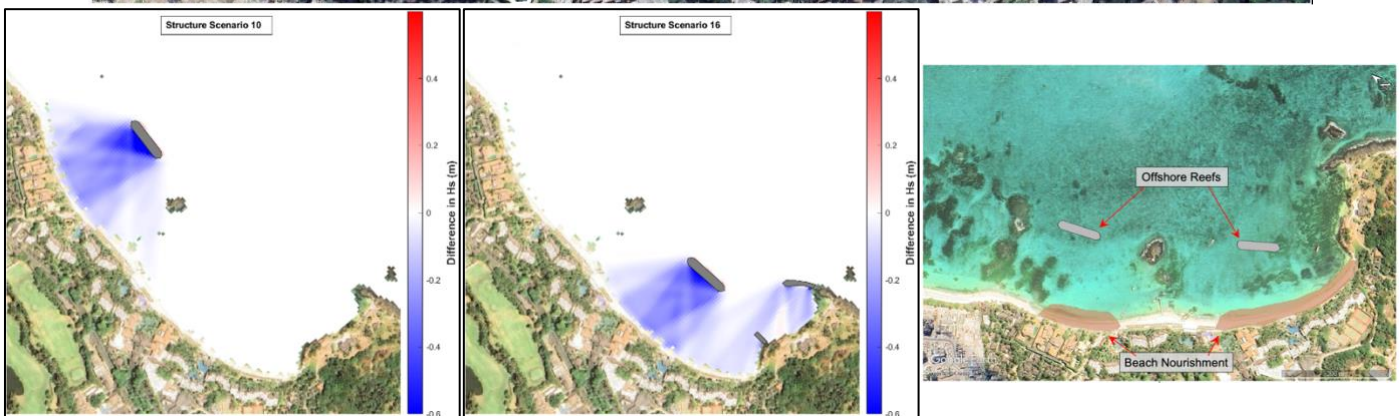


COASTAL PROCESSES AND EROSION MANAGEMENT AT BELLE MARE

CONSTANCE RESORT, BELLE MARE, MAURITIUS



(inset top left) Red dot shows the location of Belle Mare (top) the layout of the Belle Mare coastal cell and key features controlling the coastal processes. (lower left and centre) Modelled wave shadowing from offshore structures (lower right) proposed layout of offshore breakwaters and sand nourishment.

INFO:

Location: Belle Mare, Mauritius

Clients: Constance Hotels and Resorts

Project Date: January – October 2024

SCOPE OF SERVICES:

- Literature and Historical Data Review
- Site visit and analysis
- Numerical Modelling and Oceanographic Analysis
- Coastal Hazard Assessment
- Design of intervention strategy

PROJECT DESCRIPTION:

The Belle Mare Plage Resort is situated on the east coast of Mauritius and is fronted by a large coastal lagoon approximately 500 to 900 m wide. A narrow fringing reef breaks the offshore waves leaving a relatively calm area from the reef to shore. There are passes in the reef approximately 2 km north and south of the project site.

In recent years, the beach in front of the Belle Mare Plage resort has been eroding with sand being lost offshore. At the northern end of the beach, the erosion has been particularly acute and has led to the failure of a large sea wall. Concerns over the loss of the beach asset have prompted the hotel management to pursue studies in search of sand retention solutions for the beach.

The wave and wind climate at Belle Mare is dominated by the east-southeast trade winds. However, tropical cyclones are a perpetual threat with the east coast being the most vulnerable due to the track that the storms generally follow. These events can be responsible for extreme erosion and inundation.

Due to the built-up nature of the beach with limited setbacks and ability to move, the options for adaptation and intervention are limited. As such we focussed our efforts on the optimal design and placement of and offshore breakwater or reef for wave energy dissipation and beach renourishment for increasing sediment availability.