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JUNE 28th-30th, PANAMA

Science and technology for sustainablebeaches in a climate change scenario

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A Novel Approach to Beach Erosion Monitoring in the Caribbean

Implementation of a Video Monitoring System (VMS) in Hellshire, Jamaica

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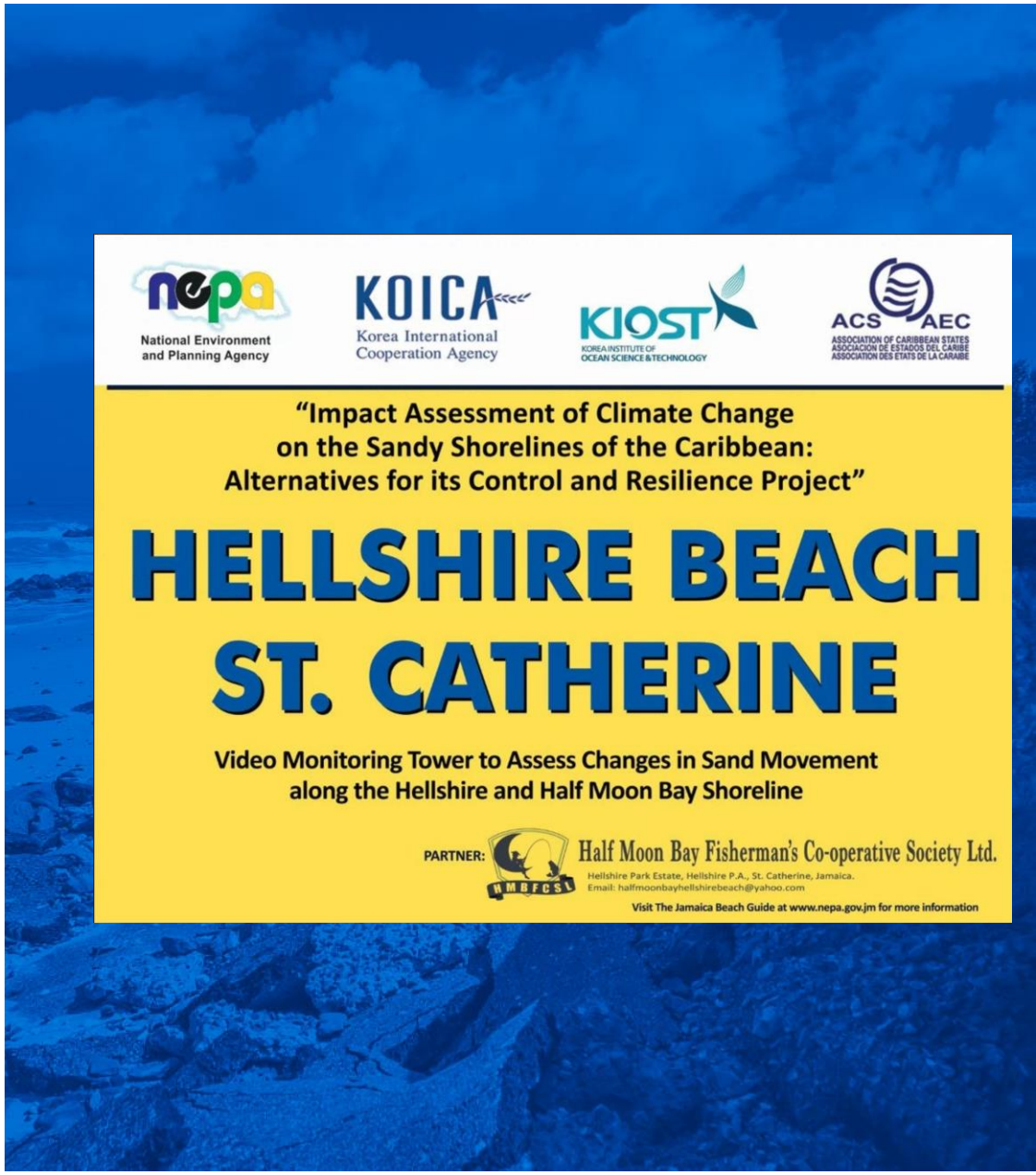

Contents

- Sandy Shorelines Project (Component 4)
- Project location
- What is video monitoring?
- Overview of Jamaica's video monitoring system (VMS)
- Beach erosion status at Hellshire Beach
- Challenges and lessons learnt

Sandy Shorelines Project

Objective

To improve the resilience of coastal communities to climate change and sea level rise through the establishment of a regional erosion monitoring network and the sharing of beach rehabilitation, observation and preservation best practices.

The project has 3 major phases broken down into 6 components; Jamaica benefited from component 4 geared monitoring beach restoration processes.

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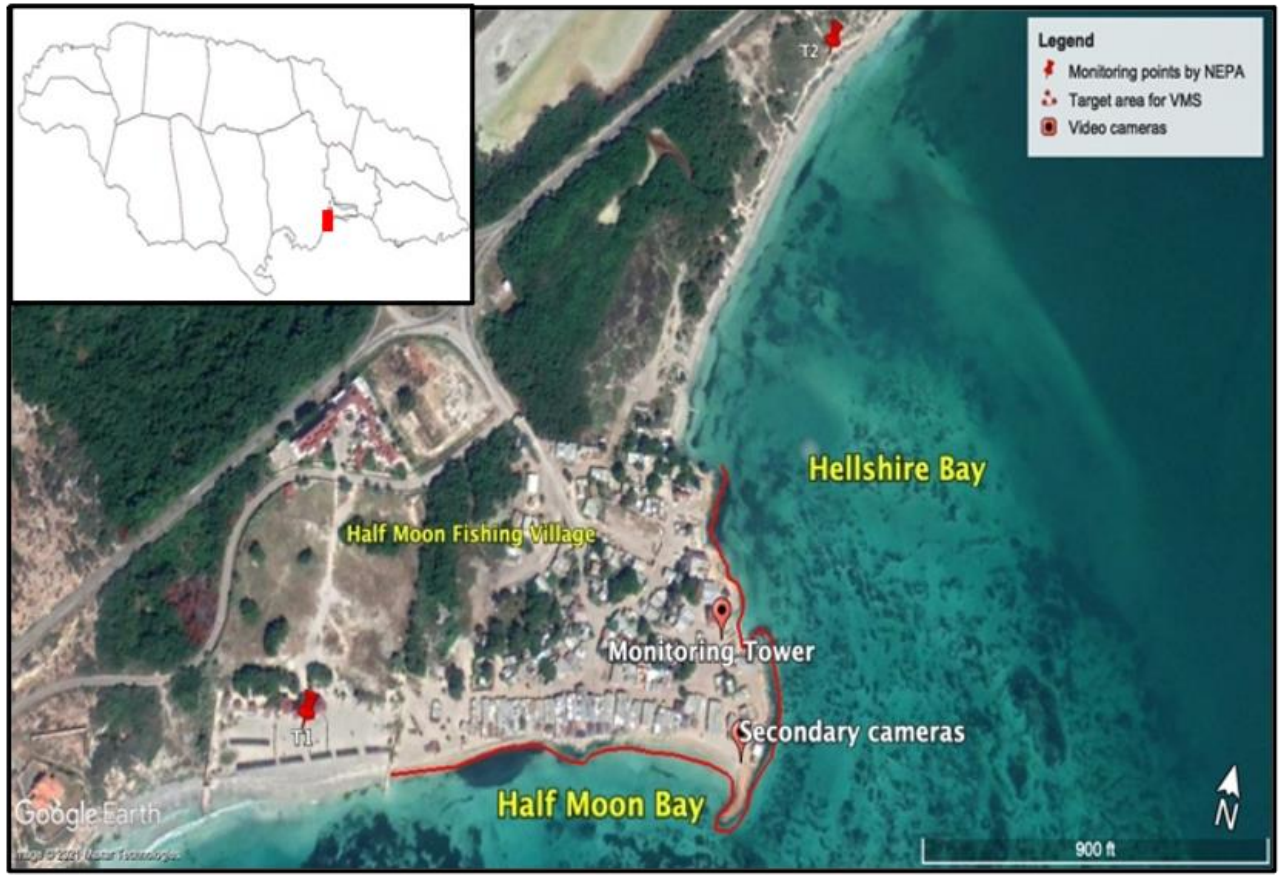
Project location



Hellshire Beach/ Half Moon Fishing Beach

Project location

Historical features

- **Vegetated sand dunes**
- **Beach width approx. 40 meters wider**
- Temporary wood and zinc structures which severed as restaurants and housing
- Bays were sheltered by relatively healthy coral reefs and seagrass beds

Section of the most easterly tip of Hellshire beach circa 2010. Source caribbeancables.com

Project location

Cause of erosion

- **Hurricane Ivan (2004) and other storms**
- **Poor water quality**
- Poor reef health
- Hard structures constructed

Remaining sections of a 'sea wall built by business owners. Source Andrew Bellamy 2020.

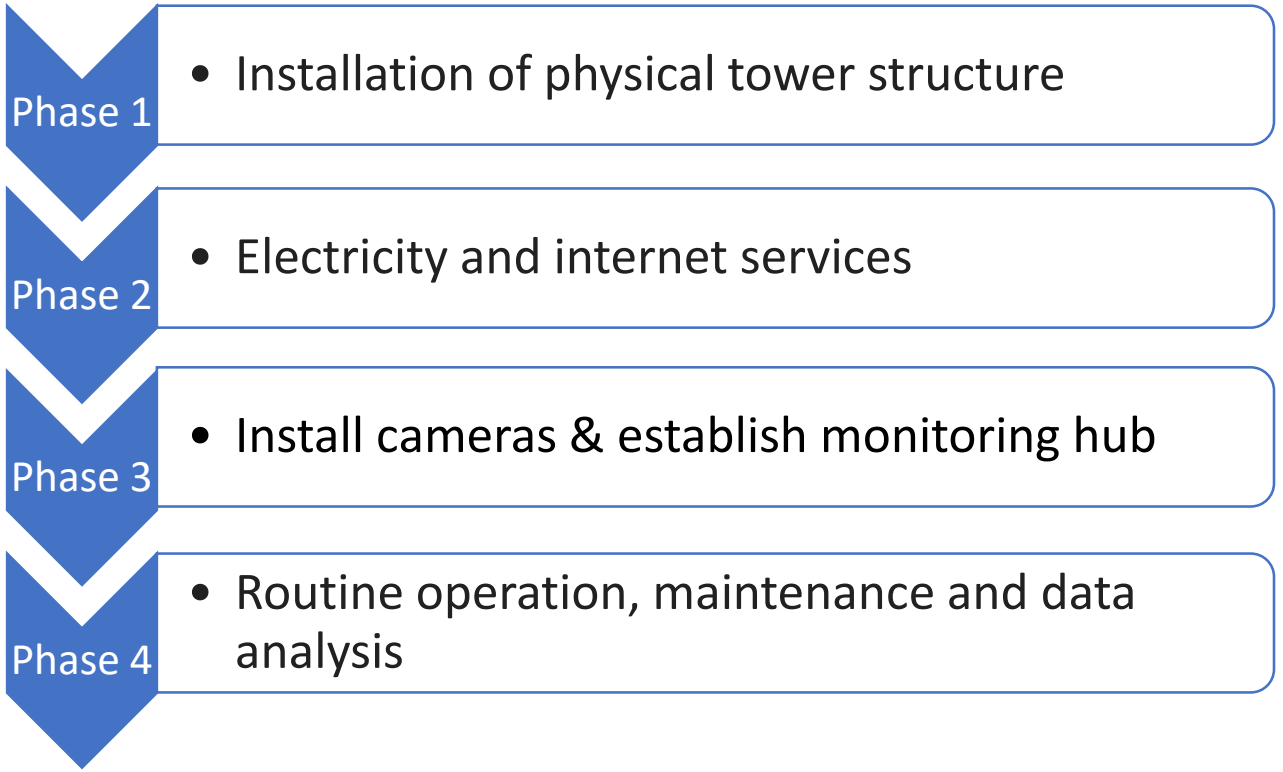
What is Video Monitoring ?

Video monitoring is a method of identifying changes to the coastline by utilizing videos recorded by installed cameras.

- Verification using survey data is required
- Limitation –horizontal changes can be determined; volumes in material eroded or accreted difficult to determine

Implementation of VMS

Implementation can be summarized in 4 phases



Jamaica's Video Monitoring System (VMS)

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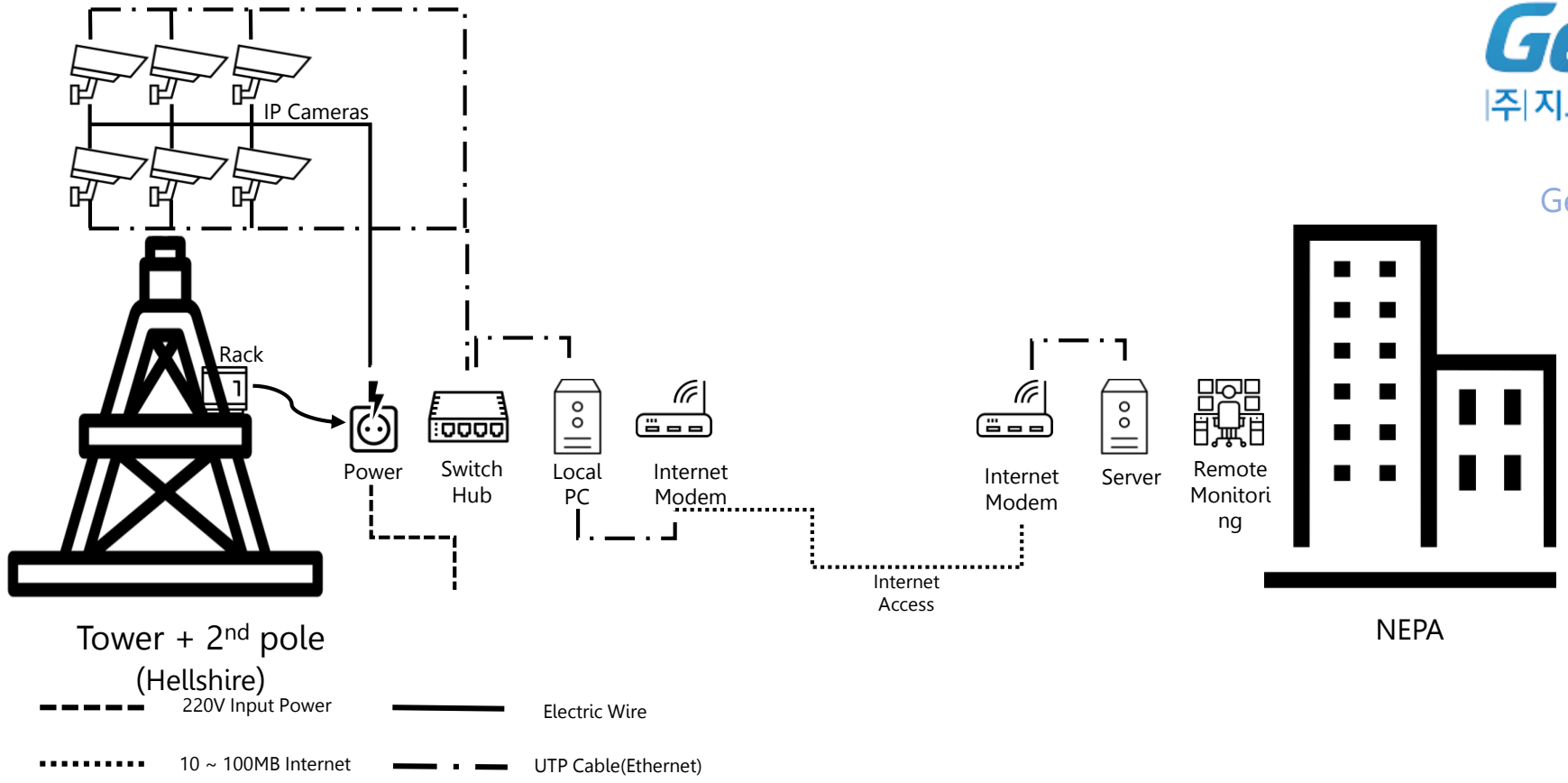
GeoSystem Research Corporation



Jamaica's Video Monitoring System (VMS)

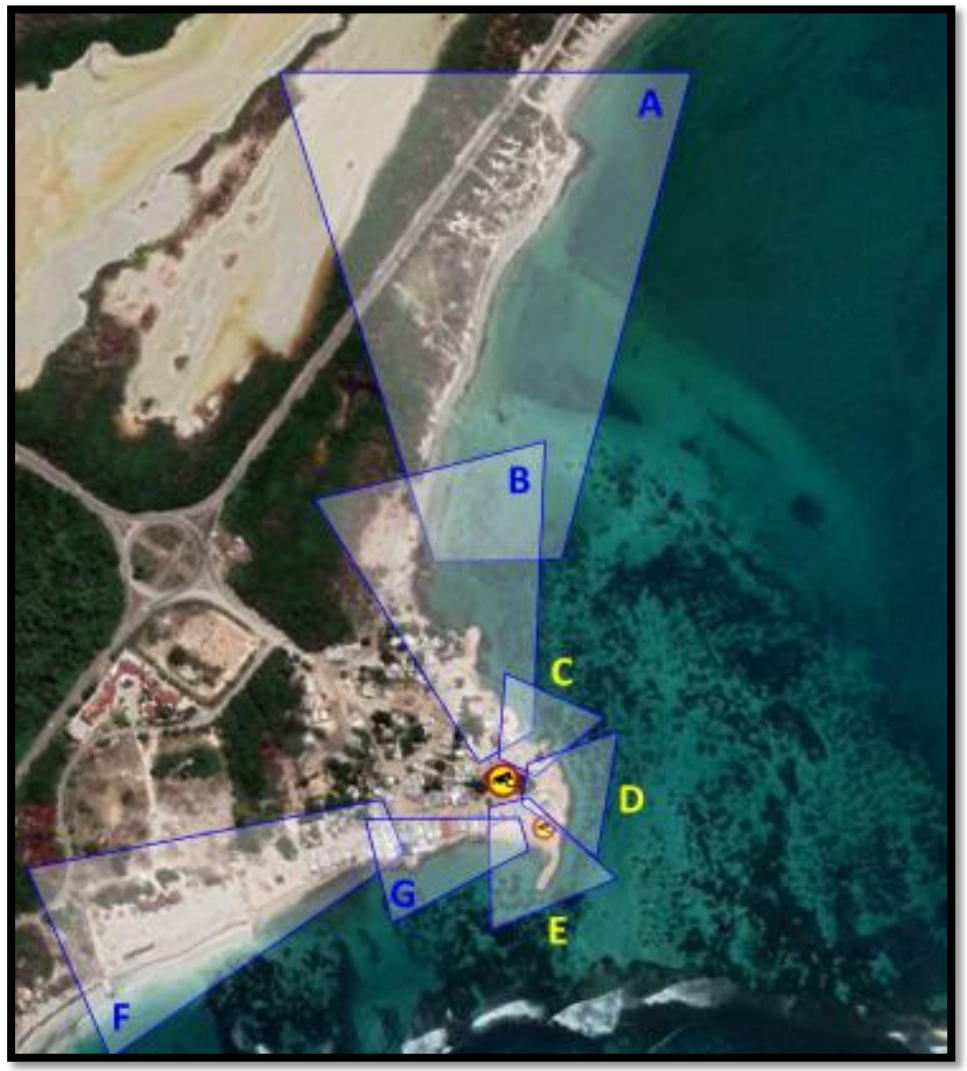
7 cameras

30 meter lattice steel tower

Secondary pole

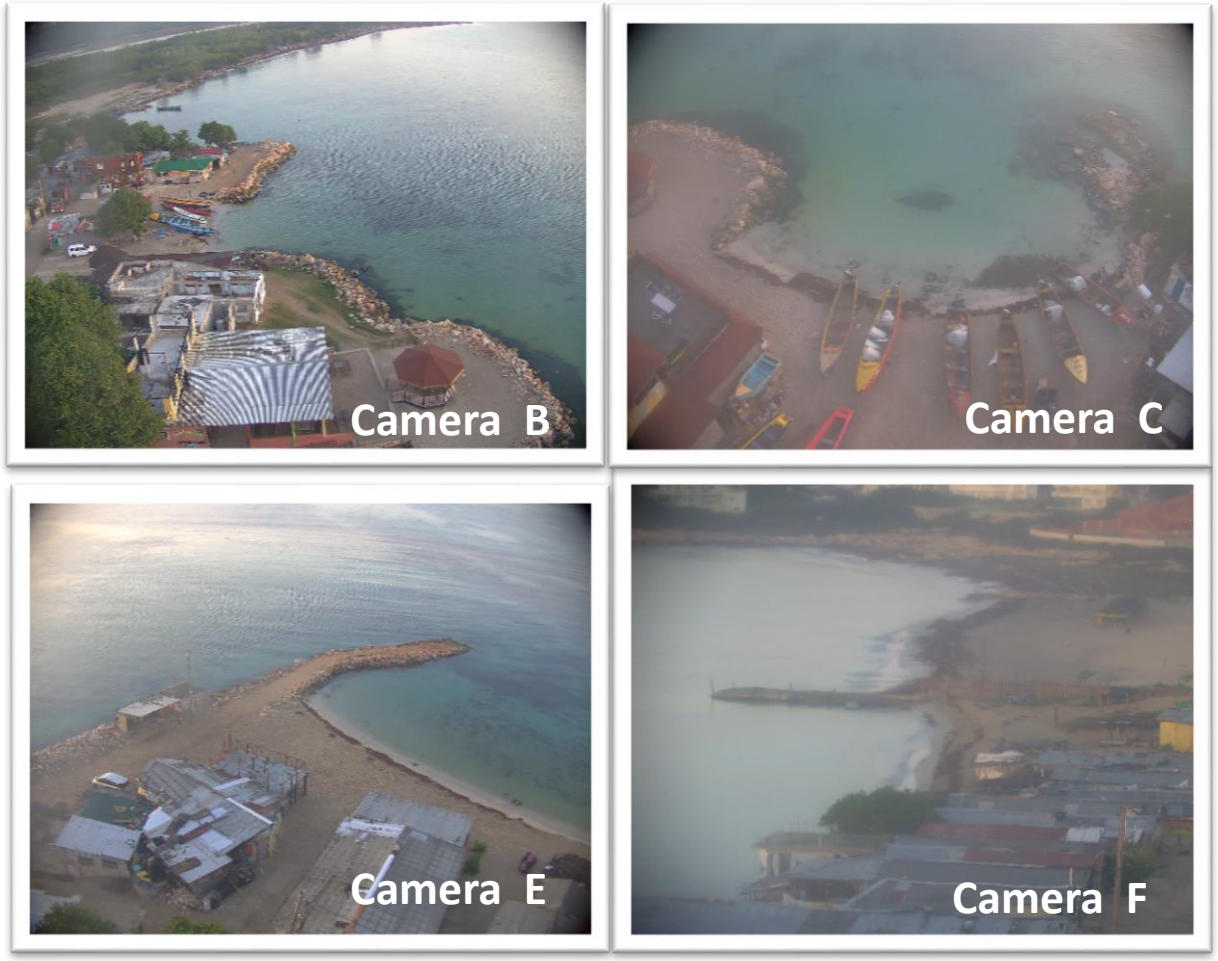
Jamaica's Video Monitoring System (VMS)

- Approximately 200 meters monitored to the North and South.

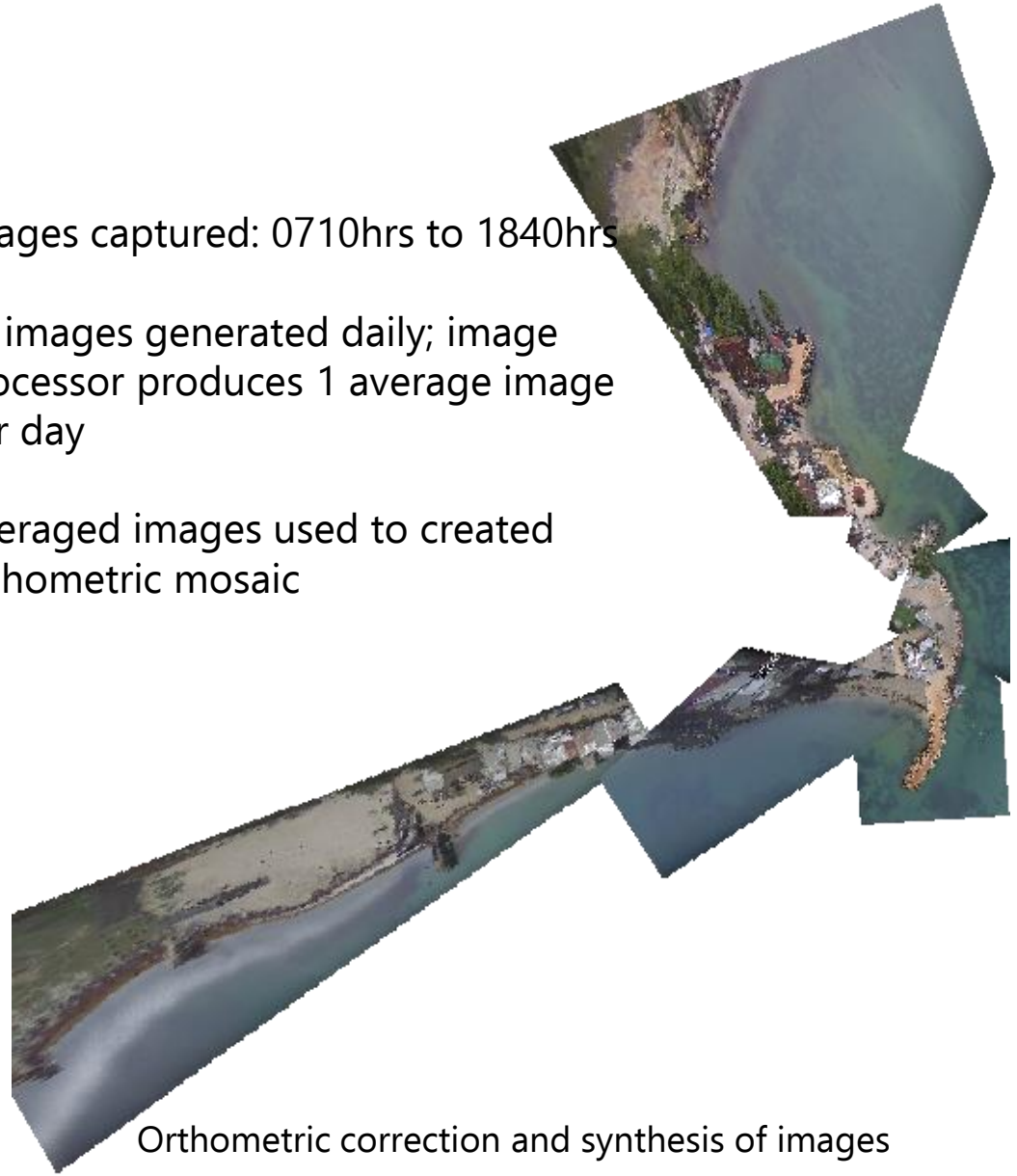


System installation location diagram

Image Processing



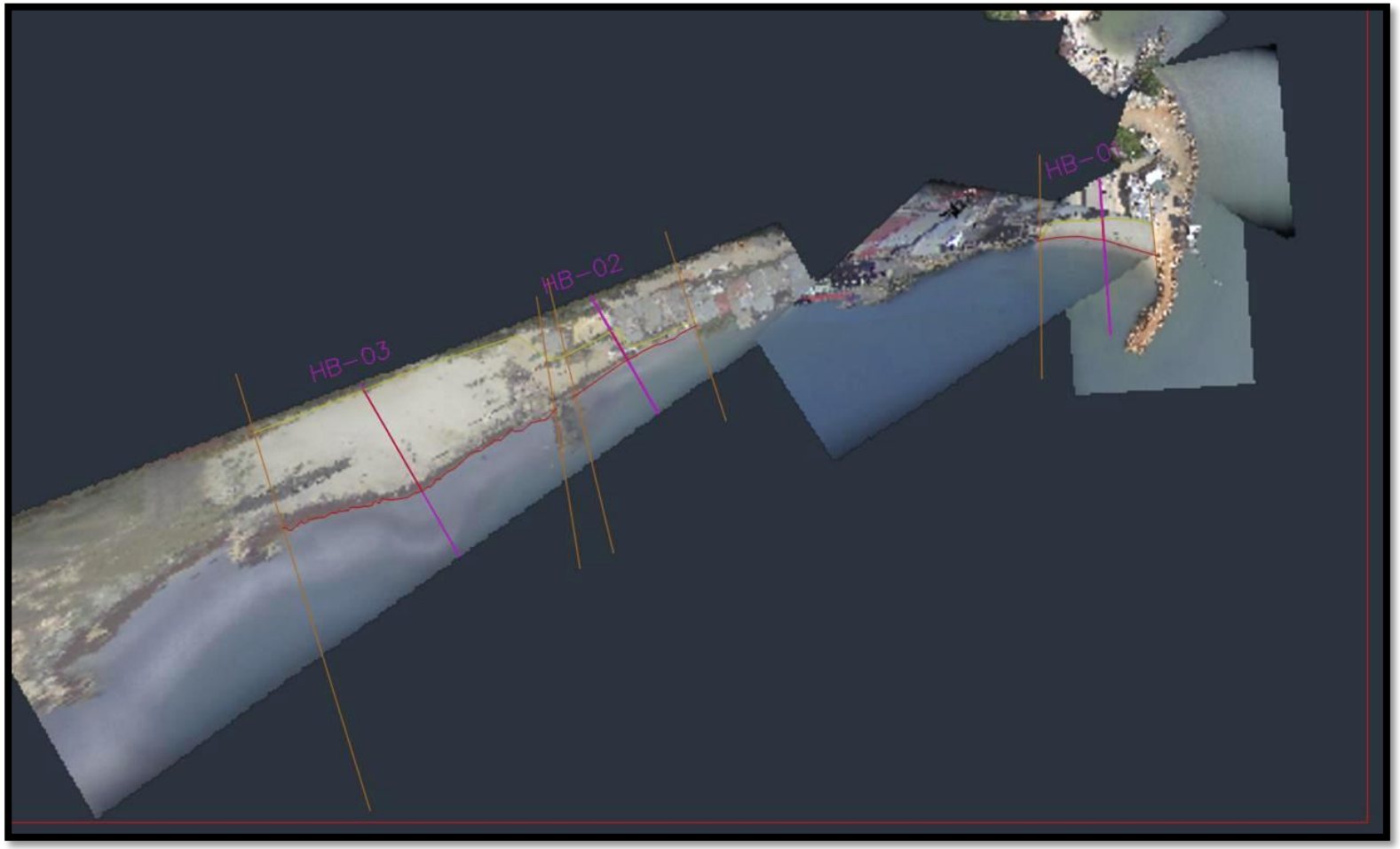
- Images captured: 0710hrs to 1840hrs
- 72 images generated daily; image processor produces 1 average image per day
- Averaged images used to created orthometric mosaic



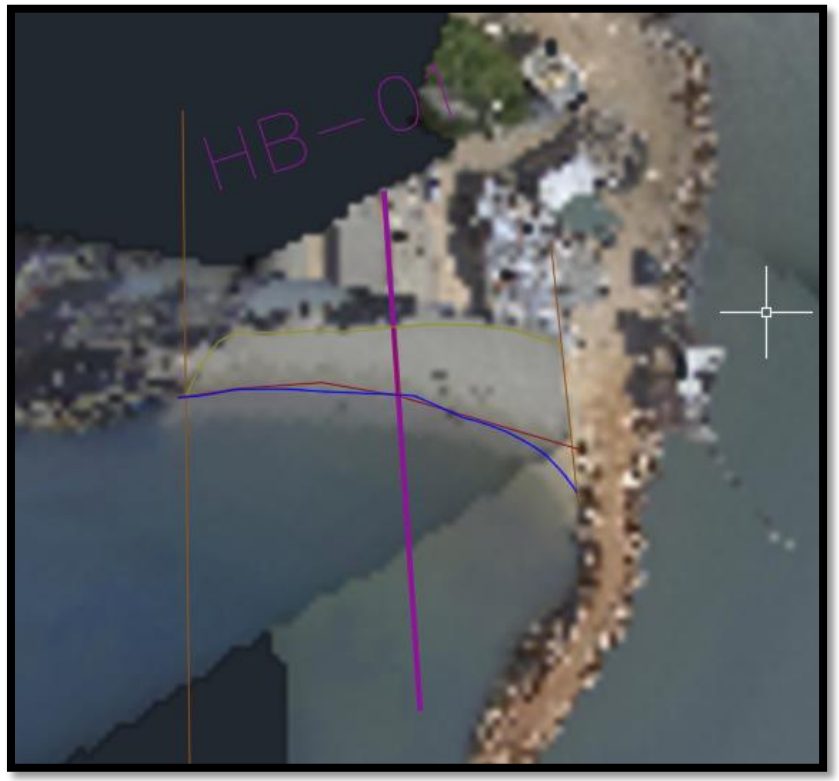
Orthometric correction and synthesis of images

Data Analysis

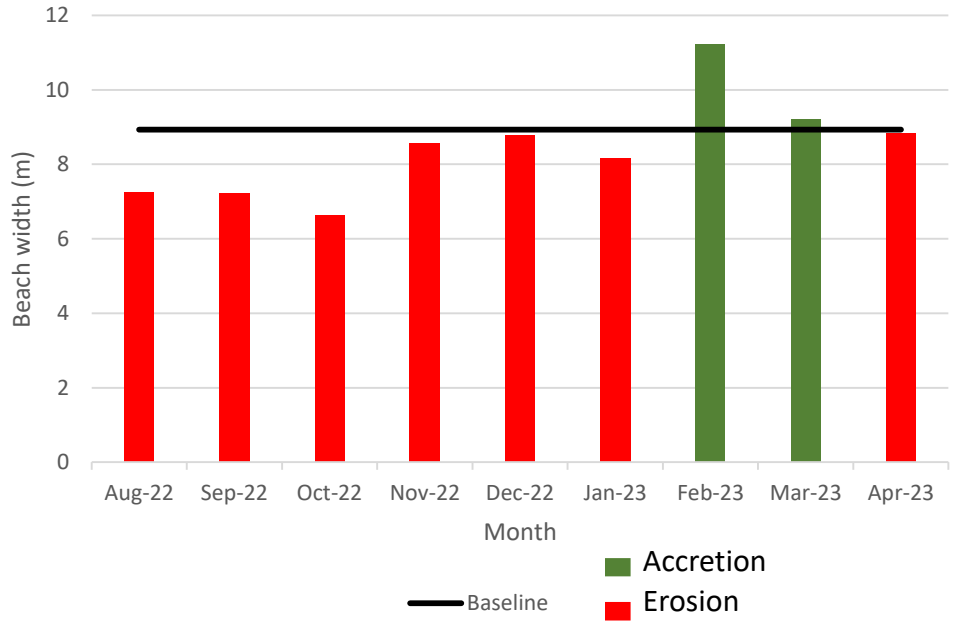
- Three beach cells established
- Shoreline manually detected



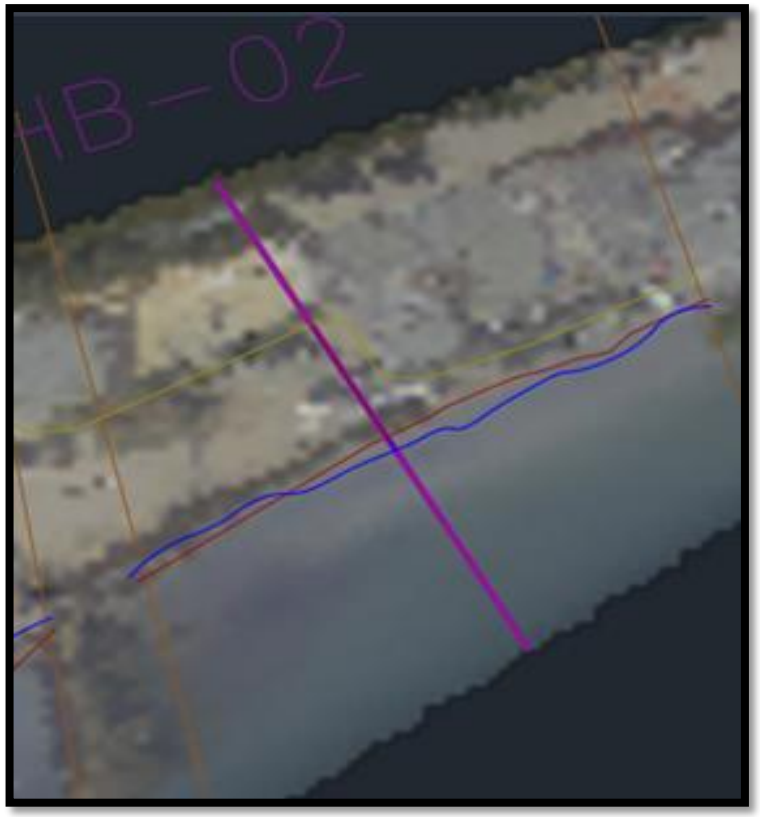
Beach Erosion Trends



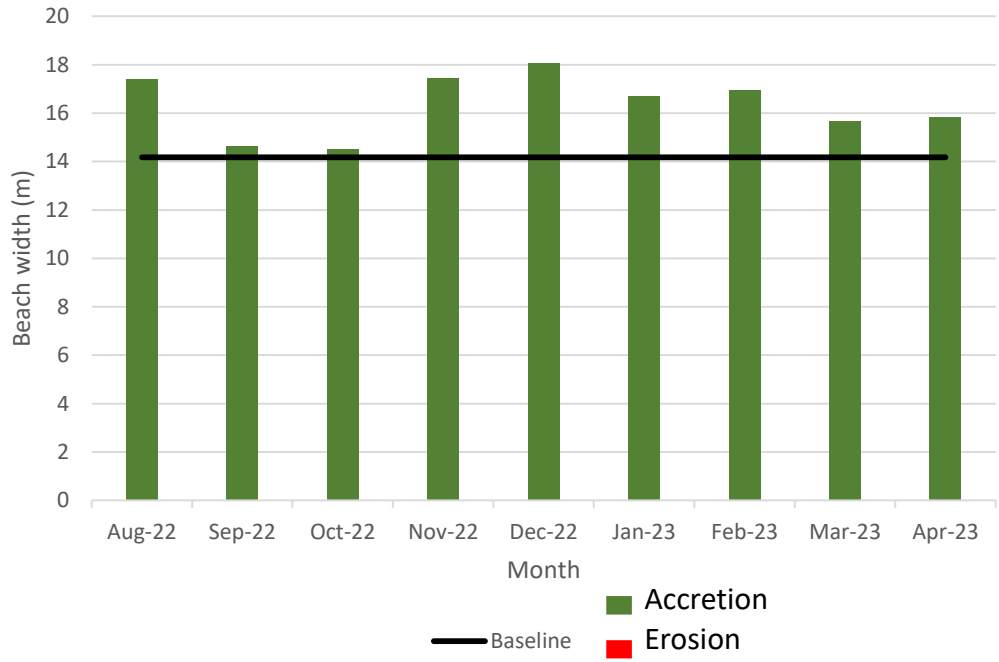
Beach Cell 1 July 2022 vs. April 2023



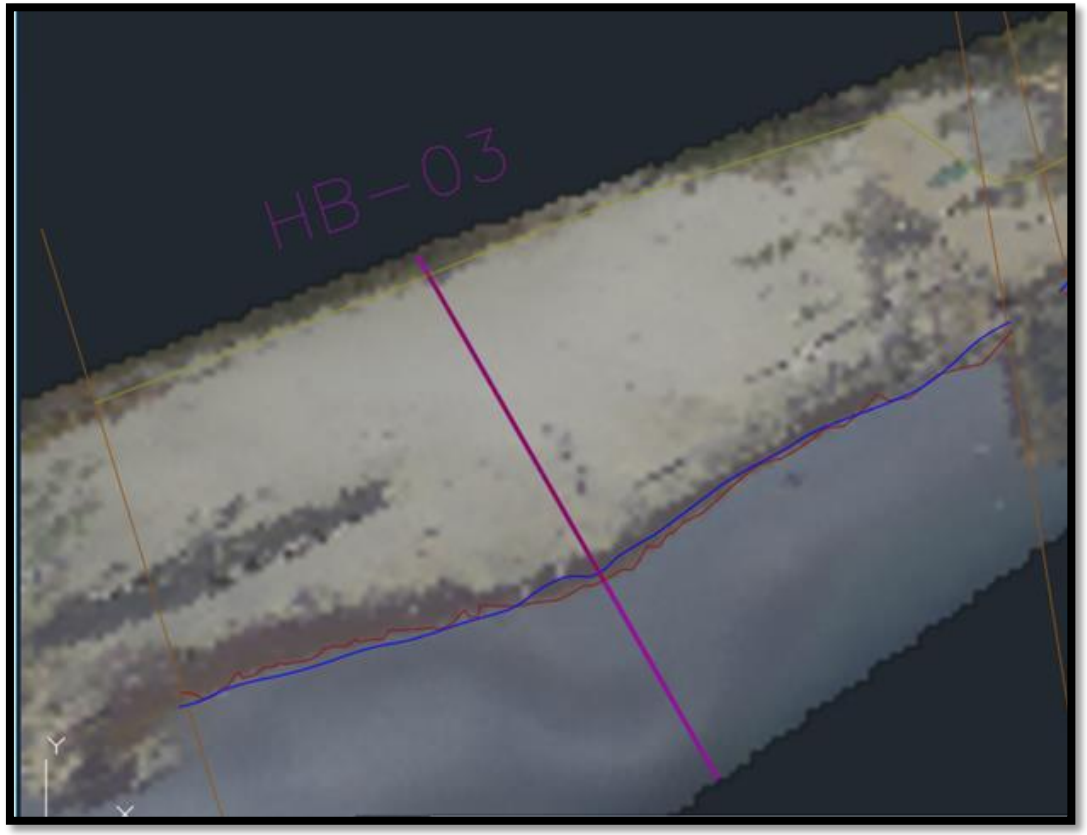
Beach Erosion Trends

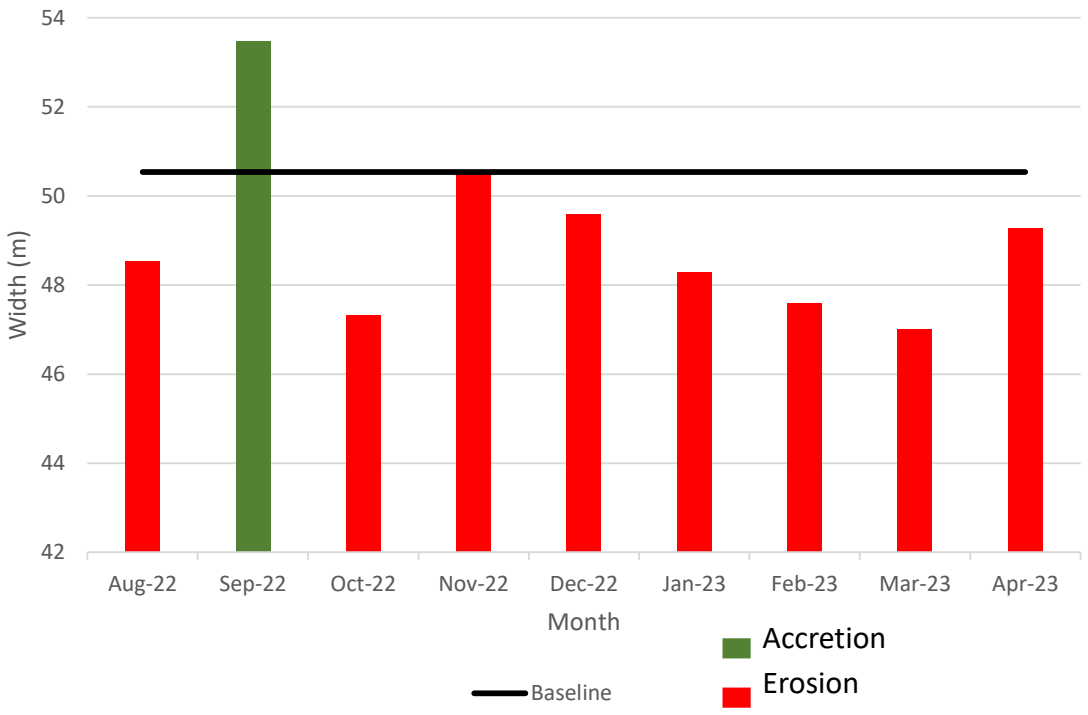


Beach Cell 2 July 2022 vs. April 2023



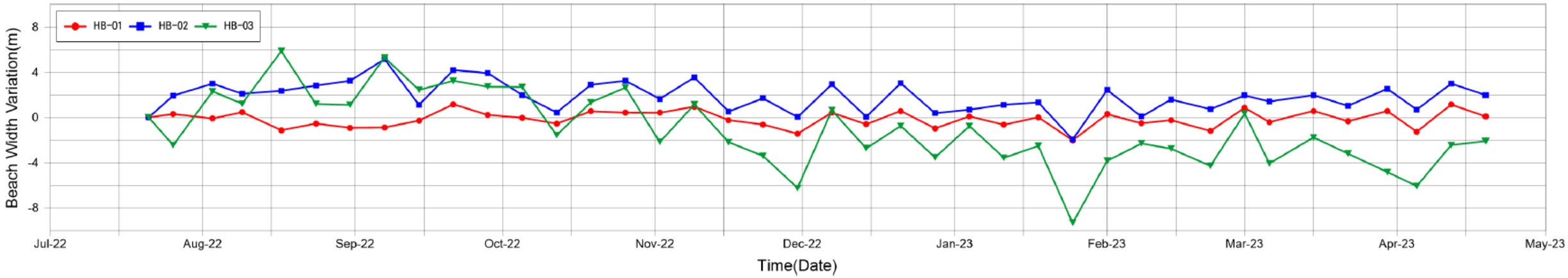
Beach Erosion Trends





Beach Cell 3 July 2022 vs. April 2023

Beach Erosion Trends



VMS as a Management Tool

- Real-time monitoring of beach erosion and changes in the shoreline
- Helps to identify erosion hotspots and areas that are most vulnerable to erosion, allowing managers to prioritize their efforts and allocate resources effectively
- Rapid assessment of the effectiveness of erosion control measures
- Maritime navigational tool

Challenges Experienced

- Coronavirus Pandemic
  - Delayed implementation and training of staff
- Socioeconomic impacts
- Cost of maintenance
  - Utilities
  - Compliance with aviation regulations
  - Outsourcing of routine maintenance
- Data gaps due to internet service interruptions
- Unauthorized access to structure

Lessons Learnt

- Budgetary support key to sustainability
- Inadequate stakeholder engagement can be costly
- Outsource capacity where necessary
- Equipment needs
  - Personal protection equipment

Thank You

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