Bird traits models 2.3

S. Haire

2025-07-25

## Fit loess univariate models with phix values >0.25 to 1 (very low values of the index had highly variable response) and years elapsed 3 or more. Use k-fold cross-validation (50 iterations) to find optimal span. Trait groups: Canopy, Forest, Ground, Oaks, Shrubland.

## Results of one run using cross-validation. Subsequent runs may differ.

## Canopy

### Optimal span = 0.9 with RMSE = 0.16 and R squared = 0.85.

## Forest

### Optimal span = 0.7 with RMSE = 0.12 and R squared = 0.86.

## Oaks

### Optimal span = 0.9 with RMSE = 0.17 and R squared = 0.88.

## Shrubland

### Optimal span = 0.9 with RMSE = 0.12 and R squared = 0.81.

## Ground

### Optimal span = 0.9 with RMSE = 0.10 and R squared = 0.83.

## Loading required package: gam

## Loading required package: splines

## Loading required package: foreach

## Loaded gam 1.22-5

##   
## Attaching package: 'gam'

## The following objects are masked from 'package:mgcv':  
##   
## gam, gam.control, gam.fit, s

## CANOPY

## Generalized Additive Model using LOESS   
##   
## 114 samples  
## 1 predictor  
##   
## No pre-processing  
## Resampling: Cross-Validated (50 fold)   
## Summary of sample sizes: 112, 112, 112, 112, 112, 112, ...   
## Resampling results across tuning parameters:  
##   
## span RMSE Rsquared MAE   
## 0.5 0.1608068 0.8444612 0.1445668  
## 0.6 0.1597544 0.8587443 0.1435231  
## 0.7 0.1590624 0.8643671 0.1427655  
## 0.8 0.1584310 0.8701536 0.1422292  
## 0.9 0.1581167 0.8640981 0.1420664  
##   
## Tuning parameter 'degree' was held constant at a value of 1  
## RMSE was used to select the optimal model using the smallest value.  
## The final values used for the model were span = 0.9 and degree = 1.

## FOREST

## Generalized Additive Model using LOESS   
##   
## 114 samples  
## 1 predictor  
##   
## No pre-processing  
## Resampling: Cross-Validated (50 fold)   
## Summary of sample sizes: 111, 112, 112, 112, 111, 112, ...   
## Resampling results across tuning parameters:  
##   
## span RMSE Rsquared MAE   
## 0.5 0.1272998 0.8547887 0.1161888  
## 0.6 0.1265010 0.8196870 0.1155738  
## 0.7 0.1258488 0.8277047 0.1148953  
## 0.8 0.1254455 0.8289185 0.1142854  
## 0.9 0.1252139 0.8277662 0.1138490  
##   
## Tuning parameter 'degree' was held constant at a value of 1  
## RMSE was used to select the optimal model using the smallest value.  
## The final values used for the model were span = 0.9 and degree = 1.

## OAKS

## Generalized Additive Model using LOESS   
##   
## 114 samples  
## 1 predictor  
##   
## No pre-processing  
## Resampling: Cross-Validated (50 fold)   
## Summary of sample sizes: 112, 112, 112, 111, 112, 112, ...   
## Resampling results across tuning parameters:  
##   
## span RMSE Rsquared MAE   
## 0.5 0.1844045 0.8641592 0.1594508  
## 0.6 0.1841838 0.8661512 0.1597807  
## 0.7 0.1837451 0.8554649 0.1594979  
## 0.8 0.1834042 0.8551392 0.1589365  
## 0.9 0.1832345 0.8526891 0.1585650  
##   
## Tuning parameter 'degree' was held constant at a value of 1  
## RMSE was used to select the optimal model using the smallest value.  
## The final values used for the model were span = 0.9 and degree = 1.

## GROUND

## Generalized Additive Model using LOESS   
##   
## 114 samples  
## 1 predictor  
##   
## No pre-processing  
## Resampling: Cross-Validated (50 fold)   
## Summary of sample sizes: 112, 112, 112, 111, 112, 111, ...   
## Resampling results across tuning parameters:  
##   
## span RMSE Rsquared MAE   
## 0.5 0.1085897 0.8328746 0.09417194  
## 0.6 0.1082194 0.8494235 0.09377411  
## 0.7 0.1078571 0.8589950 0.09342779  
## 0.8 0.1076070 0.8641614 0.09318019  
## 0.9 0.1078127 0.8653168 0.09337158  
##   
## Tuning parameter 'degree' was held constant at a value of 1  
## RMSE was used to select the optimal model using the smallest value.  
## The final values used for the model were span = 0.8 and degree = 1.

## SHRUBLAND

## Generalized Additive Model using LOESS   
##   
## 114 samples  
## 1 predictor  
##   
## No pre-processing  
## Resampling: Cross-Validated (50 fold)   
## Summary of sample sizes: 112, 111, 112, 111, 112, 111, ...   
## Resampling results across tuning parameters:  
##   
## span RMSE Rsquared MAE   
## 0.5 0.1234959 0.8337114 0.1068032  
## 0.6 0.1237965 0.8446510 0.1069545  
## 0.7 0.1236472 0.8454082 0.1069336  
## 0.8 0.1236574 0.8366387 0.1069730  
## 0.9 0.1235113 0.7897670 0.1066969  
##   
## Tuning parameter 'degree' was held constant at a value of 1  
## RMSE was used to select the optimal model using the smallest value.  
## The final values used for the model were span = 0.5 and degree = 1.

## `geom\_smooth()` using formula = 'y ~ x'

