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### Seasonal and interannual variability of the surface mixed layer heat budget in the Caribbean Sea

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The seasonal and interannual variations of the mixed layer depth (MLD) and the heat stored within this layer in the Caribbean Sea have been investigated from temperature and salinity profiles obtained from the high resolution (daily; 0.25°lat/lon) GLORYS-Mercator reanalysis model data for the 1992-2009 period. In this region the MLD is relatively shallow, oscillating from 10 to 90 m depth during the annual cycle, with the maximum values observed during the dry season (December to March). Spatially, the highest (lowest) depths were found in the northwestern (coastal region), in agreement with the wind stress curl pattern which induces down welling (upwelling) of the Ekman layer, respectively. The MLD oscillations depend on the intensity of the zonal winds and the location of the Caribbean Low Level Jet (CLLJ). The isothermal layer depth was found to be deeper than the MLD. These differences in depth have been associated with the presence of sub-superficial temperature inversions. The barrier layer depth can reach up to 60 m. Data show no significant differences of the MLD due to El Niño-La Niña (ENSO) events, but rather a Quasi-Biennial Oscillation (QBO) is observed to influence this region at interannual timescales. The seasonal ocean heat stored within the mixed layer oscillated between -285 y 240Wm<sup>-2</sup>. During the dry season (rainy season), when the MLD is deep (shallow) the region loses (gains) heat. This is determined by air-water fluxes being the net short wave radiation the main gain, and the latent heat the main loss at both timescales.

#### Biography

Raul A Montoya is an Oceanographer that has recently (April 2014) completed his Master degree in Engineering of Hydraulic Resources from the National University of Colombia, in Medellin and this research is part of his thesis. He is now starting his PhD studies in the same educational institution and is part of the OCEANICOS research group of Oceanography and Coastal Engineering. He has participated in several investigations and is co-author of many papers in oceanography and renewable energy journals.

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