

## ***Interactive comment on “A revised map of volcanic units in the Oman ophiolite: insights into the architecture of an oceanic proto-arc volcanic sequence” by Thomas M. Belgrano et al.***

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I really enjoyed reading this paper and I think it's an excellent, well-written, thorough piece of work following a rigorous methodology. It's great to see such attention to detail applied to mapping of part of the Oman-UAE ophiolite, and as such I only really have a few very minor comments to make.

In the introduction, I note that you mention both names for the ophiolite (Semail and Oman-UAE) but then decide to go with the term Semail – this can be confusing, of course, because there is a Semail block within the ophiolite. Later on (e.g. section 1.4.1) you use the term 'Oman ophiolite' instead – it's probably good to be consistent!

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I also note that you say your map is of the 'northern Semail volcanics' – why did you choose not to study the southeastern blocks? I have a suspicion that the Semail and Wadi Tayin blocks are somewhat different to the rest of the ophiolite, but consistent studies along the whole length are needed to confirm this. Also, I note that you didn't continue your map into the UAE and would be interested to know why this was - were our UAE maps difficult to obtain, or did you look at them and decide that it was not useful to extend into the UAE? The fact that there are volcanics to the north and southeast of your mapping area should at least be mentioned in the paper.

In section 1.1, you mention the previously published geological maps but don't cite any references to them. I understand you only want to include this long list of citations once, but it would be worth putting in a link to the section where they occur. As a minor point, it would be useful if some place names mentioned in the text (e.g. the Mandoos VMS deposit) were shown on the maps in the paper.

The field observations generally seem excellent, and very thorough – I absolutely agree that careful and extensive field observation is important in developing maps of the Oman-UAE ophiolite. At the start of section 4.1, please state how many samples were collected. The geochemistry section is very good and I find Figure 5 really useful as a data compilation. As you make clear, there is some overlap between the fields in some areas and this is only to be expected, as these groups represent a progressive evolution in both mantle source and degree of melting.

I can't really comment on the aeromagnetic survey section, as this is not my area of expertise. I do wonder whether some magnetic anomalies could be related to rocks beneath the volcanics – for example wehrlite intrusions at shallow levels might affect the mapped magnetic anomalies?

The map is great, and a nicely detailed piece of work. I found your discussion in section 7.3 interesting, because we mostly supported the idea of a 'gradient of subduction-zone influence' due to the absence of published evidence about the extent of later

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magmatism in Oman. Your work, and the recent work of Haase, de Graaff and others, all confirms that the 'Phase 2' magmatism is extensive as far southeast as the Semail Gap. I still think there's some uncertainty about how extensive it is in the Semail and Wadi Tayin blocks on the southeast side of the Semail Gap, which is a question that deserves more study.

Do your Lasail 'seamounts' (section 7.5) generally correspond to areas with Phase 2 intrusive complexes, as originally mapped and described in Lippard et al. (1986) and more recently discussed by de Graaff et al. (2019)? Wadi Rajmi is an excellent example of an area where the whole magmatic plumbing system can be linked together, as you describe in section 7.6.1. Your reference to syn-magmatic faulting is consistent with our work in the UAE which also showed ductile faults controlling emplacement of many Phase 2 intrusions, and I know from my own observations that similar features occur in Wadi Rajmi. I think there is more work to be done to understand the complete magmatic architecture of 'Phase 2' magmatism in the Oman-UAE ophiolite (I am using the term Phase 2 because so far we have not managed to subdivide the intrusive rocks as effectively as has been done for the volcanics). Overall though, I'm very impressed with the work in this paper and would like to extend my congratulations to the whole team!

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