Message to World Magnetic Model (WMM) Users

NOAA/NCEI – March 21, 2018

This is to inform users that the WMM Gridded Variation (GV) error has recently exceeded the performance specification in the Arctic region. Other geographic areas and other model parameters are not affected. The increased GV error may adversely affect compass navigation in those areas. We invite your feedback on potential impacts and whether an out-of-cycle WMM update would benefit your operations.

The WMM grid variation (GV) error, which is equivalent to declination error at latitudes above 55°N or below 55°S, is currently 1.5° root-mean-square (RMS) in the Northern polar cap. It is expected to cumulatively increase until it reaches 2.02° RMS by December 31, 2019 (end of current WMM period of validity). The GV error is largest in the Canadian Arctic Archipelago, Northern Greenland, parts of Northern Siberia, a large portion of Arctic Ocean and the Laptev Sea. The GV error is within specification in the Southern polar cap. Other areas are not affected. This performance degradation is caused by fast-changing core flows in the North polar region of the Earth's outer core.

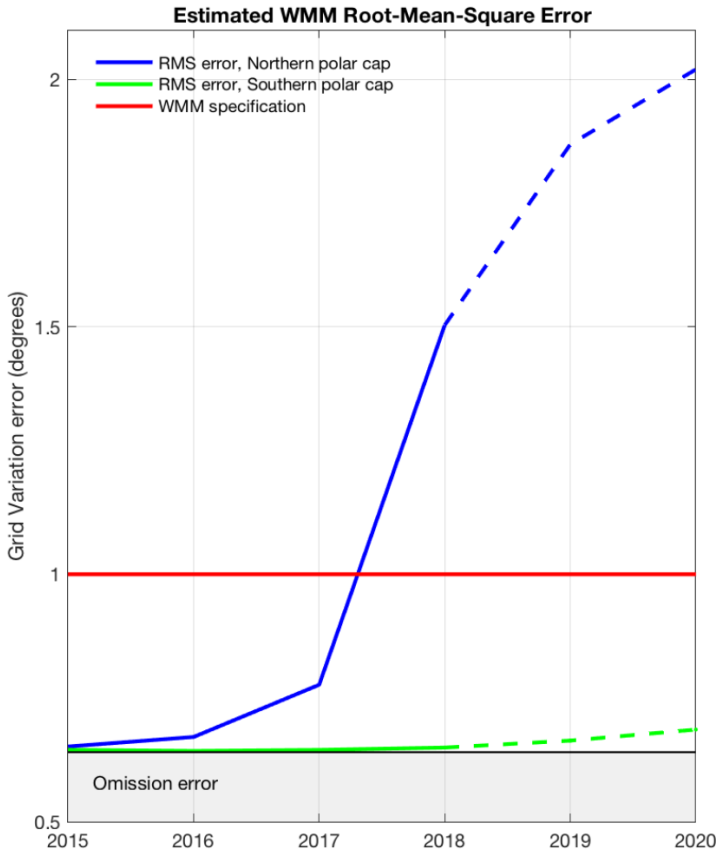

Figure 1: Temporal evolution of the WMM GV error in both polar caps during the current WMM cycle (2015-2020). The omission error is caused by un-modeled crustal and external magnetic fields and is the floor from which the WMM grows during each cycle as the secular variation departs from its linear prediction.

To help NOAA decide whether to immediately release an out-of-cycle WMM, we encourage you to respond to our following questionnaire as an email to geomag.models@noaa.gov.

1. Is your operational mission affected by the increased error of WMM (Yes/No)?
2. If yes, how does this additional error impact your mission? Be as specific as you can. Name the platform/system/software that uses WMM.
3. The next WMM is scheduled to be released in December 2019. Do you require an earlier, out-of-cycle WMM update to address this error issue?
4. If yes, would you use the online API or the downloadable WMM software?
5. Any challenges (technical, cost, etc.) that might prevent you from using an out-of-cycle update of the WMM?