A New Approach to the Detection of Vertebrate Skeletons by Ground Penetrating Radars: An Example from the Ica Desert Fossil-Lagerstätte

Supplementary Figures

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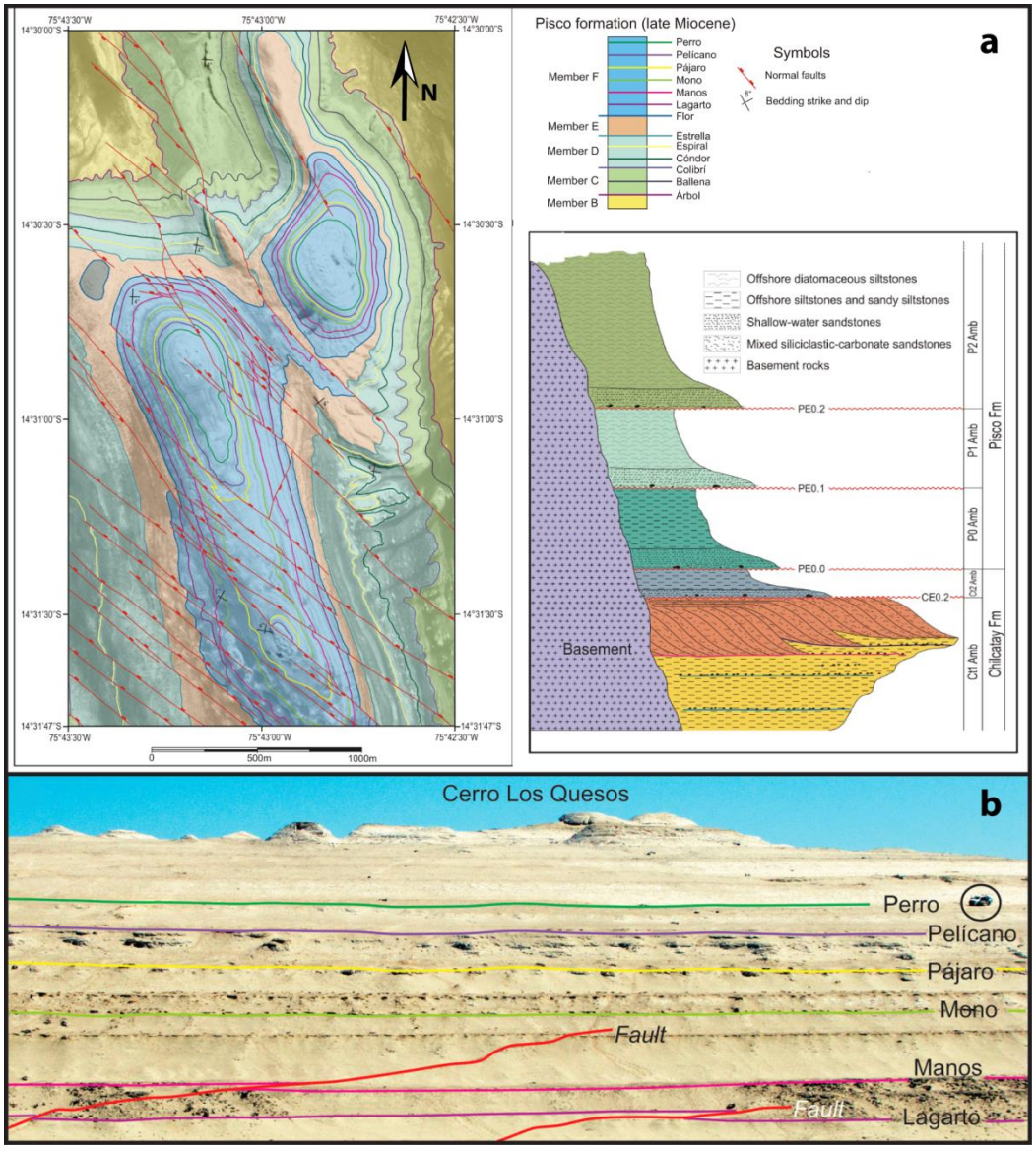

Figure S1. Geological setting of the Cerro Los Quesos (CLQ) area. (a): Geological map and stratigraphic framework (b): Eastward view of Cerro Los Quesos showing the key strat-igraphic marker beds through Member F (modified from Di Celma et al., 2016).

Figure S2. Mysticete specimen outcropping at the Pisco Formation.

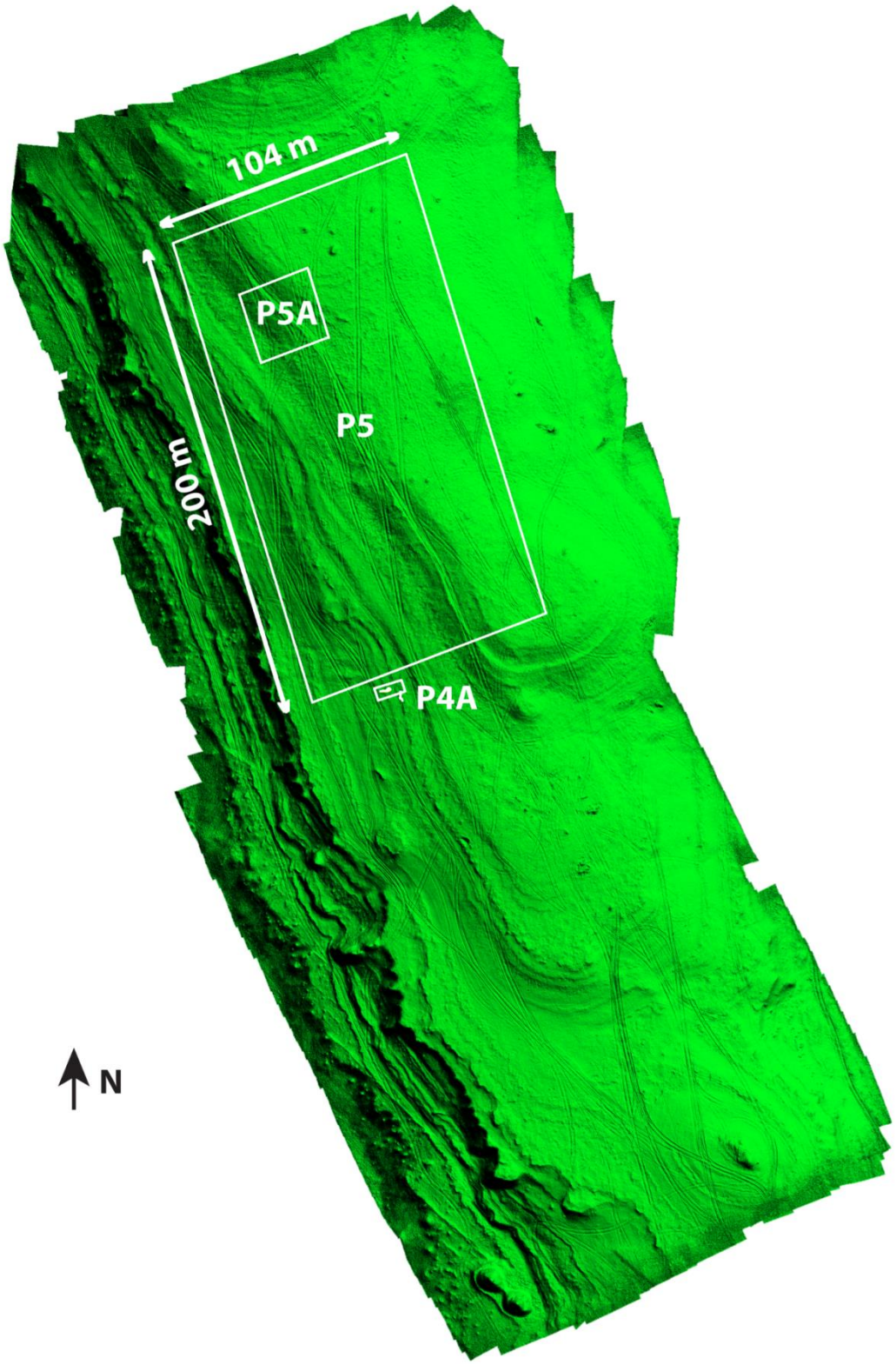

Figure S3. Location of the areas of GPR investigation.

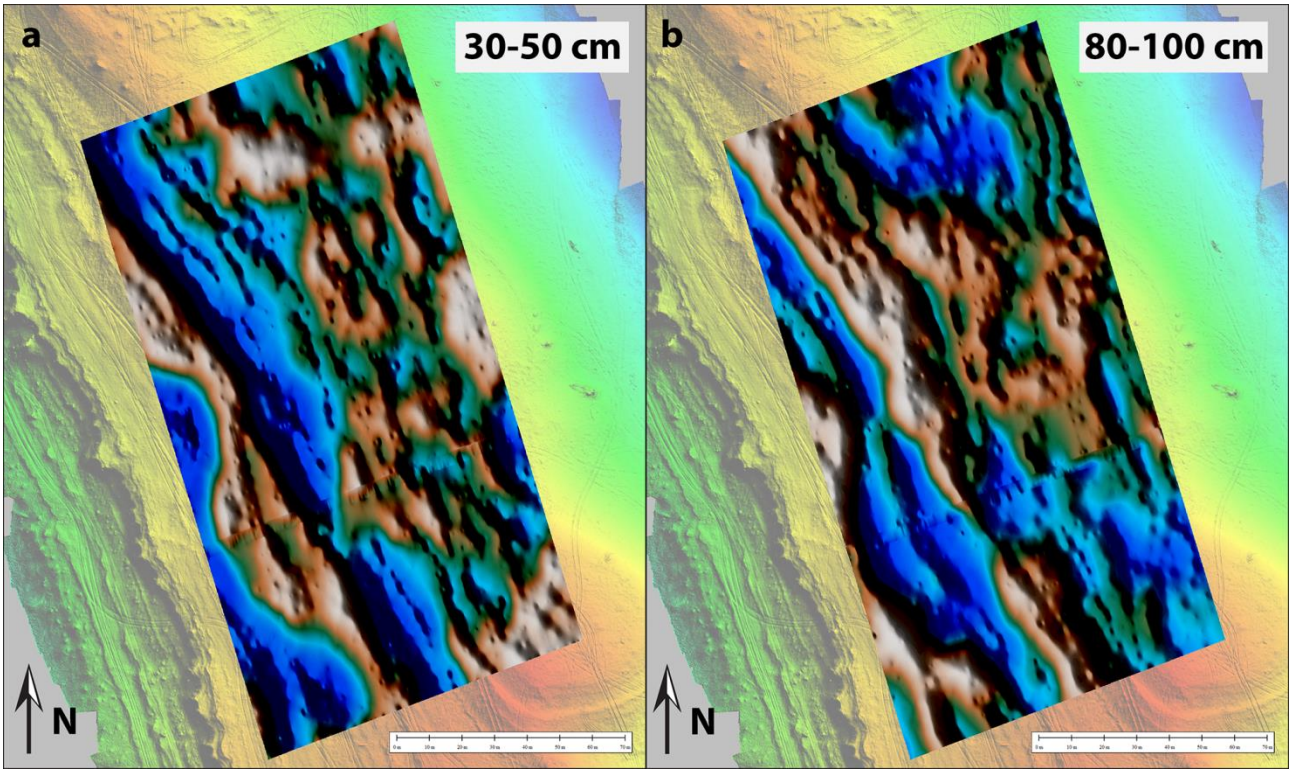

Figure S4. Amplitude slices at site P5. a: Reflection amplitudes between 30 and 50 cm depth. The background image is a DEM of Cerro Los Quesos (see methods). Blue and brown regions have low and high reflectivity, respectively. The NNW-SSE directed stripes of low or high amplitude follow the strike of a normal fault and mark the locations where reflectors are truncated along the fault plane.

Figure S5. Site P4A, showing the outcropping part of a Mysticeti whale skeleton. The reddish layer in the upper part of this photo is the Perro key stratigraphic marker bed.

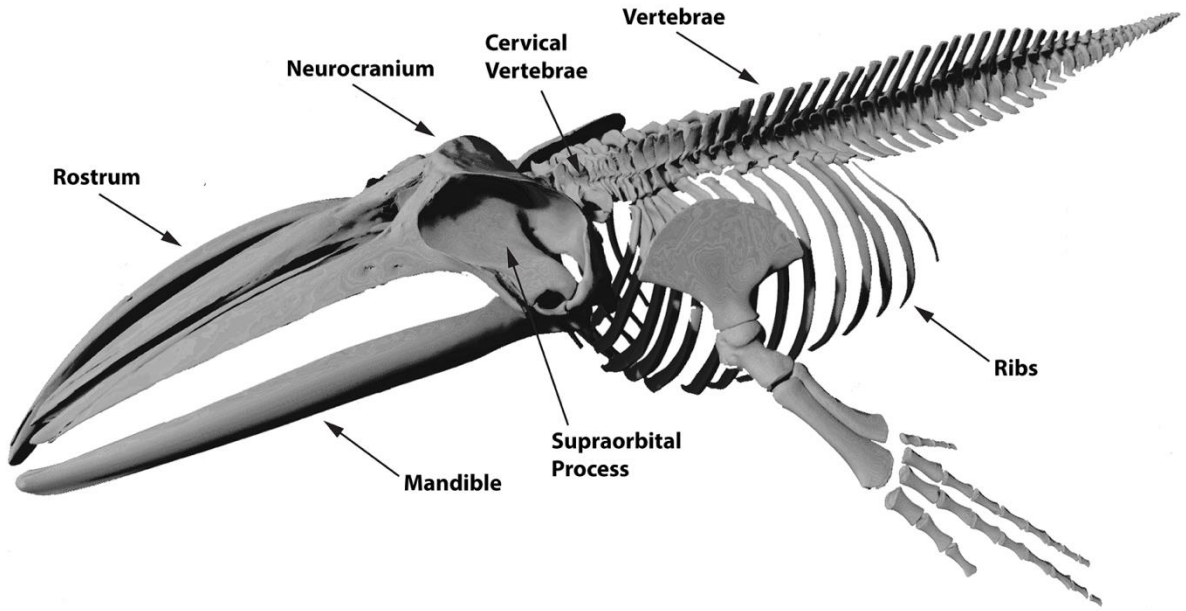

Figure S6. Skeletal components of a Mysticeti whale, identified by radar profile analysis and trace modelling.

Figure S7. Survey instrumentation. (a) SIR 4000 GSSI system equipped with a 200 MHz antenna and survey wheel. (b) Same system equipped with a 400 MHz antenna. (c) DJI Mavic 2 Enterprise Dual drone.

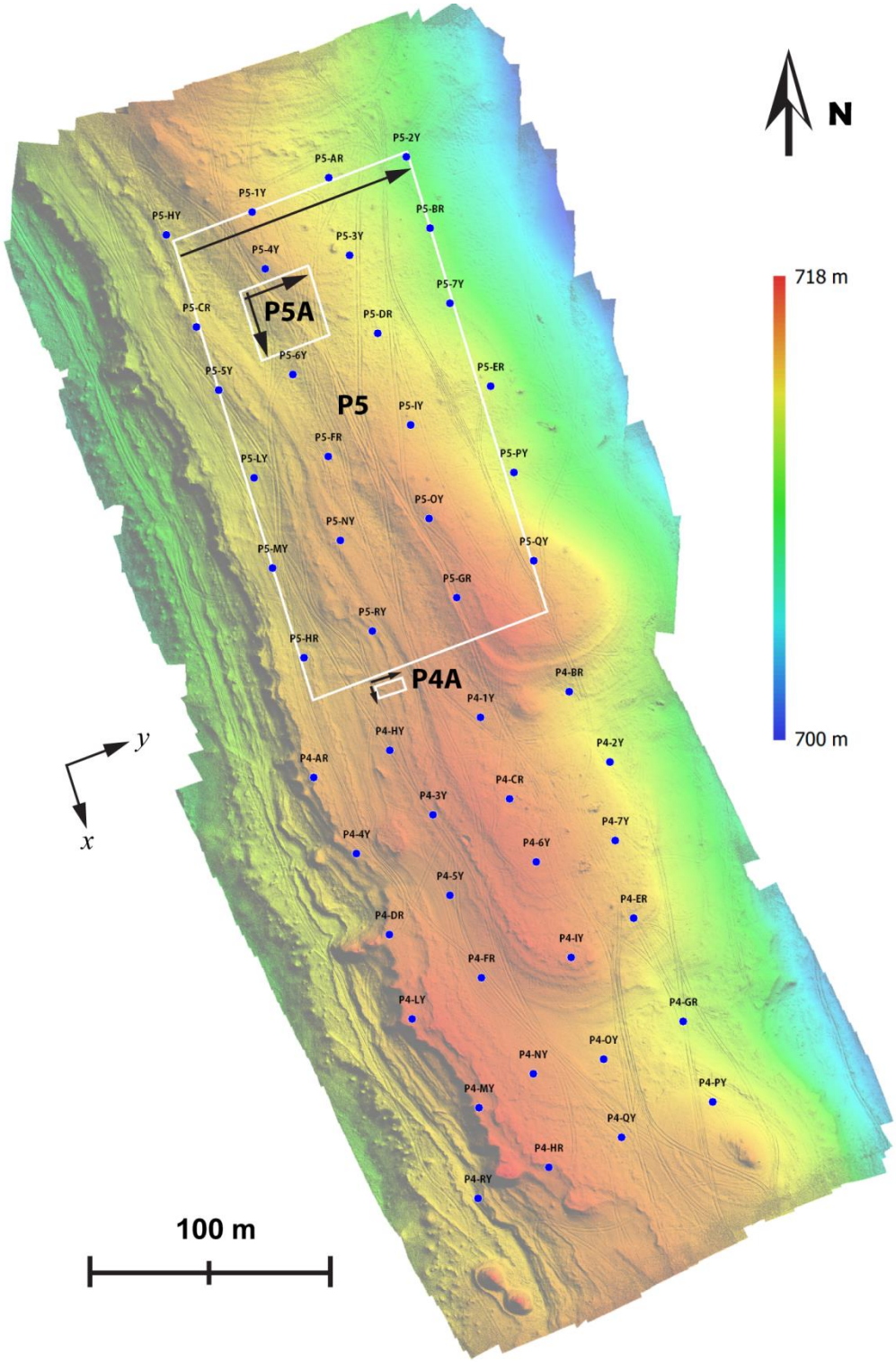

Figure S8. DEM obtained by the preliminary photogrammetric survey. The Blue dots represent photogrammetric ground control points (GCPs). Arrows in the areas of GPR survey (P5, P5A, and P4A) indicate the survey line orientations. The line spacing is 5, 0.5, and 0.25 m, respectively.

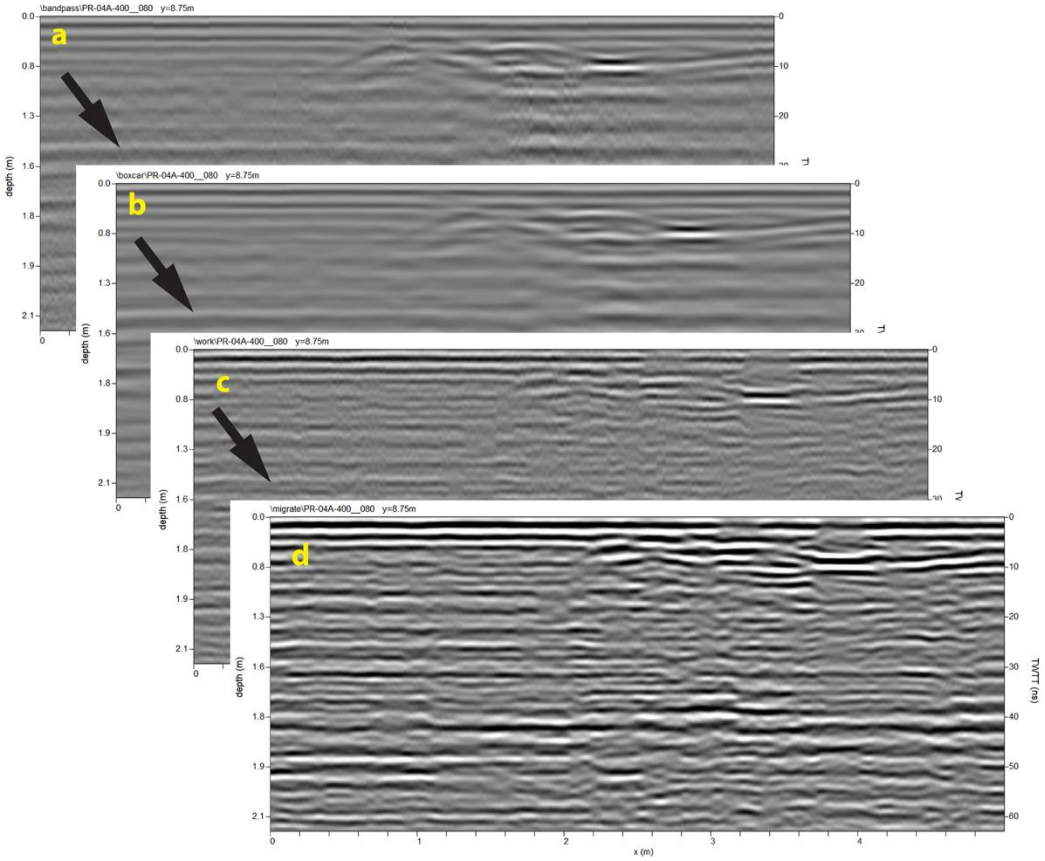

Figure S9. Radar data processing steps. (a) A radar profile after preliminary steps of time zero correction, automatic gain control (AGC), and bandpass filtering. (b) Application of trace stacking. (c) Removal of multiples by cepstrum deconvolution. (d) Final profile after Kirchoff migration. Trace analysis is performed on radar profiles that have undergone exclusively steps (a) and (b)