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Supplement of

Understanding the potential of climate teleconnections to project future groundwater drought

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Supplementary Material

Table S1 - Borehole sites used

Site Number	Site ID	Borehole Name	Aquifer Group	Record length (months)	Number of gaps	Longest gap (months)
1	SP90/64	Ashley Green STW	Chalk	350	0	0
2	SY68/34	Ashton Farm	Chalk	516	2	4
3	TA10/63	Aylesby	Chalk	460	2	9
4	TQ21/161	Beeding Hill	Chalk	447	1	4
5	SU61/47	Catherington	Chalk	576	2	4
6	TQ01/133	Chantry Post Sullington	Chalk	456	5	17
7	SU81/1	Chilgrove House	Chalk	2,173	0	0
8	TQ25/86	Chipstead	Chalk	893	7	10
9	SU34/8D	Clanville Lodge Gate	Chalk	253	1	4
10	SU71/23	Compton House	Chalk	1,476	2	13
11	SE94/5	Dalton Holme	Chalk	1,537	0	0
12	TM15/112	Dial Farm	Chalk	585	3	5
13	TL79/25	Frying Pan Lodge	Chalk	545	3	4
14	SU47/141	Gibbet Cottages	Chalk	521	0	0
15	TL89/37	Grimes Graves	Chalk	449	3	8
16	TA02/104	Horkstow Road	Chalk	417	1	3
17	TQ31/46	Houdean Bottom	Chalk	481	1	3
18	SU33/12	Kings Somborne	Chalk	363	1	6
19	TL12/122	Lilley Bottom	Chalk	438	0	0
20	TR14/9	Little Bucket Farm	Chalk	553	1	4
21	ST07/10	Pant y Lladron	Chalk	262	1	5
22	TL44/12	Redlands Hall	Chalk	643	2	17
23	SU17/57	Rockley	Chalk	1,018	2	9
24	TL84/6	Smeetham Hall Cottages	Chalk	622	3	11
25	TF83/1	South Creake	Chalk	749	4	9
26	SU78/45A	Stonor Park	Chalk	670	1	3
27	TL33/4	Therfield Rectory	Chalk	1,610	2	48
28	SU74/40B	Tile Barn Farm	Chalk	544	1	121
29	SU04/2	Tilshead	Chalk	613	6	23
30	TF81/2A	Washpit Farm	Chalk	802	5	5
31	TQ25/13	Well House Inn	Chalk	888	5	4
32	TV59/7C	West Dean No. 3	Chalk	922	1	22

33	SU01/5B	West Woodyates Manor	Chalk	901	8	9
34	SE95/6	Wetwang	Chalk	544	1	3
35	SK15/16	Alstonefield	Limestone	513	1	5
36	SE44/80	Brick House Farm	Limestone	448	1	15
37	SE35/4	Castle Farm	Limestone	549	4	25
38	SN00/11	Greenfield Garage	Limestone	274	0	0
39	SK17/13	Hucklow South	Limestone	574	5	7
40	TF03/37	New Red Lion	Limestone	932	1	296
41	NZ22/53	Newton Aycliffe	Limestone	584	5	75
42	NZ21/29	Swan House	Limestone	556	1	33
43	SP00/62	Ampney Crucis	Oolite	699	0	0
44	ST88/62A	Didmarton 1	Oolite	472	4	7
45	ST51/57	Over Compton	Oolite	545	6	5
46	NY00/328	Brownbank Layby	Sandstone	487	5	26
47	SX99/37B	Bussels No. 7A	Sandstone	544	0	0
48	SD27/6B	Furness Abbey	Sandstone	526	4	21
49	SJ62/112	Heathlanes	Sandstone	547	4	7
50	SJ15/13	Llanfair Dyffryn Clwyd	Sandstone	540	0	0
51	SK67/17	Morris Dancers	Sandstone	568	1	9
52	NX97/2	Newbridge	Sandstone	287	0	0
53	SK00/41	Nuttalls Farm	Sandstone	510	1	8
54	NT94/3B	Royalty Observation	Sandstone	314	1	3
55	NY63/2	Skirwith	Sandstone	460	2	35
56	SK10/9	Weeford Flats	Sandstone	603	2	12
57	SD41/32	Yew Tree Farm	Sandstone	525	4	27
58	ST30/7	Lime Kiln Way	Greensand	578	2	8
59	TQ41/82	Lower Barn Cottage	Greensand	502	3	3

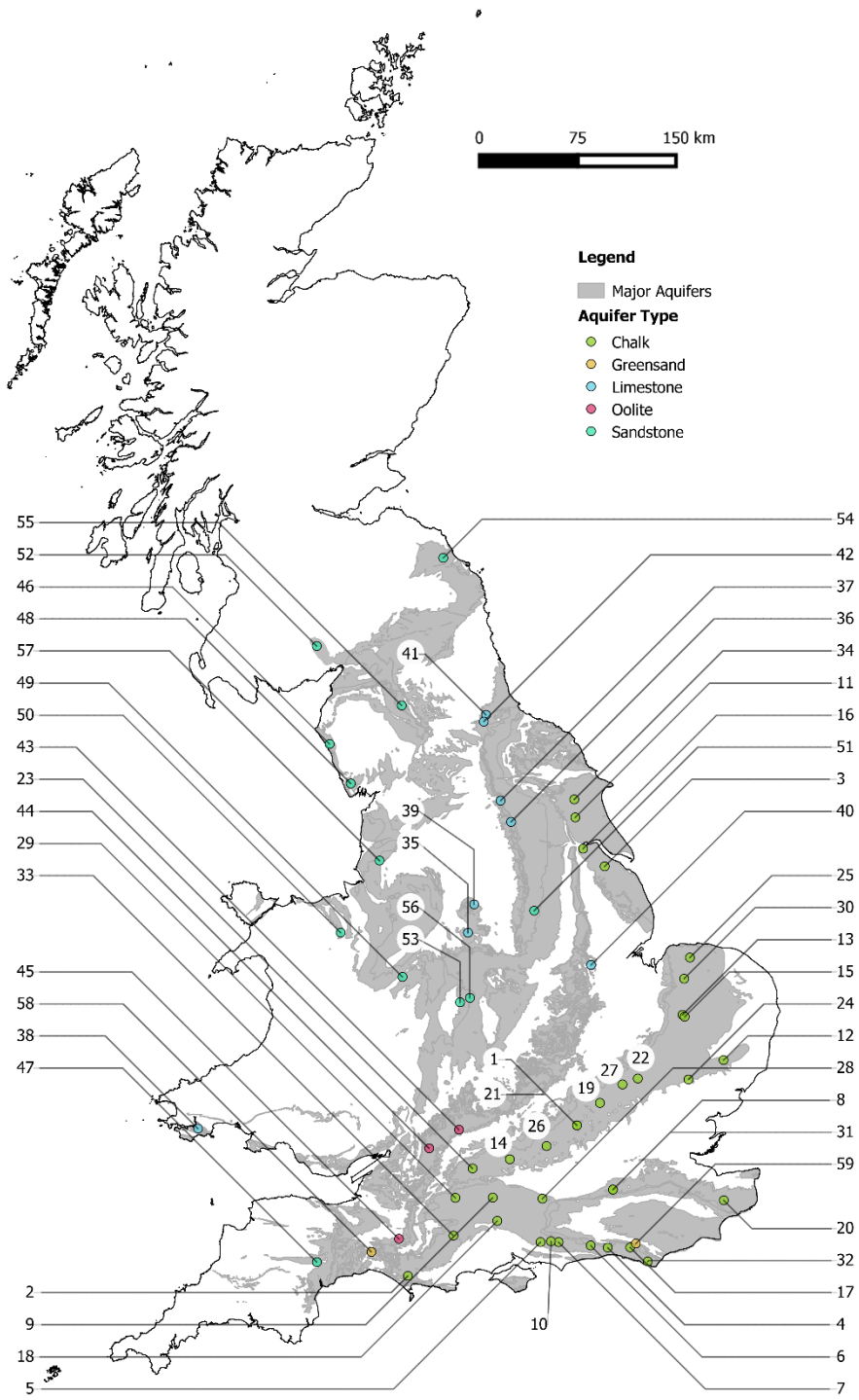


Figure S1 - Location of observation boreholes used in this study with their Site numbers, and major aquifers in the UK

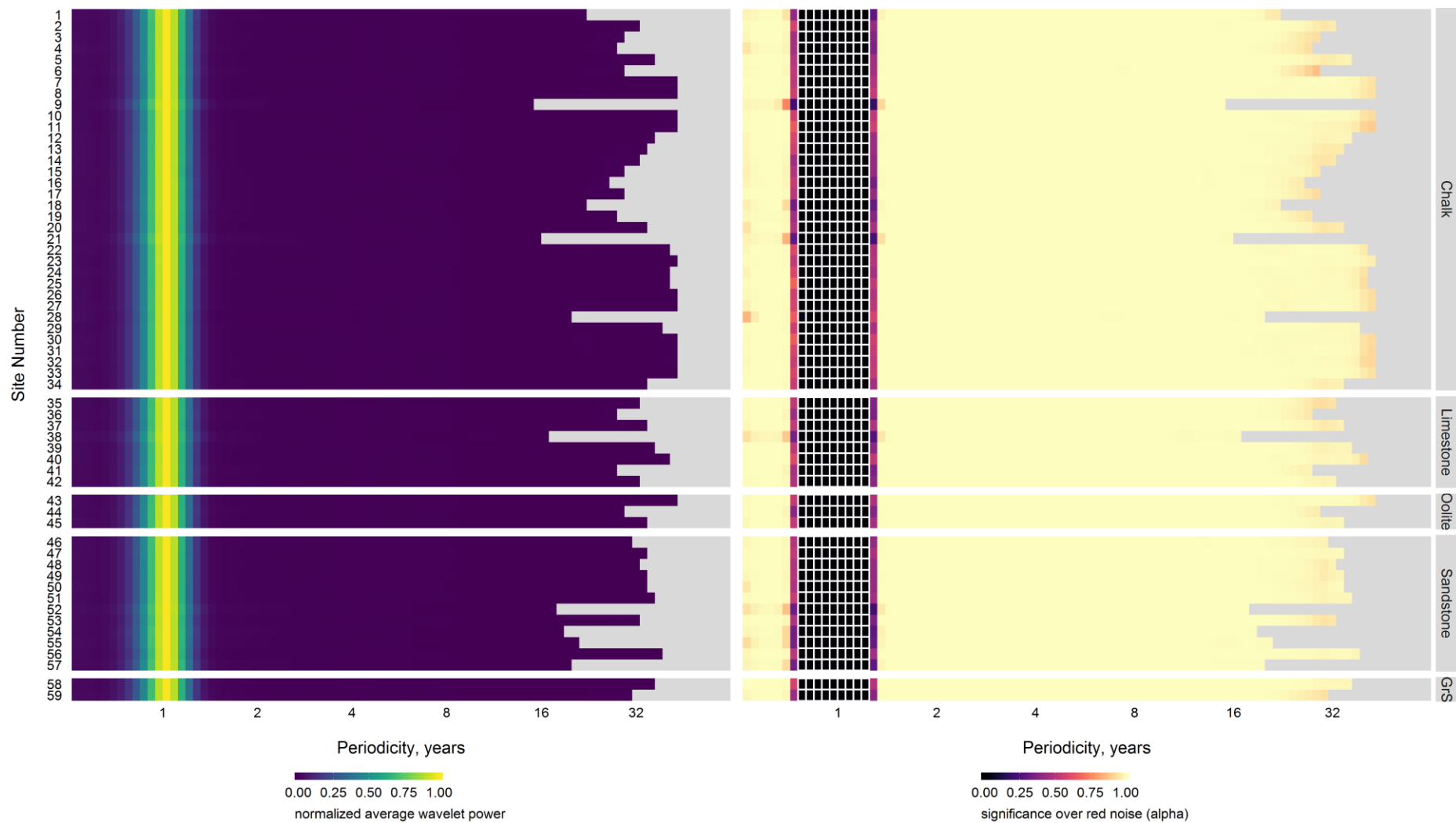


Figure S2 - Normalised average wavelet power spectra (left) and wavelet power significance alphas (right) for monthly PET time series for co-locations of the 59 index boreholes. In the right-hand figure, boxes outlined in white are those powers that are significant over red noise to a 95% confidence interval ($\alpha \leq 0.05$).