**APPENDIX B: Z-SCORES**

Table B.1.1: The z-score of the discharge of all peaks-above-base in the Central Highlands for each flood-producing mechanism.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **AR** | **Non-AR Winter** | **Convective** |
| AFR-May | 0.808 | -0.427 | -0.44 |
| BLK-Fta | 0.269 | -0.125 | -0.514 |
| BON-Mor | 0.26 | -0.261 | -0.035 |
| CHE-Glo | 0.457 | -0.589 | -0.55 |
| CIB-Chr | 0.338 | -0.606 | 0.034 |
| DBV-Rim | 0.517 | -0.509 | -0.443 |
| EAG-Mor | 0.606 | -0.139 | -0.414 |
| EFW-Fta | 0.067 | -0.126 | 0.17 |
| GIL-Blu | 0.629 | 0.053 | -0.477 |
| Gil-Cal | 0.488 | -0.092 | -0.907 |
| GIL-Sol | 0.524 | 0.012 | -0.888 |
| NEW-Rck | 0.393 | -0.295 | -0.248 |
| OAK-Crn | 0.61 | -0.735 | -0.707 |
| SCL-Per | 0.523 | -0.335 | -0.534 |
| SFR-Clf | 0.452 | -0.083 | -0.605 |
| SLT-Roo | 0.487 | -0.437 | -0.643 |
| SYC-Mcd | 0.457 | -0.624 | -0.136 |
| TON-Roo | 0.331 | -0.502 | -0.489 |
| VRD-Crk | 0.4 | -0.42 | -0.634 |
| VRD-Hsd | 0.571 | -0.546 | -1.029 |
| WCL-Cmp | 0.404 | -0.192 | -0.494 |

Table B.1.2: The z-score of the discharge of all annual peaks in the Central Highlands for each flood-producing mechanism.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **AR** | **Non-AR Winter** | **Convective** |
| AFR-May | 1.052 | -0.265 | -0.937 |
| BLK-Fta | 0.522 | -0.392 | -0.533 |
| BON-Mor | 0.224 | -0.375 | 0.062 |
| CHE-Glo | 0.654 | -0.529 | -0.416 |
| CIB-Chr | 0.575 | -0.792 | -0.084 |
| DBV-Rim | 0.762 | -0.652 | -0.423 |
| EAG-Mor | 0.796 | -0.404 | -0.369 |
| EFW-Fta | 0.101 | -0.426 | 0.046 |
| GIL-Blu | 0.518 | 0.365 | -0.727 |
| GIL-Cal | 0.507 | -0.095 | -0.843 |
| GIL-Sol | 0.618 | 0.048 | -0.65 |
| NEW-Rck | 0.55 | -0.357 | -0.48 |
| OAK-Crn | 0.83 | -0.976 | -0.49 |
| SCL-Per | 0.459 | -0.43 | -0.464 |
| SFR-Clf | 0.701 | -0.197 | -0.45 |
| SLT-Roo | 0.387 | -0.385 | -0.612 |
| SYC-Mcd | 0.47 | -0.893 | -0.032 |
| TON-Roo | 0.527 | -0.446 | -0.768 |
| VRD-Crk | 0.351 | -0.319 | -0.425 |
| VRD-Hsd | 0.489 | -0.69 | -1.063 |
| WCL-Cmp | 0.456 | -1.082 | -0.322 |

Table B.2.1: The z-score of the discharge of all peaks-above-base in the Colorado Plateau for each flood-producing mechanism.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **AR** | **Non-AR Winter** | **Convective** |
| CHN-Nmw | -0.083 | 0.069 | -0.121 |
| LCO-Cam | 0.772 | -0.24 | 0.199 |
| LCO-Stj | -0.31 | -0.521 | 0.363 |
| MKW-Mnk | -0.194 | -0.304 | 0.241 |
| PAR-Lee | -0.579 | 0.096 | 0.093 |

Table B.2.2: The z-score of the discharge of all annual peaks in the Colorado Plateau for each flood-producing mechanism.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **AR** | **Non-AR Winter** | **Convective** |
| CHN-Nmw | -0.266 | 0.094 | -0.072 |
| LCO-Cam | 1.164 | -0.179 | 0.519 |
| LCO-Stj | -0.398 | -0.36 | 0.37 |
| MKW-Mnk | -0.55 | -0.298 | 0.36 |
| PAR-Lee | -0.407 | 0.066 | 0.172 |
|  |  |  |  |

Table B.3.1: The z-score of the discharge of all peaks-above-base in the Basin and Range for each flood-producing mechanism.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **AR** | **Non-AR Winter** | **Convective** |
| ARV-Mth | 0.218 | 0.204 | -0.323 |
| BSN-Wku | 0.392 | -0.432 | -0.241 |
| SCR-Loc | 0.967 | -1.65 | 0.054 |
| SCR-Nog | 0.63 | -0.046 | -0.241 |
| SCR-Tuc | -0.164 | 0.389 | 0.086 |
| SPD-Cha | 0.492 | 0.488 | -0.068 |
| SPD-Pal | 0.15 | 0.465 | -0.219 |

Table B.3.2: The z-score of the discharge of all annual peaks in the Basin and Range for each flood-producing mechanism.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **AR** | **Non-AR Winter** | **Convective** |
| ARV-Mth | 0.22 | 0.23 | -0.267 |
| BSN-Wku | 0.512 | -0.842 | -0.078 |
| SCR-Loc | 1.016 | -1.314 | 0.253 |
| SCR-Nog | 1.104 | -0.199 | -0.195 |
| SCR-Tuc | -0.253 | 0.189 | 0.196 |
| SPD-Cha | 0.468 | 0.553 | -0.155 |
| SPD-Pal | -0.088 | 0.589 | -0.256 |

**APPENDIX C:** **CONTINGENCY TABLES**

Table C.1.1: Contingency table of direct discharge for the Gila watershed

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **AR-Related** | **Non-AR Winter** | **Convective** | **Tropical** | **Total** |
| Top Third | 17 | 15 | 4 | 0 | 36 |
| Medium Third | 5 | 18 | 9 | 3 | 35 |
| Bottom Third | 6 | 8 | 19 | 2 | 36 |
| Total | 28 | 42 | 32 | 5 | 107 |

Table C.1.2: Contingency table of z-score of discharge for the Gila watershed

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **AR-Related** | **Non-AR Winter** | **Convective** | **Tropical** | **Total** |
| Top Third | 16 | 15 | 5 | 0 | 36 |
| Medium Third | 6 | 16 | 10 | 3 | 35 |
| Bottom Third | 6 | 11 | 17 | 2 | 36 |
| Total | 28 | 42 | 32 | 5 | 107 |

Table C.2.1: Contingency table of direct discharge for the Verde watershed

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **AR-Related** | **Non-AR Winter** | **Convective** | **Tropical** | **Total** |
| Top Third | 23 | 3 | 1 | 2 | 29 |
| Medium Third | 10 | 15 | 2 | 1 | 28 |
| Bottom Third | 5 | 16 | 7 | 1 | 29 |
| Total | 38 | 34 | 10 | 4 | 86 |

Table C.2.2: Contingency table of z-score of discharge for the Verde watershed

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **AR-Related** | **Non-AR Winter** | **Convective** | **Tropical** | **Total** |
| Top Third | 23 | 3 | 1 | 2 | 29 |
| Medium Third | 9 | 15 | 2 | 2 | 28 |
| Bottom Third | 6 | 16 | 7 | 0 | 29 |
| Total | 38 | 34 | 10 | 4 | 86 |

.
Table C.3.1: Contingency table of direct discharge for the Santa Cruz watershed.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **AR-Related** | **Non-AR Winter** | **Convective** | **Tropical** | **Total** |
| Top Third | 2 | 5 | 24 | 3 | 34 |
| Medium Third | 3 | 5 | 21 | 5 | 34 |
| Bottom Third | 3 | 3 | 25 | 3 | 34 |
| Total | 8 | 13 | 70 | 11 | 102 |

Table C.3.2: Contingency table of z-score of discharge for the Santa Cruz watershed.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **AR-Related** | **Non-AR Winter** | **Convective** | **Tropical** | **Total** |
| Top Third | 3 | 4 | 24 | 3 | 34 |
| Medium Third | 3 | 5 | 20 | 6 | 34 |
| Bottom Third | 2 | 4 | 26 | 2 | 34 |
| Total | 8 | 13 | 70 | 11 | 102 |

Table C.4.1: Contingency table of direct discharge for the Little Colorado watershed.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **AR-Related** | **Non-AR Winter** | **Convective** | **Tropical** | **Total** |
| Top Third | 6 | 10 | 5 | 2 | 23 |
| Medium Third | 0 | 12 | 11 | 1 | 24 |
| Bottom Third | 2 | 11 | 9 | 1 | 23 |
| Total | 8 | 33 | 25 | 4 | 70 |

Table C.4.2: Contingency table of z-score of discharge for the Little Colorado watershed.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **AR-Related** | **Non-AR Winter** | **Convective** | **Tropical** | **Total** |
| Top Third | 3 | 7 | 13 | 0 | 23 |
| Medium Third | 4 | 8 | 9 | 3 | 24 |
| Bottom Third | 1 | 18 | 3 | 1 | 23 |
| Total | 8 | 33 | 25 | 4 | 70 |

Table C.5.1: Contingency table of direct discharge for the Salt watershed.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **AR-Related** | **Non-AR Winter** | **Convective** | **Tropical** | **Total** |
| Top Third | 24 | 4 | 3 | 3 | 34 |
| Medium Third | 9 | 12 | 8 | 4 | 33 |
| Bottom Third | 14 | 14 | 6 | 0 | 34 |
| Total | 47 | 30 | 17 | 7 | 101 |

Table C.5.2: Contingency table of z-score of discharge for the Salt watershed.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **AR-Related** | **Non-AR Winter** | **Convective** | **Tropical** | **Total** |
| Top Third | 24 | 4 | 3 | 3 | 34 |
| Medium Third | 9 | 14 | 7 | 3 | 33 |
| Bottom Third | 14 | 12 | 7 | 1 | 34 |
| Total | 47 | 30 | 17 | 7 | 101 |

**APPENDIX D: PARAMETERS FOR DIFFERENCE IN MEANS**

Table D.1: The mean and standard deviations of the logarithmic value of discharge for each flood-producing mechanism by station.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **AR**  | **Non-AR Winter** | **Convective** |
| **BSN-Wku** |  |  |  |
| Mean | 3.884 | 3.276 | 3.417 |
| Standard Deviation | 0.642 | 0.811 | 0.431 |
| **CHN-Nmw** |  |  |  |
| Mean | 3.1 | 3.14 | 3.09 |
| Standard Deviation | 0.34 | 0.26 | 0.284 |
| **GIL-Sol** |  |  |  |
| Mean | 4.145 | 3.894 | 3.453 |
| Standard Deviation | 0.496 | 0.378 | 0.42 |
| **LCO-Cam** |  |  |  |
| Mean | 3.881 | 3.654 | 3.75 |
| Standard Deviation | 0.23 | 0.228 | 0.18 |
| **NEW-Rck** |  |  |  |
| Mean | 3.235 | 2.85 | 2.88 |
| Standard Deviation | 0.546 | 0.36 | 0.689 |
| **OAK-Crn** |  |  |  |
| Mean | 3.773 | 3.2 | 3.21 |
| Standard Deviation | 0.372 | 0.273 | 0.25 |
| **SCR-Nog** |  |  |  |
| Mean | 3.574 | 3.35 | 3.285 |
| Standard Deviation | 0.252 | 0.225 | 0.325 |
| **SFR-Clf** |  |  |  |
| Mean | 3.795 | 3.555 | 3.32 |
| Standard Deviation | 0.395 | 0.479 | 0.317 |
| **SLT-Roo** |  |  |  |
| Mean | 4.21 | 3.835 | 3.75 |
| Standard Deviation | 0.448 | 0.251 | 0.254 |
| **VRD-Hsd** |  |  |  |
| Mean | 4.31 | 3.8 | 3.579 |
| Standard Deviation | 0.451 | 0.23 | 0.288 |

Table D.2: The pooled variances, degrees of freedom, and rejection regions for each pair of comparisons at the select gauging stations.

|  |  |  |
| --- | --- | --- |
|  | AR vs. Non-AR Winter | AR vs. Convective |
| **BSN-Wku** |  |  |
| Pooled variance (s2) | 0.5184 | 0.3614 |
| Degrees of freedom | 67 | 49 |
| t-statistic at 0.010 | 2.158 – 2.39 | 3.90 – 2.423 |
| **CHN-Nmw** |  |  |
| Pooled variance (s2) | 0.08 | 0.0868 |
| Degrees of freedom | 36 | 51 |
| t-statistic at 0.010 | 2.423 – 2.457 | 2.39 – 2.423 |
| **GIL-Sol** |  |  |
| Pooled variance (s2) | 0.1958 | 0.2214 |
| Degrees of freedom | 37 | 29 |
| t-statistic at 0.010 | 2.423 – 2.457 | 2.462 |
| **LCO-Cam** |  |  |
| Pooled variance (s2) | 0.0523 | 0.0425 |
| Degrees of freedom | 26 | 10 |
| t-statistic at 0.010 | 2.479 | 2.764 |
| **NEW-Rck** |  |  |
| Pooled variance (s2) | 0.226 | 0.339 |
| Degrees of freedom | 70 | 52 |
| t-statistic at 0.010 | 2.158 – 2.39 | 2.39 – 2.423 |
| **OAK-Crn** |  |  |
| Pooled variance (s2) | 0.1164 | 0.1243 |
| Degrees of freedom | 41 | 33 |
| t-statistic at 0.010 | 2.39 – 2.423 | 2.423 – 2.457 |
| **SCR-Nog** |  |  |
| Pooled variance (s2) | 0.0557 | 0.0968 |
| Degrees of freedom | 10 | 19 |
| t-statistic at 0.010 | 2.764 | 2.539 |
| **SFR-Clf** |  |  |
| Pooled variance (s2) | 0.1864 | 0.1383 |
| Degrees of freedom | 39 | 34 |
| t-statistic at 0.010 | 2.423 – 2.457 | 2.423 – 2.457 |
| **SLT-Roo** |  |  |
| Pooled variance (s2) | 0.1513 | 0.1685 |
| Degrees of freedom | 50 | 42 |
| t-statistic at 0.010 | 2.39 – 2.423 | 2.39 -2.423 |
| **VRD-Hsd** |  |  |
| Pooled variance (s2) | N/A1 | 0.1852 |
| Degrees of freedom | 53 | 40 |
| t-statistic at 0.010 | 2.39 – 2.423 | 2.423 |