

Nonlin. Processes Geophys. Discuss., referee comment RC1
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Comment on npg-2022-4

Anonymous Referee #1

Referee comment on "Predicting sea surface temperatures with coupled reservoir computers" by Benjamin Walleshauser and Erik Bollt, Nonlin. Processes Geophys. Discuss., <https://doi.org/10.5194/npg-2022-4-RC1>, 2022

The draft manuscript titled "Predicting Sea Surface Temperatures with Coupled Reservoir Computers" is an excellent effort in using coupled reservoir computers for predicting global sea surface temperatures. The manuscript may be accepted after minor revision after the following comments have been addressed:

- Line 125 says that the actual values of SST were used for training. Can the authors comment on why normalization was not used as it has been shown to be necessary to train machine learning models?
- The authors train on a daily SST dataset, now oceans are known to operate on long temporal scales having a memory of at least a month. Can the authors comment on the utility of these forecasts? For example, Nino3, or Nino3.4 are considered based on monthly datasets precisely for the reason that the oceanic processes are slow.
- Was any hyperparameter tuning performed?
- From figure 4, it can be seen that the model performs well where there is an established trend. For example, Fig 4a-f have a clear trend and the model is performing very well in all of them. There are some deviations in Fig 4g whereas Fig 4h is showing good performance. The intent of using such as coupled reservoir computer is to simulate the chaoticity of the system, whereas out of the 8 subplots in Figure 4, 6 have a clear linear trend where the model performs well, whereas in Fig 4g where there are some deviations, the model is not performing good relative to the previous subplots. Fig 4h is satisfactory. Can the authors maybe provide some more examples or describe these features from the results?