

Coastal management on the island of Jersey

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Introduction

Much of the coastline of Jersey is exposed to erosion by the sea and a significant number of beaches are backed by hard engineering to prevent loss of property and land. The location of Jersey means that the island is exposed to the Atlantic with the prevailing wind being from the southwest and the dominant swell direction from the westerly quadrant. Jersey is also influenced by areas of low pressure which can produce storm force winds and together with high tides, storm surges. These events are capable of causing much damage to sea defences as happened in 2008 when extensive damage was caused to the sea wall at St Aubin's Bay near St Helier.

In response to these forces, many of the beaches are protected by hard engineering structures dating from the 19th Century and the 1940s. The west facing bay of St Ouen's is a good example with over 4 miles of sea defences being a combination of Victorian structures in the centre and extremes of the bay and the rest from the 1940s. The defences protect property, a main road, sites of special interest and an old municipal dump. They are in need of constant repair as the overall coastal management philosophy of Jersey is one of "hold the line".

In order to validate or review such management decisions, much environmental data is required in order to fully understand the processes at work on the beach. One key requirement is knowledge of the near shore and beach topography. This is acquired through a combination of detailed sonar based surveying and traditional beach profiling methods. With knowledge of beach profiles through time, a full understanding of beach processes such as sediment transport, erosion rates etc. can be obtained.

Findings

During the annual Cardiff University Marine Geography undergraduate field course to Jersey, beach profiling is repeated at specific locations along the beach at St Ouen's bay on the exposed west coast of the Island. Accurate beach levels and breaks of slope are surveyed using optical levels and tach staffs (ranging poles, Figure 1). Each profile is vertically referenced to a specific point on the top of the sea wall that has a known height above mean sea level. Profiles are undertaken at low water (Figure 2) in order to facilitate measurement of the beach profile from the sea wall extending seawards to approximately the mean low water mark. Height and horizontal distance (from the sea wall) are recorded at regular intervals (every 5m) and at locations of breaks of slope in order to acquire an accurate beach profile.

Results are then plotted in Microsoft Excel to produce the beach profiles (Figure 3). As the profiles are repeated at the same locations each year, spatial and temporal differences between the beach profiles can be observed and trends can



Figure 1: Start of a profile at St Ouen's Bay



Figure 2: Beach profiling at St Ouen's Bay

be identified. The changes in the beach morphology can then be investigated with reference to the coastal processes and the impact of weather/sea conditions acting on the beach.

Finally, the results of the beach profiling are submitted each year to the State of Jersey who utilise the information in order to better understand the environment and inform the coastal management decision making process.

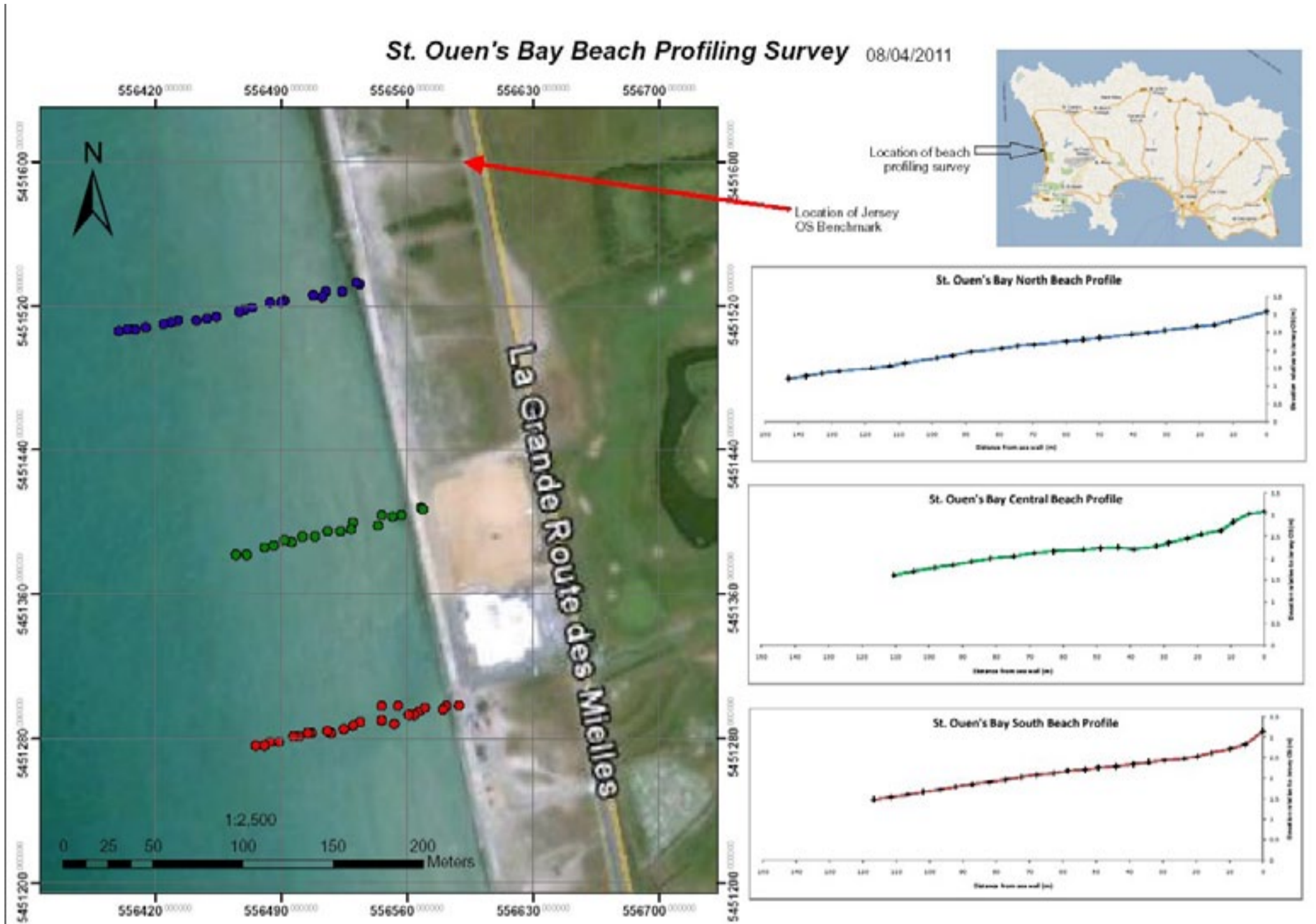


Figure 3: Graphical representation of the beach profiles

Further information

- Jersey Sea Defence Strategy, States of Jersey 2005: <https://www.gov.je/SiteCollectionDocuments/Government%20and%20administration/R%20Periodic%20update%20to%20Sea%20Defence%20Strategy%2020150923%20JM.pdf>
- Jersey Island Plan, States of Jersey 2011: <http://www.gov.je/SiteCollectionDocuments/Planning%20and%20building/IP%202011%20Natural%20Environment%20Pages%2072-108.pdf>