Review of "Using feature-based verification methods to explore the spatial and temporal characteristics of forecasts of the 2019 Chlorophyll-a bloom season over the European North-West Shelf" by Mittermaier et al.

The paper investigates possibility to exploit a feature-based verification method (initially introduced and used for numerical weather prediction model evaluations) to assess forecast and analysis of chlorophyll-a concentration (Chl-a) in the European North-West Shelf (NWS) which is provided on regular basis by the UK Met Office. With the proposed verification method, the authors evaluated the forecast provided by the Met Office Atlantic Margin Model (AMM) with and without data assimilation against observed Chl-a satellite data (a product of the Copernicus Marine Environmental Monitoring Service, CMEMS). Given this subject, the paper would definitely fit the scope of the journal, and could be published after a revision. A further revision is, however, required. Below I provide several comments and suggestions the authors might want to consider for revising the manuscript.

General comment

To illustrate advantages of the presented verification methods (newly applied for Chl-a forecast evaluation), it would be nice to compare the proposed method with other metrics like, for instance, bias (classical), MAE(MAD), bloom phenological indices (Siegel et al. 2002, Soppa et al. 2016), or any methods previously used for AMM NWS Chl-a valuation (mentioned in lines 83 - 85) with respect to complication/simplicity, possible diagnostic (meaning) and conclusions drawn by the analysis.

Specific comments

Lines 15 – 16: I like that the discussed verification method allows not only identify bias but correct (mitigate its impact when carried other further analysis). How would it compare with regular bias correction?

Lines 526 – 530: Reads as this paragraph should not be at this place. Which figure is discussed? Figure 12?

Lines 553 – 557: How would it compare with analysis of the frequency distribution (histogram)?

Part 4.5 "Onset and evolution", I would suggest change the title to "Bloom onset and evolution". I am also curious how would the material and results presented in this subsection compare with simple bloom phenology analysis based a threshold method (Siegel et al. 2002, Racualt et al. 2012, Brody et al. 2013, Soppa et al. 2016).

Brody, S.R.; Lozier, M.S.; Dunne, J.P. A comparison of methods to determine phytoplankton bloom initiation. J. Geophys. Res.: Oceans 2013, 118, 2345–2357.

Racault, M.F.; Le Quéré, C.; Buitenhuis, E.; Sathyendranath, S.; Platt, T. Phytoplankton phenology in the global ocean. Ecol. Indic. 2012, 14, 152–163

Siegel, D.; Doney, S.; Yoder, J. The North Atlantic spring phytoplankton bloom and Sverdrup's critical depth hypothesis. Science 2002, 296, 730–733. Doi: 10.1126/science.1069174

Lines 772 – 774: "Blooms were said to occur when the observed concentration threshold exceeded 2.5 mg.m^{-3}. Forecast thresholds for MODE were then relative to this value and varied from day-to-day. For MTD the seasonal equivalent threshold for the AMM7v8 forecasts was 6 mg.m^{-3}". What can be in general concluded from this about AMM7v8 performance?

Typos
Line 99: delete on of two words "product".

Line 187: "*merged*", "*matched*" – is italic font urgently required. Or it is a format error?

Line 197: "*further*" - a format error?

Line 206: "*not*" - a format error?

Line 257: *"single simple"* - a format error?

Lines 217, 218, 220, 232, 233, 237, 238, 242: please check/confirm if italic font used for a number of words is required (?since refer to specific options? right?).

Lines 546 – 548: again, a format error – used square brackets, *"exceeding the threshold"*, *"within-object"*

Lines 550 – 552: *"within-object"* - a format error?

Line 641: *"and"* - a format error?

Line 652: *"time"* - a format error?

Figure quality

Figure 2: please improve quality of the subplots titles.

Figures 3, 6 and 7: please enlarge the font used in the subplots

Figure 15: please enlarge the font used in the subplots and introduce units for Chl-a;

Figure 17: Upper and low left panels, xlabel(subtitle) brackets are missing at the end.