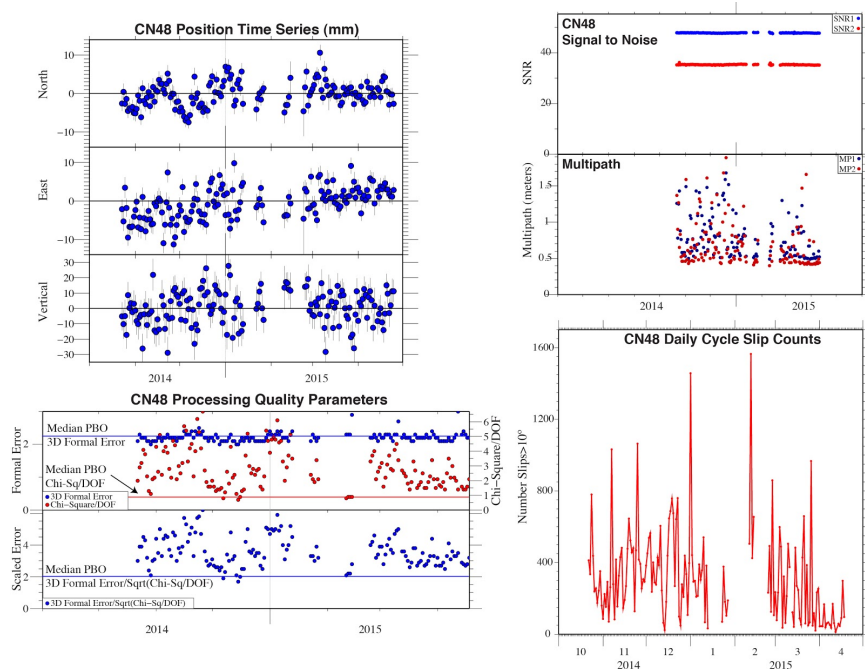


The GAGE GPS Analysis Centers process data from over 2200 GPS stations, with 1100 stations in the core PBO network, 121 stations in COCONet, and 24 stations TLALOCNet that are managed by UNAVCO. The remaining stations are operated by other agencies. The Analysis Centers and UNAVCO engineers monitor station quality, looking for abnormalities in processing such as unusually large errors, nonlinear position time series, or anomalous station velocities. Abnormalities are evaluated on a station-by-station basis with a suite of tools. Tools to analyze raw RINEX files can determine how well a station is tracking GPS satellite signals or whether there is interference near the station. Time series analysis can identify nonlinear segments, while strain rate and velocity plots highlight outliers. Abnormalities arise for many reasons. An antenna may have difficulty tracking signals if there is too much snow or vegetation growth nearby. A station position might change due to equipment replacement, site damage, co-seismic displacements, or for unknown reasons, and these changes must be accounted for when calculating the velocity of a site. The Quality Control (QC) monitoring also flags real, nonlinear ground deformation at stations. The most common and widespread is episodic tremor and slip, particularly in the Pacific Northwest. Also common is volcanic deformation at several of the active volcanoes in the network. A few stations were constructed on unstable ground, with at least one station upslope of a landslide. We present examples of QC analysis at selected stations, deducing as much about station problems as possible based on available information. Results of QC analysis are referred to the field engineers if the problem requires physical intervention and to the Analysis Centers if the problem involves metadata and maintenance-related updates. QC monitoring helps maintain the reliability of data from the UNAVCO-managed network and is an important component of efficient station maintenance and upkeep.



Quality indicators for COCONet station CN48 on the island of Dominica. The station was installed in 2014 and has a noisy time series (upper left). Error parameters from the University of Nevada QA files are plotted in the lower left. TEQC is a program that computes daily average signal-to-noise (SNR) ratio and multipath (MP) from RINEX files (upper right). The SNR is constant over time and within expected ranges, but the MP is unusually noisy. The number of cycle slips per day (lower right) are obtained from a RINEX-parsing code. There are frequent spikes in the number of slips per day that might contribute to low position solution quality.