Topics (T)
Climate Change Impacts and Challenges (Biodiversity, Forests and Land, Ocean/Marine Ecosystems, the Artic and beyond) [1] (2A)

Author: Dr. Pooja Mahapatra
World Geospatial Industry Council (WGIC), The Netherlands, p.mahapatra@fugro.com

MEASURING THE IMPACT OF SEA-LEVEL RISE ON SMALL-ISLAND NATIONS - A GLOBAL PROBLEM WITH LOCAL URGENCY.

Abstract

The IPCC's 6th Assessment Report estimates that for the remainder of this century sea levels will continue to rise, leading to increasingly frequent and severe flooding in coastal areas. Nearly 40% of the global population lives within 100km of a coastline, and 10% of people worldwide live in coastal areas that are less than 10m above sea level.

Comprehensive Geo-data for coastal environments – including satellite earth observation, topo-bathymetric maps and ocean observations – are critical to understanding the risks associated with climate change and sea-level rise. That's why government agencies, large and small, are urgently developing coastal resilience strategies that include spatial digital twins – both at global and local levels – that will enable communities to effectively plan, monitor and act in support of safe and resilient coasts.

Despite the overall value of national/global datasets, the reality is that climate hazards manifest locally and impact local communities in unique ways – this is particularly true for the vulnerable communities at or close to the sea level in small-island developing states (SIDS), Tuvalu being a notable example.

"It's been said that climate change poses an existential threat to some small island states. To some, this sounds alarmist, yet it is not far-fetched. Scientists have estimated that Tuvalu and others may become largely uninhabitable by the end of the century." according to the UNDP.

This presentation will take you through specific examples of remote sensing-based spatial digital twins that have helped coastal and SIDS stakeholders, including the Tuvalu Coastal Adaptation Project, developed by the UNDP with financing from the Green Climate Fund. The resultant models are providing enhanced understanding of the islands' hydrological processes and complex coastal risks. We can now elucidate the relationship between land elevation and sea level, to model future scenarios, and to inform design of coastal infrastructure, as well as development planning. Recurring geodata programmes that capture entire areas, both onshore and nearshore, can help perform predictive analysis, guiding the authorities in their work to improve the islands' climate resilience.

The need for non-GIS users to quickly and easily access and utilize (huge data volumes of) spatial digital twins is critical. Automatic AI-based analytics as well as intuitive and efficient GIS tools expand the use of the collected data, and provide digital access from a desktop to the hard to-reach areas – enabling better decisions with better data.