Bycatch Paper

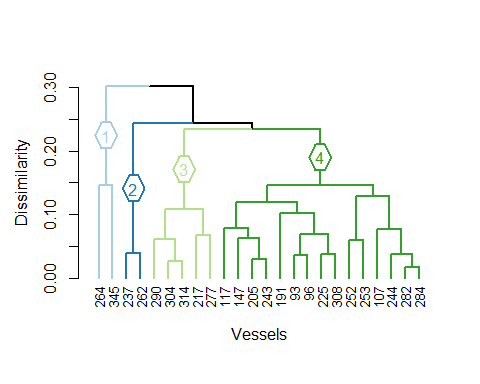
Natasha Besseling

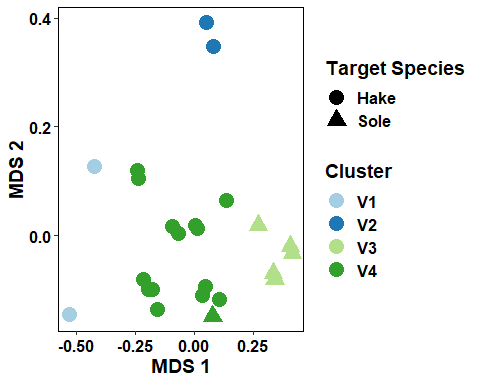
2023-06-06

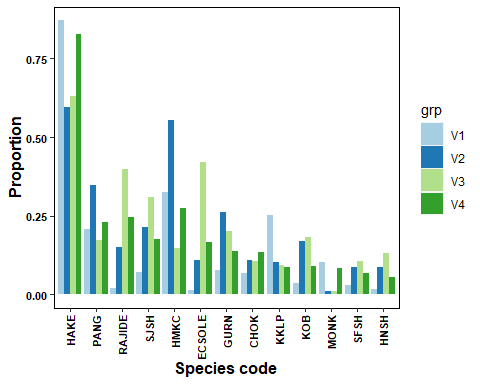
Table 1: Landed catch composition

| **Scientific Name** | **Nominal Mass** | **Cumulative Sum** | **Cumulative Percentage** |
| --- | --- | --- | --- |
| Merluccius | 4596 | 4596 | 61.25 |
| Pterogymnus laniarius | 519 | 5115 | 68.17 |
| Rajiformes | 502 | 5617 | 74.86 |
| Callorhinchus capensis | 419 | 6035 | 80.43 |
| Trachurus capensis | 320 | 6355 | 84.69 |
| Austroglossus pectoralis | 235 | 6590 | 87.83 |
| Chelidonichthys | 214 | 6804 | 90.68 |
| Loligo vulgaris reynaudii | 138 | 6942 | 92.52 |
| Genypterus capensis | 113 | 7055 | 94.02 |
| Argyrosomus | 82 | 7137 | 95.12 |
| Lophius vomerinus | 78 | 7215 | 96.16 |
| Galeorhinus galeus | 74 | 7289 | 97.14 |
| Mustelus | 64 | 7353 | 97.99 |

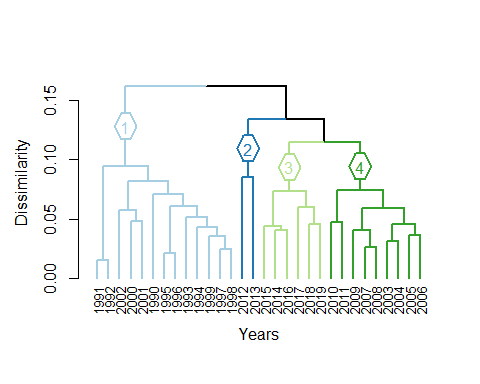
Cluster analysis of vessels

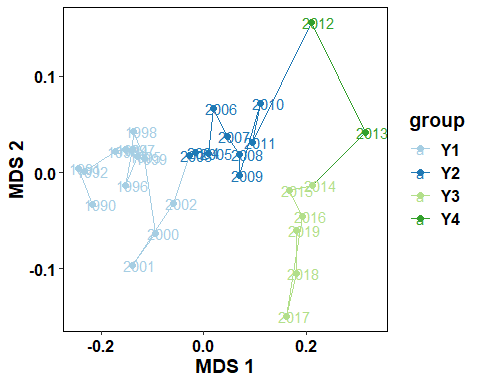


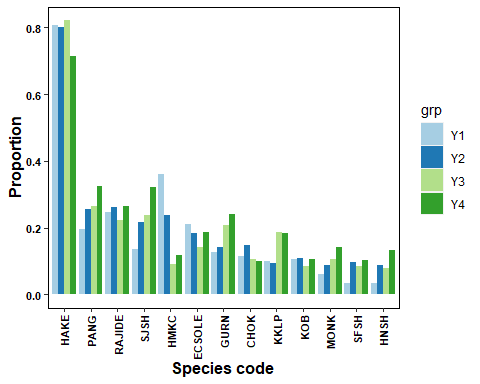


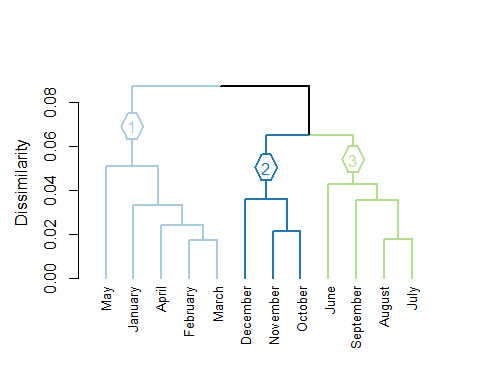


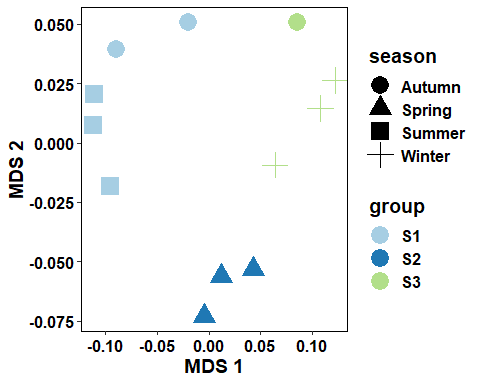
cluster analysis of year

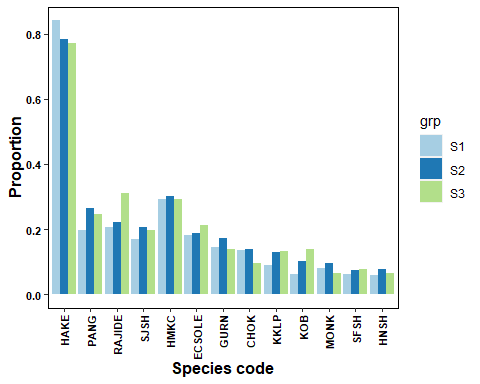




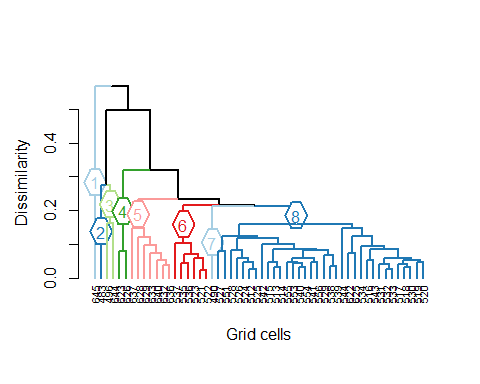


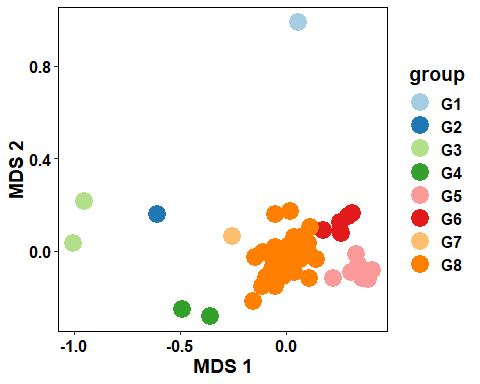
Cluster analysis of months 

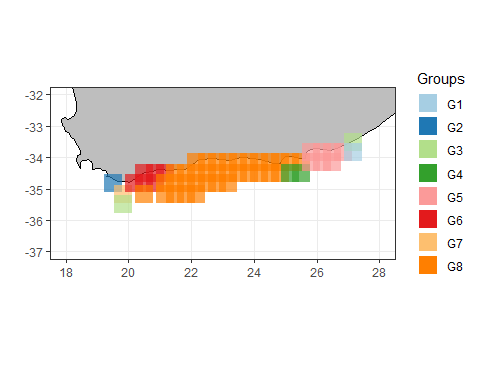


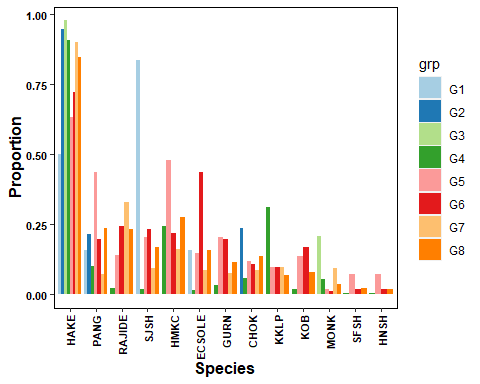


cluster analysis of area









Catch composition model per trip

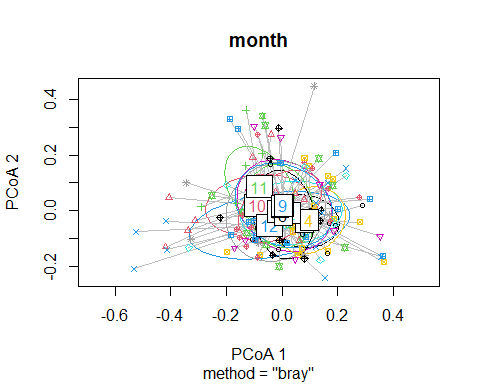
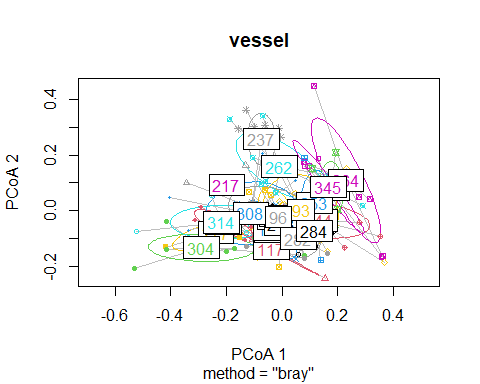
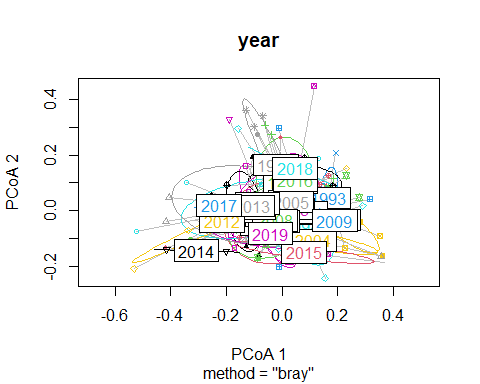
| ExplanatoryVariables | Df | SumOfSqs | R2 | F | Pr(>F) |
| --- | --- | --- | --- | --- | --- |
| docking\_date\_yy | 29 | 3.36187585 | 0.302774959 | 6.319333 | 0.030 |
| docking\_date\_mm | 11 | 0.96029035 | 0.086485011 | 4.758800 | 0.061 |
| vessel\_number | 23 | 3.67768213 | 0.331216888 | 8.716335 | 0.013 |
| docking\_date\_yy:docking\_date\_mm | 76 | 2.81820044 | 0.253810836 | 2.021370 | 0.273 |
| docking\_date\_yy:vessel\_number | 9 | 0.26715301 | 0.024060151 | 1.618099 | 0.369 |
| Residual | 1 | 0.01834478 | 0.001652155 | NA | NA |
| Total | 149 | 11.10354656 | 1.000000000 | NA | NA |

ANOVA’s of the variable’s dispersions

| Year | Df | Sum Sq | Mean Sq | F value | Pr(>F) |
| --- | --- | --- | --- | --- | --- |
| Groups | 29 | 0.5588312 | 0.01927004 | 2.623102 | 0.0001356729 |
| Residuals | 120 | 0.8815536 | 0.00734628 | NA | NA |

| Vessel | Df | Sum Sq | Mean Sq | F value | Pr(>F) |
| --- | --- | --- | --- | --- | --- |
| Groups | 23 | 0.2669127 | 0.011604898 | 2.451537 | 0.0008402867 |
| Residuals | 126 | 0.5964491 | 0.004733723 | NA | NA |

| Month | Df | Sum Sq | Mean Sq | F value | Pr(>F) |
| --- | --- | --- | --- | --- | --- |
| Groups | 11 | 0.1504576 | 0.013677968 | 1.931556 | 0.04022232 |
| Residuals | 138 | 0.9772224 | 0.007081322 | NA | NA |



Catch composition model per trawl

| ExplanatoryVariables | Df | SumOfSqs | R2 | F | Pr(>F) |
| --- | --- | --- | --- | --- | --- |
| docking\_date\_yy | 1 | 0.4580792 | 0.02218393 | 19.453369 | 0.001 |
| docking\_date\_mm | 11 | 2.0004515 | 0.09687818 | 7.723063 | 0.001 |
| grid\_code | 9 | 2.5230093 | 0.12218469 | 11.905032 | 0.001 |
| vessel\_number | 4 | 1.4754517 | 0.07145341 | 15.664597 | 0.001 |
| docking\_date\_yy:docking\_date\_mm | 11 | 1.2481142 | 0.06044387 | 4.818544 | 0.001 |
| docking\_date\_yy:grid\_code | 9 | 1.2218871 | 0.05917374 | 5.765577 | 0.001 |
| docking\_date\_mm:grid\_code | 61 | 5.8229675 | 0.28199559 | 4.053860 | 0.001 |
| docking\_date\_yy:vessel\_number | 4 | 0.4547337 | 0.02202191 | 4.827823 | 0.001 |
| docking\_date\_mm:vessel\_number | 31 | 2.8552042 | 0.13827228 | 3.911377 | 0.001 |
| grid\_code:vessel\_number | 21 | 1.4589631 | 0.07065490 | 2.950389 | 0.003 |
| Residual | 48 | 1.1302825 | 0.05473750 | NA | NA |
| Total | 210 | 20.6491441 | 1.00000000 | NA | NA |

ANOVA’s of the variable’s dispersions

| Year | Df | Sum Sq | Mean Sq | F value | Pr(>F) |
| --- | --- | --- | --- | --- | --- |
| Groups | 1 | 0.6264246 | 0.62642463 | 19.05745 | 1.994252e-05 |
| Residuals | 209 | 6.8698974 | 0.03287032 | NA | NA |

| Vessel | Df | Sum Sq | Mean Sq | F value | Pr(>F) |
| --- | --- | --- | --- | --- | --- |
| Groups | 4 | 1.417240 | 0.35431001 | 13.56521 | 7.814434e-10 |
| Residuals | 206 | 5.380519 | 0.02611902 | NA | NA |

| Grid code | Df | Sum Sq | Mean Sq | F value | Pr(>F) |
| --- | --- | --- | --- | --- | --- |
| Groups | 9 | 2.632184 | 0.29246491 | 15.39134 | 5.671774e-19 |
| Residuals | 201 | 3.819383 | 0.01900191 | NA | NA |

