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The natural ocean acidification and fertilization event caused by the submarine eruption of El Hierro

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The shallow submarine eruption which took place in October 10^{th} 2011, 1.8 km south of the island of El Hierro (Canary Islands) allowed the study of the abrupt changes in the physical-chemical properties of seawater caused by volcanic discharges. In order to monitor the evolution of these changes, seven oceanographic surveys were carried out over six months (November 2011-April 2012) from the beginning of the eruptive stage to the post-eruptive phase.

Important changes in the water column chemistry including large decreases in pH, striking effects on the carbonate system, decreases in the oxygen concentrations and enrichment of Fe(II) and nutrients were produced.

As a result of the ongoing magmatic activity, the submarine eruption produced an unprecedented episode of severe acidification and fertilization.

The findings highlight that the same volcano which was responsible for the creation of a highly corrosive environment, affecting marine biota, has also provided the nutrients required for the rapid recuperation of the marine ecosystem.