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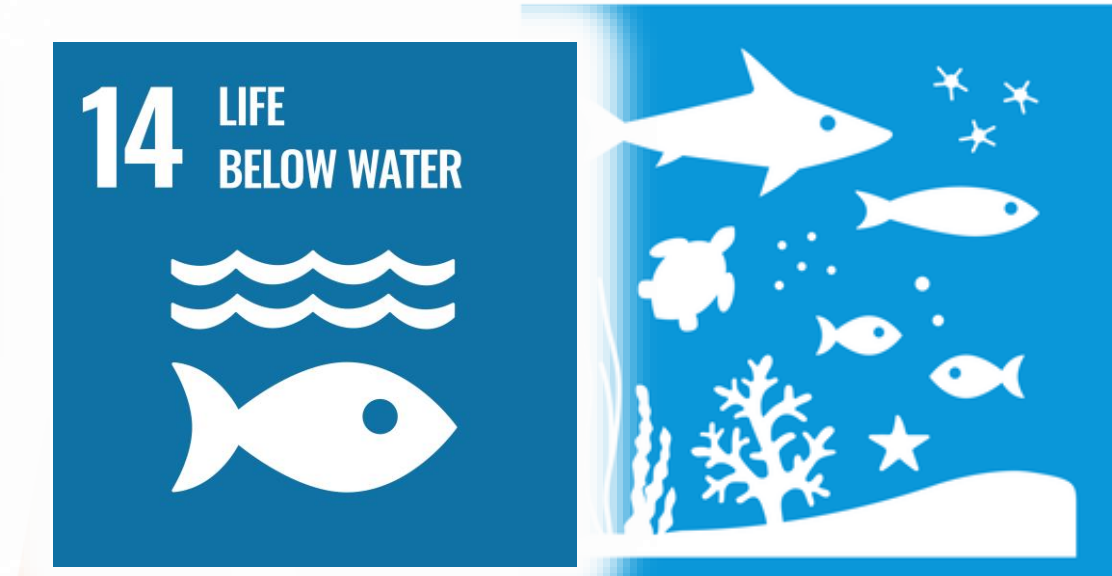
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TARGET 14-2



PROTECT AND RESTORE ECOSYSTEMS

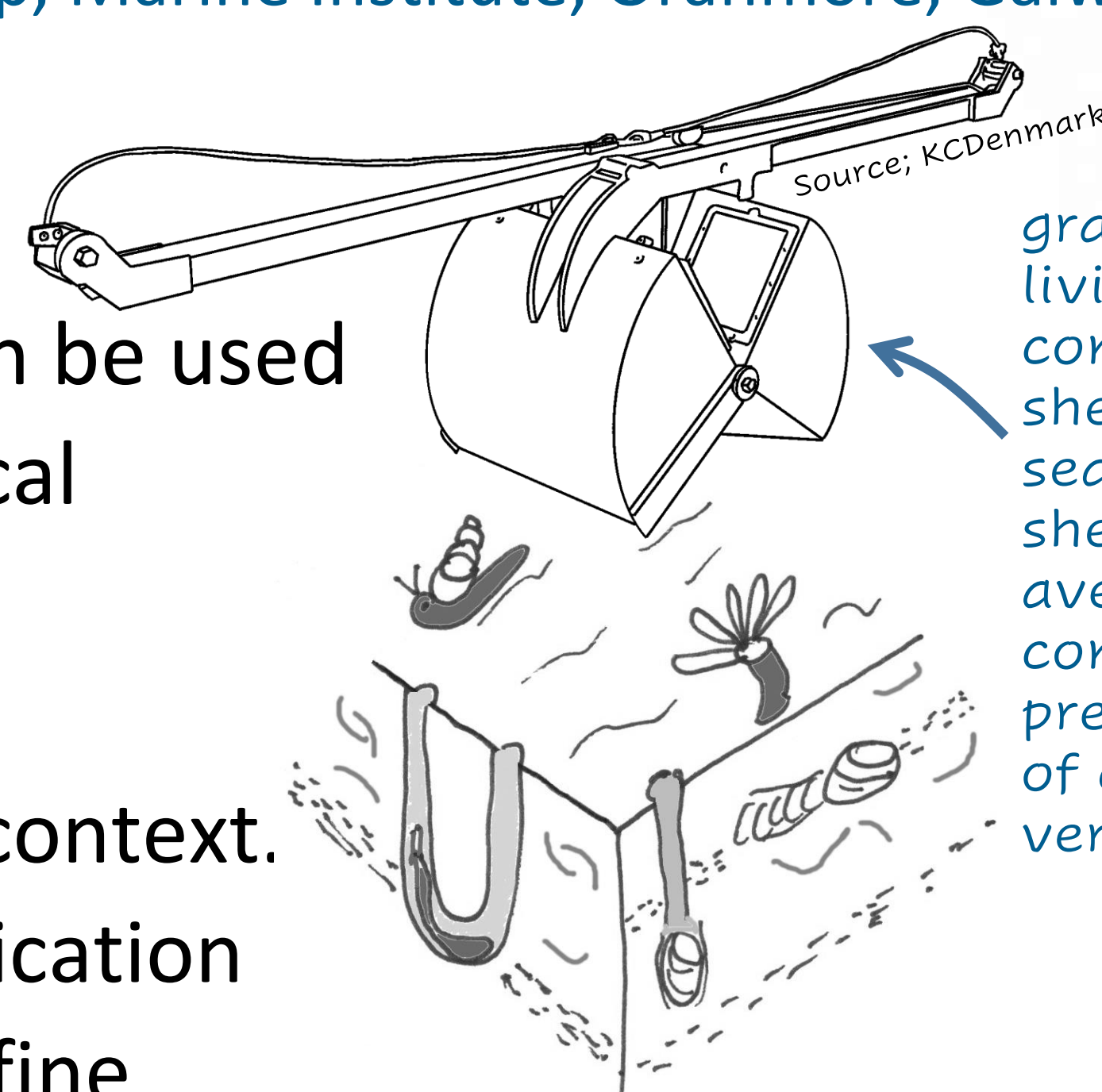
**Geohistorical records** (the 'near-time fossil record') can be used to test for differences between the diversity and ecological structure of an ecosystem today and in the recent past.

**Conservation palaeobiology** uses fossil material and palaeontological techniques to provide this longer term context.

Data on baseline conditions before anthropogenic modification can be used to assess the scale of human impact, and define restoration goals for degraded ecosystems.

For marine ecosystems such **geohistorical data** is available from the same area as the living community via cored sediments and surficial grabs (Figure 1). Direct comparison of the sub-fossil assemblages and modern communities is relatively straightforward as: (1) fossil data usually retain high levels of spatial and temporal fidelity; (2) closely related (often the same) taxa are present; (3) high-resolution dating is possible; (4) burial-related diagenetic overprint is usually minimal<sup>1</sup>. Transformation from living community to a fossil assemblage introduces post-mortem "taphonomic overprint"; qualitative and quantitative criteria can assess the extent of this (e.g. Figure 2). The hypothesis tested is that for unmodified ecosystems the fossil assemblage and the preservable component of the living assemblage have the same composition and/or ecological structure (Figure 3)<sup>2</sup>.

The use of **conservation palaeobiology** to address the current and future ecological health of Irish marine ecosystems has been limited, an oversight this research will redress.



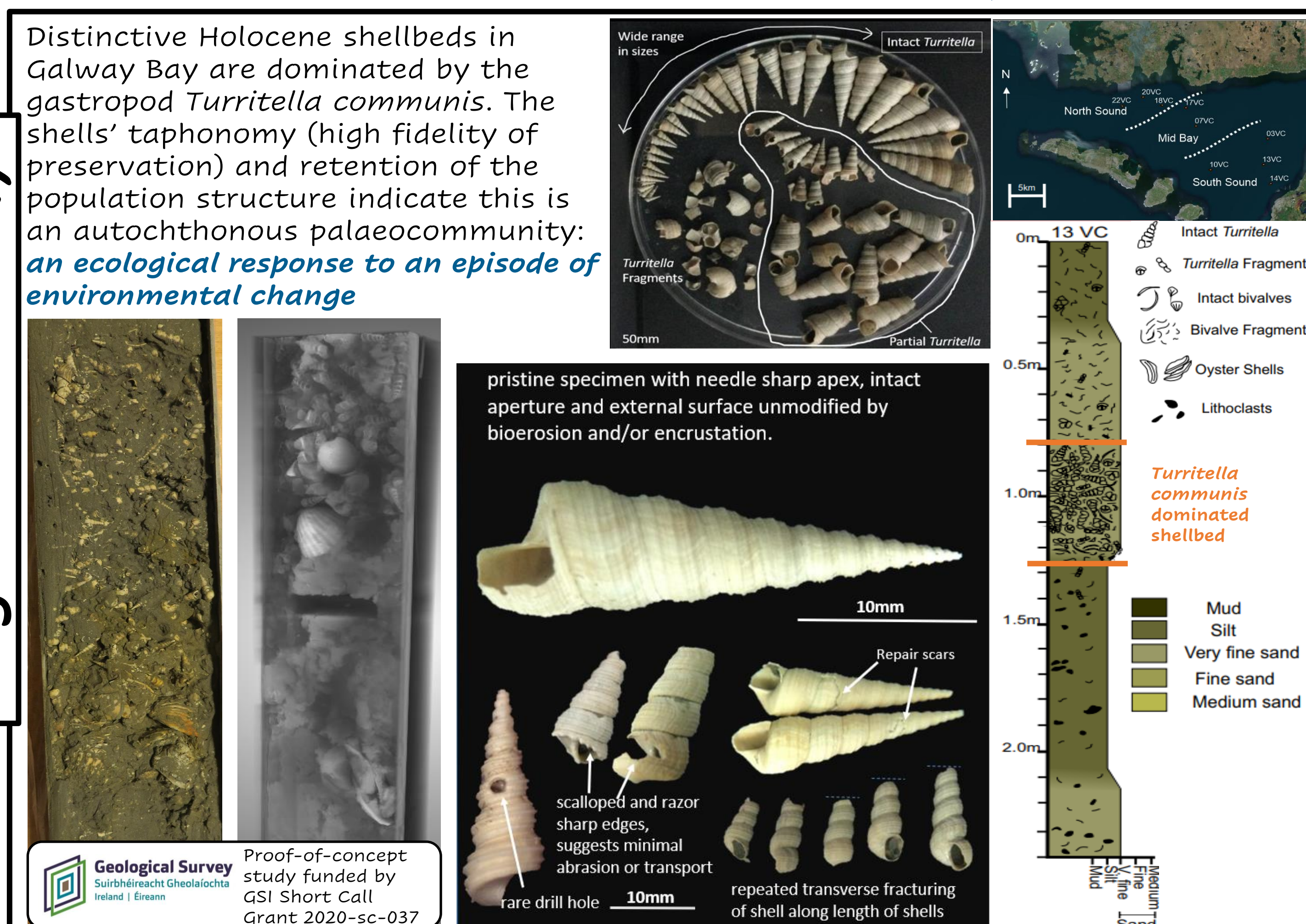
grab sampling recovers living benthic community and dead shells from upper part of sediment column: dead shells are the time averaged assemblage comprising the preservable components of communities in the very recent past

changes in recent past suggestive of anthropogenic disturbance of ecosystem

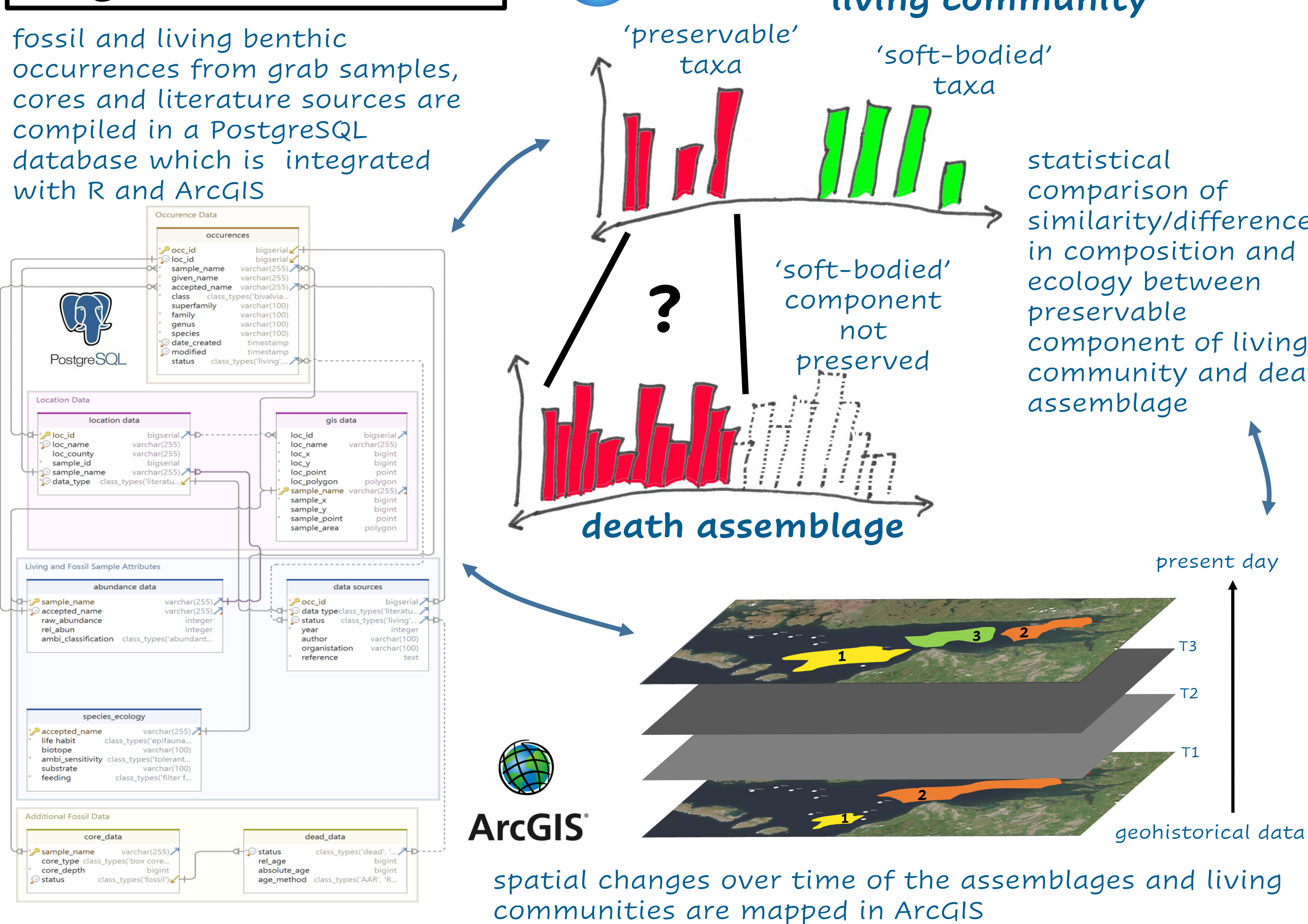
changes in faunal composition and/or relative abundance of taxa through core can be in response to changes in environmental conditions. Identifying what the causes were helps inform possible response of ecosystem to future environmental stress

**Fig 1. Data collection**

**Fig 2. Case study**



**Fig 3. Workflow**



**Testing the hypothesis**

