Introduction to Anubis software for GNSS quality control in the GAGE facility and NOTA

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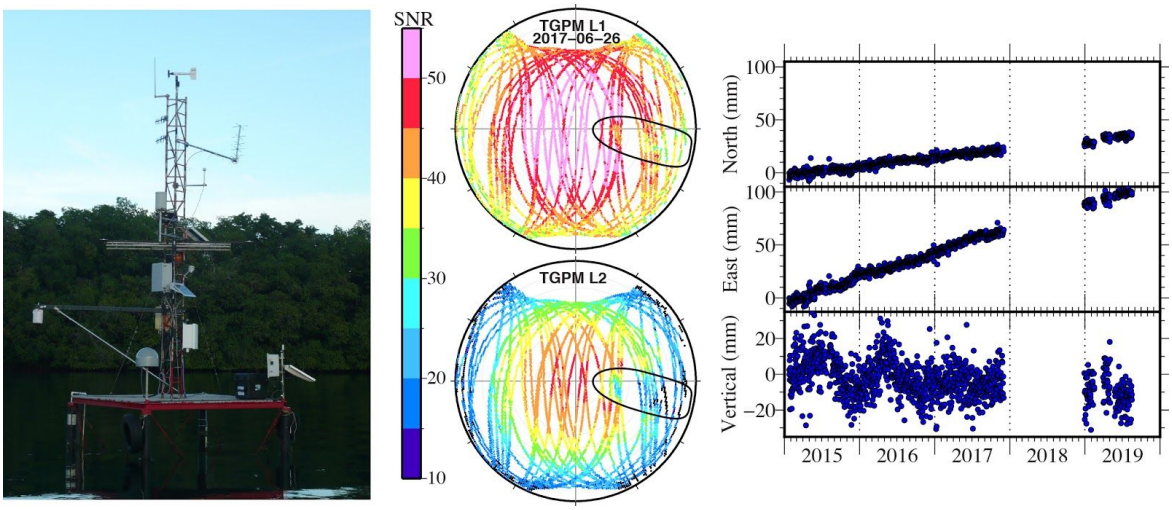
UNAVCO manages the Geodesy Advancing Geosciences (GAGE) Facility, which operates the Network of the Americas (NOTA) and other geodetic networks around the world. Most current NOTA GNSS stations record only GPS, but UNAVCO is presently modernizing NOTA stations to track other satellite constellations including GLONASS, Galileo, BeiDou, SBAS, and QZSS. Presently there are ~140 fully GNSS-enabled stations that produce data in the RINEX 3.03 format. All data from NOTA stations are currently available in RINEX 2.11, with QC analysis done by UNAVCO's in-house software teqc. TEQC does not support the RINEX3 format, and will not be updated to do so. Instead, Anubis will be used for RINEX3. Anubis is an open source software package developed by the Geodetic Observatory Pecný at the Research Institute of Geodesy, Topography and Cartography, Department of Geodesy and Geodynamics, University of Pecný, Czech Republic. Both Anubis and teqc calculate basic statistics of the daily RINEX files, including observation counts, multipath (MP), and signal-to-noise ratio (SNR), with additional, more detailed output specified on the command line or in an input file. Here we evaluate Anubis and compare output with teqc, noting differences in approach to QC that are rooted in differences between the RINEX 2.11 and 3.03 formats and the expanded set of GNSS constellations and frequency codes. Despite this, Anubis can fulfill many of the same functions for checking data quality, as we demonstrate with examples at selected NOTA stations, plotting time series for MP, SNR, and other statistics. These comparisons serve as an introduction to Anubis for the UNAVCO geodetic community.



Station TGPM was installed on a platform in a bay to act as a tide gauge (left). The mast platform casts a clear shadow when signal-to-noise-ratio is plotted as a function of elevation and azimuth (center). Despite this shadow, the time series of position solutions are of reasonable quality (right). Polar plots are based on customized output from the Anubis software.