Keeping up with Sea-level Rise in the Arabian Gulf

Maintaining a balance between rising sea levels and soil accumulation will rely on careful management of coastal regions. Soil accumulation in coastal ecosystems could mitigate rising sea levels around the Arabian Peninsula, according to research from King Abdullah University of Science and Technology (KAUST). However, this mitigation will require efforts to preserve and restore these ecosystems.

Human-driven climate change is raising sea levels around the world at increasing rates, threatening hundreds of millions of people living in coastal areas. Researchers at KAUST's Red Sea Research Center worked with colleagues at the King Fahd University of Petroleum and Minerals to determine whether this increase could be mitigated by soil accretion in coastal ecosystems.

Mangroves, Seagrass Meadows and Tidal Marshes

In a project supported by Saudi Aramco, the Saudi Arabian national petroleum and natural gas company based in Dhahran, Saudi Arabia, they collected 52 core samples from mangroves, seagrass meadows and tidal marshes along the Red Sea and the Arabian Gulf coasts of Saudi Arabia. Using lead and carbon isotope analyses of the cores, the researchers established chronologies to estimate rates of short-term and long-term soil accumulation in these ecosystems.

At the Red Sea sites, short-term soil accumulation rates outstripped sea-level rise. However, on the Arabian Gulf coast, only mangroves accumulated soil quickly enough to counter sea-level rise, which outpaced soil accumulation at the seagrass and tidal marsh sites. In general, the long-term accumulation rates were lower but similar to the rise in sea level.

More information

Vincent Saderne et al. Accumulation of Carbonates Contributes to Coastal Vegetated Ecosystems Keeping Pace With Sea Level Rise in an Arid Region (Arabian Peninsula), *Journal of Geophysical Research: Biogeosciences* (2018). DOI: 10.1029/2017JG004288. *Provided by King Abdullah University of Science and Technology. Read the full article here.*