

Dynamics of the Sea Surface Salinity Maximum Pool in the Indian Ocean

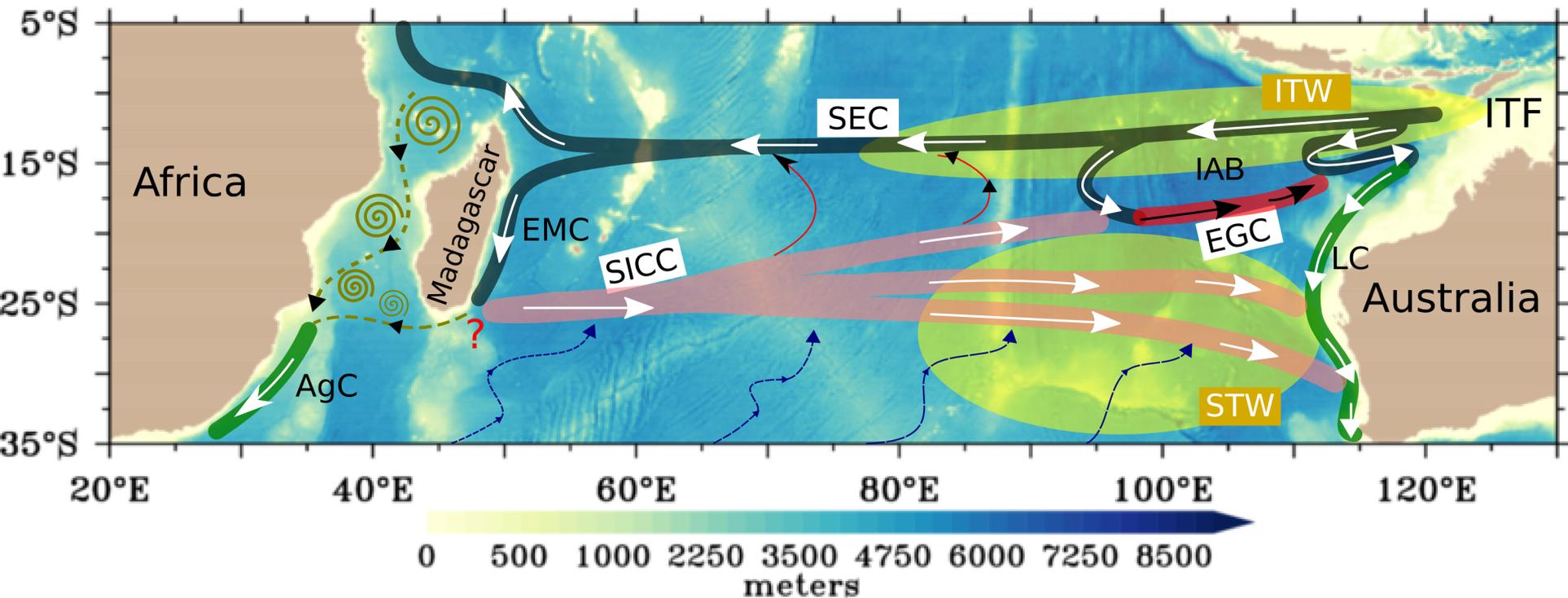
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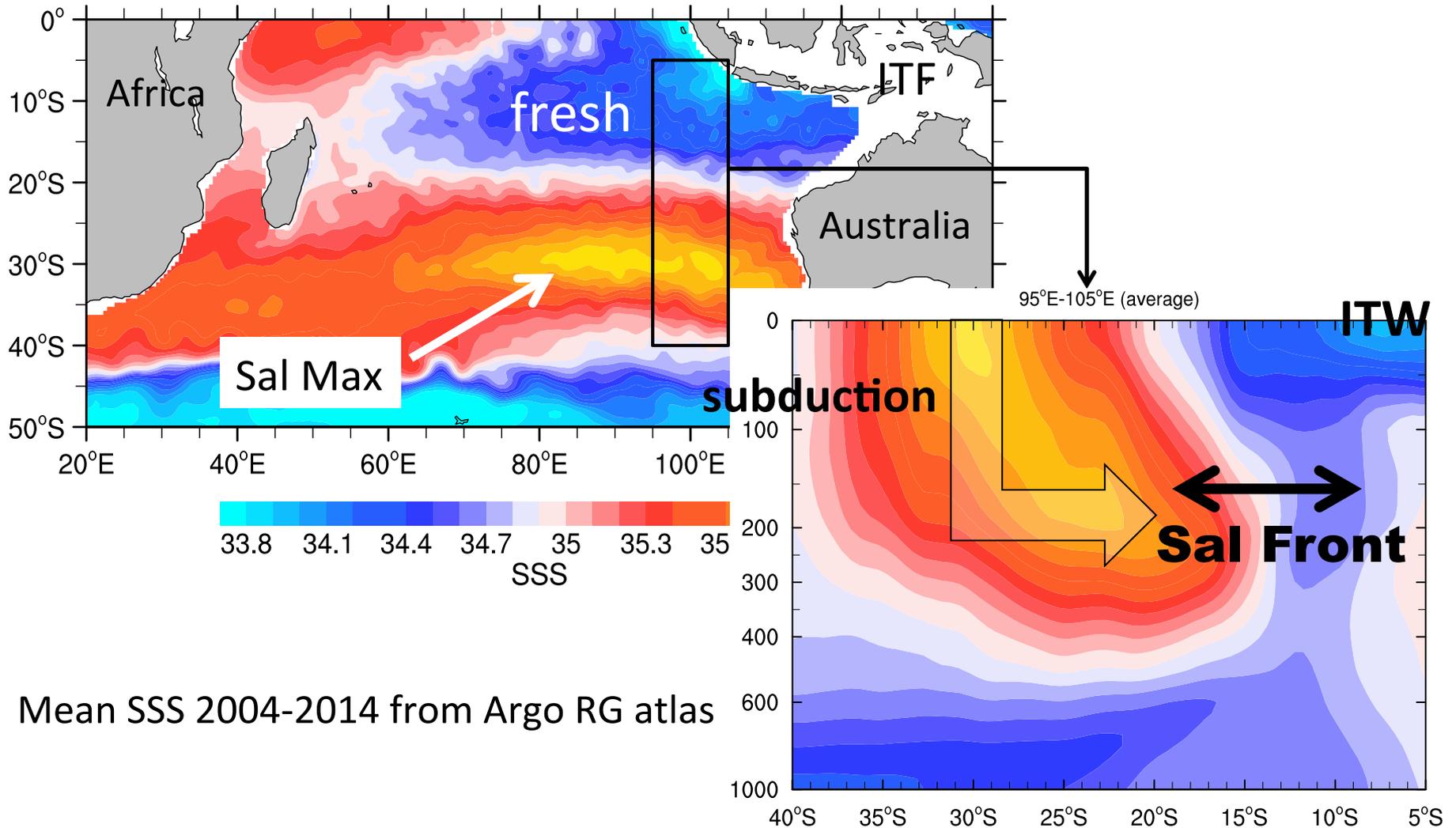
May 23 2017



SIO GEOSTROPHIC UPPER-LAYER CIRCULATION

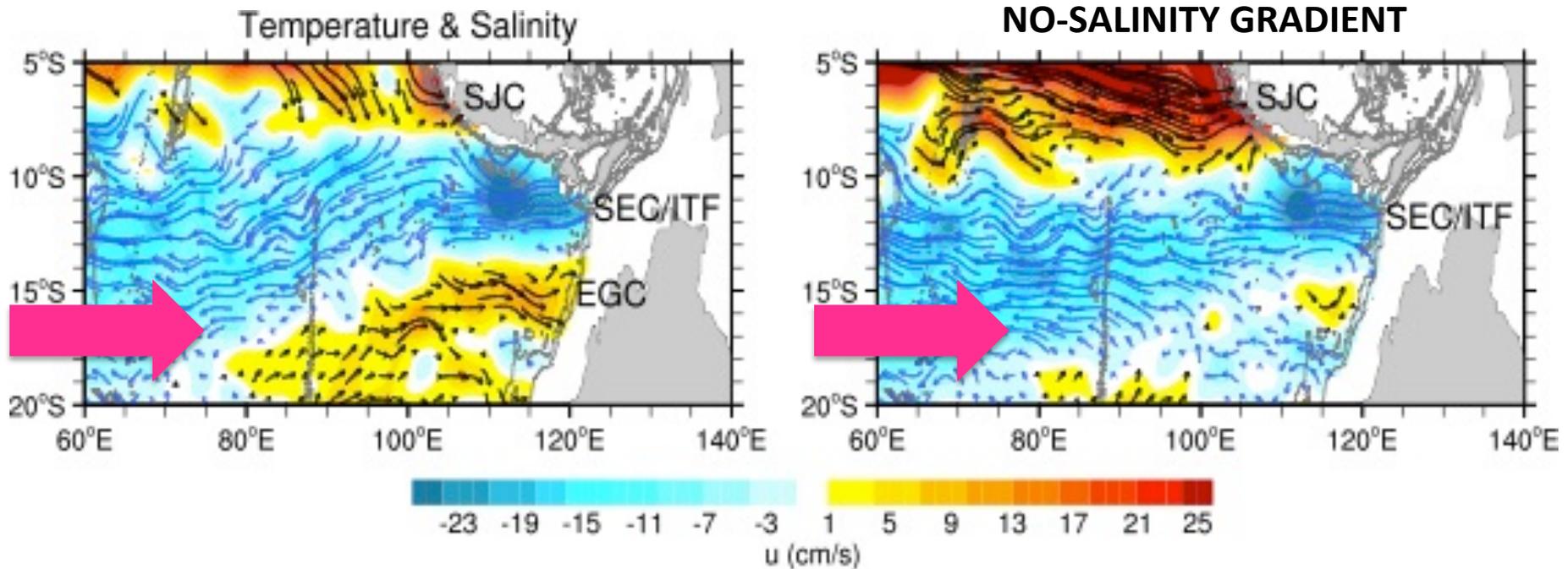


ITF-STW SALINITY FRONT



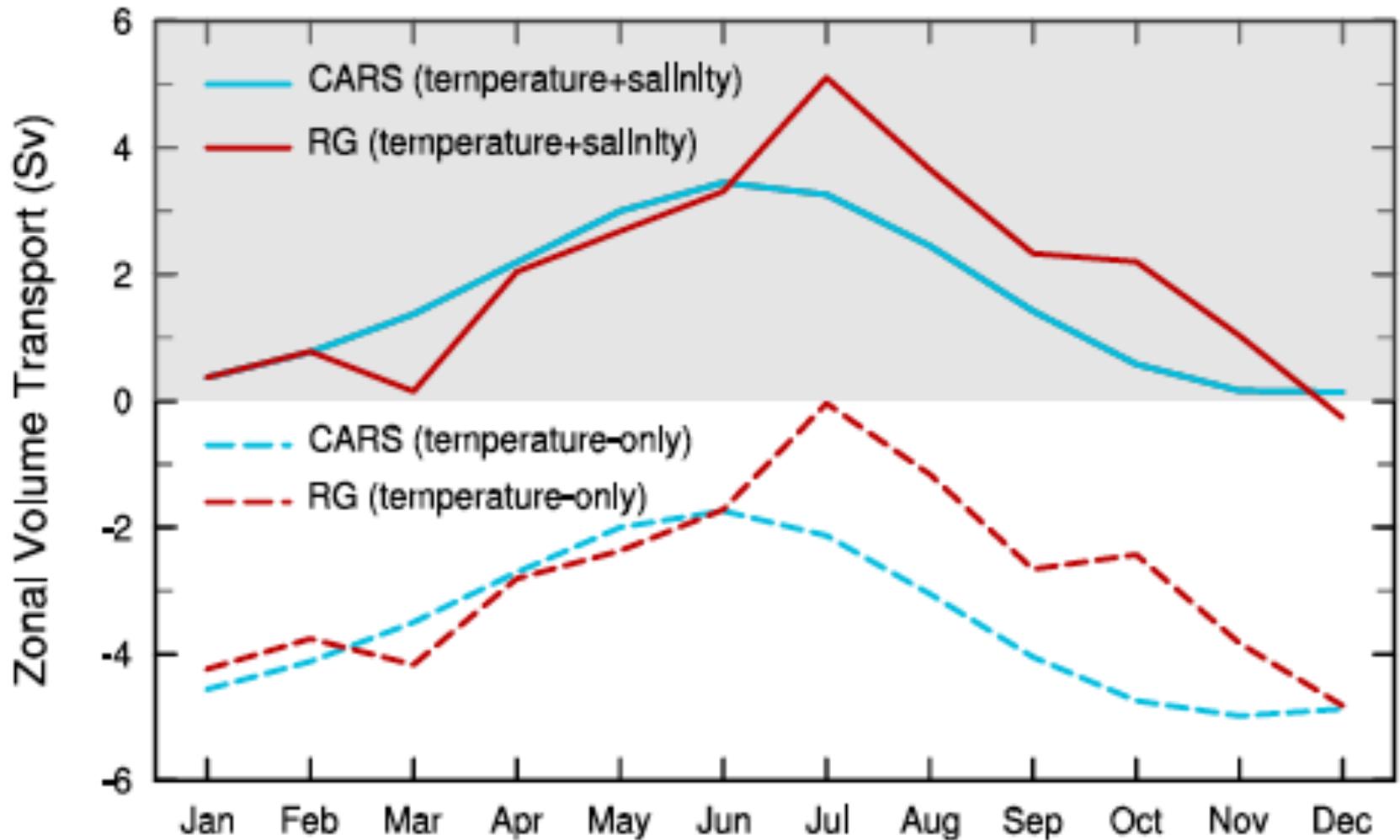
ITF-STW SALINITY FRONT IMPACTS THE SIO CIRCULATION

Eastern Gyral Current (EGC): Upstream Source for the Leeuwin Current



EASTERN GYRAL CURRENT

90° E - 120° E; 20° S - 12° S

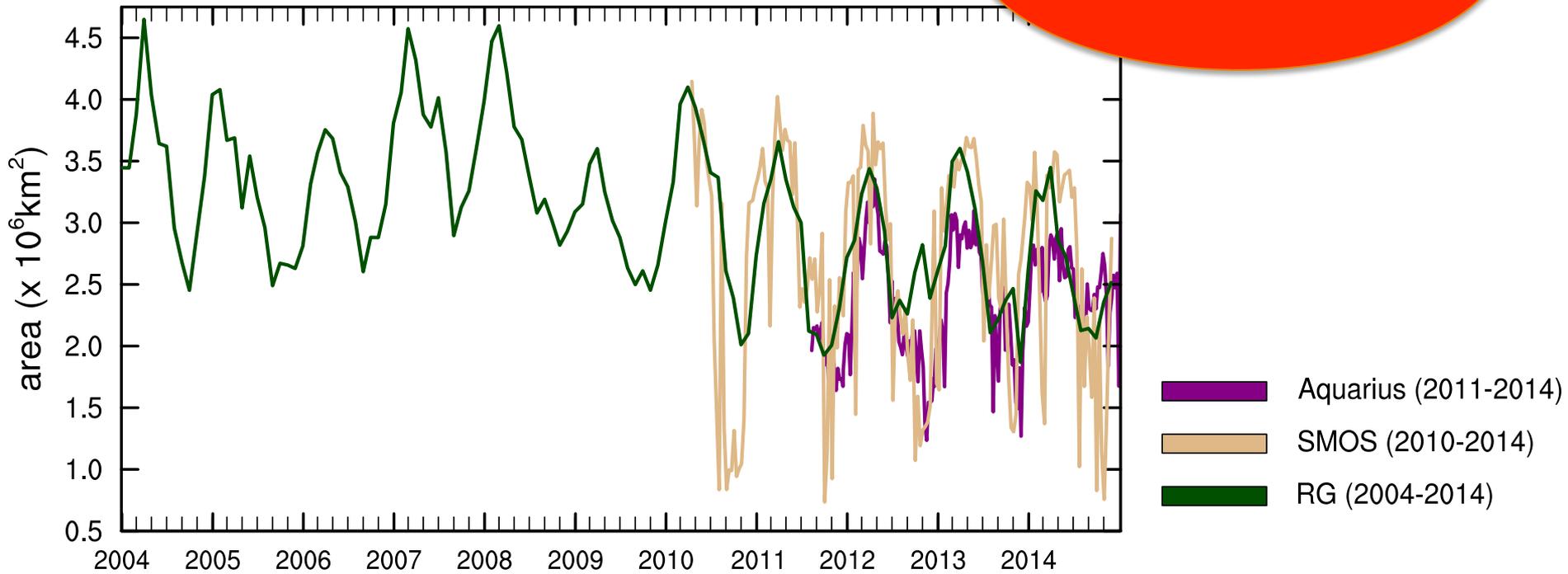


To Characterize the variability of the SIO S-MAX pool through the analysis of multi-source datasets (Satellites, ARGO & ECCO Ocean State Estimate)

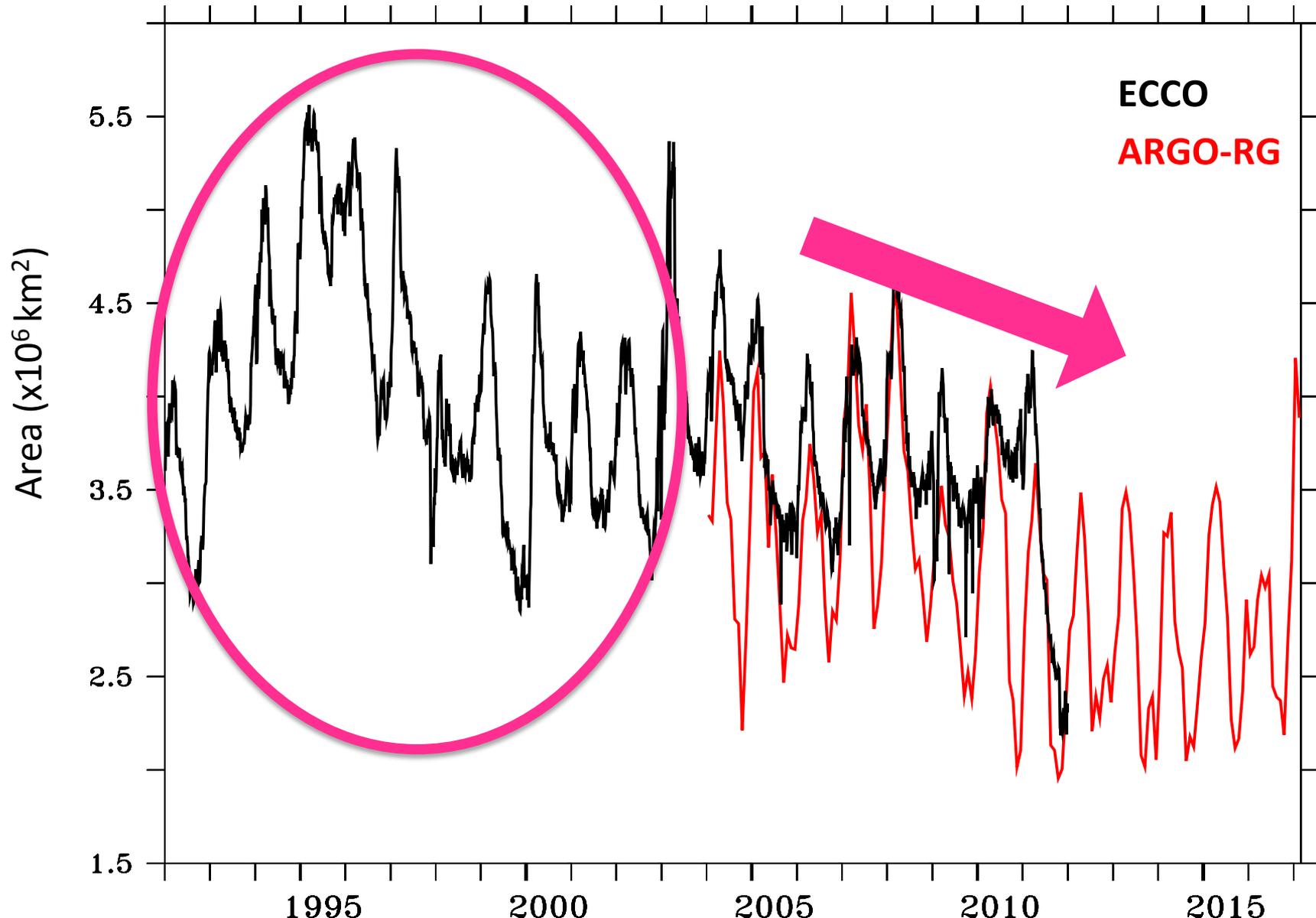
To Determine the physical mechanisms controlling the SIO S-MAX variability

SIO S-MAX AREA

35.7 psu



SIO S-MAX AREA

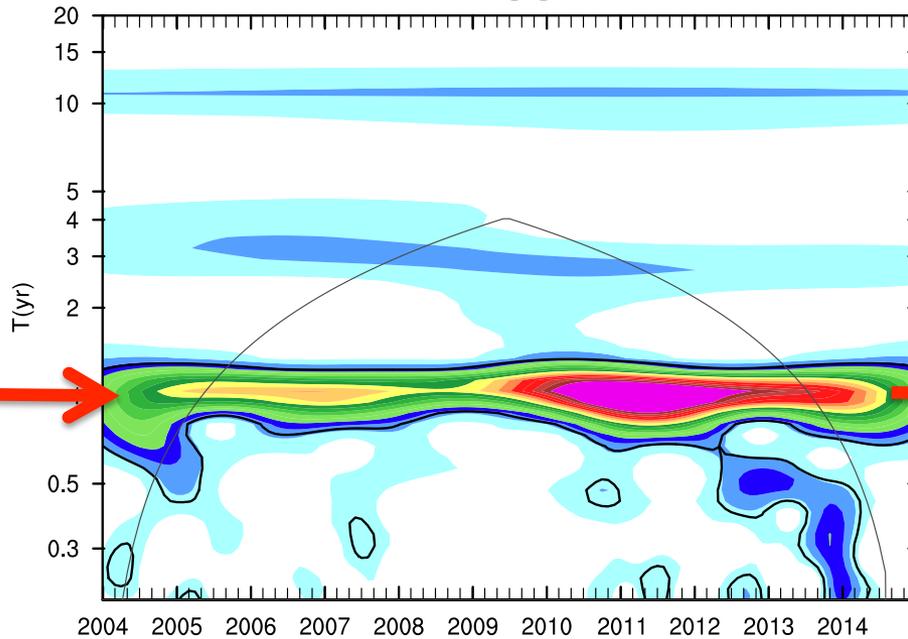


WAVELET SIO S-MAX AREA

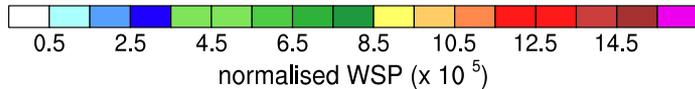
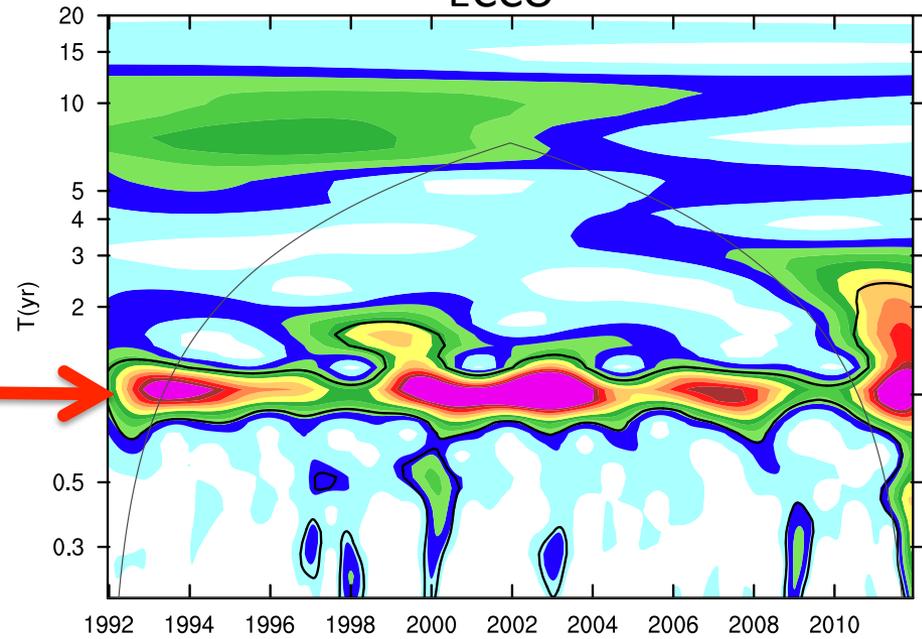
Annual cycle with interannual modulations

Possible **decadal** peak

ARGO



ECCO



TIME SCALES OF VARIABILITY

SIO S-MAX AREA

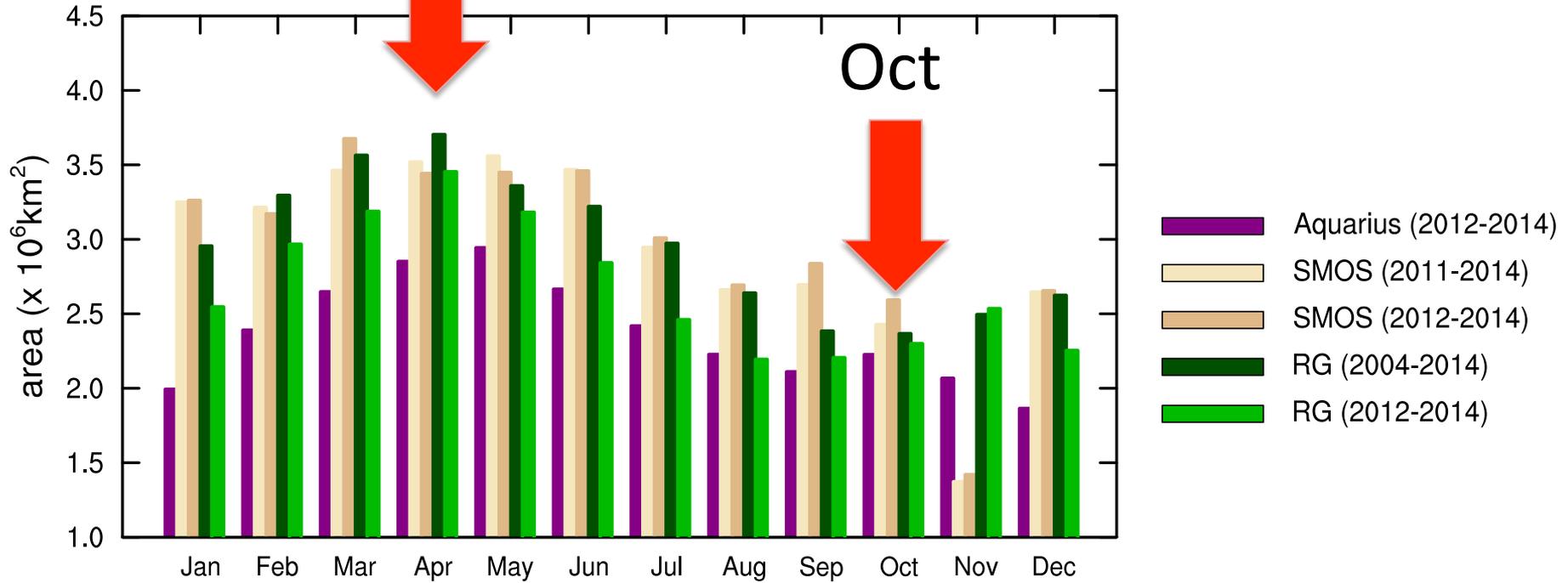
	SMAP	Aquarius	SMOS	RG	ECCO
	8d 2015-2017	7d 2011-2014	10d 2010 - 2014	30d 2004-2014	3d 1992-2011
Annual	65.3%	69.5%	55.33%	50.4%	28.6%
Inter- annual		4.9%	4.9%	42.7%	64.4%

SIO S-MAX AREA: SEASONAL

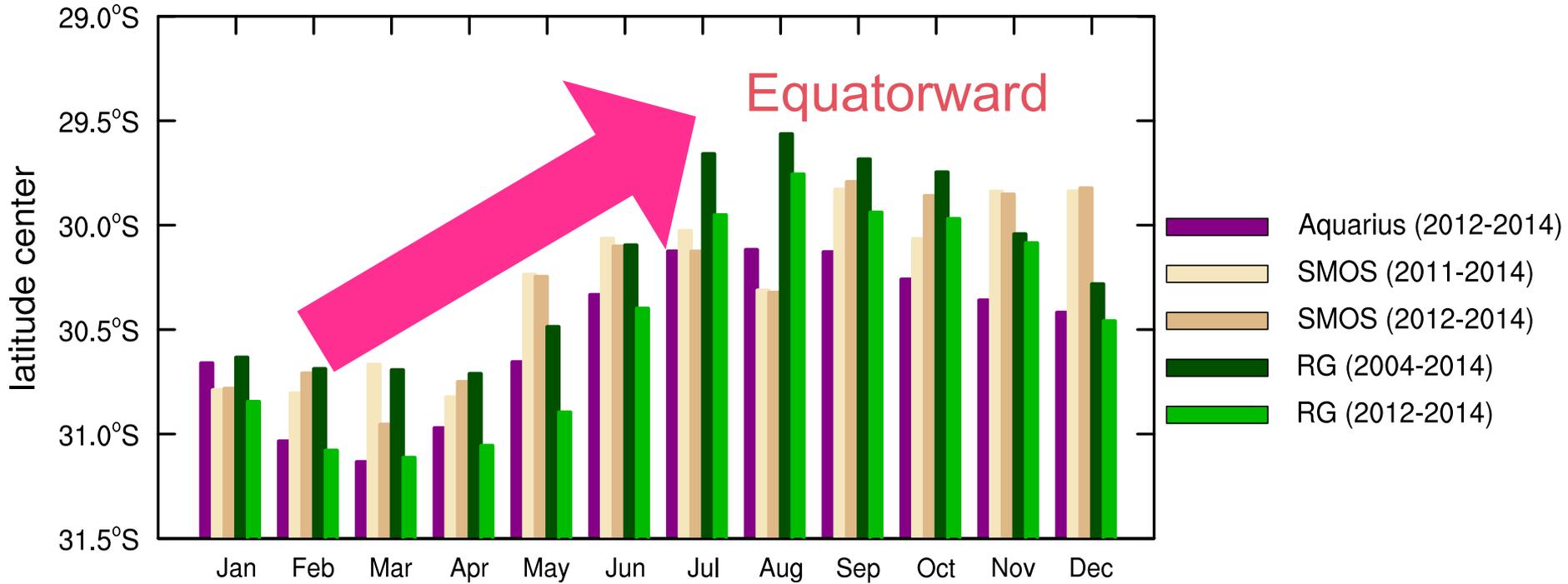
April



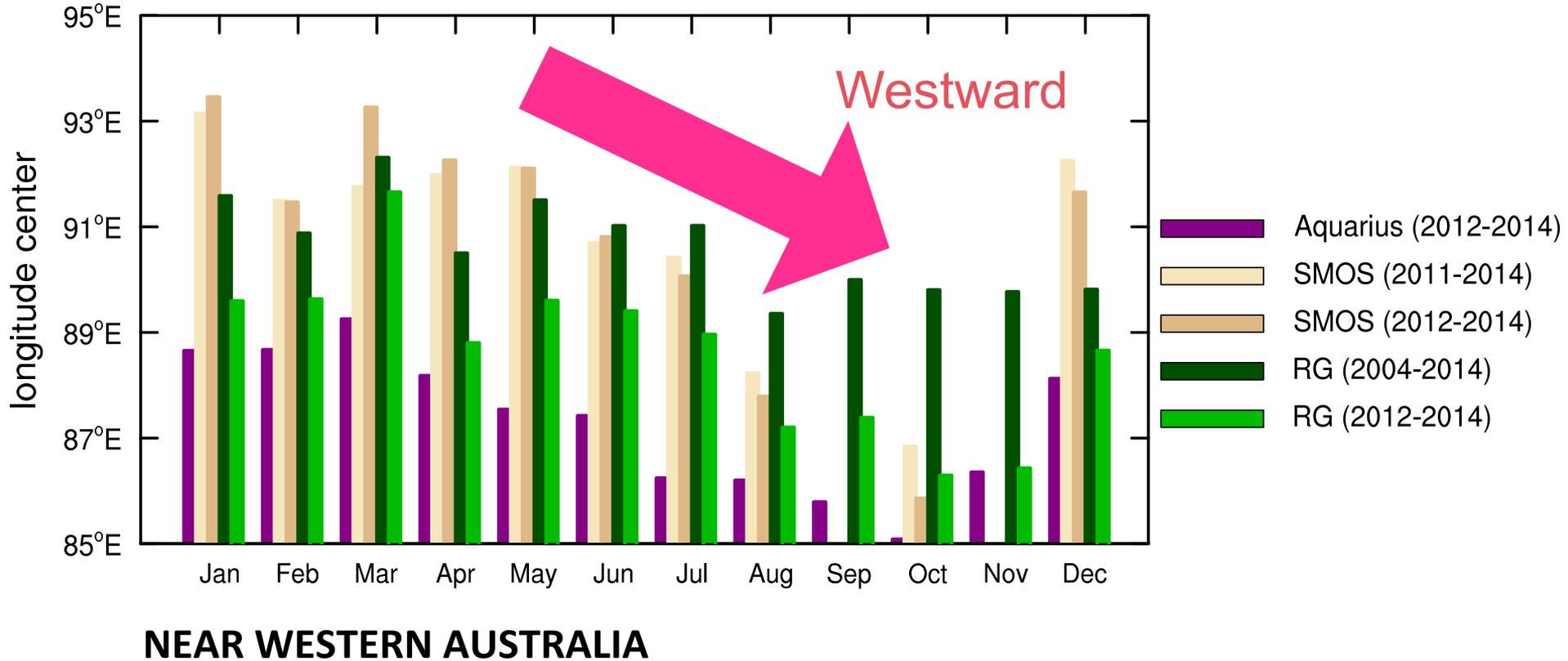
Oct



SIO S-MAX AREA: SEASONAL



SIO S-MAX AREA: SEASONAL



0th DESCRIPTION

OAFIux – TRMM 3B42

OSCAR + RG-ARGO

$$\frac{\partial S}{\partial t} = h^{-1}(E - P)S - \left(U \frac{\partial S}{\partial x} \right) - \left(V \frac{\partial S}{\partial y} \right) - W_e \cdot (S - S_{z=h})h^{-1} + R,$$

RG-ARGO: S, h, dS/dt

$$W_e = \left(\frac{\partial h}{\partial t} + \nabla \cdot h\mathbf{v} \right)$$

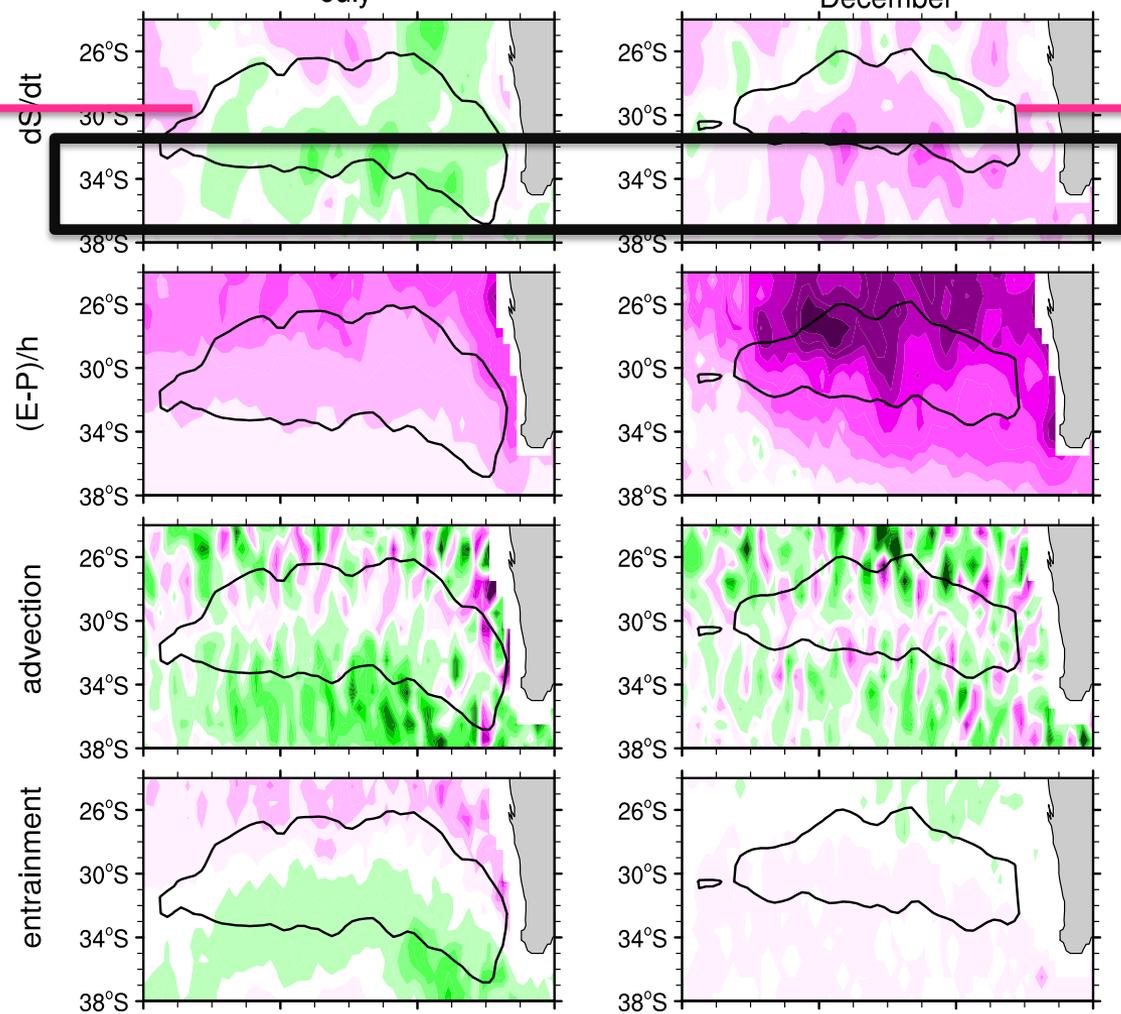
h : MLD

We: Entrainment Velocity

S: Sal MLD

R: Other therms

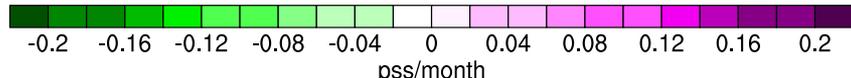
April
(Max Area)



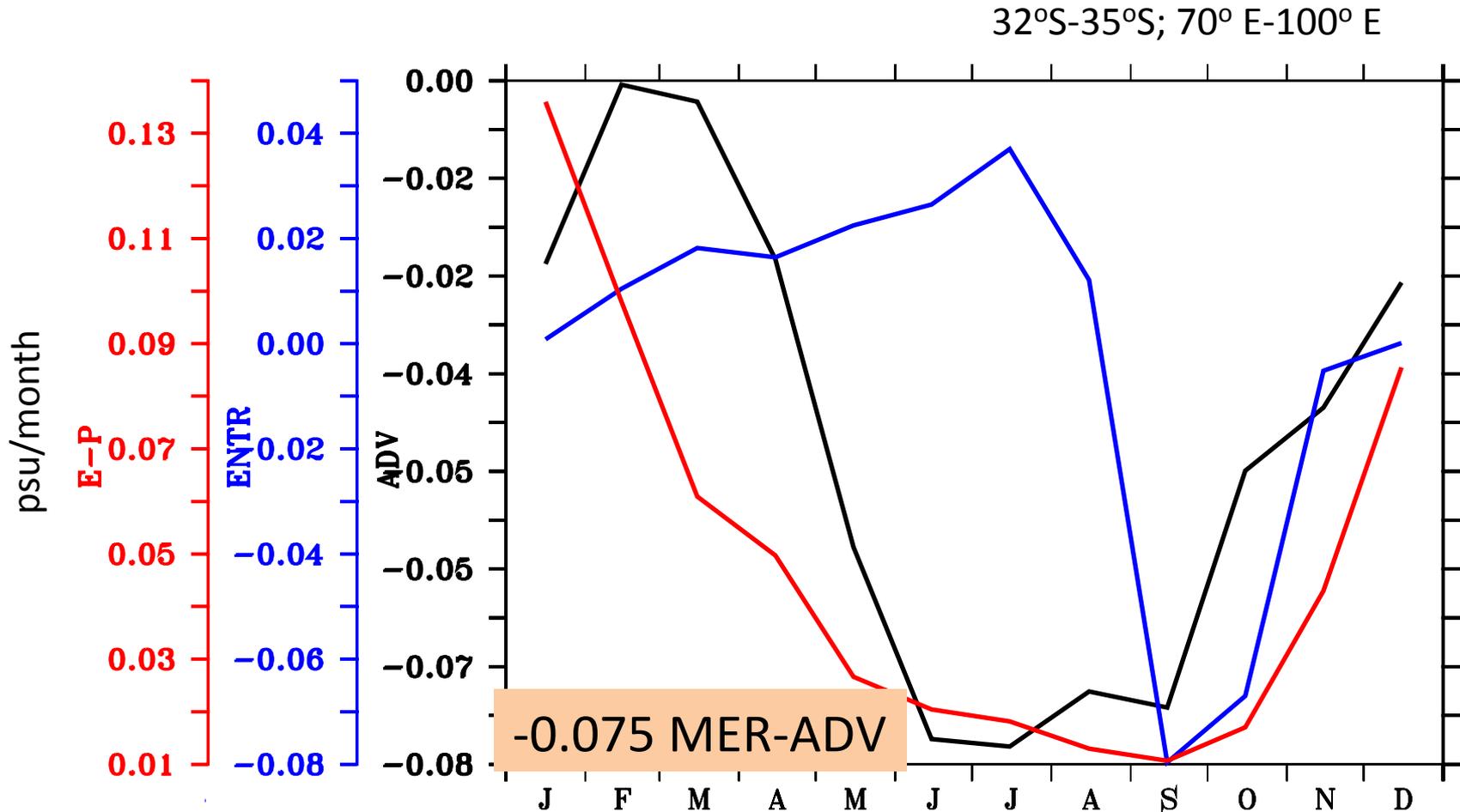
October
(Min Area)

**AUSTRAL
WINTER**

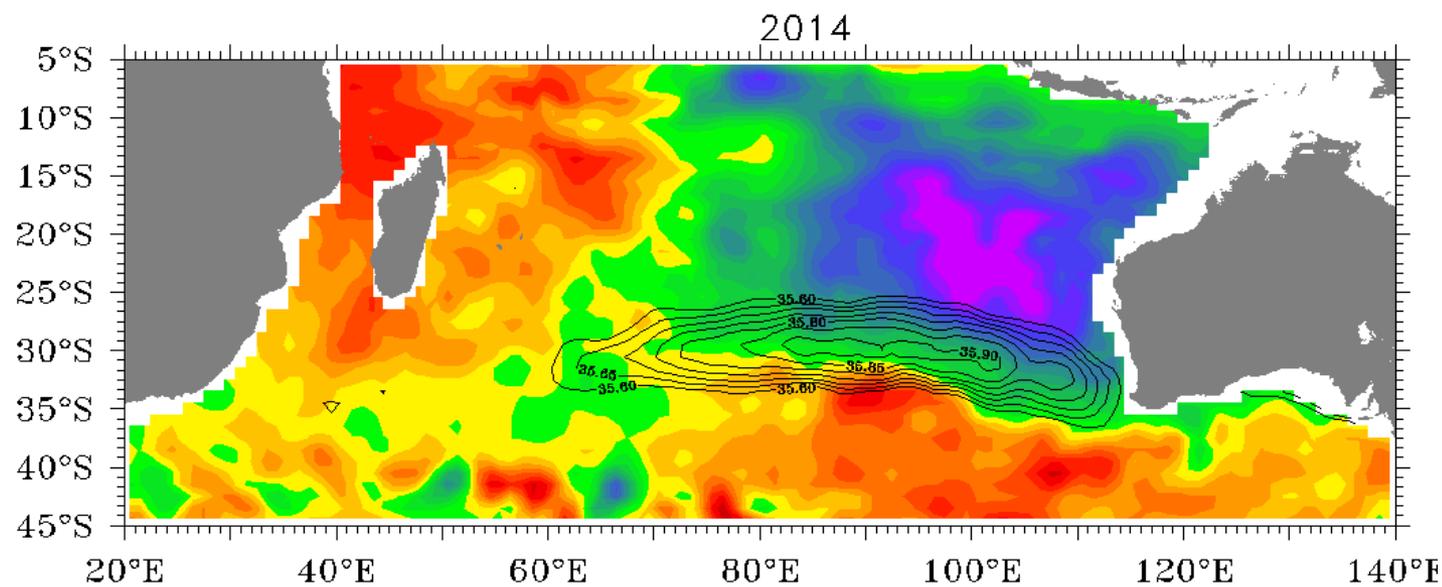
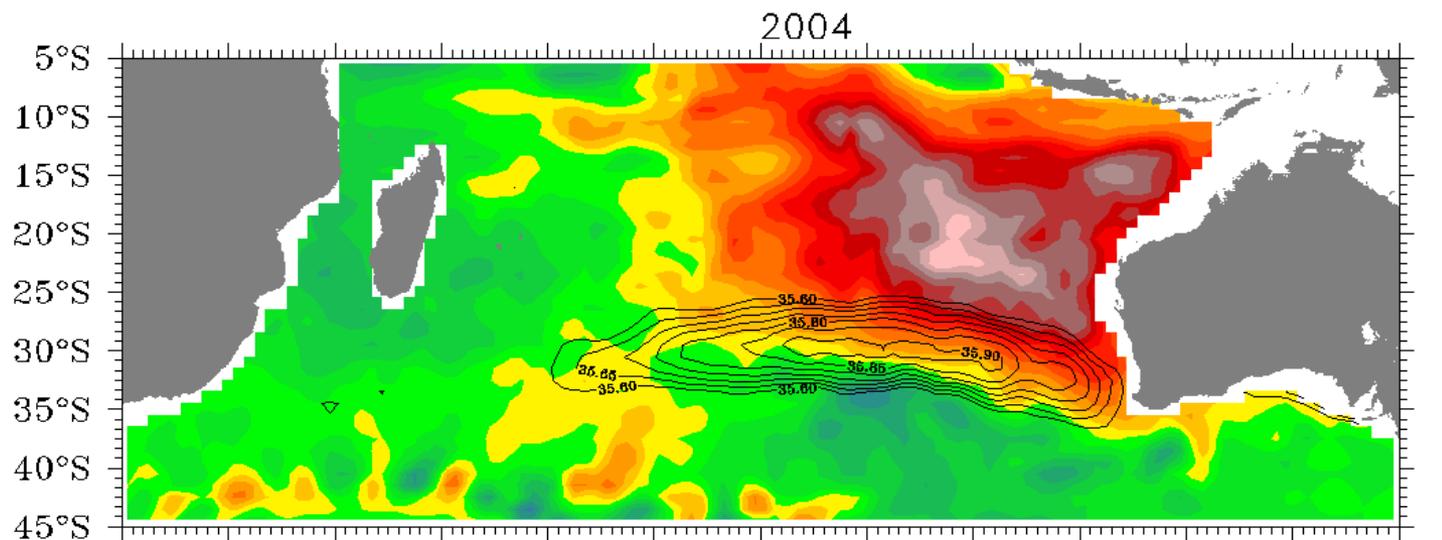
**AUSTRAL
SUMMER**



SALINITY TENDENCY EQ TERMS



**10-YR
CHANGE
FROM
ARGO**



SSSA

NON-LINEAR TREND SSA-FILTERED



SUMMARY

- Strong Seasonal Cycle: Contraction/
Expansion
- Decadal Variability
- Seasonal

Contraction → ADV and ENTR

Expansion → E-P