

World Magnetic Model WMM2025

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Date December 17, 2024

WMM.COF

WMM2025 Coefficients file

(Replace old WMM.COF (WMM2020

or WMM2015) file with this)

1. Installation Instructions

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WMM2025 GUI

Go to installed directory, find WMM.COF and remove it.

Replace it with the new WMM.COF.

WMM_Linux and WMM_Windows C software

For the version \leq WMM2020, replace the WMM.COF file in the "bin" directory with the new provided WMM.COF file

Your own software

Depending on your installation, find the coefficient file, WMM.COF (unless renamed). Replace it with the new WMM.COF file (renaming it appropriately if necessary).

If the coefficients are embedded in your software, you may need to embed the new coefficients.

2. Installation Verification

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To confirm you are using the correct WMM.COF file open it and verify that the header is:

```
2025.0      WMM-2025  11/13/2024
```

To assist in confirming that the installation of the new coefficient file is correct we provide a set of test values in this package. Here are a few as an example:

```
Date  HAE  Lat  Long  Decl  Incl   H    X    Y    Z    F    Ddot  Idot  Hdot  Xdot
Ydot  Zdot  Fdot
2020.0 66  14  143  0.12 13.08 34916.9 34916.8  70.2  8114.9 35847.5 -0.1 -0.1
29.6 29.6 -41.4 -46.4 18.3
2020.0 18  0  21  1.05 -26.46 29316.1 29311.2  536.0 -14589.0 32745.6  0.1  0.1
0.0 -0.9 51.2 54.5 -24.3
```

2020.5 6 -36 -137 20.16 -52.21 25511.4 23948.6 8791.9 -32897.6 41630.3 0.0
0.0 -21.6 -21.6 -3.8 65.4 -64.9

2020.5 63 26 81 0.43 40.84 34738.7 34737.7 259.2 30023.4 45914.9 0.0 0.1
5.9 5.9 2.4 128.2 88.3

Where HAE is height above WGS-84 ellipsoid.

Model Software Support

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- * National Centers for Environmental Information (NCEI)
- * E/NE42 325 Broadway
- * Boulder, CO 80305 USA
- * Attn: Manoj Nair or Arnaud Chulliat
- * Phone: (303) 497-4642 or -6522
- * Email: geomag.models@noaa.gov

For more details about the World Magnetic Model visit

<http://www.ngdc.noaa.gov/geomag/WMM/DoDWMM.shtml>

Field 1: Decimal year
Field 2: Altitude (km)
Field 3: geodetic latitude (deg)
Field 4: geodetic longitude (deg)
Field 5: declination (deg)
Field 6: inclination (deg)
Field 7: H (nT)
Field 8: X (nT)
Field 9: Y (nT)
Field 10: Z (nT)
Field 11: F (nT)
Field 12: dD/dt (deg/year)
Field 13: dl/dt (deg/year)
Field 14: dH/dt (nT/year)
Field 15: dX/dt (nT/year)
Field 16: dY/dt (nT/year)
Field 17: dZ/dt (nT/year)
Field 18: dF/dt (nT/year)

2025.000000 28 89 -121 -99.77 88.47 1504.298146 -255.388723 -1482.460628
56194.288771 56214.419888 2.491706 -0.009987 10.285640 62.723738 -21.242793
18.075146 18.343917

2025.000000 48 80 -96 -29.91 87.77 2164.285547 1875.982280 -1079.269389
55623.044051 55665.134163 1.248417 -0.057537 55.469239 71.596398 13.214774 -
12.148507 -9.982652

2025.000000 54 82 87 54.89 87.68 2302.427342 1324.336929 1883.428620
56740.772059 56787.466800 0.884574 0.036130 -34.169939 -48.732002 -7.505574
41.134755 39.715524

2025.000000 65 43 93 0.50 64.10 24300.764692 24299.852822 210.517066
50037.923998 55626.621348 -0.019813 0.030822 -3.938347 -3.865401 -8.437166
60.388819 52.601187

2025.000000 51 -33 109 -5.49 -67.50 21838.046477 21737.778822 -
2090.274098 -52710.003920 57054.752538 0.069861 0.026375 29.809763
32.221578 23.651711 -3.334040 14.490015

2025.000000 39 -59 -8 -15.75 -58.55 14918.115796 14358.095523 -
4049.107540 -24389.086374 28589.818346 0.010988 0.055916 -0.905656 -0.095123
2.999401 54.951779 -47.350226

2025.000000 3 -50 -103 27.96 -54.89 22106.041373 19526.532799
10362.990980 -31437.562789 38431.724126 -0.032104 0.024888 -42.140973 -
31.417096 -30.696074 88.952383 -97.003616

2025.000000 94 -29 -110 15.74 -38.25 24181.990098 23275.471080
6559.046509 -19063.605287 30792.688931 -0.011062 0.027107 -42.453758 -
39.595926 -16.008811 52.018933 -65.544285

2025.000000 66 14 143 -0.19 12.82 35003.635649 35003.441364 -116.624818
7966.315182 35898.700342 -0.055086 -0.003859 10.848172 10.735986 -33.689325 -
0.010939 10.575266

2025.000000 18 0 21 1.29 -26.06 29282.246275 29274.811882 659.800118 -
14316.722540 32594.761714 0.030544 0.079429 -8.761425 -9.110937 15.408838
54.581250 -31.844958

2025.500000 6 -36 -137 20.28 -52.11 25353.230658 23781.930678
8786.698927 -32577.518648 41280.516301 0.025348 0.014224 -34.463126 -
36.214518 -1.422651 60.968936 -69.281309

2025.500000 63 26 81 0.51 41.07 34803.980117 34802.613433 308.431881
30332.056989 46166.554053 0.018525 0.021888 20.342054 20.241534 11.432574
41.122831 42.353703

2025.500000 69 38 -144 12.93 56.97 23096.337032 22510.804524
5167.636206 35525.990264 42373.774537 -0.105300 -0.007297 -33.951051 -
23.593092 -48.967345 -62.123761 -70.589724

2025.500000 50 -70 -133 57.21 -71.94 16656.709403 9021.847823
14001.865232 -51084.838301 53731.803175 -0.036998 0.045634 8.590794
13.694592 1.395803 111.703074 -103.537175

2025.500000 8 -52 -75 14.91 -49.63 20005.506364 19331.857134 5147.774727
-23532.664273 30886.996822 -0.098427 -0.028885 -58.502212 -47.688987 -
48.263512 44.775999 -72.006513

2025.500000 8 -66 17 -33.14 -59.55 18154.870136 15201.438652 -
9925.501123 -30881.123197 35822.382382 -0.112991 0.041932 10.080437 -
11.133189 -35.489343 34.582697 -24.703647

2025.500000 22 -37 140 9.28 -68.62 21688.847590 21404.761773
3498.897430 -55397.587760 59492.006517 0.028818 0.004094 0.393984 -1.371020
10.829532 10.653875 -9.777010

2025.500000 40 -12 -129 10.76 -15.46 29105.866326 28594.451238
5432.201489 -8052.525092 30199.248583 -0.009568 0.030404 -39.188467 -
37.592705 -12.089297 27.469404 -45.094246

2025.500000 44 33 -118 11.10 57.89 23678.743422 23235.835850
4558.379362 37727.715752 44542.826874 -0.075717 -0.021971 -41.700619 -
34.896682 -38.734089 -98.573110 -105.659134

2025.500000 50 -81 -67 28.13 -67.61 18292.842720 16132.682326
8623.494405 -44412.283868 48032.062762 -0.099291 0.019879 -12.853806
3.608124 -34.016532 74.964128 -74.210029

2026.000000 74 -57 3 -22.51 -58.65 14362.206593 13268.119649 -
5498.179626 -23576.062921 27606.226129 -0.037845 0.082339 12.945610
8.327751 -13.719801 55.005355 -40.240277

2026.000000 46 -24 -122 14.01 -34.17 26638.500090 25846.118652
6448.863284 -18080.399376 32194.883578 0.000271 0.019932 -40.514451 -
39.339842 -9.685735 41.034418 -56.566841

2026.000000 69 23 63 1.17 35.92 34565.858527 34558.605297 708.078839
25043.405885 42684.549360 0.013234 0.010624 23.857027 23.688475 8.470762
27.058242 35.194683

2026.000000 33 -3 -147 9.71 -2.12 30957.666082 30514.086409 5221.840663
-1146.978999 30978.906535 -0.006185 0.036855 -36.361404 -35.276692 -9.427361
21.287924 -37.124648

2026.000000 47 -72 -22 -6.32 -61.16 18392.516222 18280.800055 -
2024.105320 -33397.486160 38127.112857 -0.048225 0.017330 -15.939764 -
17.546607 -13.632509 52.849287 -53.982732

2026.000000 62 -14 99 -1.43 -44.70 33448.275663 33437.828630 -835.919473
-33100.922253 47058.030120 0.061400 0.072480 38.755947 39.639639 34.864408
45.397052 -4.385324

2026.000000 83 86 -46 -30.61 86.84 3000.255301 2582.099403 -1527.839829
54279.308437 54362.163830 1.221388 -0.002547 3.280093 35.392266 53.372894
15.551936 15.709262

2026.000000 82 -64 87 -81.74 -75.40 13974.248411 2007.074870 -
13829.362571 -53663.514288 55453.154865 -0.187260 -0.029553 -23.144309 -
48.522801 16.344602 -24.623137 17.996086

2026.000000 34 -19 43 -14.98 -52.33 20212.448819 19525.694050 -
5224.017527 -26182.862330 33076.961273 -0.135700 0.023383 51.024088
36.917850 -59.432251 -44.004821 66.012531

2026.000000 56 -81 40 -59.77 -68.45 17877.818542 9000.536024 -
15446.900890 -45267.890393 48670.301997 -0.146798 0.017031 -1.330470 -
40.246526 -21.910829 42.754262 -40.254140

2026.500000 14 0 80 -3.10 -17.15 39489.089663 39431.415992 -2133.456168
-12188.838466 41327.424134 0.056431 0.021103 33.618195 35.670346 37.019904
5.553327 30.484922

2026.500000 12 -82 -68 29.79 -68.07 18497.480257 16052.819558
9190.416754 -45940.146795 49524.275496 -0.104864 0.021236 -11.118018
7.171828 -34.904116 76.756556 -75.354213

2026.500000 44 -46 -42 -11.36 -54.39 14140.316272 13863.176808 -
2785.834358 -19744.304022 24285.511845 0.039043 -0.119143 -63.277988 -
60.139435 21.913412 1.623579 -38.163791

2026.500000 43 17 52 1.19 23.95 36002.676553 35994.907968 747.876551
15990.895993 39394.180708 -0.010785 0.016571 20.351040 20.487426 -6.352799
21.505886 27.328663

2026.500000 64 10 78 -1.53 7.53 39441.702532 39427.724480 -1049.971869
5214.811025 39784.948821 0.031231 0.021184 27.794943 28.357414 20.751458
18.512565 29.981674

2026.500000 12 33 -145 11.96 52.51 24672.289649 24136.839639
5112.225422 32162.934508 40536.110231 -0.086620 0.000340 -40.973255 -
32.355349 -44.980044 -53.017362 -67.004405

2026.500000 12 -79 115 -137.58 -77.37 13023.480845 -9613.650418 -
8785.714482 -58104.306533 59545.961164 -0.241722 0.014808 7.471685 -
42.581077 35.518140 37.027107 -34.496496

2026.500000 14 -33 -114 18.12 -44.10 24613.183584 23393.133584
7653.110952 -23854.293436 34275.882505 -0.000322 0.022971 -42.803882 -
40.639067 -13.440897 60.620545 -72.925914

2026.500000 19 29 66 2.24 46.04 32749.959268 32725.000691 1278.343380
33958.454002 47177.711160 0.018224 0.011101 23.712541 23.287876 11.334193
37.754815 43.636705

2026.500000 86 -11 167 10.24 -31.60 33105.255278 32578.377044
5882.794932 -20368.224196 38869.300019 0.013426 -0.025948 -16.653141 -
17.766581 4.674631 -10.422224 -8.722161

2027.000000 37 -66 -5 -17.22 -59.04 17159.836500 16390.771268 -
5079.626554 -28608.243575 33360.029814 -0.043630 0.039964 -2.074991 -
5.850093 -11.867216 48.695530 -42.826703

2027.000000 67 72 -115 13.73 84.84 5026.868699 4883.287833 1192.857435
55689.615237 55916.032175 -0.315901 -0.072636 66.581032 71.256140 -11.124661
-50.889259 -44.697541

2027.000000 44 22 174 6.46 31.89 28867.487799 28683.972510 3249.857362
17961.198575 33999.066253 -0.024375 -0.000168 2.815221 4.179894 -11.885941
1.634357 3.253718

2027.000000 54 54 178 0.63 65.46 20617.099795 20615.871559 225.041793
45149.631876 49634.202547 -0.170729 0.012944 -3.909066 -3.238256 -61.473597
18.434524 15.145168

2027.000000 57 -43 50 -48.27 -63.13 16833.417225 11203.748204 -
12563.437494 -33221.366617 37242.759503 -0.165742 -0.033376 12.323002 -
28.141121 -41.606787 -72.317297 70.078525

2027.000000 44 -43 -111 24.31 -52.57 22462.470699 20471.522067
9245.505620 -29347.556906 36957.295441 -0.006299 0.024728 -40.058633 -
35.491603 -18.738696 78.579889 -86.747247

2027.000000 12 -63 178 57.87 -79.14 11720.691727 6233.774935
9925.455386 -61075.730989 62190.188377 0.151793 0.036783 27.353301 -
11.747306 39.678751 69.308326 -62.911163

2027.000000 38 27 -169 8.48 42.66 26106.758229 25821.061601
3851.701313 24058.365347 35501.658671 -0.058765 0.013094 -19.135886 -
14.976028 -29.306273 -6.601488 -18.545527

2027.000000 61 59 -77 -16.48 78.68 10884.812802 10437.775689 -
3087.391846 54397.713552 55476.034370 0.230418 -0.074136 59.669126
69.634646 25.051419 -67.643997 -54.621632

2027.000000 67 -47 -32 -13.52 -57.98 12805.786103 12450.832543 -
2994.148743 -20475.298079 24150.072239 0.115550 -0.077078 -52.470761 -
44.977997 37.378183 22.627270 -47.007290

2027.500000 8 62 53 19.39 76.67 12997.751893 12260.425578 4315.497527
54849.810218 56368.814385 0.099601 0.030088 -12.884268 -19.655269 17.035218
74.003425 69.038304

2027.500000 77 -68 -7 -16.19 -59.82 17262.817301 16578.099495 -
4813.676173 -29680.383821 34335.550744 -0.048399 0.032649 -5.108702 -
8.972297 -12.579376 47.699056 -43.800575

2027.500000 98 -5 159 7.79 -23.22 33857.496691 33544.960996 4589.735713
-14525.780052 36841.937629 -0.005671 -0.036102 -11.751062 -11.188278 -4.913401
-20.218524 -2.827531

2027.500000 34 -29 -107 15.64 -37.45 24446.053109 23540.396213
6592.363667 -18723.097084 30792.269761 -0.017007 0.030517 -44.335923 -
40.736596 -18.943541 54.615130 -68.406867

2027.500000 60 27 65 1.85 42.83 33079.422542 33062.159421 1068.555172
30667.425573 45108.083389 0.016699 0.011093 23.388908 23.065275 10.391374
33.592654 39.990433

2027.500000 73 -72 95 -102.64 -76.49 13306.747292 -2912.418045 -
12984.118939 -55399.217725 56974.931751 -0.235287 -0.006801 -8.442550 -
51.471801 20.197772 6.191978 -7.992526

2027.500000 96 -46 -85 17.93 -47.37 19914.457641 18947.658009
6129.590452 -21631.434316 29402.458634 -0.091418 -0.005439 -53.229644 -
40.865392 -46.615842 53.698344 -75.558704

2027.500000 0 -13 -59 -17.49 -15.26 22401.493010 21365.849306 -
6732.560620 -6112.313520 23220.406233 -0.173690 -0.385680 -68.873971 -
86.099325 -44.070217 -143.226783 -28.743372

2027.500000 16 66 -178 0.37 75.67 13821.614337 13821.326215 89.244328
54092.646409 55830.559897 -0.327448 0.003026 -1.280867 -0.770805 -78.997758
6.899408 6.367545

2027.500000 72 -87 38 -65.44 -70.97 16661.696834 6926.051596 -
15153.941754 -48295.635435 51088.947370 -0.148310 0.021340 0.540463 -
39.001360 -18.419660 56.777921 -53.497300

2028.000000 49 20 167 5.10 26.82 30251.262453 30131.436134 2689.876669
15295.611788 33898.298187 -0.020383 -0.011359 9.497816 10.417136 -9.874921 -
2.728173 7.244961

2028.000000 71 5 -13 -6.47 -17.66 28323.200567 28142.647915 -3192.970202
-9017.928693 29724.177504 0.166481 -0.073692 -18.125869 -8.732692 83.815865 -
34.350117 -6.850172

2028.000000 95 14 65 -0.51 17.44 36933.940251 36932.466767 -329.910612
11601.180703 38713.089985 0.011924 0.011881 29.013291 29.080794 7.427118
17.527263 32.932326

2028.000000 86 -85 -79 41.09 -70.25 16867.459172 12713.115116
11085.480728 -46988.258092 49924.018042 -0.121705 0.024621 -3.420695
20.969078 -29.252744 73.025430 -69.886927

2028.000000 30 -36 -64 -4.65 -40.08 17398.651081 17341.333537 -
1411.102609 -14639.967305 22738.551012 -0.162162 -0.152944 -69.721104 -
73.485198 -43.425730 -20.660569 -40.045784

2028.000000 75 79 125 -18.59 87.42 2582.332595 2447.595900 -823.235047
57308.751756 57366.902212 -0.910648 0.022931 -21.221891 -33.198946 -32.136170
39.082660 38.087754

2028.000000 21 6 -32 -14.34 -8.70 28453.070088 27567.094260 -7045.034525
-4352.046687 28783.980055 0.177960 -0.311470 -29.041854 -6.255704 92.814073 -
153.852374 -5.445988

2028.000000 1 -76 -75 29.87 -65.23 19597.635210 16993.742946 9761.147808
-42479.847250 46782.525885 -0.086171 0.016127 -22.854241 -5.137167 -36.941289
80.971555 -83.098300

2028.000000 45 -46 -41 -11.68 -54.96 13897.562372 13609.973828 -
2812.623735 -19816.196211 24203.798713 0.048411 -0.117246 -62.721602 -
59.047199 24.193263 3.174357 -38.612991

2028.000000 11 -22 -21 -23.24 -57.67 13528.270036 12430.606447 -
5337.987778 -21373.837958 25295.356080 0.176027 -0.196560 -92.571749 -
68.660974 74.716931 -16.002042 -35.987260

2028.500000 28 54 -120 15.43 73.74 15286.094495 14735.145798
4066.959949 52393.678137 54578.037650 -0.147623 -0.053732 20.801434
30.530225 -32.430768 -111.448817 -101.162318

2028.500000 68 -58 156 41.57 -81.52 9282.943032 6944.959164 6159.591995
-62264.415929 62952.605366 0.218259 0.014957 11.274695 -15.028950 33.936954
35.824068 -33.769886

2028.500000 39 -65 -88 29.45 -60.20 20609.270068 17946.905687
10131.662696 -35982.872979 41466.964689 -0.076076 0.014457 -36.693634 -
18.500934 -41.868201 85.117374 -92.097328

2028.500000 27 -23 81 -13.27 -58.58 25625.329284 24940.672257 -
5883.907569 -41948.733657 49156.421313 0.129297 -0.007968 18.629651
31.409843 52.004836 -43.610533 46.927695

2028.500000 11 34 0 1.57 46.77 29089.194286 29078.234597 798.434048
30945.577813 42471.284539 0.111314 0.010464 15.380882 13.823891 56.915296
27.686933 30.707939

2028.500000 72 -62 65 -67.87 -68.50 17434.847799 6567.891205 -
16150.440331 -44267.327811 47576.992646 -0.176819 -0.022421 -7.894025 -
52.815238 -12.956527 -30.762466 25.729685

2028.500000 55 86 70 67.64 87.57 2370.361097 901.741754 2192.139033
55926.154052 55976.363930 1.341225 0.014915 -13.210618 -56.340956 8.891342
32.415740 31.827250

2028.500000 59 32 163 0.15 43.10 28217.204381 28217.104175 75.200106
26405.862611 38645.571587 -0.043407 0.005164 13.000120 13.057045 -21.342658
16.936400 21.064439

2028.500000 65 48 148 -9.55 61.79 23693.546804 23365.167010 -
3931.047029 44177.553125 50130.233993 -0.040524 0.019409 4.495479 1.652822
-17.271572 44.310648 41.173752

2028.500000 95 30 28 4.56 44.27 29786.406936 29692.133298 2367.965026
29039.808439 41599.765773 0.034245 0.035803 8.349023 6.907310 18.410171
44.444119 37.003480

2029.000000 95 -60 -59 8.58 -55.17 18095.598879 17893.018948
2700.105868 -26011.845842 31687.013474 -0.053323 -0.035373 -49.689333 -
46.620155 -24.066802 37.170306 -58.889314

2029.000000 95 -70 42 -55.06 -64.54 18202.660480 10426.249753 -
14920.796381 -38237.047006 42348.655378 -0.157751 0.012766 3.604264 -
39.016467 -31.660684 14.381378 -11.435882

2029.000000 50 87 -154 -73.48 89.07 906.920459 257.877420 -869.484879
55992.308183 55999.652503 1.562405 -0.064156 62.930173 41.603892 -53.300475
13.406039 14.423442

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