Supplementary Material



**Supplementary Figure 1**. Dominant soil types in southern Mali. Representative soil types used for recharge modeling are outlined in bold in the legend. The observation wells are shown (see Supplementary Table 1 for well lithology). Soil data were obtained from the Food and Agricultural Organization (2003).



**Supplementary Figure 2.** Monthly δ18O and δ2H of Bamako precipitation (from GNIP) and groundwaters sampled in May 2008 in the Sandstone and Birimian.



**Supplementary Figure 3**. δ18O and δ2H for the Bani and Niger rivers (from GNIR) and the surface waters sampled in May of 2008.