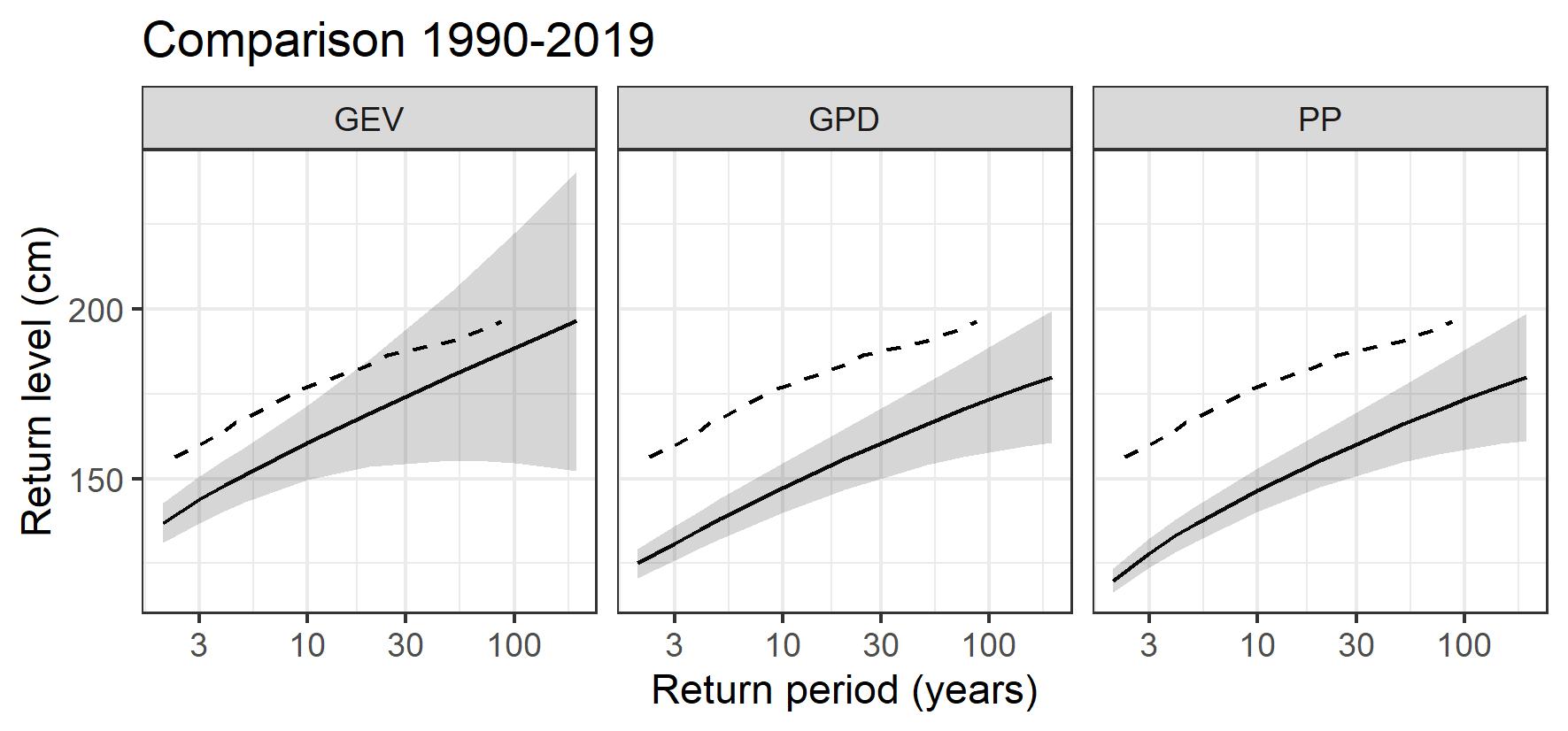
**Figure S1** – Comparisons between models fitted on 1990 – 2019 data. MSL detrending. The dashed line is the curve from the Joint probability method (JPM).



**Table S1** – Return level estimates. Numbers in brackets are the standard estimates.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Return period** | **Detrend** | **GEV** | | | **GPD** | | **PP** | | | **JPM** |
| No covariates | Location | Scale | No covariates | Scale | No covariates | Location | Scale |
| 2-years | MSL | 136(132,139) | 143(137,149) | 145(137,153) | 140(137,143) | 146(141,151) | 136(133,138) | 138(134,143) | 142(136,149) | 159 |
| 2-years | MSL\_L | 134(130,137) | 144(138,150) | 146(138,154) | 139(136,142) | 146(141,152) | 134(132,137) | 140(135,144) | 144(138,150) |  |
| 2-years | NDT | 120(116,125) | 143(137,149) | 145(137,153) | 128(125,131) | 133(128,138) | 123(120,126) | 139(134,145) | 142(136,148) |  |
| 20-years | MSL | 169(161,176) | 175(166,183) | 181(165,197) | 169(160,177) | 182(165,199) | 168(160,176) | 170(162,178) | 179(165,194) | 192 |
| 20-years | MSL\_L | 169(161,177) | 177(168,186) | 184(167,201) | 168(160,176) | 184(165,202) | 168(160,176) | 172(164,179) | 182(168,195) |  |
| 20-years | NDT | 160(152,168) | 175(166,183) | 181(165,197) | 159(150,167) | 169(155,184) | 158(150,166) | 171(163,178) | 179(166,192) |  |
| 100-years | MSL | 186(173,200) | 192(178,206) | 199(178,221) | 187(172,202) | 205(171,238) | 187(172,202) | 188(174,202) | 199(178,220) | 208 |
| 100-years | MSL\_L | 187(174,201) | 195(180,210) | 203(180,226) | 187(172,202) | 208(173,243) | 187(172,202) | 190(177,203) | 203(182,223) |  |
| 100-years | NDT | 179(166,191) | 192(178,206) | 199(178,221) | 178(163,193) | 192(165,219) | 178(163,193) | 187(176,198) | 198(178,219) |  |
| 200-years | MSL | 193(177,210) | 198(181,216) | 206(182,231) | 194(176,213) | 214(172,256) | 194(176,213) | 195(178,213) | 207(182,232) | 222 |
| 200-years | MSL\_L | 195(178,212) | 202(184,221) | 211(184,237) | 195(176,214) | 218(174,262) | 195(176,214) | 197(181,213) | 211(186,235) |  |
| 200-years | NDT | 185(170,201) | 198(181,216) | 206(182,231) | 186(167,204) | 201(167,235) | 186(167,204) | 193(180,206) | 206(182,230) |  |