

Laboratório Nacional de Energia e Geologia (LNEG)

Decision support systems (DSS) for coastal vulnerability assessments

LNEG actively utilises DSSs. The GeoPortal of Energy and Geology is a DSS that provides information on long-term shoreline variability at high resolution for specific coastal areas in Portugal.

Key decision support tools include ArcGIS Pro and the Digital Shoreline Analysis System (DSAS), which are utilized to examine shoreline variability and calculate metrics such as Shoreline Change Envelope (SCE), Net Shoreline Movement (NSM), and Linear Regression Rate (LRR). The SCE measures the total change in coastline movement, the NSM indicates the distance between the oldest and most recent detected shoreline positions, and the LRR represents the rate of change over time.

Outputs include high-resolution shoreline variability maps, where the ratio of NSM to SCE is used as a complementary tool to the net shoreline movement (NSM) and the shoreline change rates (LRR) to highlight areas experiencing significant shoreline oscillations.

Input parameters mentioned in the figure may comprise multiple sub-parameters. For more information on the input parameters see Larsen et al. (2025; Table 1, p 17).

Further readings:

Larsen, I. R., Ernstsén, V. B., Maspataud, A., Dakin, N., van Heteren, S., Koutroulli, A., Poyiadji, E. & the GSEU T5.4 Consortium (2025). EGDl multifunctional 2D/3D decision-support module v1. GSEU Report on Deliverable 5.7, 165 pp.

