

**SUPPLEMENTARY MATERIAL: SEISMIC DATA SET AND METHODS OF INTERPRETATION**

The eastern Calabrian margin was investigated using a seismic grid formed by multi-channel seismic profiles (Fig. 2) acquired from the Western Geophysical Company in 1968 after the commitment of Italy's Minister of Industry to carry out a regional survey of the entire Italian continental shelf (ViDEPI 2009). These seismic data were acquired using: an acquapulse energy source, 24-trace and 1600 m-long streamer, 2 ms sample rate, 68 m shot and group interval, 10-80 Hz filter, recorded length 4 s. The processing sequence was: deconvolution before stack, normal move out stack 1200%, time variant filter, playback unfiltered.

The eastern Calabrian margin was also studied using the data acquired within the frame of the CROP Project (performed by a pool composed of the Consiglio Nazionale delle Ricerche of Italy, CNR, the national oil company, Agip, and the national electric company, Enel) a comprehensive attempt to study the crust of Italy and surrounding seas. The CROP seismic profiles were acquired and processed in the 1980s and 1990s and an atlas of these seismic profiles was successively published by CNR (Scrocca *et al.* 2003). The CROP data differ from commercial multichannel profiles because they are Near Vertical Reflection seismic profiles characterized by deep penetration (17 s of two way-travel-time) and low resolution. Offshore sections are the most readable seismic lines, and in this paper we used two CROP seismic section that crosses the Ionian Sea.

Raster image of the overall seismic profiles were converted to segy format and then collected in a dedicated geographic information system (GIS) environment. Line drawing, interpretation of profiles and modelling of geological surfaces were performed using Kingdom® software (copyright IHS); gridding and contouring were performed on geologic horizons in order to generate 2-D and 3-D models and isochron maps of the succession. An iterative testing was done to select the best algorithm and processing parameters. The seismic units were calibrated using the lithostratigraphic data of several deep offshore and onshore boreholes (ViDEPI 2009). The seismic interpretation was made using seismic stratigraphy and sequence stratigraphy methods: seismic units are groups of seismic reflections, the parameters of which (configuration, amplitude, continuity and frequency) differ from those of adjacent groups. Sedimentary units were delineated on the basis of contact relations and internal and external configurations (e.g. Mitchum *et al.* 1977) and a sequence stratigraphy approach was used (e.g. Posamentier & Vail 1988; Van Wagoner *et al.* 1990).

In the depth conversion (Fig. 3b) of the stratigraphic units overlying the acoustic substrate we assumed an average Vp of 2,000 m/s and 2250 m/s, respectively, for Pliocene and Miocene deposits.

**SUPPLEMENTARY REFERENCES**

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