

Geological Survey Ireland (GSI)

Decision support systems (DSS) for coastal vulnerability assessments

GSI utilises a DSS when assessing coastal vulnerability. The workflow is based on work by USGS (Pendleton et al., 2010). To obtain the relevant parameters GIS is used as the primary tool (e.g. to process Lidar DTMs). The GIS plugin DSAS (Digital Shoreline Analysis System) is applied to calculate shoreline change rates based on vegetation line time series. The parameters are then standardised using discrete vulnerability categories and ranked. A simple formula is then applied to obtain a final coastal vulnerability index (CVI). The final CVI score is then ranked again from 1 to 5.

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., Ernsten, 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.

Pendleton, E.A., Barras, J.A., Williams, S.J., and Twichell, D.C. (2010). Coastal vulnerability assessment of the Northern Gulf of Mexico to sea-level rise and coastal change. U.S. Geological Survey Open-File Report 2010-1146, at <https://pubs.usgs.gov/of/2010/1146/>

