

Supporting Information for ”Impacts of aquifer’s geometry estimated from seismic refraction tomography on hydrogeophysical variables”

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Introduction

This supplementary information file provides figures and tables completing the parent article. Seismic refraction data were acquired in May 2018 and August 2019 on the Strengbach catchment, Vosges mountains, France.

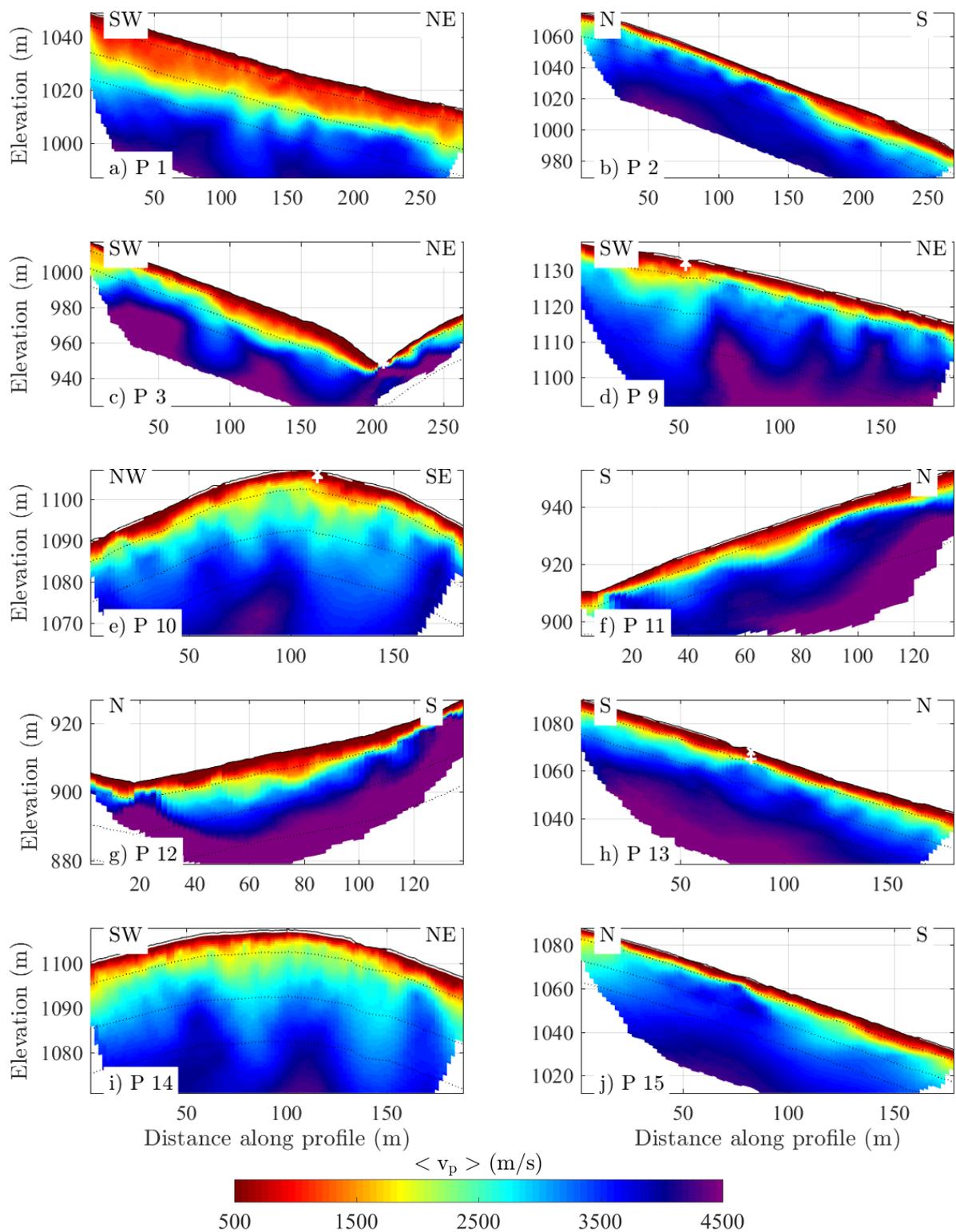


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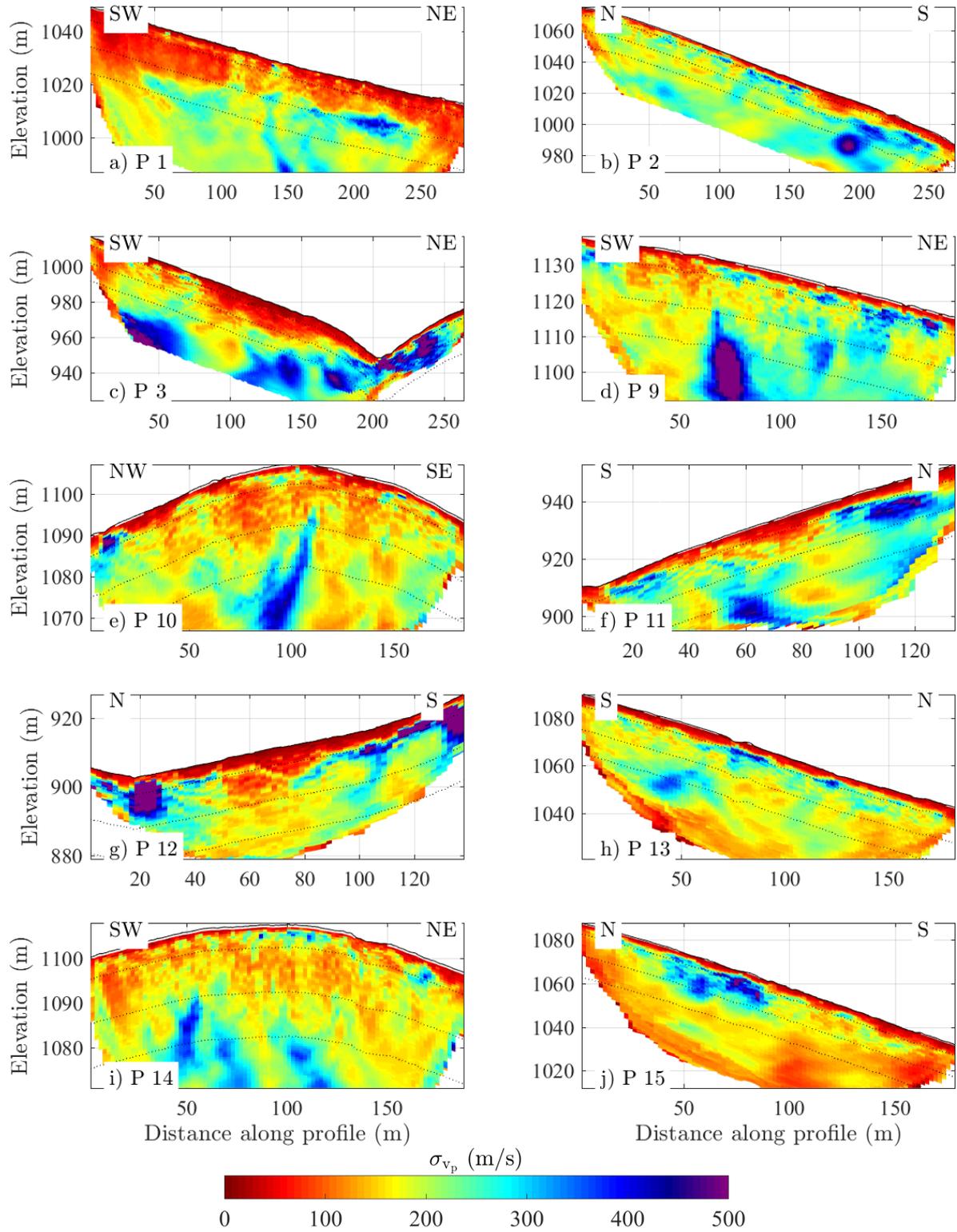


Figure S2. Standard deviation of the seismic velocity of the whole SRT profiles acquired on the Strengbach. The dotted lines correspond to the surface elevation minus 5, 15 and 25 m.

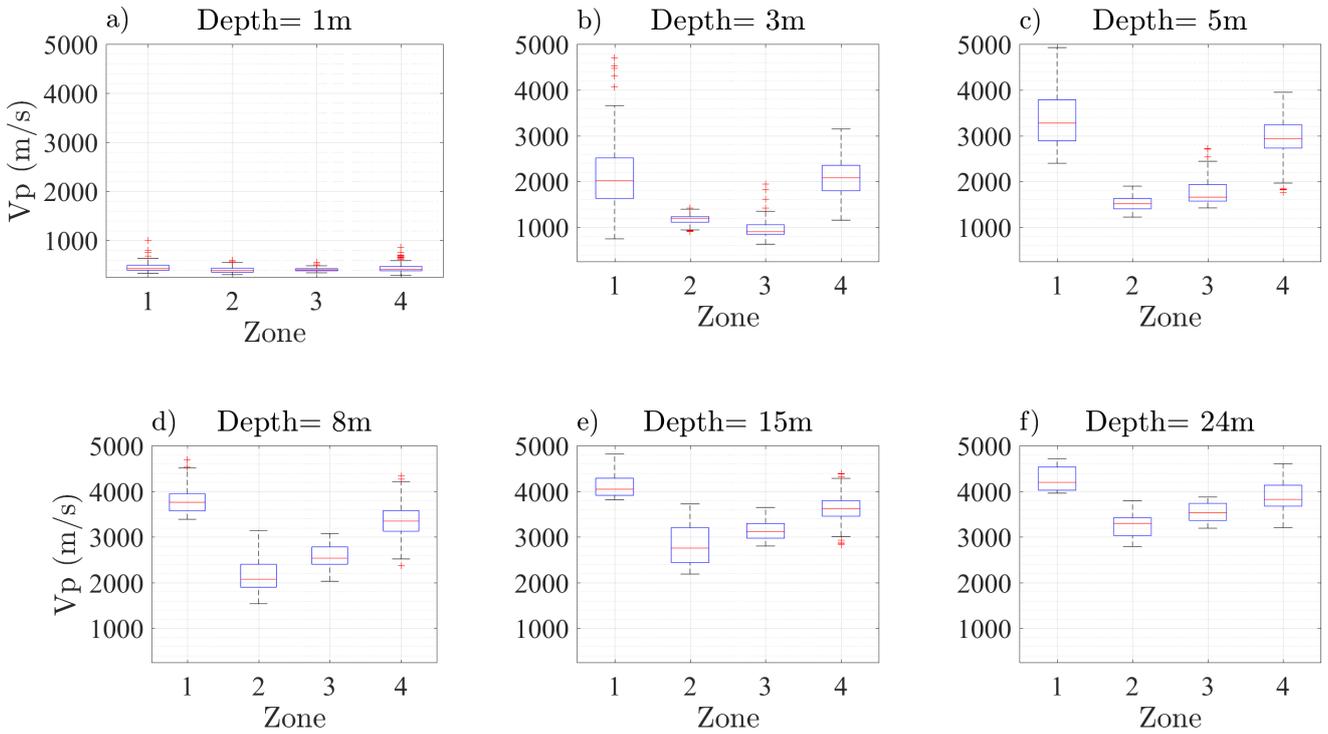


Figure S3. Distribution of v_p in each zone at different depths. In each box, the red line corresponds to the median of the distribution, the edges of the box represent the 25th and 75th percentiles, the whiskers extend to the most extreme datapoints that are not considered as outliers, indicated by the red plus.

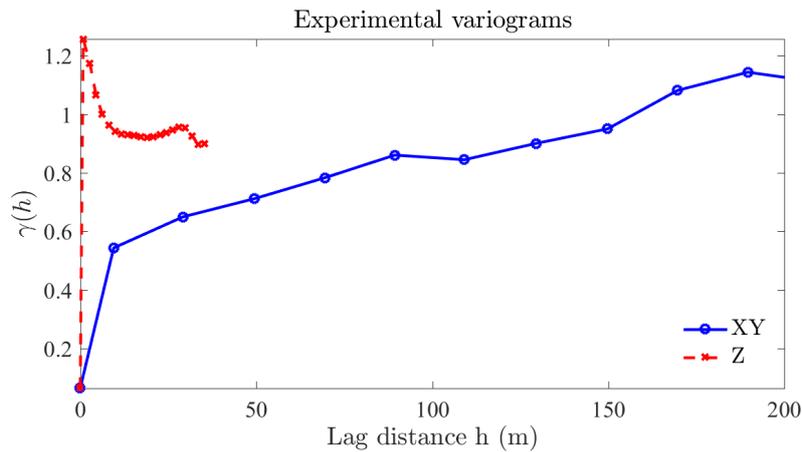


Figure S4. Variograms computed with the whole data set considering only the horizontal coordinates (XY blue curve) or only the vertical coordinates (Z, red curve).

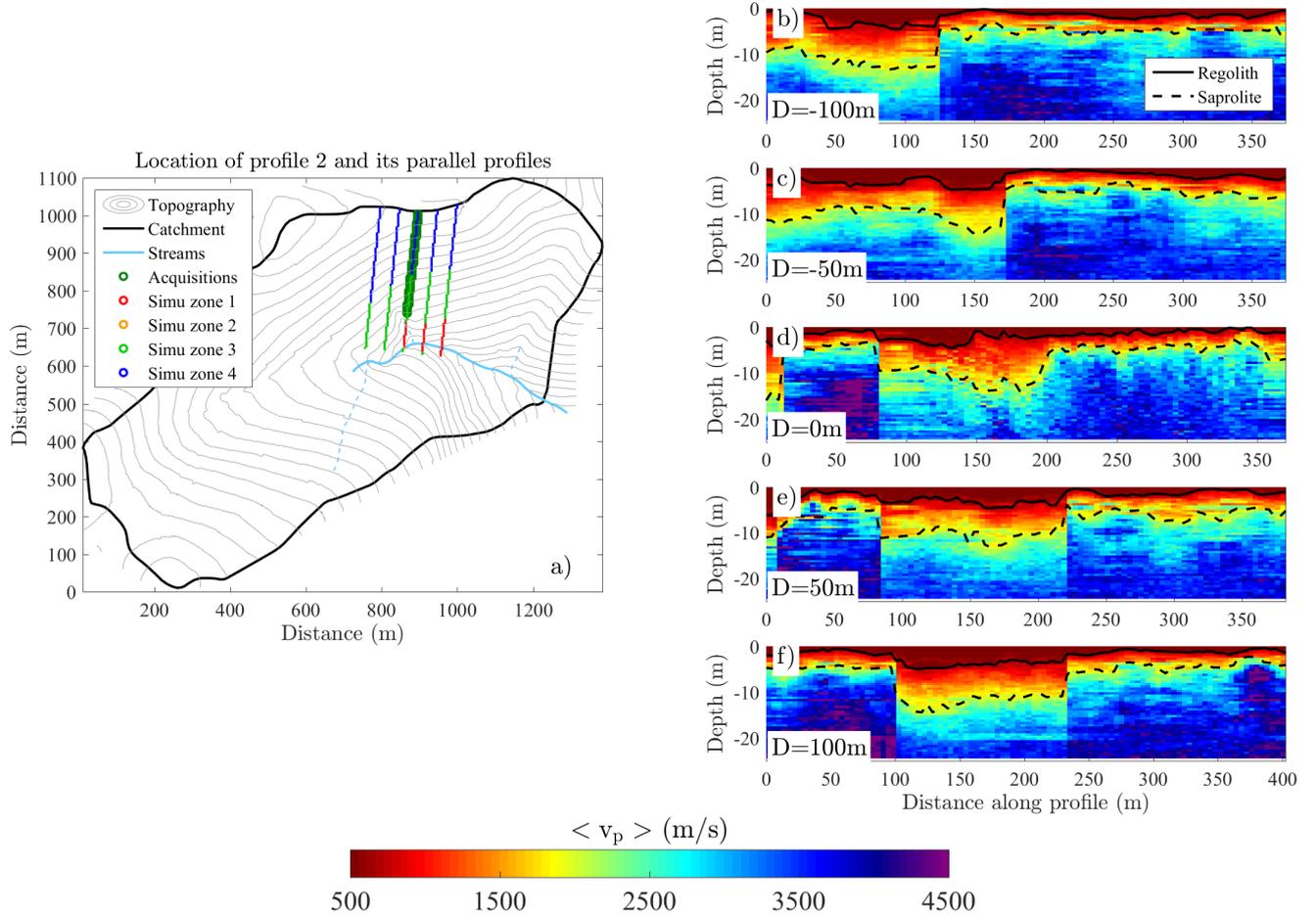


Figure S5. Location of the vertical cross-sections extracted around profile 2 from the 3D v_p field (a). Vertical cross-sections of the v_p field around profile 2 and the estimated location of the regolith and saprolite bottom interfaces corresponding to a maximum v_p threshold of 700 m/s and 2000 m/s, respectively (b, c, d, e, f).

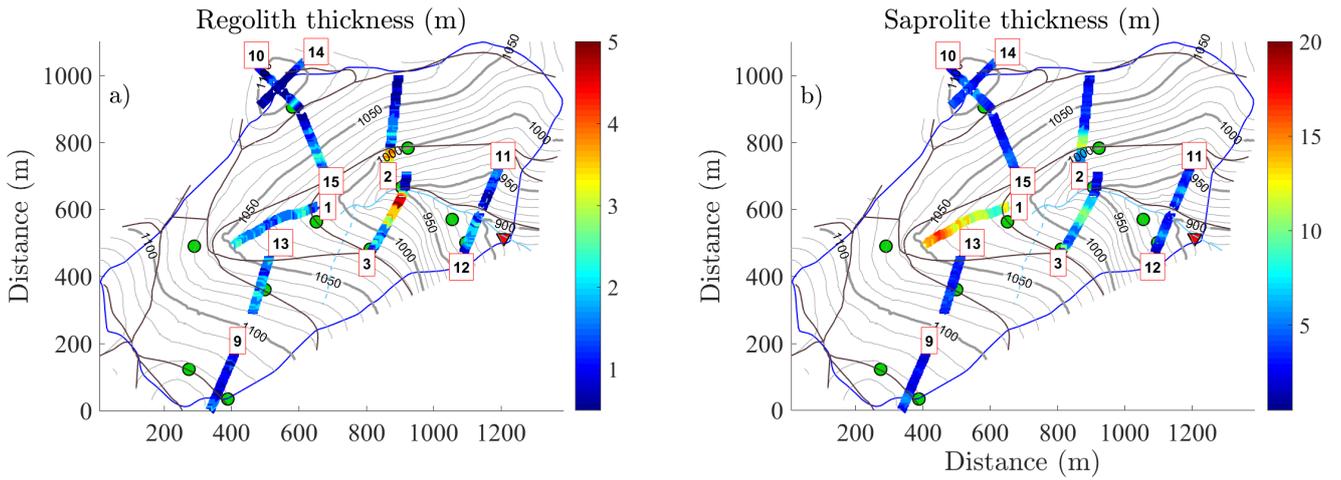


Figure S6. Estimated thicknesses of the regolith (a) and the saprolite (b) along the acquisition profiles. The maximum v_p value in the regolith (saprolite) is set to 700 m/s (2000 m/s).

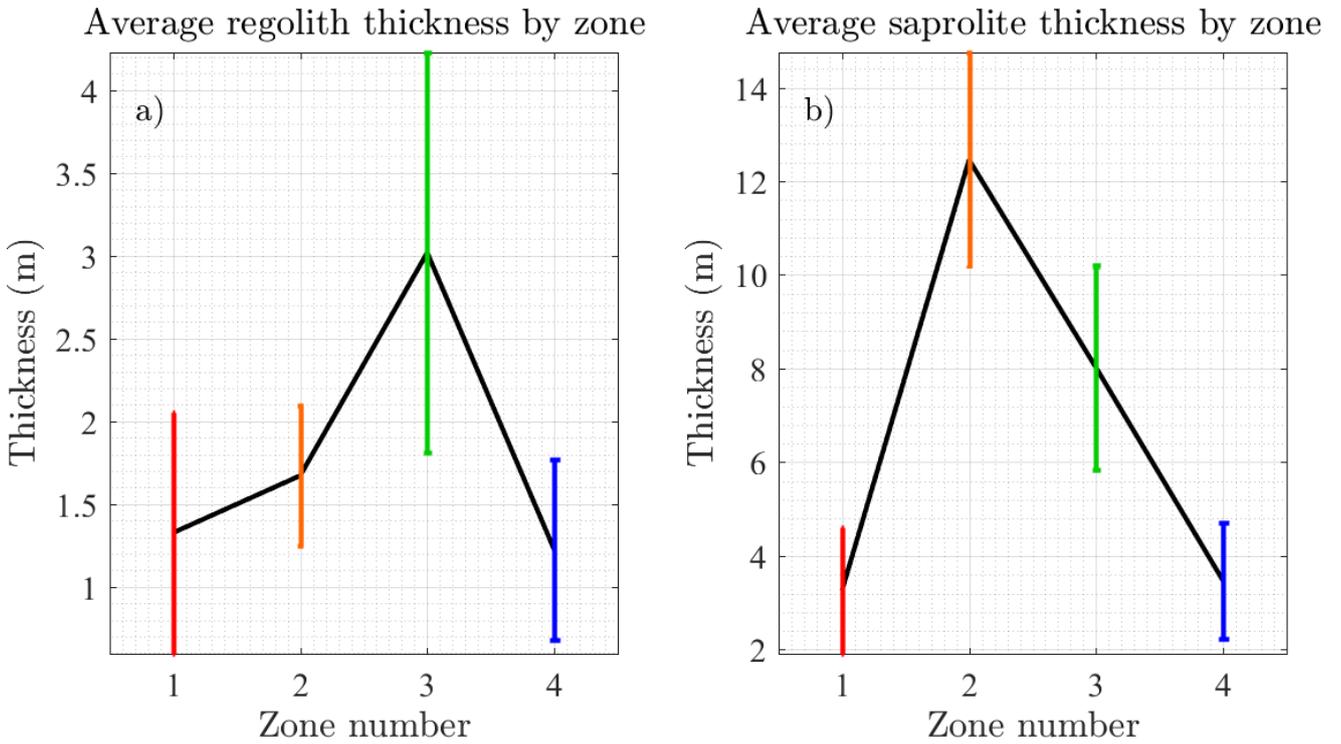


Figure S7. Average thicknesses of the regolith (a) and saprolite (b) media by zone and their corresponding standard deviation for a regolith (saprolite) maximum v_p threshold set to 700 m/s (2000 m/s).

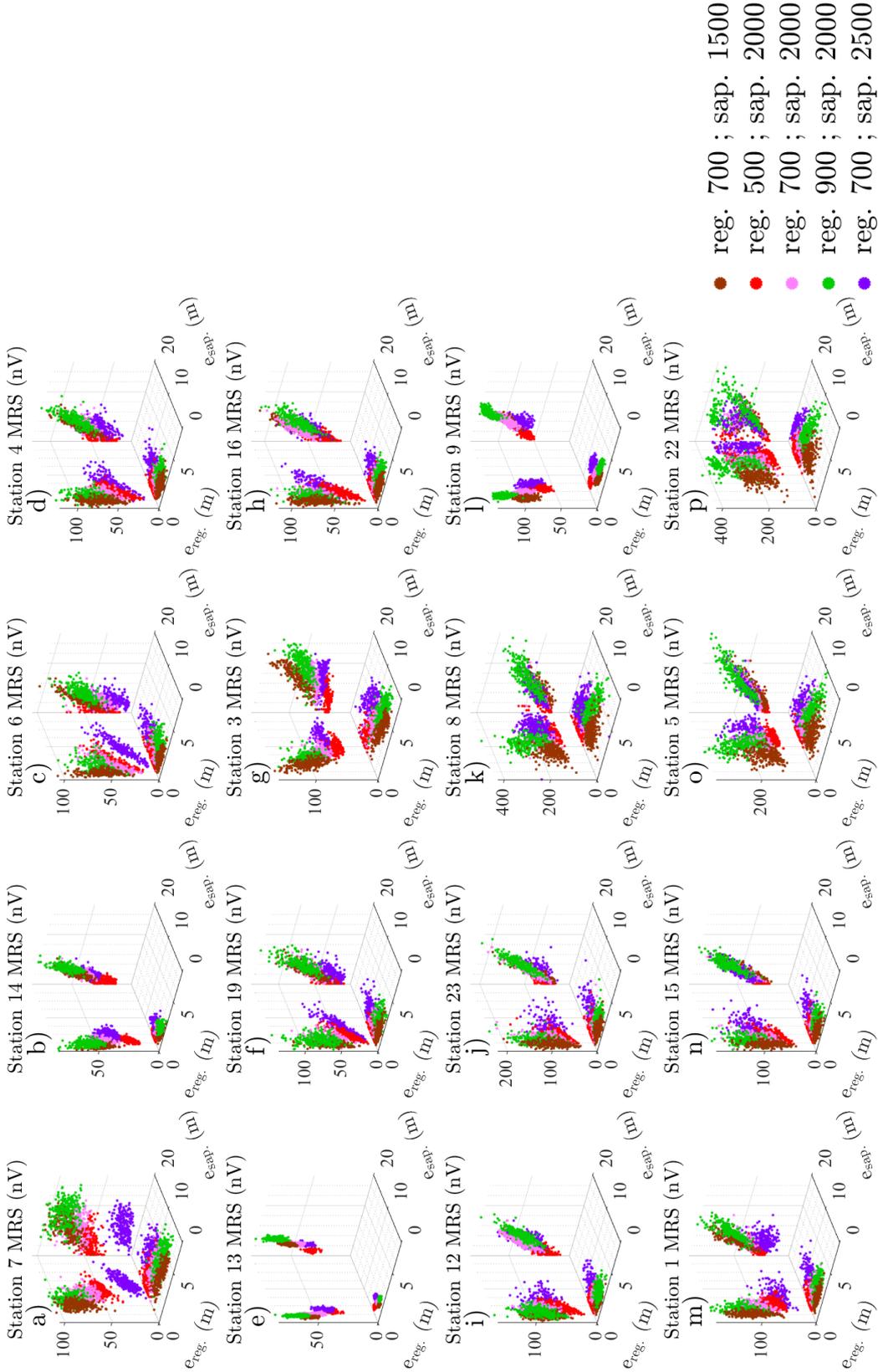


Figure S8. Distribution of MRS data as a function of the regolith and saprolite thickness

under each measurement stations. Data are estimated the 19th of April 2013 for different velocity

thresholds and the fixed set of parameter B.

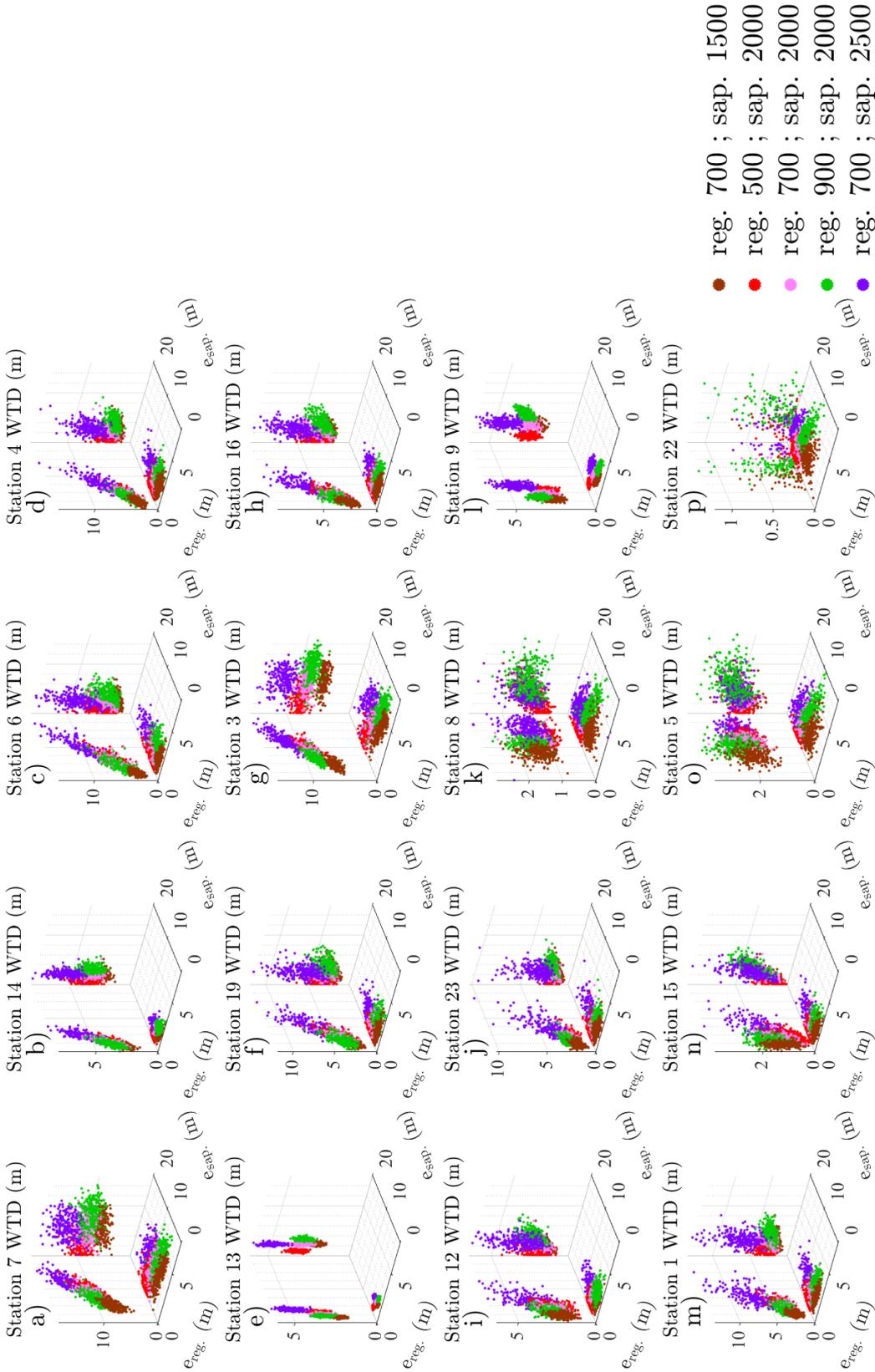


Figure S9. Distribution of WTD data as a function of the regolith and saprolite thickness

under each measurement stations. Data are estimated the 19th of April 2013 for different velocity

thresholds and the fixed set of parameter B.

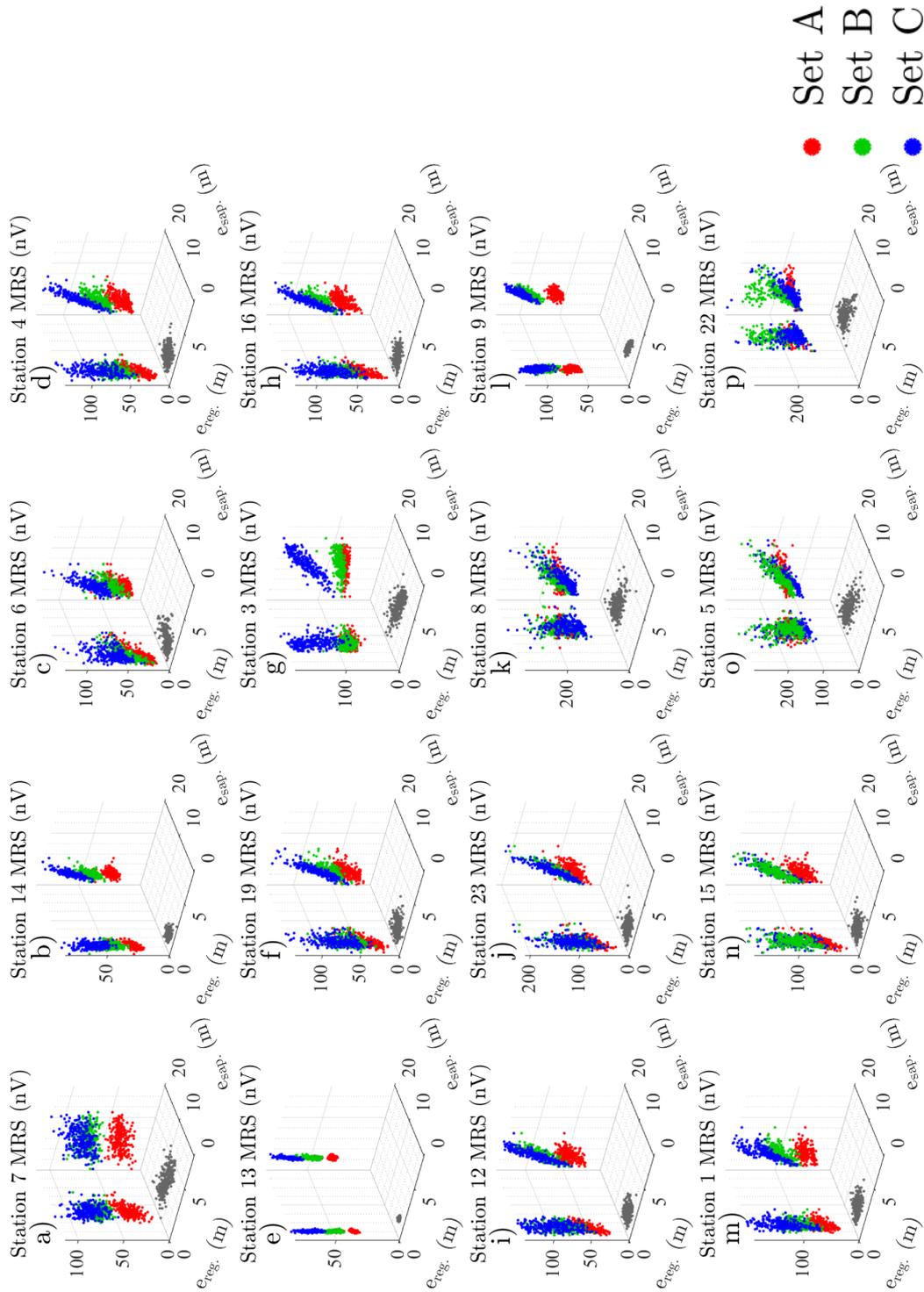


Figure S10. Distribution of MRS data as a function of the regolith and saprolite thickness

under each measurement stations. Data are estimated the 19th of April 2013 for different set of parameters and fixed velocity thresholds of 700 m/s for the regolith and 2000 m/s for the saprolite.

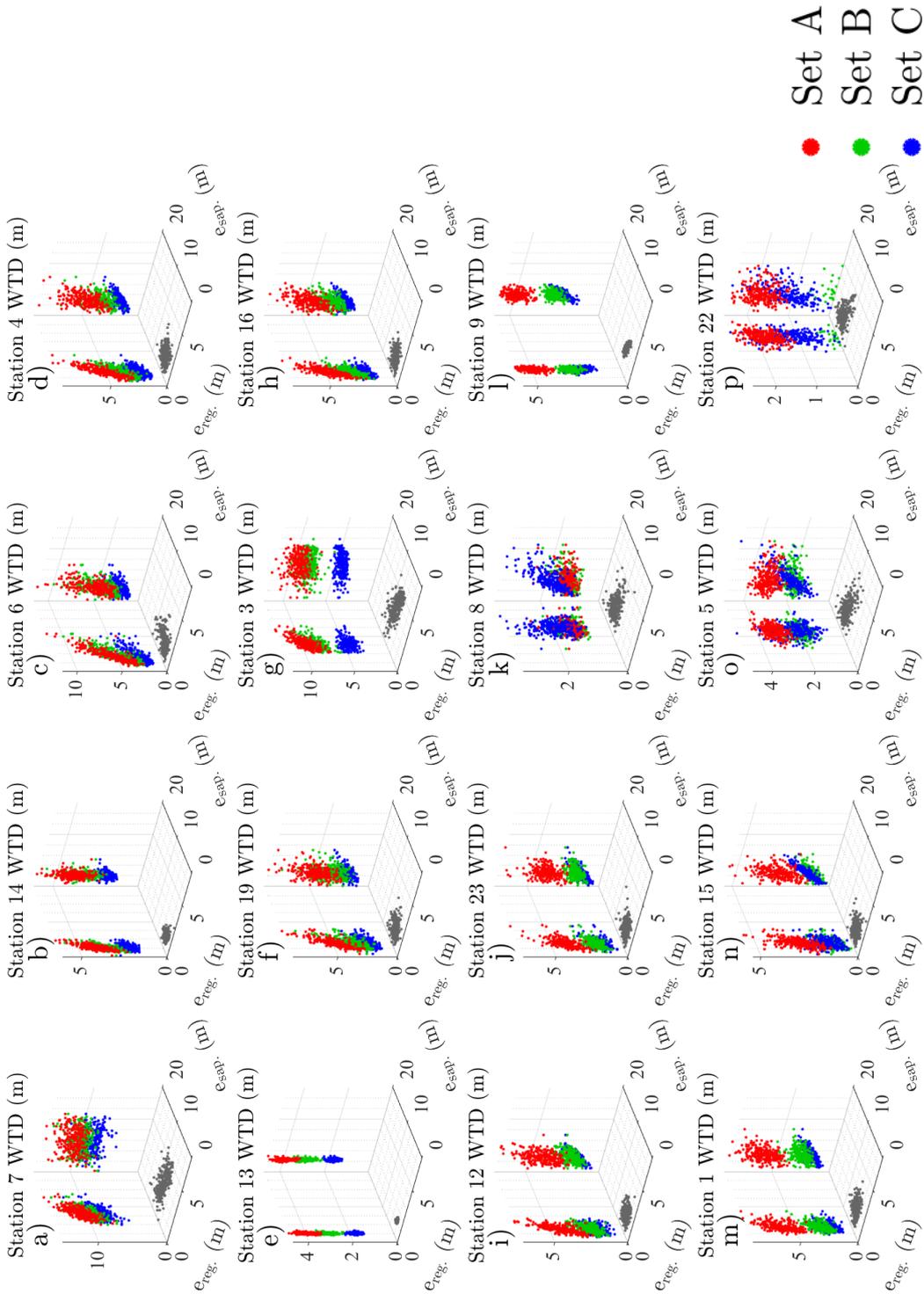


Figure S11. Distribution of WTD data as a function of the regolith and saprolite thickness

under each measurement stations. Data are estimated the 19th of April 2013 for different set of parameters and fixed velocity thresholds of 700 m/s for the regolith and 2000 m/s for the saprolite.

Table S1. Acquisition Parameters of the Seismic Lines.

Line number	1	2	3	9	10	11	12	13	14	15
Number of traces	144	144	144	96	96	72	72	96	96	96
Trace spacing (m)	2	2	2	2	2	2	2	2	2	2
Line length (m)	286	286	286	190	190	142	142	190	190	190
Number of shots	30	30	30	25	25	19	19	25	25	25
Shot spacing (m)	10	10	10	8	8	8	8	8	8	8
Recording time (s)	0.75	0.75	0.75	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Sampling time (ms)	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125
Time delay (s)	-0.1	-0.1	-0.1	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05

Table S2. Set of Parameters Used in Seismic Tomography Inversions.

Top velocity (m/s)	250, 500, 750
Bottom velocity (m/s)	2000, 3000, 4000, 5000
z_weight	0.25, 0.5, 0.75, 1
lambda	2, 20, 200