Integrating shallow head measurements and InSAR data to quantify groundwater-storage change in San Joaquin Valley, California (USA)

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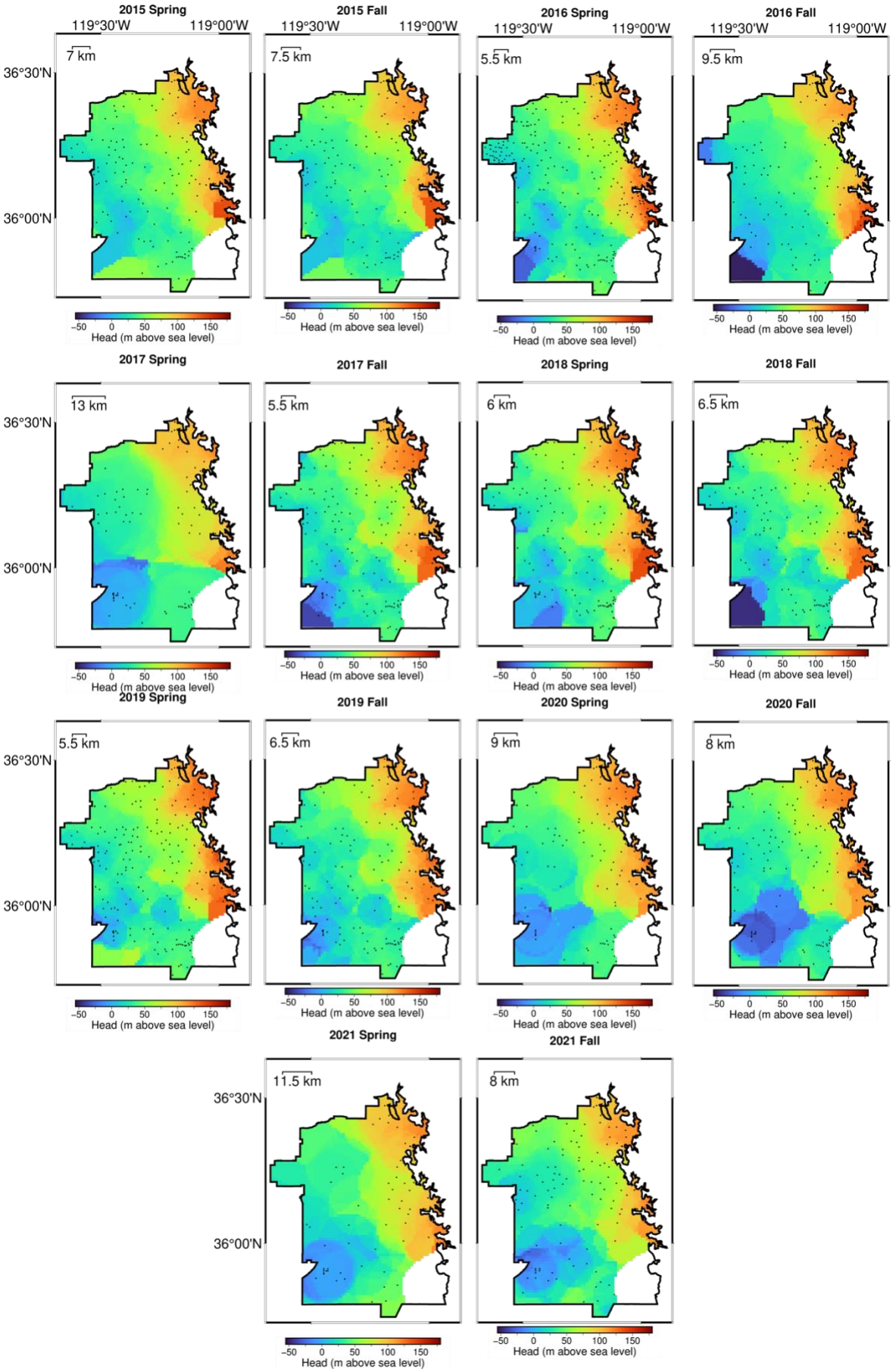

Figure S1 The 14 maps showing the interpolated shallow head grids for Spring and Fall for each year from 2015-2021. The wells which went into these maps differ for each season, and are marked as black dots.

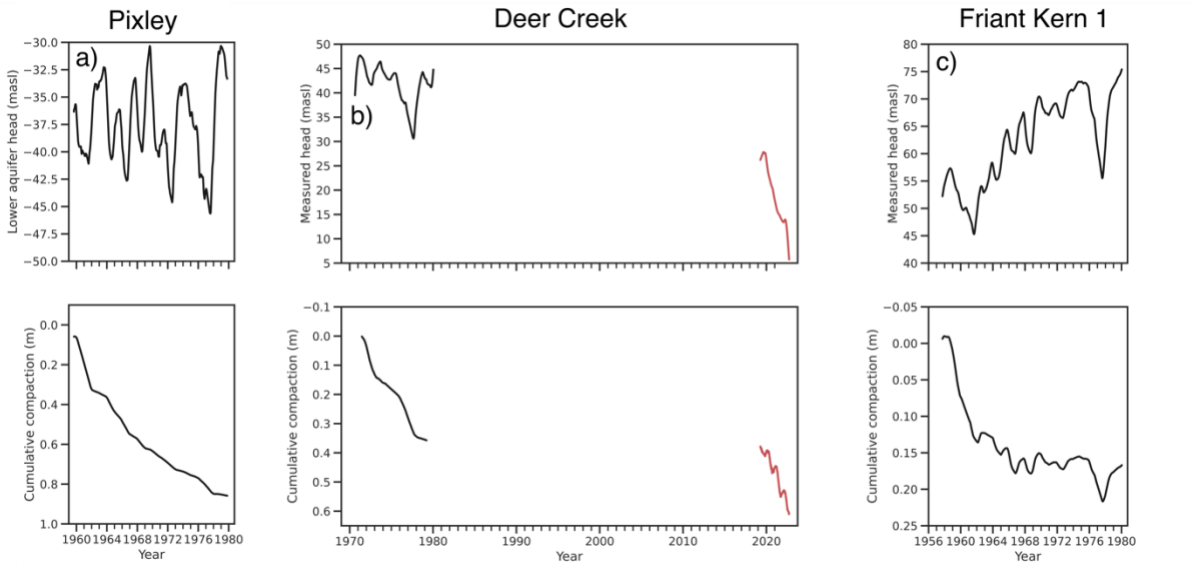

Figure S2 The raw (pre-smoothing) records of head and compaction from each of the four sites used in this study. The plots are scaled such that the horizonal direction always represents the same amount of time, so sites with a longer record are a wider plot. The y-axis scale changes between sites. At Deer Creek, the record post-rehabilitation is shown in red.

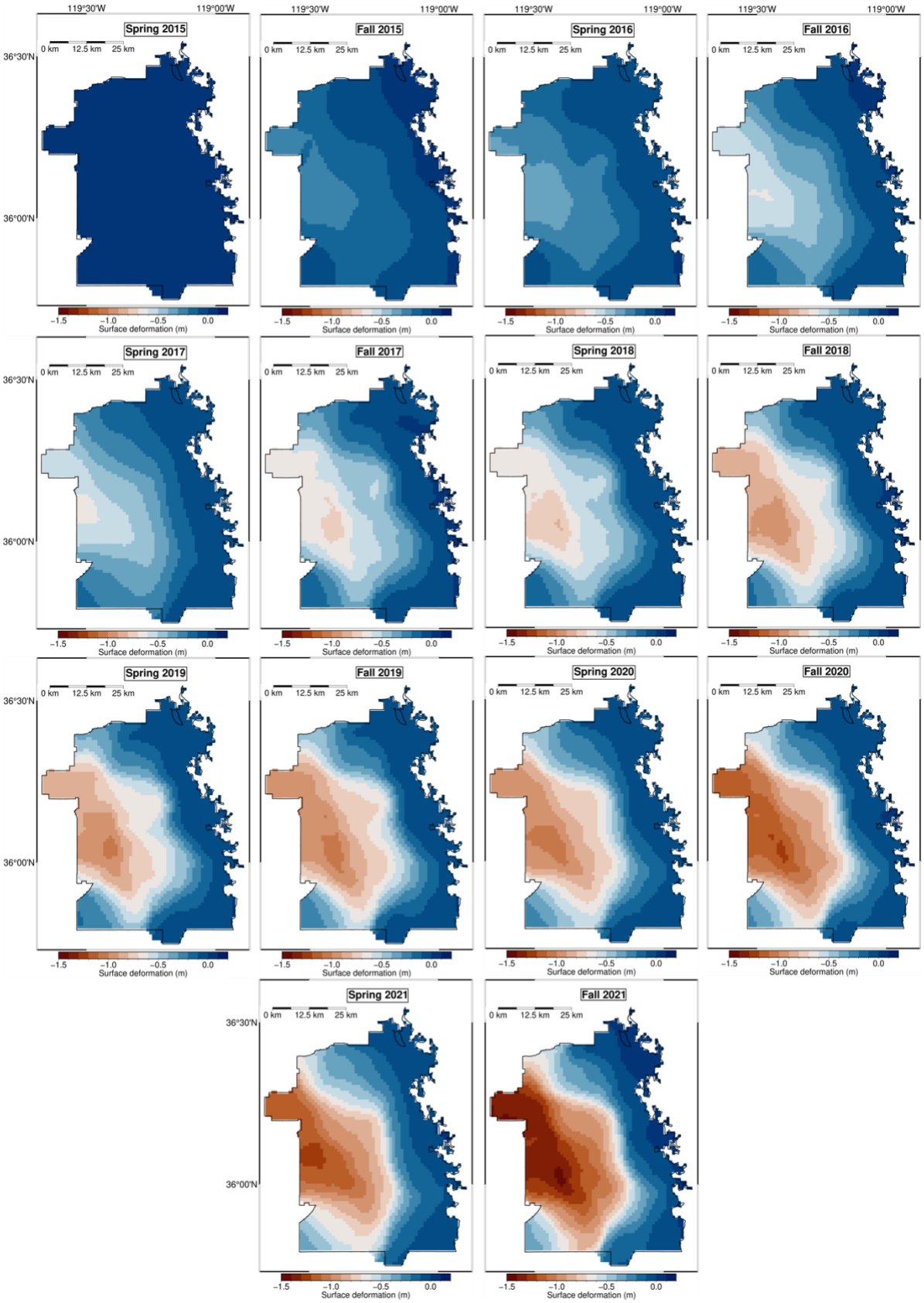

Figure S3 The 14 maps showing the interpolated InSAR surface displacement grids for Spring and Fall for each year from 2015-2021. Totals are cumulative from Spring 2015.

(Note this page is required to allow a smooth switch to landscape formatting on the following page)

Table S1 Table summarizing the coverage of upper aquifer head measurements for different search radii. Coverage is defined as the percentage of 1x1 km grid cells with at least two head measurements for a given season and year. Columns terminate once coverage reaches 90% or greater for a given season. Highlighted in yellow are the search radii used for interpolation.

Search radius (km)	Coverage (%)													
	Spr 15	Fall 15	Spr 16	Fall 16	Spr 17	Fall 17	Spr 18	Fall 18	Spr 19	Fall 19	Spr 20	Fall 20	Spr 21	Fall 21
All wells														
5.0	74.0	69.1	89.7	62.1	37.7	85.4	80.4	74.1	87.9	74.8	57.5	62.8	29.4	59.8
5.5	81.2	76.3	94.0	68.9	42.3	90.5	87.1	81.1	91.8	83.4	64.2	68.9	35.3	66.9
6.0	85.8	81.1		73.9	47.2		91.4	86.5		89.4	68.9	75.0	42.1	72.7
6.5	88.7	85.4		77.8	52.1			90.7		93.4	73.1	80.4	49.1	78.4
7.0	90.6	88.5		80.9	56.3						76.8	85.2	56.0	83.3
7.5		90.5		83.4	60.6						80.0	89.2	62.6	87.8
8.0				85.7	64.2						83.8	92.7	68.3	91.0
8.5				87.2	67.8						87.6		73.6	
9.0				88.9	71.3						90.7		77.7	
9.5				90.4	74.5								81.2	
10.0					77.1								84.0	
10.5					79.7								86.4	
11.0					82.2								88.5	
11.5					84.6								90.0	
12.0					87.1									
12.5					89.4									
13.0					91.7									

Video

Supplemental Video ESM2 shows the 7-daily raw InSAR pixels, with 40,000 pixels removed, showing the measured surface displacement from February 2015 to October 2021.