

Comparing past variability of coastal currents and upwelling regimes with plausible future anthropogenic signals – in the framework of millennial AOGCM simulations

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For assessing the role of anthropogenic factors in changing climate at large, and of ocean features, detection (anthropogenic influenced developments) and attribution (to specific causes) studies are needed. For doing so, extensive data sets of past variability as well as scenarios of plausible future developments are needed. Obviously, such data sets do hardly exist for many oceanic features such as the intensity of coastal currents and upwelling regimes. Thus, not surprisingly, only few detection and attribution studies have dealt with oceanic features, while the methodology has multiply and successfully applied to atmospheric variables.

As a demonstration, we conduct detection and attribution exercises in the framework of millennial simulations (1000-2100), forced by estimated past volcanic, solar and GHG forcing – with the last 100 years using SRES scenarios. Statistics of coastal currents, of and coastal mean sea level and upwelling regimes are considered. Estimates of early detection times are derived.