

O16.3

Using macroinvertebrates to assess the health of estuaries and coastal reefs

P. Wawrzynkowski¹, F. Tajadura², M. Bustamante², M. Becerro¹

¹Center for Advanced Studies of Blanes (CEAB-CSIC), Spain. ²Universidad del Pais Vasco (UPV/EHU), Spain

Abstract

Human impacts can cause additional stress to that associated with the strong environmental gradients found on estuaries. Being able to accurately assess the health of these habitats is a major environmental concern. Here, we investigated the health of the Nervión-Ibaizabal estuary from 1996 to 2012. This estuary is under the influence of the Greater Bilbao Area, a heavily populated and industrialized area on the Atlantic coast of Spain. The +15-yr period investigated in our study includes major efforts from the local Government to restore the health of the Nervión-Ibaizabal rivers that cross the Greater Bilbao Area and feed the estuary. To quantify health, we defined the Reef Community Health Index (RCHI), an index based on rocky macroinvertebrate abundance. The RCHI is the community abundance-weighted mean of the species sensitivity values. Sensitivity refers to the number of species at which the cumulative abundance/species frequency distribution curve changed convexity and started rising. Sensitivity provides an estimation of the minimum richness needed for a species to thrive, with decreasing sensitivity values associated with increasingly degraded sites. Our results showed that the largest RCHI values were outside the estuary area of influence, while the lowest RCHI values were in the estuary most inner section. In the +15-yr period investigated, RCHI values increased over 100% in the outer region of the estuary, a trend associated with the decrease of major pollutants and improved environmental conditions resulting from the restoration efforts. Yet, neither the inner section nor the rocky communities outside of the estuary showed signs of improvement. Our results suggest that the RCHI takes into account both natural and human-driven conditions and provides an estimate of the overall health of the system. The RCHI is therefore suitable for large-scale geographic and temporal health assessments of marine benthic communities.