



# Observations on the morphologic evolution of a mega-nourishment

## Introduction

Worldwide, beaches or the nearshore have been nourished with sand to protect against coastal retreat. Recently a new concept of nourishment was introduced. The so-called mega-nourishment should feed adjacent beaches for decades instead of several years. A pilot study of such a mega-nourishment is the Sand Motor, a hooked-shape peninsula in front of the Holland coast (see map).

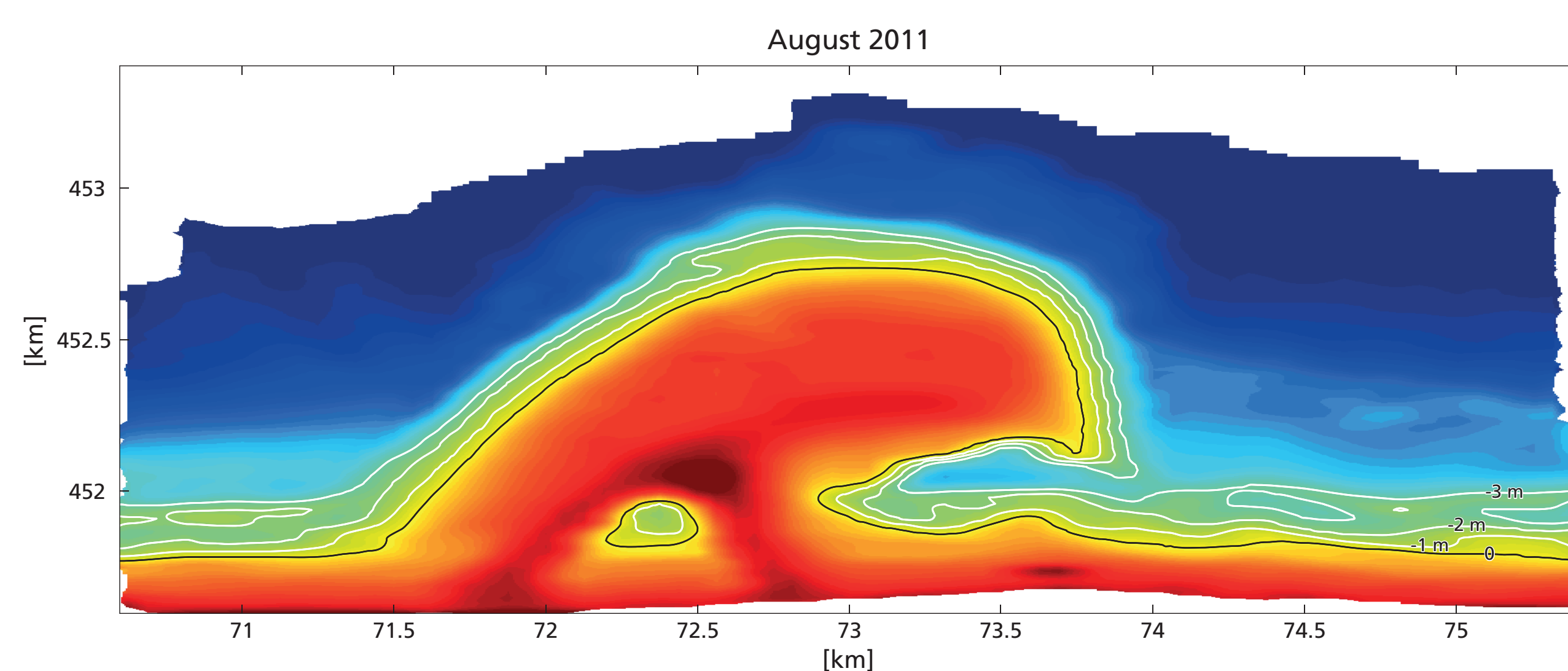
Several aspects of the mega-nourishment are studied in the Nature Coast project, from coastal safety to marine ecology. The aim of the PhD project is to understand predictively the morphological evolution in the sub- and intertidal zone of a mega nourishment on timescales of days to years.

## Field measurements

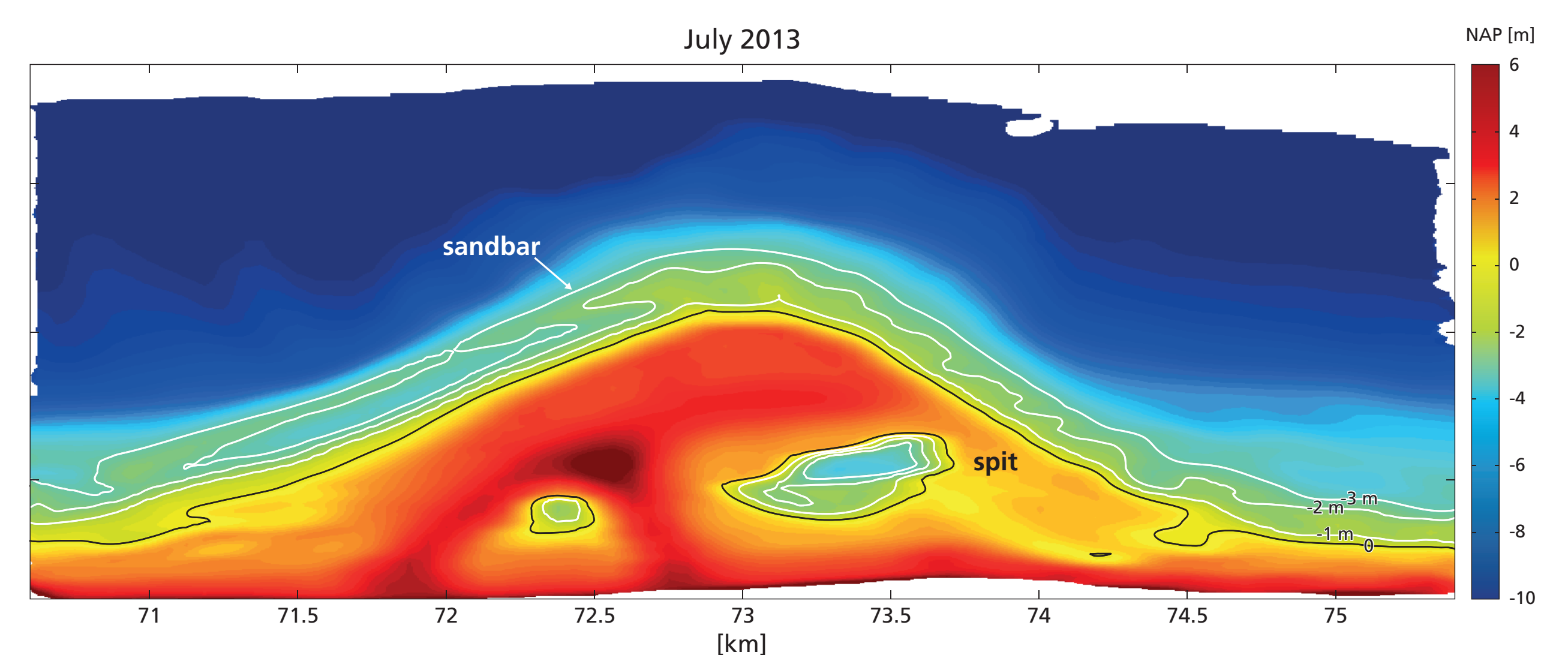
Every 1-2 months bottom elevation was measured until the 10m depth contour, using a jetski equipped with an echosounder and GPS. The intertidal and supra-tidal area were measured by quad or by foot.



(Source: SHORE Monitoring & Research)



The Sand Motor was constructed in July 2011, the first topographic survey was in August 2011.



The Sand Motor is very dynamic: sandbars, shoreline undulations and a spit developed in two years time.

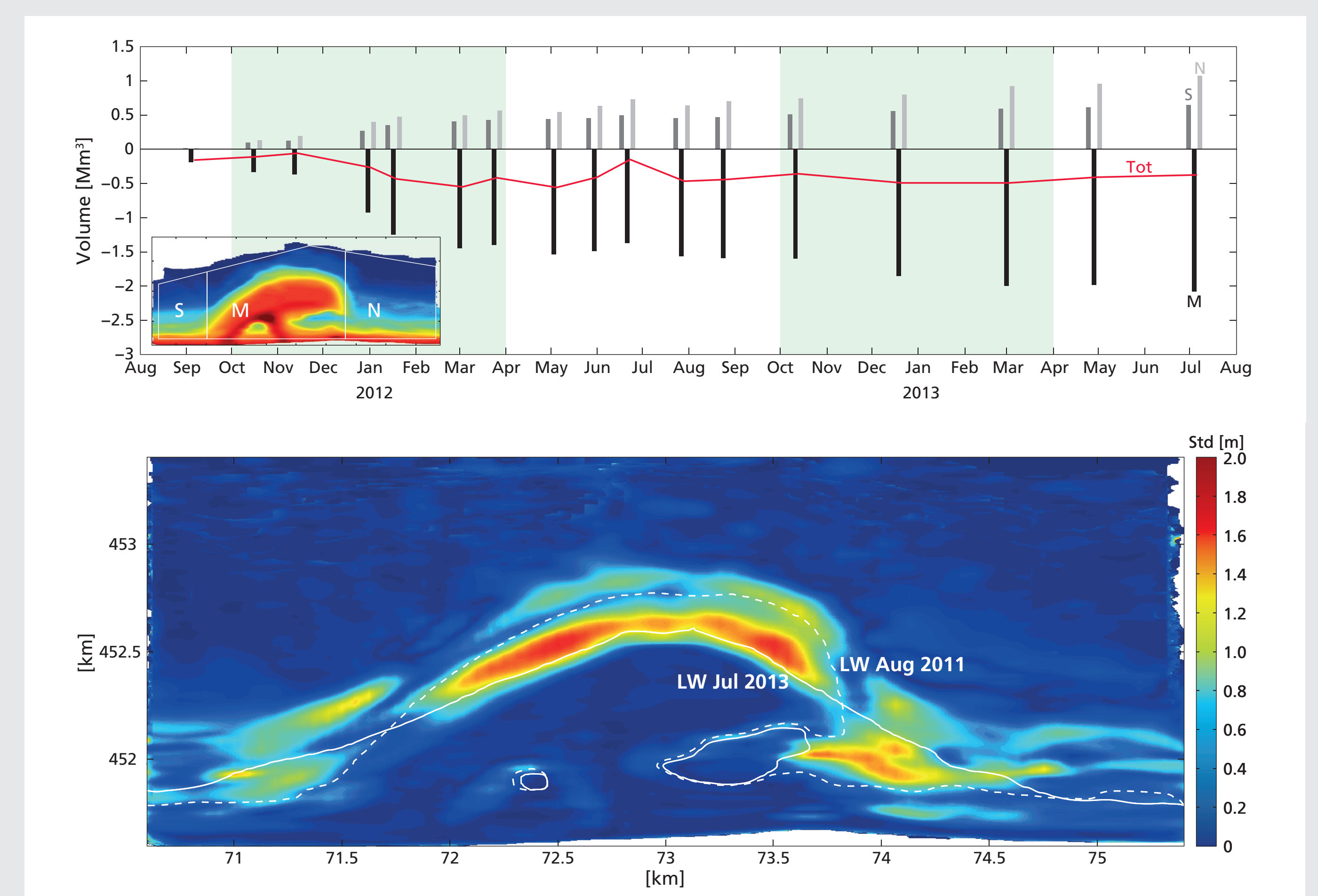
## Observations on morphologic change

### When?

- Sediment eroded at the head of the Sand Motor (M) and accreted at the southern (S) and northern beaches (N).
- Most of volumetric loss is in the winter after construction and during the next winter.
- Sediment moved out of the measurement domain (Tot): further North or South, offshore or into the dunes.

### Where?

The most dynamic areas are reflected by a high standard deviation over all 18 bathymetric surveys (Aug 2011-Jul 2013). Red areas depict shoreline retreat at the head and the formation of the spit and the sub-tidal sandbars.

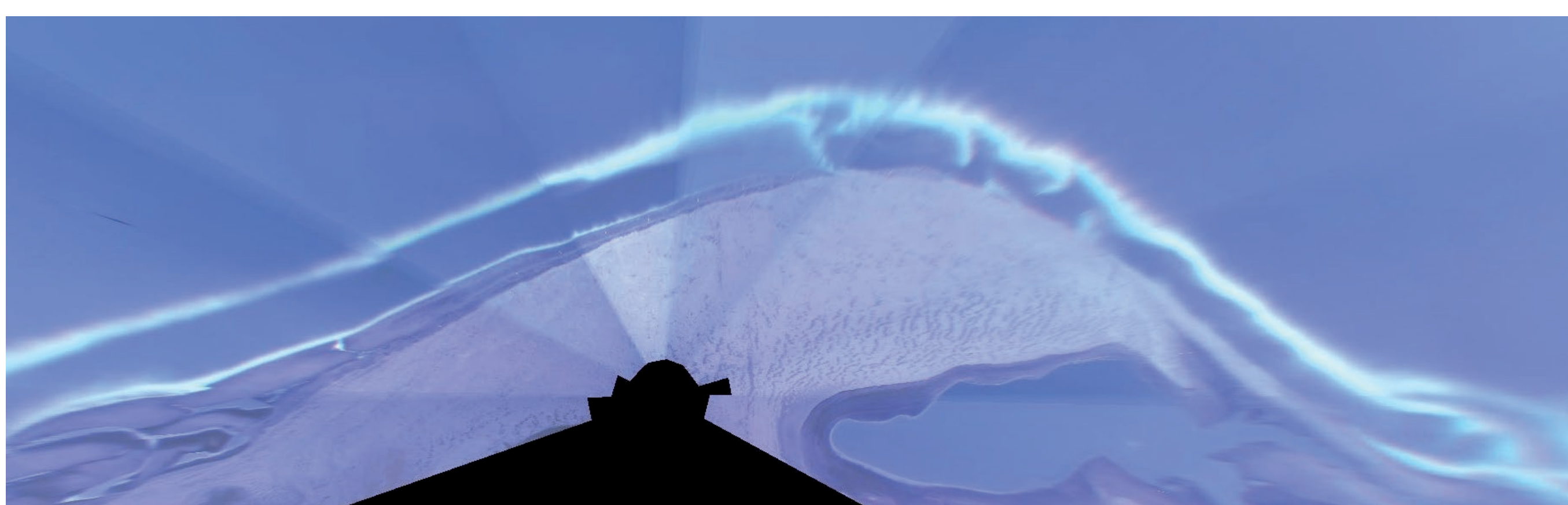


## Future

Study the inter- monthly change of sandbar-shore system using video and radar observations.

### Keywords

Depth inversion, Data-model assimilation, Remote sensing



Argus plan view 10min time-exposure image