Geophysical Research Abstracts,
Vol. 10, EGU2008-A-02624, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-02624
EGU General Assembly 2008

High-resolution stratigraphy and sedimentary facies of late Quaternary forced-regressive shorefaces from the Gulf of Lions (Western Mediterranean Sea)

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Thick forced regressive units deposited on the wide continental shelf of the Gulf of Lions (Western Mediterranean) have recorded the composite effect of sea-level changes during the Quaternary. They are mostly composed of coastal siliciclastic and bioclastic wedges showing clinoform geometry. These deposits have been intensively explored through high-resolution seismic investigations, but only recently it was possible to ground-truth seismic interpretations, thanks to a long (100 m) borehole that crossed the succession and recovered a large part of the mainly sandy deposits (84% recovery). The stratal architecture of the shelf margin is controlled by major bounding surfaces that are polygenic erosion surfaces made of coarse-grained material incorporating abundant and diverse shells, including cold-water fauna (e.g., Modiolus modiolus, Arctica islandica, etc., presently absent from the Mediterranean Sea). Between each coarse-grained lags, marked on the seismic profiles by very strong reflectors, coarsening upwards units with steep (up to 5°) foresets are made of massive (more than 20 m thick) sands, passing seawards to sands with muddy intervals, then to alter-

nating sands and silts highly bioturbated. Each prograding wedge corresponds to a forced-regressive shoreface, deposited during the overall sea-level falls during (relatively slow) interglacial/glacial transitions and therefore represent the record of 100 ky cyclicity. Detailed examination of the architecture and chrono-stratigraphy of the recent-most sequence shows that second-order bounding surfaces, corresponding to abrupt shallowing of sedimentary facies, separate stepped downward-stepping parasequences within the main sequence. These events are in phase with millennial-scale glacial climatic and sea-level variability. They provide a comprehensive and well-constrained Pleistocene analogue to the numerous shoreface deposits attributed to falling-stage systems tracts recognized in the stratigraphic record.