**S6 Appendix - Results of binomial generalized linear models**

1. **Model comparing performance of portfolios under different vegetation dynamics scenarios**

Table 1A: Random effects

|  |  |  |
| --- | --- | --- |
| **Groups**  | **Variance**  | **Std.Dev.** |
| species (intercept) | 270.70  | 16.453  |
| Scenario (intercept) | 2.23  | 1.493  |

Number of obs: 2352, groups: species, 48; scenario, 12

Table 1B: Fixed effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Estimate** | **Std.** **Error** | **z value** | **Pr(>|z|)**  |
| **Intercept** | 12.70238  | 1.36125  | 9.331  | < 2e-16  |
| **Moderate climate change** | -0.03457  | 0.26295  | -0.131  | 0.89540  |
| **Current distributions** | -1.39713  | 0.28240  | -4.947 | 7.52e-07  |
| **All scenarios**  | 0.68480  | 0.26428  | 2.591  | 0.00956  |

Table 1C: Correlation of Fixed Effects:

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Intercept** | **Moderate climate change** | **Current** **distributions** |
| **Moderate** **climate change** | -0.098 |  |  |
| **Current** **distributions** | -0.202 | 0.467 |  |
| **All scenarios**  | -0.060 | 0.496 | 0.434 |

Table 1D: Simultaneous Tests for General Linear Hypotheses - Multiple Comparisons of Means: Tukey Contrasts

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Estimate | Std. Error | z value | Pr(>|z|)  |
| Moderate climate change – severe climate change | -0.03457  | 0.26295  | -0.131  | 0.9992  |
| Current distributions – severe climate change | -1.39713  | 0.28240  | -4.947  | <0.001  |
| All scenarios – severe climate change | 0.68480  | 0.26428  | 2.591  | 0.0471  |
| Current distributions – moderate climate change | -1.36256  | 0.28212  | -4.830  | <0.001  |
| All scenarios – moderate climate change | 0.71937  | 0.26461  | 2.719  | 0.0331  |
| All scenarios – current distributions | 2.08193  | 0.29127  | 7.148  | <0.001  |

1. **Model comparing performance of portfolios under different scenarios of urban development policy.**

Table 2A: Random effects

|  |  |  |
| --- | --- | --- |
| **Groups**  | **Variance**  | **Std.Dev.** |
| species (intercept) | 264.084 | 16.251 |
| Scenario (intercept) | 1.873 | 1.369 |

Number of obs: 2352, groups: species, 48; scenario, 12

Table 2B: Fixed effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Estimate** | **Std. Error** | **z value** | **Pr(>|z|)**  |
| **Intercept** | 11.0733  | 1.3374  | 8.280  | < 2e-16  |
| **Unregulated urban development** | 1.6194  | 0.2895  | 5.594  | 2.22e-08  |
| **Regulated urban** **development** | 1.3693  | 0.2869  | 4.773  | 1.81e-06  |
| **All scenarios** | 2.1522  | 0.2976  | 7.231  | 4.79e-13  |

Table 2C: Correlation of Fixed Effects:

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Intercept** | **Unregulated** **urban development** | **Regulated urban development** |
| **Unregulated** **urban development** | 0.005 |  |  |
| **Regulated** **urban development** | -0.006 | 0.569 |  |
| **All scenarios**  | 0.024 | 0.583 | 0.573 |

Table 2D: Simultaneous Tests for General Linear Hypotheses Multiple Comparisons of Means: Tukey Contrasts

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Estimate | Std. Error | z value | Pr(>|z|)  |
| Unregulated urban development – current distributions | 1.6194  | 0.2895  | 5.594  | <0.001  |
| Regulated urban development – current distributions | 1.3693  | 0.2869  | 4.773  | <0.001  |
| All scenarios – current distributions | 2.1522  | 0.2976  | 7.231  | <0.001  |
| Regulated urban development – unregulated urban development | -0.2501  | 0.2677  | -0.934  | 0.7860  |
| All scenarios – unregulated urban development | 0.5328  | 0.2681  | 1.987  | 0.1924  |
| All scenarios – regulated urban development | 0.7829  | 0.2702  | 2.897  | 0.0198  |

1. **Model comparing performance of portfolios under different scenarios of urban development rate.**

Table 3A: Random effects

|  |  |  |
| --- | --- | --- |
| **Groups**  | **Variance**  | **Std.Dev.** |
| species (intercept) | 253.912  | 15.935  |
| Scenario (intercept) | 1.442  | 1.201  |

Number of obs: 2928, groups: species, 48; scenario, 13

Table 3B: Fixed effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Estimate** | **Std. Error** | **z value** | **Pr(>|z|)**  |
| **Intercept** | 12.36299  | 1.78694  | 6.919 | 4.56e-12 |
| **Low** **development rate** | -0.02991  | 1.27222  | -0.024  | 0.981  |
| **Moderate** **development rate** | 0.13510  | 1.27221  | 0.106  | 0.915  |
| **Current** **distributions** | -1.42876  | 1.27563  | -1.120  | 0.263  |
| **All scenarios**  | 0.56367  | 1.27258  | 0.443  | 0.658  |

Table 3C: Correlation of Fixed Effects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Intercept** | **Low** **development** **rate** | **Moderate** **development** **rate** | **Current** **distributions** |
| **Low** **development rate** | -0.646  |  |  |  |
| **Moderate** **development rate** | -0.645  | 0.980  |  |  |
| **Current** **distributions** | -0.660  | 0.977  | 0.977  |  |
| **All scenarios**  | -0.642  | 0.979  | 0.980  | 0.976  |

Table 3D: Simultaneous Tests for General Linear Hypotheses - Multiple Comparisons of Means: Tukey Contrasts

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Estimate | Std. Error | z value | Pr(>|z|)  |
| Low development – high development  | -0.02991  | 1.27222  | -0.024  | 1.000  |
| Moderate development – high development  | 0.13510  | 1.27221  | 0.106  | 1.000  |
| Current distributions – high development | -1.42876  | 1.27563  | -1.120  | 0.772  |
| All scenarios – high development | 0.56367  | 1.27258  | 0.443  | 0.991  |
| Moderate development – low development  | 0.16501  | 0.25704  | 0.642  | 0.963  |
| Current distributions – low development | -1.39885  | 0.27416  | -5.102  | <0.001  |
| All scenarios - low development | 0.59358  | 0.25846  | 2.297  | 0.126  |
| Current distributions – moderate development | -1.56386  | 0.27551  | -5.676  | <0.001  |
| All scenarios – moderate development | 0.42857  | 0.25763  | 1.663  | 0.421  |
| All scenarios – current distributions | 1.99243  | 0.28049  | 7.103  | <0.001  |