Atlantic Warm Pool: climate variability, thermal ocean-atmosphere interactions and remote response to ENSO and NAO.

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The Atlantic Warm Pool (AWP) is a big body of warm water with SST greater or equal to 28.5°C, that appears in the Gulf of Mexico, the Caribbean and the western tropical North Atlantic and it is a key element of the climate system. Previous studies have focused on climate variability within the AWP, but did not take into account the distinctive properties of AWP sub-regions. In other cases, obtained results had not been tested against selected databases. This work will try to deal systematically with these limitations. Ocean reanalysis databases have been used in order to detect AWP climate variability, mechanisms through which thermal component of ocean-atmosphere interactions operates and the effect of remote phenomena such as El Niño-Southern Oscillation (ENSO) and North Atlantic Oscillation (NAO). Empirical Orthogonal Functions, spectral analysis, linear correlation and composites analysis techniques have been used. A large portion of AWP variability comes from Caribbean Sea and Gulf of Mexico while North tropical Atlantic contains a large internal variability. The thermal component of ocean-atmosphere interactions appears partitioned in Gulf of Mexico and Atlantic from Caribbean Sea. SST/latent heat feedback mechanism operates not globally in the AWP but stronger in the open Atlantic sub-region. ENSO+ enhances AWP development, while ENSO- is opposite to both development and decay of AWP. NAO effect is stronger in its negative phase by enhancing the AWP decay.