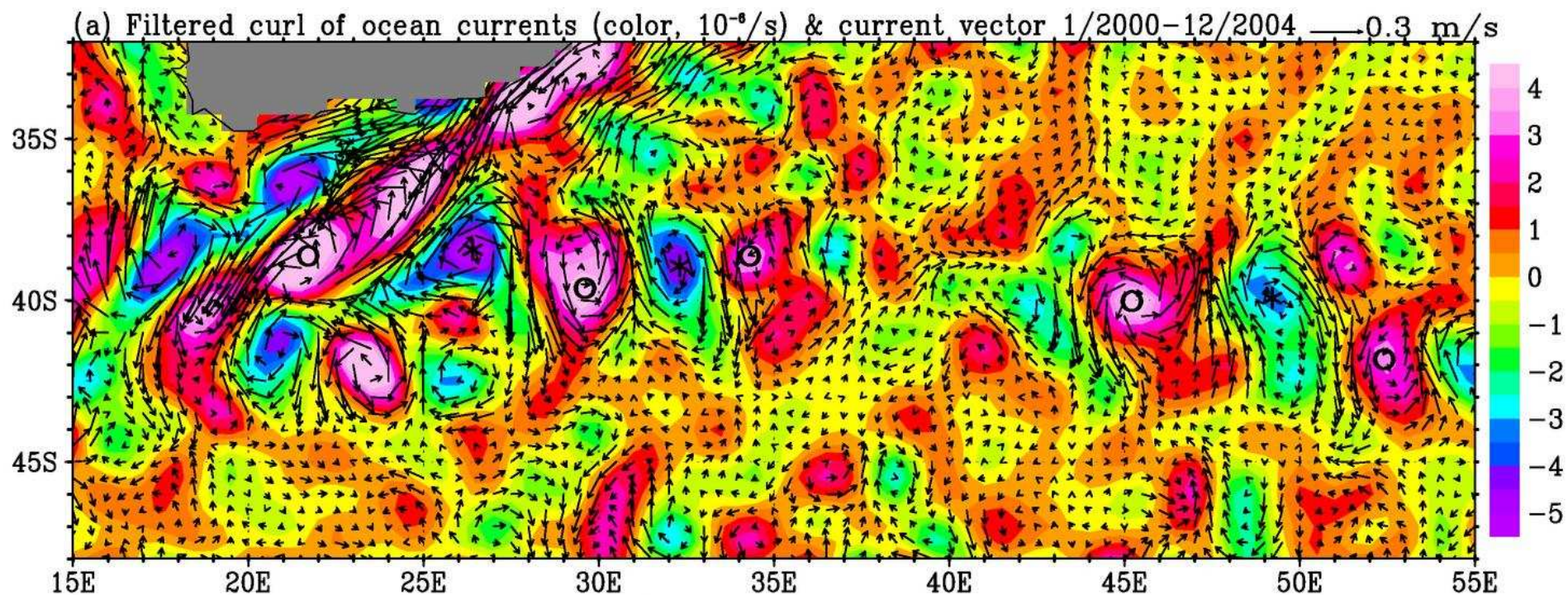






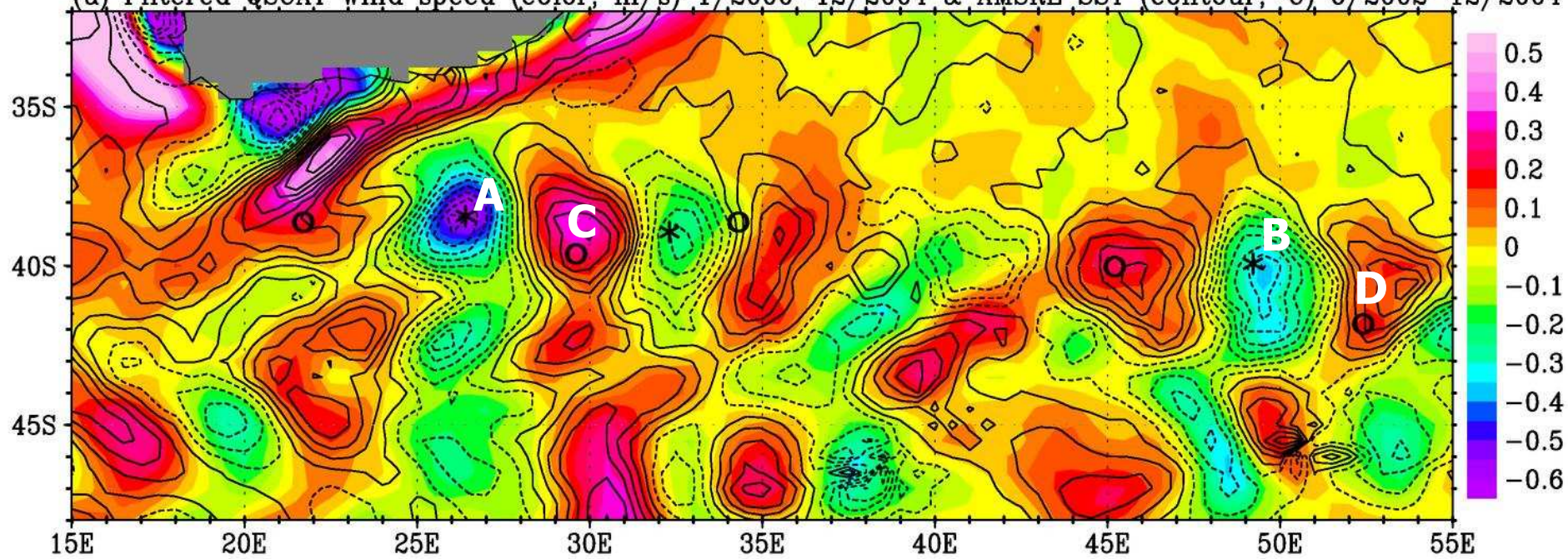




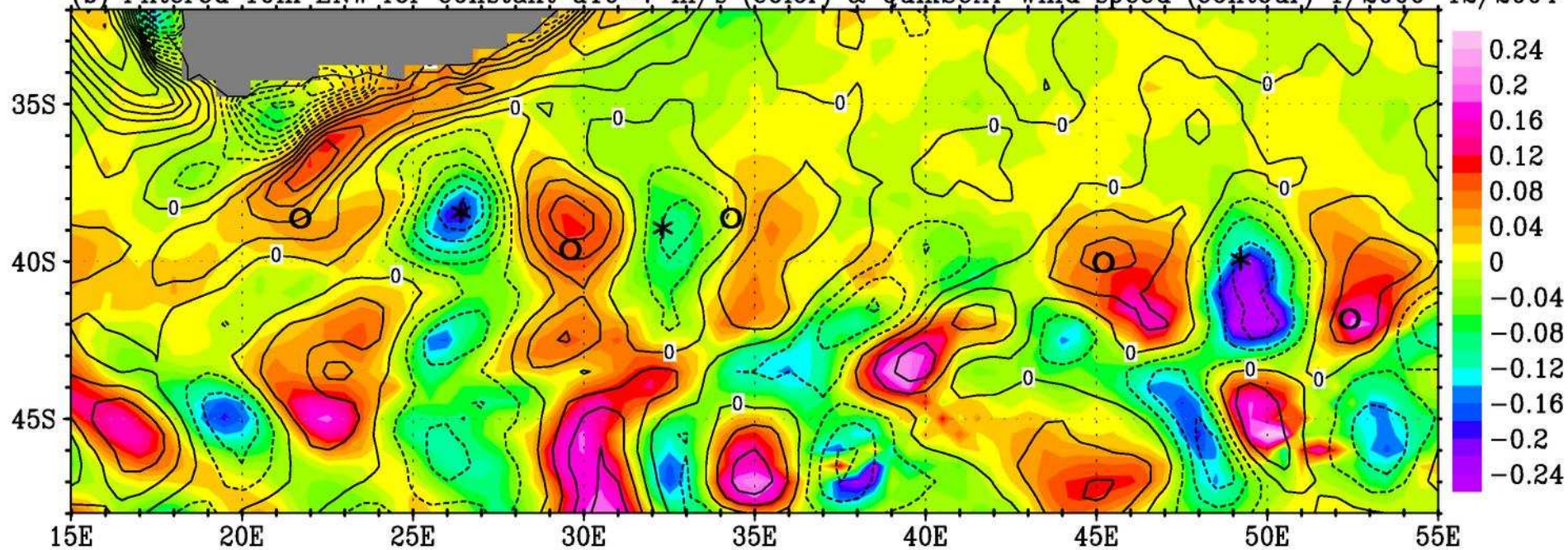




(a) Filtered QSCAT wind speed (color, m/s) 1/2000–12/2004 & AMSRE SST (contour, °C) 6/2002–12/2004

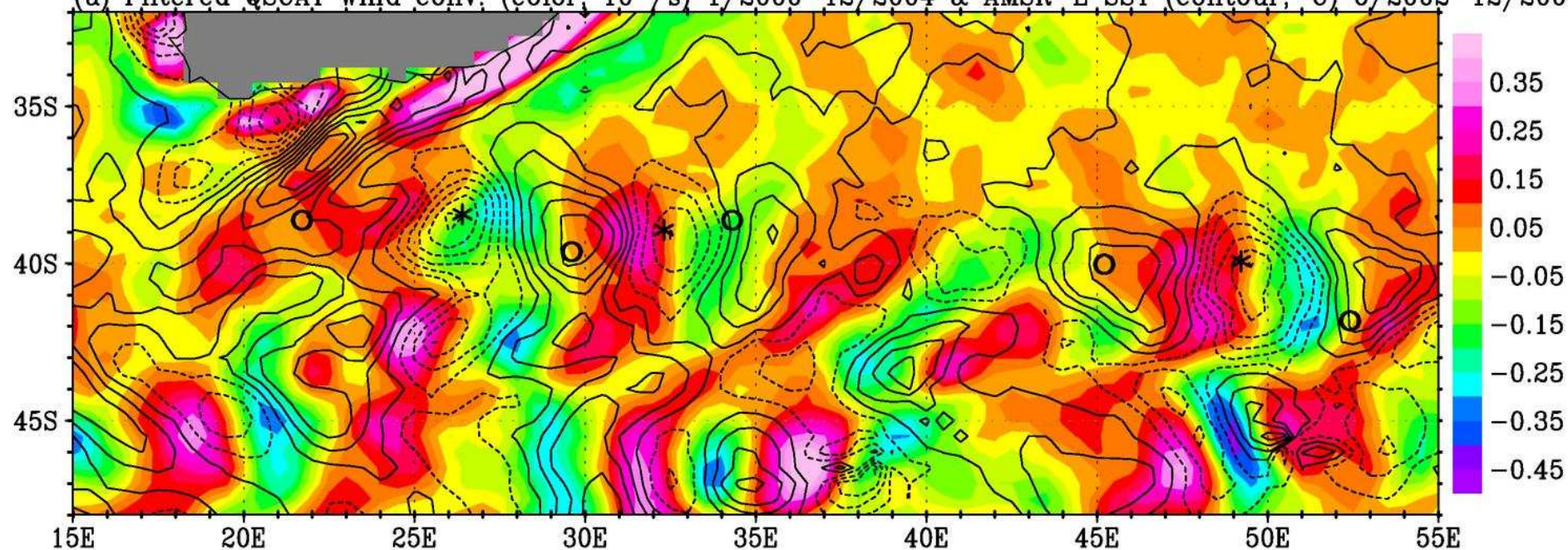


(b) Filtered 10m ENW for constant  $u_{10}=7$  m/s (color) & QuikSCAT wind speed (contour) 1/2000–12/2004

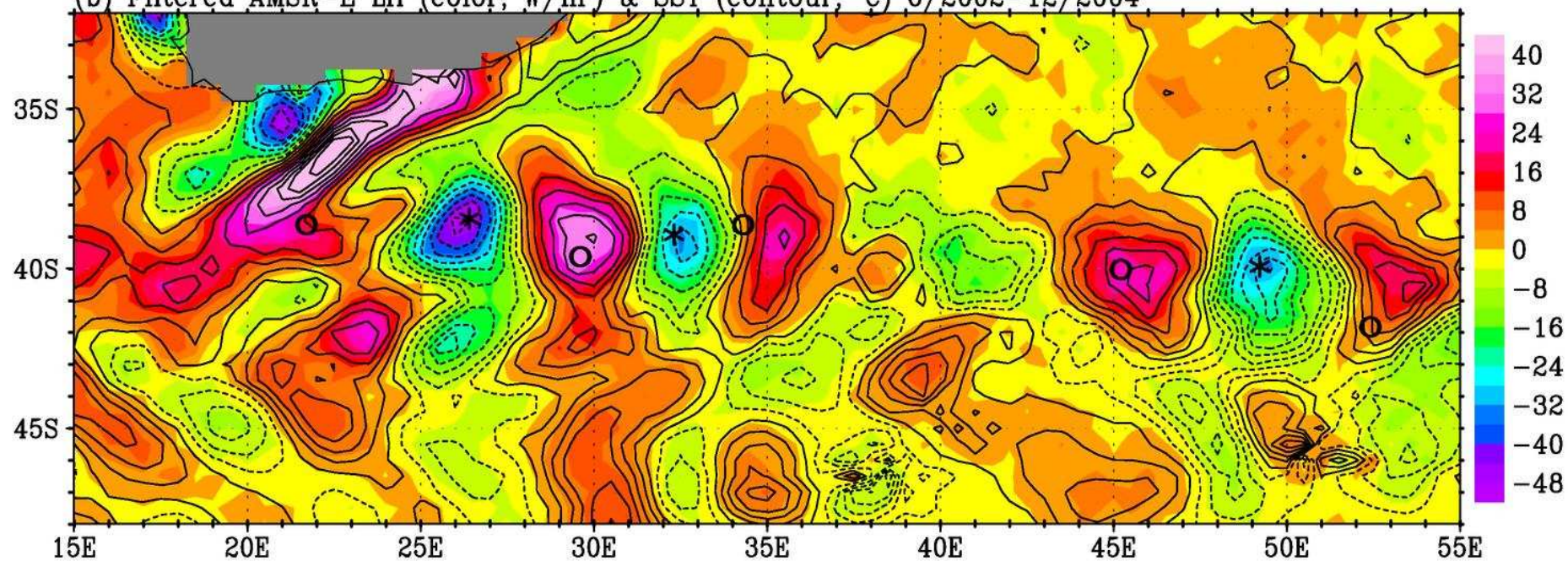




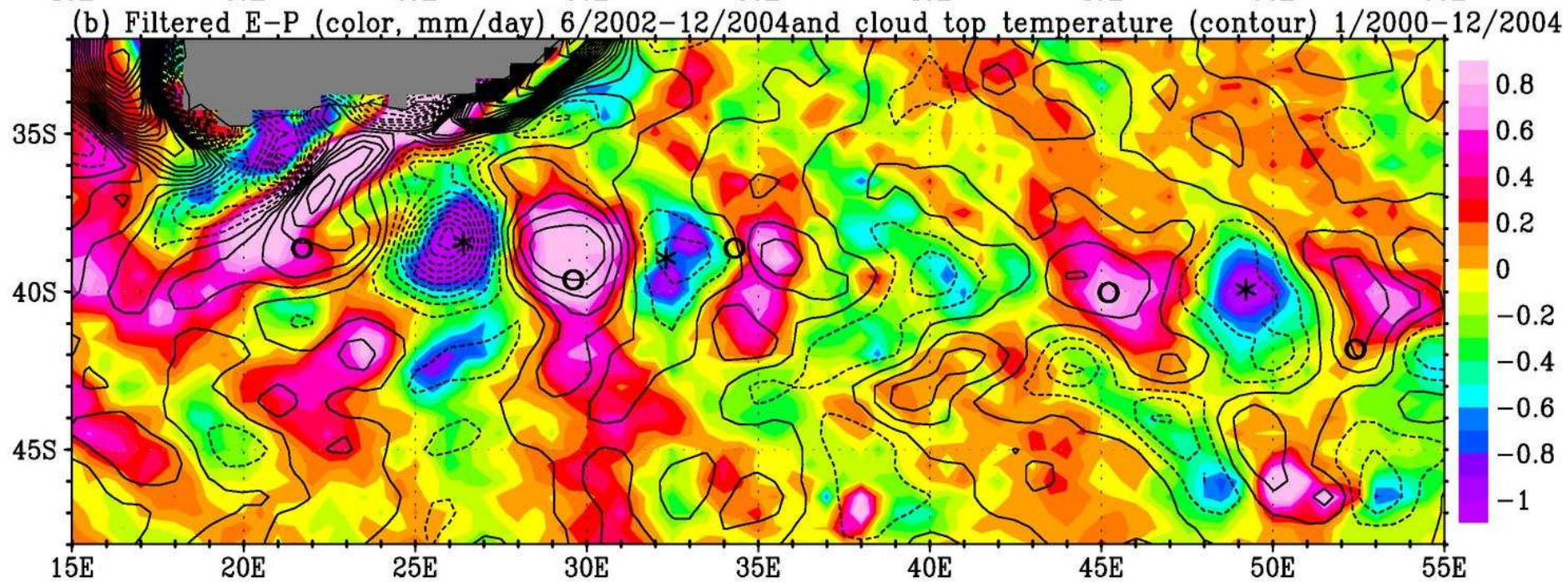
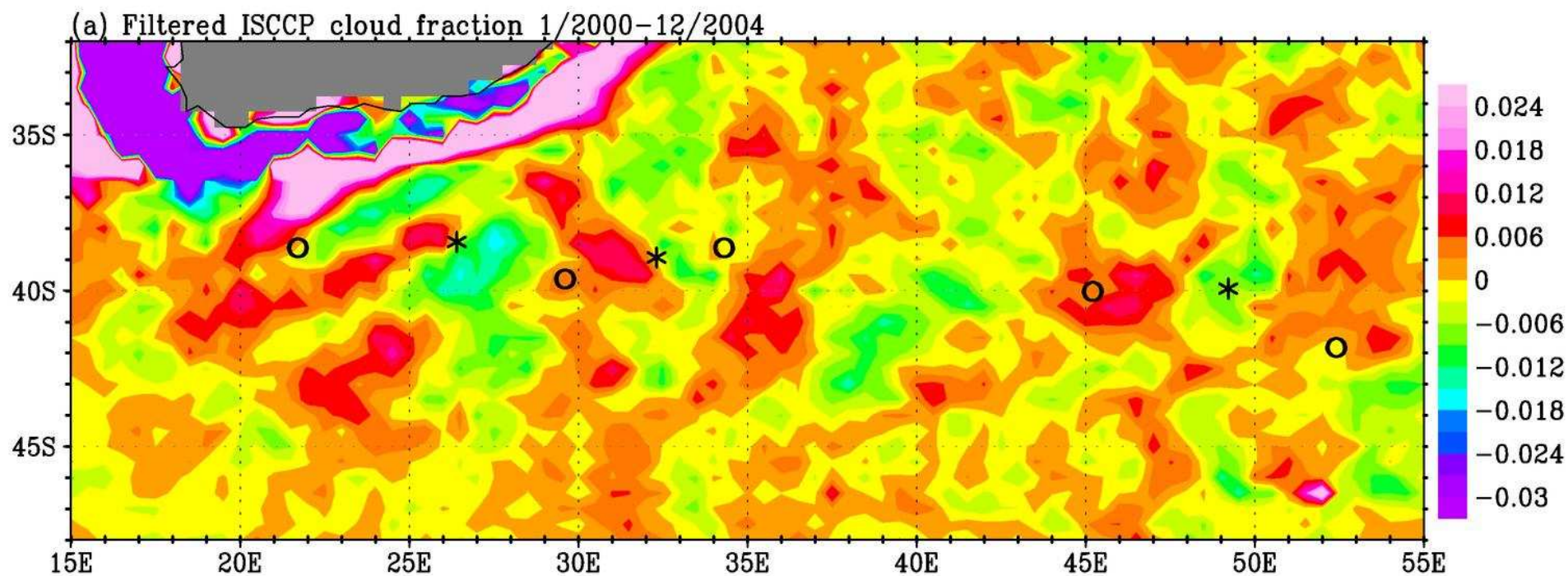
(a) Filtered QSCAT wind conv. (color,  $10^{-5}/s$ ) 1/2000-12/2004 & AMSR-E SST (contour,  $^{\circ}C$ ) 6/2002-12/2004



(b) Filtered AMSR-E LH (color,  $W/m^2$ ) & SST (contour,  $^{\circ}C$ ) 6/2002-12/2004









**Evaporation (E), precipitation (P), and moisture advection ( $\Theta$ )  
over ocean were independently derived from space.**

**E-P and  $\nabla \cdot \Theta$  show similar geographic patterns**

