

## PREFACE

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ECOSUD was a research project of international cooperation financed by the European Commission (contract no. ICA4-CT-2001-10027, A4-INCO-DEV Programme). It addressed the sustainable development of estuarine and coastal areas using advanced knowledge from field observations and numerical simulation tools. From here a set of scientifically motivated strategies was derived for two specific field cases, namely the Patos Lagoon in the south of Brazil and the Jucar River Estuary in the Spanish Mediterranean coast.

Within the project a number of significant advances in both site-specific and generic knowledge were obtained related to the hydrodynamics of both areas and the corresponding consequences for water quality and socio-economic impacts. These advances are summarized in the enclosed set of papers which are considered to provide a faithful picture of the present state-of-art, while incorporating new point-wise advancement in natural processes, numerical tools and socio-economic implications.

This special issue covers, therefore, these advances starting with the hydrodynamics of a semi-enclosed coastal bay (Jucar case) and an estuarine (Mangueira Bay in Patos Lagoon case) water body. The efficiency of natural and man-made barriers and bottom topography in controlling the resulting water fluxes are examined in this issue. The role of 2D and 3D numerical models is also considered in terms of predicting the driving hydrodynamic fields that control water quality.

The sources and sinks of nutrients and pollutants, and the resulting water quality are studied next within the plume domain, the estuarine domain and the more open bay domain. This is applied to both field cases. Conclusions on phytoplankton dynamics, mollusk and polychaete dynamics as well as aquaculture dynamics are considered as a natural consequence of the driving hydrodynamics. The special issue also includes papers which summarize the resulting water and sediment quality for both sites and the role of river plume dynamics under different forcing conditions.

The special issue ends with three papers which address the challenge of sustainable aquaculture and the role played by socio-economic evaluation and conflict-solving techniques for the Brazil and Spanish cases.

Agustin Sanchez-Arcilla, Joan Pau Sierra and César Mösso  
Editors JCR ECOSUD Special Issue

Barcelona, 10 May 2006