

## ***Interactive comment on “Subseasonal prediction of springtime Pacific-North American transport using upper-level wind forecasts” by John R. Albers et al.***

### **Anonymous Referee #1**

Received and published: 19 January 2021

General Comments: This work explores the use of subseasonal time scale forecasts of jet variability to predict stratosphere-to-troposphere transport and tropical-to-extratropical moisture transport over the NH Pacific and surrounding land mass. The study does a good job of first examining the transport features with the leading EOFs of the upper-level Pacific jets. The ability to use the forecasts of the upper-level winds to predict the transport types is then considered. The study is appropriate for the journal and should be of interest. Overall, the paper is fairly well constructed and written. I believe it should be acceptable for publication after the authors address a few minor issues.

C1

### Specific Comments:

- 1) I wonder why only the spring months were examined. I believe the seasonality of the STT would limit the ability during summer and fall, but I would think the magnitude of STT during DJF is great enough to be useful. At the very least, a short discussion of the other seasons and the possibility of prediction outside of MAM should be presented.
- 2) Lines 185-187: It is not clear how the claim of “vertically deep” shifts in the jet stream is made from the 2-D comparison. I am assuming that is because the jet climatology is derived from vertically averaged winds between 100-500 hPa. However, given the strong vertical gradients of wind around the jet stream, the wind changes don't have to be vertically deep to result in shifts to the jet. In addition, the phrase could also be interpreted to imply the jet stream location shifts vertically which is not necessarily the case.
- 3) Line 223 and Table 2: Please add the significance level information (e.g. what is >95% significance level?). The correlations are much less meaningful without this information.
- 4) There are several instances where the references cited only include recent papers and could benefit by being more historical. For examples: lines 201-202, previously cited work by Reed and Shapiro should be included here too; and Line 358, Olsen, et al., JGR, 2013.
- 5) Fig 10 and related discussion: There are multiple regions and 3 transport types considered. Figure 10 and the discussion concentrates on only 4 of these possible combinations. Are the results not statistically significant for the other area/transports that are not discussed? Or is the discussion representative of the other areas too? Some comment on this should be made in the paper.
- 6) Many of the figures lack labels on the color bars and/or the axes. These need to be added.

C2

7) The color bar placements in Figure 1 should be better aligned to indicate which figures they are applicable to.

8) What are the contour levels in Figure 2?

9) Fig. 10: It would be greatly helpful if the color coding of the lines were shown in a legend. Also, why are the medians and whiskers not shown for the verifications? Please include them since it would be useful in the comparisons.

Technical Corrections:

1) Lines 138-142: Please add: "...jet variability [in Section 3.1], we compare the EOFs..." for clarity.

2) Line 192: "loading" likely more appropriately "magnitude"

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