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TITLE: The coasts of our world: Ecological, economic and social importance

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ABSTRACT:

We integrated the emerging information of the ecological, economic and social importance of the coasts at a global scale. We defined coastal regions to range from the continental shelf (to a depth of 200 m), the intertidal areas and adjacent land within 100 km of the coastline. We used the 1 km resolution Global Land Cover Characteristics Database and calculated the area covered by 11 different land cover classes (natural and human-altered ecosystems) within the 100 km limit [Burke, L., Kura, Y., Kasem, K., Revenga, C., Spalding, M., McAllister, D., 2001. Coastal Ecosystems. Washington DC World Resource Institute. 93 pp.]. Cover of aquatic ecosystems was calculated based on several world databases. Our results show that the coasts of the world comprise a wide variety of geomorphological characteristics of which mountainous coasts with a narrow shelf are the most abundant. Sandy shores are found on 16% of the coastal countries. The coasts are located in every weather regime and the number of biomes is equally variable. Within the 100 km limit, 72% still is covered by natural ecosystems and 28% have been altered by human activities (urban and croplands). Open shrubs and evergreen broadleaf forests are the most abundant terrestrial ecosystems. Canada has the largest area of natural and relatively well preserved terrestrial ecosystems. Indonesia and China have the largest percentages of cropland area near the shore, and Japan and the US have the largest coastal urban areas. Indonesia, Australia, Brazil, Bahamas and New Caledonia have the largest areas of aquatic ecosystems. The calculated economic value of goods and services provided by coastal ecosystems showed that altogether, coastal ecosystems contribute 77% of global ecosystem-services value calculated by Costanza et al. [Costanza, R., d'Arge, R., de Groot, R., Farber, S., Grasso, M., Hannon, B., Naeem, S., Limburg, K., Paruelo, J., O?Neill, R.V., Raskin, R., Sutton, P., ven den Belt, M., 1997. The value of the world?s ecosystem services and natural capital. Nature 387, 253?260]. According to 2003 data, 2.385 million people live within the coastal limit, which represents 41% of world global population. More than 50% of the coastal countries have from 80 to 100% of their total population within 100 km of the coastline. Twenty-one of the 33 world's megacities are found on the coast. Multivariate analyses grouped coastal countries according to their ecological, economic and social characteristics. Three gradients explained 55% of the variance: degree of conservation, ecosystem service product and demographic trends. Given the current scenario and the climate change prediction, the coastal environments will be confronting serious environmental issues that should be worked in advance, in order to achieve a sustainable development of the most valued locations of the world. Several recommendations are made.

SOURCE: Ecological economics

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