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| --- | --- | --- | --- | --- |
| *Metric* | *Model* | *df* | *AIC* | *ΔAIC* |
| **Chlα** | ~s(date) + s(plastic\_concentration) | 1780.445 | 16192.780 |  |
|  | ~s(date) + s(plastic\_concentration) + plastic\_type | 1778.841 | 16060.170 |  |
|  | ~s(date, by=plastic\_type) + s(plastic\_concentration, by=plastic\_type) | 1747.162 | **14250.320** | -1942.460 |
|  | ~s(date, by=plastic\_type) + s(plastic\_concentration, by=plastic\_type) + plastic\_type | 1748.014 | 14252.710 |  |
| **NPP** | ~s(date) + s(plastic\_concentration) | 12.004 | 676.970 |  |
|  | ~s(date) + s(plastic\_concentration) + plastic\_type | 14.053 | 651.103 |  |
|  | ~s(date, by=plastic\_type) + s(plastic\_concentration, by=plastic\_type) | 24.032 | 666.173 |  |
|  | ~s(date, by=plastic\_type) + s(plastic\_concentration, by=plastic\_type) + plastic\_type | 26.522 | **638.171** | -38.799 |
| **ER** | ~s(date) + s(plastic\_concentration) | 12.350 | 340.145 |  |
|  | ~s(date) + s(plastic\_concentration) + plastic\_type | 14.395 | 321.797 |  |
|  | ~s(date, by=plastic\_type) + s(plastic\_concentration, by=plastic\_type) | 27.578 | 330.989 |  |
|  | ~s(date, by=plastic\_type) + s(plastic\_concentration, by=plastic\_type) + plastic\_type | 29.899 | **310.652** | -29.493 |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Metric* | Model | *Estimate* | *Std. Error* | *t-value* | *df/edf* | *Ref.df* | *F* | *p-value* |
| **Chlα** | ~s(date, by=plastic\_type) + s(plastic\_concentration, by=plastic\_type) |  |  |  |  |  |  |  |
|  | Parametric: Plastic Type Elastollan (*intercept*) | 3.451 | 0.034 | 101.370 |  |  |  | <0.0001 |
|  | Parametric: Plastic Type TPU 181 | -0.728 | 0.048 | -15.140 |  |  |  | <0.0001 |
|  | Parametric: Plastic Type TPU FC2.1 | -0.570 | 0.048 | -11.860 |  |  |  | <0.0001 |
|  | s(date) : Elastollan |  |  |  | 7.076 | 8.126 | 11.630 | <0.0001 |
|  | s(date): TPU 181 |  |  |  | 4.970 | 6.064 | 22.630 | <0.0001 |
|  | s(date) : TPU FC2.1 |  |  |  | 6.996 | 8.062 | 19.410 | <0.0001 |
|  | s(concentration) : Elastollan |  |  |  | 8.872 | 8.989 | 88.960 | <0.0001 |
|  | s(concentration): TPU 181 |  |  |  | 8.962 | 8.999 | 96.590 | <0.0001 |
|  | s(concentration) : TPU FC2.1 |  |  |  | 8.961 | 8.999 | 95.480 | <0.0001 |
| **NPP** | ~s(date, by=plastic\_type) + s(plastic\_concentration, by=plastic\_type) + plastic\_type | |  |  |  |  |  |  |
|  | Parametric: Plastic Type Elastollan *(intercept*) | 3.058 | 0.025 | 121.287 |  |  |  | <0.0001 |
|  | Parametric: Plastic Type TPU 181 | -0.200 | 0.035 | -5.615 |  |  |  | <0.0001 |
|  | Parametric: Plastic Type TPU FC2.1 | -0.102 | 0.035 | -2.856 |  |  |  | 0.0044 |
|  | s(date) : Elastollan |  |  |  | 2.951 | 3.600 | 7.834 | <0.0001 |
|  | s(date): TPU 181 |  |  |  | 7.931 | 8.553 | 6.436 | <0.0001 |
|  | s(date) : TPU FC2.1 |  |  |  | 6.907 | 7.651 | 2.377 | 0.0248 |
|  | s(concentration) : Elastollan |  |  |  | 1.179 | 1.333 | 4.878 | 0.0286 |
|  | s(concentration): TPU 181 |  |  |  | 2.084 | 2.501 | 2.911 | 0.0662 |
|  | s(concentration) : TPU FC2.1 |  |  |  | 1.470 | 1.777 | 1.374 | 0.1729 |
| **ER** | ~s(date, by=plastic\_type) + s(plastic\_concentration, by=plastic\_type) + plastic\_type | |  |  |  |  |  |  |
|  | Parametric: Plastic Type Elastollan (*intercept*) | 3.092 | 0.027 | 113.387 |  |  |  | <0.0001 |
|  | Parametric: Plastic Type TPU 181 | -0.184 | 0.385 | -4.776 |  |  |  | <0.0001 |
|  | Parametric: Plastic Type TPU FC2.1 | -0.116 | 0.039 | -3.012 |  |  |  | 0.0028 |
|  | s(date) : Elastollan |  |  |  | 2.534 | 3.092 | 4.744 | 0.0026 |
|  | s(date): TPU 181 |  |  |  | 8.497 | 8.886 | 3.799 | 0.0001 |
|  | s(date) : TPU FC2.1 |  |  |  | 5.482 | 6.301 | 2.379 | 0.0236 |
|  | s(concentration) : Elastollan |  |  |  | 6.617 | 7.175 | 5.301 | <0.0001 |
|  | s(concentration): TPU 181 |  |  |  | 1.602 | 1.948 | 0.933 | 0.3335 |
|  | s(concentration) : TPU FC2.1 |  |  |  | 1.167 | 1.313 | 0.650 | 0.3771 |

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| --- | --- | --- | --- | --- | --- |
| *Metric* | *Time* | *Model* | *df* | *AIC* | *ΔAIC* |
| **Biomass** | 0 Days | ~ s(log plastic concentration) | 7.16 | **348.6975** | 0 |
|  |  | ~ plastic\_type + s(log plastic concentration) | 7.61 | 354.5477 |  |
|  |  | ~ plastic\_type + s(log plastic concentration, by=plastic\_type) | 10.5 | 353.2517 |  |
|  | Day 36 | ~ s(log plastic concentration) | 3 | 496.3469 |  |
|  |  | ~ plastic\_type + s(log plastic concentration) | 5.86 | **495.5277** | -0.8192 |
|  |  | ~ plastic\_type + s(log plastic concentration, by=plastic\_type) | 7 | 486.9898 |  |
|  | Day 56 | ~ s(log plastic concentration) | 3.62 | 480.785 |  |
|  |  | ~ plastic\_type + s(log plastic concentration) | 5.3 | 482.2608 |  |
|  |  | ~ plastic\_type + s(log plastic concentration, by=plastic\_type) | 8.77 | **470.5446** | -10.2404 |
|  | Day 97 | ~ s(log plastic concentration) | 3.76 | 521.5976 |  |
|  |  | ~ plastic\_type + s(log plastic concentration) | 5.27 | 523.151 |  |
|  |  | ~ plastic\_type + s(log plastic concentration, by=plastic\_type) | 9.51 | **517.434** | -4.1636 |
| **Abundance** | 0 Days | ~ s(log plastic concentration) | 4.63 | **325.7937** | 0 |
|  |  | ~ plastic\_type + s(log plastic concentration) | 6.61 | 327.9645 |  |
|  |  | ~ plastic\_type + s(log plastic concentration, by=plastic\_type) | 10.45 | 329.7833 |  |
|  | Day 36 | ~ s(log plastic concentration) | 3 | 435.2188 |  |
|  |  | ~ plastic\_type + s(log plastic concentration) | 5 | 431.5656 |  |
|  |  | ~ plastic\_type + s(log palstic concentration, by=plastic\_type) | 8.8 | **420.5889** | -14.6299 |
|  | Day 56 | ~ s(log plastic concentration) | 3 | 437.5938 |  |
|  |  | ~ plastic\_type + s(log plastic concentration) | 5.82 | 438.3046 |  |
|  |  | ~ plastic\_type + s(log plastic concentration, by=plastic\_type) | 10.09 | **424.9858** | -12.608 |
|  | Day 97 | ~ s(log plastic concentration) | 3 | 463.223 |  |
|  |  | ~ plastic\_type + s(log plastic concentration) | 5 | 462.8304 |  |
|  |  | ~ plastic\_type + s(log plastic concentration, by=plastic\_type) | 8.99 | **447.2662** | -15.9568 |

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| --- | --- | --- | --- | --- | --- | --- |
| *Metric* | *Time* | *Effect* | *df/edf* | *Ref.df* | *F* | *p-value* |
| **Biomass** | 0 Days | s(log.con) | 4.447 | 5.164 | 4.896 | 0.00169 |
|  | Day 36 | plastic\_type + s(log.con, by = plastic\_type) | 2 |  | 23.02 | <0.0001 |
|  |  | s(log.con) : Elastollan | 1 | 1 | 106.75 | <0.0001 |
|  |  | s(log.con): TPU 181 | 1 | 1 | 14.21 | 0.0007 |
|  |  | s(log.con) : TPU FC2.1 | 1 | 1 | 12.55 | 0.0013 |
|  | Day 56 | plastic\_type + s(log.con, by = plastic\_type) | 2 |  | 14.98 | <0.0001 |
|  |  | s(log.con) : Elastollan | 1.86 | 2.287 | 52.665 | <0.0001 |
|  |  | s(log.con) : TPU 181 | 1 | 1.001 | 7.903 | 0.0087 |
|  |  | s(log.con) : TPU FC2.1 | 1.265 | 1.478 | 2.454 | 0.0766 |
|  | Day 97 | plastic\_type + s(log.con, by = plastic\_type) | 2 |  | 5.107 | 0.0128 |
|  |  | s(log.con) : Elastollan | 2.125 | 2.601 | 14.723 | <0.0001 |
|  |  | s(log.con) : TPU 181 | 1.558 | 1.909 | 0.442 | 0.607 |
|  |  | s(log.con) : TPU FC2.1 | 1.001 | 1.002 | 1.032 | 0.318 |
| **Aubundance** | 0 Days | s(log.con) | 2.143 | 2.63 | 1.823 | 0.274 |
|  | Day 36 | plastic\_type + s(log.con, by = plastic\_type) | 2 |  | 18.99 | <0.0001 |
|  |  | s(log.con) : Elastollan | 1 | 1.001 | 54.696 | <0.0001 |
|  |  | s(log.con): TPU 181 | 1 | 1.001 | 0.461 | 0.502 |
|  |  | s(log.con) : TPU FC2.1 | 1 | 1 | 2.307 | 0.139 |
|  | Day 56 | plastic\_type + s(log.con, by = plastic\_type) | 2 |  | 7.062 | 0.0033 |
|  |  | s(log.con) : Elastollan | 2.017 | 2.48 | 13.754 | 0.0001 |
|  |  | s(log.con) : TPU 181 | 2.004 | 2.464 | 0.777 | 0.613 |
|  |  | s(log.con) : TPU FC2.1 | 1 | 1 | 0.932 | 0.343 |
|  | Day 97 | plastic\_type + s(log.con, by = plastic\_type) | 2 |  | 9.597 | 0.0006 |
|  |  | s(log.con) : Elastollan | 2.434 | 2.952 | 11.889 | <0.0001 |
|  |  | s(log.con) : TPU 181 | 1 | 1 | 4.177 | 0.0502 |
|  |  | s(log.con) : TPU FC2.1 | 1 | 1 | 0.071 | 0.7916 |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| *Metric* | *Time* | *Effect* | *df* | *SumofSqs* | *R2* | *F* | *p-value* |
| **16S** | 0 Days | plastic\_type | 2 | 0.0813 | 0.0848 | 1.2438 | 0.2228 |
|  |  | plastic\_concentration | 1 | 0.0374 | 0.0391 | 1.1455 | 0.3207 |
|  |  | chlα | 1 | 0.4486 | 0.0468 | 1.3729 | 0.2018 |
|  |  | plastic\_type:plastic\_concentration | 2 | 0.0434 | 0.0453 | 0.6643 | 0.8841 |
|  | Day 16 | plastic\_type | 2 | 0.1167 | 0.1037 | 1.6519 | 0.0899 |
|  |  | plastic\_concentration | 1 | 0.0168 | 0.0149 | 0.4757 | 0.8801 |
|  |  | chlα | 1 | 0.1105 | 0.0982 | 3.1284 | **0.0030** |
|  |  | plastic\_type:plastic\_concentration | 2 | 0.0685 | 0.0609 | 0.9705 | 0.4835 |
|  | Day 36 | plastic\_type | 2 | 0.1523 | 0.1111 | 1.9516 | **0.0410** |
|  |  | plastic\_concentration | 1 | 0.0533 | 0.0389 | 1.3658 | 0.1868 |
|  |  | chlα | 1 | 0.1846 | 0.1347 | 4.7313 | **0.0020** |
|  |  | plastic\_type:plastic\_concentration | 2 | 0.0833 | 0.0608 | 1.0673 | 0.3766 |
|  | Day 56 | plastic\_type | 2 | 0.1388 | 0.1179 | 2.3266 | **0.0280** |
|  |  | plastic\_concentration | 1 | 0.0538 | 0.0455 | 1.8030 | 0.0869 |
|  |  | chlα | 1 | 0.2077 | 0.1764 | 6.9608 | **0.0010** |
|  |  | plastic\_type:plastic\_concentration | 2 | 0.0910 | 0.0773 | 1.5253 | 0.1199 |
|  | Day 94 | plastic\_type | 2 | 0.1104 | 0.0964 | 1.4821 | 0.1099 |
|  |  | plastic\_concentration | 1 | 0.0271 | 0.0251 | 0.7717 | 0.6344 |
|  |  | chlα | 1 | 0.0570 | 0.0527 | 1.6205 | 0.1289 |
|  |  | plastic\_type:plastic\_concentration | 2 | 0.0846 | 0.0783 | 1.2036 | 0.2677 |
| **18S** | 0 Days | plastic\_type | 2 | 0.0842 | 0.0976 | 1.3657 | 0.1988 |
|  |  | plastic\_concentration | 1 | 0.0383 | 0.0444 | 1.2421 | 0.2637 |
|  |  | chlα | 1 | 0.0730 | 0.0846 | 2.3678 | 0.0829 |
|  |  | plastic\_type:plastic\_concentration | 2 | 0.0510 | 0.0591 | 0.8270 | 0.4336 |
|  | Day 16 | plastic\_type | 2 | 0.0510 | 0.0379 | 0.5947 | 0.8202 |
|  |  | plastic\_concentration | 1 | 0.0138 | 0.0102 | 0.3208 | 0.8721 |
|  |  | chlα | 1 | 0.1263 | 0.0939 | 2.9455 | **0.0350** |
|  |  | plastic\_type:plastic\_concentration | 2 | 0.1671 | 0.1244 | 1.9495 | 0.1179 |
|  | Day 36 | plastic\_type | 2 | 0.1980 | 0.1131 | 1.9187 | 0.1359 |
|  |  | plastic\_concentration | 1 | 0.0233 | 0.0133 | 0.4524 | 0.6364 |
|  |  | chlα | 1 | 0.2478 | 0.1415 | 4.8023 | **0.0180** |
|  |  | plastic\_type:plastic\_concentration | 2 | 0.0956 | 0.0546 | 0.9264 | 0.4605 |
|  | Day 56 | plastic\_type | 2 | 0.2483 | 0.1338 | 2.2851 | 0.0559 |
|  |  | plastic\_concentration | 1 | 0.0543 | 0.0293 | 1.0003 | 0.3636 |
|  |  | chlα | 1 | 0.1998 | 0.1077 | 3.6781 | **0.0270** |
|  |  | plastic\_type:plastic\_concentration | 2 | 0.1037 | 0.0559 | 0.9539 | 0.4526 |
|  | Day 94 | plastic\_type | 2 | 0.1176 | 0.6539 | 1.2036 | 0.3087 |
|  |  | plastic\_concentration | 1 | 0.1393 | 0.0775 | 2.8528 | **0.0400** |
|  |  | chlα | 1 | 0.1490 | 0.0829 | 3.0512 | 0.0739 |
|  |  | plastic\_type:plastic\_concentration | 2 | 0.2689 | 0.1495 | 2.7526 | **0.0240** |