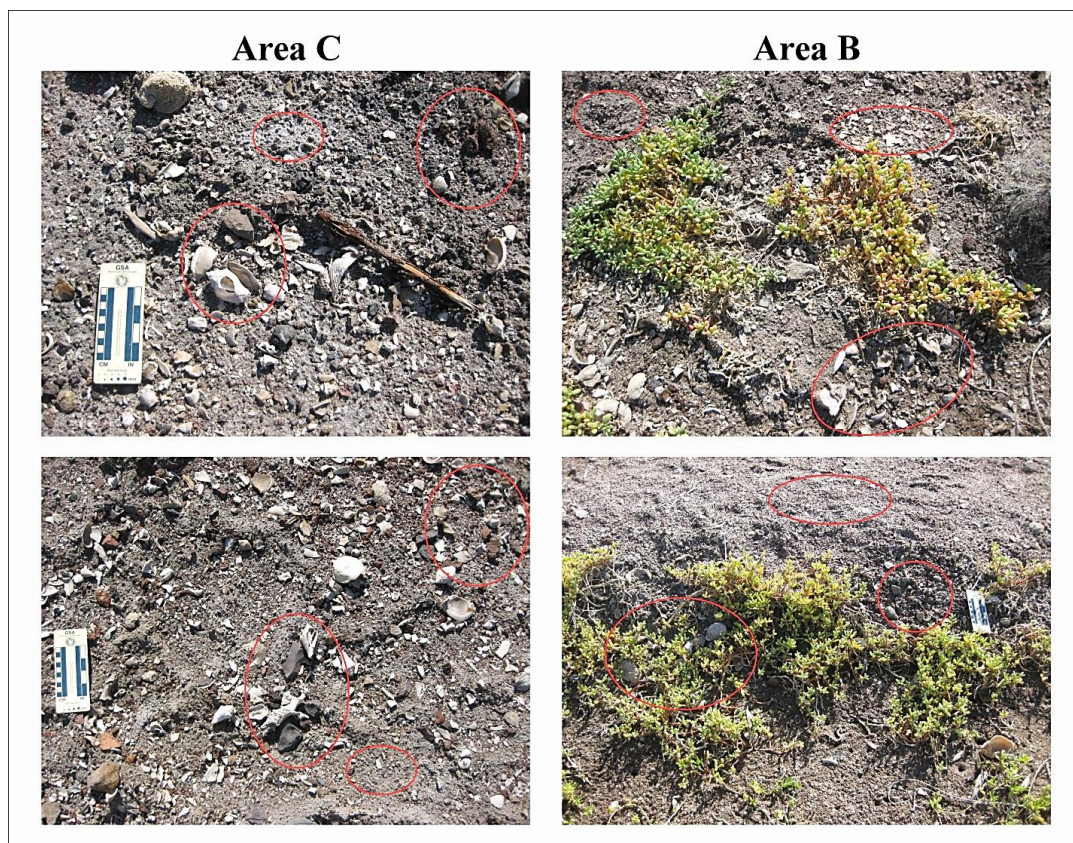


## Supplementary Materials



**Figure S1.** Shell preservation. The sharpness of the fine morphological features demonstrates the high level of preservation for the five shells selected for dating.





**Figure S2.** Extreme spatial heterogeneity. Red circles outline small areas, separated by a few cm, where the dominant sediment size varies from clay/silt/sand to gravel. Similar heterogeneity is evident in the percentage of shells.

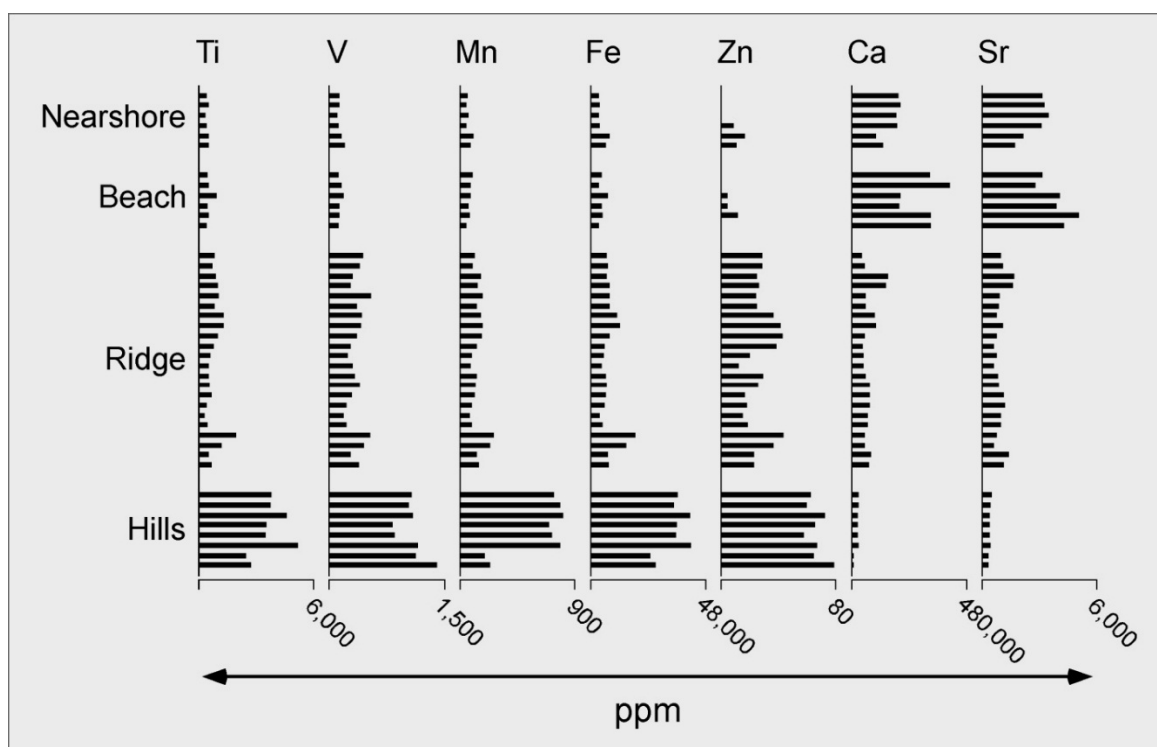


**Figure S3.** Embedded rocks. Red circles outline rocks that are embedded in the clay matrix, surrounded by shells.





**Figure S4.** Imbrication. Note the consistent orientation of the overlapping clasts.



**Figure S5.** Geochemical profiles. Material collected from the shelly ridge (Area B) (middle) has intermediate elemental concentration values when compared to marine samples (top) and terrestrial samples (bottom). This occurs in both terrestrial (Ti, V, Mn, Fe, Zn) and marine (Ca, Sr) indicators.