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[1] An understanding of fault kinematics in areas of active tectonic deformation requires detailed knowledge of local and regional ground-surface displacement vectors. Where faulting displaces coastlines, dated marine notches can provide reference markers to measure the magnitude, rate and timing of fault displacement [Pirazzoli et al., 1999]. This is particularly important in areas of multi-generational faulting and where uplift may include both local and regional scale components, features which characterise the actively extending Gulf of Corinth rift (Figure 1). Cooper et al. [2007] interpret the distribution and elevation of raised Holocene and marine isotope stage (MIS) 5 (~125 ka) fossil shorelines from the Perachora peninsula in the Gulf of Corinth as due to spatially variable uplift along the fault footwall of a western segment to the Pisia fault which ruptured in 1981 [Jackson et al., 1982]. This comment draws attention to previously published studies of raised shorelines in the area and presents new field observations that help test the structural uplift models of Cooper et al. [2007] and Morewood and Roberts [1999].

[2] Cooper et al. [2007] describe uplift rates increasing eastwards with distance from the fault tip at Makrugoaz Ridge to Agriliou Bay (Figure 1). They model spatially variable footwall uplift rates of the coastal section, increasing from 0.29 mm/yr to 0.5 mm/yr along the fault from the tip, values derived from Leeder et al. [2003, Figure 3]. However, as given by Leeder et al. [2003], the uplift rates are clearly stated as 0.5 mm/yr during the Holocene and an average of 0.2–0.35 mm/yr since MIS 5 and interpreted as evidence of spatially uniform and temporally variable uplift of these shorelines, but are mis-quoted as spatially variable uplift rates.

[3] The model predictions of Cooper et al. [2007] were tested against the elevation of raised marine shorelines along the footwall coastal section. Their test is dependent on precisely mapped shoreline elevations and accurate reconstruction of the uplift history of Holocene and MIS 5 shorelines and is supported by chronologies that are extrapolated from other locations on the Perachora peninsula. For brevity, we comment here on the west tip at Makrugoaz Ridge and more rapid uplifting east end at Agriliou Bay, modelled as laterally increasing uplift from 1.0 m to 3.0 m of Holocene uplift and 30 m to 80 m uplift of the MIS 5 shoreline at the west fault tip marine notches, which characteristically define sea level in this Mediterranean setting [Pirazzoli et al., 1994], are preserved above 1.0 m elevation. These are recorded by Vita-Finzi and King [1985] where shells from the sublittoral-dwelling _Notirus irus_ from 1.7 m elevation are $^{14}$C dated to 6.89 ± 0.09 ka and proposed to represent a fossil shoreline of 3.0 m elevation. The evidence for Holocene shorelines above 1.0 m is supported by Stiros [1995]. At Agriliou Bay a well defined notch at 1.6 m is $^{14}$C dated to 6.8 cal ka BP (sample OX1-14022; 5978 ± 30 $^{14}$C year in Leeder et al. [2007]). We have found no evidence to support previous claims of a notch above this elevation at Agriliou Bay [Leeder et al., 2007] (auxiliary photo of Cooper et al.’s [2007], the upper notch’s deepest recess, at the man’s shoulder, is 1.5 m above modern high water).

[4] Establishing the age of mapped notches from which uplift is calculated is the key to determining uplift rates for validation of any uplift model. Cooper et al. [2007] infer ages for their sequence of four mapped notches (Table 1) by reference to $^{14}$C dated _Lithophaga_ shells by Pirazzoli et al. [1994], although Cooper et al. [2007] misquote the shells as _Notirus irus_ species. The ages used for Cooper et al.’s [2007] model are from a flight of three notches at Heraion and one of three dated palaeoshores from Mylokopi (Figure 1) outside the study area of Cooper et al. [2007]. The Mylokopi age of 310 ± 190 B.P. adopted for the modelleed youngest notch is a mixture of shell fragments and is discarded as an unreliable age by Pirazzoli et al. [1994, Table 1]. There are preserved _Lithophaga_ shells suitable for dating along the coastal section discussed by Cooper et al. [2007] that can potentially provide a direct chronology and a more robust test of the model to supplement the two ages of Vita-Finzi and King [1985] and Leeder et al. [2007]; these require careful study.

[5] Over longer timescales uplift rates can be calculated where dated corals from marine sediments are associated with littoral zone beach conglomerates and notches of paleo-shorelines up section [Vita-Finzi, 1993; Leeder et...
Figure 1. (a) Perachora peninsula in the eastern Gulf of Corinth, southern Greece. (b) Uplift of the shoreline from Makrugoaz Ridge to Agriliou Bay, inferred by Cooper et al. [2007] as footwall uplift by a hypothesised active western extension of the Pisia fault, but by Leeder et al. [2003, 2005] as regional uplift. (c) Uplift of dated shorelines is near-uniform on the footwall and hangingwall of the hypothesised fault; elevation points are shoreline inner edges, except those of Dia et al. [1997], which are coral sample elevations, symbol locations as in Figure 1b, see key for reference source.
Table 1. Ages From Pirazzoli et al. [1994] Inferred for Age of Notches on the Coastal Section Modelled by Cooper et al. [2007]a

<table>
<thead>
<tr>
<th>Location</th>
<th>Sample</th>
<th>Elevation (m)</th>
<th>Age 14C (yr B.P. ± σ)</th>
<th>Calibrated Date (yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Herionon</td>
<td>Lithophaga</td>
<td>3.1</td>
<td>5820 ± 60</td>
<td>1440–4320 B.C.</td>
</tr>
<tr>
<td></td>
<td>Lithophaga</td>
<td>2.2</td>
<td>4120 ± 60</td>
<td>2440–2260 B.C.</td>
</tr>
<tr>
<td></td>
<td>Chthamalus</td>
<td>1.4 ± 0.1</td>
<td>1990 ± 100</td>
<td>190–440 A.D.</td>
</tr>
<tr>
<td>Mylokiopoi</td>
<td>Lithophaga</td>
<td>3.0</td>
<td>4705 ± 50</td>
<td>3170–3010 B.C.</td>
</tr>
<tr>
<td></td>
<td>Chthamalus</td>
<td>1.1 ± 0.3</td>
<td>620 ± 130</td>
<td>1450–1830 A.D.b</td>
</tr>
<tr>
<td></td>
<td>V. triqueter</td>
<td>0.8</td>
<td>1865 ± 55</td>
<td>400–540 A.D.</td>
</tr>
</tbody>
</table>

aThe dated shell species Nototis iris described by Cooper et al. [2007] is correctly shown as Lithophaga in Table 1.

This magnitude and a defined fault line typical of an active fault have not been demonstrated or observed in the field.

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References


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