O-5.34

Benthic ecosystem responses to glacier retreatment process: a15 years case study at Potter Cove

R SAHADE[1], D ABELE[2], S ACOSTA[1], G ALURRALDE[1], C DEARANZAMENDI[1], V FUENTES[3], C LAGGER[1], F MOMO[4], A OLARIAGA[3], C OREJAS[5], NATALIA SERVETTO[1], S TARANTELLI[1], M TATIÁN[1], L TORRE[1], P WIERNES[1], N ZAMBONI[1]

[1]*Instituto de Diversidad y Ecología Animal (IDEA) F.C.E.F. y Nat., U.N.C.- CONICET Av. Vélez Sársfield 299, CP 5000, Córdoba, Argentina.*

[2]*Alfred Wegener Institute. Am Handelshafen 12, D-27570 Bremerhaven, Germany.*

[3]*Instituto de Ciencias del Mar (CSIC), Pg. Maritim de la Barceloneta 37-49, 08003 Barcelona, Spain*

[4]*Universidad Nacional de General Sarmiento. Instituto de Ciencias. J.M. Gutiérrez 1150. Los Polvorines. Bs As. Argentina.*

[5]*Instituto Español de Oceanografía, Centro Oceanográfico de Baleares. Moll de Ponent s/n, 07013 Palma de Mallorca, Islas Baleares, Spain*

Glacier retreatment registered consistently along the Antarctic Peninsula, caused by the rapid temperature increase experienced in the last five decades, can impact coastal ecosystems in two ways: on one hand affecting the established communities by increased ice calving, sedimentation rates and fresh water input; on the other hand, this process is also opening new ice free areas available for colonization and establishment of benthic organisms. In Potter Cove both effects, marked shifts in the structure of already established benthic communities and colonization by benthic organisms of newly ice free areas, have been observed. In the first case the most affected group were ascidians whose populations dropped down from a maximum of 26.8 ind.·m^{-2} in 1994to 8.16 ind.·m^{-2} in 2009. Whereas the sea pen *Malacobelemnon daytoni* showed a marked population increase, from 27.06 ind.·m^{-2}and reaching up to 314.3 ind.·m^{-2}. This species not only increased its population but also extended its distribution range in 1994 *M. daytoni* was confined to shallow waters above 15 m depth, and later the species effectively colonized depths up to 30 m. These shifts took place in a time span of almost 15 years but they were not gradual, the most marked changes occurred in the first 4 years, suggesting that both extremes could be two alternative states of equilibrium in this system. On the other hand, in a new island just uncovered by glacier retreatment 10 years ago, displayed after 4 to 6 years of being ice free, a dense benthic community dominated by ascidians, whose measured densities are, to our knowledge, the highest ever reported reaching 419.16 ind.·m^{-2}. These findings together are not only surprising but also challenge some established ideas on the Antarctic ecosystem dynamics, i.e. the stability of Antarctic benthic communities, the velocity of colonization processes and growth rates of some Antarctic organisms or the suitability of under ice habitats for the development of benthic assemblages; depending whether the observed communities in newly ice free areas are the result of a rapid colonization process or if they were already established in ice pockets under the glacier. Potential factors driving the observed shifts in benthic assemblages are discussed on the basis of environmental data and available knowledge of the biology and ecology of more affected species.