**Geoscientific
Model Development**
Discussions

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Interactive comment on "Stride Search: a general algorithm for storm detection in high resolution climate data" *by* P. A. Bosler et al.

Anonymous Referee #3

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Overall, this is a well written paper that introduces a new detection and tracking algorithm for climate extremes in large climate datasets. The analysis utilizes a widely used algorithm for tropical cyclones developed at GFDL for comparison, as well as demonstrates new capabilities with polar lows. Besides a few general and specific comments below, I think the manuscript should be accepted with minor revisions.

General Comments:

1. I am a little confused as two why the tropical cyclone analysis is only performed on 3 months of the data. If there are multiply years of data, why not compare the tracker on a larger subset of the data to provide additional insight into the comparison between the two algorithms?

2. The authors utilize TSTORMS for comparison to Stride Search, and provide good results. However, I think there should be some mention of the larger differences that can occur between storm trackers on the same data (e.g., Horn et al. 2014, doi: 10.1175/JCLI-D-14-00200.1).

Specific Comments:

Text:

1. L12,P7728: The phrasing of extreme latitudes is a little confusing in this context. I would recommend using "high" latitudes.

2. L10,P7731: It would be good to elaborate here what the list includes (i.e., storm location, intensity, etc.).

3. L13,P7732: Why is this ideal? In specific cases we know the general direction a storm should move (i.e., tropical cyclones are most likely to move westward and poleward). Perhaps, some assumption based on the steering flow would help generalize this requirement?

4. L25,P7733: How is the location of the storm defined? This likely depends on the type of storm being searched for; perhaps providing an example here would be useful (i.e., maximum vorticity, minimum surface pressure, etc.).

5. L14,P7738: This already assumes intensity is the definition of a storm location. See the point above. Is it not possible that the storm center location could be removed from the location of peak intensity?

6. L6-10,P7739: This is a long sentence and could be broken into two. Also, there should be a citation for the point about tropical cyclones at low-resolution L9-10, as well as some additional context. There is plenty of literature that has suggested that global models with 100 km grid spacing can simulate tropical storms, but with reduced intensity and storm counts. So, what "low" resolution is being referred to here?

7. L14-19,P7739: Probably should refer to this type of run as a "climatological" run as this is common nomenclature in the community.

8. L24,P7739: Is there precedent for this poorly resolved 2dx feature? If so, a citation would be helpful.

9. L29,P7739: The 2 is missing the 'degree' symbol.

10. L8-9,P7740: You should specify in the text that the vorticity is taken at 850 hPa.

11. L19-L20,P7741: It would be useful if the authors provide some additional motivation as two why this time period was chosen? Why not run the algorithm on the entire dataset?

12. L23,P7742: Some additional reasoning for why these values of Umax and tmin are used should be provided? Is it to match TSTORMS? Also, please described what tmin is. Is it consecutive points, or can times be skipped?

13. L26-28,P7742: I am curious as to whether you looked in to the cases that were captured by Stride Search and not TSTORMS? What caused it to be captured in one and not the other? Is it possible that some of the tracks captured by Stride Search are actually the same track (i.e., a break in the break that results in the track being counted as two)?

14. L6,P7747: Define P_sl and tau_P in the text.

15. L9,P7747: At the end of the sentence, should use a left 'bracket' not 'parenthesis'.

16. L11,P7747: You should specify what theta_700 is potential temperature here in the text. Also, you should consider using a different symbol given that theta is already used as latitude throughout the manuscript. Also, define SST.

17. L5,P7748: Is there any consequence for running the algorithm on the first year of the data. Has it been shown that the simulation is "spun-out" appropriately early in the simulation?

Figures:

1. Figures 3&4: There appears to be a plotting artifact along the equator and at 90E, 180, 90W that is showing up as a white line. This makes some tracks look like two separate tracks.

2. Figure 7: I would recommend labeling the subplots (i.e., (a), (b), (c), etc.) to be consistent with the other figures.

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