

### Updated Coastal Process Assessment

A detailed Coastal Process Assessment will be carried out based on existing studies and recently collected data. As part of this process numerical modelling of waves, hydrodynamics and sediment transport will be undertaken. This will utilise all of the data that has been collected and will provide an accurate representation of our coastal system.

### Coast Vulnerability and Hazard Mapping

This involves the consultant undertaking Coastal Hazard Assessment and Mapping for the years 2017, 2030, 2050, 2070, 2090, 2120 to identify the current risk of storm erosion, historic shoreline movement, erosion caused by future sea level rise and current risk of storm surge inundation. The consultant will complete a coastal vulnerability assessment which analyses the exposure, sensitivity, potential impacts and adaptive capacity of the system.

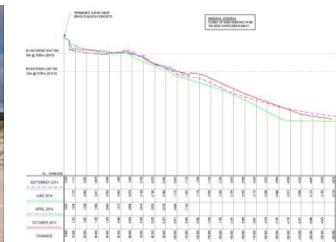
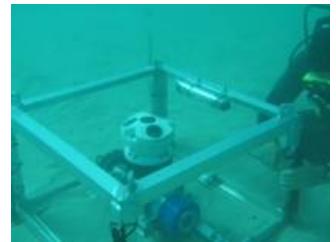
### Trial Groynes – Upgrade

**Start: April 2014**

In autumn 2014 two trial sand bag groynes were constructed at the western end of the revetment and nourished with 10,000m<sup>3</sup> of sand. Results show that local erosion in this area has stabilised. In autumn 2016 and 2017 a small addition of sand bags were added to the groynes to maintain their structural integrity. Sand nourishment will be carried out to this area as required. This trial is ongoing.

### Seagrass Productivity Studies

Following the Seagrass Mapping completed in 2014, this study involves taking measurements over four periods (summer and winter solstice and two equinoxes). By measuring leaf production and retention it is possible to calculate vertical growth and rate of sediment entrapment. With this information it is possible to calculate the time required for Middleton Bay to recover. This work will be undertaken by **Geoff Bastyan & Associates**.



## 1 AWAC

**Start: December 2013**  
In December 2013 an Acoustic Water and Current Device (AWAC) was installed by **DoT** offshore of Emu Beach. This measures wave height, period and direction, current speed and direction, water temperature and water levels. The data will be used for model calibration, which assists the design of coastal management solutions. The AWAC is managed by **DoT** and is ongoing.

## 2 AWAC

**Start: September 2015**  
In September 2015 an Acoustic Water and Current Device (AWAC) was installed by the **City of Albany** offshore of Middleton Beach. This will allow near shore data from Middleton Beach to be collected which will complement the data being collected at Emu Point. The AWAC will be in the water for 18 months. This is managed by specialist coastal consultants, **RHDHV**.

## 3 Anemometer

**Start: January 2014**  
In early 2014 an Anemometer was installed atop the **Albany Port Authorities'** navigation beacon at Emu Beach. This instrument measures wind speed, direction and gusts and provides localised data. Live wind data is available for viewing on the **City of Albany** website. This is managed by **Ecotech Pty Ltd.** and is ongoing.

## 4 Tide Gauge

**Start: September 2014**  
In September 2014 a tide gauge was installed by **DoT** at the Emu Point Boat Pens. The aim of recording water levels in Oyster Harbour is to establish the effect of the narrow entrance on the water levels in Oyster Harbour during normal tidal conditions and in storm events. This instrument is supplied and managed by **DoT** and is ongoing.

## 5 Fixed Camera

**Start: October 2014**  
In October 2014 a fixed time lapse camera was installed at the western end of the rock revetment. This camera takes an image every half hour and these images are compiled into a time series video. This is managed by **BMT Oceanica** and is ongoing.

## Photo Monitoring

**Start: July 2013**  
In July 2013 a photo monitoring program commenced that covered the area from Ellen Cove to the Emu Point Boat Pens. Photo monitoring is inexpensive and identifies trends in beach change, beach management issues and assists in developing strategic directions for coastal planning. It is carried out monthly year round by **City of Albany** staff and **Community volunteers**. This is ongoing.

## Beach Profiles

**Start: October 2013**  
In October 2013, permanent survey markers were installed to enable beach transects to be conducted from Ellen Cove to Emu Point Boat Pens, from the secondary dunes to 250m offshore. This is carried out every 3 months, at the beginning of each season. In 2016/17 the area east of the channel at the base of Mt Martin will also be surveyed. **DoT** will also carry out annual bathymetry surveys. This is ongoing.

## Structure Condition Assessment

**Start: October 2013**  
A Structure Condition Survey was conducted of all rock structures at Emu Point by coastal engineers in April 2012, October 2013 and November 2014. Photos with GPS coordinates have been recorded to allow for accurate comparison. This is undertaken annually.