

Interactive comment on “Predicting carbon dioxide and energy fluxes across global FLUXNET sites with regression algorithms” by Gianluca Tramontana et al.

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Dear Referee, Thanks very much for providing detailed comments to our work. Please find enclosed the responses to all comments point-by-point.

Comment 1: General comments: 1) Good paper, but English can significantly be improved. I added the reviewed manuscript with a lot of examples for improvement. Please take care of this action.

Reply 1: We thank the reviewer for his/her comments. We will improve the English in the revised manuscript by the help of a native speaker and following the suggestion by the reviewer as proposed in the supplementary material.

C1

Comment 2: 2) Use the present tense wherever possible.

Reply 2: Thank you for suggestion. We are open to this suggestion: the use the past tense was requested by the managing editor but we are ready to change if needed.

Comment 3: 3) Scientifically I have no comments on this paper. Its thesis is sound and the argumentation as well. Specific comments: 1) Page 5 line 83-84: According to me, VI's are only partially descriptive for vegetation state! Please comment and discuss on my statement. Reply 3: Yes, we agree with the reviewer. We will clarify this point in the revised manuscript.

Comment 4: 2) Page 8, line 138: Give references for the QA/QC standard procedure for flux post-processing.

Reply 4: Thanks, we will add the appropriate references.

Comment 5: 3) Page 8, line 178: FPAR is an erroneous acronym for fAPAR. Please correct in the manuscript.

Reply 5: Thank you, we will correct it.

Comment 6: 4) Page 9, line 189: Why was the Maximum Value Composite criterion (MVC) not used? Please explain.

Reply 6: We have used different MODIS product, each one having specific composite method. The composite methods have been explained in the reference papers of the MODIS products (they are reported in the manuscript text). About the specific point outlined by the referee, firstly we have filtered the good quality data on the basis of the MODIS quality check layer, then we have extracted the mean value of a 3X3km² area centered on the tower location to better represent the flux tower footprint, as reported in Xiao et al. (Xiao, J., et al: A continuous measure of gross primary production for the conterminous United States derived from MODIS and AmeriFlux data, Remote Sens Environ, 114, 576–591, doi: 10.1016/j.rse.2009.10.013, 2010).

C2

Comment 7: 5) Page 9, line 192-193: A 16 days composite? What criterion was used for this multitemporal composite?

Reply 7: This is the standard MODIS composition system as described in Huete et al (2002). We will better clarify this in the reviewed version of the manuscript.

Comment 8: 6) Page 9, line 199: VPD? Define VPD please. How was it calculated?

Reply 8: We will define the acronym VPD (vapor pressure deficit) in the revised manuscript.

Comment 9: 7) Page 9, line 201-202: ERA-Interim dataset? Give references for this dataset.

Reply 9: We currently have used as reference "Dee, D. P., et al.: The ERA-Interim reanalysis: configuration and performance of the data assimilation system, Q.J.R. Meteorol Soc, 137, 553–597, doi: 10.1002/qj.828, 2011". To clarify this we can move (Dee et al., 2011) right after 'ERA-Interim'

Comment 10: 8) Page 17, line 387: predictive skill. This is a rather nonsensical expression, rather use predictive capacity or capability.

Reply 10: Thank you, we will try to use the suggested expression among the ones proposed by the reviewer.

Comment 11: 9) Page 18, Line 411: Individual ML methods also exhibited higher skill than... What does skill mean here? Unclear to me. Please also note the supplement to this comment:

Reply 11: Thank you. We are referring to the predictive capacity. We will use another expression from the ones proposed by the reviewer.

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