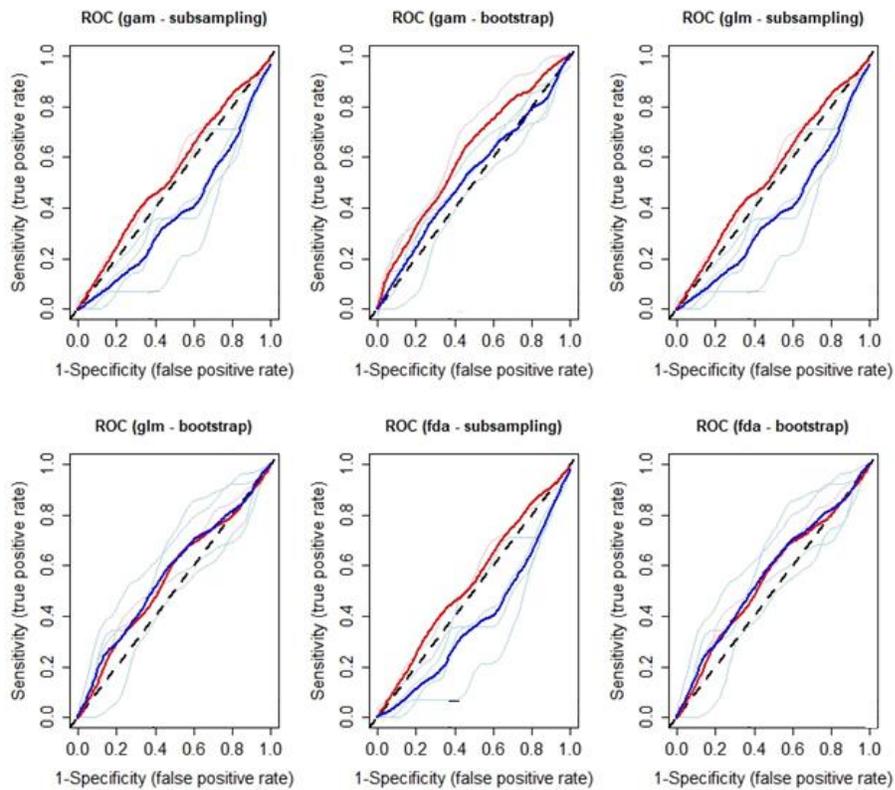
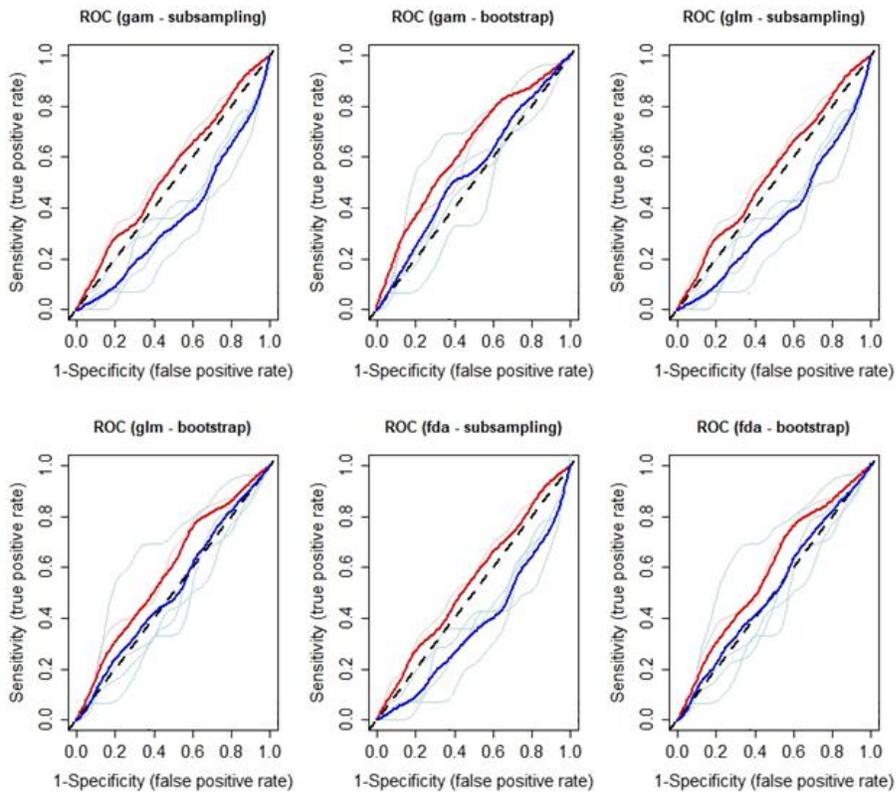


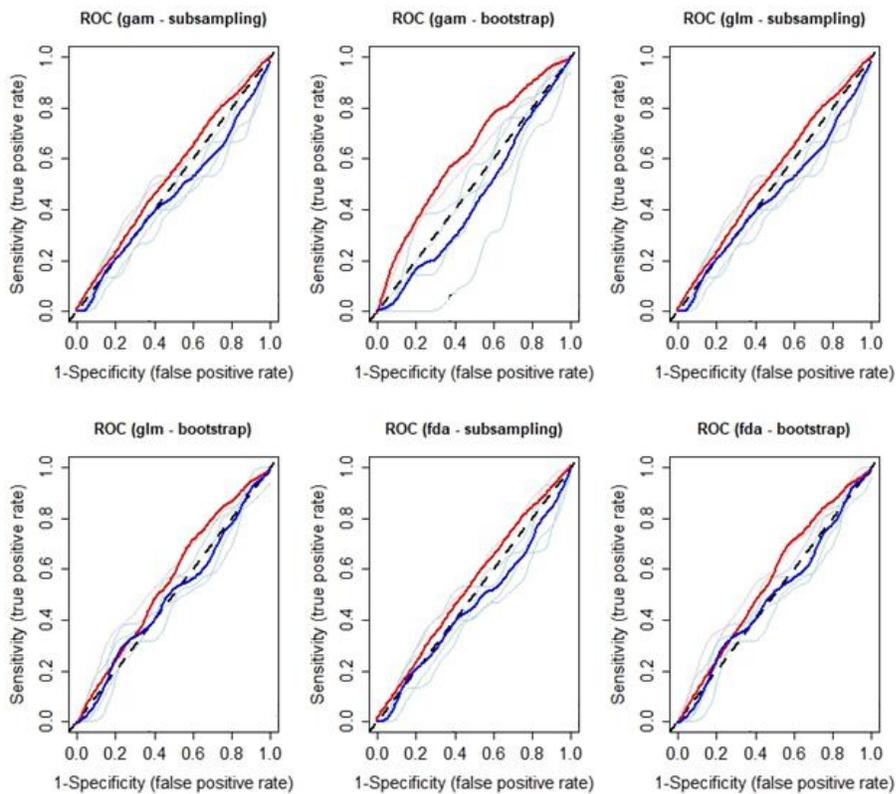
(a) Albacore



(b) Bigeye

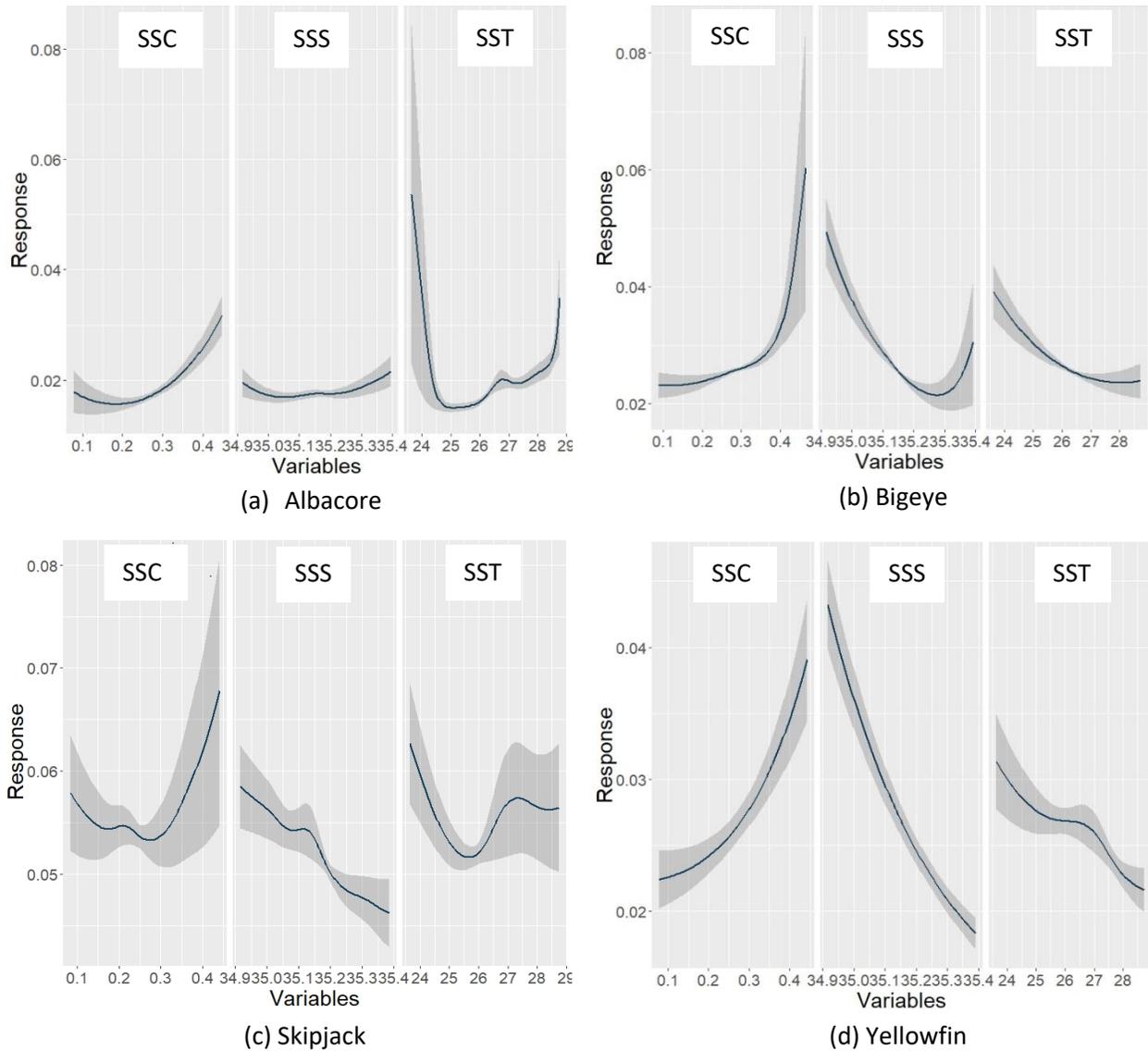


(c) Skipjack



(d) Yellowfin

**Figure S1.** Receiver operator characteristics (ROC) curve using bootstrap and subsampling replication methods for different *sdfs* for (a) Albacore, (b) Bigeye, (c) Skipjack and (d) Yellowfin taken within the EEZ of Tonga. Sensitivity (true positive rate) of the vertical line and 1-specificity (false positive rate) of the horizontal line describe the proportion of correctly and incorrectly classified samples. The red and blue curves represent the mean of AUC using training and test data respectively.



**Figure S2.** Response curves from the ensemble models to the three selected environmental variables for Albacore, Bigeye, Skipjack and Yellowfin in panels (a), (b), (c) and (d) respectively taken within the EEZ of Tonga. Response curves were fitted through locally estimated scatterplot smoothing (LOESS). SSC = sea surface current, SSS = sea surface salinity and SST = sea surface temperature.