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Supporting Information for

Towards retrieving distributed aquifer hydraulic parameters from distributed strain sensing

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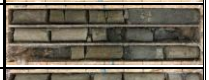
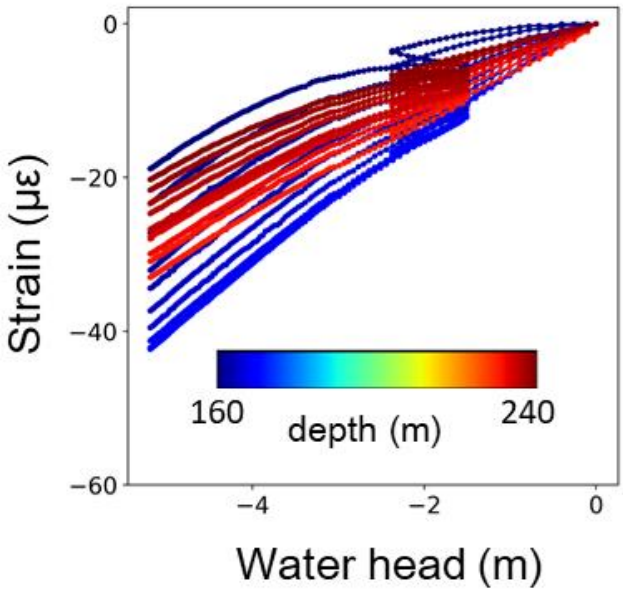
Contents of this file

Depth (m)			Cores
150.0	~	153.0	
153.0	~	156.0	
156.0	~	159.0	
159.0	~	162.0	
162.0	~	165.0	
165.0	~	168.0	
168.0	~	171.0	
171.0	~	174.0	
174.0	~	177.0	
177.0	~	180.0	
180.0	~	183.0	
183.0	~	186.0	
186.0	~	189.0	
189.0	~	192.0	
192.0	~	195.0	
195.0	~	198.0	
198.0	~	201.0	
201.0	~	204.0	
204.0	~	207.0	
207.0	~	210.0	
210.0	~	213.0	
213.0	~	216.0	
216.0	~	219.0	
219.0	~	222.0	
222.0	~	225.0	

225.0	~	228.0	
228.0	~	231.0	
231.0	~	234.0	
234.0	~	237.0	
237.0	~	240.0	

19

20 **Figure S1.** The sampled cores during drilling the wellbore showing the sandstone with mud
21 and siltstone alternations.
22



23

24 **Figure S2.** Nonlinear strain changes with respect to water head in depth intervals between
25 160 m and 170 m, and 230 m and 240 m.

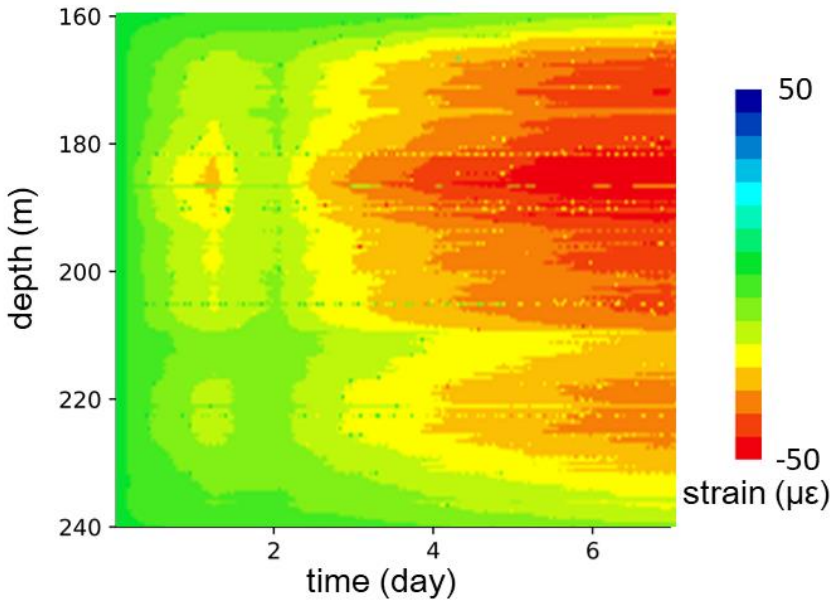


Figure S3. Raw strain data were recorded by distributed fiber optic strain sensing during water extraction. At some depths, the strain errors due to incorrectly matching Rayleigh scattering power spectra using the cross-correlation method are shown.

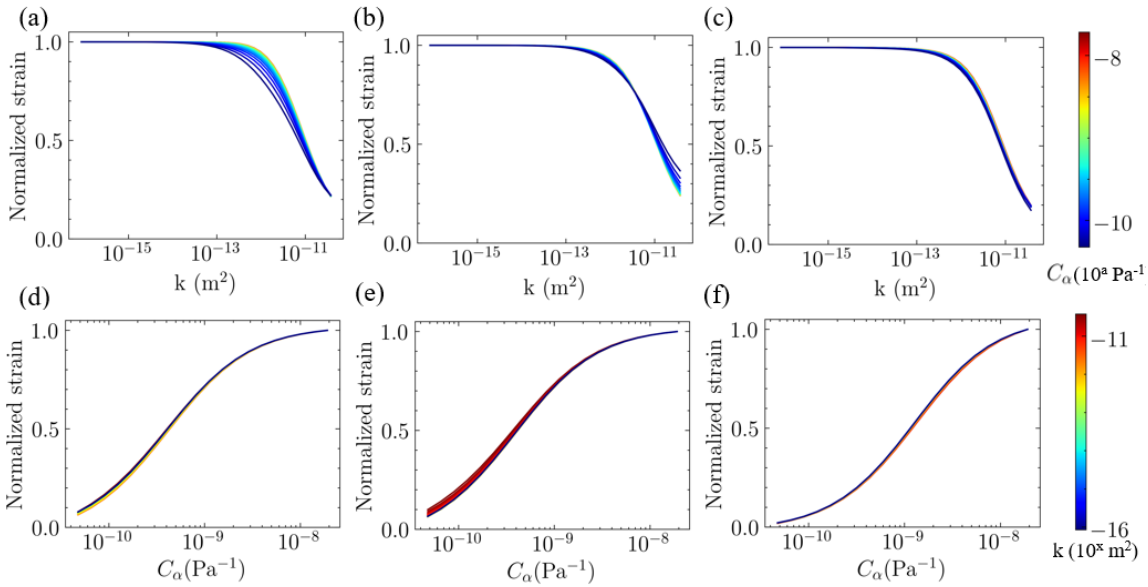


Figure S4. Normalized strain change with respect to permeability (k) (a-c) and compressibility (C_α) (d-f) for locations A, B and C in Figure 4a.

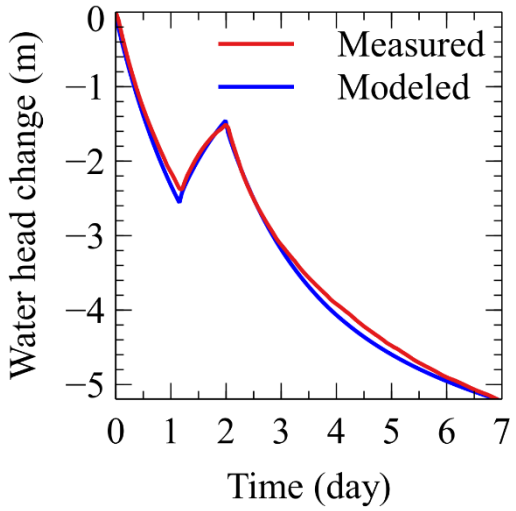


Figure S5. Comparison of the modeled water head change with the measured one.

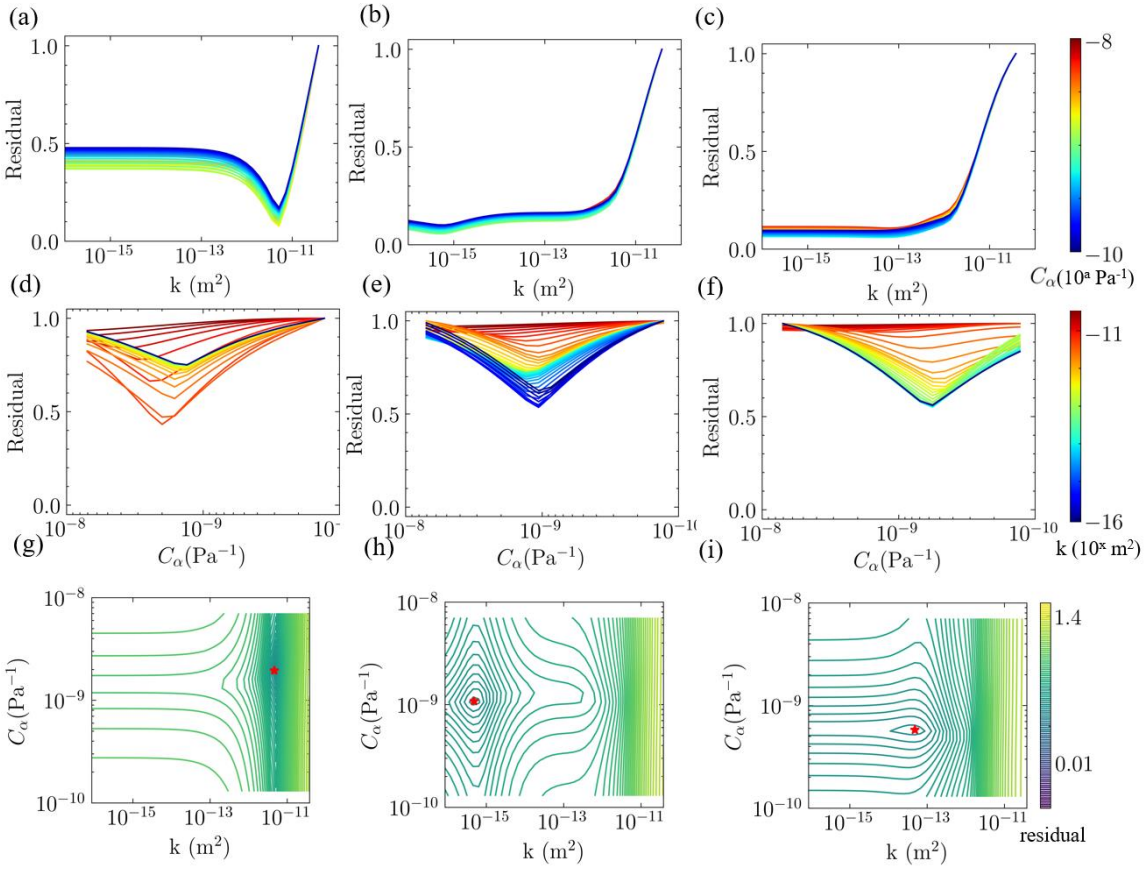


Figure S6. Normalized sensitivity of residual with respect to permeability (k) (a-c), compressibility (C_α) (d-f), and the process of finding best solution in the solution space (g-i) for locations A, B and C in Figure 9a.

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