

Letter

# Neural Network Approaches to Reconstruct Phytoplankton Time-Series in the Global Ocean

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**Supplementary material**

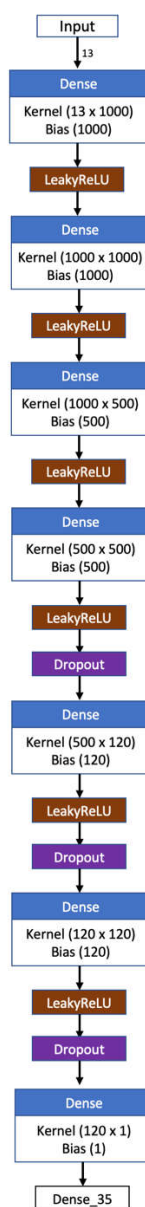
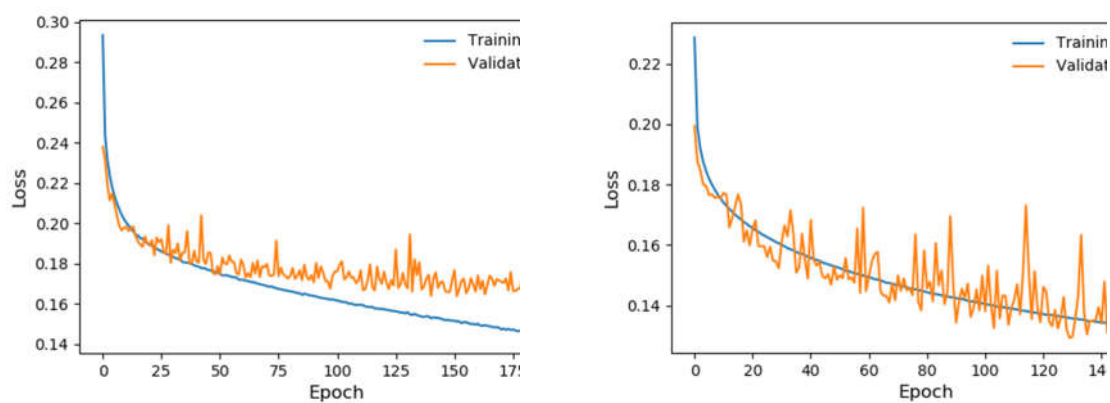


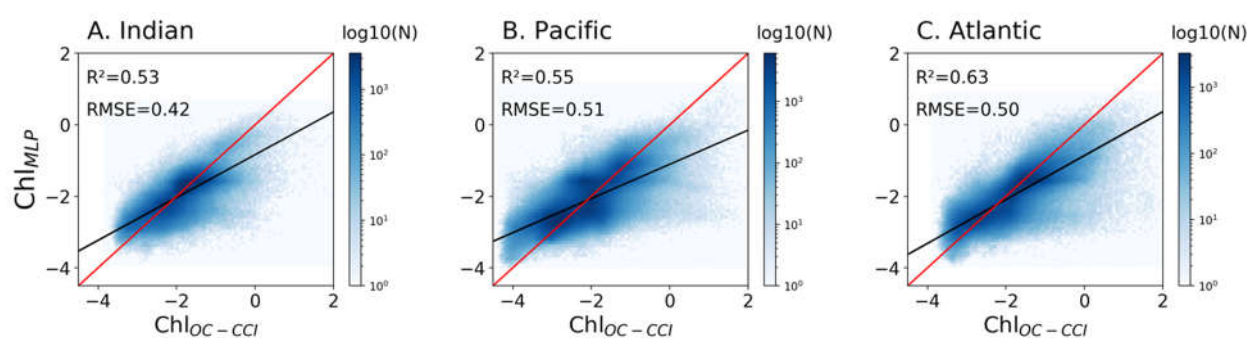
Figure S1. MLP architecture.

Table S1. MLP configuration.

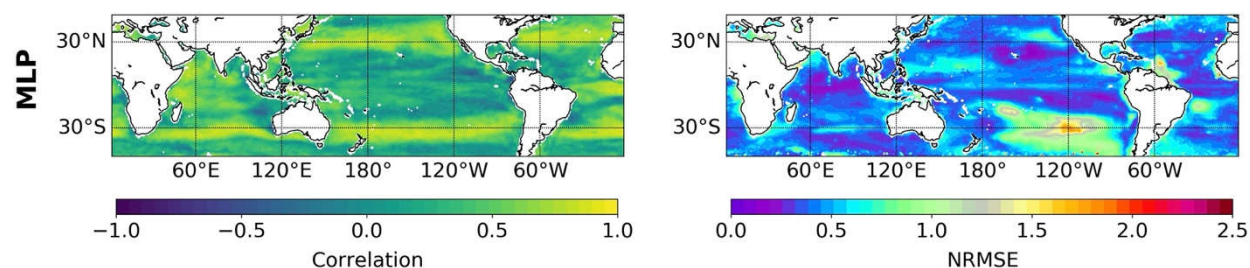
Batch size	Epochs	Optimizer	Learning rate	Loss
256	200 with EarlyStopping (i.e., monitor='val_loss'; mode='min'; patience=150)	Adam with its default parameters (lr = 0.001; beta <sub>1</sub> = 0.9; beta <sub>2</sub> =0.999; epsilon=1e-07; amsgrad= False)	0.001	MSE



**Figure S2.** Learning curves of left)  $\text{Chl}_{\text{MLP-9\%}}$  and right)  $\text{Chl}_{\text{MLP}}$ .



**Figure S3.** Scatter plots of log of  $\text{Chl}_{\text{MLP}}$  trained on 80% of the dataset but only for predictors with a relative importance higher than 0.1 in Table 2, for each oceanic basin between 50°S and 50°N and over 1998–2015. The  $\text{Chl}_{\text{OC-CCI}}$  vs.  $\text{Chl}_{\text{MLP}}$  regression lines are plotted in black and the 1:1 regression lines are plotted in red. The figure is color-coded according to the density of observations.



**Figure S4.** (Left) Correlation and (Right) NRMSE of  $\text{Chl}_{\text{OC-CCI}}$  vs.  $\text{Chl}_{\text{MLP}}$  trained on 80% of the dataset but only for predictors with a relative importance higher than 0.1 in Table 2, over 1998–2015.

