



OBJECTIVE Characterize the short-term morphodynamics of the Almagreiro beach (Peniche).

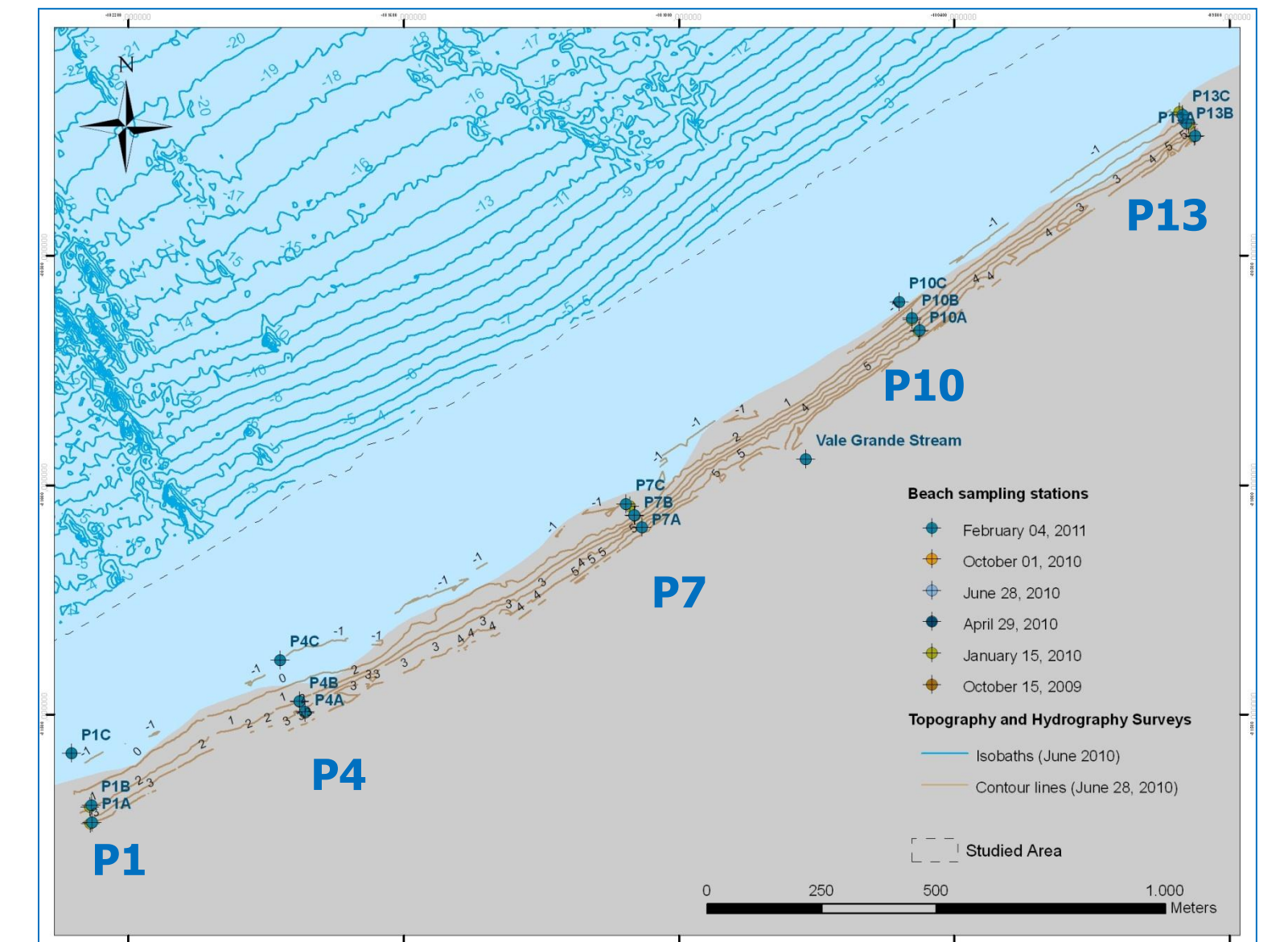
The Almagreiro beach, is a 3 km coastal stretch located on the NE-SW coast between Peniche and Lagoa de Óbidos. It is a narrow, low gradient and dissipative beach, backed by low to medium active cliffs .



METHODS

Morphosedimentary characterization was based in 13 campaigns that took place between October 2009 and February 2011. Systematic topographic survey, including 5 cross-shore profiles (P1, P4, P7, P10 and P13) was complemented with superficial sediments sampling at the beach berm, face, terrace and nearby stream.

- wave data was collected by an Acoustic Doppler Current Profiler (ADCP) deployed offshore (27 m depth) in 17 minutes burst events, with sampling rate of 2 Hz, every three hours.

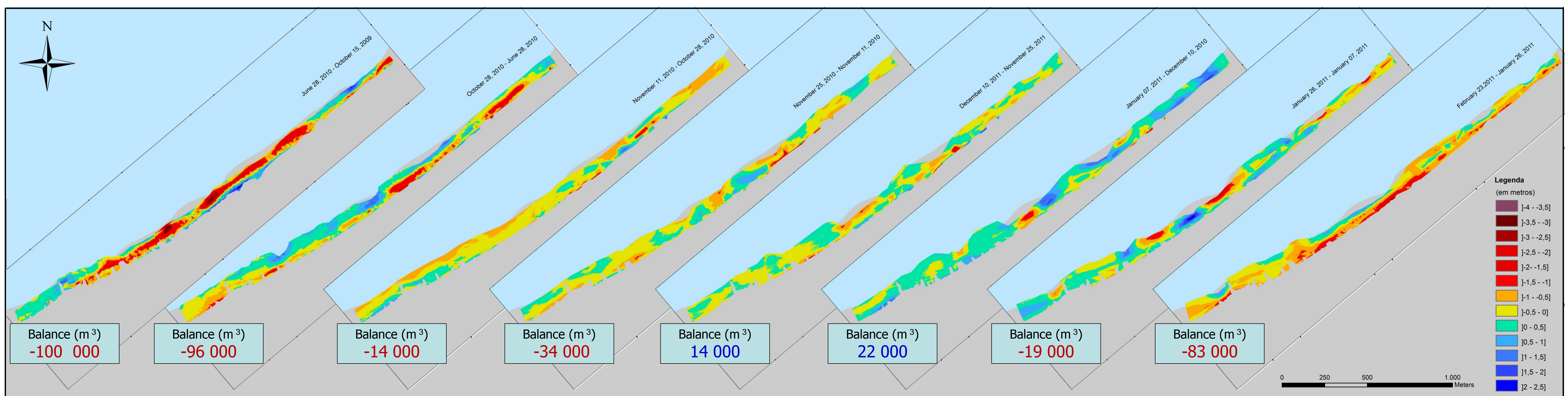
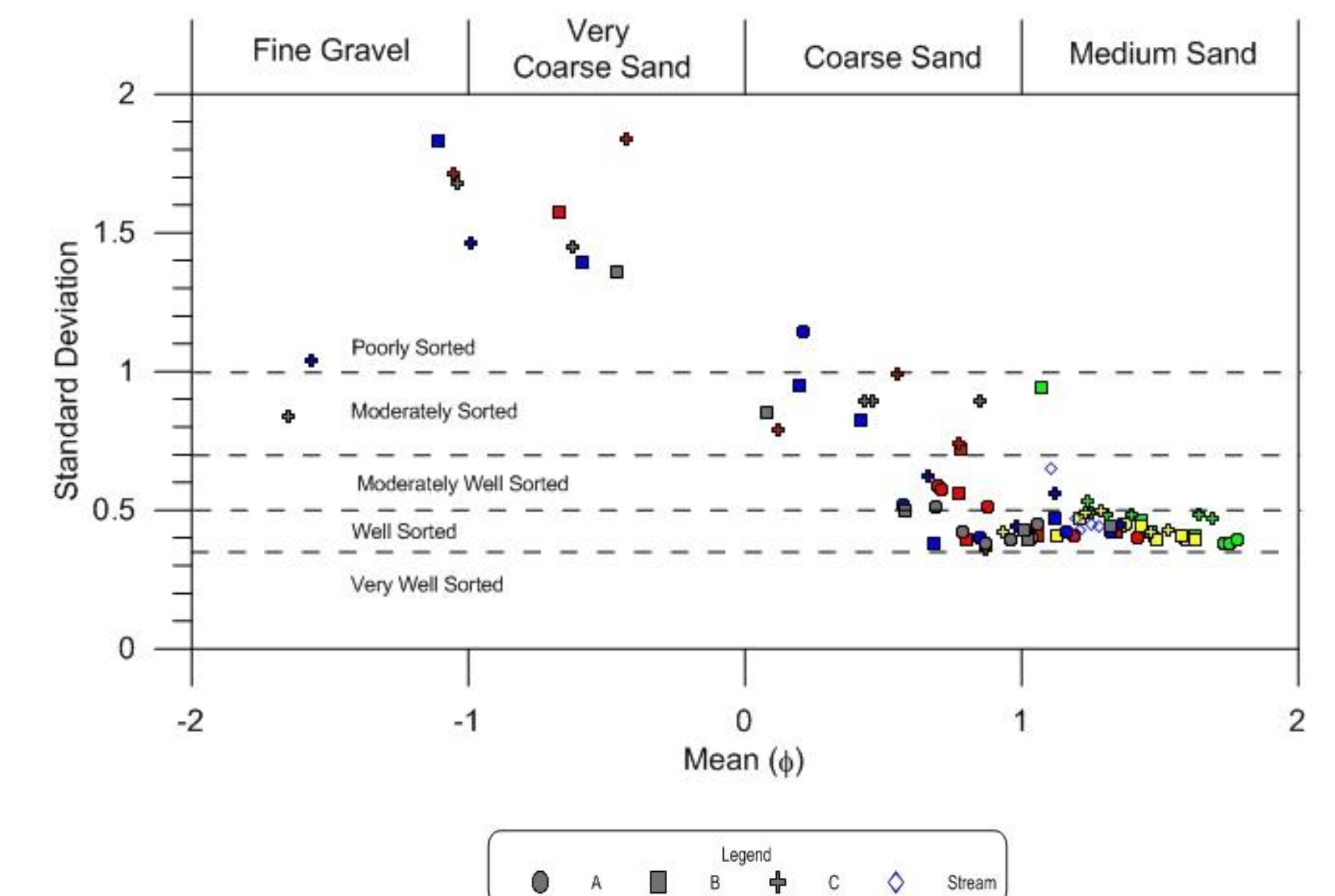


RESULTS

Sedimentary characterization: sediments are coarse to medium sands (0 to 2 ϕ). Longshore variability: in the southernmost sector (P1 and P4), the sediments are medium sands (1 to 2 ϕ); central and northern sectors the grain size increases to coarse sands (0 to 1 ϕ), and occasionally, fine gravel (-2 to -1 ϕ). Cross-shore variability: upper beach and beach face are characterized by medium to coarse sands while the beach low-tide terrace sediments are coarser to very coarse.

Morphodynamics: Almagreiro beach revealed a persistent erosional behaviour that endured in both winter and summer. Results showed a overall decrease in net beach volume of about 310 000 m³.

During the observational period the wave regime was unusually more rotated westwards than the average long-term direction, this induced an abnormal northward direct longshore drift, which translated in observed erosional trend.



DISCUSSION AND CONCLUSION

- Beach revealed a persistent erosional behaviour related with northern directed longshore drift.
- The accumulation and erosion patterns is constrained by the geomorphological setting (at the end of a littoral cell) and, thus, dominated by the longshore drift gradients. This background makes the sedimentary balance at Almagreiro beach very susceptible to the direction of incident waves.
- As the observational period correspond to a major negative NAO anomaly - which is related to western-than-average mean wave direction - it explains the persistent northern directed longshore drift and erosion observed at Almagreiro beach.