Young high-arsenic groundwater confirmed to 250 m depth across the India-Bangladesh border

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Community wells tapping deep (>150 m) aquifers have become the mainstay of efforts to reduce exposure to As of millions of villagers throughout the Bengal basin. A number of surveys have indicated that one sizeable area where these aquifers do not appear to be consistently low in As straddles the border of India and Bangladesh between 23.1-23.3^{o} N - the approximate latitude of the district town of Jessore. Following a broader survey conducted in January 2015 on both sides of the border to target wells of interest, concentrations of As >50 ug/L were confirmed in a total of 10 wells whose screen depths spanning the 150-250 m range were verified with a downhole camera. Unlike a number deep high-As wells tested elsewhere in the basin, no sign of a shallow leak or faulty installation was detected in these wells. The dissolved inorganic carbon (DIC) in groundwater from these 10 wells was dated at NOSAMS and found to average 1.8+0.8 kyr ^{14}C years without corrections. This is remarkably young compared to uncorrected DIC radiocarbon ages averaging ~10 kyr in the same depth range elsewhere in the Bengal basin. The striking absence of clay and silt layers reported in the sampled area on both sides of the India-Bangladesh border evidently favors much deeper penetration of relatively young groundwater. The extent to which this unusual circulation pattern is responsible for elevated As levels at depth remains to be established. Similarly, further investigation is needed to determine whether deep groundwater pumping in the area has played a role. What can be reported with more confidence than in the past because screen depths were verified is that elevated As levels can be found in groundwater of the Bengal basin in relatively young groundwater well below the level of the sealevel low-stand during the last glaciation. The implications of these findings, along with additional radiocarbon data, will be explored.