## **Recommendations RT&NRT IGS products**

• It is strongly recommended that GNSS receivers be collocated at Global Climate Observing System (GCOS) Upper-Air Network (GUAN) sites and UA Reference (GRUAN) sites for independent verification and validation of critical climate observations.

• Individuals assimilating GNSS observations into atmospheric models should be aware that if an atmospheric model analysis or prediction is used to determine or modify the mapping functions used to estimate the zenith neutral delay, then the errors in the atmospheric model and the errors in the GNSS observations assimilated into the model are correlated, and the degree of correlation may not be well understood. Geodesists should utilize improved (i.e. more realistic) atmospheric models to reduce systematic errors in the mapping functions.

• The IGS should acknowledge the importance of the continuously growing number of NRT PPP users who especially require a more precise and robust IGU clock product. Therefore, efforts should be made to encourage ACs to continue (or start) their participation in the IGS Ultra-rapid clock products. NRT PPP users also need a higher IGU clock rate (i.e. from 15min to 5min and ultimately 30sec) and a more frequent IGU combination update (i.e. going from 4 to 8 updates per day).