

Mediterranean Marine Science

Vol 23, No 4 (2022)

VOL 23, No 4 (2022)



Fishing the waves: comparing GAMs and random forest to evaluate the effect of changing marine conditions on the energy performance of vessels

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doi: [10.12681/mms.29721](https://doi.org/10.12681/mms.29721)

To cite this article:

COLOMBELLI, A., PULCINELLA, J., BONANOMI, S., NOTTI, E., MORO, F., & SALA, A. (2022). Fishing the waves: comparing GAMs and random forest to evaluate the effect of changing marine conditions on the energy performance of vessels. *Mediterranean Marine Science*, 23(4), 935–951. <https://doi.org/10.12681/mms.29721>

Fishing the waves: comparing GAMs and random forest to evaluate the effect of changing marine conditions on the energy performance of vessels

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Mediterranean Marine Science, 23 (4) 2022

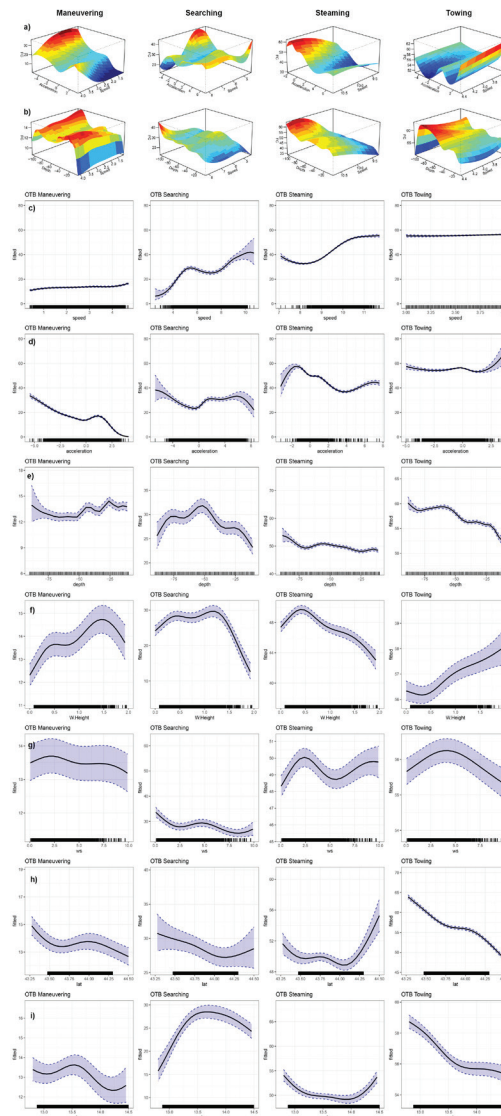


Fig. S1: Estimated influence of both interactions and single predictors on consumption. The estimates for consumption (l/h) shown represent the predictions of the GAM model observed for the bottom otter trawler. Predictions for the response variable are generated exploring the response shape of the focal predictor of interest while retaining the other variables constant at their mean values. a) and b) tensor product splines representing the interaction between the variables acceleration and speed(a), and speed and depth (b) and their combined effect on consumption observed by activity; From c) to j) Estimated smooth effects, observed by activity, of the individual predictors independent of the other variables. The rug under each smoother’s plot represent the actual distribution of the observations within the training dataset. The variables shown include speed(c), acceleration (d), depth (e), significant wave height (W.Height, f), wind speed (ws, g), latitude (lat, h) and longitude (lon, i). The dotted lines represent the 95% confidence intervals around the response curve. On the bottom (j) is represented the parametric effect of the categorical variables Vessel, Crosswind, Crosswave and Season.

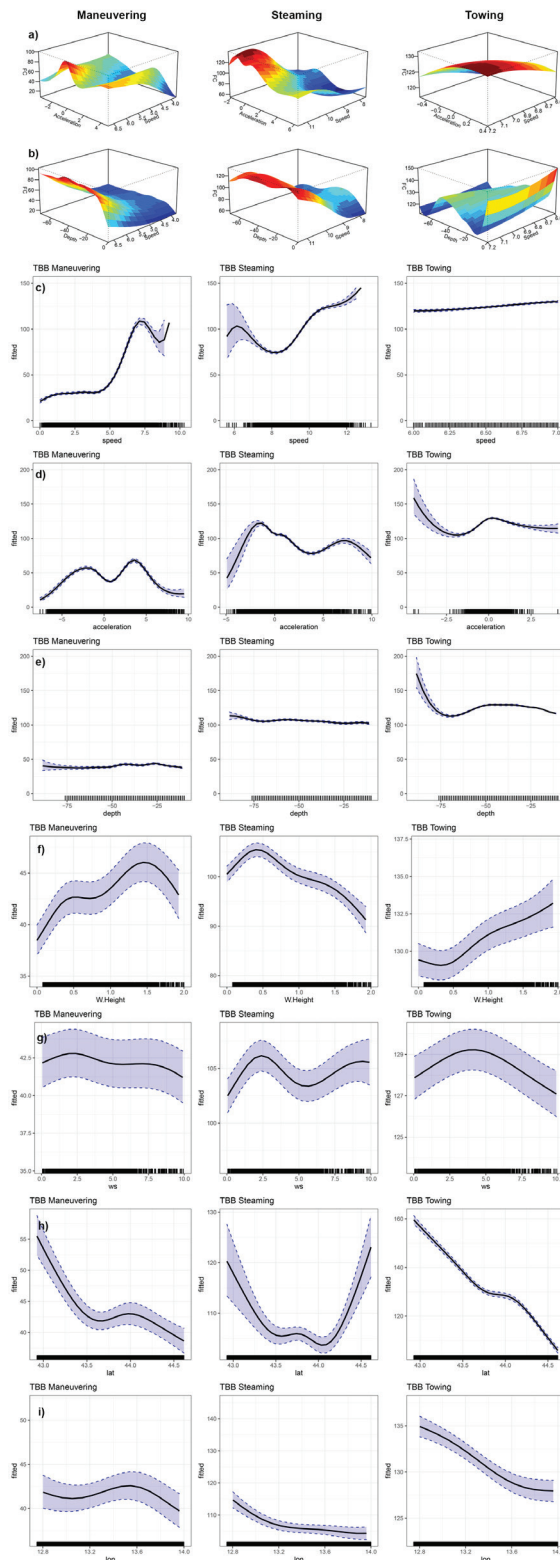


Fig. S2: Estimated influence of both interactions and single predictors on consumption. The estimates for consumption (l/h) shown represent the predictions of the GAM model observed for the beam trawler. Predictions for the response variable are generated exploring the response shape of the focal predictor of interest while retaining the other variables constant at their mean values. a) and b) tensor product splines representing the interaction between the variables acceleration and speed(a), and speed and depth (b) and their combined effect on consumption observed by activity.; From c) to j) Estimated smooth effects, observed by activity, of the individual predictors independent of the other variables. The rug under each smoother's plot represent the actual distribution of the observations within the training dataset. The variables shown include speed(c), acceleration (d), depth (e), significant wave height (W.Height, f), wind speed (ws, g), latitude (lat, h) and longitude (lon, i). The dotted lines represent the 95% confidence intervals around the response curve. On the bottom (j) is represented the parametric effect of the categorical variables Vessel, Crosswind, Crosswave and Season.