Supplementary Tables and Figures: Estimating Spatially Varying Severity Thresholds of the Forest Fire Danger Rating System Using Max-Stable Extreme Event Modelling

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Table 1: Posterior mean parameter estimates with lower and upper end-points for 90% Bayesian credible intervals. The marginal posterior standard deviations of $\beta_{\mu,0}$, $\beta_{\sigma,0}$ and $\beta_{\xi,0}$ are all arbitrarily equal to 10 (see Appendix B). Latitudes and longitudes were centered and scaled to 10-degree units.
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Table 2: Posterior means for Generalized Extreme Value parameters at a small number of the 17 363 gridded sites. The lower and upper limits of 90% Bayesian credible intervals for the 10-year return level (RL) are also given. The 10-year return level is not adjusted for high wind speed scenarios. In high daily wind speed scenarios the actual index may be double the values given here. The third column gives an approximate identifiable area close to the gridded site location.
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Table 3: A suggested spatially varying fire danger severity threshold for local government areas of Victoria. Victorian local government areas are classified using cities (C) rural cities (RC) and shires (S). Local government areas that did not contain any gridded data sites are not included.
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<tr>
<td>14550</td>
<td>Kyogle (A)</td>
<td>65</td>
<td>14920</td>
<td>Liverpool Plains (A)</td>
<td>73</td>
</tr>
<tr>
<td>17400</td>
<td>Tenterfield (A)</td>
<td>66</td>
<td>14200</td>
<td>Inverell (A)</td>
<td>73</td>
</tr>
</tbody>
</table>

Table 4: A suggested spatially varying fire danger severity threshold for local government areas of New South Wales (Part I). New South Wales local government areas are classified using cities (C) and areas (A). Local government areas that did not contain any gridded data sites are not included.
| Code  | Name                        | Threshold | | Code  | Name                        | Threshold |
|-------|-----------------------------|-----------| |-------|-----------------------------|-----------|
| 17750 | Wagga Wagga (C)             | 73        | | 13450 | Griffith (C)                | 79        |
| 16180 | Palerang (A)                | 73        | | 16200 | Parkes (A)                  | 80        |
| 10050 | Albury (C)                  | 73        | | 15500 | Murray (A)                  | 80        |
| 18550 | Wyong (A)                   | 73        | | 12950 | Gilgandra (A)               | 80        |
| 13310 | Goulburn Mulwaree (A)       | 74        | | 12300 | Corowa Shire (A)            | 80        |
| 13800 | Hawkesbury (C)              | 75        | | 17700 | Urana (A)                   | 80        |
| 17350 | Temora (A)                  | 75        | | 14250 | Jerilderie (A)              | 80        |
| 18250 | Willoughby (C)              | 75        | | 14750 | Leeton (A)                  | 80        |
| 12700 | Dungog (A)                  | 75        | | 15800 | Narrandera (A)              | 80        |
| 17420 | The Hills Shire (A)         | 75        | | 15750 | Narrabri (A)                | 81        |
| 13100 | Gosford (C)                 | 76        | | 15550 | Murrumbidgee (A)            | 81        |
| 16950 | Shoalhaven (C)              | 76        | | 15850 | Narrumine (A)               | 81        |
| 17150 | Sutherland Shire (A)        | 76        | | 11860 | Conargo (A)                 | 81        |
| 18100 | Weddin (A)                  | 76        | | 14600 | Lachlan (A)                 | 82        |
| 11500 | Campbelltown (C)            | 76        | | 13850 | Hay (A)                     | 82        |
| 13660 | Gwydir (A)                  | 77        | | 17800 | Wakool (A)                  | 83        |
| 12600 | Dubbo (C)                   | 77        | | 12150 | Coonamble (A)               | 85        |
| 15650 | Muswellbrook (A)            | 77        | | 17950 | Warren (A)                  | 85        |
| 11720 | Cessnock (C)                | 77        | | 10950 | Bogan (A)                   | 86        |
| 16400 | Port Stephens (A)           | 77        | | 11750 | Cobar (A)                   | 86        |
| 12000 | Coolamon (A)                | 78        | | 10300 | Balranald (A)               | 87        |
| 16350 | Penrith (C)                 | 78        | | 15300 | Moree Plains (A)            | 87        |
| 14950 | Lockhart (A)                | 78        | | 11200 | Brewarrina (A)              | 89        |
| 16250 | Parramatta (C)              | 78        | | 17900 | Walgett (A)                 | 89        |
| 17000 | Singleton (A)               | 78        | | 18200 | Wentworth (A)               | 91        |
| 10650 | Berrigan (A)                | 78        | | 11150 | Bourke (A)                  | 92        |
| 12900 | Forbes (A)                  | 79        | | 11700 | Central Darling (A)         | 95        |
| 11600 | Carrathool (A)              | 79        | | 19399 | Unincorporated NSW          | 105       |
| 10800 | Bland (A)                   | 79        | |       |                             |           |

Table 5: A suggested spatially varying fire danger severity threshold for local government areas of New South Wales (Part II). New South Wales local government areas are classified using cities (C) and areas (A). Local government areas that did not contain any gridded data sites are not included.
Figure 1: A map of 10-year return level estimates for the FFDI, derived from applying our model to data from the 1960s.

Figure 2: Half-lengths of 90% Bayesian credible intervals for 10-year return levels for the FFDI, derived from applying our model to data from the 1960s. The half-lengths represent the level of uncertainty regarding the return level estimates.
Figure 3: A map of 10-year return level estimates for the FFDI, derived from applying our model to data from the 1970s.

Figure 4: Half-lengths of 90% Bayesian credible intervals for 10-year return levels for the FFDI, derived from applying our model to data from the 1970s. The half-lengths represent the level of uncertainty regarding the return level estimates.
Figure 5: A map of 10-year return level estimates for the FFDI, derived from applying our model to data from the 1980s.

Figure 6: Half-lengths of 90% Bayesian credible intervals for 10-year return levels for the FFDI, derived from applying our model to data from the 1980s. The half-lengths represent the level of uncertainty regarding the return level estimates.
Figure 7: A map of 10-year return level estimates for the FFDI, derived from applying our model to data from the 1990s.

Figure 8: Half-lengths of 90% Bayesian credible intervals for 10-year return levels for the FFDI, derived from applying our model to data from the 1990s. The half-lengths represent the level of uncertainty regarding the return level estimates.
Figure 9: A map of 10-year return level estimates for the FFDI, derived from applying our model to data from the 2000s.

Figure 10: Half-lengths of 90% Bayesian credible intervals for 10-year return levels for the FFDI, derived from applying our model to data from the 2000s. The half-lengths represent the level of uncertainty regarding the return level estimates.
Figure 11: A map of 10-year return levels for annual temperature maxima. Temperature is one of the meteorological variables used in the calculation of the FFDI.

Figure 12: Half-lengths of 90% Bayesian credible intervals for 10-year return levels for annual temperature maxima. The half-lengths represent the level of uncertainty regarding the return level estimates.
Figure 13: A map of 10-year return levels for annual relative humidity minima. Relative humidity is one of the meteorological variables used in the calculation of the FFDI.

Figure 14: Half-lengths of 90% Bayesian credible intervals for 10-year return levels for annual relative humidity minima. The half-lengths represent the level of uncertainty regarding the return level estimates.