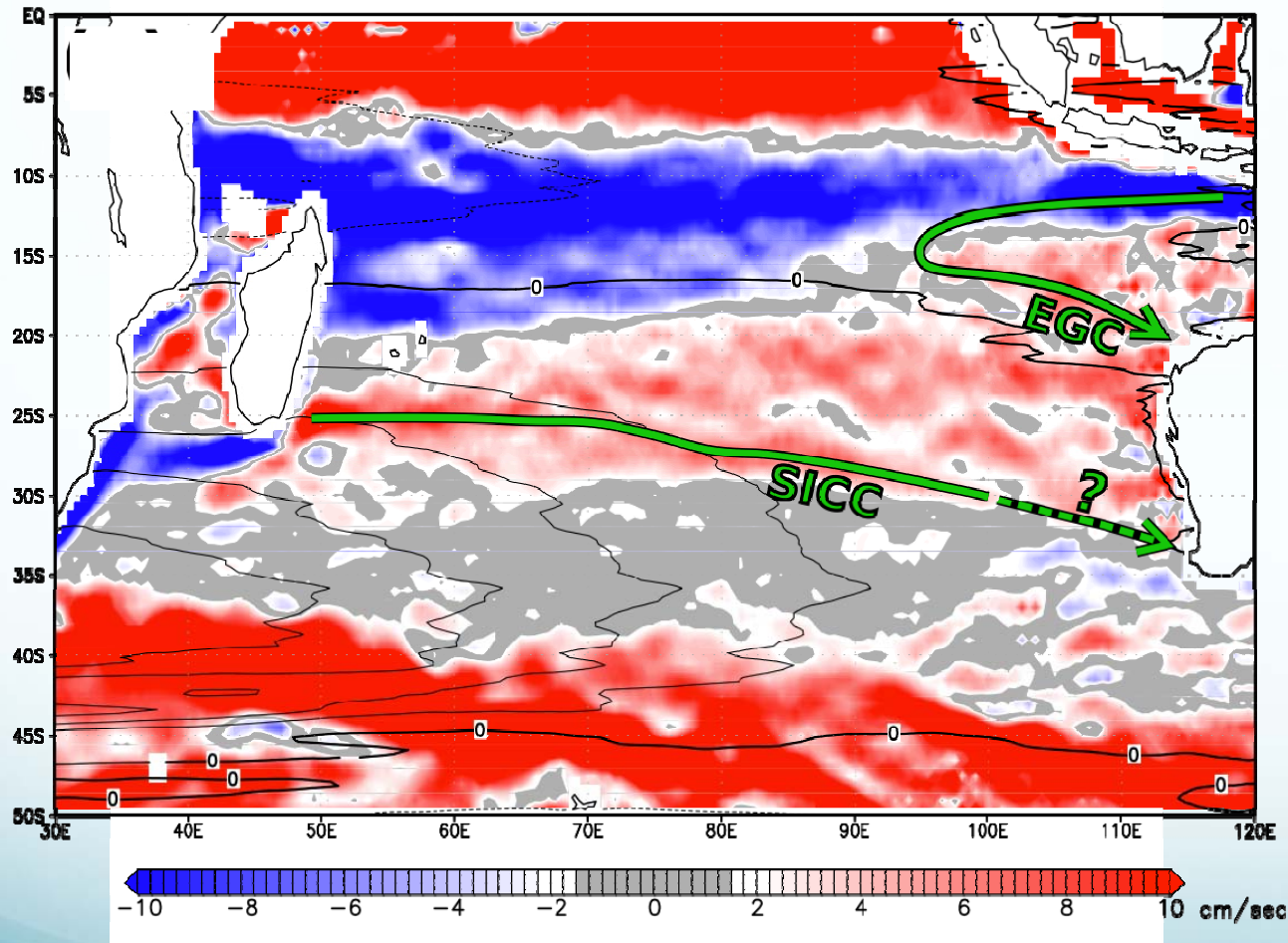


# Near-surface Eastward Currents in the South Indian Ocean

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# Near-surface eastward flows



Surface zonal  
geostrophic flow  
from mean  
dynamic  
topography  
(shading)

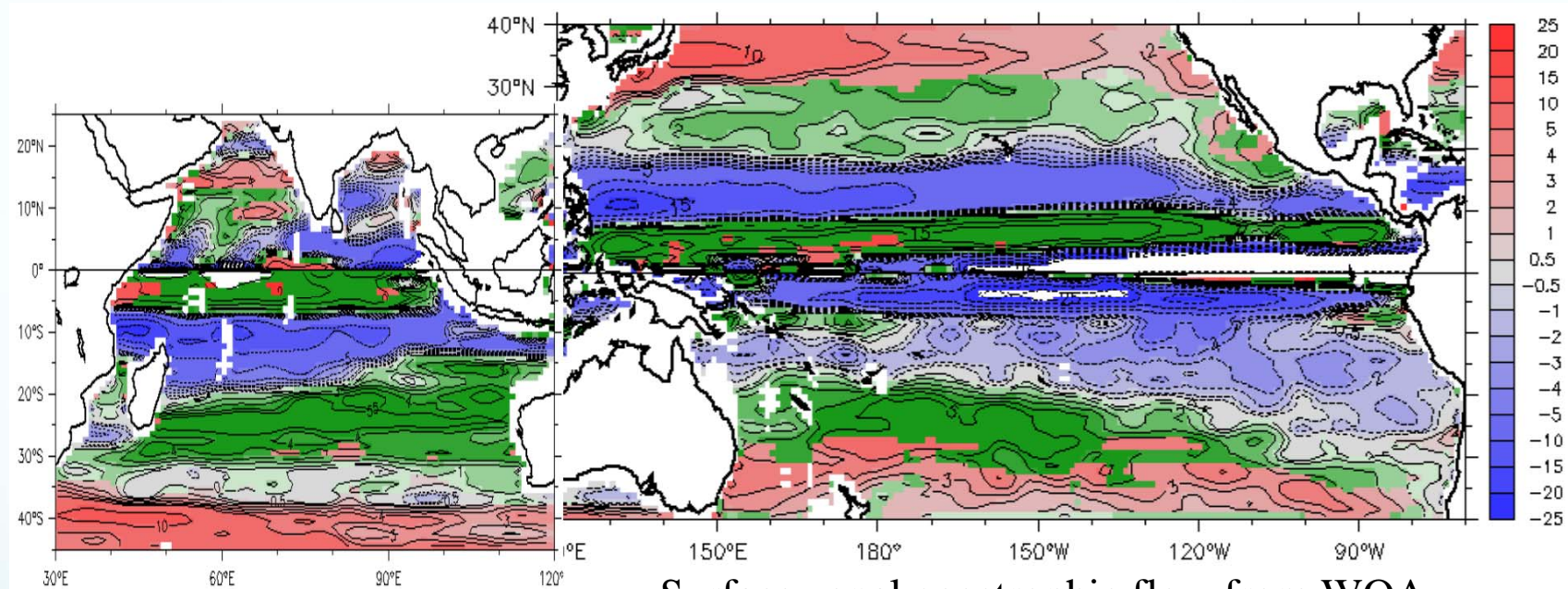
Annual mean  
Sverdrup  
streamfunction  
(contours)

# Why are they special?

- They flow in the opposite direction to the flow predicted by Ekman and Sverdrup theories
- They bring Indian Ocean surface waters into the coast of WA, contributing their chemical and biological signature to local waters
- They are associated with downwelling in the Leeuwin Current and offshore flow below 200m

# Indian and Pacific surface flows

Figure courtesy of Billy Kessler



Surface zonal geostrophic flow from WOA

**Eastward**

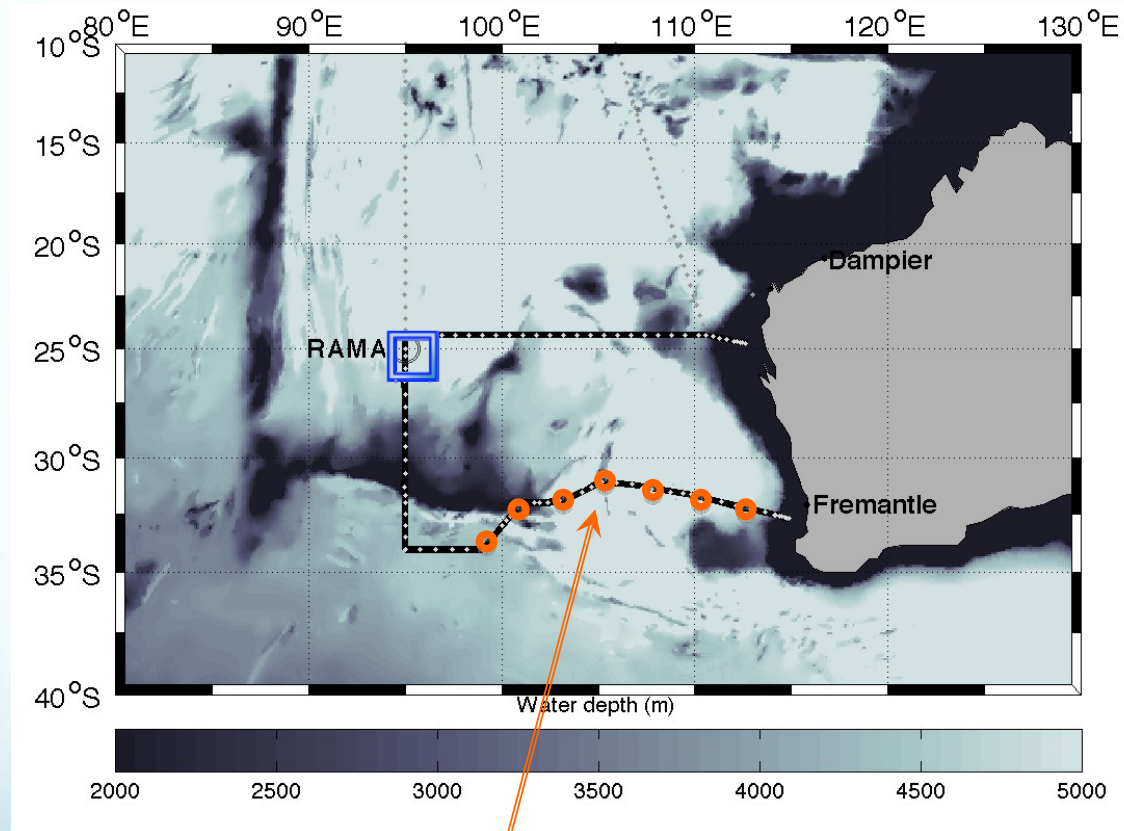
**Westward**

**Eastward at the surface overlying westward subsurface flow**

# The Eastward flow project

- A modelling investigation of the controlling mechanisms for the eastward flows and links with the Indonesian Throughflow, the Leeuwin Current, and subduction of mode waters south and west of Australia
  - Jay McCreary and Ryo Furue, International Pacific Research Center, Hawaii
- An observational study to analyse existing observations and make new measurements of the velocity structure of the flows, and their chemistry and biological signatures
  - Nathan Bindoff and Helen Phillips, University of Tasmania
  - Ming Feng, CSIRO
  - Anya Waite, University of Western Australia

# Proposed voyage 2011/12



CTD stations – temperature, salinity, velocity, oxygen, nutrients, Chl a

EM-APEX float deployments - to sweep northwestward measuring temp, sal, velocity

RAMA Mooring – surface meteorology and fluxes, upper ocean temp, sal, velocity (PMEL-Mike McPhaden)

