Proxy MSY Reference Points for data poor stocks

Power of length based indicators to detect overfishing.

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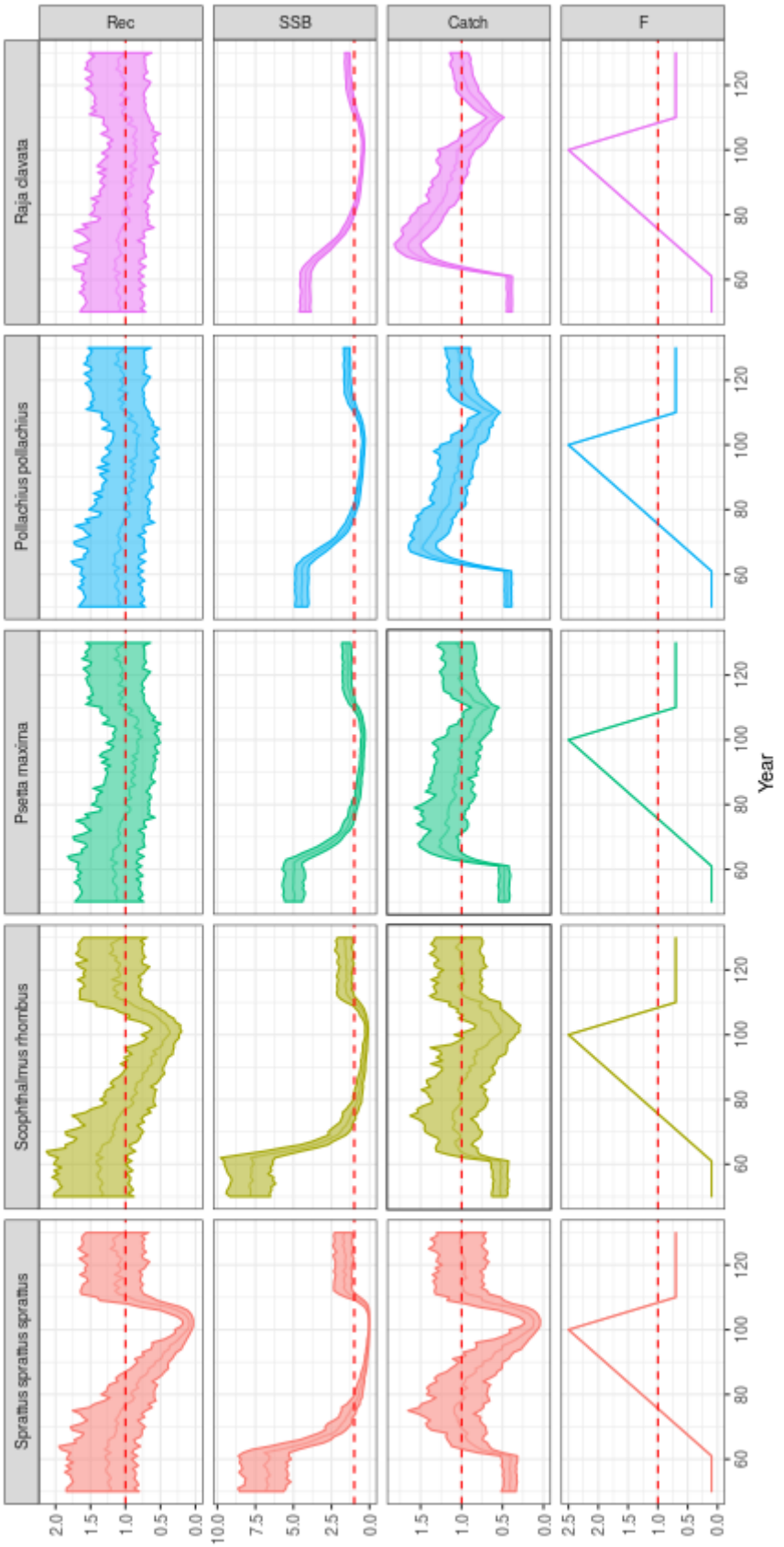
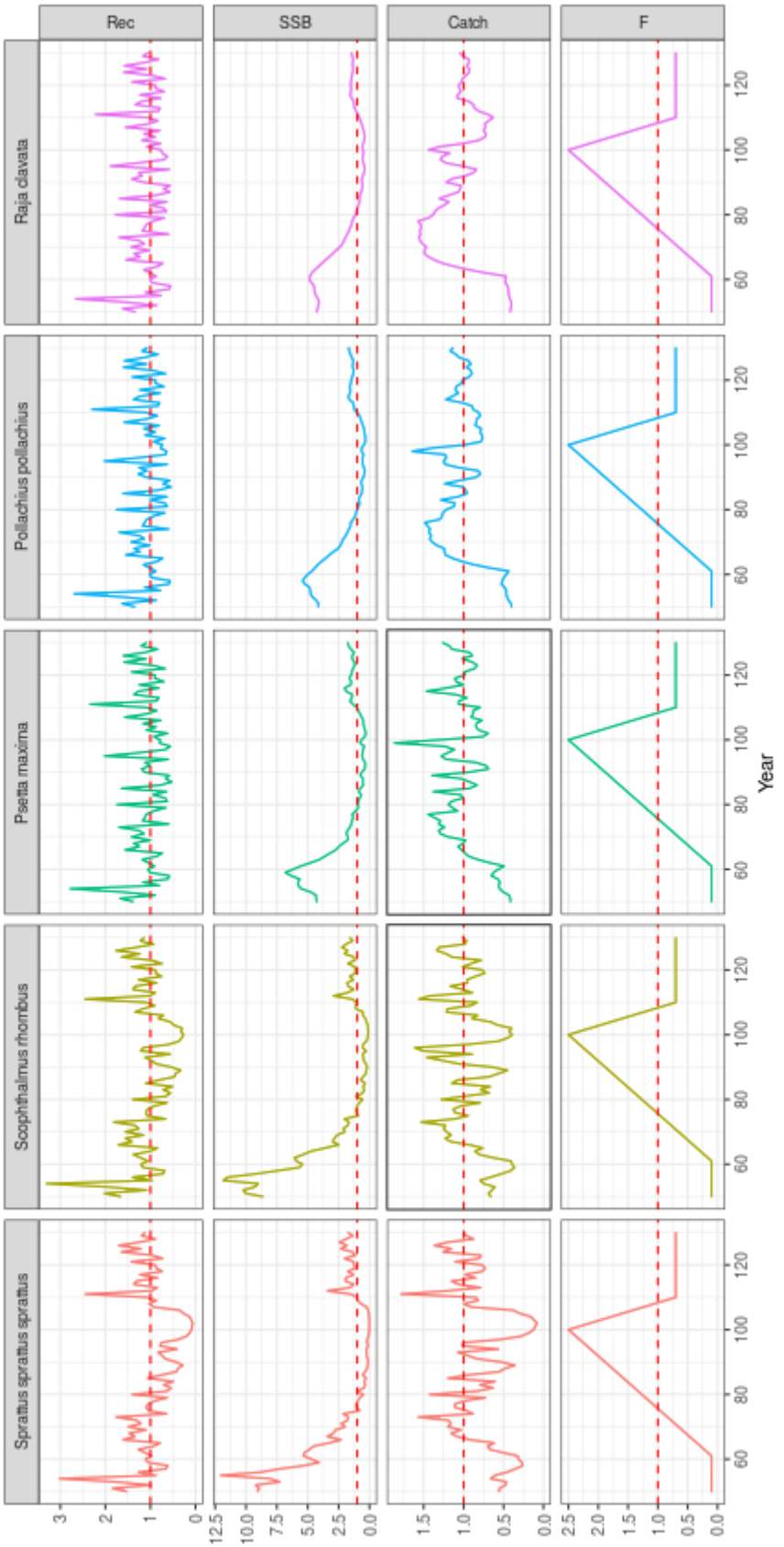
Summary

- The OM has been rerun where F after recovery is $0.7F_{MSY}$.
- The reference period is 61:120 and the period of overfishing is 80:109. this gives 60 years for which 30 are overfished.
- The biomass indicator L_{maxy} has been added.
- Figures aren't final but hopefully show the types of plots we might want to include
- Figure 7 is new and shows the "best performance", i.e. point closest to TPR=1 and FPR=0, this could be the entry point to the regression tree.

Figure 1 Life history parameters and the correlations between them.


Rec
SSB
Catch
F
Raja clavata
Pollachius pollachius
Psetta maxima
Scophthalmus rhombus
Sprattus sprattus sprattus
Year


Rec
SSB
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Raja clavata
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Year

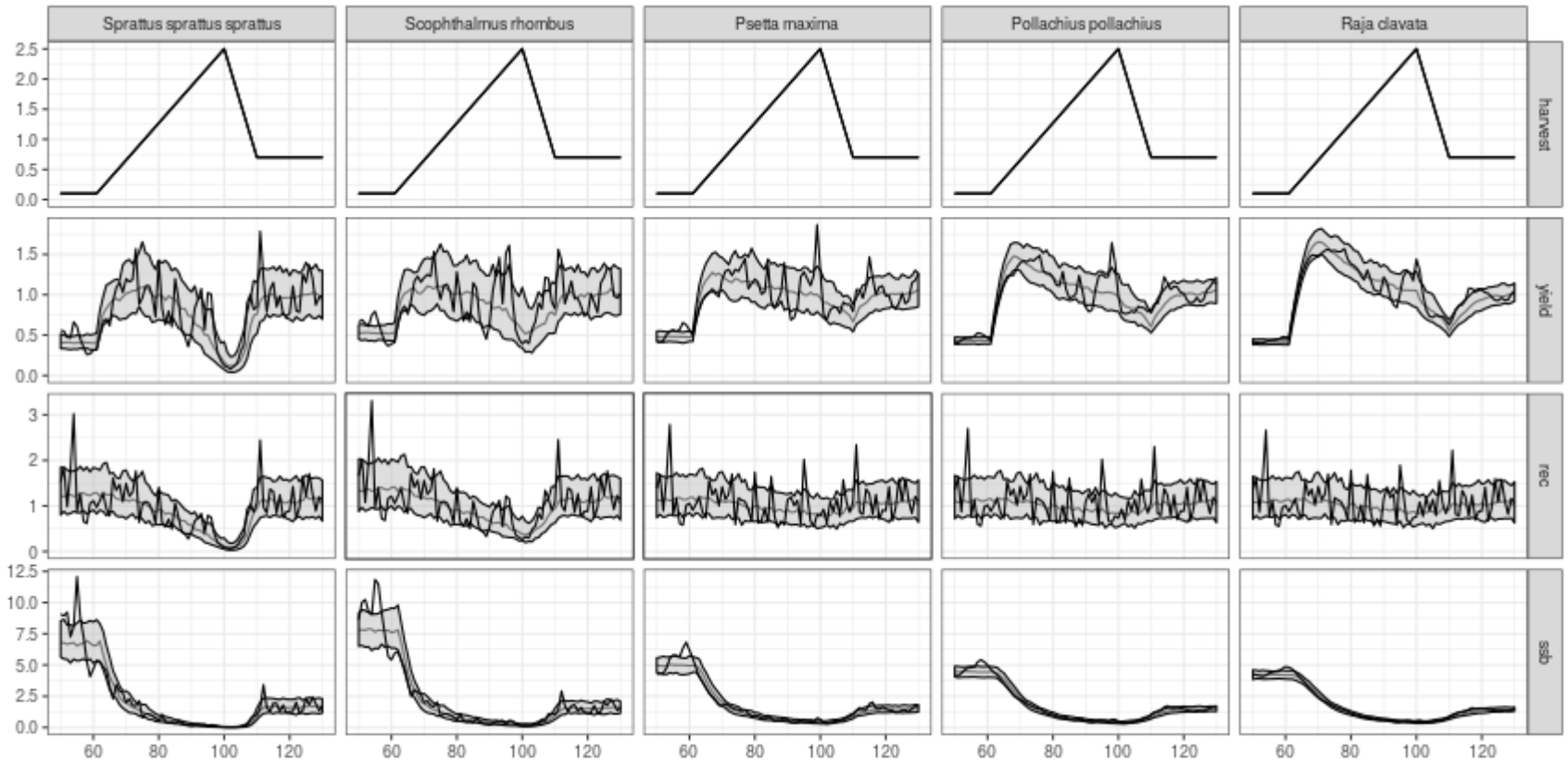

Figure 2 Operating Models: time series relative to MSY benchmarks.

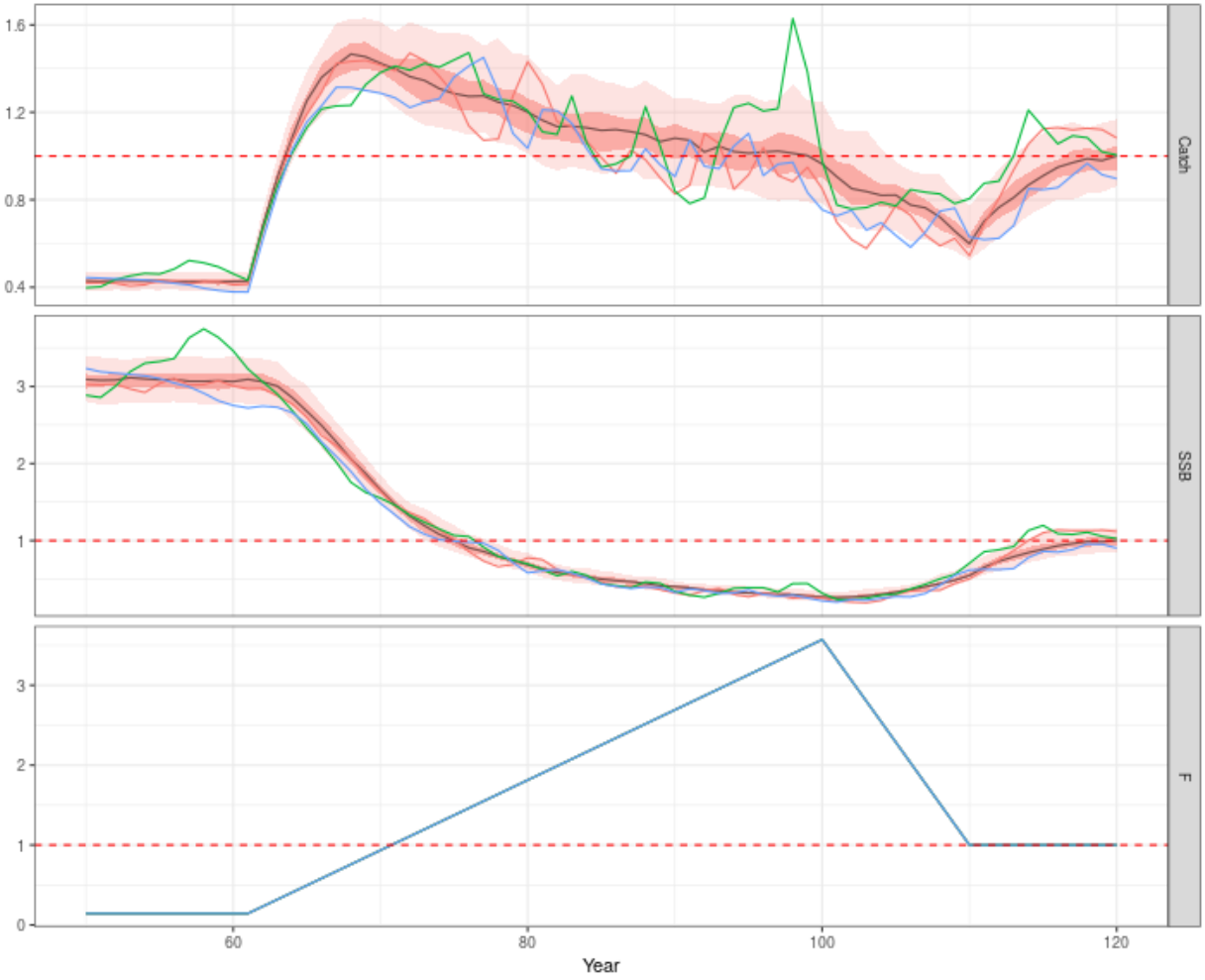

Figure 3 Operating Model example for pollack of time series relative to MSY with individual realisations.

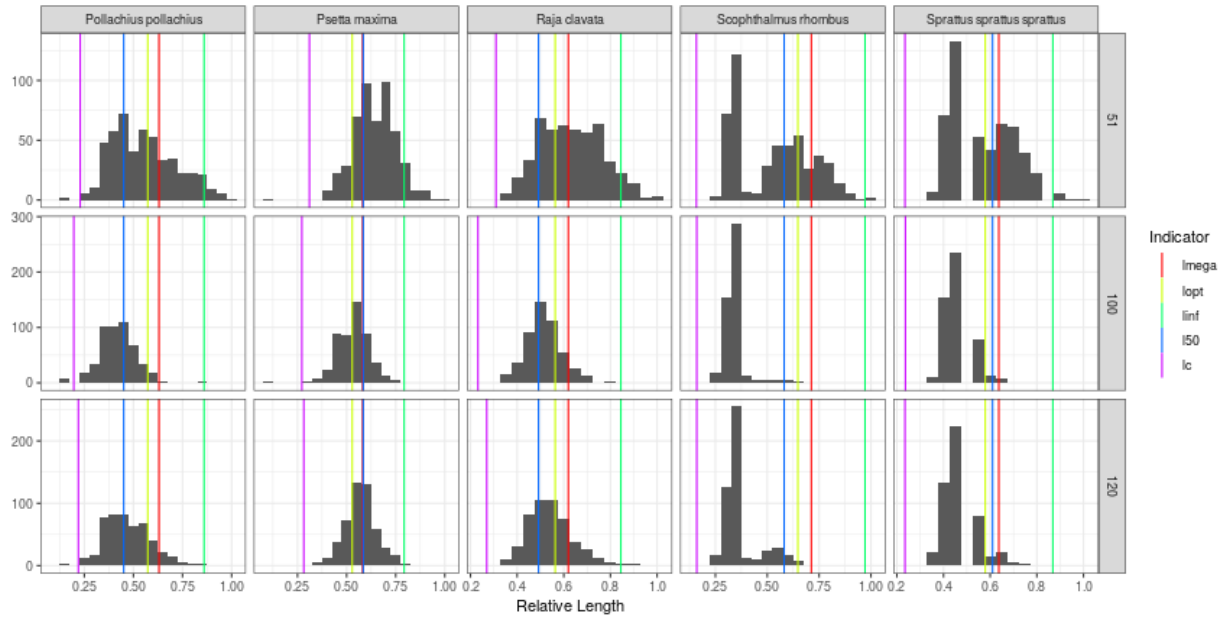

Figure 4. Simulated length frequencies distributions with indicators.

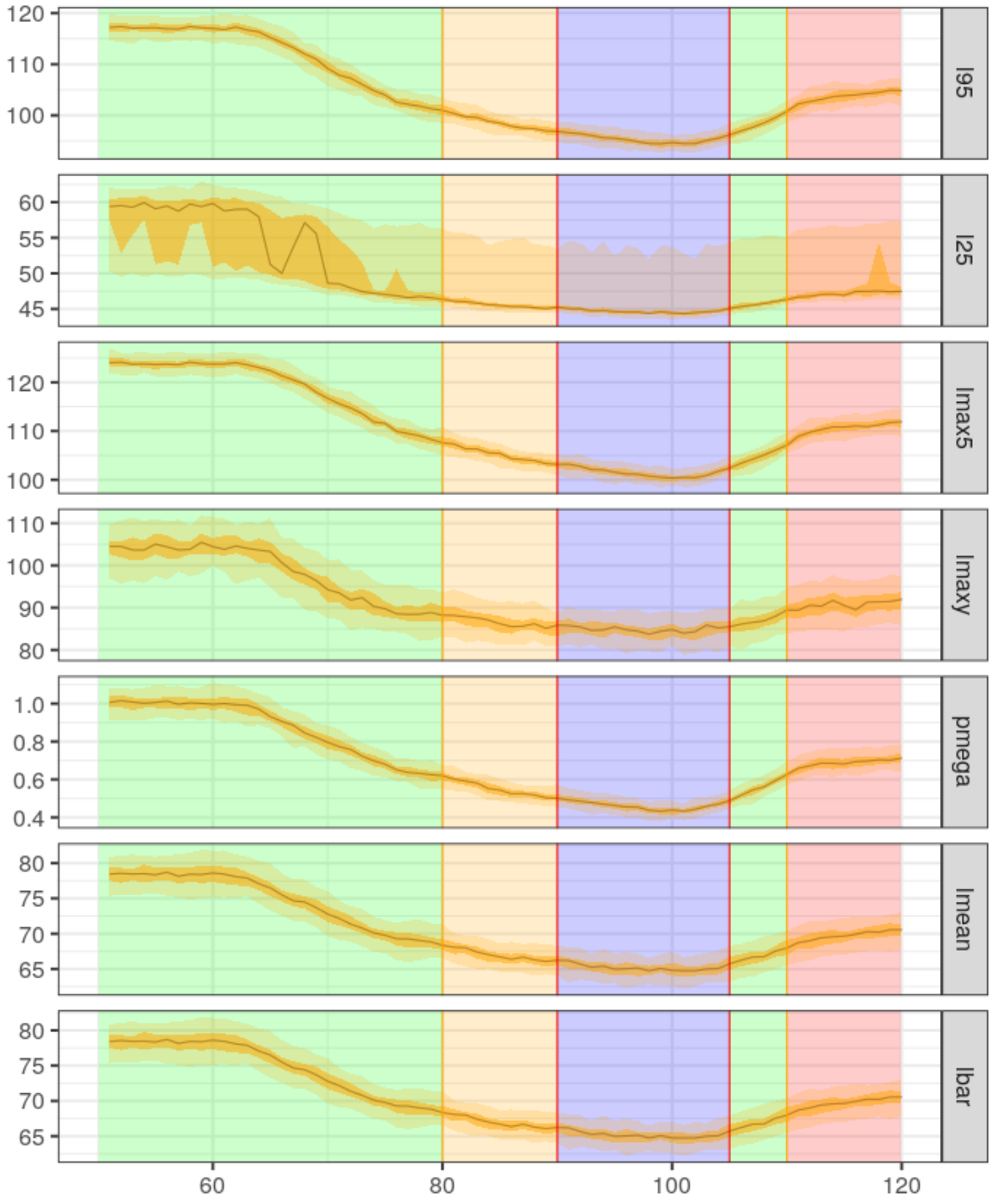

Figure 5. Time series of indicators relative to $F : F_{MSY}$, vertical lines indicate 1 (green), 1.5 (orange) and 2 (red) times F_{MSY}.

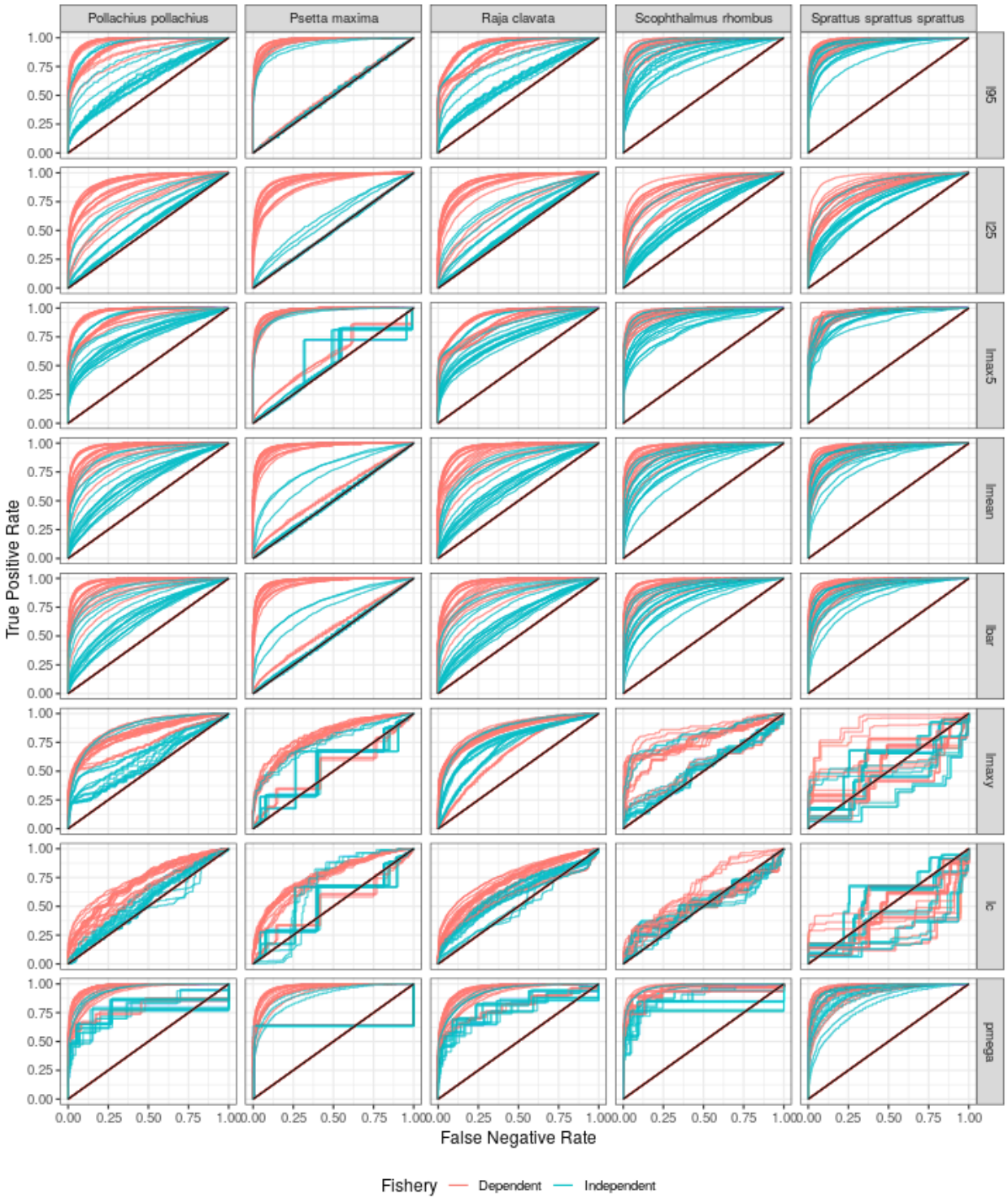

Figure 6. ROC curves.

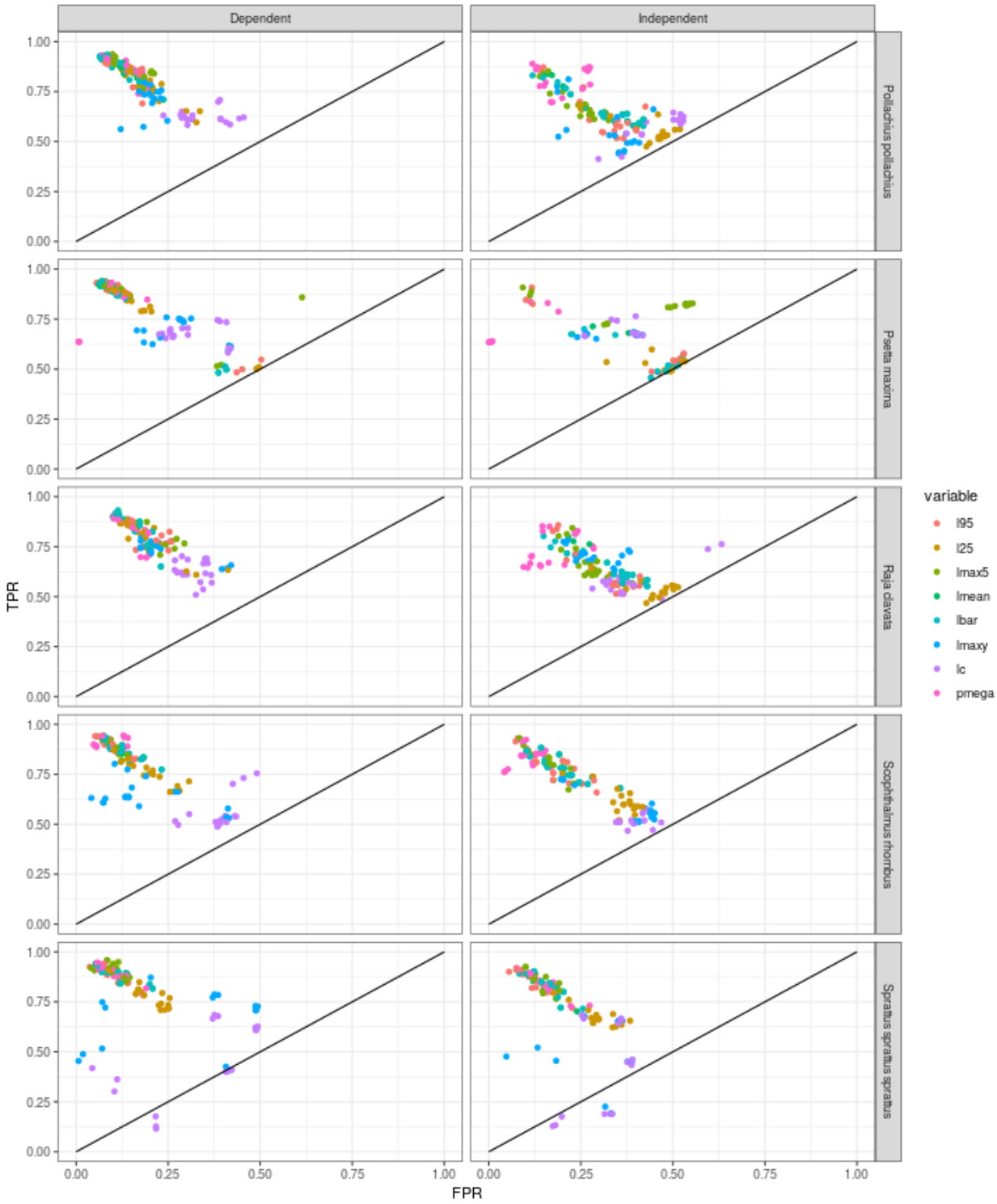

Figure 7. Best performance, i.e. point closest to TPR=1 and FPR=0.

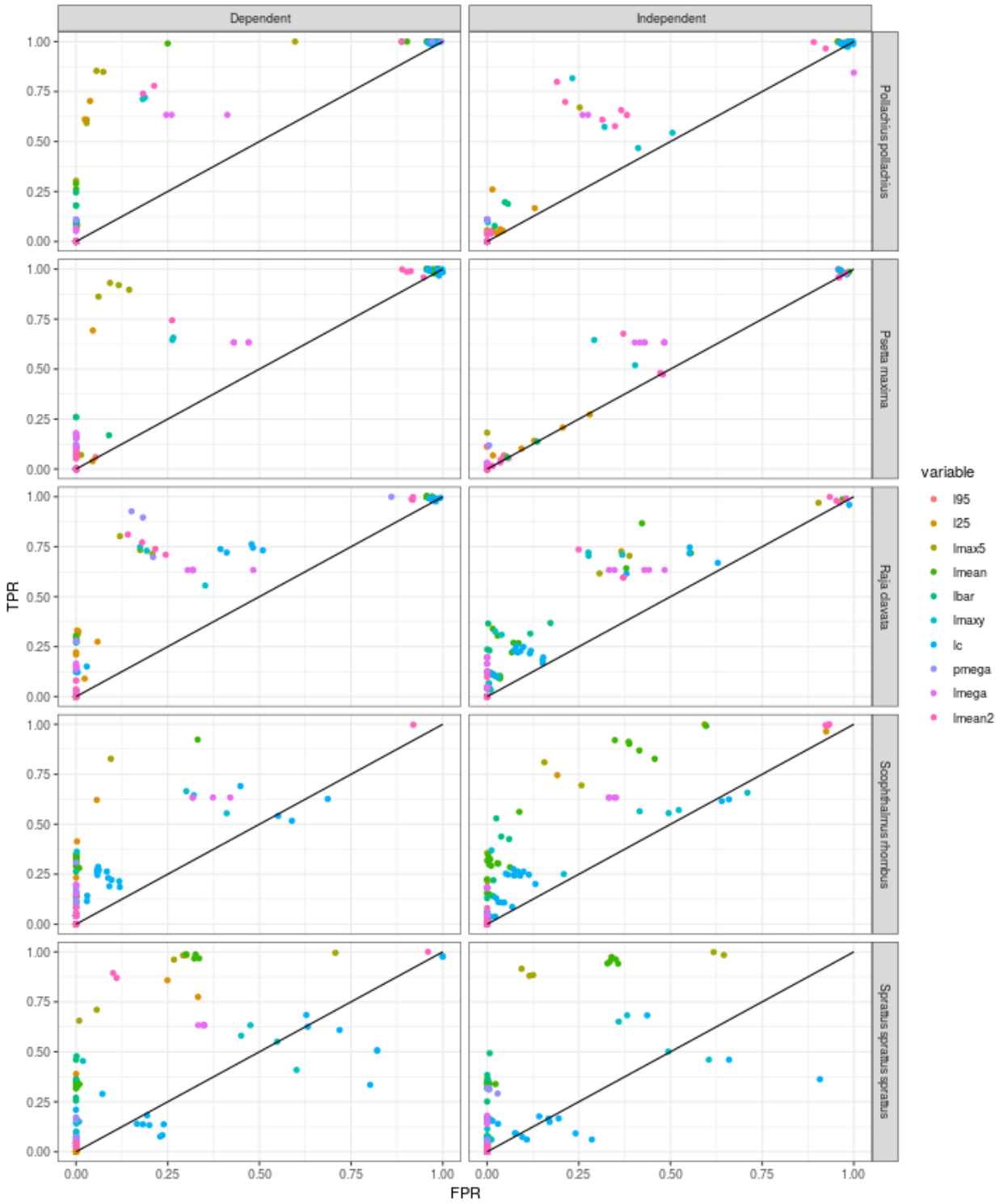

Figure 8. ICES performance; values by TPR and FPR.

Figure 9. Reference values for best performance, i.e. point closest to TPR=1 and FPR=0.

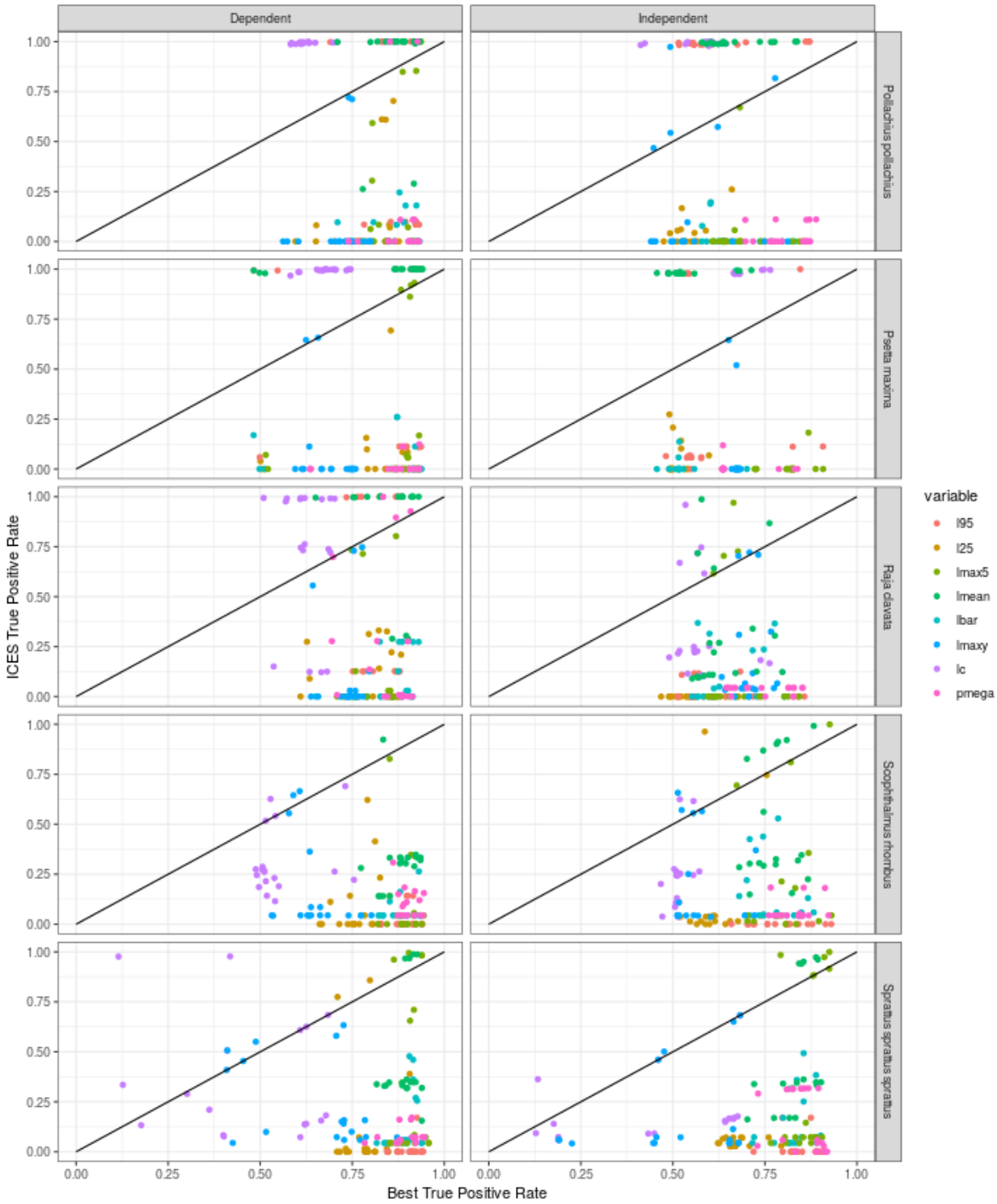

Figure 10. Comparison of ICES TPR with best performance.

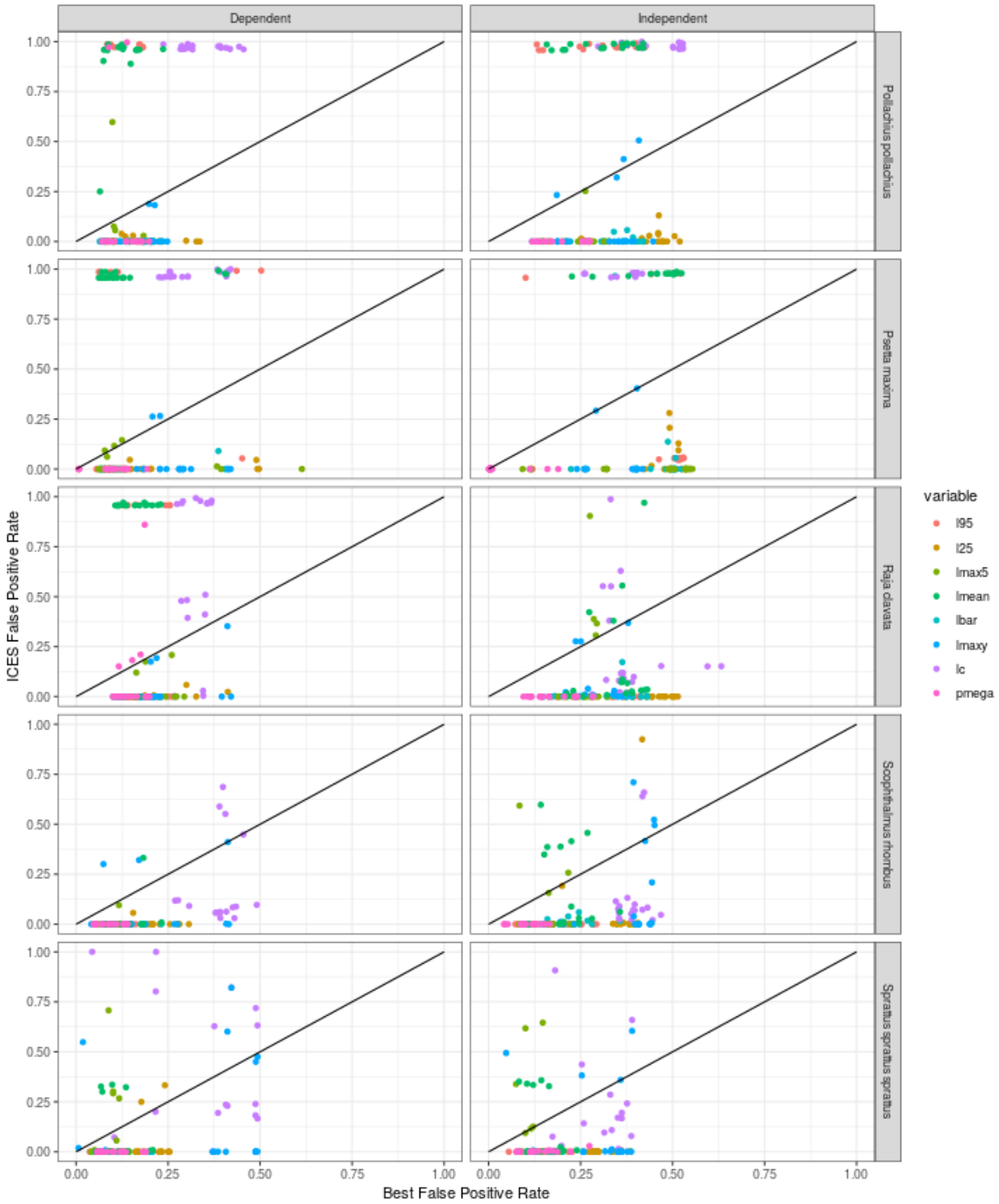

Figure 11. Comparison of ICES FPR with best performance.

References

Session Info

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Running under: Ubuntu 18.04.3 LTS

Matrix products: default
BLAS:   /usr/lib/x86_64-linux-gnu/openblas/libblas.so.3
LAPACK: /usr/lib/x86_64-linux-gnu/libopenblasp-r0.2.20.so

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 [3] LC_TIME=en_GB.UTF-8        LC_COLLATE=en_US.UTF-8
 [5] LC_MONETARY=en_GB.UTF-8    LC_MESSAGES=en_US.UTF-8
 [7] LC_PAPER=en_GB.UTF-8       LC_NAME=C
 [9] LC_ADDRESS=C               LC_TELEPHONE=C
[11] LC_MEASUREMENT=en_GB.UTF-8 LC_IDENTIFICATION=C

attached base packages:
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other attached packages:
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 [7] GGally_1.4.0        reshape_0.8.8       dplyr_0.8.3
[10] plyr_1.8.4          ggplotFL_2.6.7      mydas_1.1.6
[13] FLife_3.3.1         FLasher_0.6.0       FLFishery_0.3.0
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[19] iterators_1.0.12    lattice_0.20-38     knitr_1.26

loaded via a namespace (and not attached):
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