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Supporting Information for

Global crustal groundwater volumes larger than previous estimates

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Introduction

Here, we present additional figures to show the sensitivity of estimated groundwater volumes to variations in porosity. Groundwater volumes vary from 26.5 to 71.0 million km^3 (Figure S1) depending on the porosities used in the calculations. Variation in porosity are relatively well understood for the upper 5.5 km of sediments but are largely characterized for crystalline rocks (Figure S2). The classification of the crust into sediments and crystalline rock using the CRUST1.0 (Figure S3), creates additional uncertainty due to the much higher porosity of sediments.

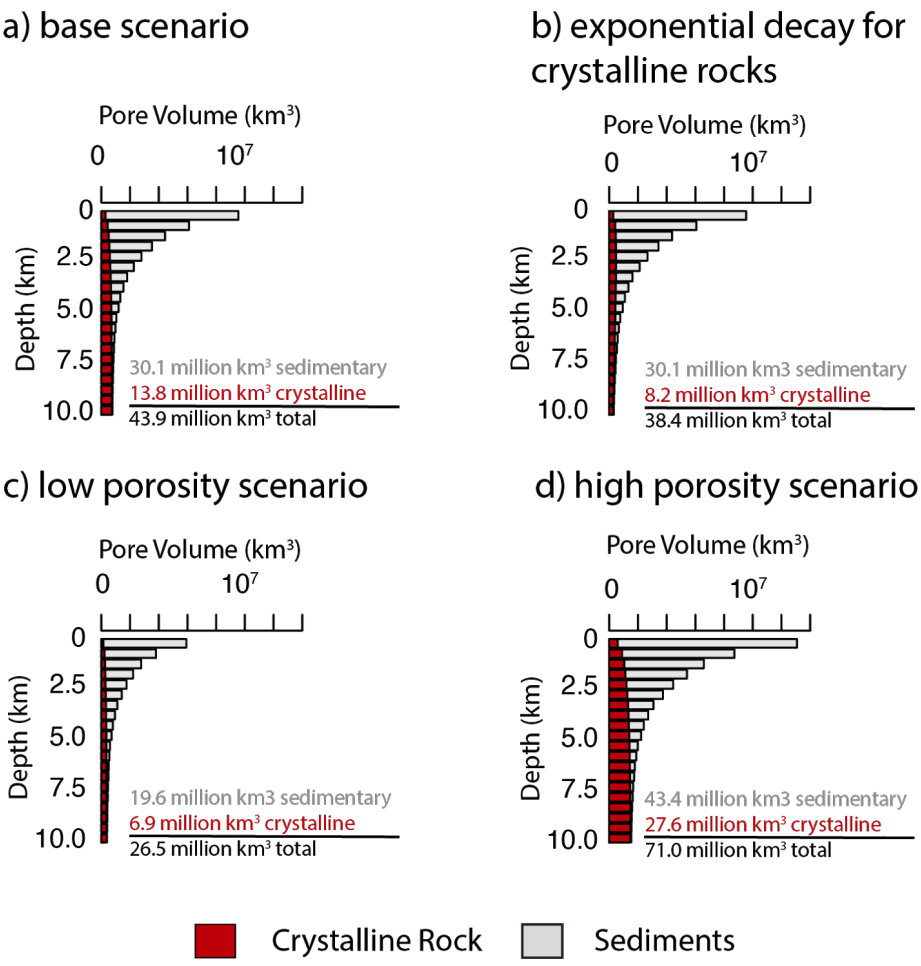

Figure S1. Distribution of pore volumes with depth for a) the base case using porosities for sedimentary rocks based on the median values from Ehrenberg and Nadeau (2005) and a porosity of 1% for crystalline rocks, b) using porosities for sedimentary rocks based on the median values from Ehrenberg and Nadeau (2005) and an exponentially decaying porosity for crystalline rocks described by Sherwood Lollar et al (2014)., c) porosities for sedimentary rocks based on the 10th percentiles from Ehrenberg and Nadeau (2005) and a porosity of 0.5% for crystalline rocks and d) porosities for sedimentary rocks based on the 90th percentiles from Ehrenberg and Nadeau (2005) and a porosity of 2% for crystalline rocks.

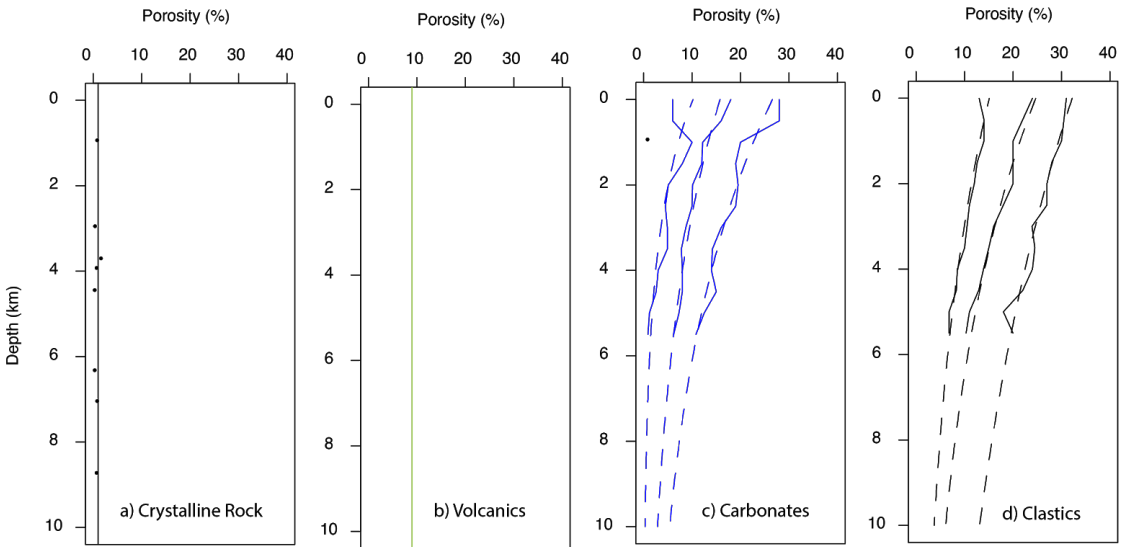

Figure S2. Porosity estimates for a) crystalline rock, b) volcanics, c) carbonates and d) clastics. Solid lines in c) and d) represent 10th, 50th and 90th percentiles and dashed lines represent best-fit lines from using equation 1. Points in a) are derived from the few known measurements of porosity from deep crystalline rock (Morrow & Lockner, 1994; Stober & Bucher, 2007).

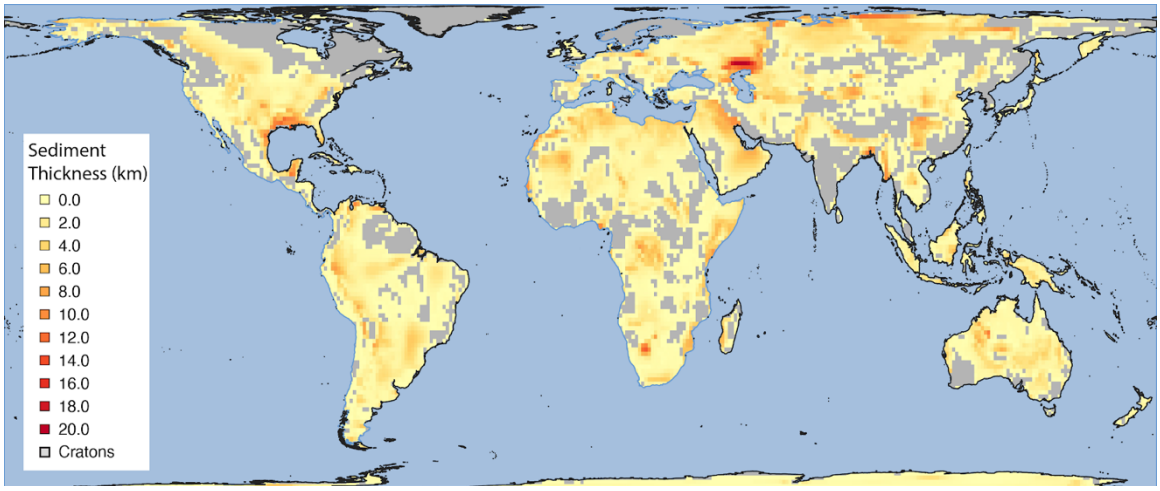

Figure S3. Sediment thicknesses from the CRUST1.0 database (data from Laske et al., 2013).