

A Vulnerability Index for Assessing Coastal Change Impacts on Lebanese Maritime Archaeology

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Rationale

Coastal change poses a clear threat to maritime archaeology in Lebanon.

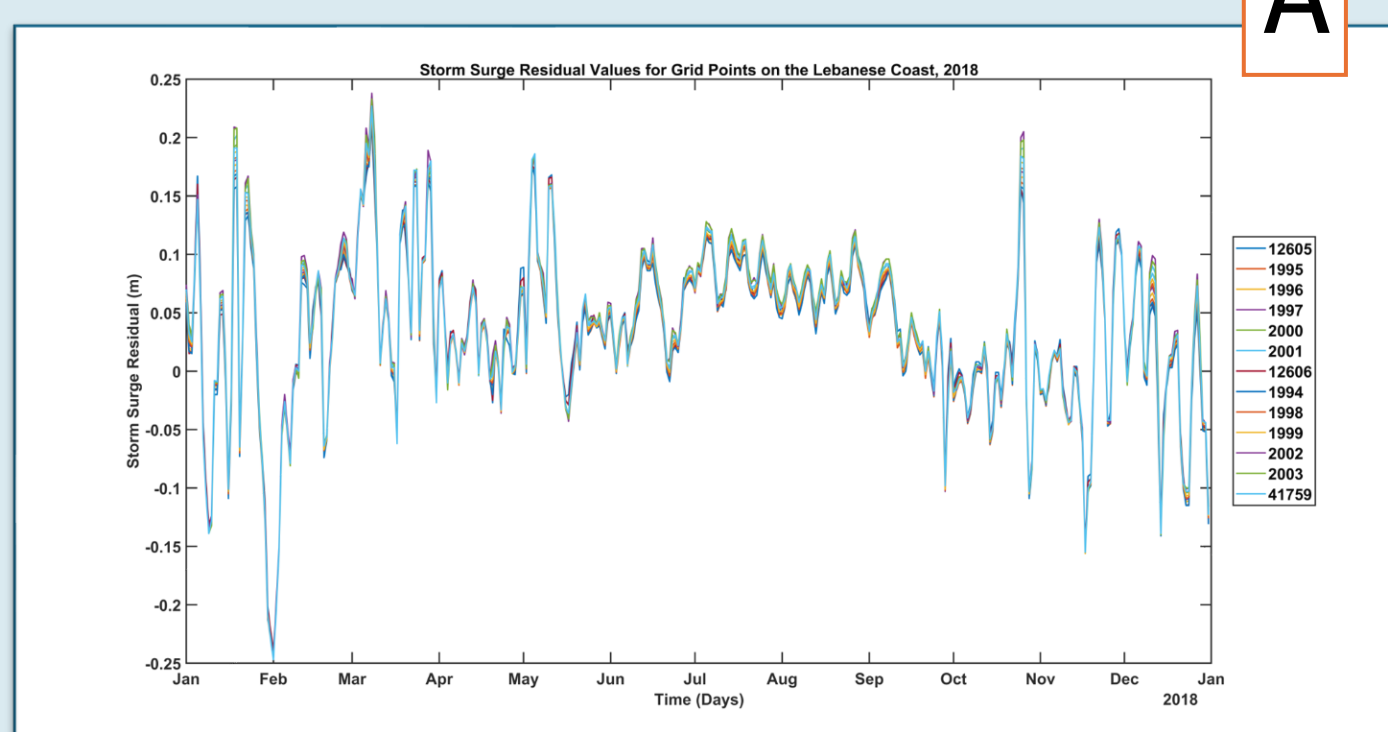
In Lebanon, the lack of a baseline classification of sites which incorporates both archaeological and geomorphological criteria, in addition to limited access to higher-resolution data mean vulnerability has not yet been quantified at local scales.

Aims to **assess the impacts of coastal change to Lebanese maritime archaeology using an index-based approach**, integrating archaeological, geomorphological, and hydrodynamic data to produce indicators of vulnerability at local scales.

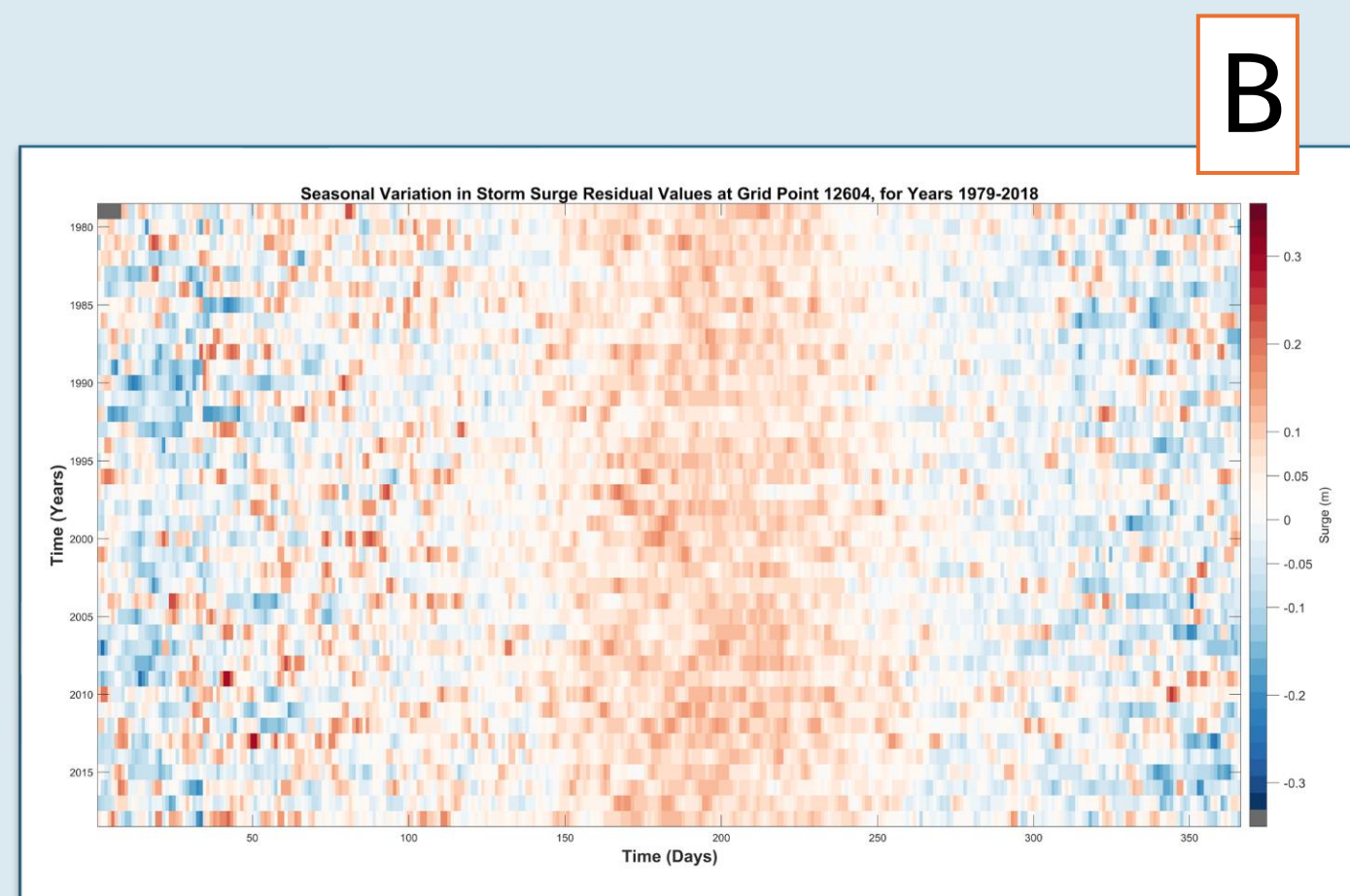
Classifying Lebanese Maritime Archaeology

Produce a baseline classification of sites that incorporates archaeological and geomorphological criteria.

Draws from varied sources including open-source datasets.



- Spatial comparison of storm surge values for 15 grid location points across the Lebanese coast, 2018.
- Seasonal variation in surge patterns at one grid point from 1979–2018.



Characterising Coastal Dynamics at a Local Scale

Characterise coastal dynamics at a finer scale, through site-level explorations of coastal morphology and hydrodynamic processes.

Baseline wave and surge data can be downscaled to produce higher-resolution indicators of flooding and erosion.

Producing a Coastal Vulnerability Index (CVI)

A standard method which has been applied in an archaeological context at a regional scale for the Mediterranean (Reimann et al., 2018 [2]) but not yet locally in Lebanon.



Great potential for the addition of higher-resolution archaeological data to a CVI framework for Lebanese case study sites.

Next Steps

- Finalise baseline classification of maritime archaeological sites.
- Produce a CVI to assess the vulnerability of all sites in study area starting with a limited set of standard variables.
- Continue to refine CVI methodology for most suitable application to all sites in study area.
- Ensure results are accessible, reproducible, and productive through digitisation and sharing.



Byblos (top) and Tyre (bottom); two complementary case study sites on the Lebanese coast [1]

SMMI PGR and Leverhulme Poster Event

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[1] Dauge, V. (n.d.) *Byblos; Tyre* [Photographs]. UNESCO.

[2] Reimann, L. et al. (2018) 'Mediterranean UNESCO World Heritage at risk from coastal flooding and erosion due to sea-level rise', *Nature Communications*, 9(4161), pp. 1–11.