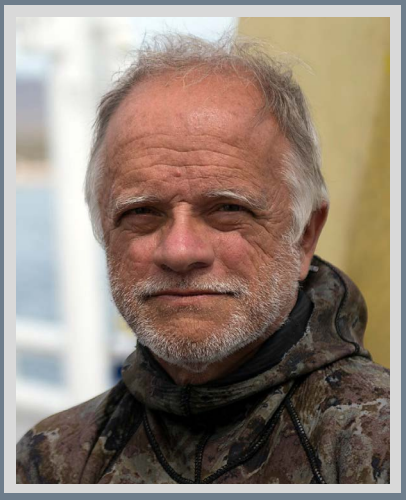

BALLESTEROS ENRIC,

Researcher
1986 - Present

SHIFTING FUNDS IN MARINE BENTHIC ECOSYSTEMS: FROM SURVIVAL TO PLENTY AND BACK

11 February 1986. My first day at work in a brand new research institute devoted to Marine Ecology and Artificial Intelligence close to the city of Barcelona, but far away enough from Barcelona to be in close contact with nature. Its name, Centre d'Estudis Avançats de Blanes (CEAB; Center of Advanced Studies from Blanes), is vague enough to accommodate almost any kind of scientific discipline that can be branded as "advanced". I suppose that it was not an easy task to find a name for a scientific institute whose research areas were marine ecology, artificial intelligence and -later on- astrophysics.

The building is surrounded by luxurious Mediterranean pine forests, has amazing views over the Montseny, a beautiful mountain whose cap is occasionally covered by snow in winter, and is located at a 5 minutes drive from granitic rocky shores with interspersed small coves. I am here to develop my scientific career as a marine ecologist. The best job and place I could ever imagine. A dream.

I come from the Department of Ecology at the University of Barcelona, where I had been working in my PhD thesis between 1981 and 1984 and was appointed as teaching assistant from 1985 until yesterday. There, I did not have an office, but a place in a room plenty of other assistants, technicians and students. This place was like an ant's nest, where I could hardly concentrate on my work and prepare my teaching lessons. But I was feeling great. Friendship atmosphere, youth, plenty of interaction with rookie ecologists like me, and with a big boss, Ramon Margalef, idolized by everybody.

First field work expedition carried out by CEAB scientists together with researchers from the Marine Science Institute of Barcelona (ICM). From left to rigth: Andrés Maldonado (ICM), Kike Ballesteros, Iosune Uriz (CEAB) and Jordi Camp (ICM). October 1986, Cabrera, on-board of "Garcia del Cid".

I park my beat-up Citroën in front of the building and I am welcomed by the oceanographer Dr. Antonio Cruzado, earlier director of the institute.

After a brief walk inside the almost empty building, he asks me to choose a room. All the rooms are completely empty. Four walls, that's it. I choose a big one; it will become my office. The warehouse assistant brings me a table without drawers, a chair, and a telephone that he plugs into the phone connection and places it over the floor. "This is everything", he tells me. I am shocked. I leave the room (it does not deserve the name "office") to ask Antonio Cruzado if this is a joke. Where I am supposed to put all my books? The laboratory I have in front of my room is also completely empty: not even a single test tube. And microscopes? What is this? He replies me that this is everything the institute will provide me as a new researcher. He kindly offers me a second chair, in case somebody is coming to visit me. "The first thing you have to do is asking for projects (=money)" he asserts. I come back to my room, sit down, look around at the echoing walls, and question myself if coming here has been a smart choice. Probably not, but I have to succeed. I am not a person easy to be defeated. Dreams cannot turn into smoke so quickly!

Fortunately, there is another marine biologist at the institute, María Jesús (Iosune) Uriz. We join our two single-member teams to apply for the project "Towards a model of organization of Mediterranean littoral rocky benthic assemblages", which receives funding from the Spanish Government. Iosune also gets the project "Ecological foundations for searching new pharmacological drugs in Mediterranean benthic ecosystems" funded by the company Pharma-Mar. These two projects allow us to furnish our offices and buy the basic materials for performing our research (microscopes and other lab material, inflatable boat, tanks, diving compressor, van), but most importantly to engage other young people in these two research lines, whether scholarship assistants and researchers or emerging professors at the University of Barcelona. These very first years we were able not only to survive but we started the basis for the current Department of Marine Ecology of the CEAB. These projects and energy were key for obtaining new research positions in the CEAB and for not being absorbed by the powerful Institute of Marine Sciences based in Barcelona.

The collaboration between Iosune and me, essential during these first years, progressively decreased as she increasingly focused her research in

Cover image of the Handbook of Coastal Habitats of Catalonia, a study carried out to help policy makers and stakeholders to improve the management of natural resources of the Catalan coast.

Carcharhinus albimarginatus, *a very common shark species inhabiting the tropical reefs studied by the Pristine Seas project.*

processes occurring at the level of cells, individuals and populations and I gained interest at processes taking place whether at the community or ecosystem level. A critical year for my research was 1992, when the invasive seaweed *Caulerpa taxifolia,* the killer alga, became renowned. In order to control the progression and to study the biology and ecology of this alga in the Mediterranean I got European, national and regional funding together with other labs in Marseilles and Nice (France). Easy money. I became a specialist in marine bioinvasions in a place and time where and when almost nobody worked on this issue. Bioinvasions also allowed me to start a collaboration with the Departments of Environment and/or Fisheries of regional governments (Generalitat de Catalunya, Govern de les Illes Balears) that lasted for 21 years and progressively broadened to the implementation of the Water Framework Directive, the Habitats Directive and the creation and management of Marine Reserves. Thanks to the plenty of money I was able to build up a team of specialists that excelled in the knowledge of different taxonomical groups and methodologies. Monitoring projects were put in place and carried on during several years. In this period of time we also obtained some of the so-called "competitive" grants or projects. We also focused in other questions that deserved a more specific, different, or accurate approach, like the populations and communities made up by species of the algal genus *Cystoseira*, the Mediterranean underwater ecological relatives of oaks *(Quercus)* from the terrestrial environment, or the highly biodiverse and vulnerable coralligenous outcrops, Mediterranean biogenic reefs that only grow at dim light conditions.

However, nothing lasts forever. The current economic crisis that so sharply stroked Spain from 2009 onwards suddenly cut off most financial revenues. Still, in 2010 we obtained a project to make a description and cartography of all the littoral habitats from Catalonia, where we developed a completely new methodology to map littoral habitats, which are restricted to very small areas following steep gradients of environmental factors. This project finished in 2013 (http://mediambient.gencat.cat/ca/05_ambits_dactuacio/patrimoni_natural/sistemes_dinformacio/habitats/habitats-litorals-/) and the extension to be done in the sublittoral zone down to 135 meters depth (the continental shelf) was stopped due to funding restrictions. The awarding of a CSIC project with internal funds (2013-2016) has allowed the continuation and finishing of the loose ends of the last and previous projects but has not guaranteed the long-term surveys that were in some cases initiated as far away as in 1992. We find ourselves again in the path of survival but with the conviction that most of the investment in money, time and energy of two decades has been thrown away and with the almost certainty that time for long-term surveys is over. Moreover, the eagerness has turned up into confusion and frustration. Bad feelings if we want to keep moving onto science.

But survivors as we are, we will keep trying. Crisis, also, will not last forever and some initiatives are emerging. We will try to continue monitoring the abundances and effects of invasive species, try to better understand the dynamics of *Cystoseira,* the "Mediterranean underwater trees", and will continue surveying the littoral and sublittoral assemblages for temporal changes in relation to anthropogenic disturbances. Moreover, our engagement in the Pristine Seas project of National Geographic (http://ocean.nationalgeographic.com/ocean/explore/pristine-seas/) is exciting, as this project is becoming the most relevant contribution to marine conservation ever. Surrender is not a word in our dictionary.