April 2, 2012

Addendum to

Kansas Geological Survey Barometric Response Function User's Guide

(KGS Open File Report 2011-10)

In March 2012 we revised the Barometric Response Function code to allow the user to determine whether the water level, barometric pressure and/or earth tide data should be detrended prior computation of the BRF coefficients and correction of the water levels. This revised version of the code, released April 2, 2012 and included in this zip file, supersedes and is incompatible with the previous version. That is, the older version of the KGS BRF Excel workbook (KGS_BRF.xls and copies thereof) will not work with the new executable (kgs_brf.exe) and vice-versa.

In the original version of the code, the data were always detrended prior to BRF computation and water level correction. The detrending step removes any overall linear trend from each of the data records (water level, barometric pressure and/or earth tide). The BRF coefficients are then applied to the original (not detrended) water levels, so that the corrected water levels show essentially the same overall trend as the original water levels (in most cases). This procedure assumes that the overall trend in water levels is independent of barometric pressure variations and so should be retained in the corrected data. However, as pointed out to us by Jonathan Carter at Barr Engineering Co., you may encounter cases where the water level trend actually reflects the barometric pressure trend, particularly if you are working with shorter data records. In this case, the BRF coefficients should be computed based on the original data, so that the barometrically induced water level trend is accounted for and removed in the correction process. That is, in the case, it is inappropriate to detrend the data prior to computation.

The detrending option is controlled by a checkbox on the Input_Template worksheet (at about cell D14). The data will be detrended when this checkbox is checked and will not be detrended if it is not.