Submarine geomorphology offshore Ionian Sea, Italy

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Submarine continental slopes are landscapes characterized by large variety of relief from rills and gullies to large canyon net systems, but how these features develop is still not well understood. Marine-geoscientists suspect that sediments delivered from the adjacent land might be the ultimate "driver" for these landscapes, for example, by supplying erosive sedimentary flows. However, it is difficult to prove an intimate cause for submarine system formation as along most coasts the shelf is too wide to allow us to assign individual canyons to rivers and we have poor idea of the sediment supply. The coasts of NE Sicily and SW Calabria have narrow shelves and their uplift rates are well quantified. As the Sicilian coast landscape in particular is mature, the long term sediment flux can be assessed from the uplift rates and their drainage catchment areas. The marine geophysical dataset, used for the present study, reaches to within 100m water depth around the coast. As, according to estimates, local relative sea level was depressed by 120m, the data represents areas that were exposed during the Last Glacial Maximum. This allows an assessment of sediment transport paths during glacial times. Spectacular underwater landscape is observed from the data with developing rills, gullies and deeply incised canyons. Our findings suggest that channels lying offshore large rivers are characterized by canyons with broad channels and channels that lie offshore small rivers are characterized by small relief channels.