About us

Land-Ocean Interactions in the Coastal Zone (LOICZ) is a core project of the International Geosphere-Biosphere Programme (IGBP) and the International Human Dimensions Programme on Global Environmental Change (IHDP)

LOICZ is an international research project involving scientists from across the globe who have been investigating changes in the biology, chemistry and physics of the coastal zone since 1993. Since 2003, LOICZ has expanded its areas of research to include social, political and economic sciences in order to address the human dimensions of the coastal zone.

The research results are used to explore the role humans play in the coastal zone, their vulnerability to changing environments, and the options to protect coasts for future generations.

The main goal of LOICZ is “to provide the knowledge, understanding and prediction needed to allow coastal communities to assess, anticipate and respond to the interaction of global change and local pressures which determine coastal change.”

What is the Coastal Zone and why is it important?

The coastal zone represents the interface between land, sea and atmosphere. Due to variable definitions of what constitutes a coastal zone numbers of coastal population vary considerably. However, following the UNEP’s Global Environmental Outlook (GEO) Yearbook 2004/05, approximately 3 billion people live within 200 km of the coastline, i.e. almost half of the current global population (see: Creel 2003, Population Reference Bureau). For the future, and comparing 1995 figures with a likely scenario of 2025, the Centre for Climate Systems Research (CCSR) of the Earth Institute at Columbia University estimates a strong growth of coastal population. Due to the close link between population development and natural resources they expect an increase of about 35% in an even much narrower band of about 100km of the coast which translates to roughly 2.75 billion people in this area who will more or less be under direct influence of global change effects in the coastal zone. The coastal zone contains natural systems that provide more than half of the global ecosystem goods (e.g., fish, oil, minerals) and services (e.g., natural protection from storms and tidal waves, recreation).

In addition, 14 of the world’s 17 largest megacities are located along coasts and most of them (11) are located in Asia’s fastest growing economies. 40% of these cities accommodate populations of 1 million to 10 million people generating a variety of pressures driven by demand for water, energy, space, sanitation and infrastructure. On the other hand, the OECD recently estimates that with some 3.000 billion US$ of assets at stake in coastal port cities (mostly cities in industrialized countries contribute to this calculation) about 5% of global GDP is at stake in context of flooding and storm surges (Nicholls et al. 2007).

In summary, various user groups have vested interests and compete for coastal land and sea resources and goods and services. This often results in conflict eventually causing deterioration of the coastal zone. In addition the coastal zone not only serves national economic development of coastal states but also of beneficiaries which can be far distant. As a consequence, globalization increases tele-connected feedbacks in coastal land and sea use. Obviously, the coastal zone with its biodiversity, productive habitats and major biogeochemical processes supports the life, welfare and health of a growing part of the global population and this strongly relies on the maintenance of the coastal environment and functions. Therefore, the meaningful scale of the coastal zone is quite variable in nature and can – subject to the issue of concern – include whole river catchment areas as well the continental shelves. This fact is reflected in the scientific work of LOICZ across all Scientific Themes and Priority Topics.