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## A global analysis of how human infrastructure squeezes sandy coasts

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**Coastal ecosystems provide vital services, including water storage, carbon sequestration, biodiversity, and coastal protection. Human disturbances, however, cause massive losses. The most direct impact is habitat destruction through infrastructure development, restricting the space available to coastal ecosystems and impeding their capacity to adapt to sea level rise by landward retreat – a phenomenon called ‘coastal squeeze’. While shoreline retreat is intensively studied, coastal congestion through infrastructure remains unquantified. Here we calculated the distance to the nearest human-made structure along 263,900 transects worldwide to show that infrastructure occurs at a 560-meter median distance from the shoreline. Moreover, we find that 18% of global sandy shores harbour less than 100 m of infrastructure-free space, and that 14-17% of the unimpacted space may drown by 2100 according to sea level rise projections. Further analyses show that population density and gross domestic product explain 40-44% of observed squeeze variation, emphasizing the intensifying pressure imposed as countries develop and populations expand. Encouragingly, we find that nature reserves relieve squeezing by 3-5 times, illustrating their effectiveness. Yet, at present only 16% of world’s sandy shores has a protected status. We therefore argue that expansion of nature reserves could be key to preserving coastal resilience to sea level rise.**