

Reviewer 1 Response to Revised Submission ' A Two-Component Parameterization of Marine Ice Nucleating Particles Based on Seawater Biology and Sea Spray Aerosol Measurements in the Mediterranean Sea' by Jonathan V. Trueblood et al.

MS No.: acp-2020-487

MS type: Research article

Iteration: Revised Submission

General Comments: The paper Trueblood et al. 2020 has taken this reviewer's corrections on board and satisfactorily answered this reviewer's comments. I recommend this article for publication, pending a few minor revisions.

Specific comments for minor corrections:

Line 34 – POC acronym used without definition in abstract

Line 52 – the word 'recent' may be omitted as studies are from 1973 & 1976

Line 65 – TOC acronym used without definition for first time

Line 82-86 – Listed numbers should have commas

Line 92 – a space should be added around hyphen to read ' May 10 – June 10'

Line 167 – authors have equations with multipliers of 'x' and '*' in same sentence. Choose one for consistency.

Line 192 – it should read '0.5'

Line 197 – replace 500 nm with 0.5 μm

Line 213 – authors may use INP rather than 'ice nucleating particles'

Line 246 – it should read '...INP in ambient aerosol in future studies.'

Line 266 – the long dash should be replaced with a short dash, i.e. '-'

Line 279 (Table 1 description) – authors may replace $p > .05$ with ' $p > 0.05$ '. This is repeated in all table descriptions.

Line 279 – 280 (Table 1) – DOC_SSW r-val pre-dust should be italicized. Dissolved Iron p values should have a 0 in front of decimal place. Bacteria HNA r-val pre-dust should be italicized. TOC_SML r-val all days should be italicized.

Line 286 – authors report pre dust days with $r = 0.83$, when table states this is all days

Line 293 (Figure 4) – Reported R^2 values on graphs are overlaid on data point, the authors may adjust this for better clarity.

Line 316 – authors may use TOC rather than 'total organic carbon'

Line 338 – 342 – The authors summarise results just presented which is redundant, these sentences should be deleted such that the text reads, '...presumably due to low biological productivity. This complicated relationship between seawater TOC and INP_SML...'

Line 352 – replace ‘of’ with ‘on’

Line 355 - replace 500 nm with 0.5 μm

Line 367 – do the authors mean micro-NCBL?

Line 421 – acronym already defined, replace ‘organic mass fraction of sea-spray (OMSS)’ with ‘OMSS’

Line 432 (Figure 9 description) – text should read ‘Figure 9. Scatter plots of INPSSA at three temperatures and SSA properties, with corresponding correlation statistics reported in Table 4...’ (note- if nothing else the text incorrectly states Table 2)

Figure 469 (Figure 10 description) – ‘b’, ‘c’, and ‘d’ should be preceded by a period or comma

Line 490 – average should be 2.1×10^5

Line 515 – 517 – Have the authors considered a delayed biological surge or behaviour from Fe deposition?

Line 520 - acronym already defined; replace ‘water soluble organic matter’ with ‘WSOM’

Line 522 - acronym already defined; replace ‘water insoluble organic carbon’ with ‘WIOC’

Line 524- acronym already defined; replace ‘water insoluble organic matter’ with ‘WIOM’. In relation to line 522, do authors mean to differentiate with WIOC and WIOM here?

Line 533 – add text to read, ‘The re-calculated parametrization’

Line 534-536 – Is it the author’s intent that the two-component model be used for Eutrophic waters too? If not the authors may adjust the text to read ‘...incorporate marine INP emissions from oligotrophic waters into numerical models.’

Supplementary text:

Table S2 – Model names in table are not explained

Figures S3 – each panel graph has a description above that is not explained, e.g. 25D+N

Figure S5 – This Figure is not referenced in the main text, either omit it or reference it. Text is indented unlike all other Figure description text.