

## **THE INFLUENCE OF THE UPWELLING REGIME IN ROCKY SHORE BIOACOUSTIC SIGNATURE OFF CABO FRIO ISLAND**

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In coastal zones, snaps, clicks, pops and crackles produced by benthic fauna can be quite representative in the soundscape (Butler et al., 2017). These sounds can be caused simply by the movement of these organisms on the substrate, by the stridulation/friction of the hard parts of their bodies or water circulation (Simmonds and MacLennan, 2008). Thus, when many individuals are active in an environment, the sounds merge into a timed sound, producing a Rocky Shore Bioacoustic Signature (RSBS).

This work aims to characterize the RSBS and its upwelling regime relationship. A structure with 4 hydrophones was installed near the Cabo Frio Island, Brazil. The Cabo Frio region is recognized as one of the main points of occurrence of upwelling phenomenon on the Brazilian coast. This phenomenon is characterized by the outcropping of deep, cold (lower than 20°C) and nutrient-rich waters to the surface and increasing of the primary productivity (Calado et al., 2018), especially during spring and summer. This one along with other hydrodynamic features makes the site a unique biological environment (Ferreira, 2003). Temperature data were collected and analyzed together with acoustic data. In addition, was utilized a sound propagation model to evaluate the transmission loss from sources distributed along the rocky shore (simulating RSBS). This simulation was performed for two scenarios, with and without upwelling characteristics.

The results showed the usual daily pattern, which present an increase in biological noise during twilight periods. We can see an interesting relationship between upwelling phenomenon and RSBS, where the RSBS is modulated by the water temperature (decreases in cold waters). This one occurs due to both high transmission loss and low source level caused by upwelling and probably decrease in metabolic rate of benthic organisms, respectively. This relationship between temperature and RSBS can contribute to the understanding of the organisms behavior in relation to the upwelling and to the development of new biotechnological applications.

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