



RIA FORMOSA

Challenges of a coastal lagoon in a changing environment

Edited by

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Preface

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This book entitled "RIA FORMOSA. Challenges of a coastal lagoon in a changing environment" is an astonishing exercise of disclosing the main challenges of Ria Formosa, a vital lagoon for the Algarve Region and for Portugal as a whole.

Coastal interface areas between sea and land are very important, rich, sensitive and extremely dynamic areas. There are multiple and complex changes that, either by nature or by human action, occur in coastal zones, from erosion to silting phenomena, from changes in currents to floods ...

This lagoon system, protected by barrier-islands with dunes, is the support of relevant economic activities. Apparently, these barrier-islands were born in the sea and are in permanent movement, towards the continent. The movement is visible, within a decade, there are areas of sand that are decreasing dangerously and others to gain more sand.

The example of the Ria Formosa reminds us of the need for any planning of activities, industrial or non-industrial, using the coastline should always keep in mind the respect for the environment and should foresee, as far as possible, the physical dynamics that the natural marine resource will have in the future. Failure to take account of the high probability of changes in the coastline, motivated by nature or human beings, means that there may be considerable economic, social and environmental damage that can be avoided.

Congratulations to the authors of this book, that invested their time and deep knowledge to bring to light relevant challenges that Ria Formosa faces and suggestions to overcome the identified risks. The need to implement specific integrated procedures devoted to the management of the back barrier shores. The understanding of the interconnectivity between the lagoon and the sea that does not depend exclusively on tides but also on other driving forces acting on the coast, such as wind and associated oceanographic processes, either inner countercurrent or upwelling. The importance of the use of mathematical modelling of waste water plumes is a tool that enables the prediction of water quality. The continuous observation of microorganism's activity enabled by the development of epifluorescence microscopy and sensitive radioisotope techniques is key. The intertidal areas of Ria Formosa are systems with low Ulvaes herbivory, meaning that they are not top-down controlled. Phytoremediation on wetlands can be considered an important type of eco-services to society, based on 'green' technologies and low energy consumption. The presence of hazardous substances such as metals, persistent organic compounds, and polycyclic aromatic hydrocarbons and emerging contaminants including personal care products and pharmaceutical compounds is a cause of concern for the sustainability of the lagoon. The opportunity to test a floatable tidal energy converter at the lagoon and the application of remote sensing for monitoring the Ria Formosa is shown in this book.

One of the most important lessons I have learned in my many travels around the world to analyse human development across the ocean is that this resource is much less homogeneous than it seems. Each point in the sea is different (in terms of temperature, depth, currents, nutrients ...). In this context, it is fundamental to study very well all the physical characteristics of the sea in order to be able to develop, in a sustainable way, this fantastic resource. This book is a fundamental contribution to the sustainable development of the oceans, not only because it studies very well the specific characteristics of a place, but also because it analyses in an integrated way the multiple challenges that blue growth has to face in the future.