

Direction reconstruction strategy

M3~D94\_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 | wd94 | 94m | 1.231 | 289.2975 | 31/10/2010 00:00 | 12/02/2012 20:50 | 25/04/2018 11:27 |
| Reconstructed | D94\_Recon | 94m | 1.4563 | 289.8672 | 31/10/2010 00:00 | 28/04/2012 06:20 | 11/07/2022 11:20 |

Reconstruction options used

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Reference direction | Reference speed | Records spliced | Data spliced [years] | Max splice potential [years] | Distance from site data [m] |
| M3~wd42~Mean | M3~ws94S~Mean | 299 | 0.0057 | 0.0057 | 52 |
| M2~wd57~Mean | M2~ws60N~Mean | 11550 | 0.2196 | 0.2253 | 2991 |

Excluded reconstruction options

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

Calculation Steps

Reconstruction stage : Synthesis from M3~wd42~Mean

Correlation

|  |  |
| --- | --- |
| Correlate wind speeds and directions |  |
| Reference speed | M3~ws94S~Mean |
| Reference direction | M3~wd42~Mean |
| Site speed | M3~ws94S~Mean |
| Site direction | M3~wd94~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 M3~wd42~Mean and M3~wd94~Mean |
|  |

Direction Trend

|  |  |  |
| --- | --- | --- |
| Reference direction [degrees] | Site direction [degrees] | Number of Records |
| 0.000000 | 8.296694 | 1080 |
| 10.000000 | 17.523040 | 754 |
| 20.000000 | 27.044516 | 794 |
| 30.000000 | 35.133164 | 654 |
| 40.000000 | 44.177060 | 669 |
| 50.000000 | 54.706454 | 949 |
| 60.000000 | 62.592878 | 1034 |
| 70.000000 | 72.042722 | 836 |
| 80.000000 | 82.068680 | 744 |
| 90.000000 | 90.621357 | 746 |
| 100.000000 | 100.025821 | 703 |
| 110.000000 | 110.364931 | 552 |
| 120.000000 | 120.826185 | 549 |
| 130.000000 | 131.796574 | 437 |
| 140.000000 | 143.203267 | 456 |
| 150.000000 | 155.753148 | 531 |
| 160.000000 | 164.513774 | 462 |
| 170.000000 | 173.874165 | 645 |
| 180.000000 | 185.392832 | 734 |
| 190.000000 | 196.072120 | 706 |
| 200.000000 | 206.368215 | 870 |
| 210.000000 | 218.454746 | 1175 |
| 220.000000 | 228.061107 | 1662 |
| 230.000000 | 239.470938 | 1525 |
| 240.000000 | 249.390053 | 1438 |
| 250.000000 | 257.959995 | 1856 |
| 260.000000 | 265.322535 | 3786 |
| 270.000000 | 274.295162 | 5239 |
| 280.000000 | 284.529026 | 3462 |
| 290.000000 | 295.615691 | 2549 |
| 300.000000 | 307.099848 | 1788 |
| 310.000000 | 317.618973 | 1718 |
| 320.000000 | 327.764721 | 1653 |
| 330.000000 | 334.755534 | 1556 |
| 340.000000 | 345.675217 | 2395 |
| 350.000000 | 358.385728 | 1204 |
| Unweighted Offset | 5.1891 |  |

Apply direction trend to series

|  |  |
| --- | --- |
| Summary |  |
| Source series | M3~wd42~Mean |
| Direction trend | - |
| Destination series | M3~wd42~Mean\_DirTrend |

|  |  |
| --- | --- |
| Reference direction (degrees) | Site direction (degrees) |
| -10.0 | 358.3857 |
| 0.0 | 8.2967 |
| 10.0 | 17.5230 |
| 20.0 | 27.0445 |
| 30.0 | 35.1332 |
| 40.0 | 44.1771 |
| 50.0 | 54.7065 |
| 60.0 | 62.5929 |
| 70.0 | 72.0427 |
| 80.0 | 82.0687 |
| 90.0 | 90.6214 |
| 100.0 | 100.0258 |
| 110.0 | 110.3649 |
| 120.0 | 120.8262 |
| 130.0 | 131.7966 |
| 140.0 | 143.2033 |
| 150.0 | 155.7531 |
| 160.0 | 164.5138 |
| 170.0 | 173.8742 |
| 180.0 | 185.3928 |
| 190.0 | 196.0721 |
| 200.0 | 206.3682 |
| 210.0 | 218.4547 |
| 220.0 | 228.0611 |
| 230.0 | 239.4709 |
| 240.0 | 249.3901 |
| 250.0 | 257.9600 |
| 260.0 | 265.3225 |
| 270.0 | 274.2952 |
| 280.0 | 284.5290 |
| 290.0 | 295.6157 |
| 300.0 | 307.0998 |
| 310.0 | 317.6190 |
| 320.0 | 327.7647 |
| 330.0 | 334.7555 |
| 340.0 | 345.6752 |

Compare Frequency Distribution

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

|  |  |  |
| --- | --- | --- |
|  | Frequency distribution name | Mean windspeed (m/s) |
| Frequency Distribution 1 | matchedSiteFD | 7.549832 |
| Frequency Distribution 2 | syntheticMatchedSiteFD | 7.549832 |
| FD 1/FD 2 |  | 100.0% |

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Reconstruction stage : Synthesis from M2~wd57~Mean

Correlation

|  |  |
| --- | --- |
| Correlate wind speeds and directions |  |
| Reference speed | M2~ws60N~Mean |
| Reference direction | M2~wd57~Mean |
| Site speed | M3~ws94S~Mean |
| Site direction | M3~wd94~Mean |
| Reference low windspeed cut off | 3 |
| Site low windspeed cut off | 3.445089 |
| Iterate to site cut off | True |
| Force through origin | True |

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

Direction Trend

|  |  |  |
| --- | --- | --- |
| Reference direction [degrees] | Site direction [degrees] | Number of Records |
| 0.000000 | 5.053484 | 756 |
| 10.000000 | 13.020385 | 826 |
| 20.000000 | 16.758809 | 331 |
| 30.000000 | 30.392407 | 947 |
| 40.000000 | 42.148339 | 720 |
| 50.000000 | 52.445294 | 712 |
| 60.000000 | 60.732314 | 958 |
| 70.000000 | 70.726462 | 861 |
| 80.000000 | 81.378423 | 822 |
| 90.000000 | 90.859300 | 583 |
| 100.000000 | 101.912091 | 598 |
| 110.000000 | 111.693975 | 450 |
| 120.000000 | 122.204877 | 366 |
| 130.000000 | 131.255133 | 245 |
| 140.000000 | 142.467067 | 247 |
| 150.000000 | 152.579321 | 306 |
| 160.000000 | 163.793699 | 340 |
| 170.000000 | 175.013441 | 213 |
| 180.000000 | 187.489628 | 207 |
| 190.000000 | 197.308250 | 475 |
| 200.000000 | 208.541025 | 604 |
| 210.000000 | 216.629598 | 706 |
| 220.000000 | 225.037755 | 915 |
| 230.000000 | 233.438525 | 992 |
| 240.000000 | 243.930041 | 1203 |
| 250.000000 | 254.566893 | 1731 |
| 260.000000 | 263.163749 | 2634 |
| 270.000000 | 272.232876 | 4300 |
| 280.000000 | 282.684721 | 4175 |
| 290.000000 | 295.513246 | 2488 |
| 300.000000 | 307.967312 | 1907 |
| 310.000000 | 318.308712 | 1703 |
| 320.000000 | 327.093820 | 1216 |
| 330.000000 | 335.291849 | 992 |
| 340.000000 | 343.415122 | 2080 |
| 350.000000 | 356.787812 | 828 |
| Unweighted Offset | 3.7177 |  |

Apply direction trend to series

|  |  |
| --- | --- |
| Summary |  |
| Source series | M2~wd57~Mean |
| Direction trend | - |
| Destination series | M2~wd57~Mean\_DirTrend |

|  |  |
| --- | --- |
| Reference direction (degrees) | Site direction (degrees) |
| -10.0 | 356.7878 |
| 0.0 | 5.0535 |
| 10.0 | 13.0204 |
| 20.0 | 16.7588 |
| 30.0 | 30.3924 |
| 40.0 | 42.1483 |
| 50.0 | 52.4453 |
| 60.0 | 60.7323 |
| 70.0 | 70.7265 |
| 80.0 | 81.3784 |
| 90.0 | 90.8593 |
| 100.0 | 101.9121 |
| 110.0 | 111.6940 |
| 120.0 | 122.2049 |
| 130.0 | 131.2551 |
| 140.0 | 142.4671 |
| 150.0 | 152.5793 |
| 160.0 | 163.7937 |
| 170.0 | 175.0134 |
| 180.0 | 187.4896 |
| 190.0 | 197.3082 |
| 200.0 | 208.5410 |
| 210.0 | 216.6296 |
| 220.0 | 225.0378 |
| 230.0 | 233.4385 |
| 240.0 | 243.9300 |
| 250.0 | 254.5669 |
| 260.0 | 263.1637 |
| 270.0 | 272.2329 |
| 280.0 | 282.6847 |
| 290.0 | 295.5132 |
| 300.0 | 307.9673 |
| 310.0 | 318.3087 |
| 320.0 | 327.0938 |
| 330.0 | 335.2918 |
| 340.0 | 343.4151 |

Compare Frequency Distribution

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

|  |  |  |
| --- | --- | --- |
|  | Frequency distribution name | Mean windspeed (m/s) |
| Frequency Distribution 1 | matchedSiteFD | 7.582162 |
| Frequency Distribution 2 | syntheticMatchedSiteFD | 7.584016 |
| FD 1/FD 2 |  | 100.0% |

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Splicing steps to reconstruct final output

Splice Series

|  |  |
| --- | --- |
| Summary |  |
| Input high priority series | M3~wd94~Mean |
| Input low priority series | M3~wd42~Mean\_DirTrend |
| Output series | M3~wd94~Mean\_Splice1 |

|  |  |
| --- | --- |
| Coverage |  |
| High priority input coverage | 1.23 years |
| Output coverage | 1.24 years |
| Proportion of spliced data in output | 0.459668% |

Splice Series

|  |  |
| --- | --- |
| Summary |  |
| Input high priority series | M3~wd94~Mean\_Splice1 |
| Input low priority series | M2~wd57~Mean\_DirTrend |
| Output series | M3~D94\_Recon |

|  |  |
| --- | --- |
| Coverage |  |
| High priority input coverage | 1.24 years |
| Output coverage | 1.46 years |
| Proportion of spliced data in output | 15.078920% |