

Review of Misios et al. "Decline of Etesian winds after large volcanic eruptions in the last millennium".

This is an interesting and novel paper. I thank authors for doing this work and the editor for giving me opportunity to review it. Misios et al., using simulations from CESM-LME, show decline in strength and occurrence of summer Etesian winds following explosive volcanic eruptions. Such understanding will help improve weather predictions in the region. They show that warmer summer over India following eruptions weakened ISM that eventually declined Etesian winds. I have one major theoretical concern on their results on temperature anomalies post eruptions and how that would affect ISM. Please see my comments below.

Major concerns

Figures 4 and 5

I am surprised to see positive summer temperatures following a few eruptions over India. In Stevenson et al., 2016 (Figure 3), using CESM, they show negative tmp anomalies in winter for 1 and 2 years post eruptions when plotting for entire Tropical and Northern eruptions. In my experience (not published), also see negative anomalies in India for spring season as well for tropical and northern eruption composites. I have not looked at CESM tmp anomalies for summer season, so maybe it is a summer thing or maybe some eruptions have such effect.

If this is not too much work, I would like to see summer temperature anomaly plots for $n=0, 1$ and 2 years post eruption for each eruption and also a composite plot by eruption type (all Tropical and all Northern eruptions).

Are these anomalies in temperature, wind, and velocity for the year of eruption, or 1 or 2 years post eruptions? I think the authors say first summer post eruption, suggest making it clear in caption as well.

Furthermore, warmer temperatures in Indian land compared to the Indian Ocean region (as seen in Figure 4), would increase land-sea thermal gradient (that is increase ocean-to-land pressure gradient) and that is supposed enhance southwest ISM winds and rainfall. See, Ramesh and Goswami (2007) that show warmer ocean than land in past decades reduced the land-sea thermal gradient that declined the Indian monsoon rainfall. What is authors' take on this fact?

Ramesh and Goswami, 2007. Reduction in temporal and spatial extent of the Indian summer monsoon. *Geophysical Research Letters*.

Other minor comments

Introduction

I very much liked the technical content of the Introduction. But I think it would be nice to have a short paragraph on the value of Etesian winds after its Introduction in first paragraph. So a second paragraph on: what changes in climate conditions we see due to changes in winds, and what regions and who (people) are affected by those changes, what are its socioeconomic effects with specific examples, and ending the paragraph with a note on why we need to study this wind system.

The authors give some hints on socioeconomic impacts, but do not provide specific examples at the end of first paragraph. Similarly, at the beginning of third paragraph, they give only mentioned the region is a climate change hotspot, but then quickly move forward on what they plan to do.

I would recommend making one separate paragraph on discussing the societal impacts of changes in Etesian winds. The authors can condense the last two paragraphs to make one to cover the increase in words in adding a new paragraph.

Line 39-41 I would recommend against the use of word 'thought' when making statement based on published work that have proven the fact stated.

Line 53-54 The mismatch exist maybe because the ISM has actually declined in the past few decades (Ramesh and Goswami, 2007; Kumar et al., 2020)

Ramesh and Goswami, 2007. Reduction in temporal and spatial extent of the Indian summer monsoon. *Geophysical Research Letters*.

Kumar et al., 2020. Recent unprecedented weakening of Indian summer monsoon in warming environment. *Theoretical and Applied Climatology*.

Section 2.2 (labeled as 2.1)

Can the authors add a sentence on how 'typical (common)' is that the wind is strongest at the selected grid of study (37.5N, 25.E)? Do the authors mean, observations show strongest winds at this particular location over certain period? I would recommend to be specific when the author say 'typical'.

And, maybe it is more appropriate to discuss model performance compared to observations/ reanalysis in the first section under Results.

Line 131-132 Can you support your statement by doing the significance test for the trend over the past century? This result, positive trend in NED and WSP over the 20th century, does not align with monsoon behavior, which is declining over the past several decades (Kumar et al., 2020). I am sure this study is focused on volcanic forcing and not long-term trends, but still it makes sense to add a sentence on this discrepancy.

Line 195 zonal mean temperatures subtracted from what? You mean subtracted from temperature 5 years prior to eruption?

Conclusion I like the way the authors have not only summarized their findings, but concluded with so what do we learn now which we did not know prior to this work.