

Direction reconstruction strategy

M2~D57\_Recon

Reconstruction summary

Input and output direction time series summary

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Signal Name | Signal Height | Valid data [years] | Mean | Start Date | End Date | Date Last Calculated |
| Input | wd57 | 57m | 1.4353 | 285.7345 | 11/11/2010 03:40 | 28/04/2012 06:20 | 13/10/2022 16:45 |
| Reconstructed | D57\_Recon | 57m | 1.4818 | 285.1724 | 31/10/2010 00:00 | 28/04/2012 06:20 | 13/10/2022 18:37 |

Reconstruction options used

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Reference direction | Reference speed | Records spliced | Data spliced [years] | Max splice potential [years] | Distance from site data [m] |
| M2~wd46~Mean | M2~ws60N~Mean | 112 | 0.0021 | 0.0021 | 11 |
| M3~wd94~Mean | M3~ws94S~Mean | 2331 | 0.0443 | 0.0464 | 2991 |

Excluded reconstruction options

|  |  |  |  |
| --- | --- | --- | --- |
| Reference direction | Reference speed | Max splice potential [years] | Distance from site data [m] |

Calculation Steps

Reconstruction stage : Synthesis from M2~wd46~Mean

Correlation

|  |  |
| --- | --- |
| Correlate wind speeds and directions |  |
| Reference speed | M2~ws60N~Mean |
| Reference direction | M2~wd46~Mean |
| Site speed | M2~ws60N~Mean |
| Site direction | M2~wd57~Mean |
| Reference low windspeed cut off | 3 |
| Site low windspeed cut off | 3 |
| Iterate to site cut off | True |
| Force through origin | True |

|  |
| --- |
| Correlation of mean wind directions recorded at M2~wd46~Mean and M2~wd57~Mean |
|  |

Direction Trend

|  |  |  |
| --- | --- | --- |
| Reference direction [degrees] | Site direction [degrees] | Number of Records |
| 0.000000 | -1.214395 | 986 |
| 10.000000 | 9.978683 | 907 |
| 20.000000 | 16.343986 | 487 |
| 30.000000 | 29.328574 | 1194 |
| 40.000000 | 39.168459 | 752 |
| 50.000000 | 48.043645 | 790 |
| 60.000000 | 57.426457 | 1055 |
| 70.000000 | 66.951499 | 1104 |
| 80.000000 | 76.652978 | 1173 |
| 90.000000 | 87.241294 | 898 |
| 100.000000 | 96.329339 | 1024 |
| 110.000000 | 109.095622 | 767 |
| 120.000000 | 120.018489 | 509 |
| 130.000000 | 129.903014 | 447 |
| 140.000000 | 141.340653 | 406 |
| 150.000000 | 151.294120 | 427 |
| 160.000000 | 161.475300 | 482 |
| 170.000000 | 171.717732 | 336 |
| 180.000000 | 182.580673 | 318 |
| 190.000000 | 191.559866 | 655 |
| 200.000000 | 202.160635 | 842 |
| 210.000000 | 211.944135 | 970 |
| 220.000000 | 221.785433 | 1319 |
| 230.000000 | 232.316523 | 1304 |
| 240.000000 | 242.423136 | 1516 |
| 250.000000 | 252.169281 | 2174 |
| 260.000000 | 261.979457 | 3729 |
| 270.000000 | 272.337338 | 4644 |
| 280.000000 | 282.152102 | 4874 |
| 290.000000 | 291.566778 | 2734 |
| 300.000000 | 300.259770 | 2027 |
| 310.000000 | 308.861072 | 1767 |
| 320.000000 | 315.878723 | 1679 |
| 330.000000 | 328.710829 | 1296 |
| 340.000000 | 336.964089 | 2660 |
| 350.000000 | 348.722133 | 1100 |
| Unweighted Offset | 359.8743 |  |

Apply direction trend to series

|  |  |
| --- | --- |
| Summary |  |
| Source series | M2~wd46~Mean |
| Direction trend | - |
| Destination series | M2~wd46~Mean\_DirTrend |

|  |  |
| --- | --- |
| Reference direction (degrees) | Site direction (degrees) |
| -10.0 | 348.7221 |
| 0.0 | -1.2144 |
| 10.0 | 9.9787 |
| 20.0 | 16.3440 |
| 30.0 | 29.3286 |
| 40.0 | 39.1685 |
| 50.0 | 48.0436 |
| 60.0 | 57.4265 |
| 70.0 | 66.9515 |
| 80.0 | 76.6530 |
| 90.0 | 87.2413 |
| 100.0 | 96.3293 |
| 110.0 | 109.0956 |
| 120.0 | 120.0185 |
| 130.0 | 129.9030 |
| 140.0 | 141.3407 |
| 150.0 | 151.2941 |
| 160.0 | 161.4753 |
| 170.0 | 171.7177 |
| 180.0 | 182.5807 |
| 190.0 | 191.5599 |
| 200.0 | 202.1606 |
| 210.0 | 211.9441 |
| 220.0 | 221.7854 |
| 230.0 | 232.3165 |
| 240.0 | 242.4231 |
| 250.0 | 252.1693 |
| 260.0 | 261.9795 |
| 270.0 | 272.3373 |
| 280.0 | 282.1521 |
| 290.0 | 291.5668 |
| 300.0 | 300.2598 |
| 310.0 | 308.8611 |
| 320.0 | 315.8787 |
| 330.0 | 328.7108 |
| 340.0 | 336.9641 |

Compare Frequency Distribution

|  |  |
| --- | --- |
| Summary |  |
| Frequency distribution 1 | matchedSiteFD |
| Frequency distribution 2 | syntheticMatchedSiteFD |

|  |  |  |
| --- | --- | --- |
|  | Frequency distribution name | Mean windspeed (m/s) |
| Frequency Distribution 1 | matchedSiteFD | 6.467126 |
| Frequency Distribution 2 | syntheticMatchedSiteFD | 6.467126 |
| FD 1/FD 2 |  | 100.0% |

|  |
| --- |
|  |

Reconstruction stage : Synthesis from M3~wd94~Mean

Correlation

|  |  |
| --- | --- |
| Correlate wind speeds and directions |  |
| Reference speed | M3~ws94S~Mean |
| Reference direction | M3~wd94~Mean |
| Site speed | M2~ws60N~Mean |
| Site direction | M2~wd57~Mean |
| Reference low windspeed cut off | 3 |
| Site low windspeed cut off | 2.610394 |
| Iterate to site cut off | True |
| Force through origin | True |

|  |
| --- |
| Correlation of mean wind directions recorded at M3~wd94~Mean and M2~wd57~Mean |
|  |

Direction Trend

|  |  |  |
| --- | --- | --- |
| Reference direction [degrees] | Site direction [degrees] | Number of Records |
| 0.000000 | -8.137645 | 1011 |
| 10.000000 | 3.695876 | 941 |
| 20.000000 | 16.012922 | 760 |
| 30.000000 | 28.698731 | 761 |
| 40.000000 | 37.906788 | 717 |
| 50.000000 | 44.175580 | 884 |
| 60.000000 | 59.818221 | 1043 |
| 70.000000 | 68.960270 | 838 |
| 80.000000 | 79.392973 | 761 |
| 90.000000 | 87.388899 | 604 |
| 100.000000 | 95.536069 | 625 |
| 110.000000 | 107.623811 | 467 |
| 120.000000 | 121.225794 | 384 |
| 130.000000 | 125.463276 | 334 |
| 140.000000 | 137.313608 | 266 |
| 150.000000 | 146.511490 | 243 |
| 160.000000 | 156.060836 | 331 |
| 170.000000 | 164.013129 | 305 |
| 180.000000 | 174.894735 | 211 |
| 190.000000 | 185.787929 | 339 |
| 200.000000 | 193.053689 | 371 |
| 210.000000 | 203.231410 | 747 |
| 220.000000 | 214.388089 | 900 |
| 230.000000 | 226.653292 | 1209 |
| 240.000000 | 235.911783 | 926 |
| 250.000000 | 246.232281 | 1441 |
| 260.000000 | 256.313004 | 2726 |
| 270.000000 | 269.011223 | 5153 |
| 280.000000 | 279.945272 | 3771 |
| 290.000000 | 287.460658 | 2353 |
| 300.000000 | 295.869546 | 1626 |
| 310.000000 | 302.303291 | 1555 |
| 320.000000 | 309.909385 | 1484 |
| 330.000000 | 320.256956 | 1448 |
| 340.000000 | 334.021699 | 2108 |
| 350.000000 | 341.416614 | 951 |
| Unweighted Offset | 355.7869 |  |

Apply direction trend to series

|  |  |
| --- | --- |
| Summary |  |
| Source series | M3~wd94~Mean |
| Direction trend | - |
| Destination series | M3~wd94~Mean\_DirTrend |

|  |  |
| --- | --- |
| Reference direction (degrees) | Site direction (degrees) |
| -10.0 | 341.4166 |
| 0.0 | -8.1376 |
| 10.0 | 3.6959 |
| 20.0 | 16.0129 |
| 30.0 | 28.6987 |
| 40.0 | 37.9068 |
| 50.0 | 44.1756 |
| 60.0 | 59.8182 |
| 70.0 | 68.9603 |
| 80.0 | 79.3930 |
| 90.0 | 87.3889 |
| 100.0 | 95.5361 |
| 110.0 | 107.6238 |
| 120.0 | 121.2258 |
| 130.0 | 125.4633 |
| 140.0 | 137.3136 |
| 150.0 | 146.5115 |
| 160.0 | 156.0608 |
| 170.0 | 164.0131 |
| 180.0 | 174.8947 |
| 190.0 | 185.7879 |
| 200.0 | 193.0537 |
| 210.0 | 203.2314 |
| 220.0 | 214.3881 |
| 230.0 | 226.6533 |
| 240.0 | 235.9118 |
| 250.0 | 246.2323 |
| 260.0 | 256.3130 |
| 270.0 | 269.0112 |
| 280.0 | 279.9453 |
| 290.0 | 287.4607 |
| 300.0 | 295.8695 |
| 310.0 | 302.3033 |
| 320.0 | 309.9094 |
| 330.0 | 320.2570 |
| 340.0 | 334.0217 |

Compare Frequency Distribution

|  |  |
| --- | --- |
| Summary |  |
| Frequency distribution 1 | matchedSiteFD |
| Frequency distribution 2 | syntheticMatchedSiteFD |

|  |  |  |
| --- | --- | --- |
|  | Frequency distribution name | Mean windspeed (m/s) |
| Frequency Distribution 1 | matchedSiteFD | 6.504295 |
| Frequency Distribution 2 | syntheticMatchedSiteFD | 6.469529 |
| FD 1/FD 2 |  | 100.5% |

|  |
| --- |
|  |

Splicing steps to reconstruct final output

Splice Series

|  |  |
| --- | --- |
| Summary |  |
| Input high priority series | M2~wd57~Mean |
| Input low priority series | M2~wd46~Mean\_DirTrend |
| Output series | M2~wd57~Mean\_Splice1 |

|  |  |
| --- | --- |
| Coverage |  |
| High priority input coverage | 1.44 years |
| Output coverage | 1.44 years |
| Proportion of spliced data in output | 0.148138% |

Splice Series

|  |  |
| --- | --- |
| Summary |  |
| Input high priority series | M2~wd57~Mean\_Splice1 |
| Input low priority series | M3~wd94~Mean\_DirTrend |
| Output series | M2~D57\_Recon |

|  |  |
| --- | --- |
| Coverage |  |
| High priority input coverage | 1.44 years |
| Output coverage | 1.48 years |
| Proportion of spliced data in output | 2.990916% |