Sea level rise is one of the most important consequences of actual global warming. This rise has been recorded with satellite altimetry measurements and accounts for ~3.3 +/- 0.4 mm/yr since 1993 and, sea level trends display a large regional variability. Some regions experience a sea level rise (e.g., the west tropical Pacific ocean, the subpolar north Atlantic ocean…) whereas other regions experience a sea level drop (e.g., the east tropical Pacific ocean, golf of Alaska …) over 1993-2010 (Ablain et al., 2009). Those sea level trends appear to be steric in nature. Moreover, steric changes appear to be mainly driven by ocean warming and its impact on sea level variability.

In the present study, we investigate the respective contribution of atmospheric forcing (i.e., wind stress and diabatic forcing trends) using ECCO estimate to ocean heat content and thermosteric sea level trends over 1993-2010. We confirm the linear response of wind stress trend contribution to the west tropical Pacific ocean warming and regional sea level rise which has been previously reported by recent studies (Timmermann et al., 2010; Merriefield et al., 2012 …). However, in some regions, it appears to be more complex. For instance, the subpolar north Atlantic ocean experiences a warming over 1993-2010 with a rate of 0.37 °C/decade with 35% due to wind stress trend contribution and 65% due to diabatic forcing trend contribution. Further investigations using ECCO solutions are needed to better understand and ascertain the physical processes involved in the regional variability of ocean warming and its impact on sea level variability.

**References**
- Wunsch et al., Oceanography, 2009.