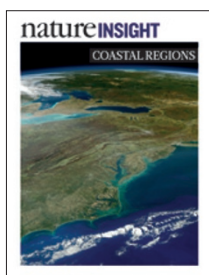


# natureINSIGHT

## COASTAL REGIONS

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Earth's coastlines are a mere sliver between the continental interiors and the open ocean, yet their importance for humans is larger than their surface area suggests. Coastal areas house billions of people and provide our societies with multiple ecosystem services that have environmental and economic value. The intense human usage of coastal areas, for example through land-use change, groundwater extraction and dam construction, is placing pressures on coastal ecosystem functions that may be exacerbated by global increases in temperature and sea level. The articles in this Insight explore some of the local and global processes that are shaping coastal systems, and how they sustain diverse, but mostly human-dominated, ecosystems.

A variety of processes, operating at a range of spatial scales, govern the stability of coastal systems. For instance, ocean circulation, climate and glacial hydrology are driving the submarine melting of Greenland's outlet glaciers. Wetland stability and coastal biogeochemical cycles are affected by local sediment and nutrient supply. Human activities have led to changes in these processes at all spatial scales, threatening the survival of coastal ecosystems.

However, careful management could help to ensure the sustainability of these important regions and may reveal additional ecosystem services. Coastal defences could be engineered through ecosystem creation and restoration on a large scale, providing more environmentally sound coastal protection than conventional engineering. Exploitation of offshore, submarine groundwater reserves might complement the water supply to densely populated coastal regions.

This Insight presents some of the many scientific challenges associated with coastal research. In so doing, it highlights the need for a better understanding of the vulnerability of the coastal landscape, which will be required to both protect the valuable coastal region and enjoy its services.

**Juliane Mossinger, Michael White & Patrick Goymer**

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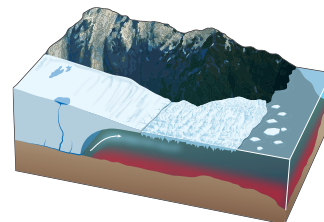


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