Post Audit of the 2013 Regulatory Plan

Prepared for:

Harris-Galveston Subsidence District
1660 W. Bay Area Blvd
Friendswood, TX 77546
(281) 486-1105

Fort Bend Subsidence District
301 Jackson St., #610
Richmond, TX 77469
(281) 342-3273

Prepared by:

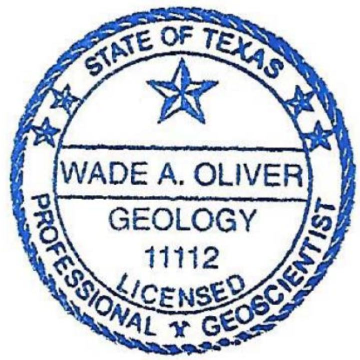
INTERA Incorporated
Three Sugar Creek Center Blvd
Suite 675
Sugar Land, TX 77478
(281) 560-4560

July 2022

This page is intentionally left blank.

PROFESSIONAL GEOSCIENTIST SEAL

The work shown in the following document was overseen by the following Licensed Professional Geoscientist:



July 11, 2022

____________________________________ ____________

Wade A. Oliver — Date
Texas Licensed Professional Geoscientist #11112
Firm PG License No. 50189

This page is intentionally left blank.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ACROYNMS AND ABBREVIATIONS

HGSD	Harris-Galveston Subsidence District
FBSD	Fort Bend Subsidence District
HAGM	Houston Area Groundwater Model
USGS	United States Geologic Survey

1.0 INTRODUCTION

INTERA was retained by the Harris-Galveston Subsidence District (“HGSD”) and Fort Bend Subsidence District (“FBSD, together “Districts”) to assist with several tasks related to the review of the regulatory plans of the districts. This technical memorandum documents INTERA’s post audit of the 2013 Regulatory Plan, with a particular focus on the groundwater modeling. This was done to help inform the approach and analyses employed during the current Regulatory Plan Review to be completed in 2023.

The primary mission of the Districts is to help protect the lives and property within the District’s boundaries from land surface subsidence. This is done through the regulation of groundwater production, which is the primary cause of compaction and subsidence in the area. The Districts maintain appropriate management strategies by periodically reviewing and updating the projected demands for water, subsidence modeling tools, and projected impacts. Since the last regulatory plan update in 2013, a significant amount of data has been collected on subsidence, compaction, and pumping. To help inform the current Regulatory Plan Review, we completed a post audit of how well the tools used during the last round of planning performed against observed conditions.

It is important to acknowledge that the focus of this post audit task shifted over the course of the analysis. At the beginning of the effort, both INTERA and the Districts anticipated using the post audit to identify areas within the Houston Area Groundwater Model (HAGM) that did not perform well compared to observed conditions (Kasmarek and others, 2012). These areas would then become a focus for updating hydraulic properties and compaction parameters during the update to the HAGM (known as the GULF 2023 model) currently being developed by the U.S. Geological Survey (USGS). This presupposed that USGS would use the distribution of hydraulic properties and compaction parameters in the current HAGM as the base on which to develop the updated model. Through discussions with USGS after beginning the post audit task, we learned that USGS does not plan to use the existing distribution of hydraulic properties to inform the new model, but will instead develop an updated distribution of properties using recently developed subsurface information from geophysical logs such as clay thickness, clay percentage and depth of burial. This is an important improvement to the modeling process and will yield a more continuous distribution of hydraulic properties that is closely linked with geologic and hydrogeologic data. However, this also shifted the focus of this post audit from identifying areas of the Districts in need of particular attention during model calibration to assessing the performance of the model to help inform the approach to the Regulatory Plan Review currently underway.

1.1 Hydrogeologic Setting

The hydrogeologic setting of the northern portion of the Gulf Coast Aquifer in Texas has been studied extensively and is detailed in many previous reports. The aquifer system consists of five hydrogeologic units: the Chicot Aquifer, Evangeline Aquifer, Burkeville confining unit, Jasper Aquifer, and the

Catahoula. We limited our analysis to the shallowest four units – that is, excluded the Catahoula – because that unit is not represented separately in the HAGM and is not currently used as a water source in the Districts. As described in Kasmarek and others (2012), portions of the Catahoula are included in the Jasper Aquifer layer of the HAGM in the northwestern areas of the model, but these are outside the Districts.

1.2 Houston Area Groundwater Model and Representation of Subsidence

The HAGM was developed by the USGS to simulate groundwater flow and land surface subsidence in the northern Gulf Coast Aquifer System from predevelopment (defined as 1891 in the model) through 2009 (Kasmarek and others, 2004; Kasmarek and others, 2012). Groundwater flow was modeled using MODFLOW 2000 (Harbaugh and others, 2000) and subsidence was simulated using the SUB package.

The SUB package was designed to simulate compaction and storage changes in confined aquifer systems based on Terzaghi's principle of effective stress (Terzaghi, 1925). In a confined aquifer, the effective stress is balanced by pore fluid pressures. Removal of groundwater in a confined aquifer system reduces fluid pore pressures and can substantially increase effective stress. An increase in effective stress will compress an aquifer and cause inelastic (irreversible) and/or elastic (reversible) compaction. Unconsolidated, fine-grained silts and clays interbedded in an aquifer system can be highly compressible. The factors that influence the compressibility of fine-grained interbeds include depositional processes (e.g. speed of deposition and depth of burial), geological processes (e.g. erosion, burial history, desiccation, and diagenesis), historical groundwater levels, and sediment age. In the Gulf Coast Aquifer System, these hydrogeological factors created many clay interbeds that are susceptible to compaction.

2.0 DATA SOURCES

Over the past decade, the Districts, the University of Houston, USGS and others have collected compaction and subsidence measurements throughout the Houston region. This data provides an opportunity to assess how well the HAGM predicted subsidence between 2010 and 2019. The degree of match between the HAGM predictions and measured data over this period is influenced both by the hydrogeologic parameters in the model and the relationship between projected and actual water use as reported to the Districts.

2.1 GPS Monitoring Stations

The Districts, in cooperation with the University of Houston, neighboring groundwater conservation districts, TxDOT and other cooperating entities currently operate a network of approximately 230 GPS stations at which vertical and lateral changes of the land surface are monitored. Since our analysis is focused on how the data informs the representation of subsidence in the HAGM, we only used the data on vertical changes in land surface (i.e. elevation) and not lateral/horizontal movement. A negative displacement measured at a GPS station indicates subsidence while a positive displacement indicates uplift.

2.2 Borehole Extensometers

Borehole extensometers are anchored benchmarks consisting of a pipe secured to a concrete plug that is typically rooted at the base of an aquifer unit. As clay units above the concrete root compact or expand, a slip joint in the well casing allows for the pipe to expand or compress. This change in the pipe is recorded and reflects the change in thickness of the aquifer unit being monitored. The USGS has installed 13 extensometers in the Districts (Table 1). More detail on these extensometers are provided in Liu and others (2019). A new extensometer has been installed in Fort Bend County, but the data from this station was not included in our analysis because the period of record was not long enough (less than 2 years). Of the 13 extensometers we analyzed, seven are considered to measure “total” compaction, meaning the concrete plug was installed at the base of an aquifer unit. It therefore measures the total compaction of all clay layers in the overlying aquifer. The other six extensometers were installed within an aquifer unit and are considered “partial” completions. To directly compare modeled compaction and observed compaction in the partial extensometers, the total modeled compaction in each aquifer was scaled based on the fraction of aquifer covered by the extensometer.

Table 1: USGS borehole extensometers in Harris and Galveston counties.

Station Name	Regulatory Area	Year Installed	Total or Partial Completion	Notes*
Texas City	HGSD 1	1973	Partial	anchored about 200 feet above base of Chicot
Johnson Space Center	HGSD 1	1973	Total	anchored near base of Chicot
Seabrook	HGSD 1	1973	Partial	anchored about 1/3 into Evangeline
Baytown Shallow	HGSD 1	1973	Partial	anchored about 200 feet above base of Chicot
Baytown Deep	HGSD 1	1973	Partial	anchored midway through Evangeline
East End	HGSD 1	1973	Partial	anchored about 1/6 into Evangeline
Pasadena	HGSD 1	1975	Total	anchored near base of Evangeline
Clear Lake Shallow	HGSD 1	1976	Partial	anchored about midway through Evangeline
Clear Lake Deep	HGSD 1	1976	Total	anchored near base of Evangeline
Southwest	HGSD 2	1980	Total	anchored near base of Burkeville
Northeast	HGSD 2	1980	Total	anchored near base of Evangeline; may include part of Burkeville
Lake Houston	HGSD 2	1980	Total	anchored near base of Evangeline
Addicks	HGSD 3	1974	Total	anchored near base of Evangeline; may include part of Burkeville

**Written Communication: the USGS was contacted to determine if the extensometer was designed to represent “total” or “partial” subsidence.*

2.3 Pumping Scenarios and Modeled Subsidence

For the post audit task, the primary original objective was to identify and describe areas where the HAGM accurately predicted observed subsidence and areas where it did not. As described above, originally this was done to identify focus areas for the calibration of the model currently under development by USGS. With the changed USGS approach to developing hydraulic properties, we shifted the purpose of the analysis to better understand approaches to developing and using the model to inform the Regulatory Plan Review. We evaluated two pumping scenarios and the associated subsidence in the HAGM:

> **Scenario 1**: Modeled subsidence projected to occur using pumping associated with the 2013 Regulatory Plan
>
> **Scenario 2**: Modeled subsidence projected to occur using actual pumping reported to the Districts between 2010 and 2019

In Scenario 2, model pumping was identical to Scenario 1 prior to 2010. The model pumping file from Scenario 1 was revised in Scenario 2 to best represent the pumping rates and spatial distributions of actual reported pumping between 2010 and 2019 provided by the Districts for Harris, Galveston and Fort Bend counties. To incorporate these pumping data into the model we 1) allocated the measured annual pumping from each permitted well to the aquifer layer(s) it intersected, and 2) distributed well pumping to each aquifer layer in the model grid based on the latitude and longitude of each well. Surface elevations were determined for each well using the USGS digital elevation model (USGS, 2020). The reported pumping data included the depth to the first well screen and the total depth of each well. For distributing the pumping, we used the length of the well column between these two points that intersected one or more aquifers. For example, if 20% of the column between the top of the first well screen and the well bottom intersected the Chicot Aquifer, then the Chicot Aquifer would be assigned 20% of the pumping from that well each year.

Pumping is also reported to the District by permit, not by well. For permits that are associated with multiple wells, we divided the reported pumping evenly among the active wells each year. While we recognize this is not a perfect assumption, we believe it is an appropriate approximation for the purposes of this study.

For areas outside Harris, Galveston and Fort Bend counties, we obtained pumping estimates for the 2010 to 2018 period from the TWDB Historical Groundwater Pumpage Database. We then scaled the 2009 pumping distribution to match the county-wide totals for each year in each county. The spatial distribution of pumping was not modified in surrounding counties because TWDB does not link pumping to specific wells or locations. Since at the time of our analysis TWDB had not yet reported historical groundwater pumping estimates for 2019, we used the county totals for 2018 during 2019 in the model run.

3.0 Results

3.1 Groundwater Pumping Comparison

Table 2 shows a comparison of the pumping volumes used during development of the 2013 Regulatory Plan and actual pumping reported to the Districts. In general, over this period the pumping assumed during development of the 2013 Regulatory Plan was higher than the actual reported pumping. This difference was expected, however, because of the conservative assumption used during the development of the 2013 Regulatory Plan that all pumping that was allowed would actually be pumped.

Figure 3-1 shows a spatial comparison of the pumping by aquifer. As shown in Figure 3-1, the spatial distribution of the regulatory plan pumping closely mimics the spatial distribution of actual pumping. One notable difference between the two distributions is that the regulatory plan distribution is more "spread out" in less developed areas such as northwestern Harris County and southern Fort Bend County.

Table 2: Difference between regulatory plan pumping and actual pumping in each regulatory area between 2011 and 2020. Note, values have been rounded to two significant figures.

Difference Between Regulatory Plan Pumping and Actual Pumping (Millions of Gallons)	Regulatory Area	Aquifer	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
	HGSD 1	Chicot	1,700	1,300	1,900	1,700	2,000	2,000	2,100	2,100	2,000	2,100
		Evangeline	310	-170	170	140	480	500	320	410	260	290
		Jasper	0	0	0	0	0	0	0	0	0	0
	HGSD 2	Chicot	2,500	2,800	3,200	3,600	3,500	3,500	3,200	3,600	3,500	3,700
		Evangeline	4,200	2,000	3,600	4,800	4,800	4,000	2,800	4,400	3,800	3,900
		Jasper	0	0	0	0	0	0	0	0	0	0
	HGSD 3	Chicot	5,000	4,400	9,400	11,000	13,000	14,000	16,000	17,000	18,000	20,000
		Evangeline	12,000	110	14,000	13,000	19,000	17,000	16,000	17,000	18,000	19,000
		Jasper	-390	-370	-120	130	210	-6	130	370	420	490
	FBSD A	Chicot	1,300	-2,000	4,400	4,700	4,200	5,200	5,400	5,600	6,000	6,600
		Evangeline	88	-3,800	630	3,300	1,700	3,200	2,600	2,500	2,000	2,500
		Jasper	-11	-6	-7	-9	-5	-7	-8	-98	-11	-11
	FBSD B	Chicot	370	-1,400	-170	-580	330	530	440	860	510	580
		Evangeline	110	190	260	260	300	330	330	390	390	410
		Jasper	0	0	0	0	0	0	0	0	0	0

Positive values suggest Regulatory Plan Pumping > Actual Pumping **Negative values** suggest Regulatory Plan Pumping < Actual Pumping

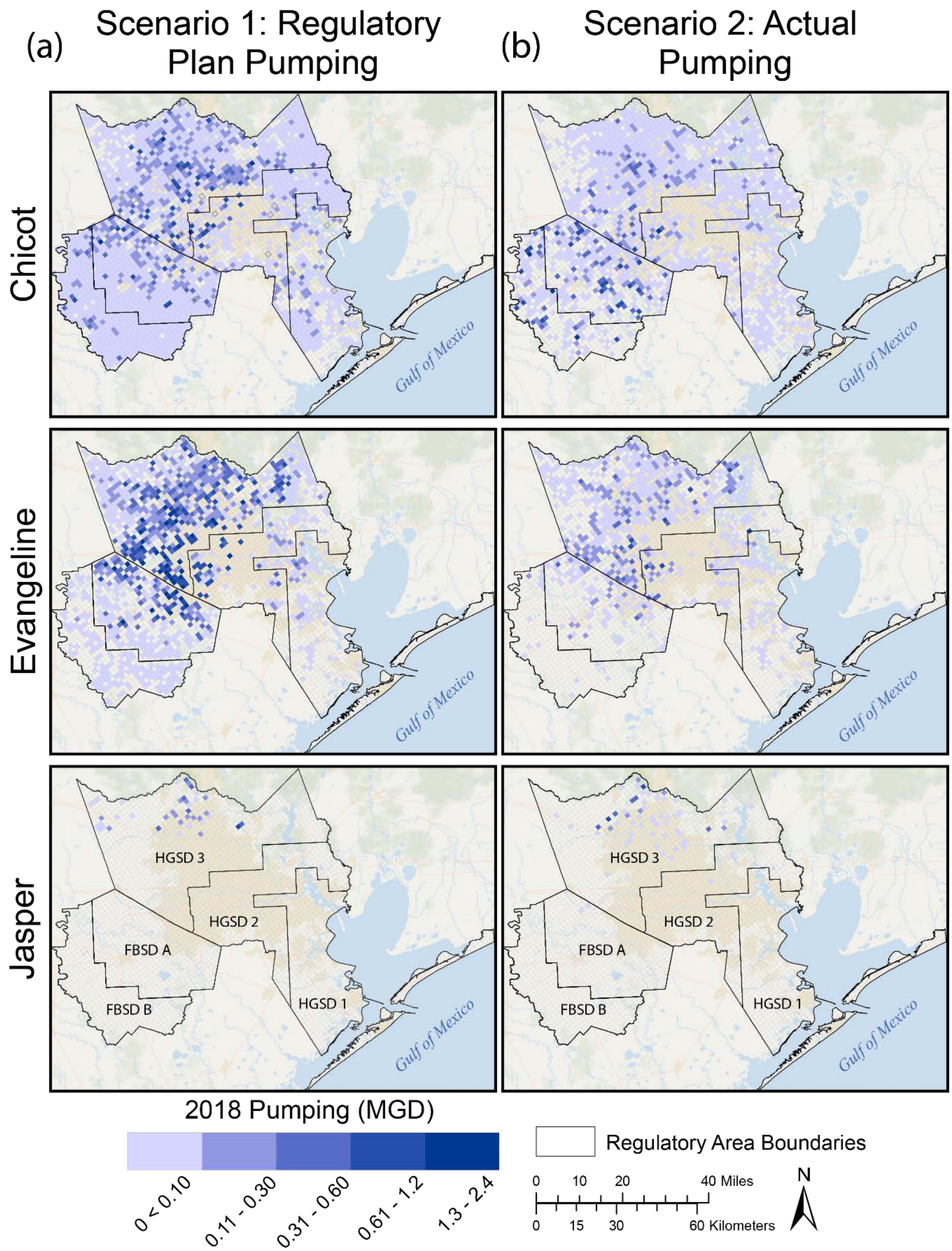


Figure 3-1 (a) Predicted pumping distribution in 2018 from the 2013 Regulatory Plan pumping, and (b) actual pumping distributions in 2018.

3.2 Model Scenario Subsidence Comparison

The total subsidence of the 2010 through 2019 period at each GPS station is plotted in Figure 3-2. The highest rates of subsidence are concentrated in HGSD Regulatory Area 3 (Figure 3-2). Trends in observed and modeled subsidence for each GPS station are presented in Appendix A. An example of one of these figures for GPS station P017 in northern Harris County in shown in Figure 3-3, where nearly 1 foot of subsidence occurs from 2000 to 2016.

The relationship between the modeled compaction and the compaction measured by the extensometers is shown in Appendix B. The extensometers, 12 of which are in Harris-Galveston Subsidence District Regulatory Areas 1 and 2, indicate that much of the historical subsidence occurred due to compaction of the Chicot in these regions. This is most evident at Clear Lake and Baytown extensometers where both shallow and deep extensometers were installed. Compaction rates observed at extensometer stations over the past three decades are generally much lower than rates observed prior to 1990 (Appendix B). The 2011 drought correlates with a notable increase in compaction (up to 4 inches) at the Baytown and Pasadena extensometers. This highlights that while compaction rates are considerably lower when compared to historical rates, increased groundwater withdrawals can lead to rapid increases in compaction.

Figure 3-4 shows the difference between modeled and observed subsidence between 2010 and 2019 for the two model scenarios described above. In the scenario using actual pumping that occurred between 2010 and 2019, modeled subsidence in most areas of the Districts was generally close to observed subsidence. Harris-Galveston Subsidence District Regulatory Areas 1 and 2 and all of Fort Bend Subsidence District had a few GPS stations where subsidence was over or under predicted, but overall the match was good. This indicates that the model reasonably responded to pumping and represented subsidence in these areas.

The main exception to this is Regulatory Area 3 in Harris-Galveston Subsidence District. In this area, the model mostly under-predicted subsidence when actual pumping was used. This indicates that the hydraulic and/or subsidence parameters in the HAGM in this area may not accurately reflect the aquifer conditions. As shown in Figure 3-1, much of this area correlates with areas of HGSD with pumping in the Jasper. There is a lack of geotechnical data on clays within the Jasper Aquifer and no direct measurements of compaction (i.e., no extensometers within the Jasper) incorporated into the HAGM. The initial values of elastic-clay storativity in the Jasper were calculated by multiplying previously estimated clay thickness by 1.0×10^{-6}. Initial values of inelastic-clay storativity were derived by multiplying the values of elastic-clay storativity by 100 (Kasmarek et al., 2012). In a study of subsidence risk corresponding to the use of brackish water in the Jasper, Kelley and others (2018) highlighted the uncertainty associated with existing estimates of Jasper compaction and hydraulic properties.

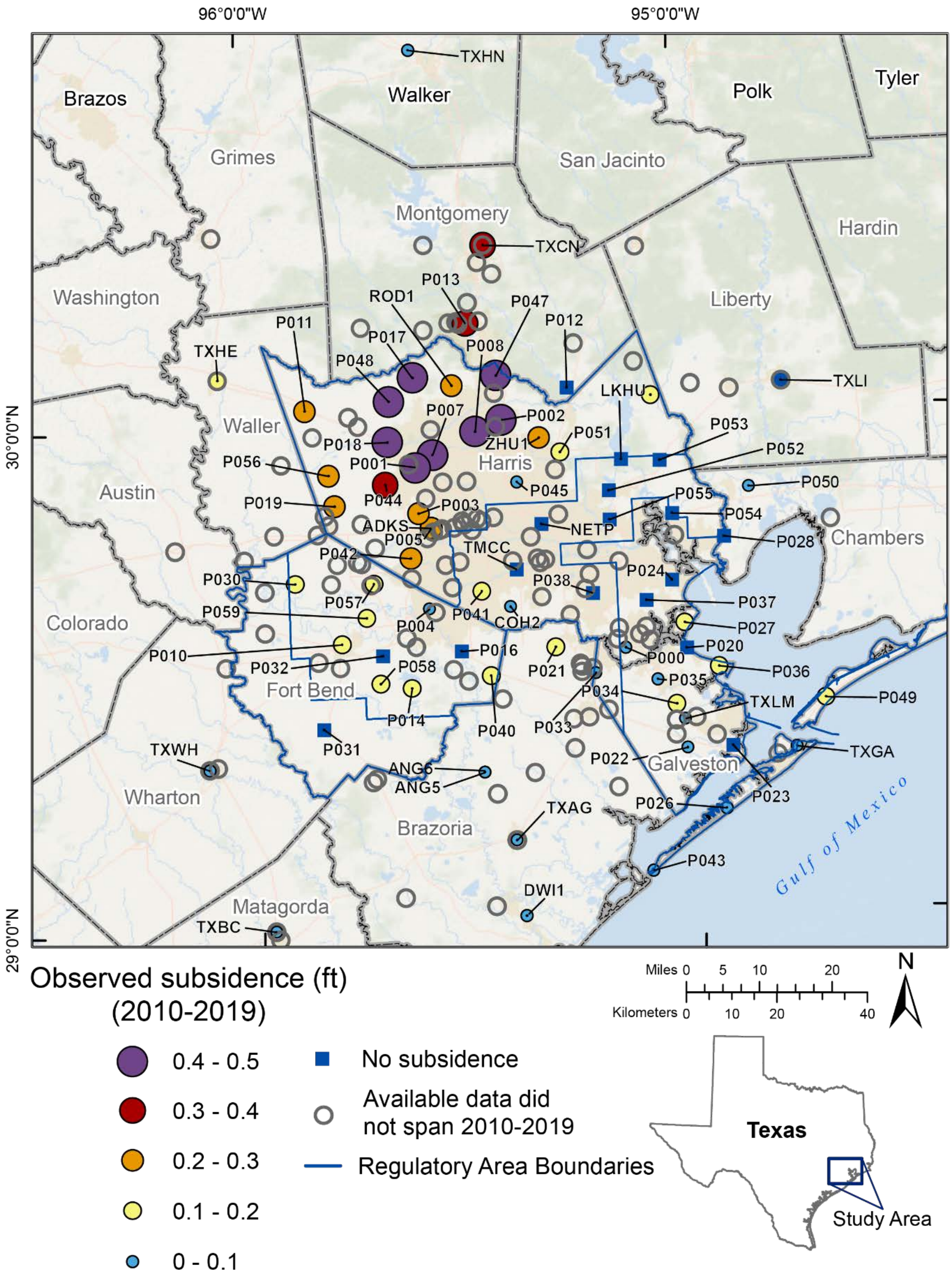


Figure 3-2 Observed subsidence from 2010 to 2019.

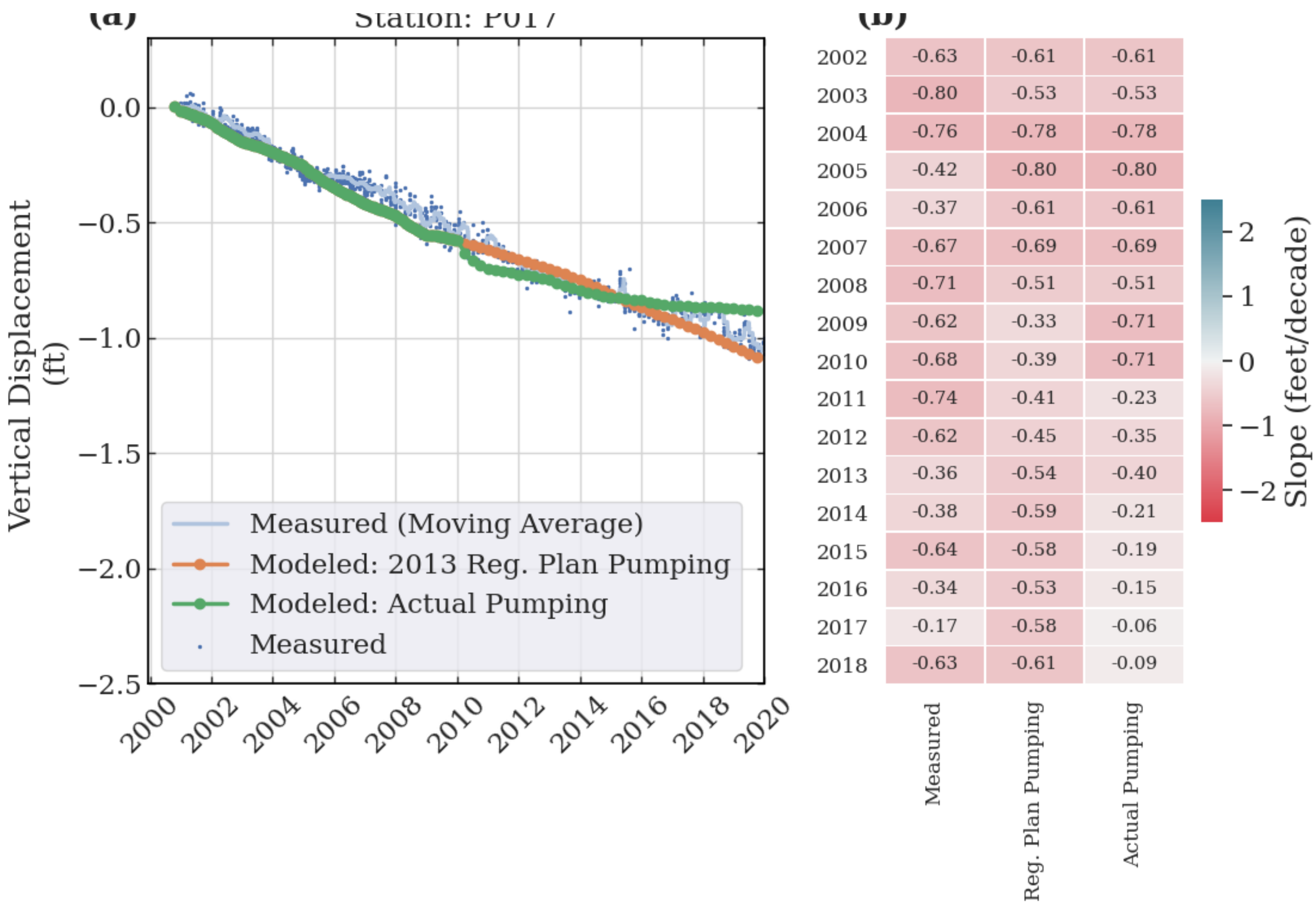


Figure 3-3 (a) Measured vertical displacement at HGSD GPS station P017 station, modeled subsidence in the 2013 regulatory plan pumping scenario, and the 2010-2019 actual pumping scenario. (b) Observed and modeled annual vertical displacement rates calculated with a three-year moving linear approximation. Red colors indicate subsidence, blue indicates uplift, and grey-white indicates little to no movement.

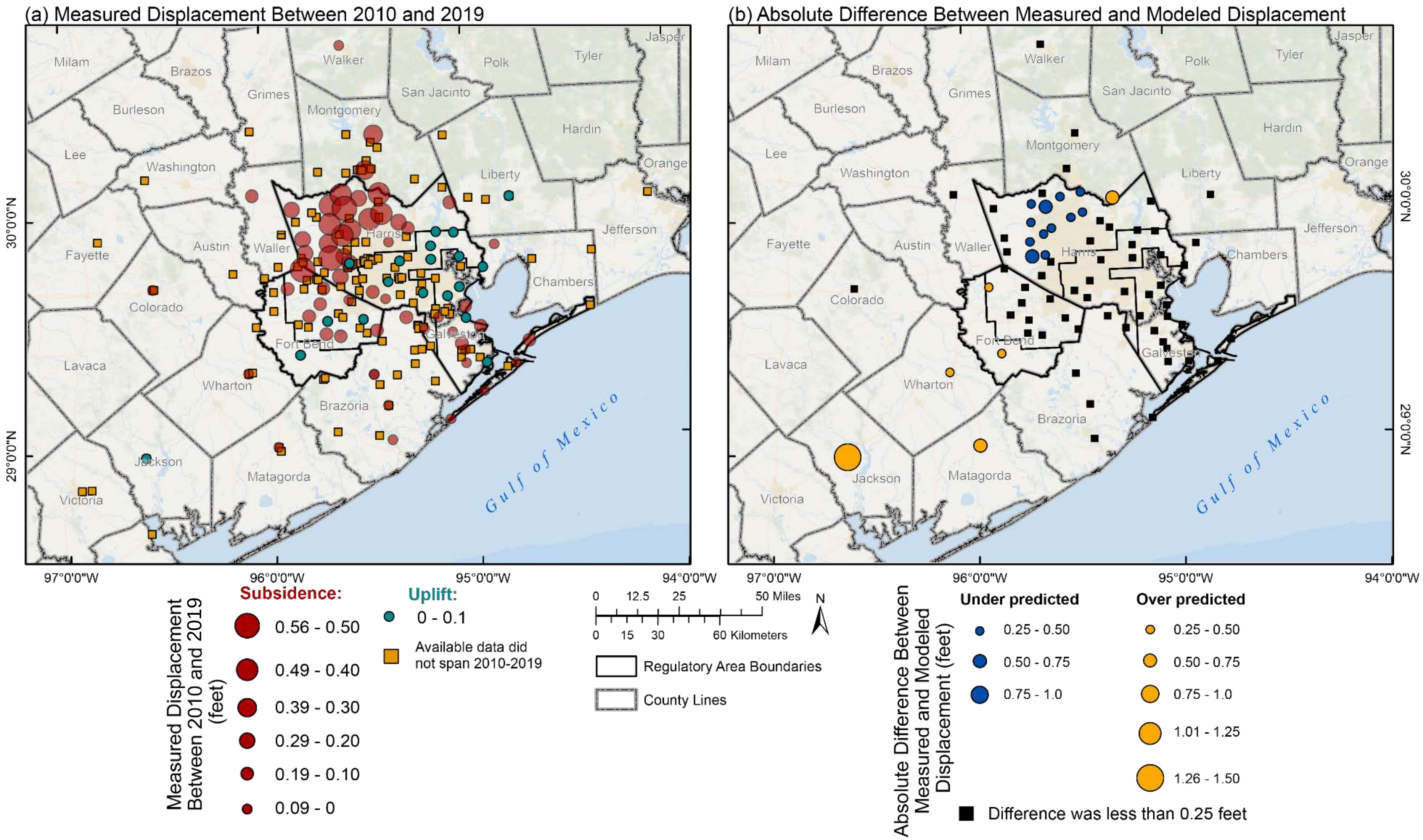


Figure 3-4 (a) Observed subsidence from 2010 to 2019, and (b) the difference between modeled and measured subsidence from 2010 to 2019 using the reported actual pumping.

4.0 Conclusions and Recommendations

As described above, the purpose for completing the post audit of the modeling associated with the 2013 Regulatory Plan changed during this study. Though the intent changed, the analysis yielded valuable information that can help inform the development, calibration and use of the forthcoming GULF 2023 model. It should be noted that the authors have been working in close coordination with USGS during this study to ensure the findings were passed along and could be considered and incorporated into the model development process.

One key finding in our analysis is that the HAGM did a good job of representing the relationship between pumping and subsidence throughout most areas of the Districts. The scenario described above using actual pumping between 2010 and 2019 demonstrates this clearly.

The one area of the Districts where the model consistently deviated from observed results was the north central portion of HGSD Regulatory Area 3. In this area the model underpredicted subsidence at most GPS stations. This may be due to hydraulic properties in the model in this area or in the limited compaction potential of the Jasper incorporated in the model (a known model limitation). Regardless of the cause, this area will need additional attention during development of the GULF 2023 model.

A second key finding in our analysis is that delayed compaction can and does occur in the Gulf Coast System. This aspect of subsidence is not incorporated into the HAGM, but it is currently being incorporated into the GULF 2023 model. This will be a significant improvement and may help address some of the smaller magnitude subsidence in regulatory areas that have already undergone conversion such as Galveston County.

Through the course of our analysis, one aspect of model development and calibration came to light that led to discussions with USGS and the Districts. Typically, when a model is being developed, calibration targets are developed based on the absolute measured values (water levels or subsidence). While these are important and should not be neglected, it can be very useful to also calibrate to the trends in these observations (that is, their change over time, not just their absolute values). Incorporating calibration targets for water level and subsidence trends over time (e.g., a rolling 3-year rate of change) could improve the ability of the model to predict future conditions.

Finally, the analysis described here illustrates that there are considerations beyond permitted use that the Districts may want to review during the current Regulatory Plan Review. For example, the drought in 2011 is associated with increased pumping in some areas and the onset of subsidence where it had previously been stable. The risk of drought and longer-term changes in climate should be important considerations when reviewing and interpreting modeled subsidence predictions during the current Regulatory Plan Review. Another consideration during the current Regulatory Plan Review may be the difference between pumping allowed under the regulatory plan and estimated actual pumping. This could help the Districts understand both the potential and projected subsidence in each regulatory area.

5.0 References

Baker, E.T., 1979, Stratigraphic and Hydrogeologic Framework of Part of the Texas Coastal Plain; Texas Department of Water Resources: Austin, TX, USA.

Espey, Huston & Associates, Inc., 1982, Water Management Study – Phase II, Harris-Galveston Coastal Subsidence District, Friendswood, Texas.

Fugro South, Inc., 2000, Subsidence Predictions, Scenarios FBSD-100 and FBSD-101, Fort Bend Subsidence District, Fort Bend Subsidence District, Friendswood, Texas.

Galloway, D.L.; Jones, D.R.; Ingebritsen, S.E., 1999, Land Subsidence in the United States; U.S. Geological Survey: Reston, VA, USA.

Kasmarek, Mark C. and Robinson, James L., 2004, Hydrogeology and Simulation of Ground Water Flow and Land-Surface Subsidence in the Northern Part of the Gulf Coast Aquifer System, Texas, U. S. Geological Survey Scientific Investigations Report 2004-5102, 103 p.

Kasmarek, M.C., 2013, Hydrogeology and Simulation of Groundwater Flow and Land-Surface Subsidence in the Northern Part of the Gulf Coast Aquifer System, Texas, 1891–2009; Scientific Investigation Report 2012-5154; U.S. Geological Survey: Reston, VA, USA.

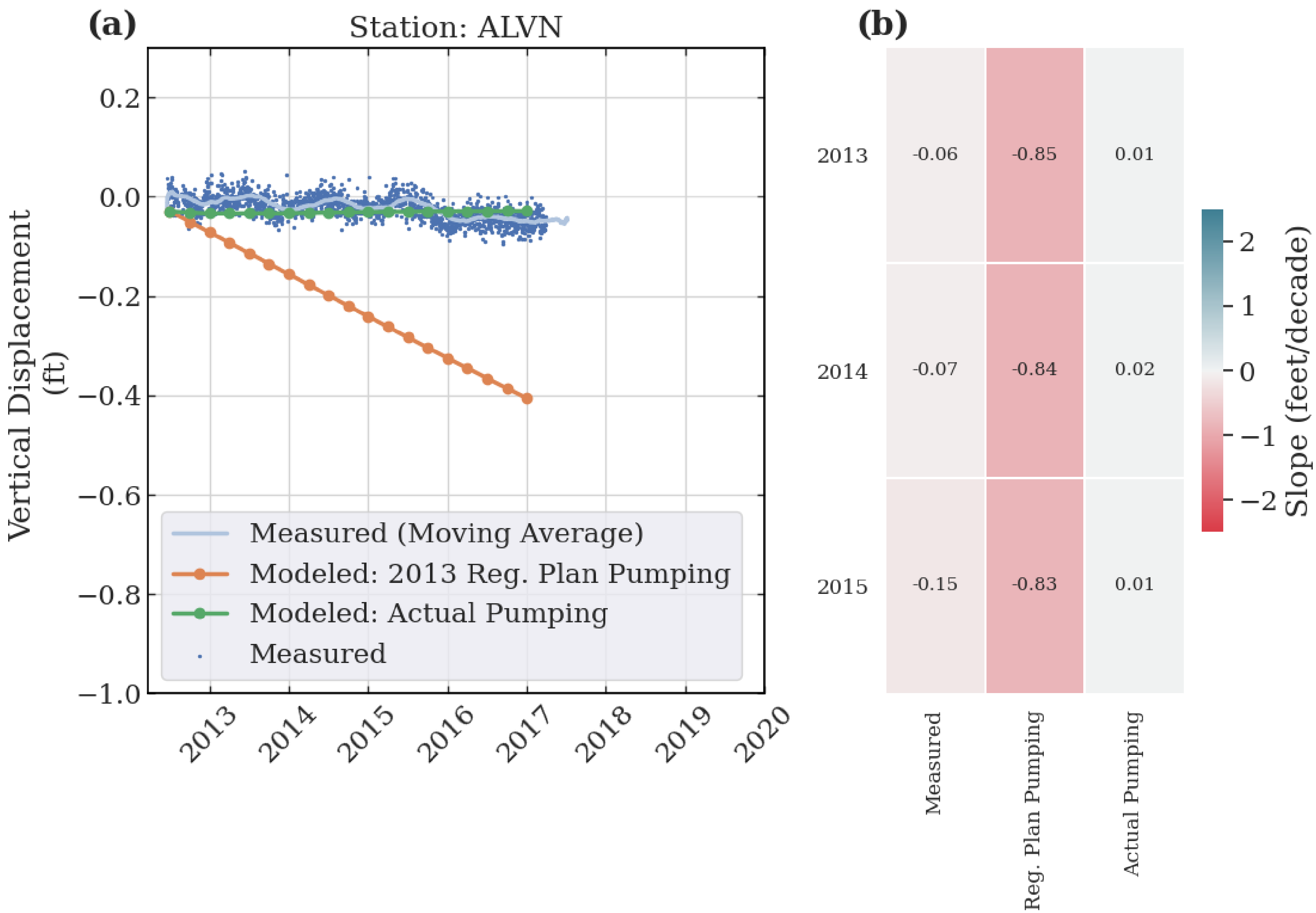
LBG-Guyton Associates (2011), "Groundwater Model Update and Improvements Harris-Galveston Subsidence District, Fort Bend Subsidence District and Lone Star Groundwater Conservation District," Harris-Galveston Coastal Subsidence District, Friendswood, Texas.

Liu, Yi, Jiang Li, and Zheng N. Fang., 2019, Groundwater Level Change Management on Control of Land Subsidence Supported by Borehole Extensometer Compaction Measurements in the Houston-Galveston Region, Texas. Geosciences 9.5 (2019): 223.

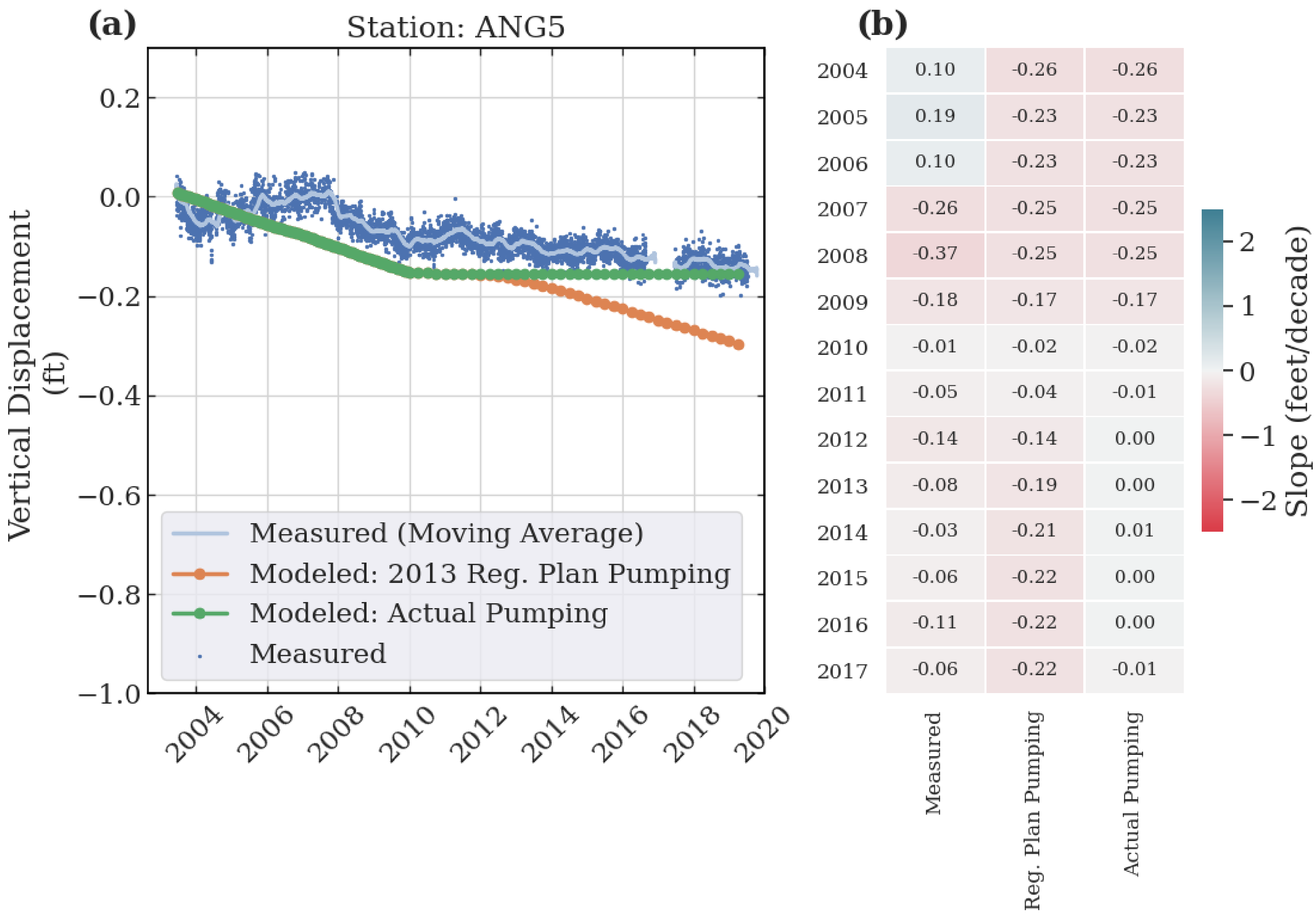
McClelland Engineers, Inc., 1979, Subsidence Cause and Effect, Chapter IV, in Water Management Study – Phase I, by Espey, Huston & Associates, Inc., Harris-Galveston Coastal Subsidence District, Friendswood, Texas.

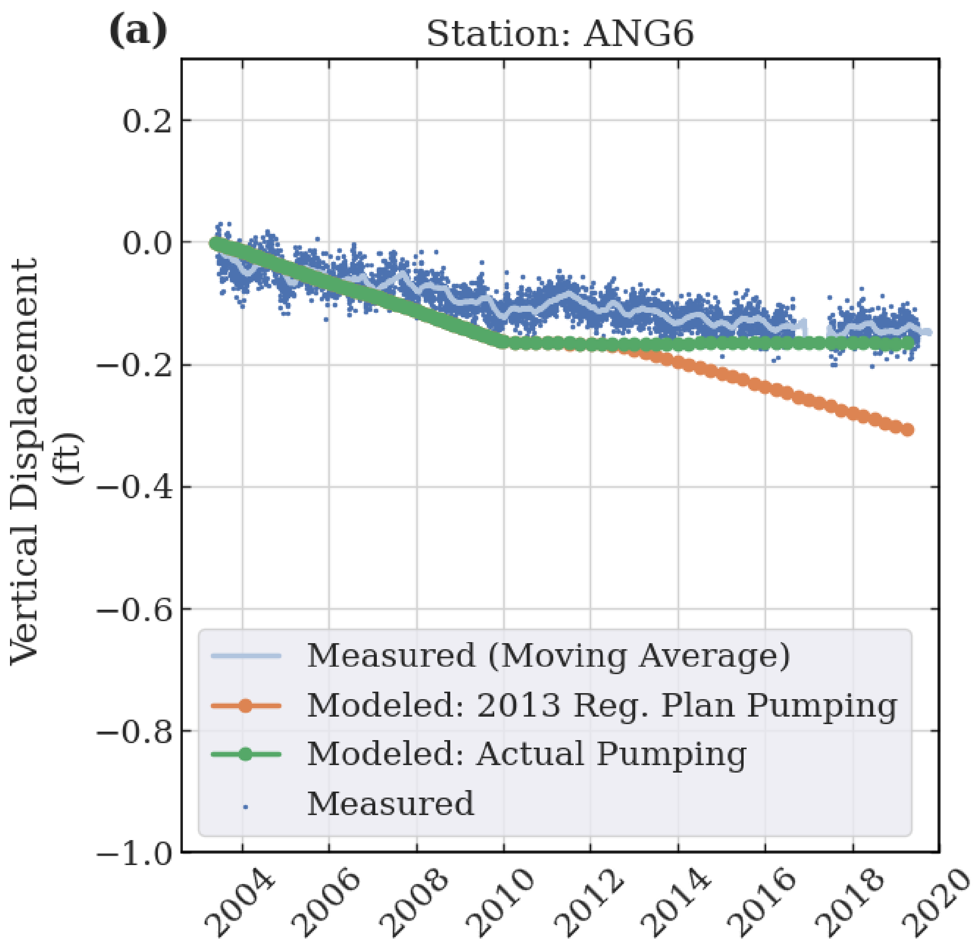
Shah, S.D., Ramage, J.K., and Braun, C.L., 2018, Status of groundwater-level altitudes and long-term groundwater-level changes in the Chicot, Evangeline, and Jasper aquifers, Houston-Galveston region, Texas, 2018: U.S. Geological Survey Scientific Investigations Report 2018–5101, 18 p., https://doi.org/10.3133/sir20185101.

APPENDIX A:
GPS STATION RESULTS



INTERA
GEOSCIENCE & ENGINEERING SOLUTIONS

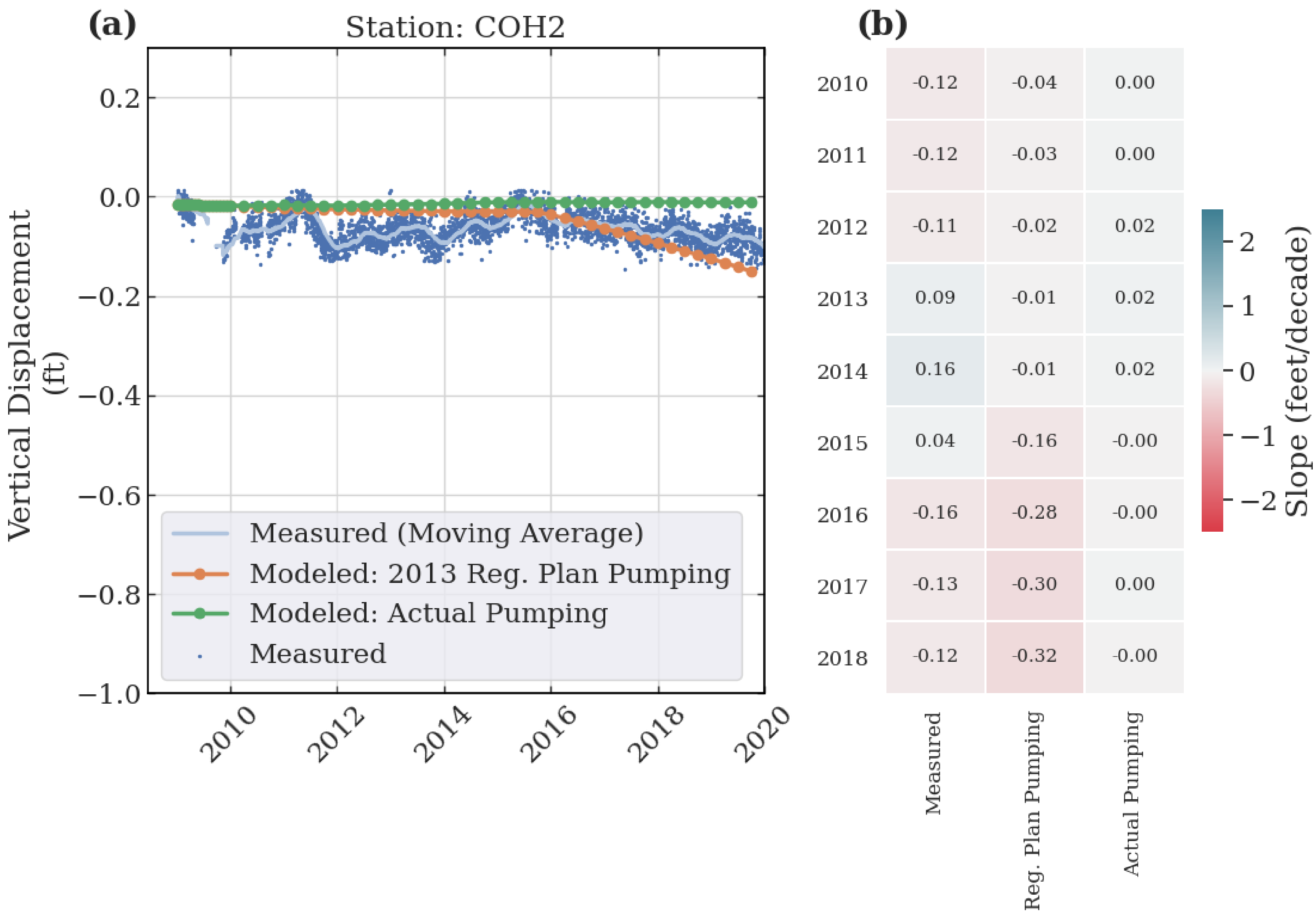

(a)
Station: ANG5
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2004 0.10 -0.26 -0.26
2005 0.19 -0.23 -0.23
2006 0.10 -0.23 -0.23
2007 -0.26 -0.25 -0.25
2008 -0.37 -0.25 -0.25
2009 -0.18 -0.17 -0.17
2010 -0.01 -0.02 -0.02
2011 -0.05 -0.04 -0.01
2012 -0.14 -0.14 0.00
2013 -0.08 -0.19 0.00
2014 -0.03 -0.21 0.01
2015 -0.06 -0.22 0.00
2016 -0.11 -0.22 0.00
2017 -0.06 -0.22 -0.01
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

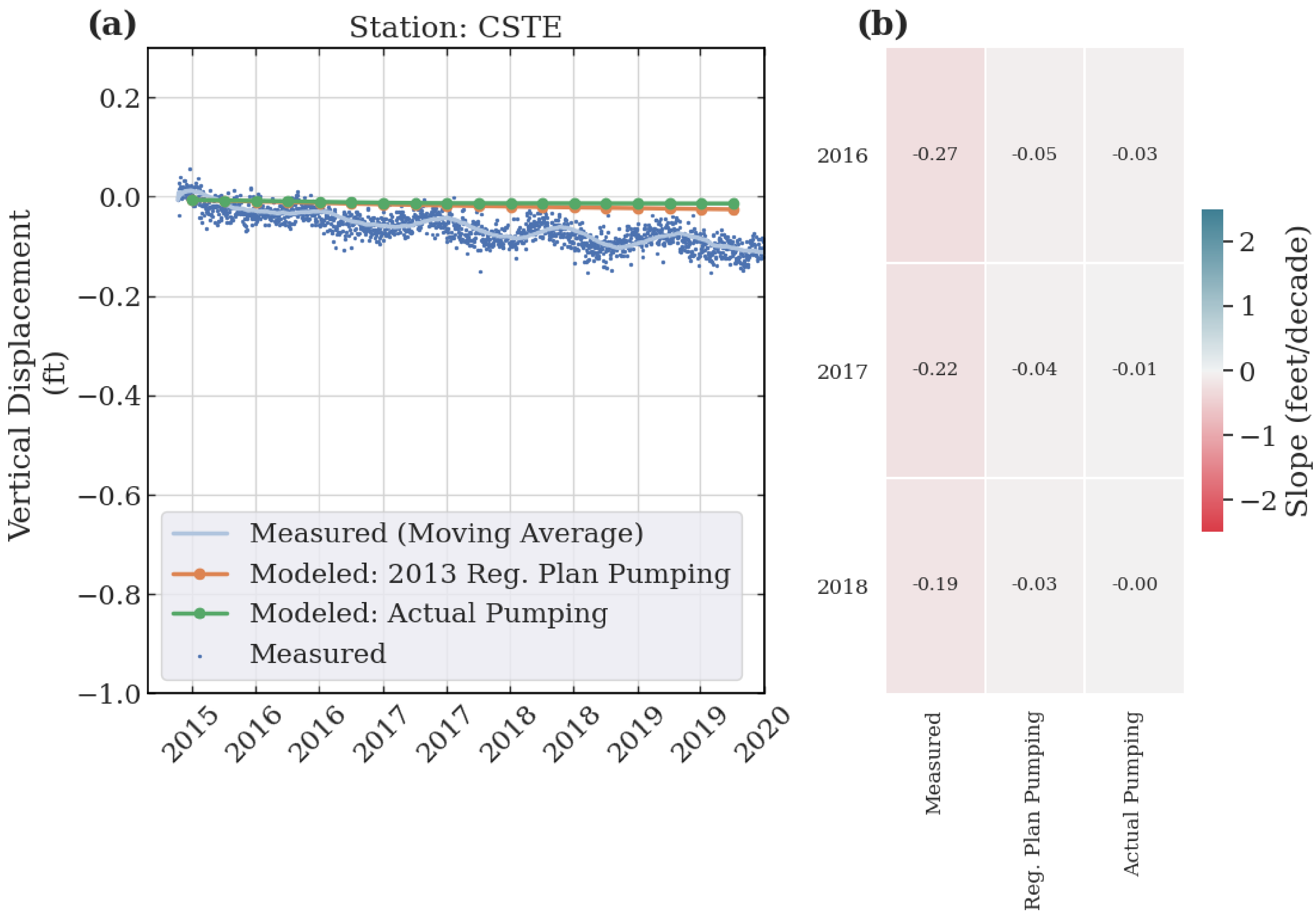


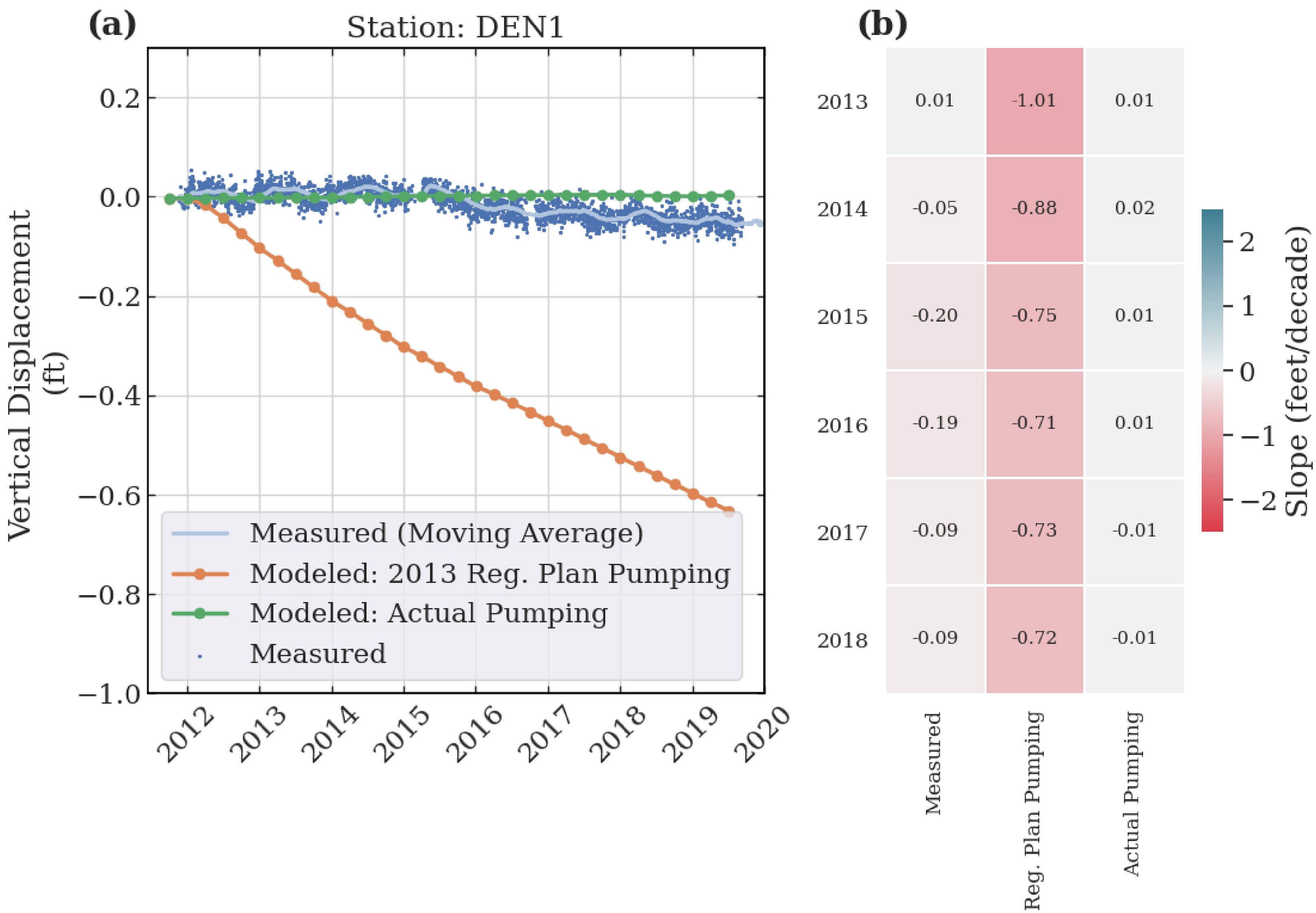
(b)

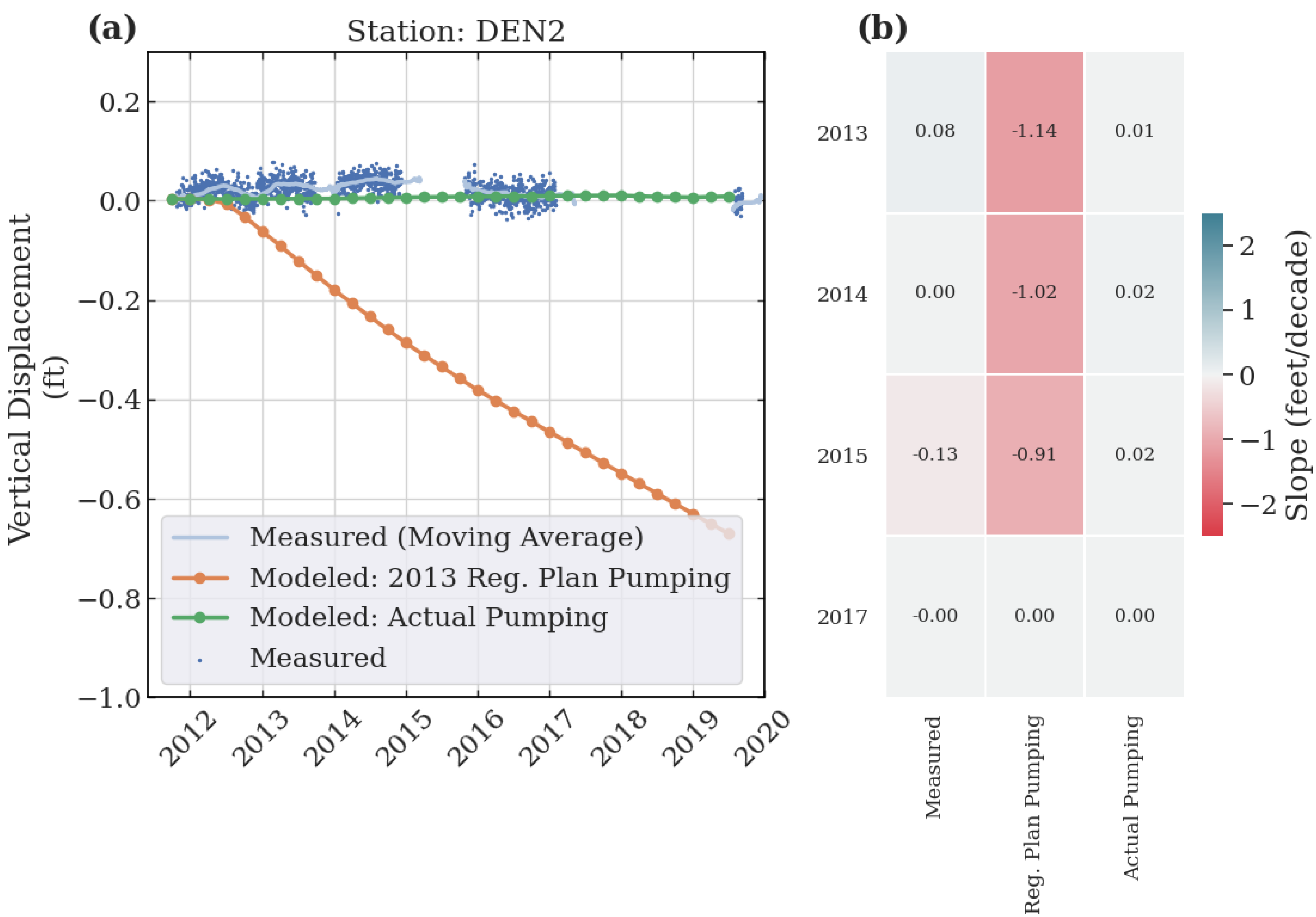
	Measured	Reg. Plan Pumping	Actual Pumping
2004	-0.12	-0.26	-0.26
2005	-0.11	-0.23	-0.23
2006	-0.07	-0.23	-0.23
2007	-0.10	-0.25	-0.25
2008	-0.19	-0.25	-0.25
2009	-0.13	-0.17	-0.17
2010	0.02	-0.02	-0.02
2011	-0.02	-0.04	-0.01
2012	-0.14	-0.14	0.00
2013	-0.09	-0.19	0.00
2014	-0.06	-0.21	0.01
2015	-0.06	-0.22	0.00
2016	-0.05	-0.22	0.00
2017	-0.01	-0.22	-0.01

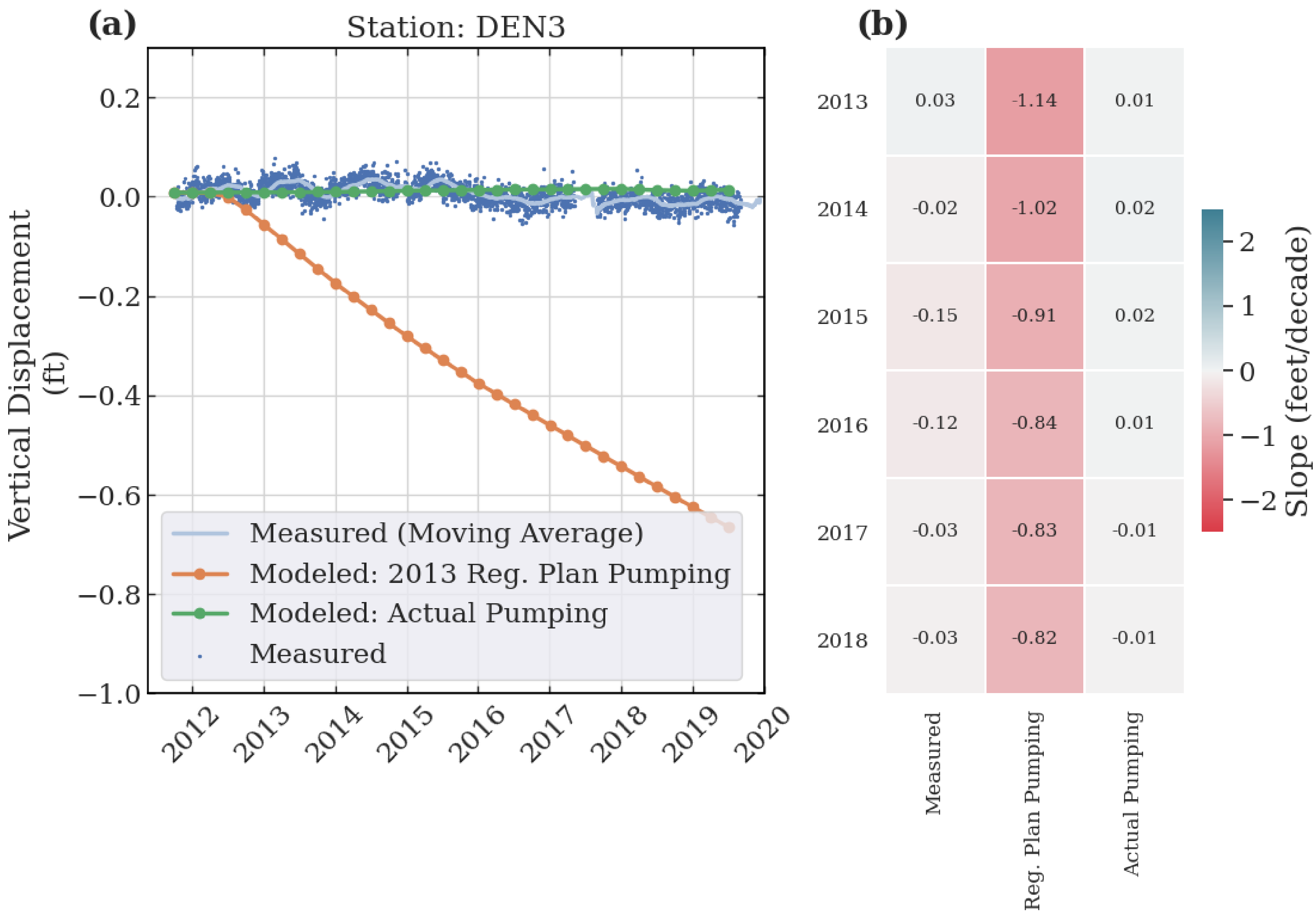
Slope (feet/decade): 2, 1, 0, −1, −2


(a)
Station: COH2
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2010
2012
2014
2016
2018
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2010
2011
2012
2013
2014
2015
2016
2017
2018
-0.12 -0.04 0.00
-0.12 -0.03 0.00
-0.11 -0.02 0.02
0.09 -0.01 0.02
0.16 -0.01 0.02
0.04 -0.16 -0.00
-0.16 -0.28 -0.00
-0.13 -0.30 0.00
-0.12 -0.32 -0.00
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

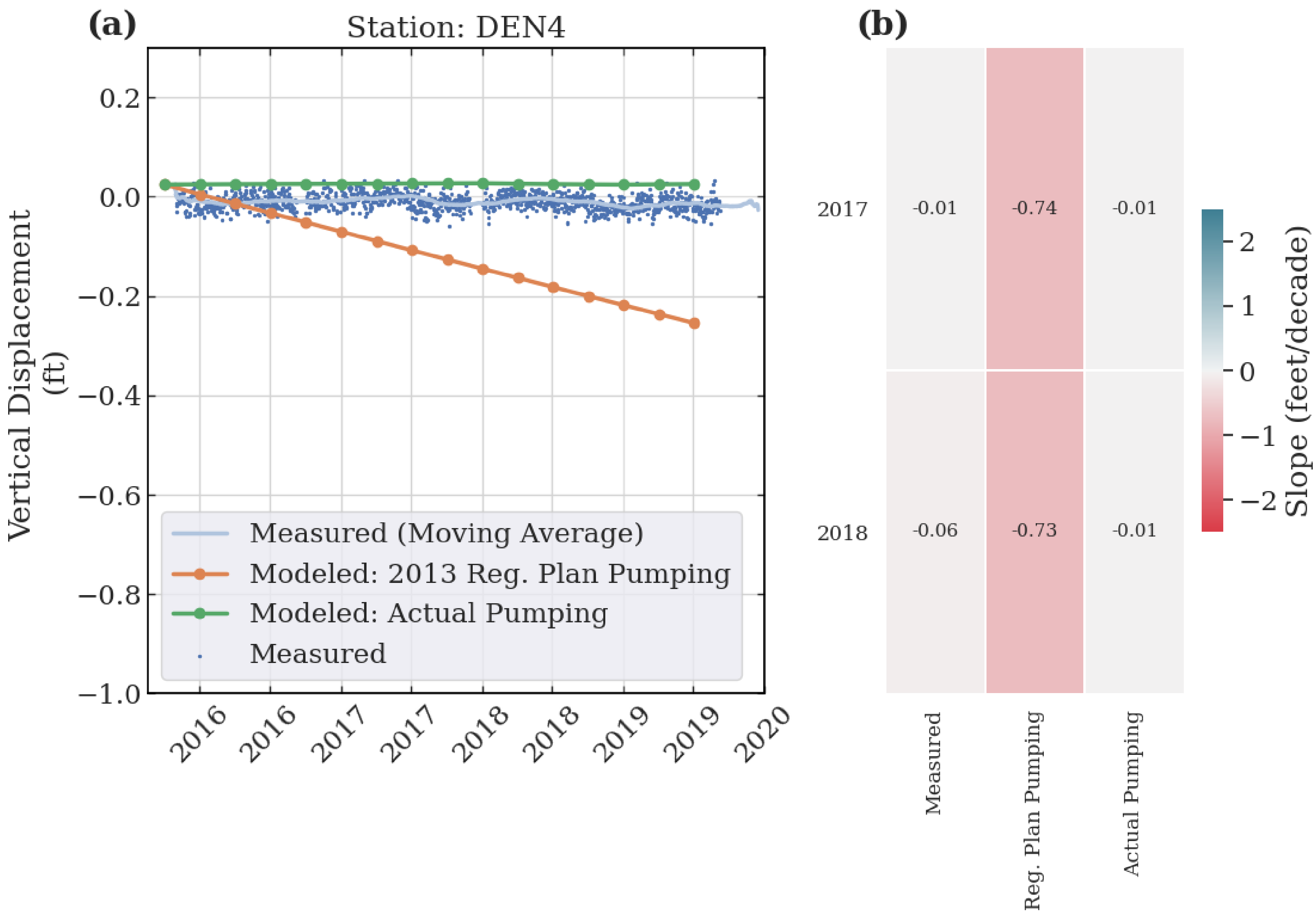

(a)
Station: CSTE
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2015
2016
2016
2017
2017
2018
2018
2019
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2016
2017
2018
-0.27
-0.05
-0.03
-0.22
-0.04
-0.01
-0.19
-0.03
-0.00
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2

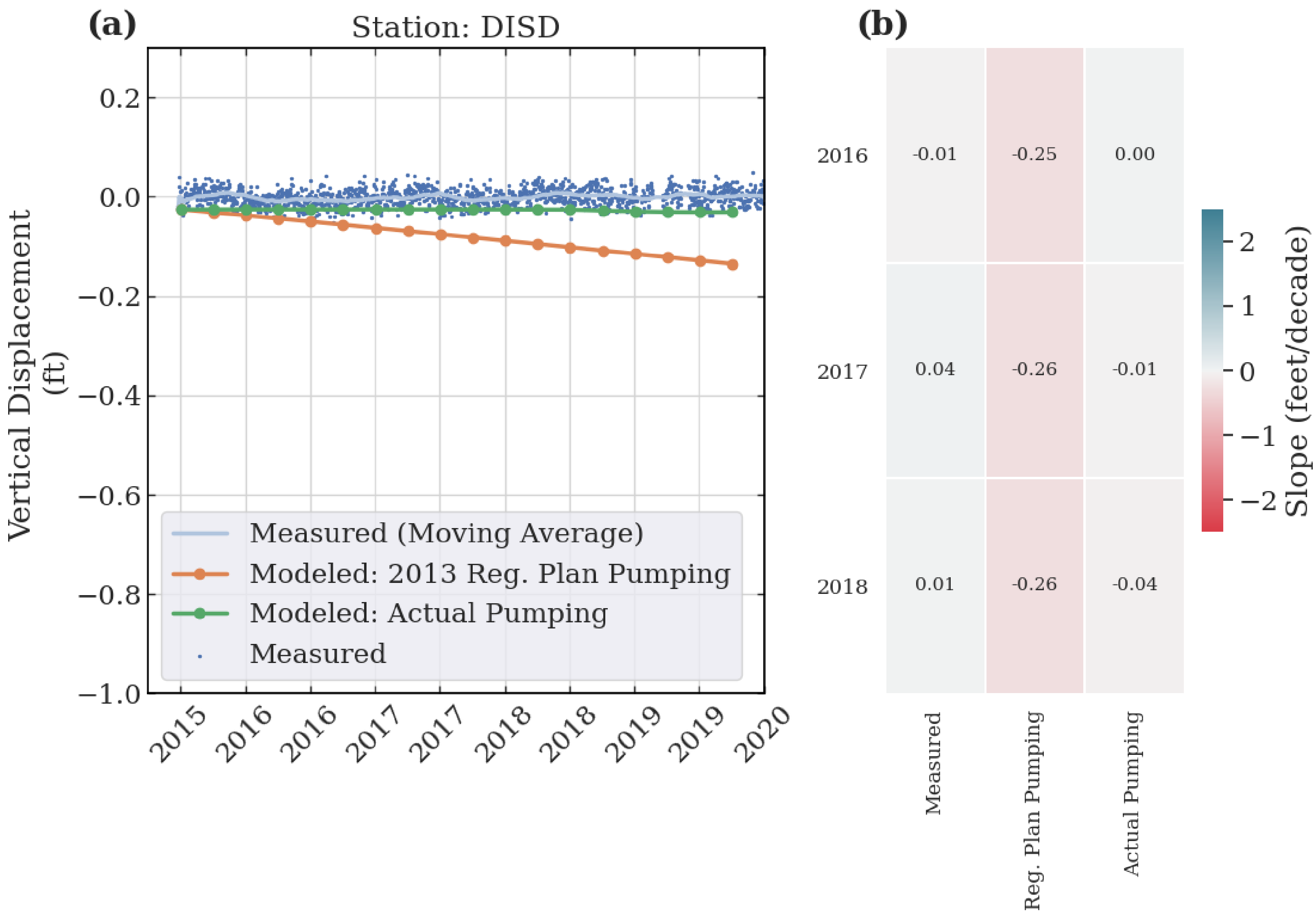

(a)
Station: DEN1
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2012
2013
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2013
0.01
-1.01
0.01
2014
-0.05
-0.88
0.02
2015
-0.20
-0.75
0.01
2016
-0.19
-0.71
0.01
2017
-0.09
-0.73
-0.01
2018
-0.09
-0.72
-0.01
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2

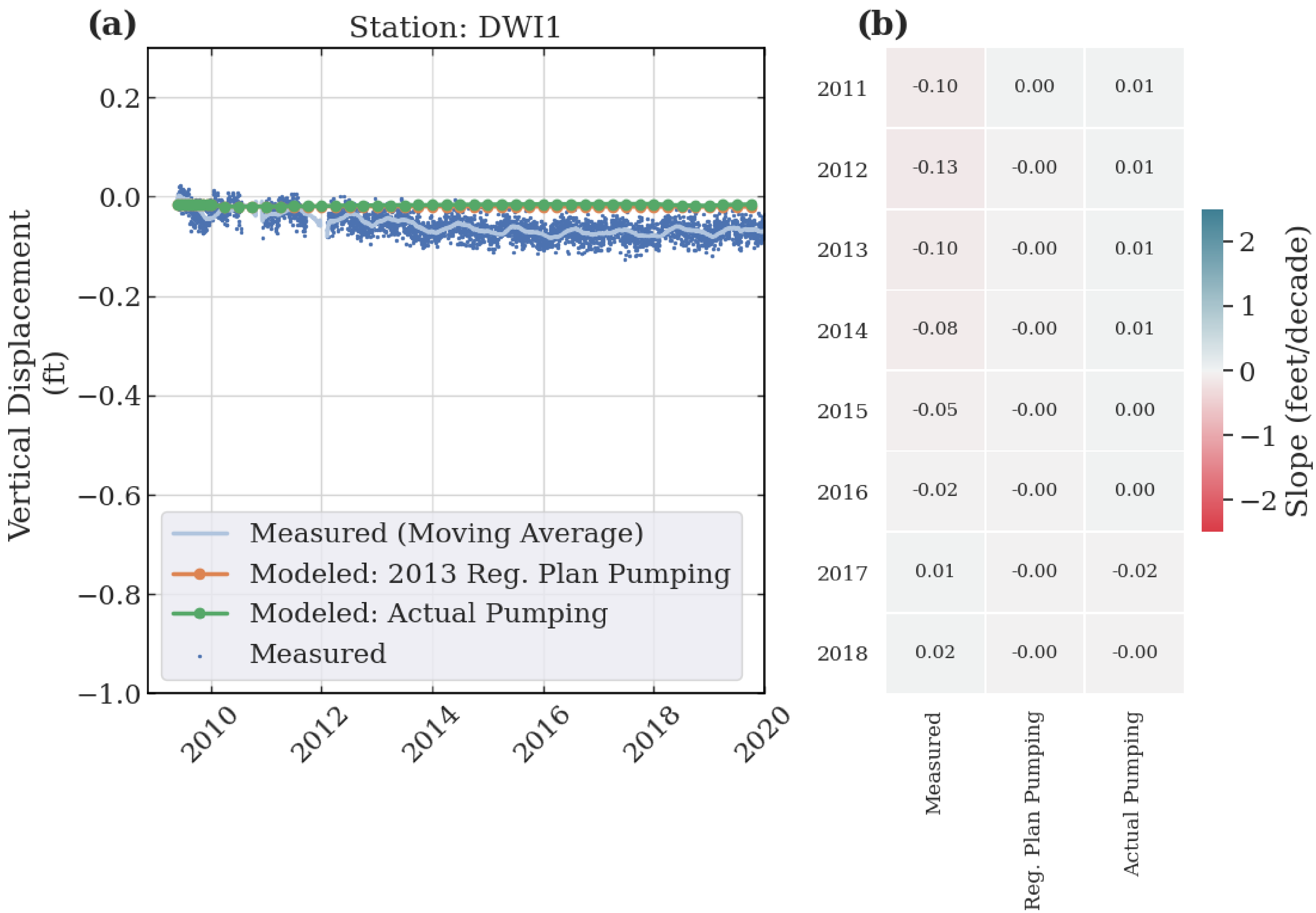

(a)
Station: DEN2
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2012
2013
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2013
2014
2015
2017
0.08
-1.14
0.01
0.00
-1.02
0.02
-0.13
-0.91
0.02
-0.00
0.00
0.00
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

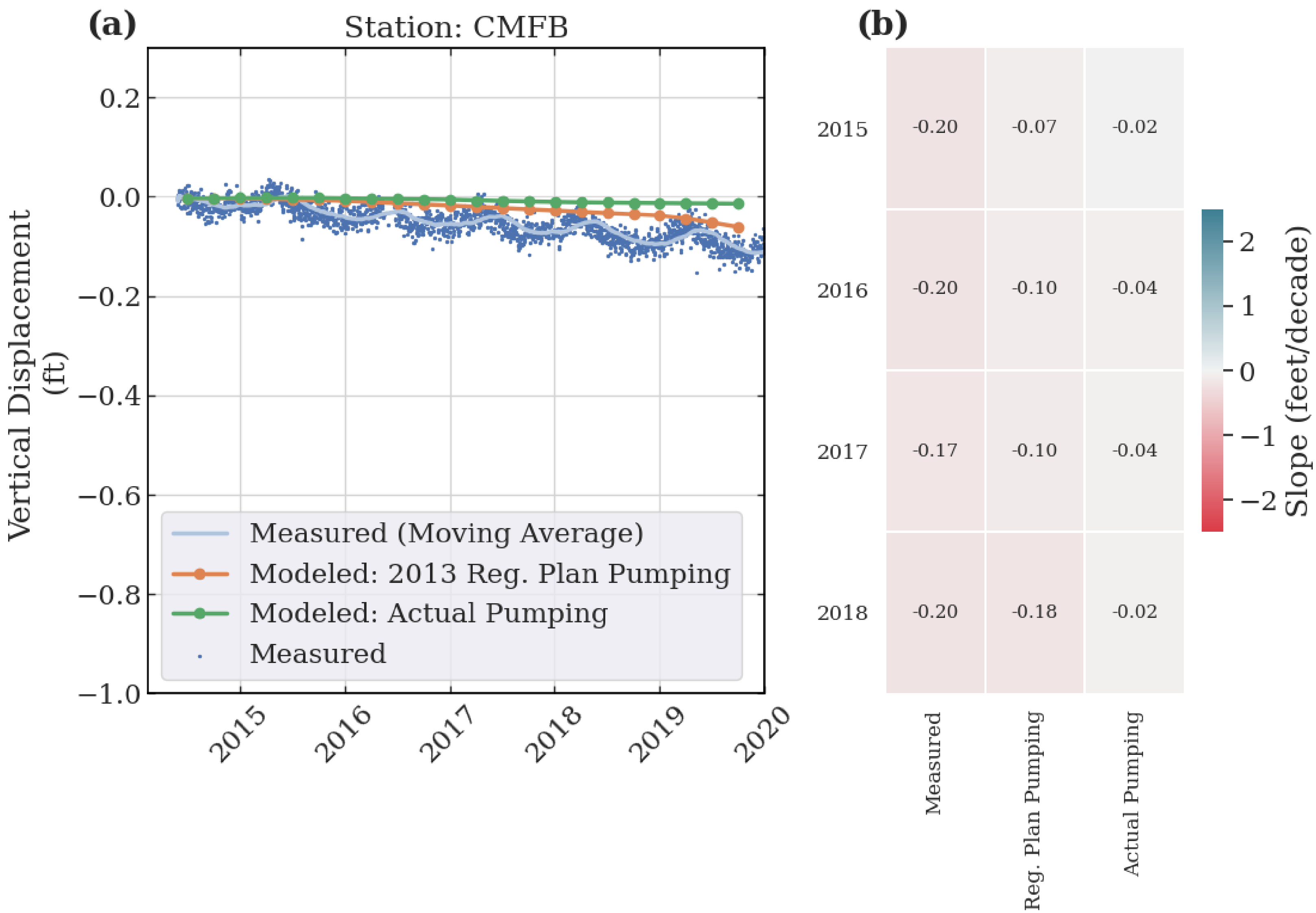


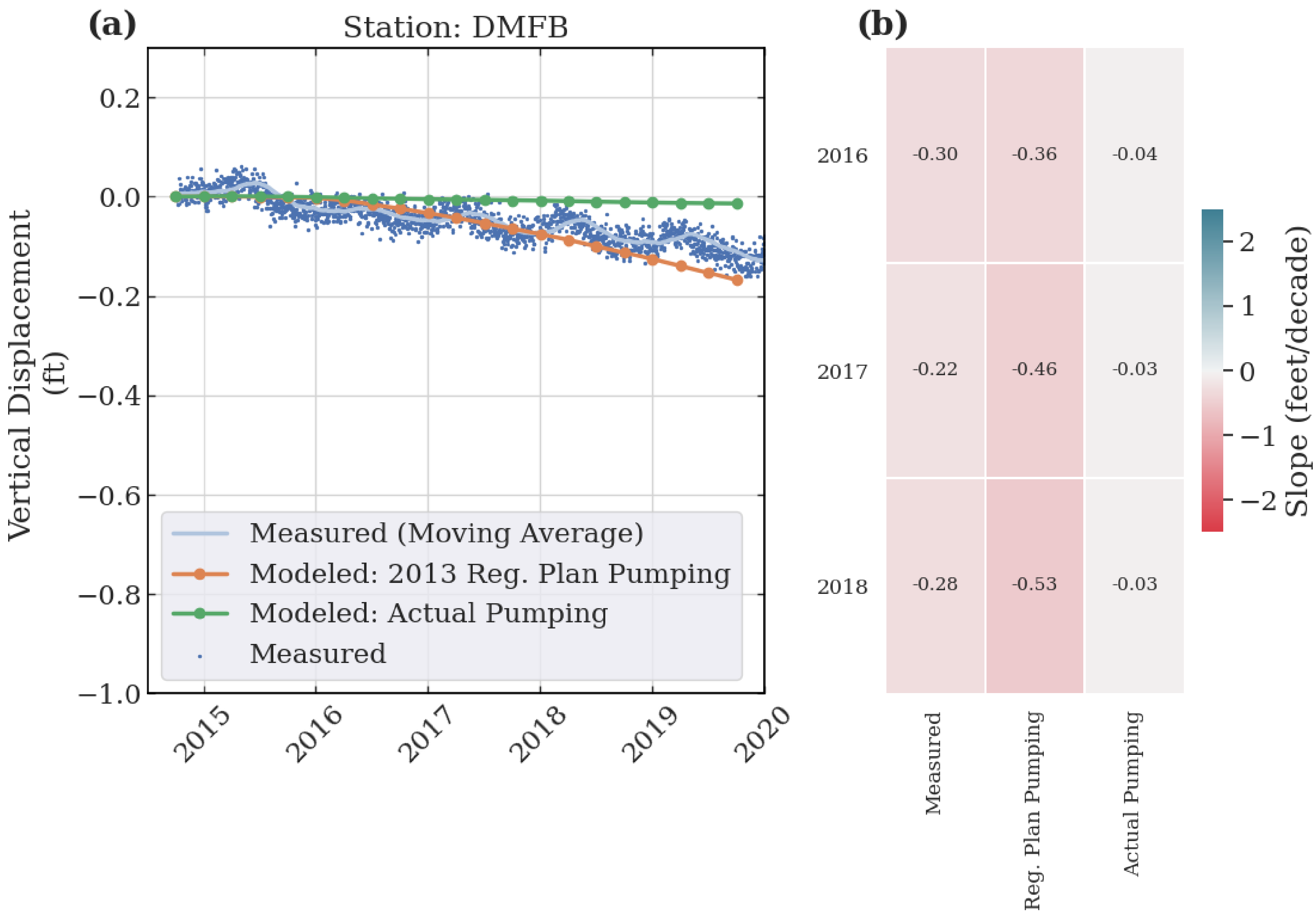
INTERA
GEOSCIENCE & ENGINEERING SOLUTIONS


(a)
Station: DEN4
Vertical Displacement
(ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2016
2016
2017
2017
2018
2018
2019
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2017
2018
-0.01
-0.74
-0.01
-0.06
-0.73
-0.01
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2

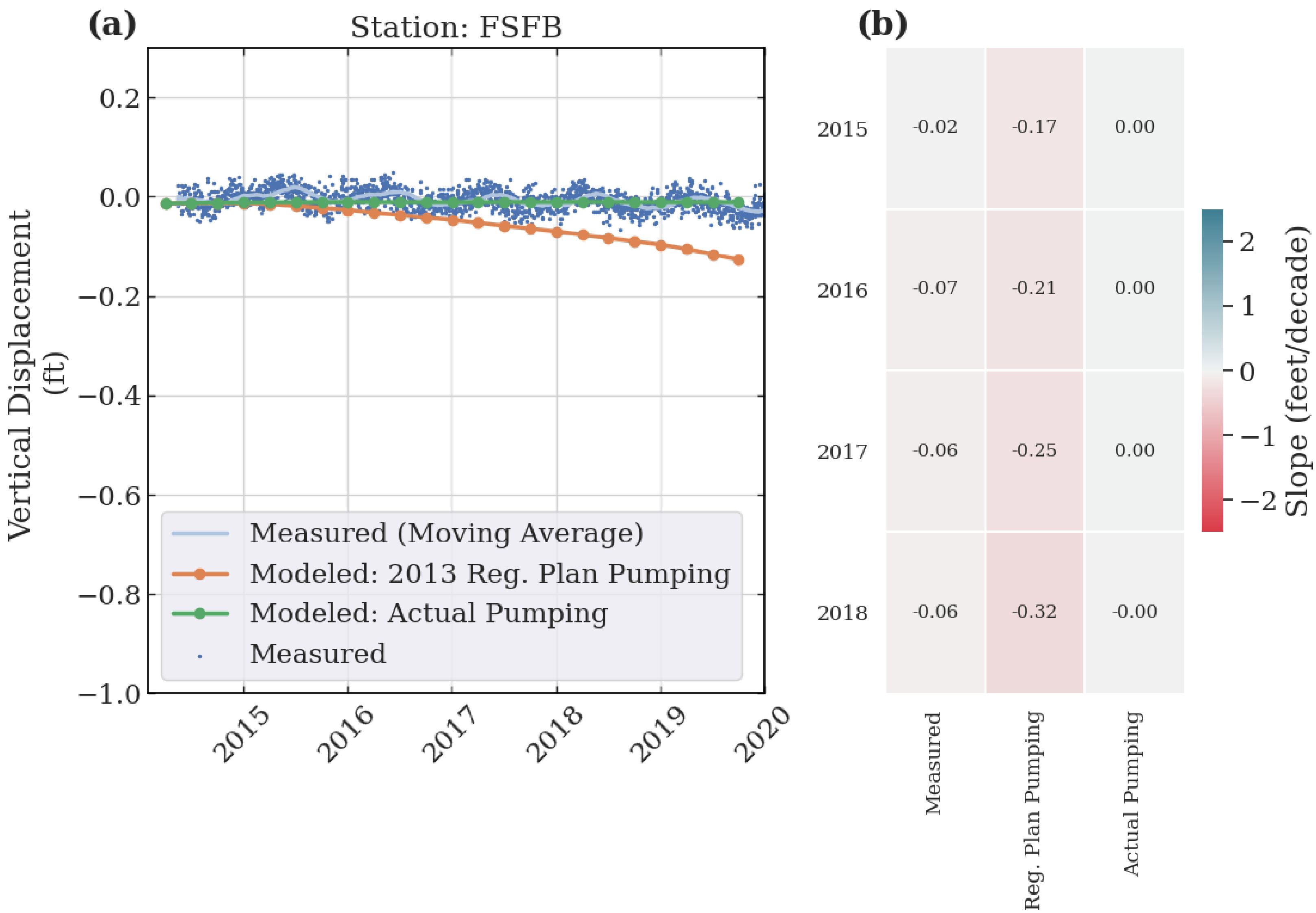

(a)
Station: DISD
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2015
2016
2016
2017
2017
2018
2018
2019
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2016
2017
2018
-0.01
-0.25
0.00
0.04
-0.26
-0.01
0.01
-0.26
-0.04
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2

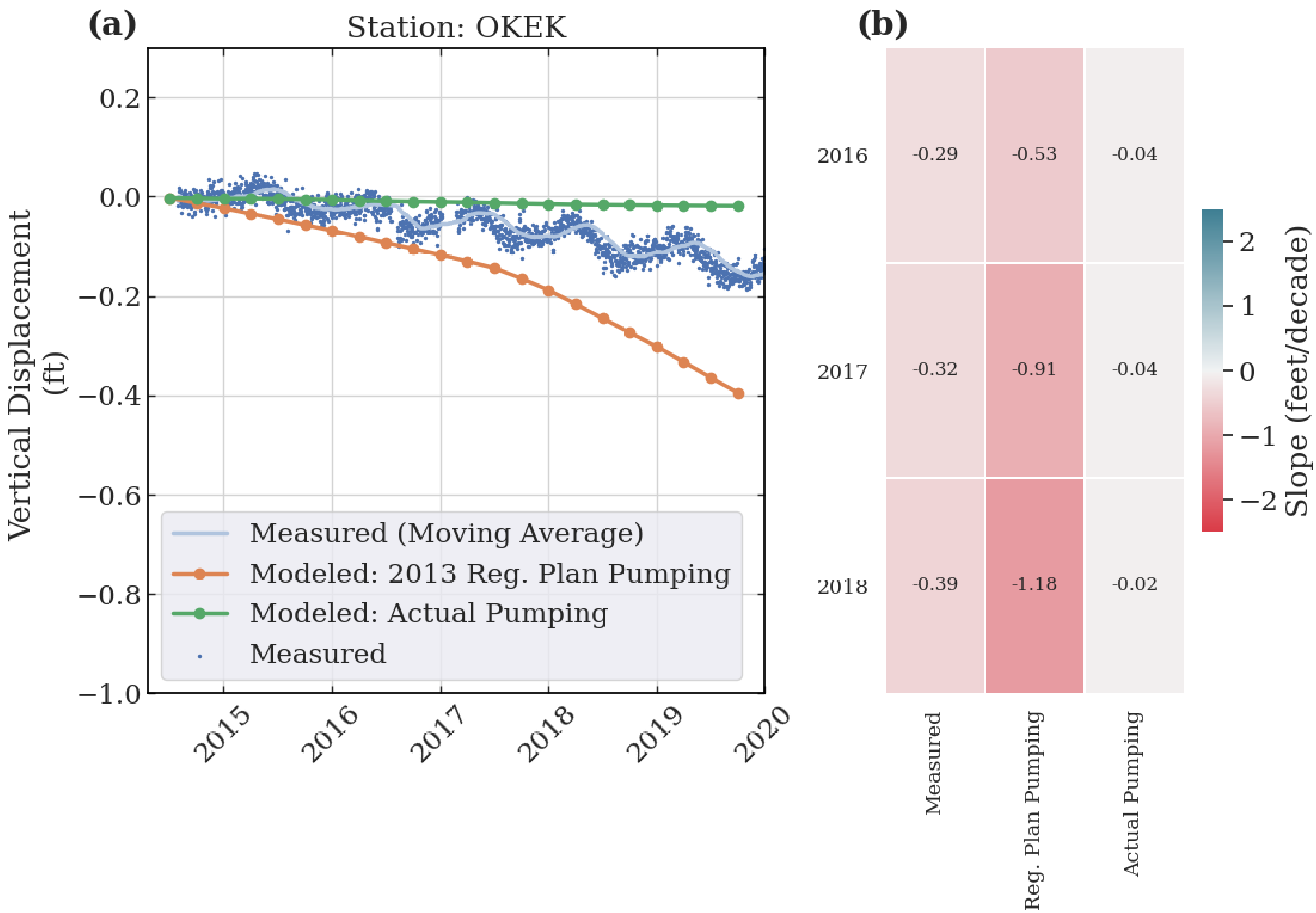

(a)
Station: DWI1
Vertical Displacement
(ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2010
2012
2014
2016
2018
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2011 -0.10 0.00 0.01
2012 -0.13 -0.00 0.01
2013 -0.10 -0.00 0.01
2014 -0.08 -0.00 0.01
2015 -0.05 -0.00 0.00
2016 -0.02 -0.00 0.00
2017 0.01 -0.00 -0.02
2018 0.02 -0.00 -0.00
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)


(a)
Station: CMFB
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2015
2016
2017
2018
-0.20
-0.07
-0.02
-0.20
-0.10
-0.04
-0.17
-0.10
-0.04
-0.20
-0.18
-0.02
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2

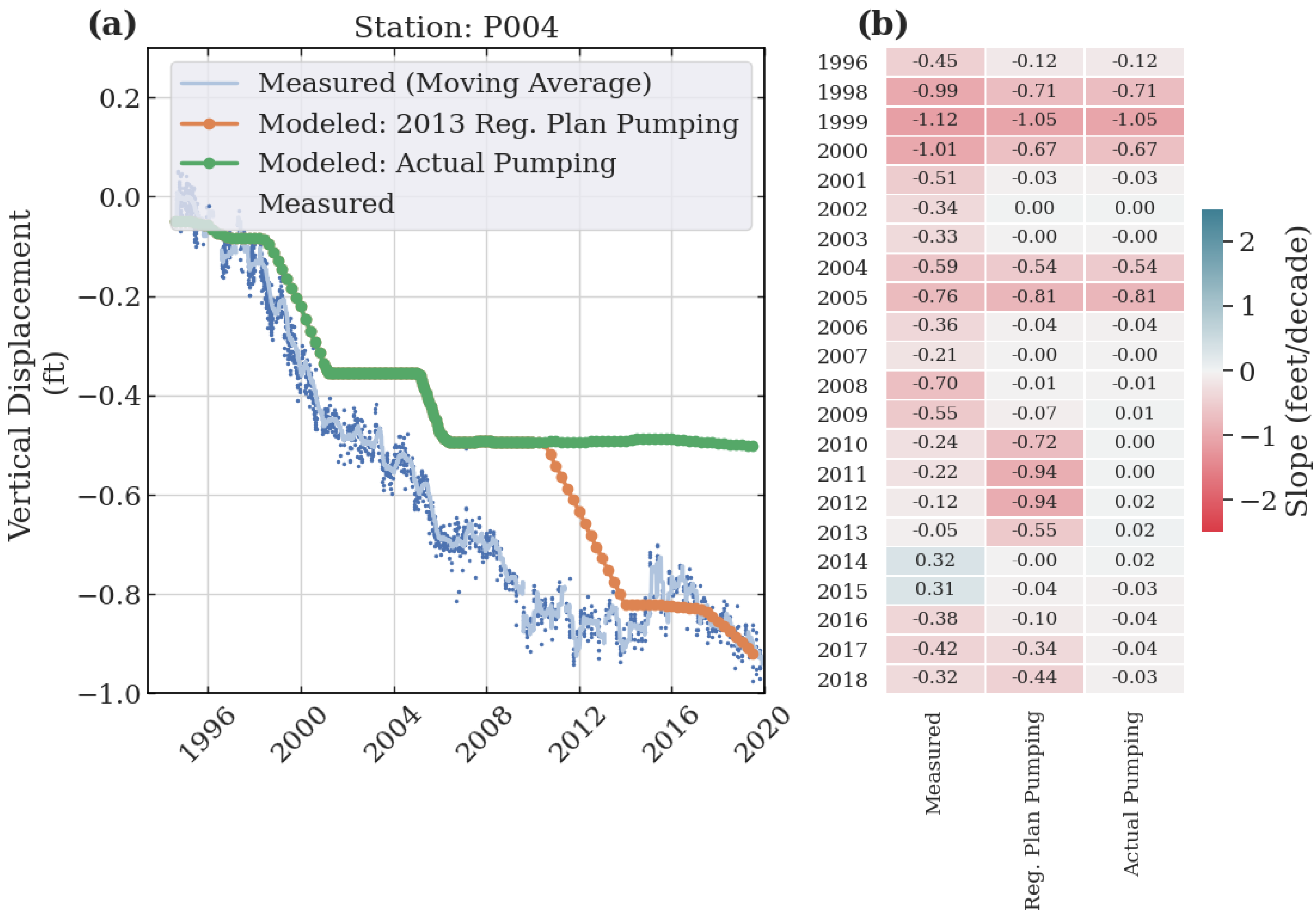


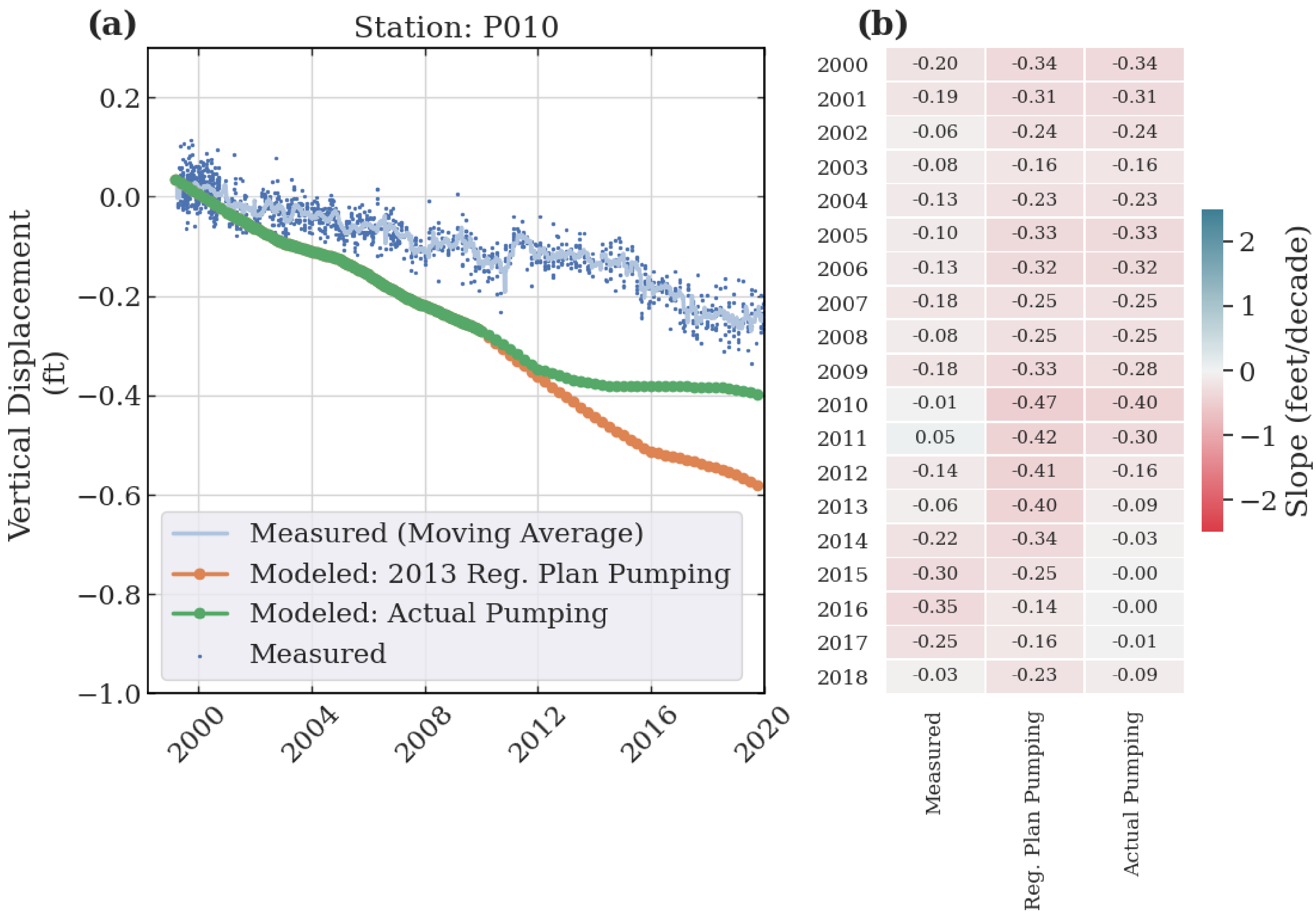
INTERA
GEOSCIENCE & ENGINEERING SOLUTIONS


(a)
Station: FSFB
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2015
2016
2017
2018
-0.02
-0.17
0.00
-0.07
-0.21
0.00
-0.06
-0.25
0.00
-0.06
-0.32
-0.00
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

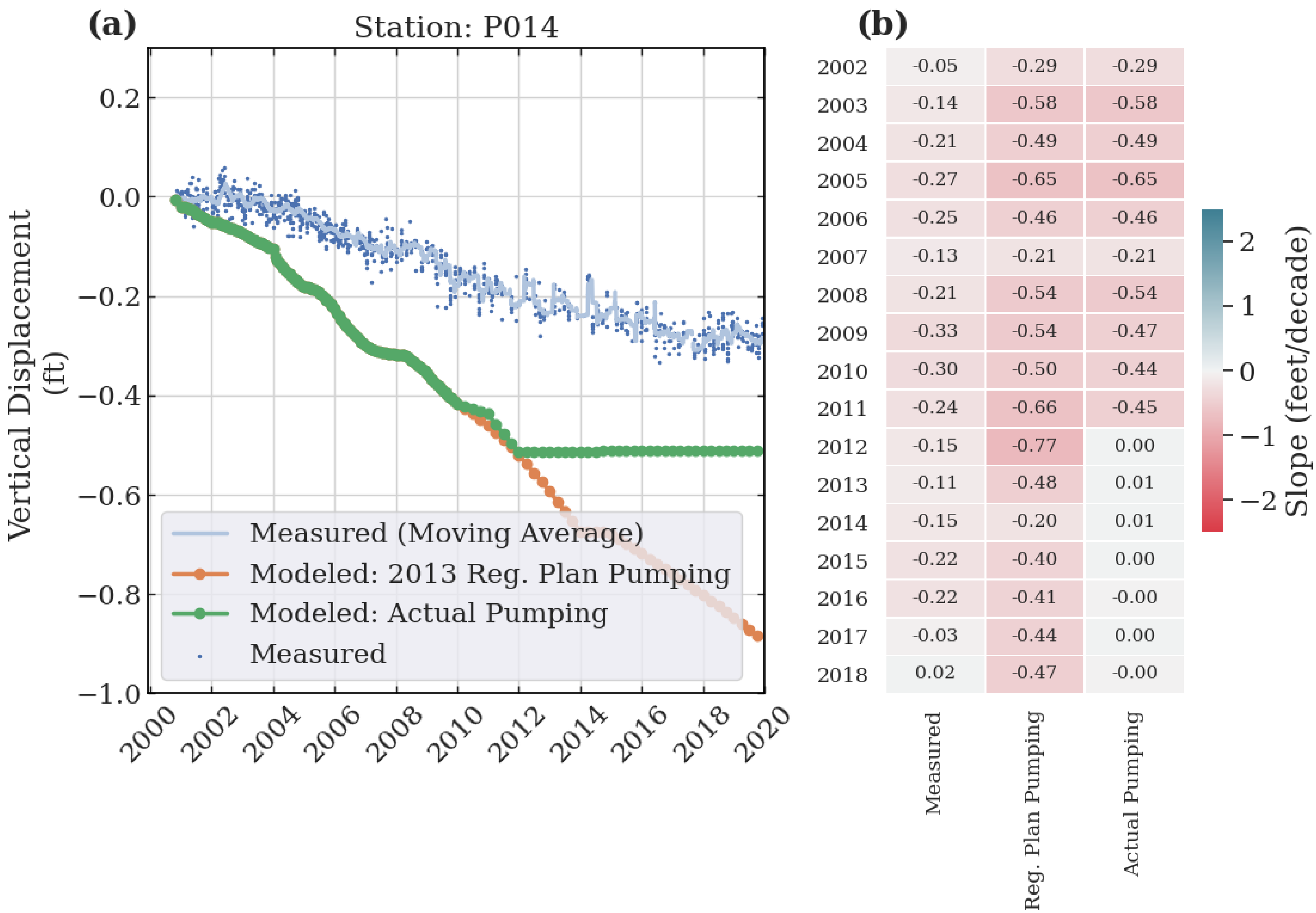


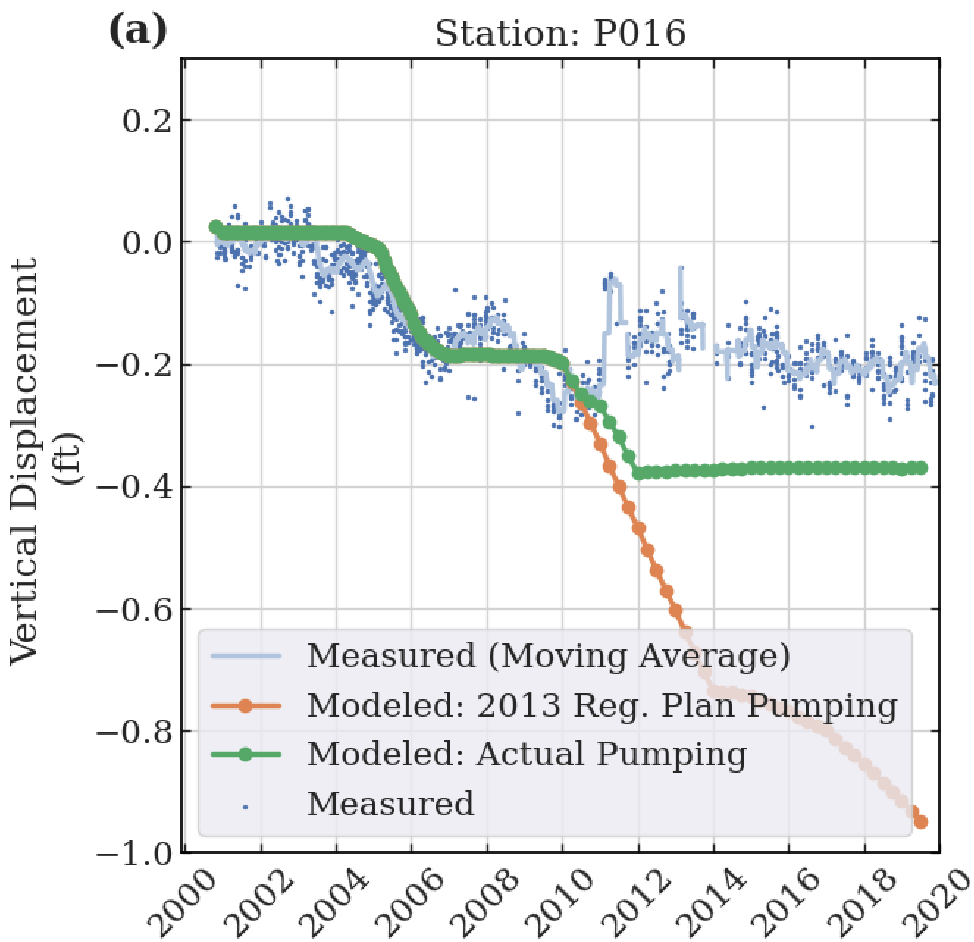
(a)
Station: OKEK
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2016
2017
2018
-0.29
-0.53
-0.04
-0.32
-0.91
-0.04
-0.39
-1.18
-0.02
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)


(a)
Station: P004
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
1996
2000
2004
2008
2012
2016
2020
(b)
Measured
Reg. Plan Pumping
Actual Pumping
1996 -0.45 -0.12 -0.12
1998 -0.99 -0.71 -0.71
1999 -1.12 -1.05 -1.05
2000 -1.01 -0.67 -0.67
2001 -0.51 -0.03 -0.03
2002 -0.34 0.00 0.00
2003 -0.33 -0.00 -0.00
2004 -0.59 -0.54 -0.54
2005 -0.76 -0.81 -0.81
2006 -0.36 -0.04 -0.04
2007 -0.21 -0.00 -0.00
2008 -0.70 -0.01 -0.01
2009 -0.55 -0.07 0.01
2010 -0.24 -0.72 0.00
2011 -0.22 -0.94 0.00
2012 -0.12 -0.94 0.02
2013 -0.05 -0.55 0.02
2014 0.32 -0.00 0.02
2015 0.31 -0.04 -0.03
2016 -0.38 -0.10 -0.04
2017 -0.42 -0.34 -0.04
2018 -0.32 -0.44 -0.03
Slope (feet/decade)
2
1
0
−1
−2



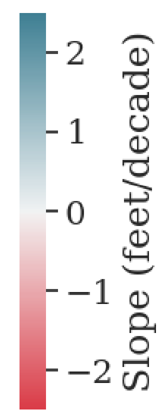
INTERA
GEOSCIENCE & ENGINEERING SOLUTIONS


(a)
Station: P014
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2002 -0.05 -0.29 -0.29
2003 -0.14 -0.58 -0.58
2004 -0.21 -0.49 -0.49
2005 -0.27 -0.65 -0.65
2006 -0.25 -0.46 -0.46
2007 -0.13 -0.21 -0.21
2008 -0.21 -0.54 -0.54
2009 -0.33 -0.54 -0.47
2010 -0.30 -0.50 -0.44
2011 -0.24 -0.66 -0.45
2012 -0.15 -0.77 0.00
2013 -0.11 -0.48 0.01
2014 -0.15 -0.20 0.01
2015 -0.22 -0.40 0.00
2016 -0.22 -0.41 -0.00
2017 -0.03 -0.44 0.00
2018 0.02 -0.47 -0.00
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

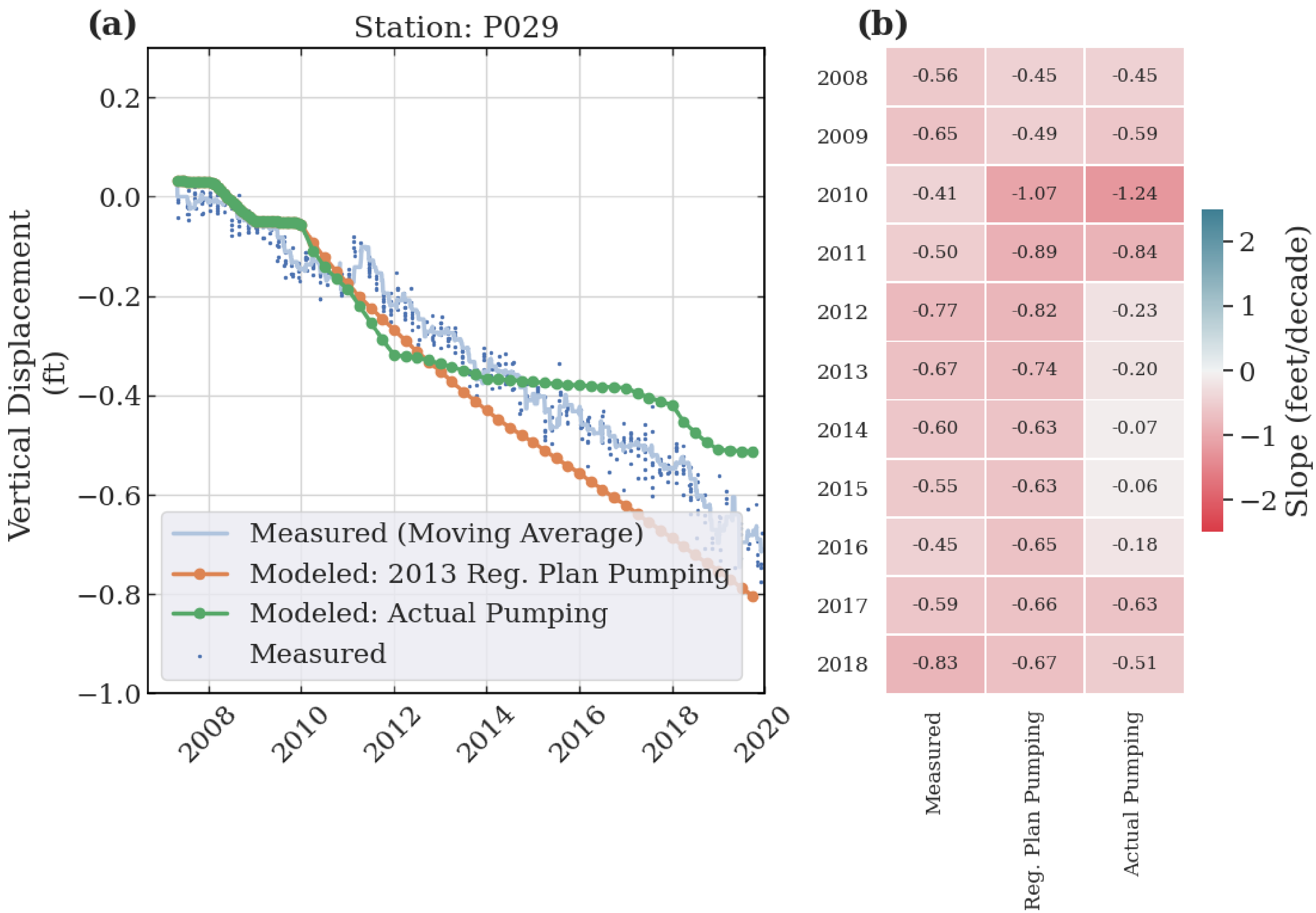


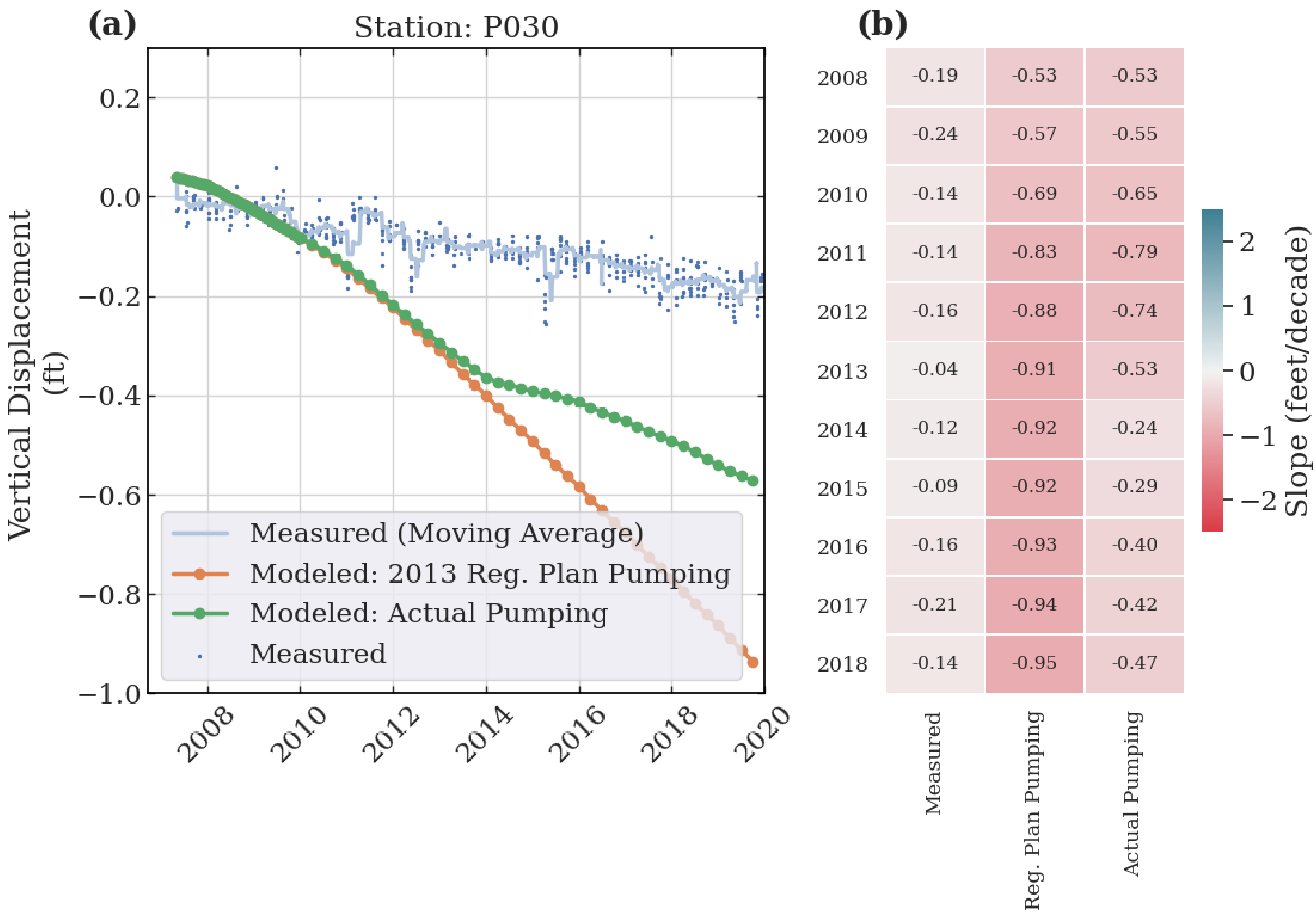
(b)

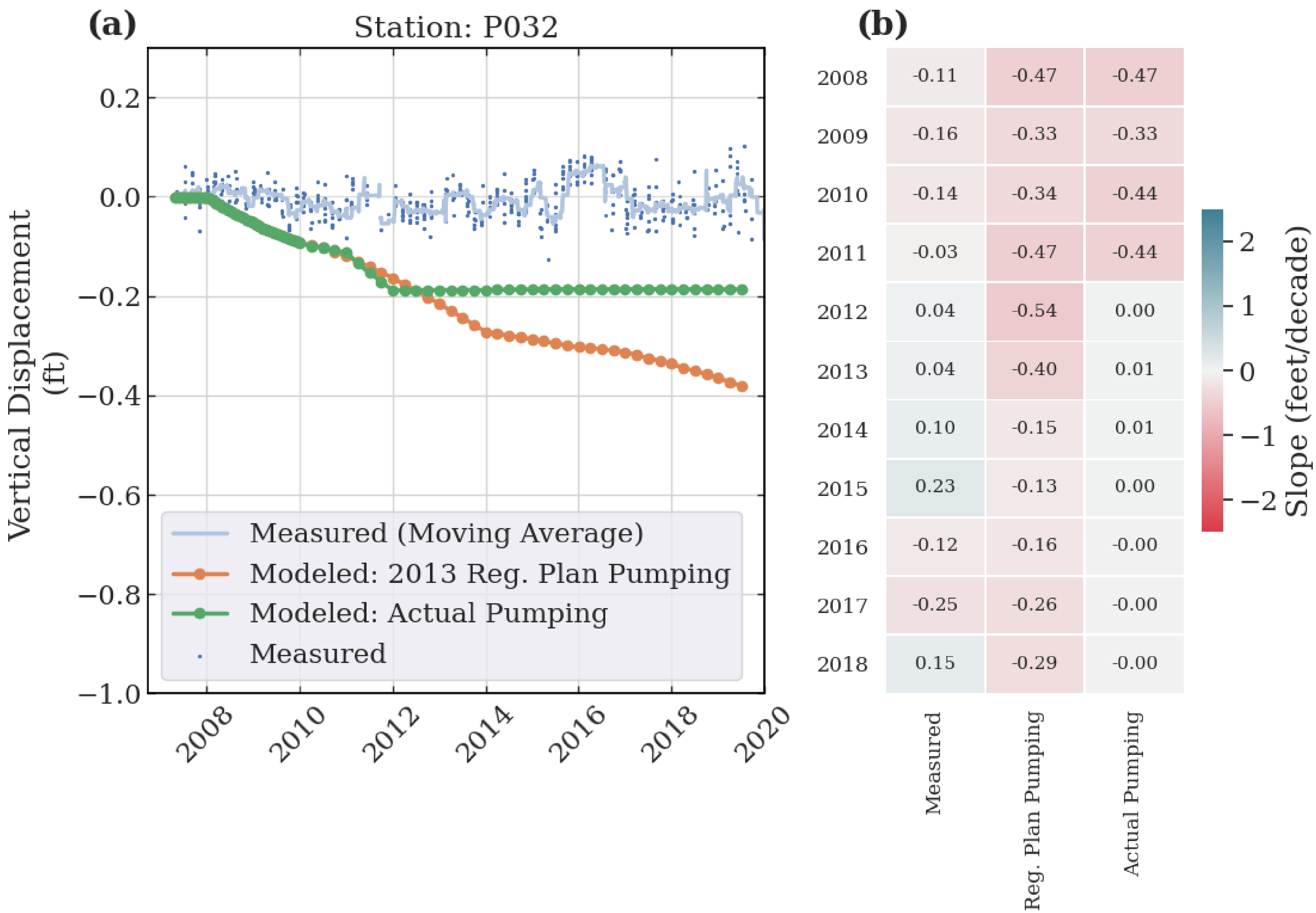
	Measured	Reg. Plan Pumping	Actual Pumping
2002	-0.12	0.00	0.00
2003	-0.29	-0.09	-0.09
2004	-0.45	-0.66	-0.66
2005	-0.64	-1.03	-1.03
2006	-0.24	-0.25	-0.25
2007	0.04	-0.00	-0.00
2008	-0.43	-0.04	-0.04
2009	-0.43	-0.53	-0.41
2010	0.32	-1.36	-0.79
2011	0.32	-1.38	-0.64
2013	-0.04	-0.81	0.02
2014	-0.19	-0.16	0.02
2015	-0.13	-0.27	0.00
2016	-0.12	-0.41	0.00
2017	-0.01	-0.57	-0.00
2018	0.01	-0.62	-0.01

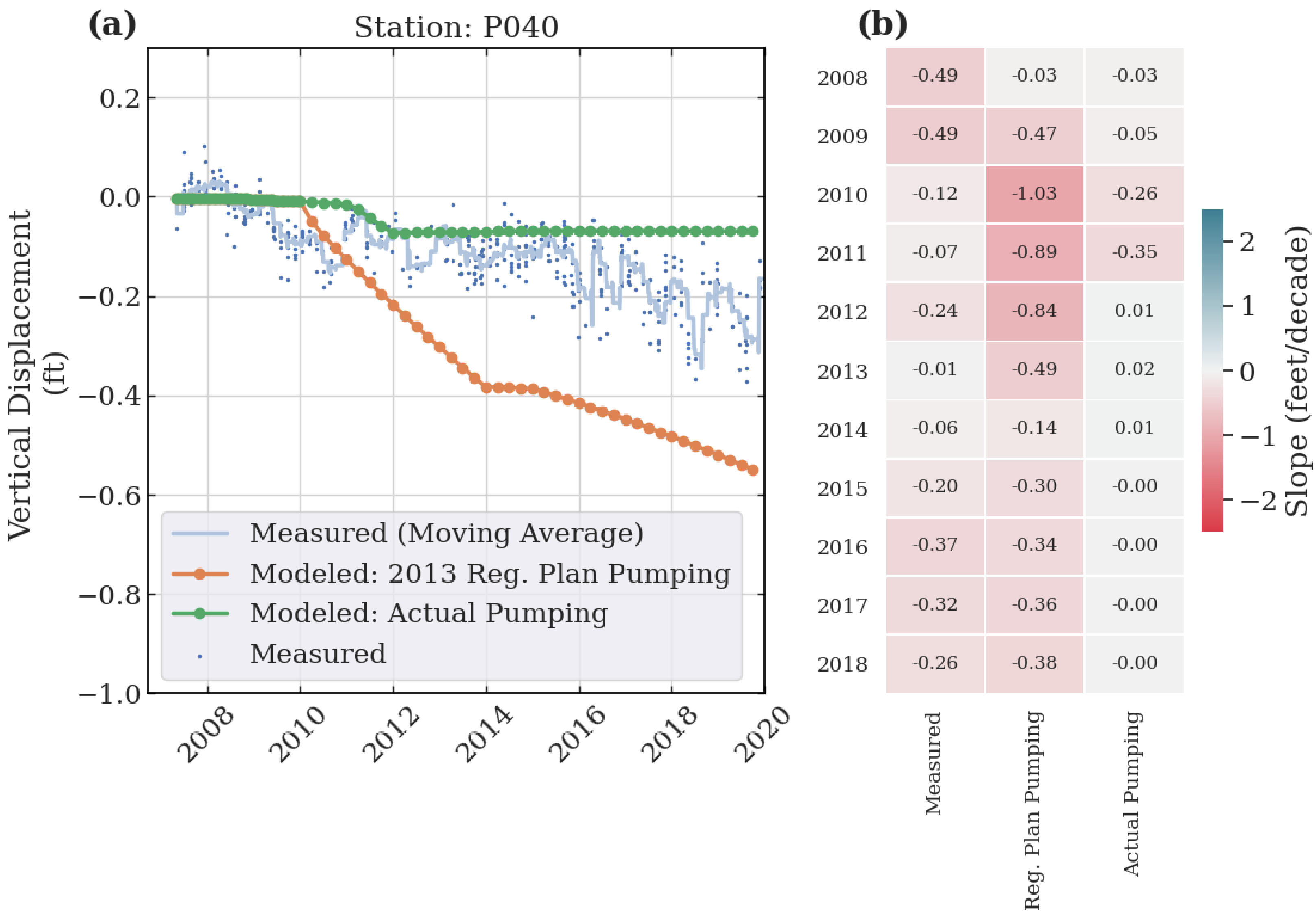


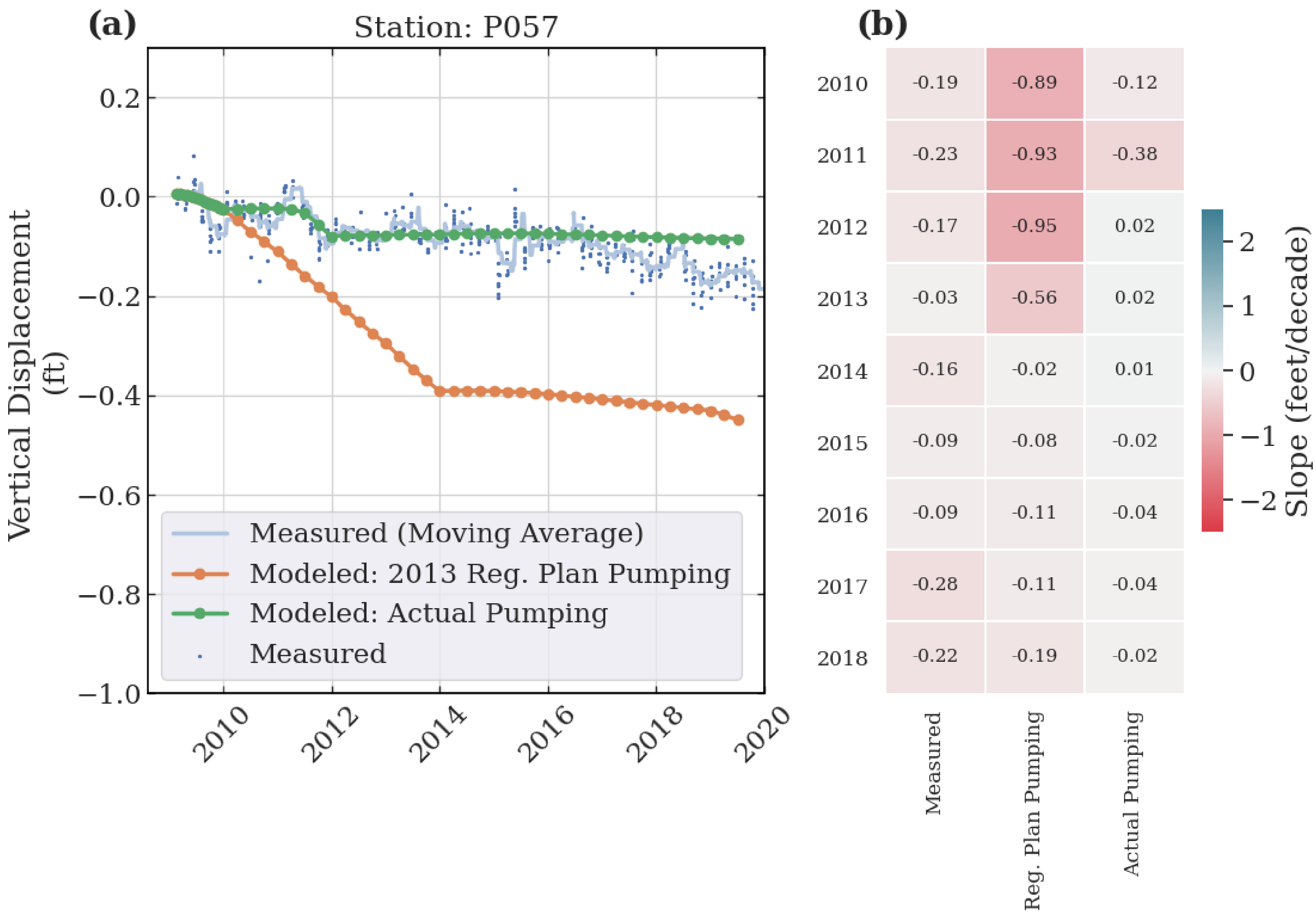
INTERA
GEOSCIENCE & ENGINEERING SOLUTIONS

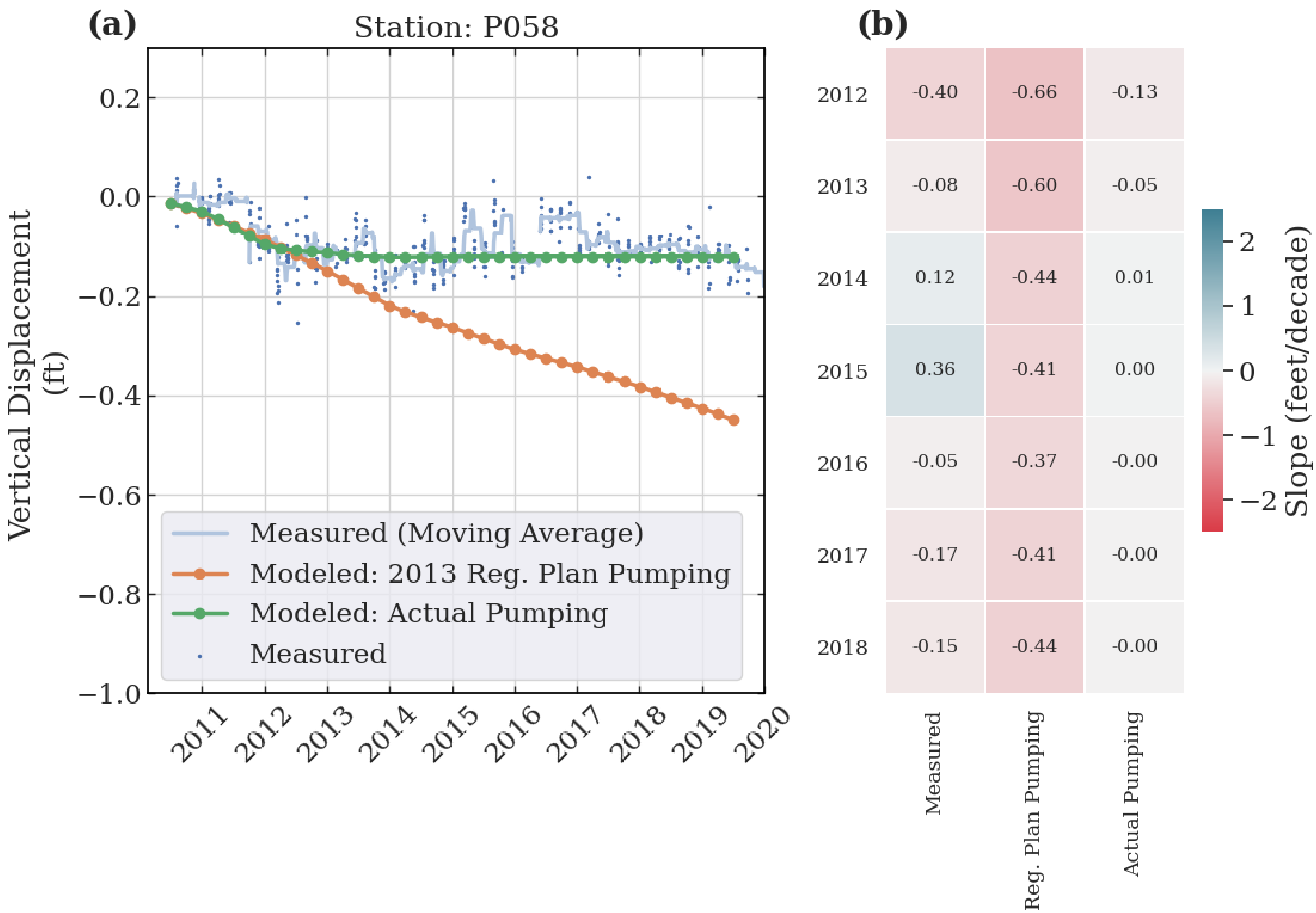

(a)
Station: P029
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2008
2010
2012
2014
2016
2018
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2008 -0.56 -0.45 -0.45
2009 -0.65 -0.49 -0.59
2010 -0.41 -1.07 -1.24
2011 -0.50 -0.89 -0.84
2012 -0.77 -0.82 -0.23
2013 -0.67 -0.74 -0.20
2014 -0.60 -0.63 -0.07
2015 -0.55 -0.63 -0.06
2016 -0.45 -0.65 -0.18
2017 -0.59 -0.66 -0.63
2018 -0.83 -0.67 -0.51
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

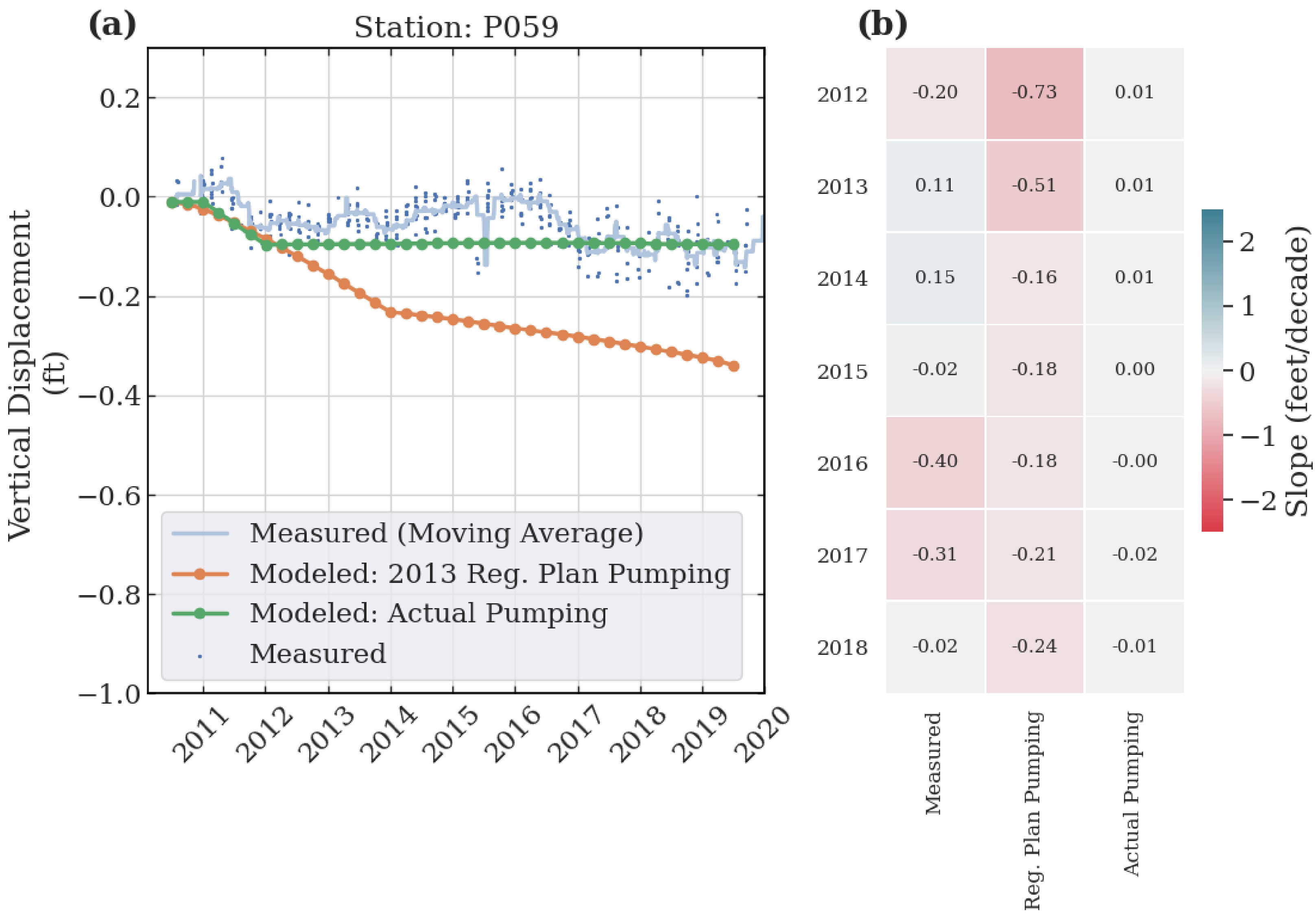

(a)
Station: P030
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2008
2010
2012
2014
2016
2018
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2008 -0.19 -0.53 -0.53
2009 -0.24 -0.57 -0.55
2010 -0.14 -0.69 -0.65
2011 -0.14 -0.83 -0.79
2012 -0.16 -0.88 -0.74
2013 -0.04 -0.91 -0.53
2014 -0.12 -0.92 -0.24
2015 -0.09 -0.92 -0.29
2016 -0.16 -0.93 -0.40
2017 -0.21 -0.94 -0.42
2018 -0.14 -0.95 -0.47
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

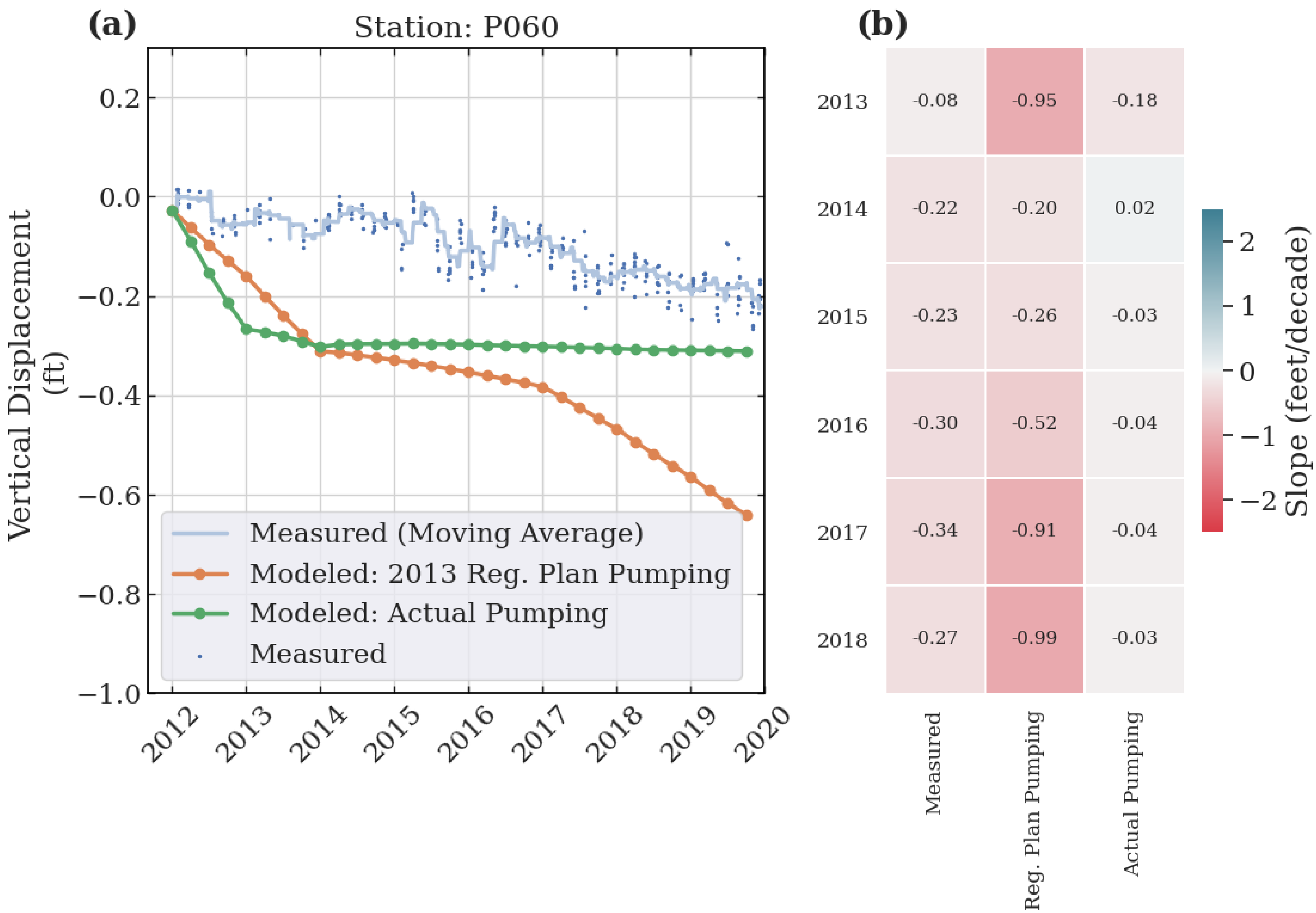

(a)
Station: P032
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2008
2010
2012
2014
2016
2018
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2008 -0.11 -0.47 -0.47
2009 -0.16 -0.33 -0.33
2010 -0.14 -0.34 -0.44
2011 -0.03 -0.47 -0.44
2012 0.04 -0.54 0.00
2013 0.04 -0.40 0.01
2014 0.10 -0.15 0.01
2015 0.23 -0.13 0.00
2016 -0.12 -0.16 -0.00
2017 -0.25 -0.26 -0.00
2018 0.15 -0.29 -0.00
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

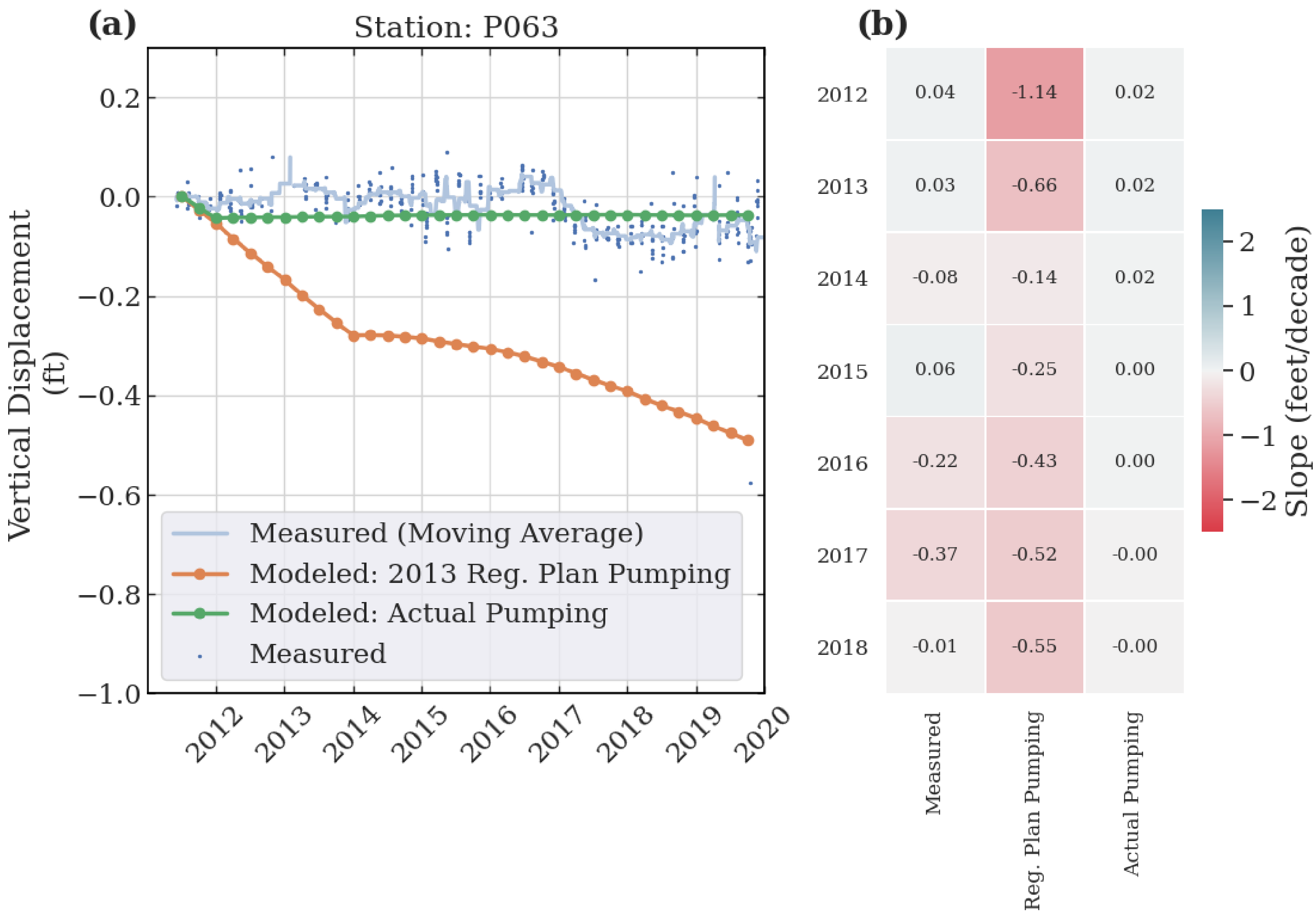

(a)
Station: P040
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2008
2010
2012
2014
2016
2018
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2008 -0.49 -0.03 -0.03
2009 -0.49 -0.47 -0.05
2010 -0.12 -1.03 -0.26
2011 -0.07 -0.89 -0.35
2012 -0.24 -0.84 0.01
2013 -0.01 -0.49 0.02
2014 -0.06 -0.14 0.01
2015 -0.20 -0.30 -0.00
2016 -0.37 -0.34 -0.00
2017 -0.32 -0.36 -0.00
2018 -0.26 -0.38 -0.00
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2

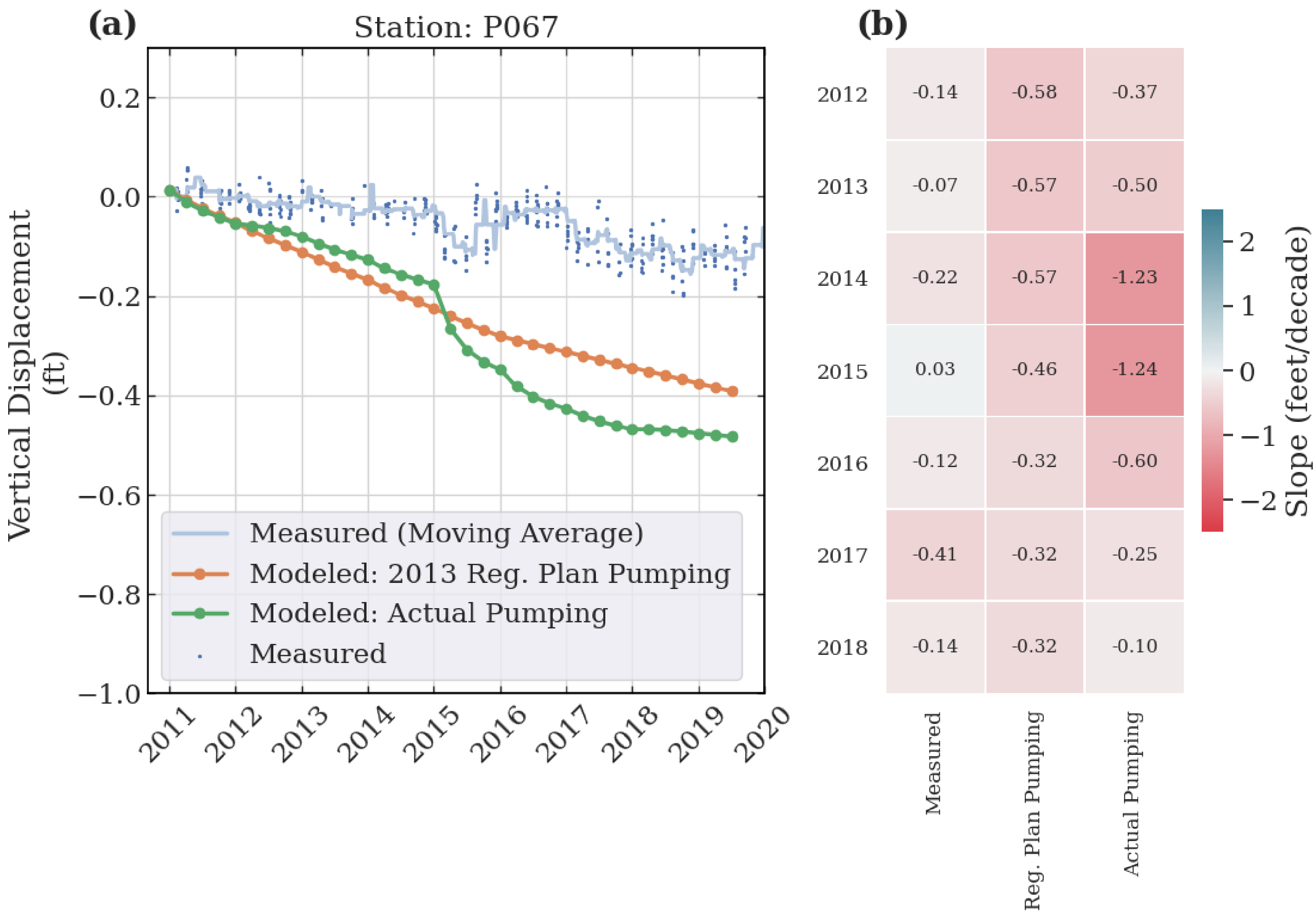

(a)
Station: P057
Vertical Displacement
(ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2010
2012
2014
2016
2018
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2010
2011
2012
2013
2014
2015
2016
2017
2018
-0.19
-0.89
-0.12
-0.23
-0.93
-0.38
-0.17
-0.95
0.02
-0.03
-0.56
0.02
-0.16
-0.02
0.01
-0.09
-0.08
-0.02
-0.09
-0.11
-0.04
-0.28
-0.11
-0.04
-0.22
-0.19
-0.02
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)


(a)
Station: P058
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2012
2013
2014
2015
2016
2017
2018
-0.40
-0.66
-0.13
-0.08
-0.60
-0.05
0.12
-0.44
0.01
0.36
-0.41
0.00
-0.05
-0.37
-0.00
-0.17
-0.41
-0.00
-0.15
-0.44
-0.00
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2

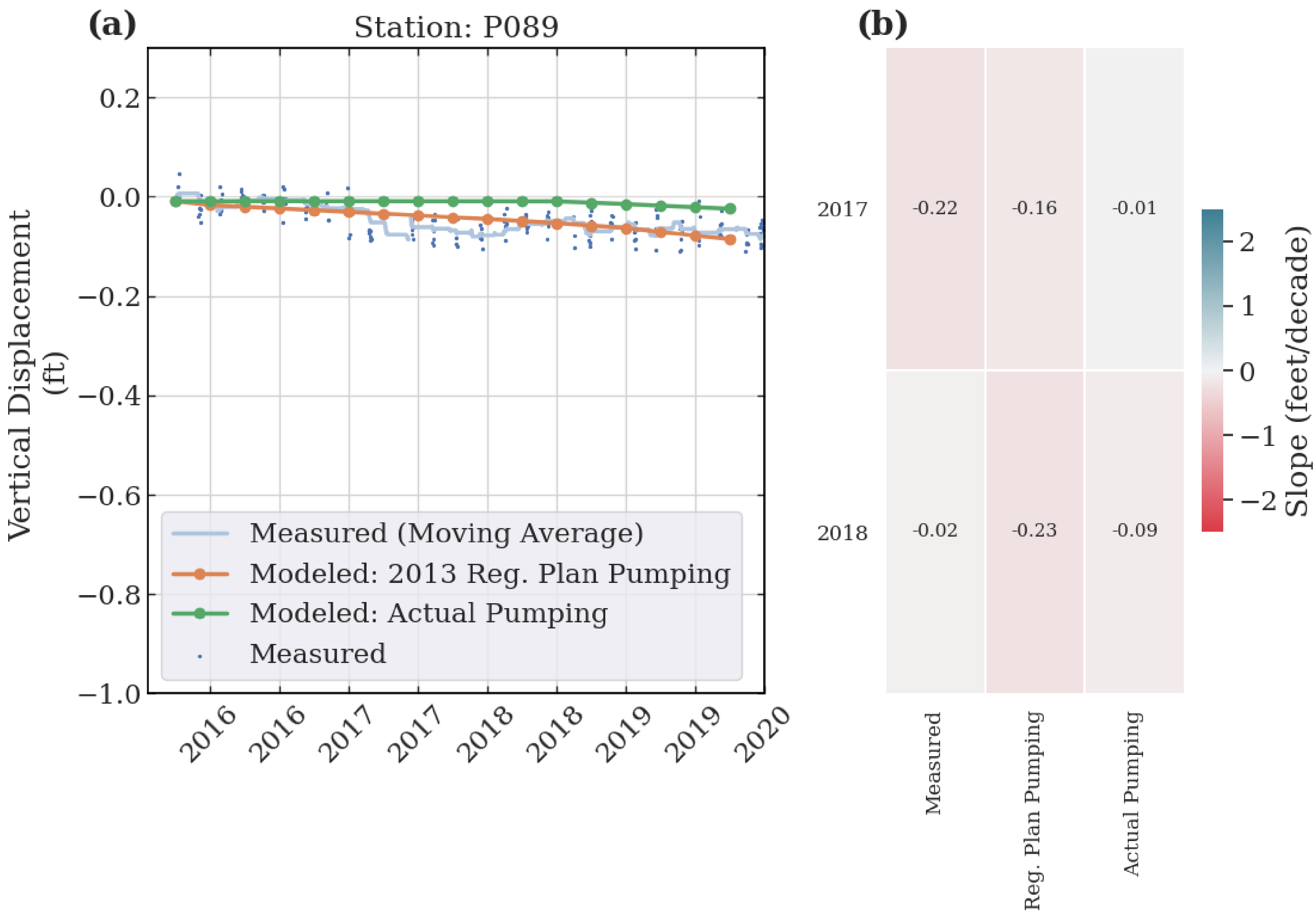

(a)
Station: P059
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2012 -0.20 -0.73 0.01
2013 0.11 -0.51 0.01
2014 0.15 -0.16 0.01
2015 -0.02 -0.18 0.00
2016 -0.40 -0.18 -0.00
2017 -0.31 -0.21 -0.02
2018 -0.02 -0.24 -0.01
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2

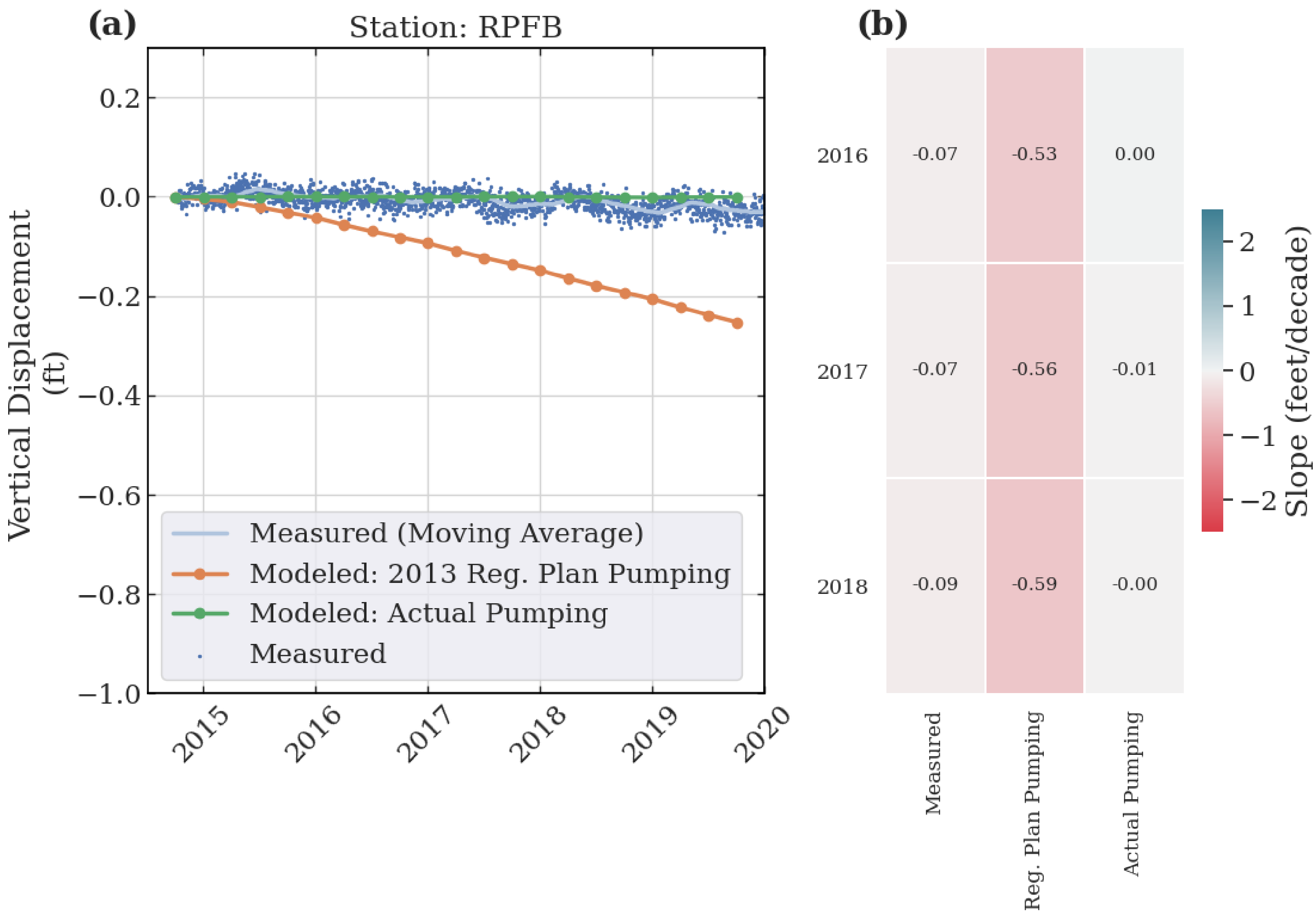

(a)
Station: P060
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2012
2013
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2013 -0.08 -0.95 -0.18
2014 -0.22 -0.20 0.02
2015 -0.23 -0.26 -0.03
2016 -0.30 -0.52 -0.04
2017 -0.34 -0.91 -0.04
2018 -0.27 -0.99 -0.03
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2

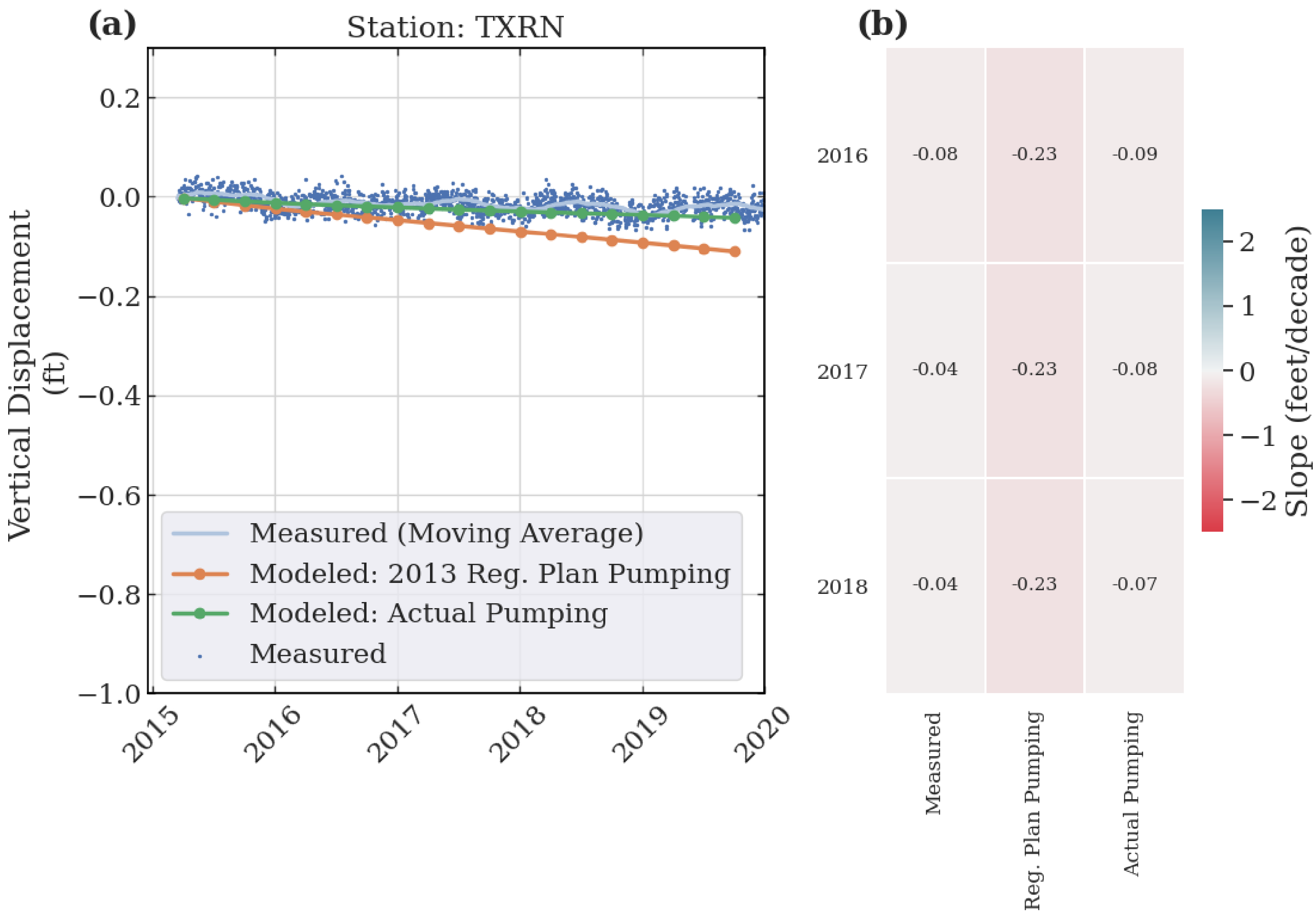

(a)
Station: P063
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2012
2013
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2012 0.04 -1.14 0.02
2013 0.03 -0.66 0.02
2014 -0.08 -0.14 0.02
2015 0.06 -0.25 0.00
2016 -0.22 -0.43 0.00
2017 -0.37 -0.52 -0.00
2018 -0.01 -0.55 -0.00
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

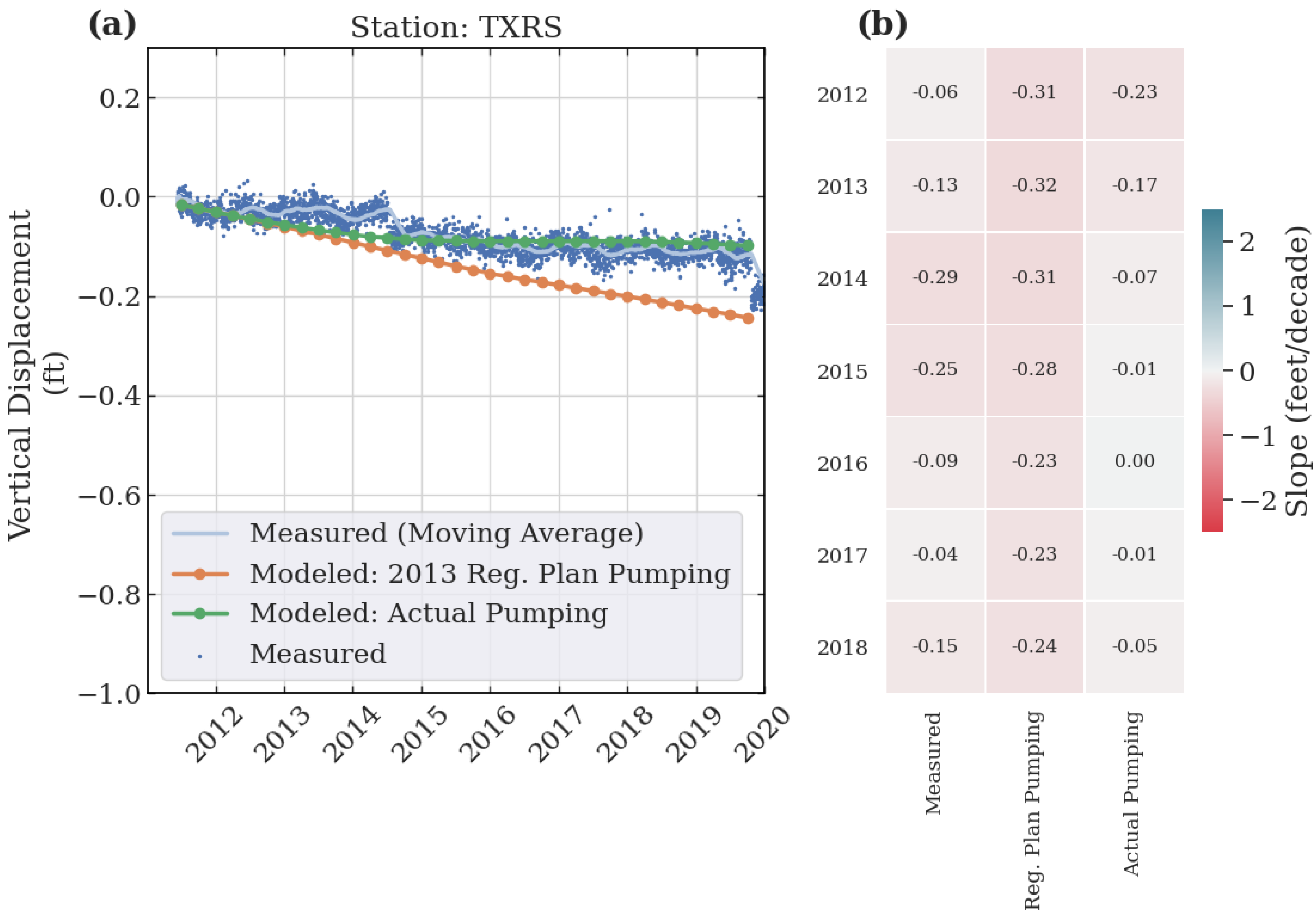


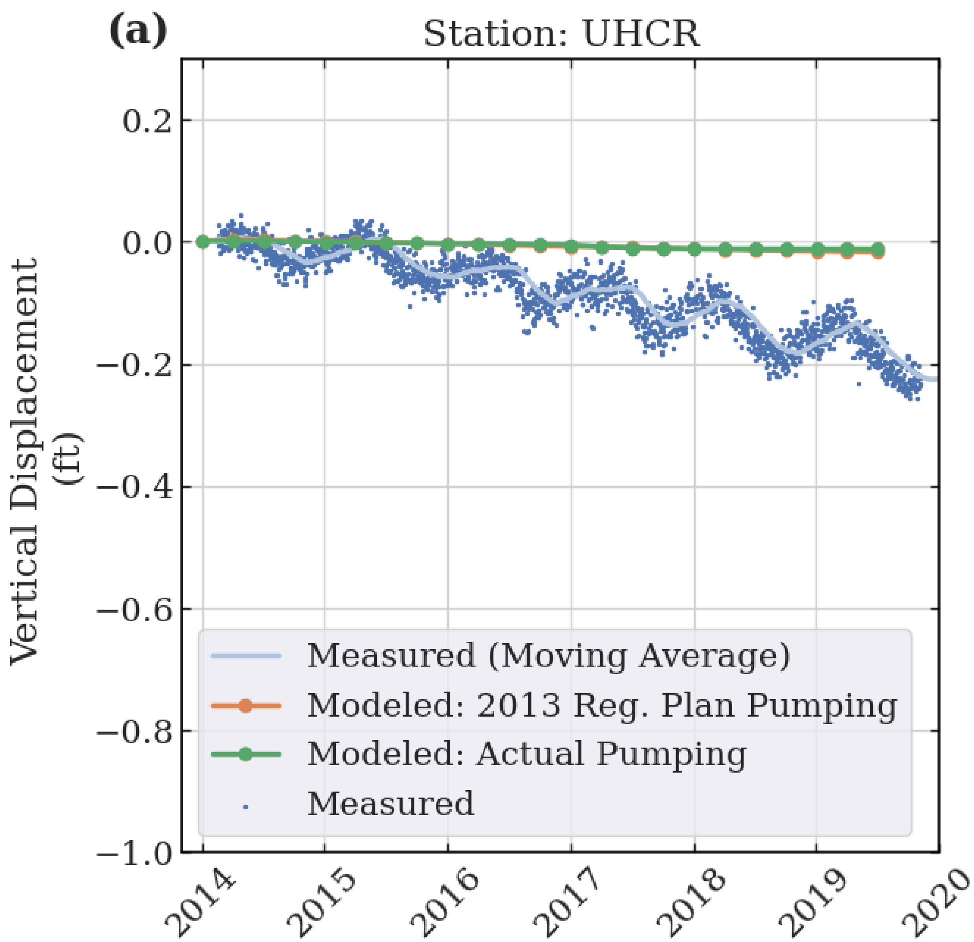
GEOSCIENCE & ENGINEERING SOLUTIONS

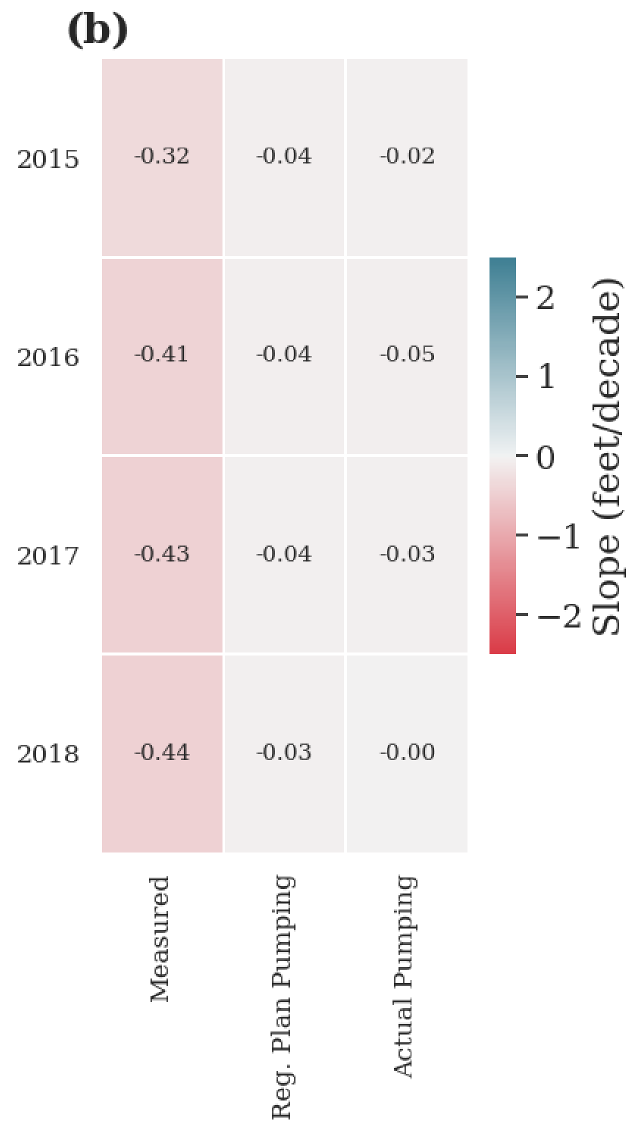

(a)
Station: P089
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2016
2016
2017
2017
2018
2018
2019
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2017
2018
-0.22
-0.16
-0.01
-0.02
-0.23
-0.09
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2

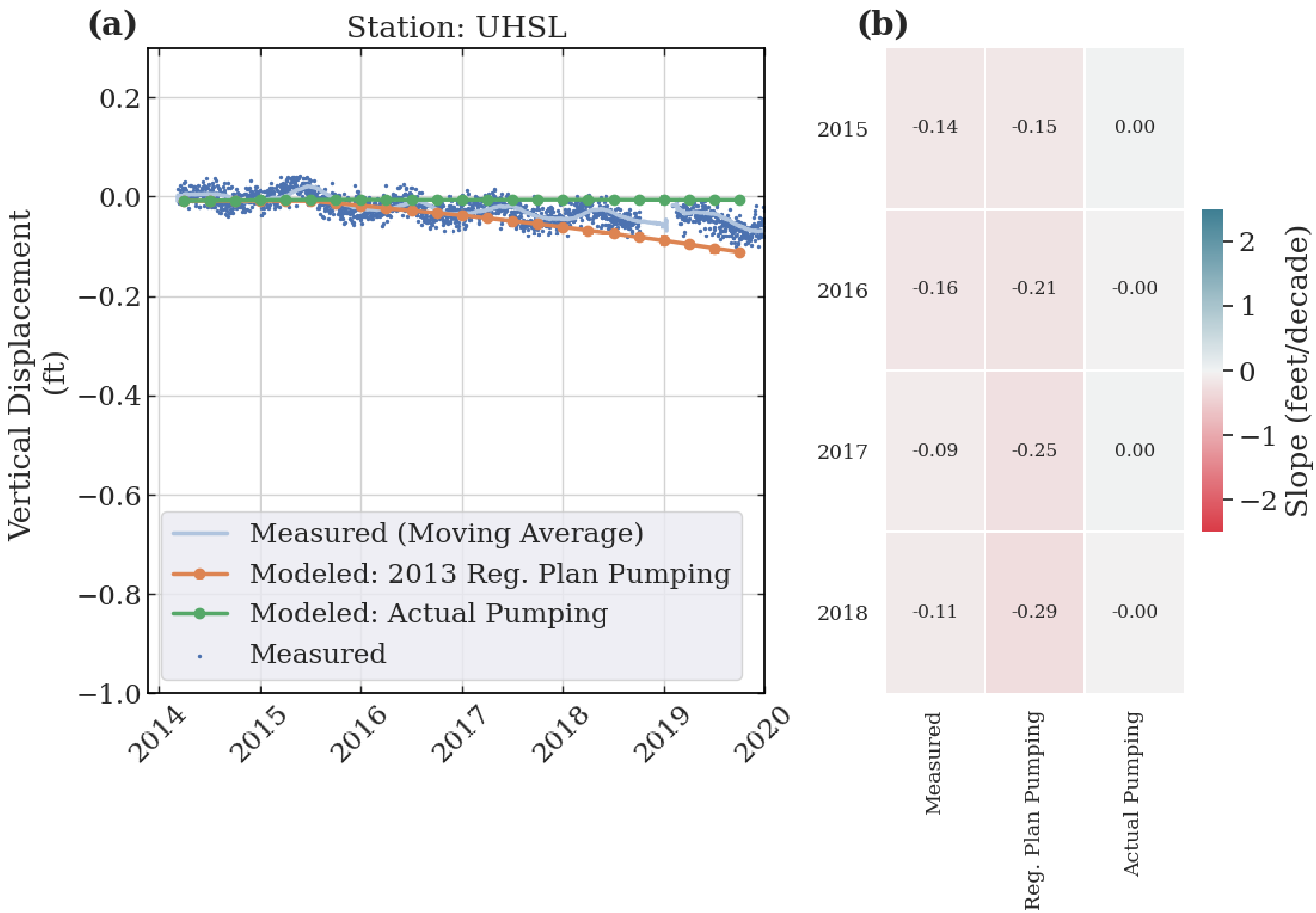

(a)
Station: RPFB
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2016
2017
2018
-0.07
-0.53
0.00
-0.07
-0.56
-0.01
-0.09
-0.59
-0.00
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

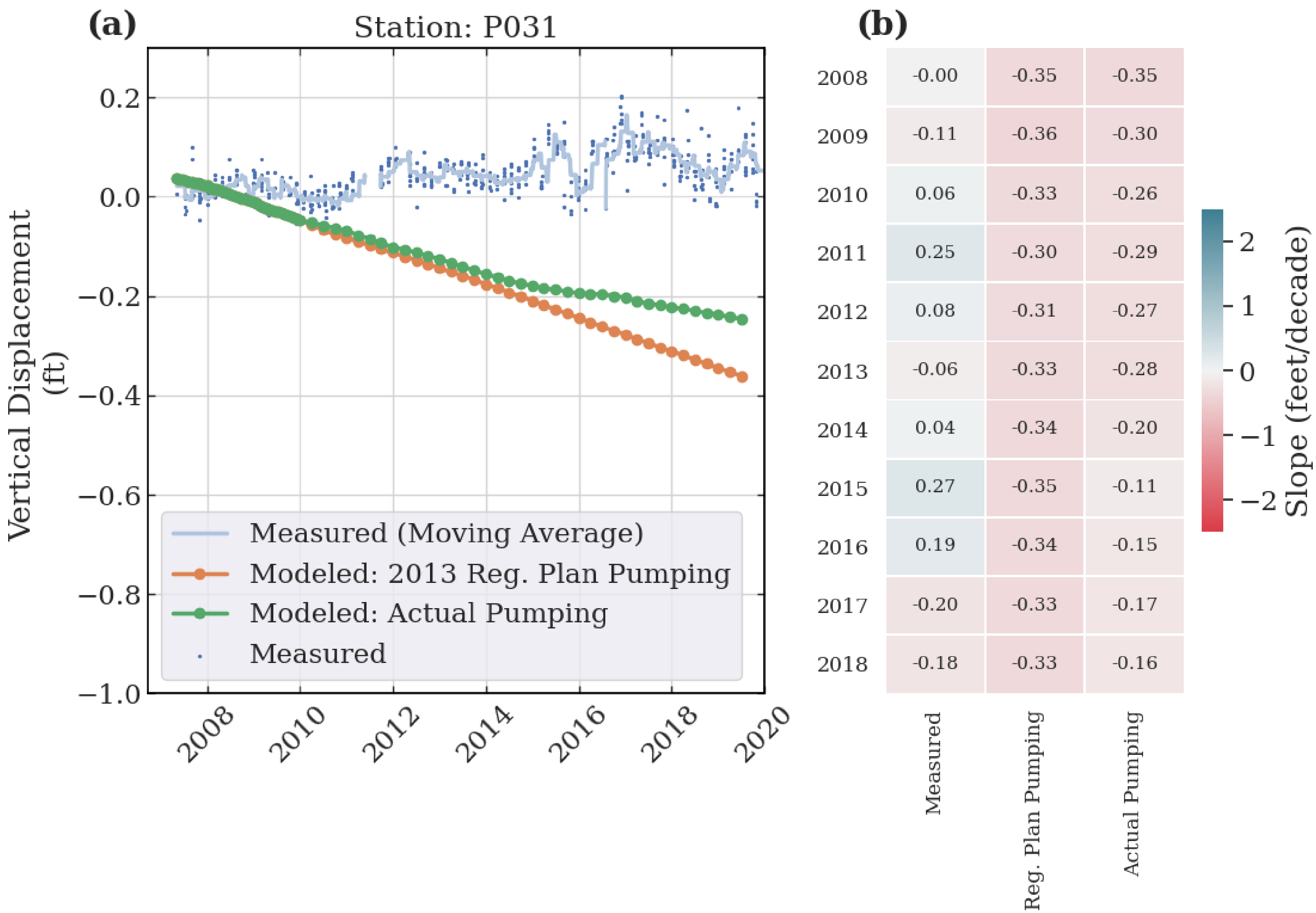

(a)
Station: TXRN
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2016
2017
2018
-0.08
-0.23
-0.09
-0.04
-0.23
-0.08
-0.04
-0.23
-0.07
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2

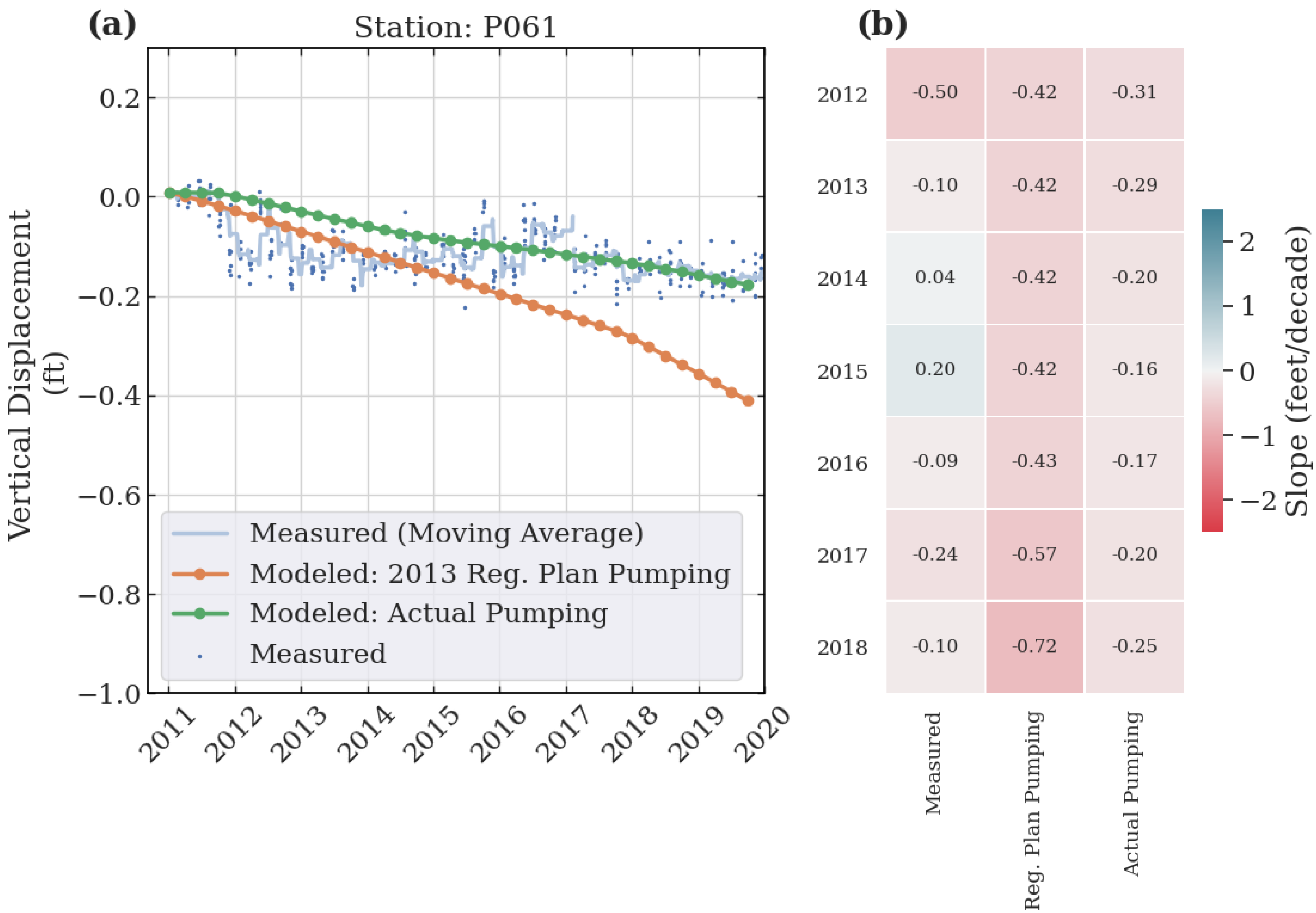

(a)
Station: TXRS
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2012
2013
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2012
2013
2014
2015
2016
2017
2018
-0.06
-0.31
-0.23
-0.13
-0.32
-0.17
-0.29
-0.31
-0.07
-0.25
-0.28
-0.01
-0.09
-0.23
0.00
-0.04
-0.23
-0.01
-0.15
-0.24
-0.05
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)


(a)
Station: UHCR
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured

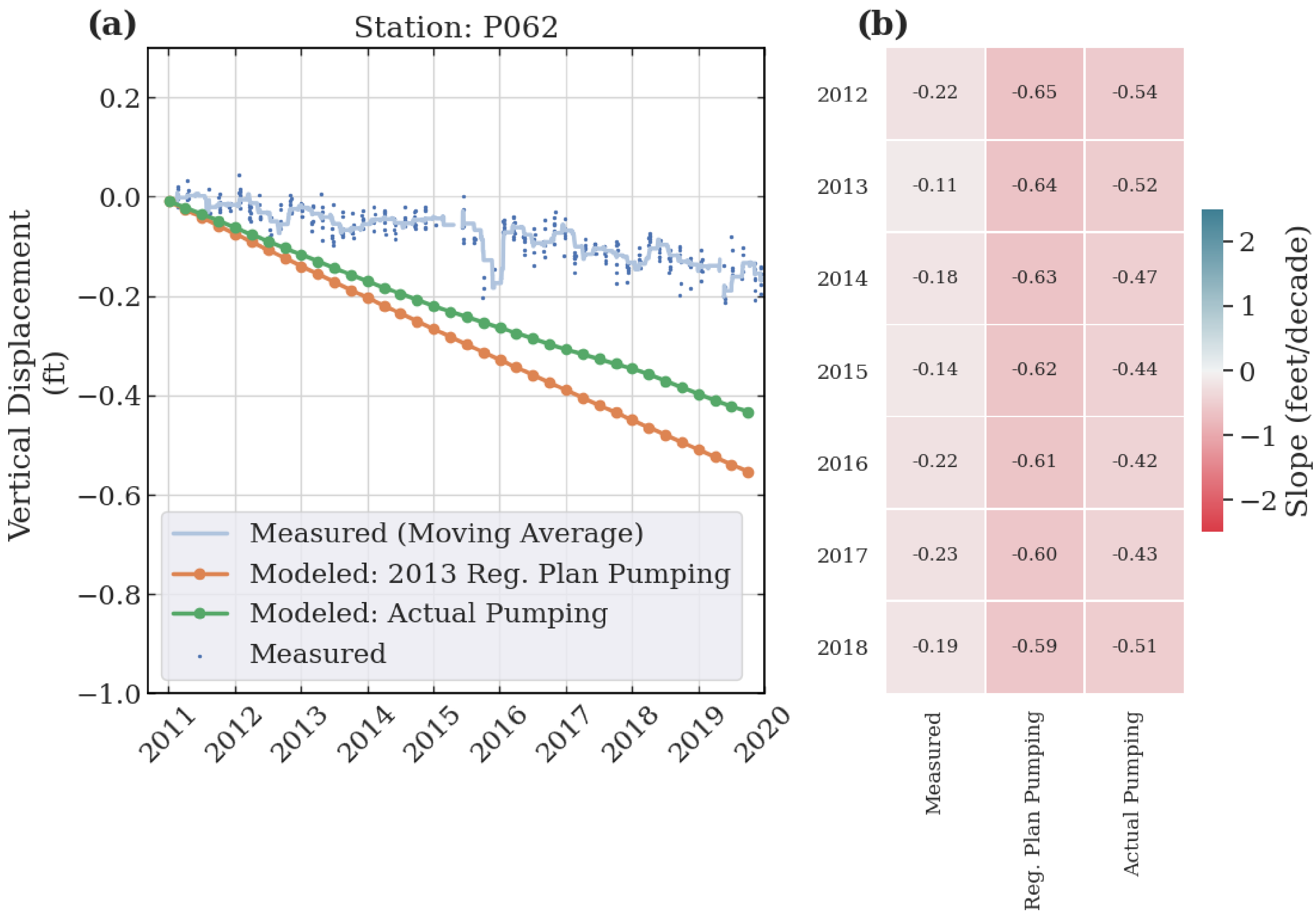

(b)
2015
2016
2017
2018
-0.32
-0.04
-0.02
-0.41
-0.04
-0.05
-0.43
-0.04
-0.03
-0.44
-0.03
-0.00
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2

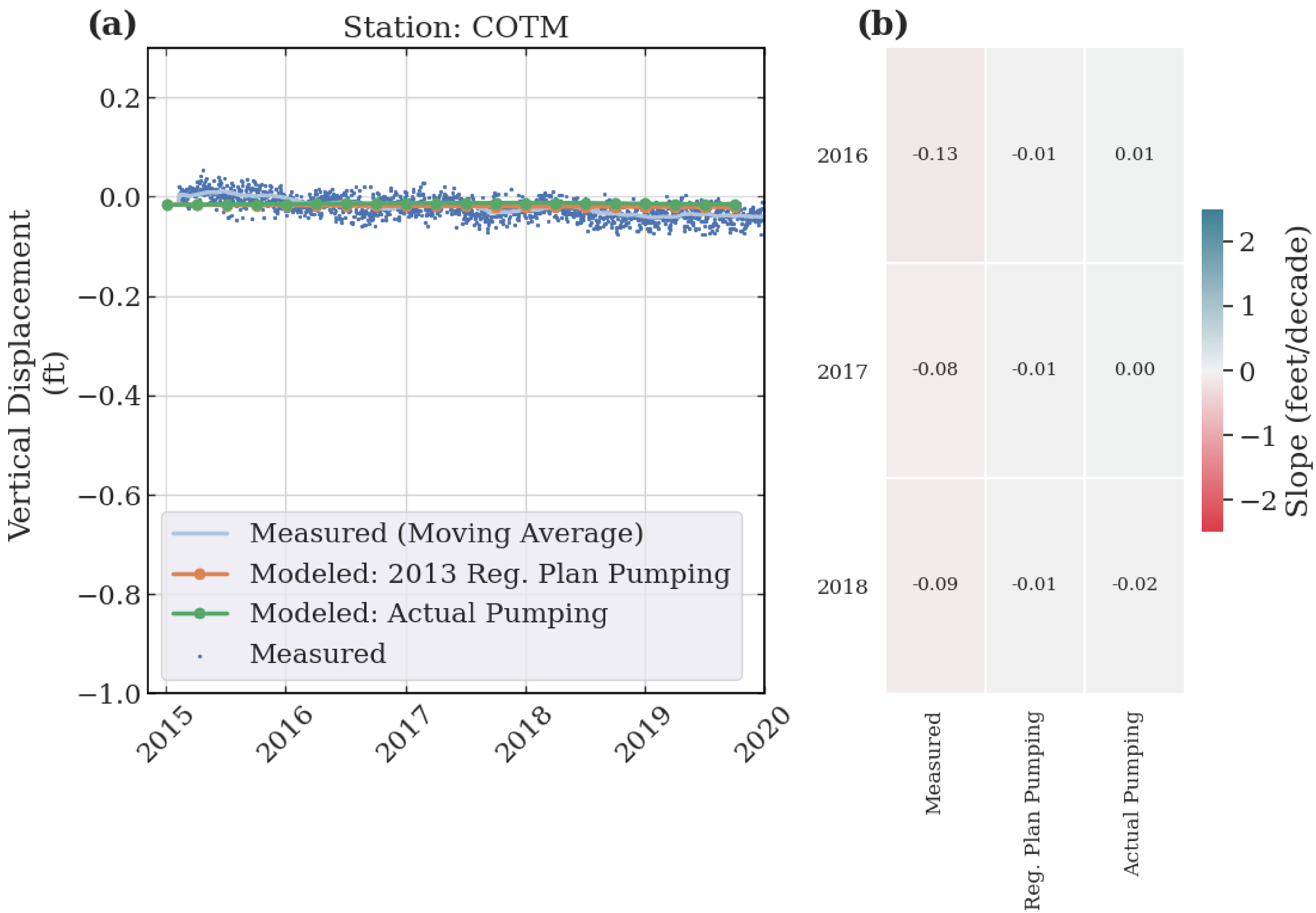

(a)
Station: UHSL
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2015
2016
2017
2018
-0.14
-0.15
0.00
-0.16
-0.21
-0.00
-0.09
-0.25
0.00
-0.11
-0.29
-0.00
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

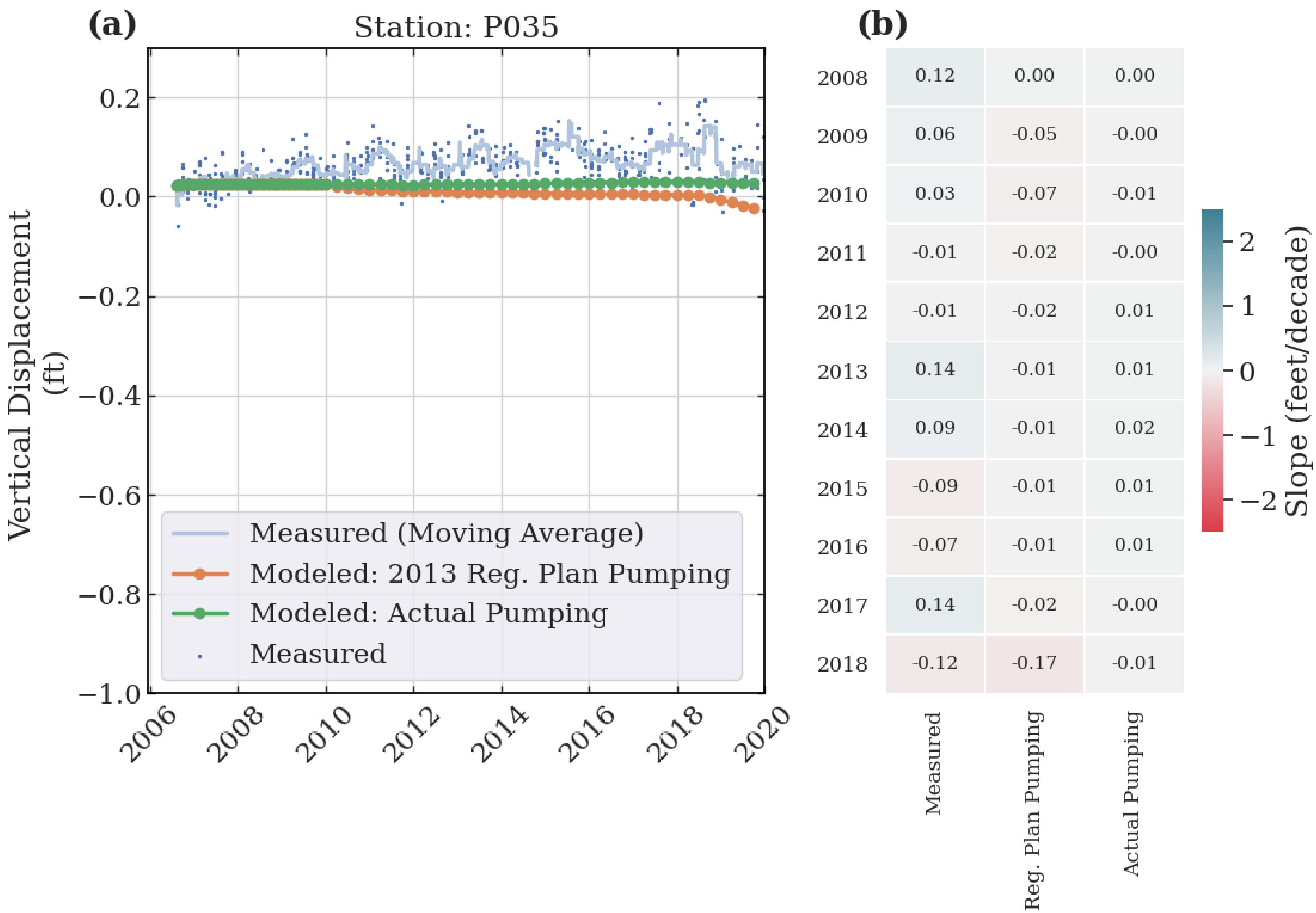

(a)
Station: P031
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2008
2010
2012
2014
2016
2018
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2008 -0.00 -0.35 -0.35
2009 -0.11 -0.36 -0.30
2010 0.06 -0.33 -0.26
2011 0.25 -0.30 -0.29
2012 0.08 -0.31 -0.27
2013 -0.06 -0.33 -0.28
2014 0.04 -0.34 -0.20
2015 0.27 -0.35 -0.11
2016 0.19 -0.34 -0.15
2017 -0.20 -0.33 -0.17
2018 -0.18 -0.33 -0.16
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)



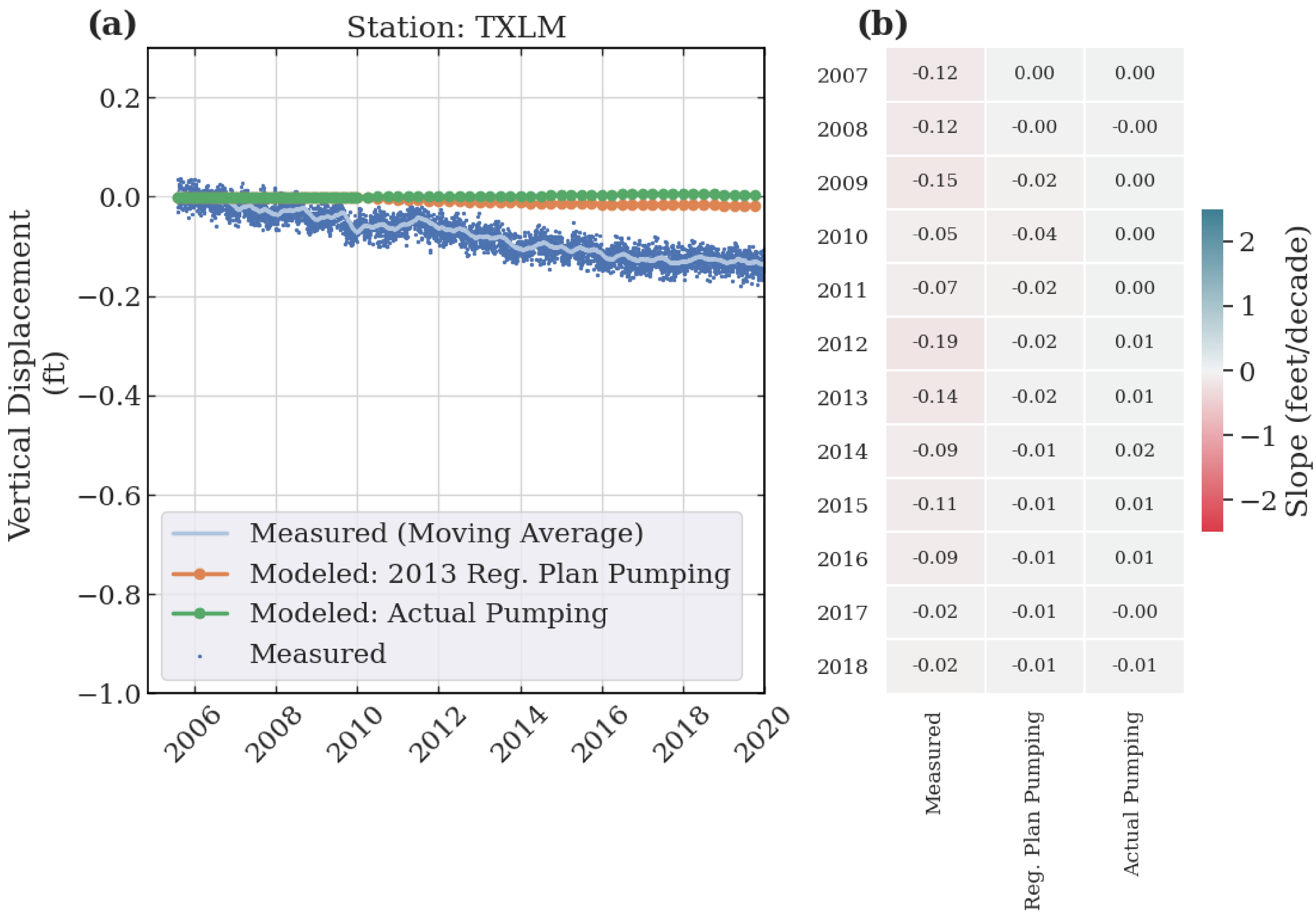
(a)
Station: P061
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2012
2013
2014
2015
2016
2017
2018
-0.50
-0.42
-0.31
-0.10
-0.42
-0.29
0.04
-0.42
-0.20
0.20
-0.42
-0.16
-0.09
-0.43
-0.17
-0.24
-0.57
-0.20
-0.10
-0.72
-0.25
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

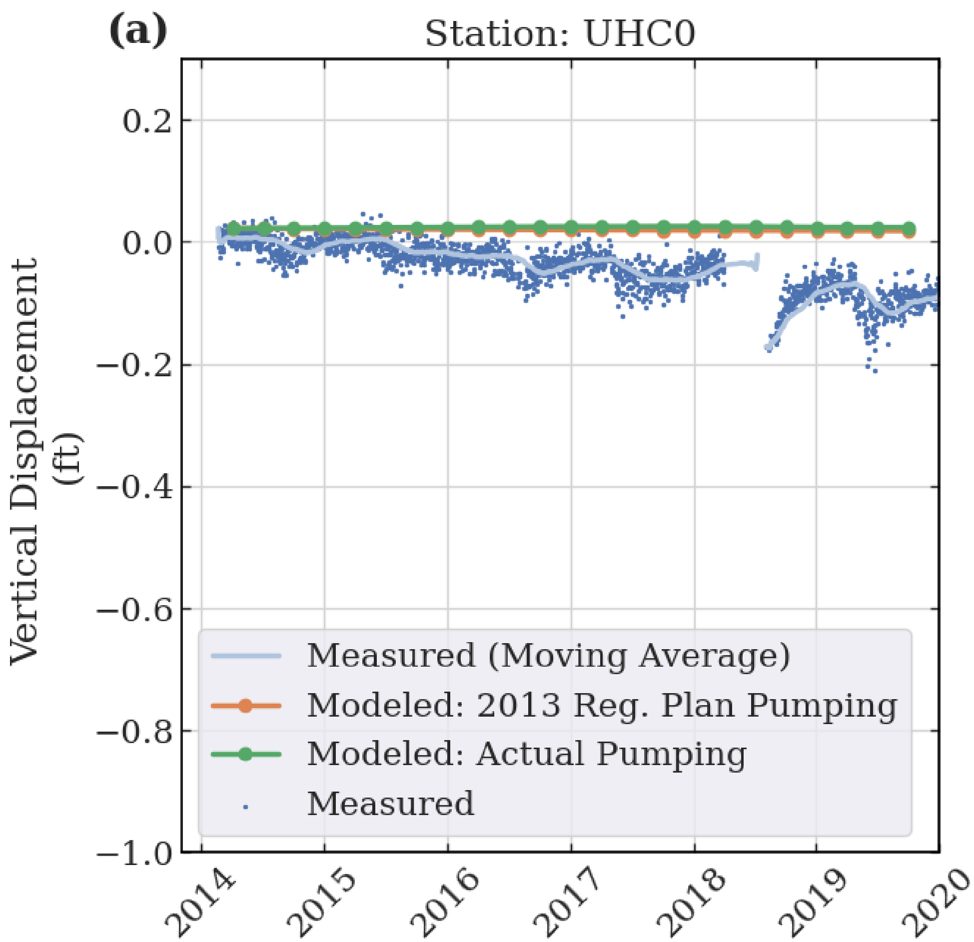

(a)
Station: P062
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
(b)
2012 -0.22 -0.65 -0.54
2013 -0.11 -0.64 -0.52
2014 -0.18 -0.63 -0.47
2015 -0.14 -0.62 -0.44
2016 -0.22 -0.61 -0.42
2017 -0.23 -0.60 -0.43
2018 -0.19 -0.59 -0.51
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

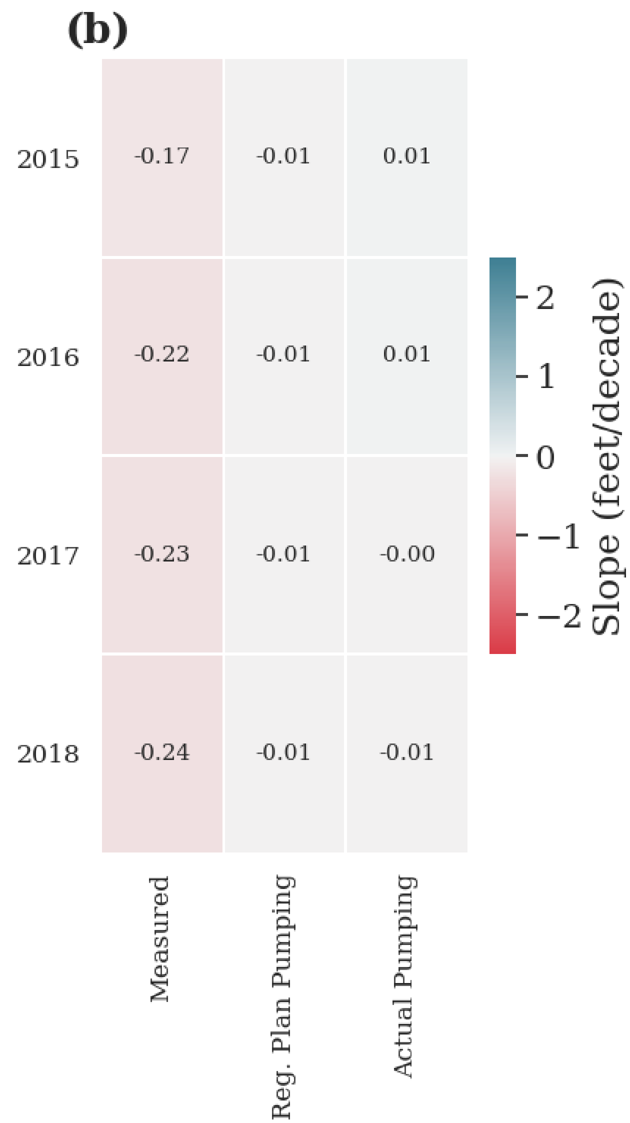

(a)
Station: COTM
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2016
2017
2018
-0.13
-0.01
0.01
-0.08
-0.01
0.00
-0.09
-0.01
-0.02
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

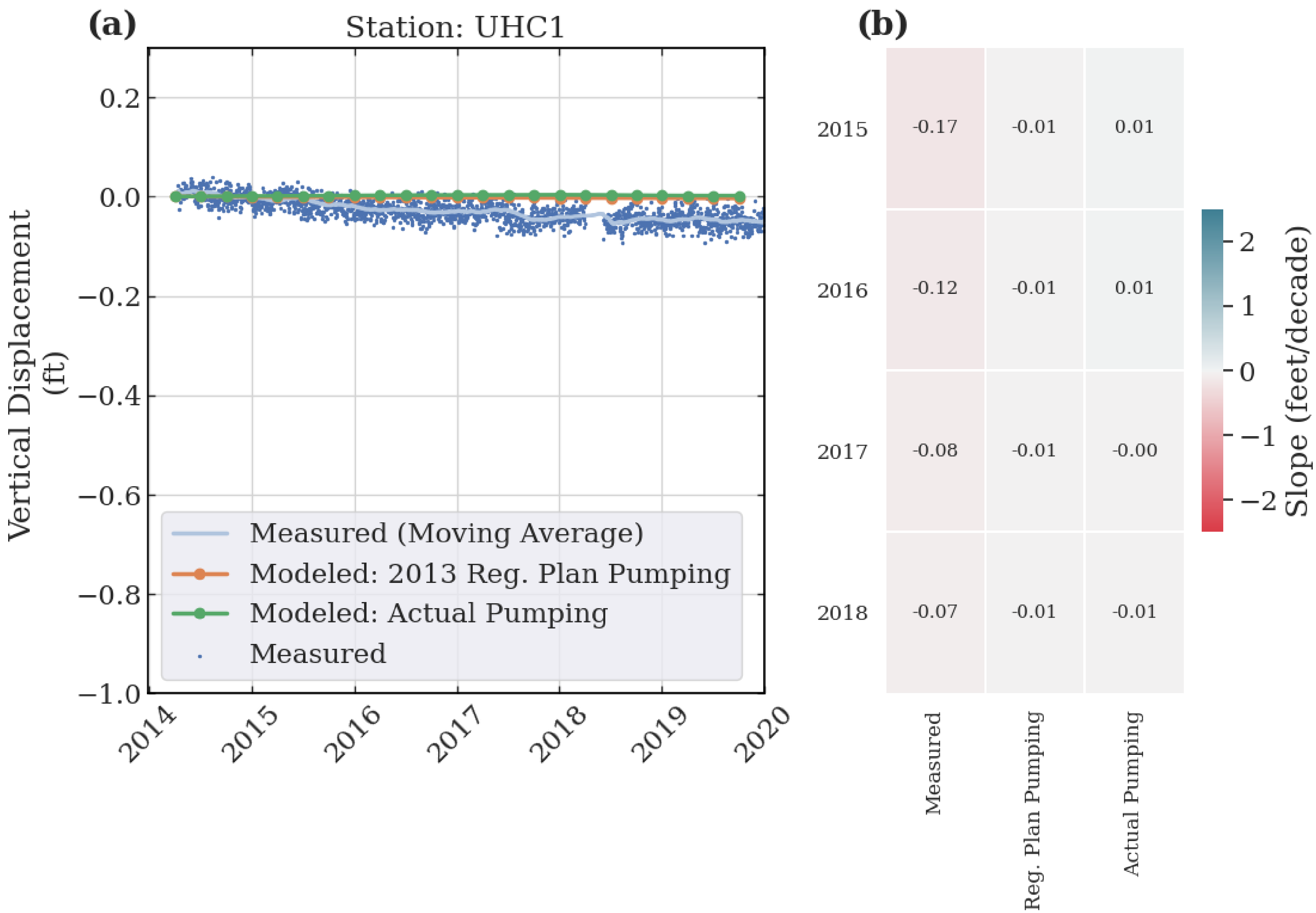


INTERA
GEOSCIENCE & ENGINEERING SOLUTIONS

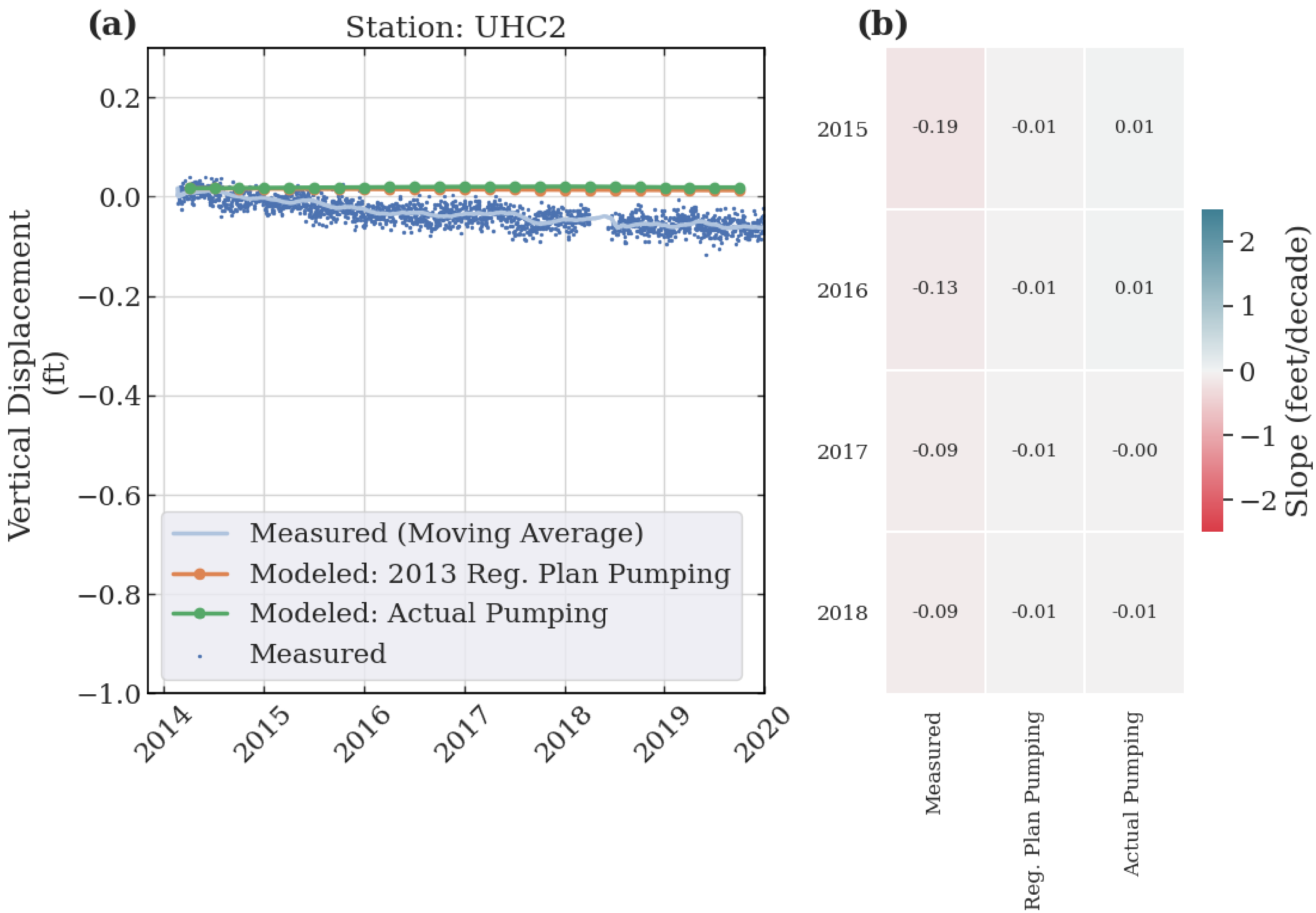

(a)
Station: TXLM
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2006
2008
2010
2012
2014
2016
2018
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2007 -0.12 0.00 0.00
2008 -0.12 -0.00 -0.00
2009 -0.15 -0.02 0.00
2010 -0.05 -0.04 0.00
2011 -0.07 -0.02 0.00
2012 -0.19 -0.02 0.01
2013 -0.14 -0.02 0.01
2014 -0.09 -0.01 0.02
2015 -0.11 -0.01 0.01
2016 -0.09 -0.01 0.01
2017 -0.02 -0.01 -0.00
2018 -0.02 -0.01 -0.01
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

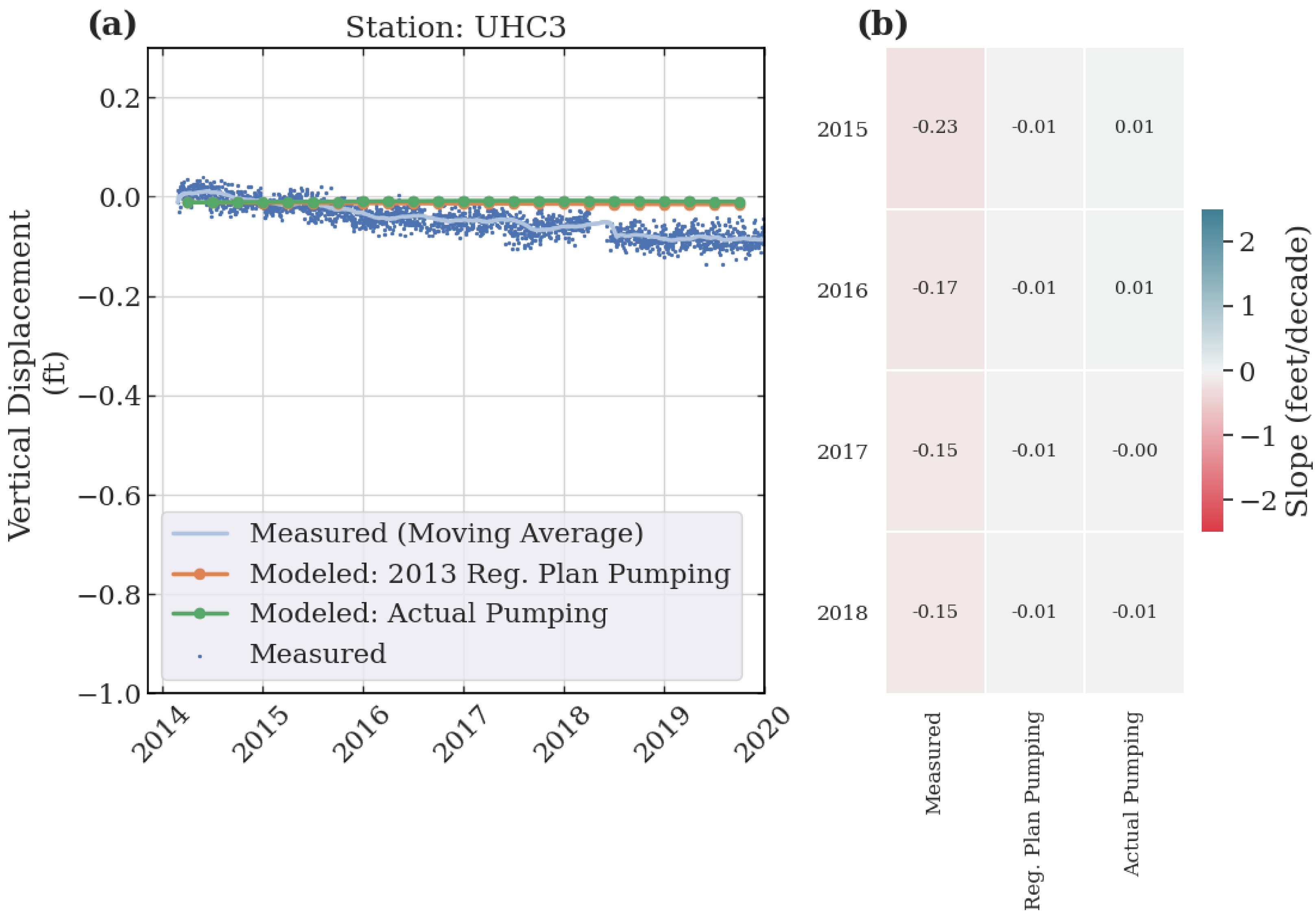

(a)
Station: UHC0
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured


(b)
2015
-0.17
-0.01
0.01
2016
-0.22
-0.01
0.01
2017
-0.23
-0.01
-0.00
2018
-0.24
-0.01
-0.01
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

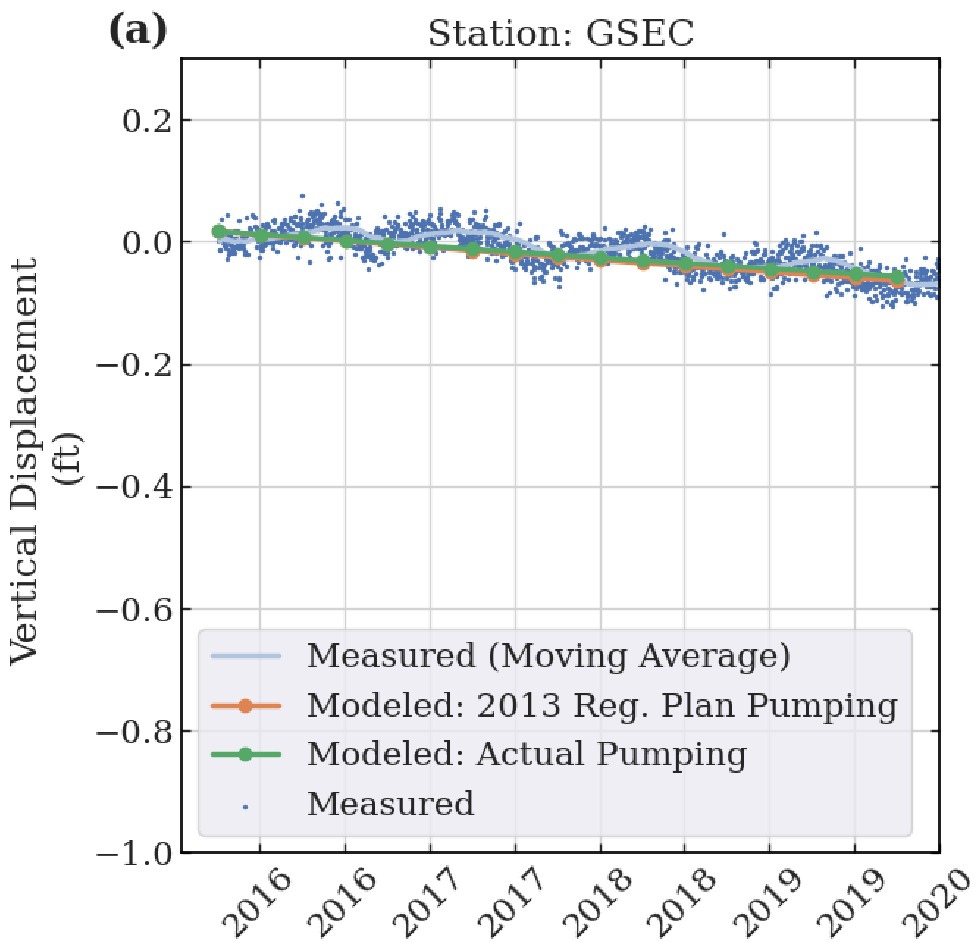


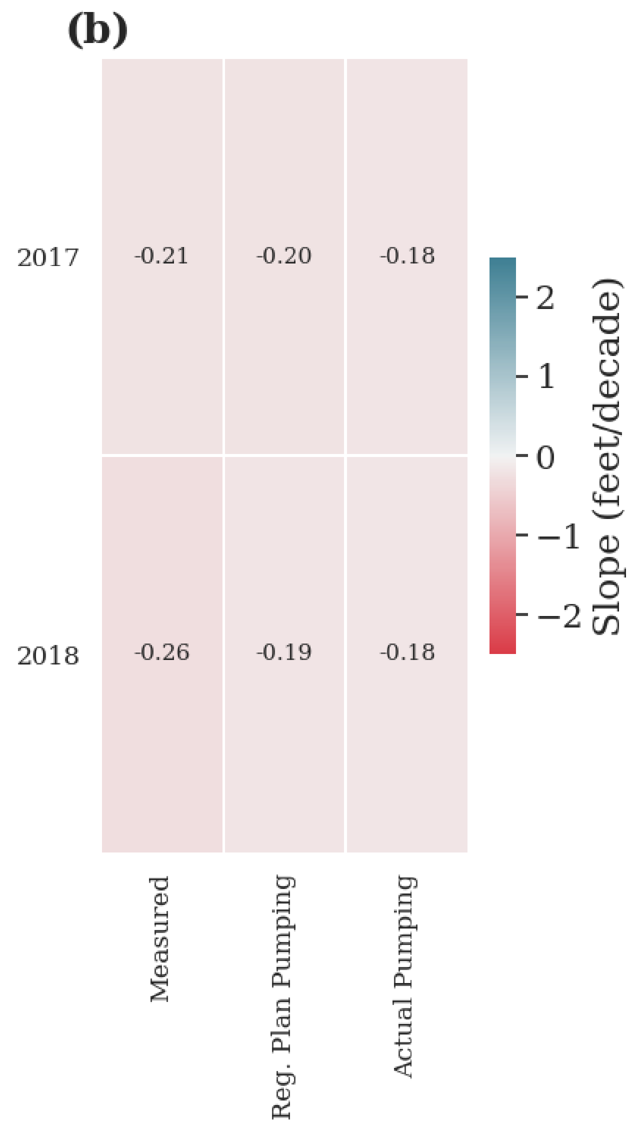
INTERA
GEOSCIENCE & ENGINEERING SOLUTIONS

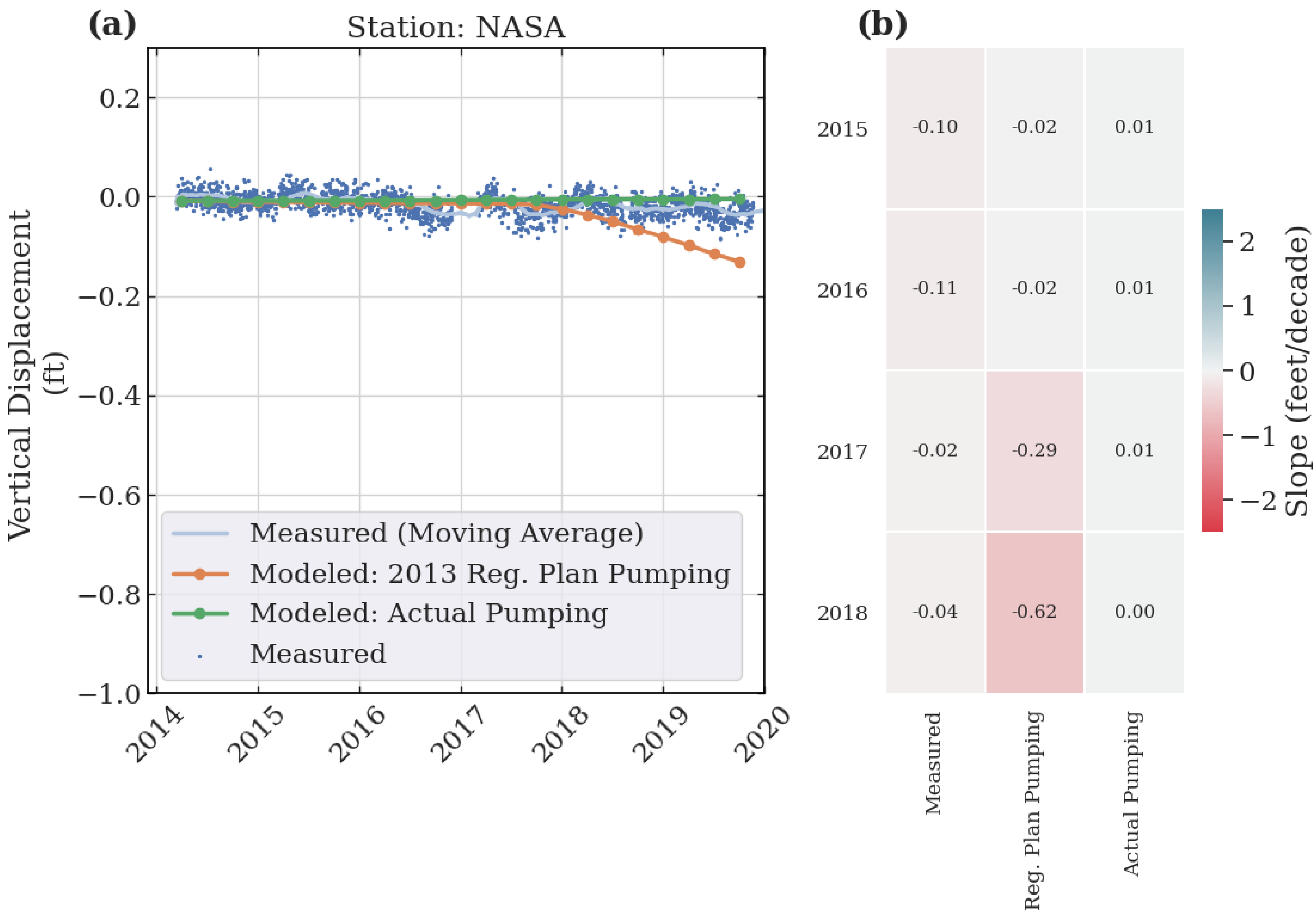

(a)
Station: UHC2
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2015 -0.19 -0.01 0.01
2016 -0.13 -0.01 0.01
2017 -0.09 -0.01 -0.00
2018 -0.09 -0.01 -0.01
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2



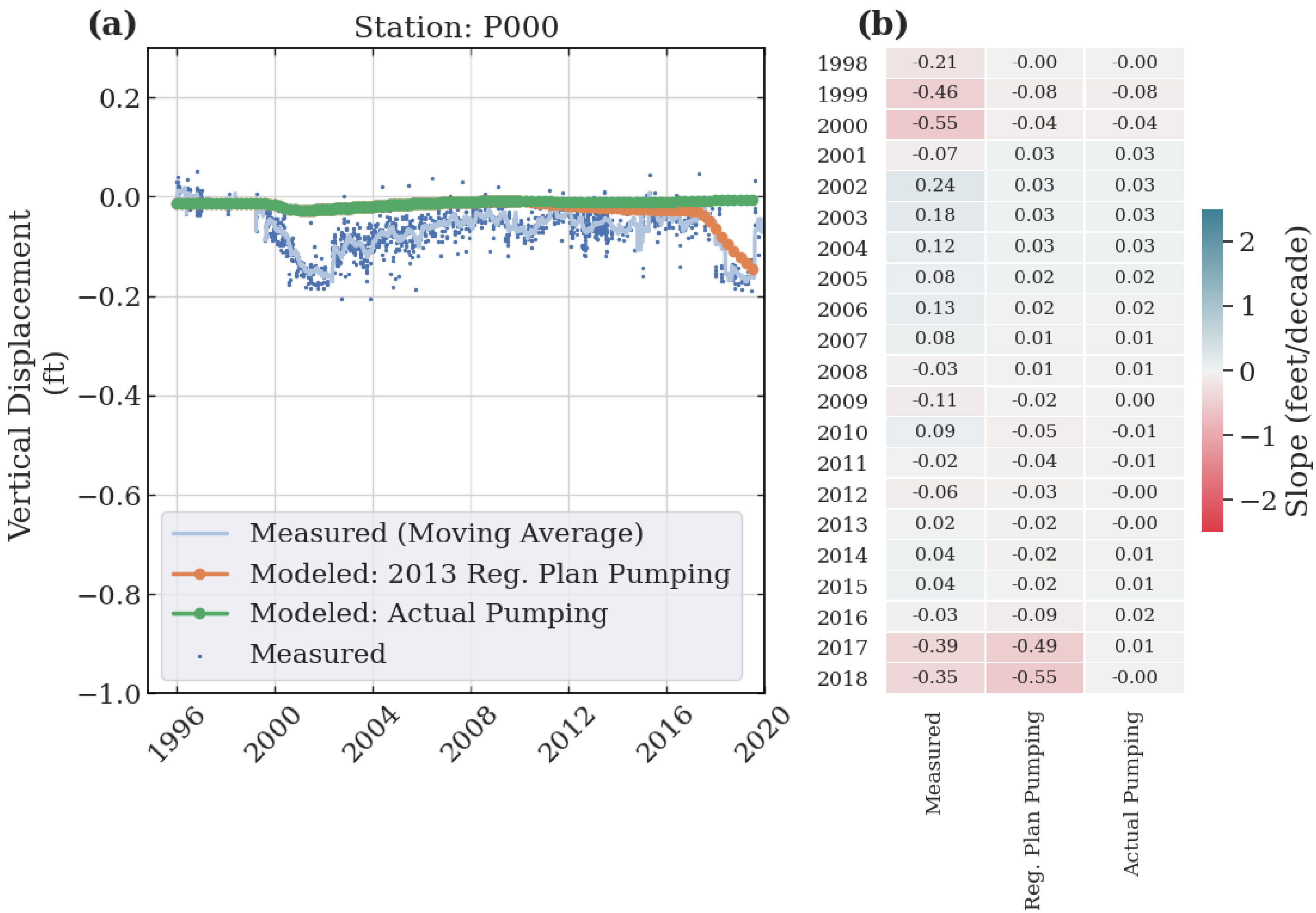
INTERA
GEOSCIENCE & ENGINEERING SOLUTIONS

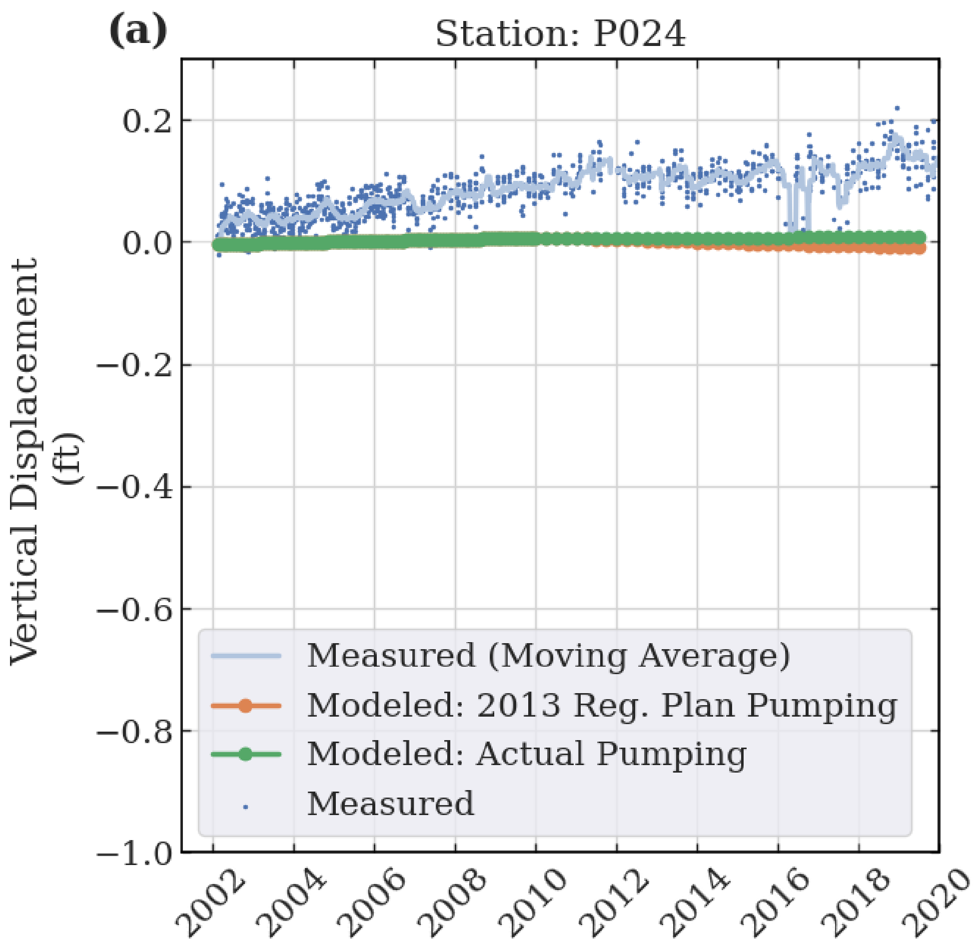

(a)
Station: GSEC
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
2016
2016
2017
2017
2018
2018
2019
2019
2020


(b)
2017
-0.21
-0.20
-0.18
2018
-0.26
-0.19
-0.18
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)



(a)
Station: NASA
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2015
2016
2017
2018
-0.10
-0.02
0.01
-0.11
-0.02
0.01
-0.02
-0.29
0.01
-0.04
-0.62
0.00
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

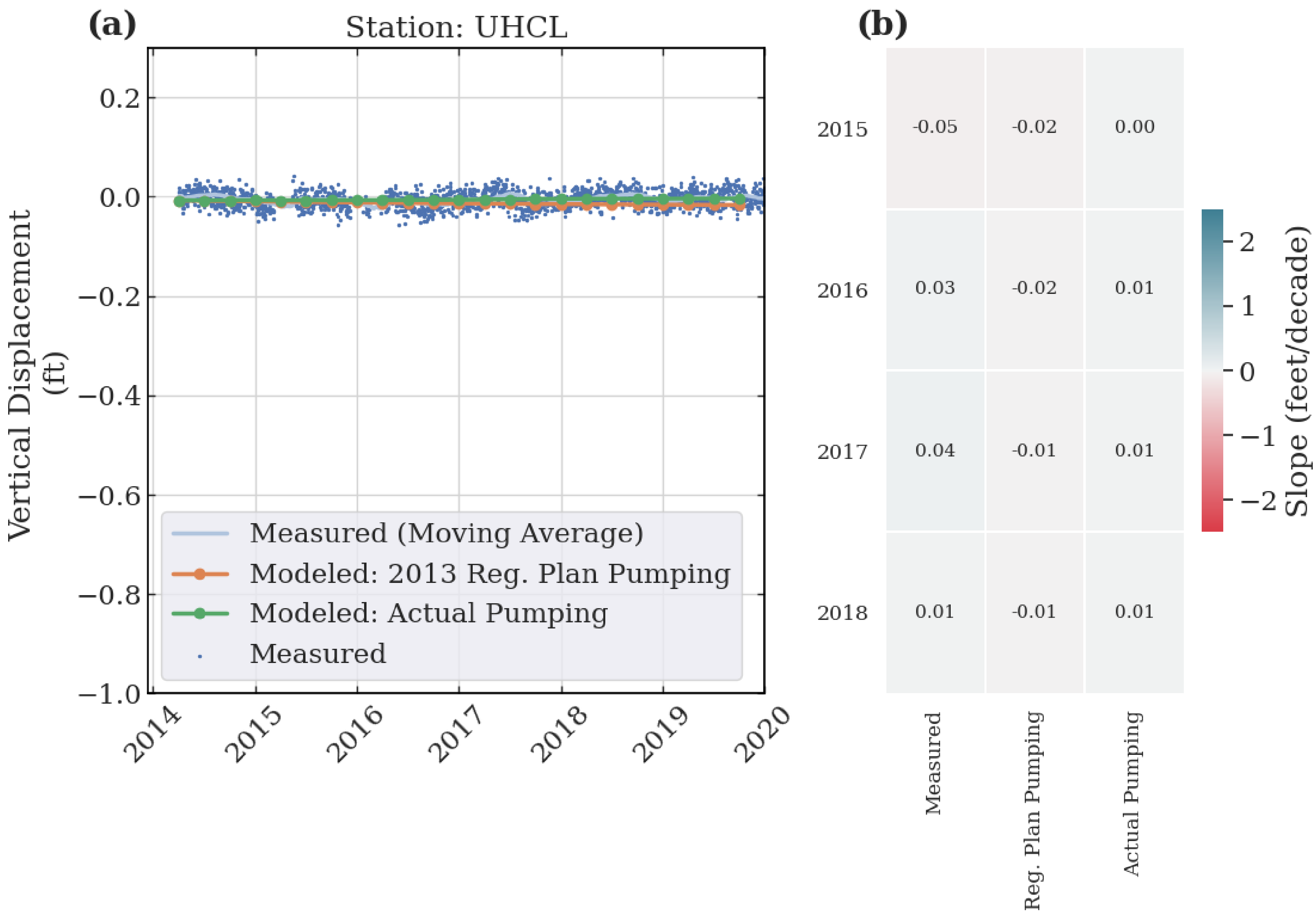

(a)
Station: P000
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
1996
2000
2004
2008
2012
2016
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
1998 -0.21 -0.00 -0.00
1999 -0.46 -0.08 -0.08
2000 -0.55 -0.04 -0.04
2001 -0.07 0.03 0.03
2002 0.24 0.03 0.03
2003 0.18 0.03 0.03
2004 0.12 0.03 0.03
2005 0.08 0.02 0.02
2006 0.13 0.02 0.02
2007 0.08 0.01 0.01
2008 -0.03 0.01 0.01
2009 -0.11 -0.02 0.00
2010 0.09 -0.05 -0.01
2011 -0.02 -0.04 -0.01
2012 -0.06 -0.03 -0.00
2013 0.02 -0.02 -0.00
2014 0.04 -0.02 0.01
2015 0.04 -0.02 0.01
2016 -0.03 -0.09 0.02
2017 -0.39 -0.49 0.01
2018 -0.35 -0.55 -0.00
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

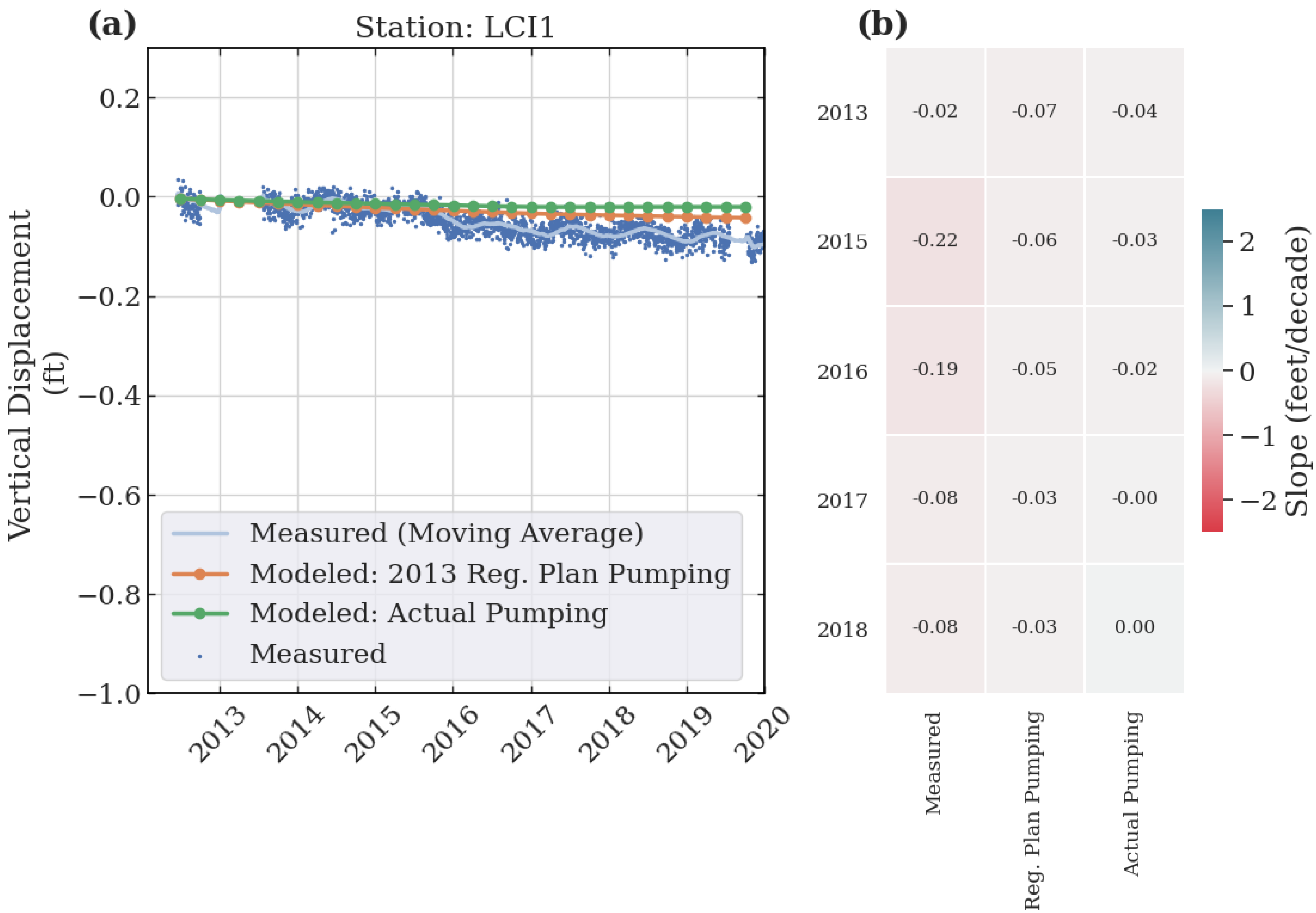


(b)

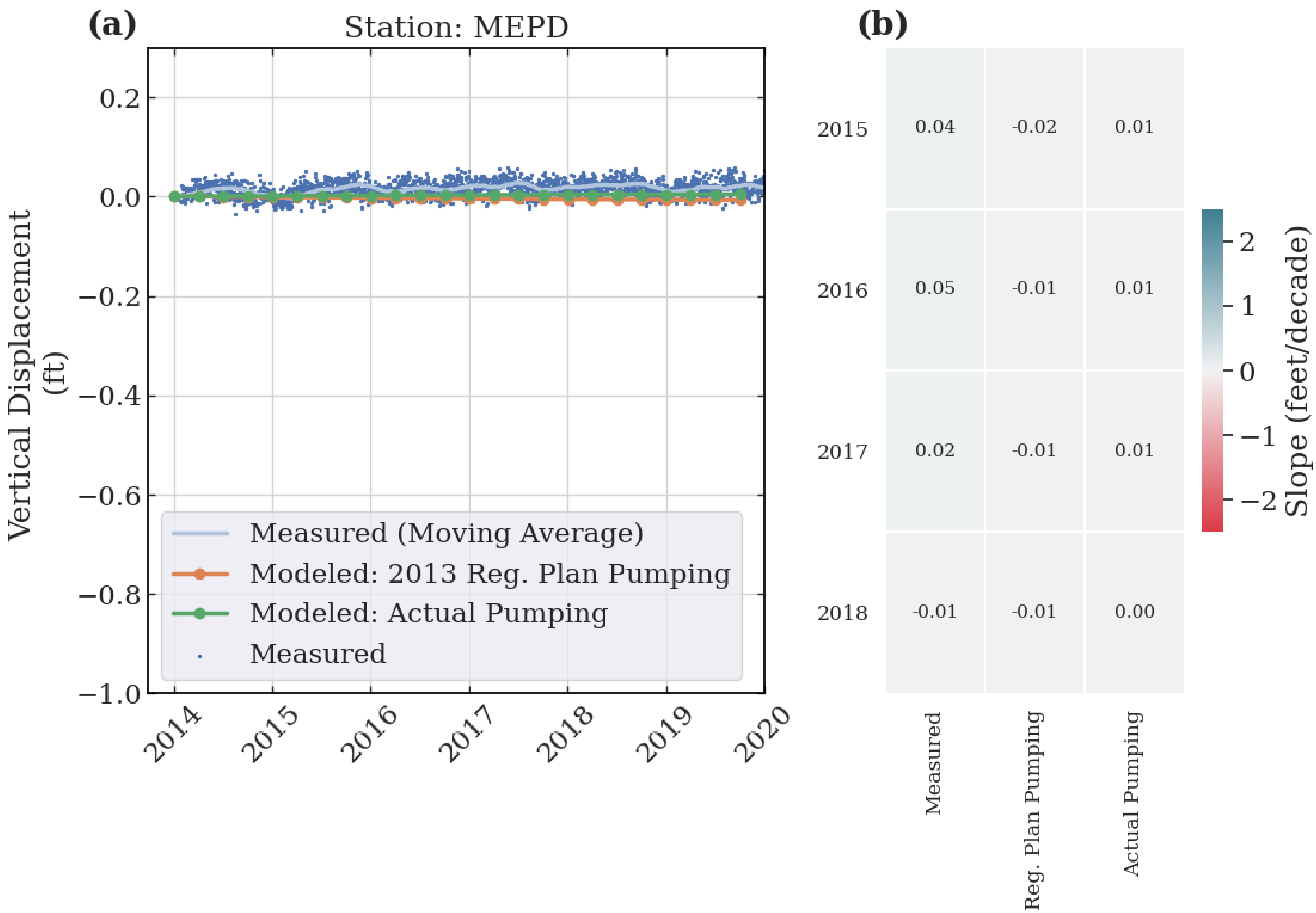
	Measured	Reg. Plan Pumping	Actual Pumping
2003	0.07	0.01	0.01
2004	0.10	0.01	0.01
2005	0.09	0.01	0.01
2006	0.10	0.01	0.01
2007	0.08	0.01	0.01
2008	0.13	0.01	0.01
2009	0.08	0.00	0.01
2010	0.15	-0.01	-0.00
2011	0.04	-0.02	-0.00
2012	-0.06	-0.02	0.00
2013	-0.01	-0.02	0.00
2014	0.06	-0.02	0.00
2015	0.01	-0.02	0.01
2016	-0.02	-0.02	0.01
2017	0.22	-0.01	0.01
2018	0.14	-0.01	0.00

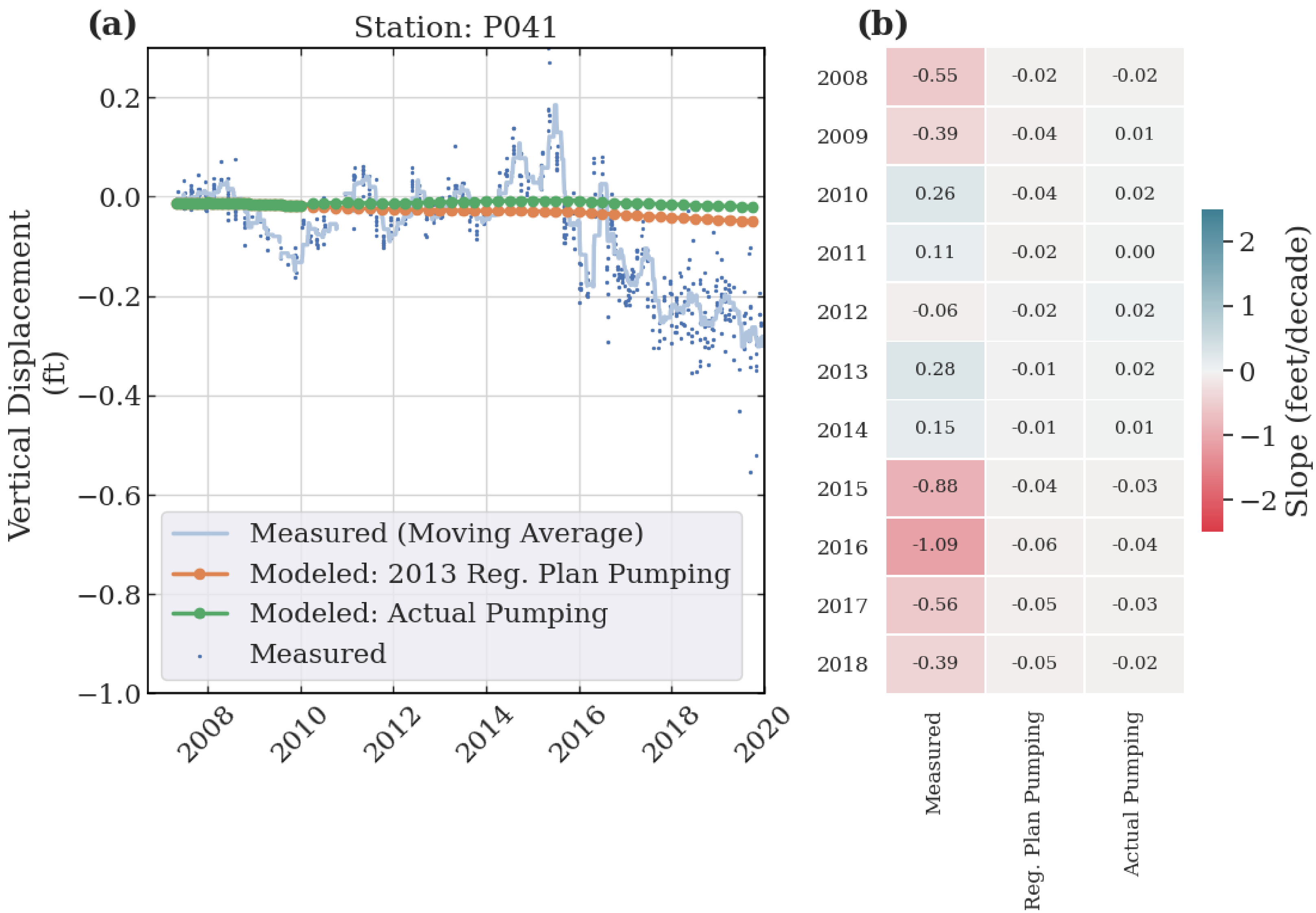
Slope (feet/decade): 2, 1, 0, −1, −2

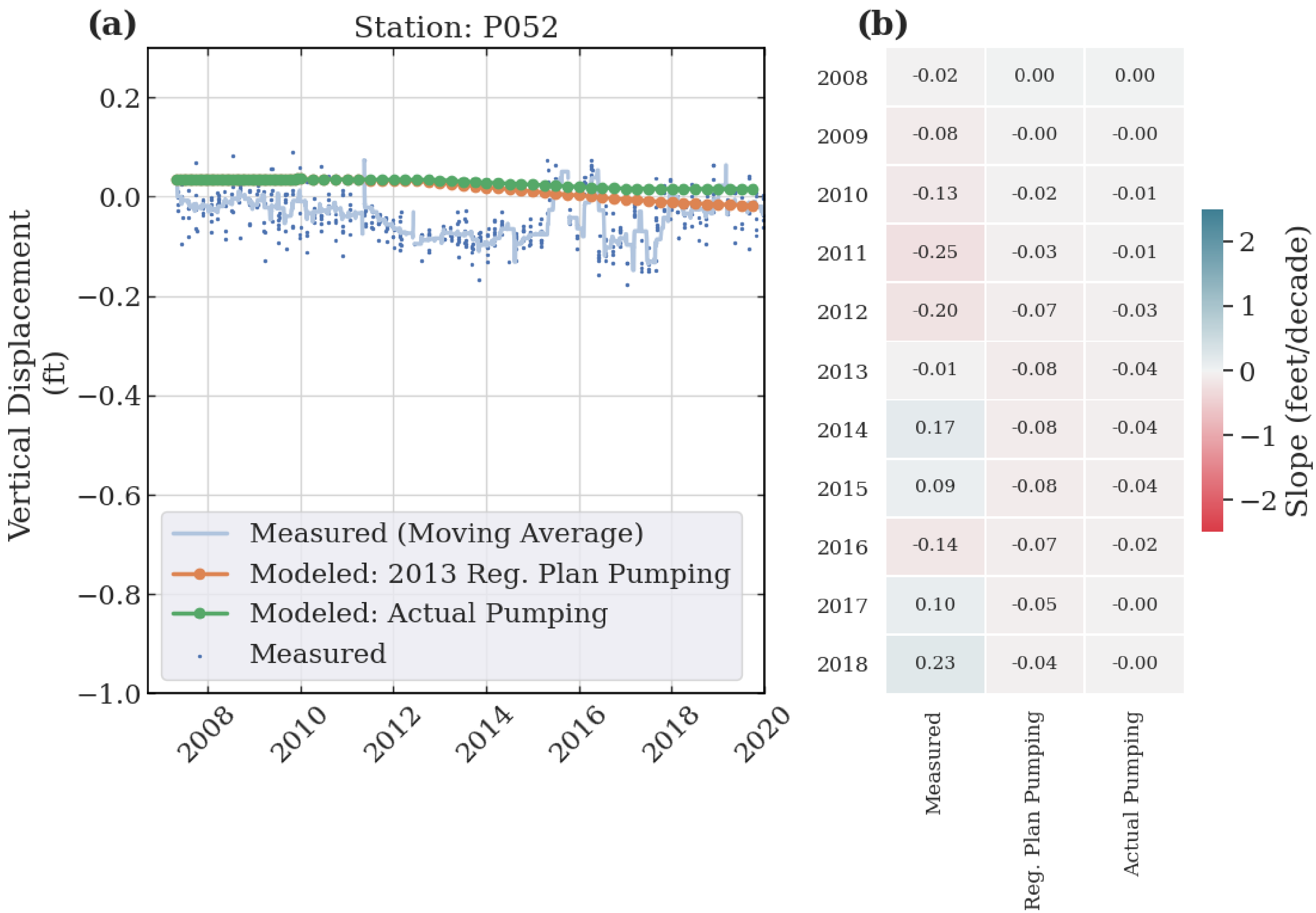

(a)
Station: UHCL
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2015
2016
2017
2018
-0.05
-0.02
0.00
0.03
-0.02
0.01
0.04
-0.01
0.01
0.01
-0.01
0.01
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2

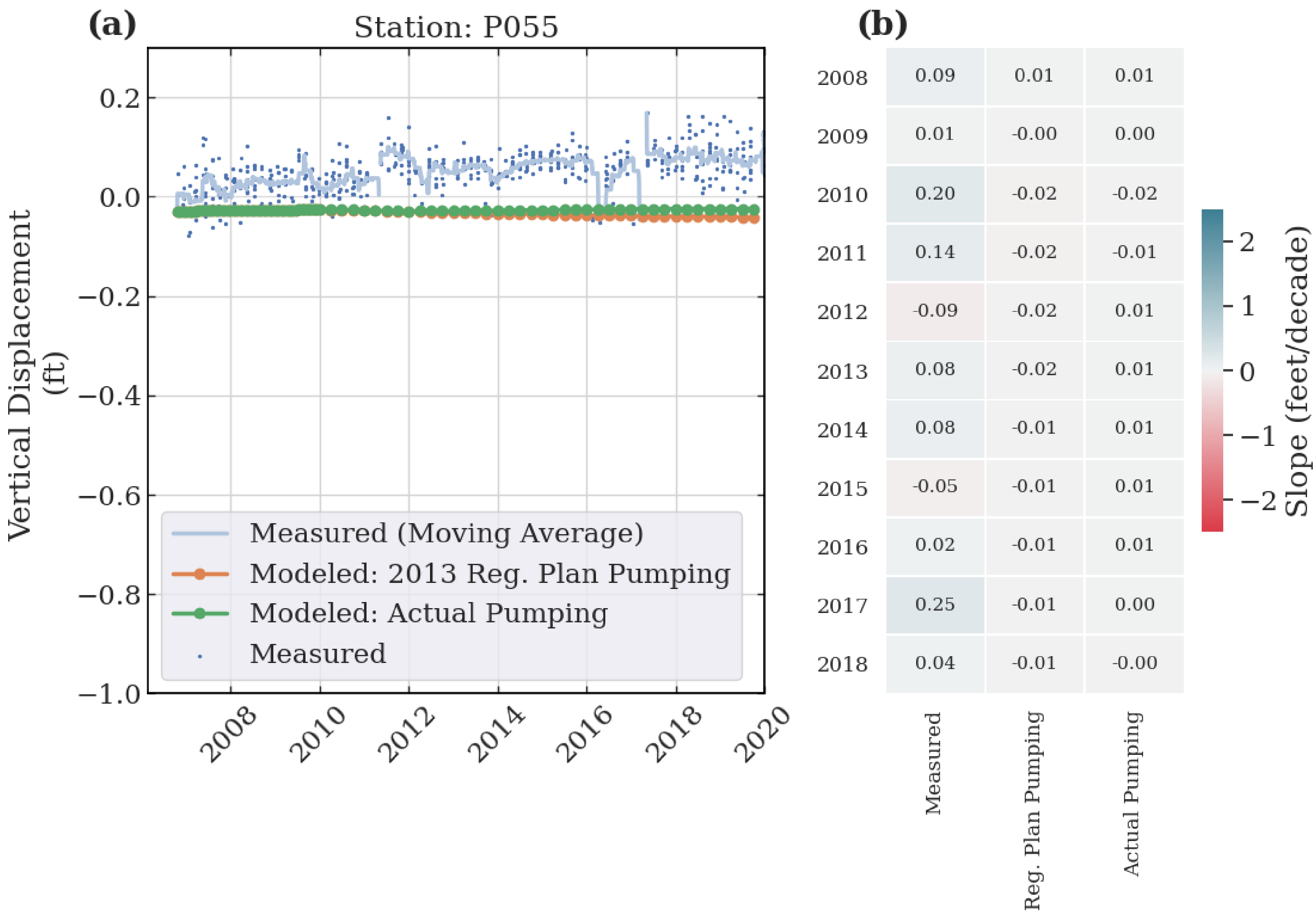


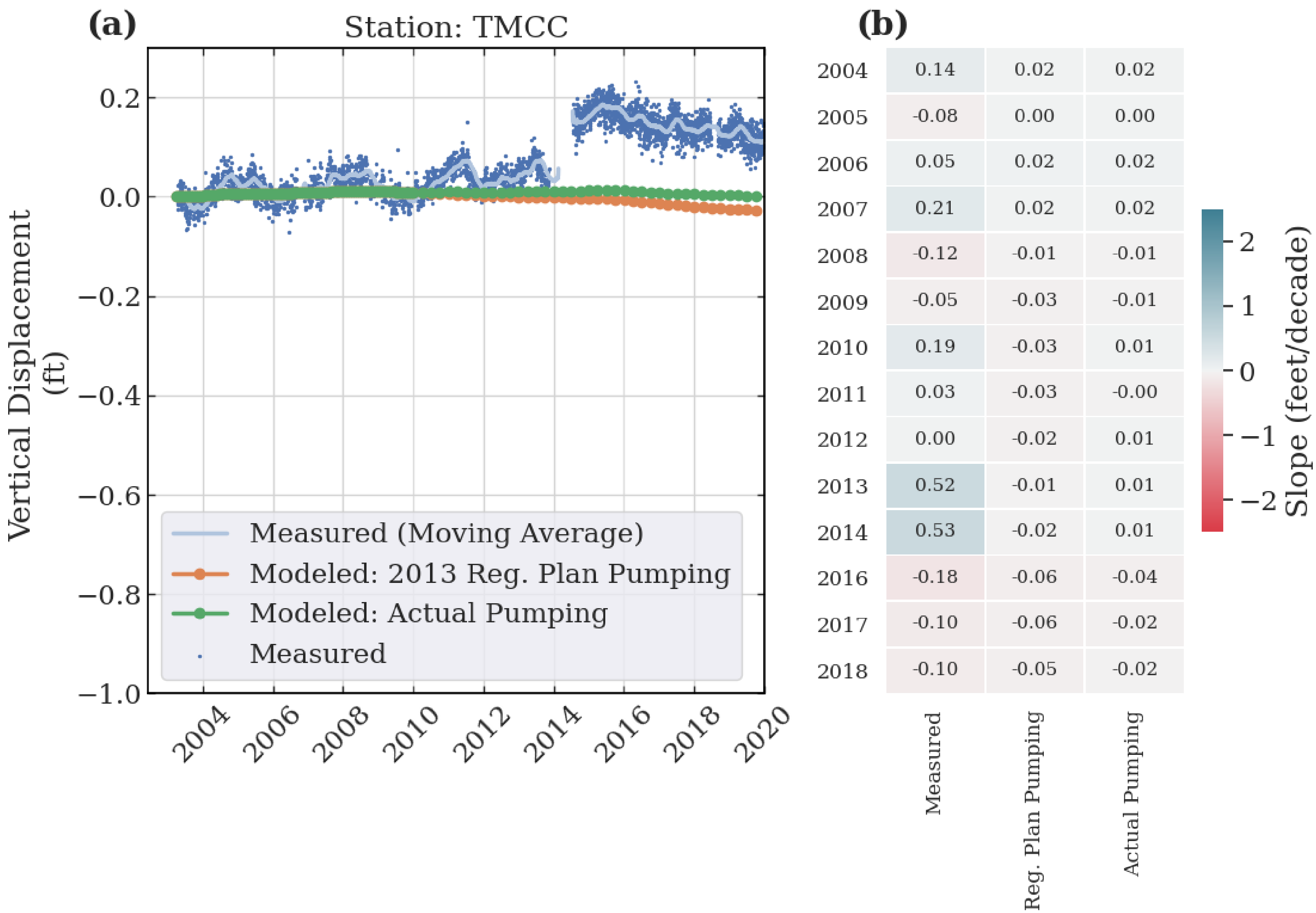
INTERA
GEOSCIENCE & ENGINEERING SOLUTIONS

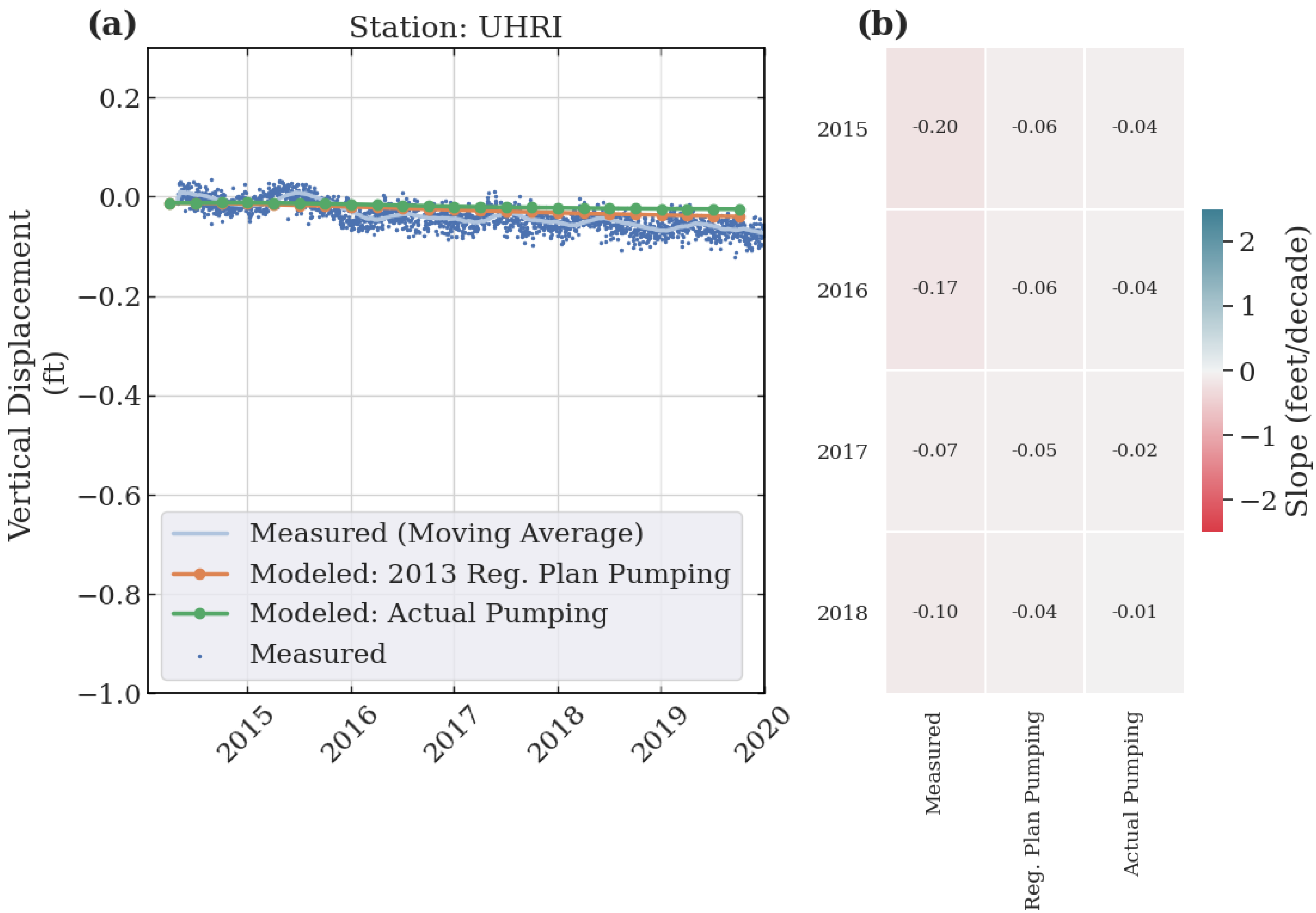

(a)
Station: MEPD
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2015
2016
2017
2018
0.04
-0.02
0.01
0.05
-0.01
0.01
0.02
-0.01
0.01
-0.01
-0.01
0.00
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

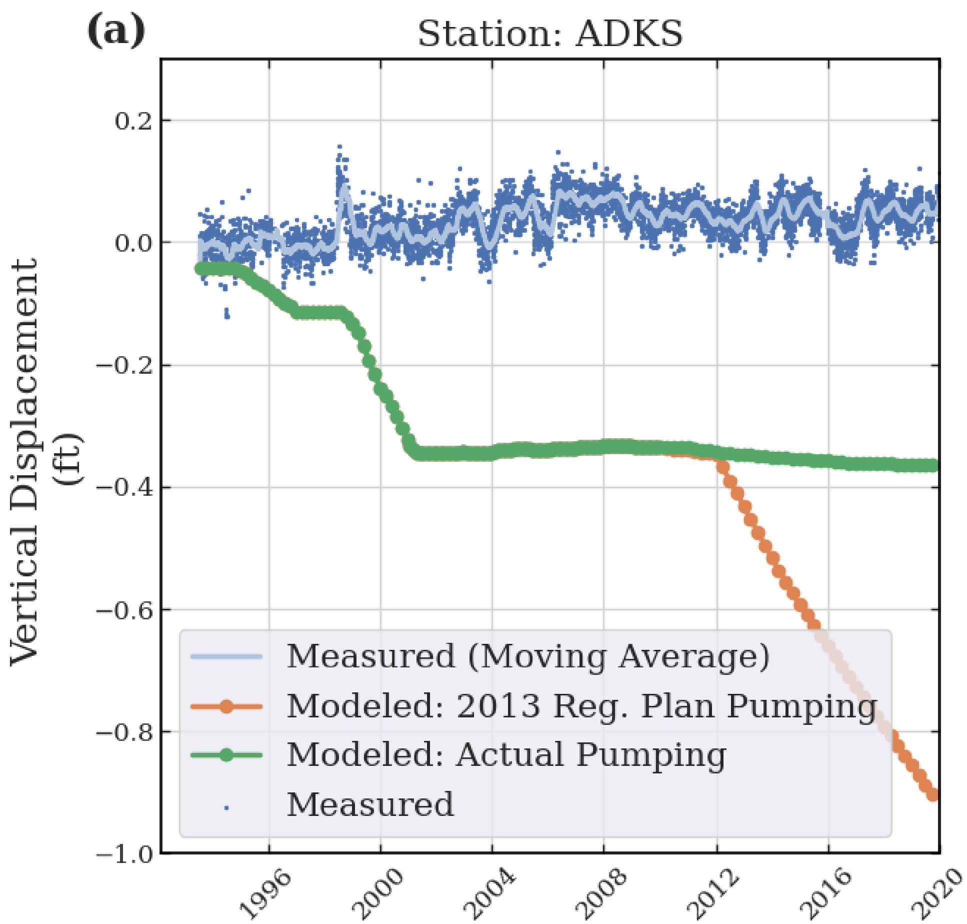

(a)
Station: P041
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2008
2010
2012
2014
2016
2018
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2008 -0.55 -0.02 -0.02
2009 -0.39 -0.04 0.01
2010 0.26 -0.04 0.02
2011 0.11 -0.02 0.00
2012 -0.06 -0.02 0.02
2013 0.28 -0.01 0.02
2014 0.15 -0.01 0.01
2015 -0.88 -0.04 -0.03
2016 -1.09 -0.06 -0.04
2017 -0.56 -0.05 -0.03
2018 -0.39 -0.05 -0.02
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)


(a)
Station: P052
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2008
2010
2012
2014
2016
2018
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2008 -0.02 0.00 0.00
2009 -0.08 -0.00 -0.00
2010 -0.13 -0.02 -0.01
2011 -0.25 -0.03 -0.01
2012 -0.20 -0.07 -0.03
2013 -0.01 -0.08 -0.04
2014 0.17 -0.08 -0.04
2015 0.09 -0.08 -0.04
2016 -0.14 -0.07 -0.02
2017 0.10 -0.05 -0.00
2018 0.23 -0.04 -0.00
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2


(a)
Station: P055
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2008
2010
2012
2014
2016
2018
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2008 0.09 0.01 0.01
2009 0.01 -0.00 0.00
2010 0.20 -0.02 -0.02
2011 0.14 -0.02 -0.01
2012 -0.09 -0.02 0.01
2013 0.08 -0.02 0.01
2014 0.08 -0.01 0.01
2015 -0.05 -0.01 0.01
2016 0.02 -0.01 0.01
2017 0.25 -0.01 0.00
2018 0.04 -0.01 -0.00
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

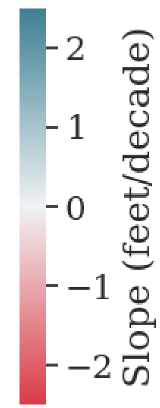

(a)
Station: TMCC
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
Measured
Reg. Plan Pumping
Actual Pumping
2004 0.14 0.02 0.02
2005 -0.08 0.00 0.00
2006 0.05 0.02 0.02
2007 0.21 0.02 0.02
2008 -0.12 -0.01 -0.01
2009 -0.05 -0.03 -0.01
2010 0.19 -0.03 0.01
2011 0.03 -0.03 -0.00
2012 0.00 -0.02 0.01
2013 0.52 -0.01 0.01
2014 0.53 -0.02 0.01
2016 -0.18 -0.06 -0.04
2017 -0.10 -0.06 -0.02
2018 -0.10 -0.05 -0.02
Slope (feet/decade)
2
1
0
−1
−2

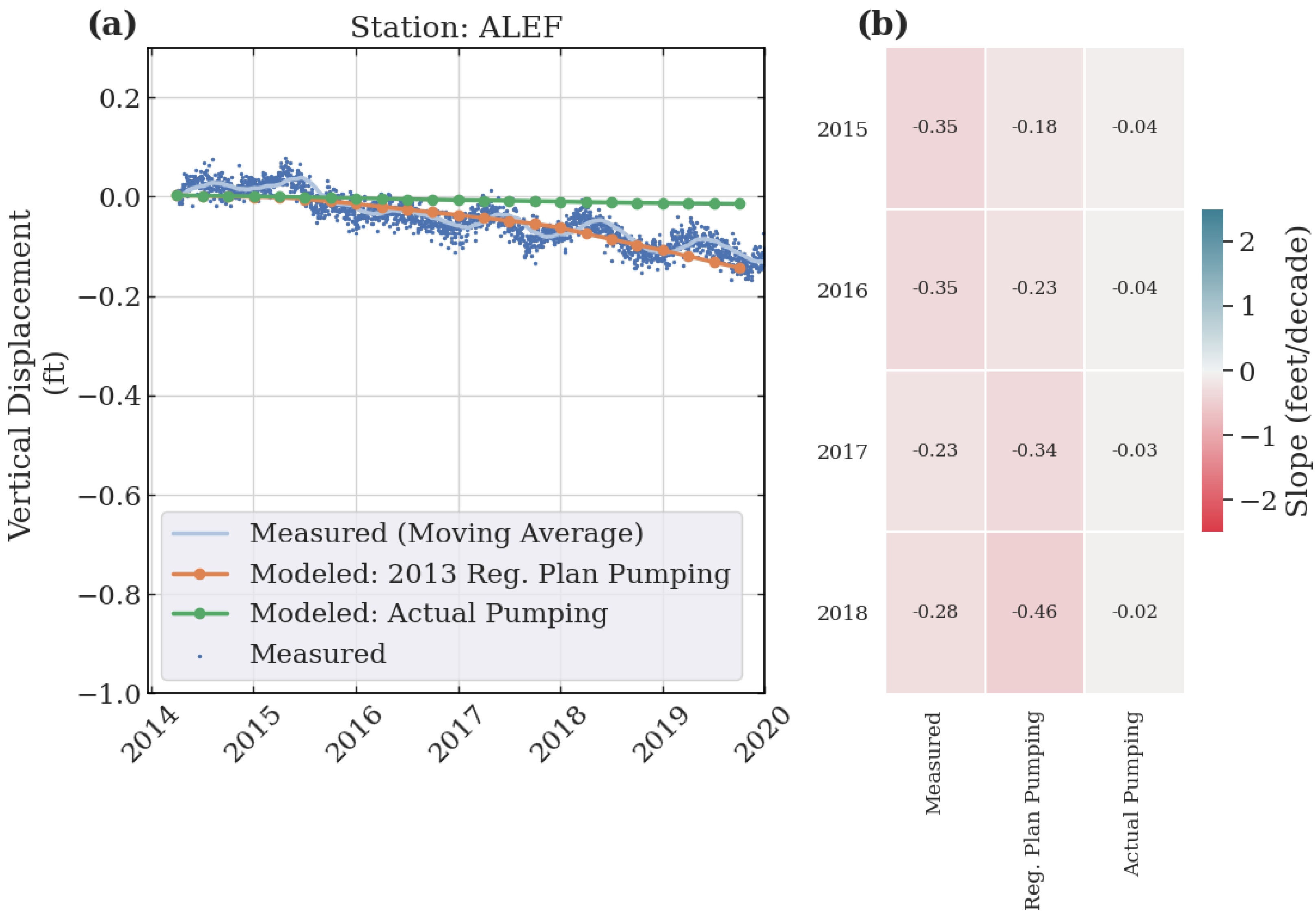

(a)
Station: UHRI
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2015
2016
2017
2018
-0.20
-0.06
-0.04
-0.17
-0.06
-0.04
-0.07
-0.05
-0.02
-0.10
-0.04
-0.01
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2

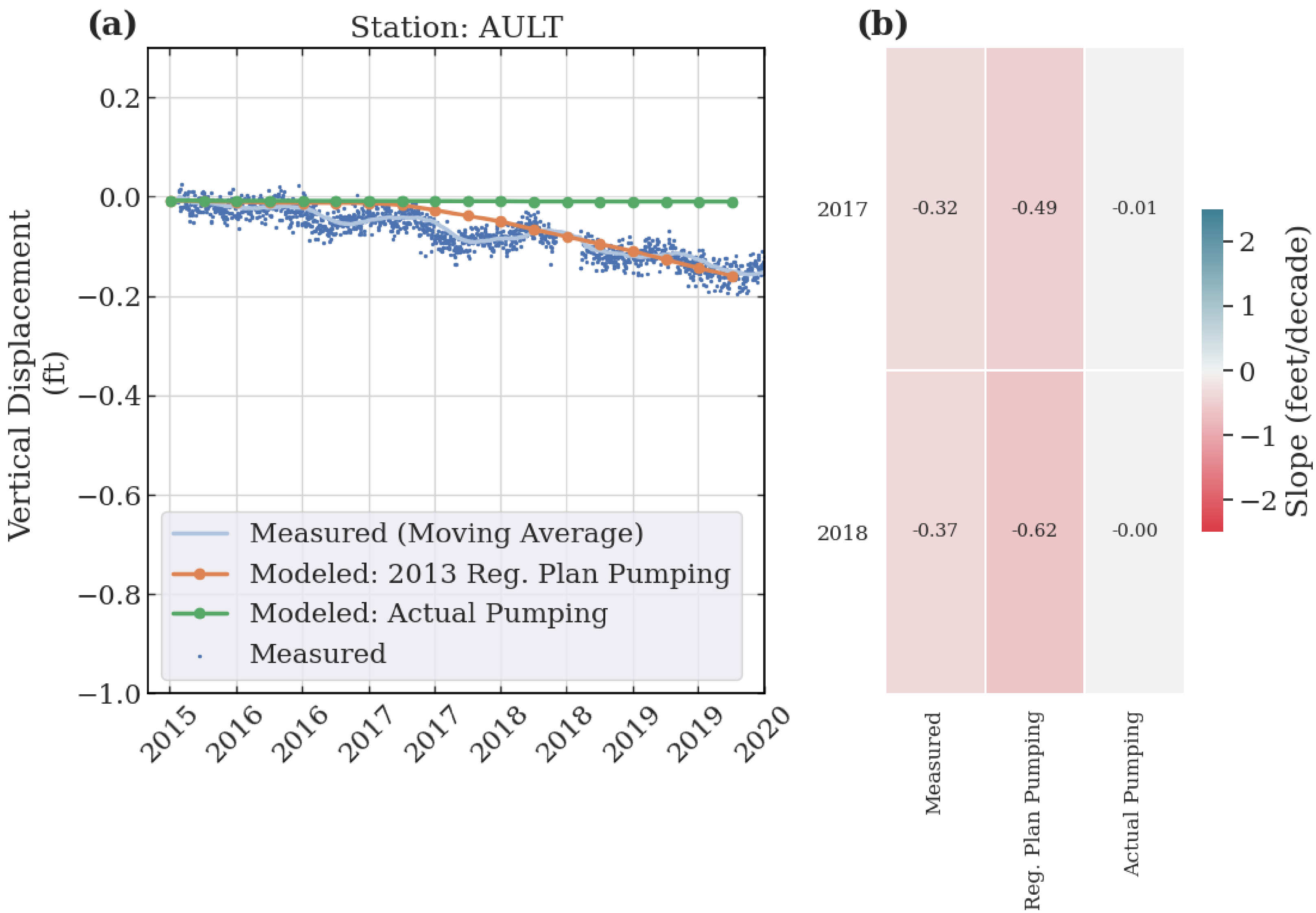


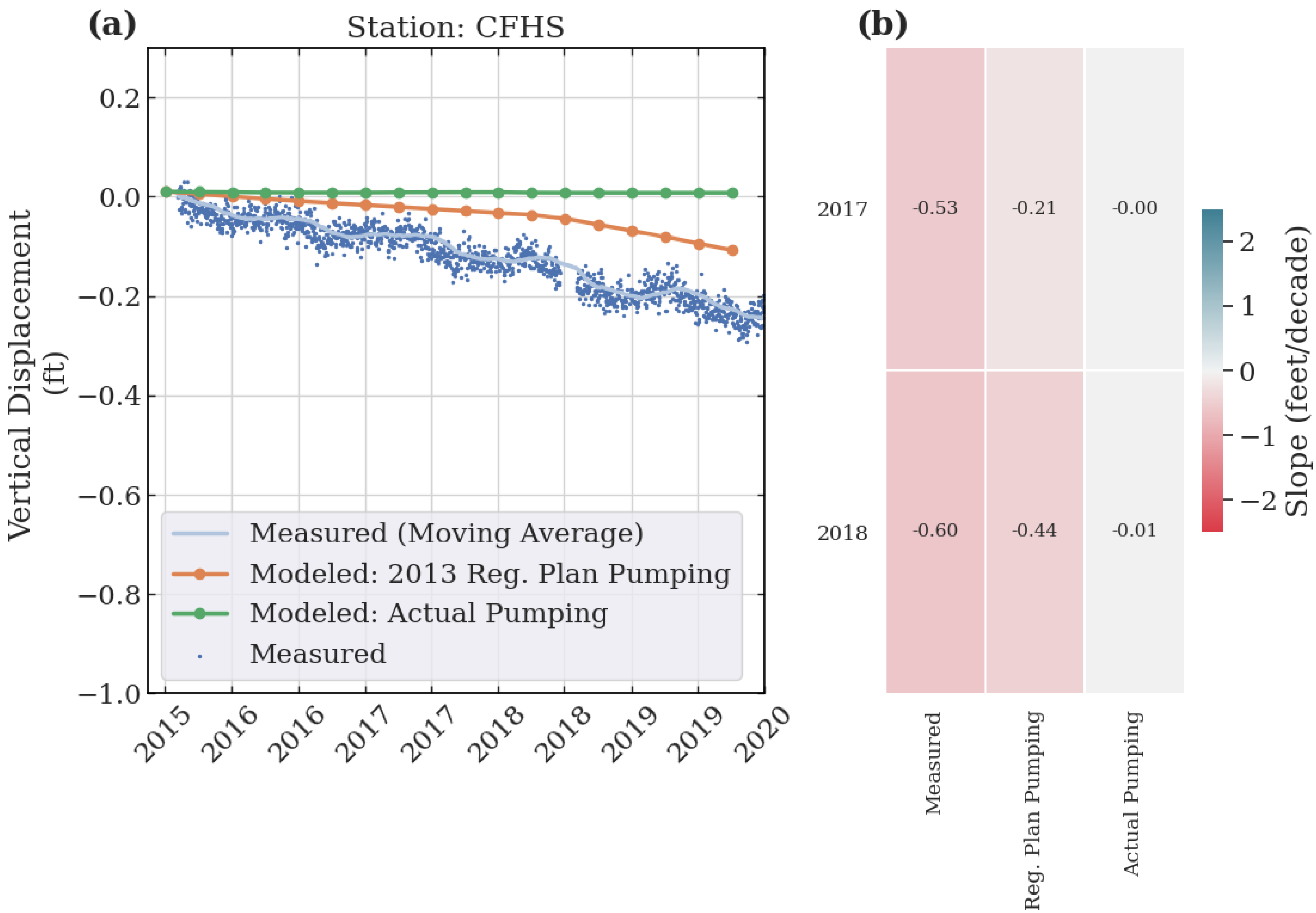
(b)

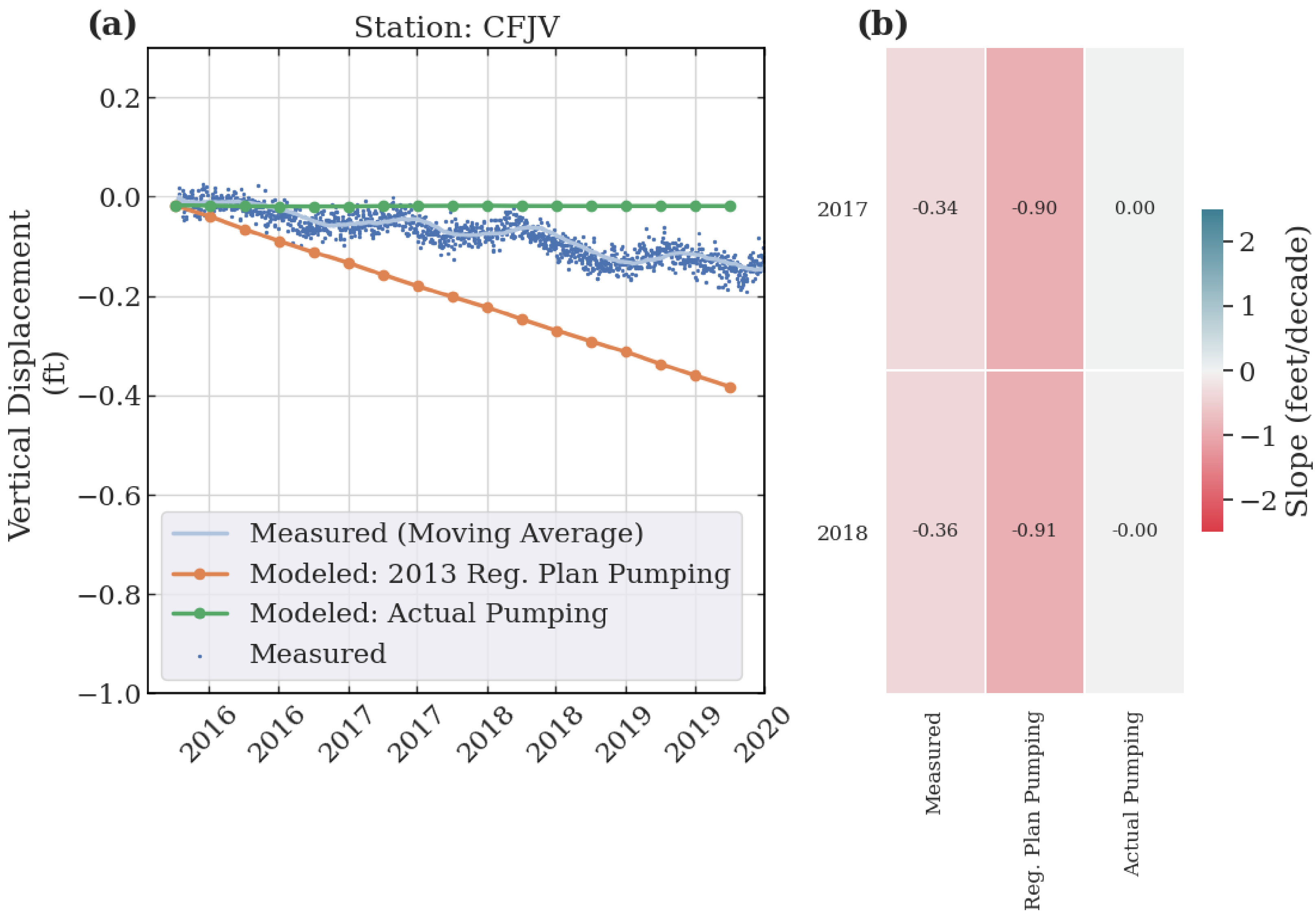
	Measured	Reg. Plan Pumping	Actual Pumping
1994	0.07	-0.17	-0.17
1995	0.03	-0.33	-0.33
1996	-0.07	-0.20	-0.20
1997	0.21	-0.02	-0.02
1998	0.12	-0.57	-0.57
1999	-0.02	-0.96	-0.96
2000	-0.02	-0.58	-0.58
2001	0.07	-0.03	-0.03
2002	0.07	-0.00	-0.00
2003	0.07	0.04	0.04
2004	0.04	0.01	0.01
2005	0.11	0.01	0.01
2006	0.10	0.03	0.03
2007	-0.02	0.01	0.01
2008	-0.14	-0.01	-0.01
2009	-0.11	-0.03	-0.00
2010	-0.02	-0.05	-0.03
2011	-0.09	-0.38	-0.07
2012	-0.06	-0.85	-0.04
2013	0.09	-0.82	-0.04
2014	0.07	-0.73	-0.03
2015	-0.19	-0.67	-0.04
2016	-0.04	-0.66	-0.03
2017	0.13	-0.64	-0.01
2018	-0.01	-0.64	-0.01

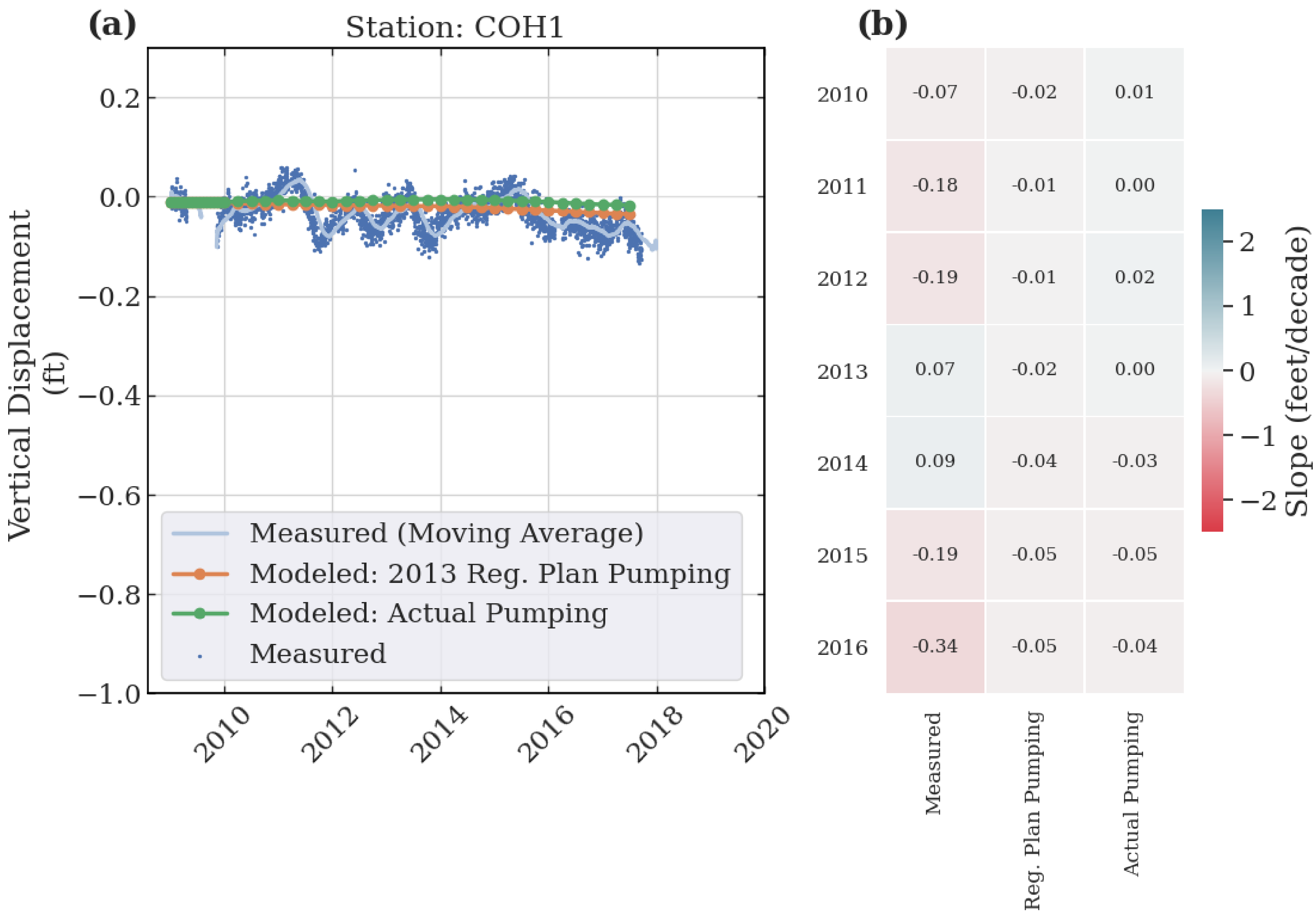


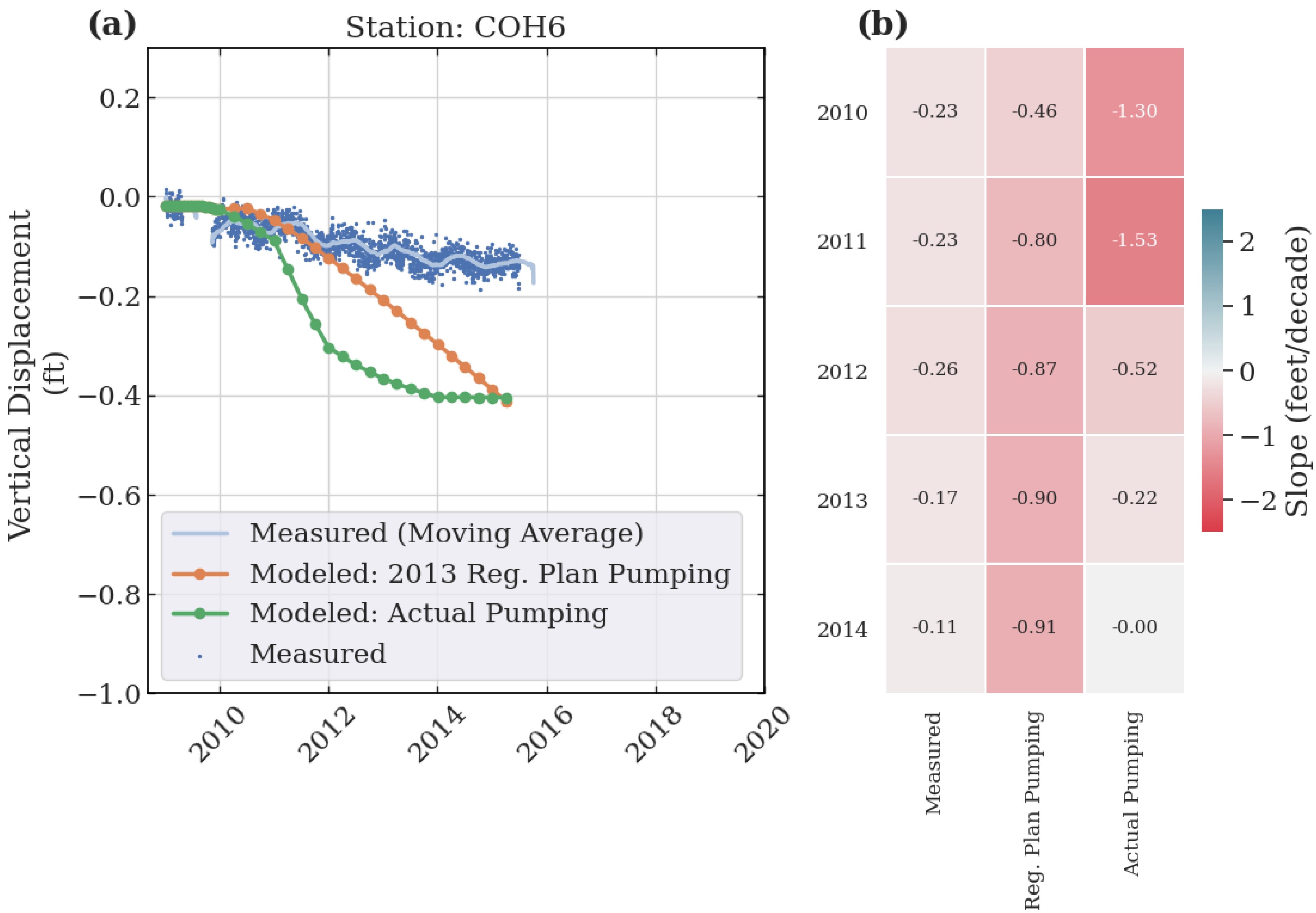

(a)
Station: ALEF
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2015
2016
2017
2018
-0.35
-0.18
-0.04
-0.35
-0.23
-0.04
-0.23
-0.34
-0.03
-0.28
-0.46
-0.02
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2


(a)
Station: AULT
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2015
2016
2016
2017
2017
2018
2018
2019
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2017
2018
-0.32
-0.49
-0.01
-0.37
-0.62
-0.00
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2

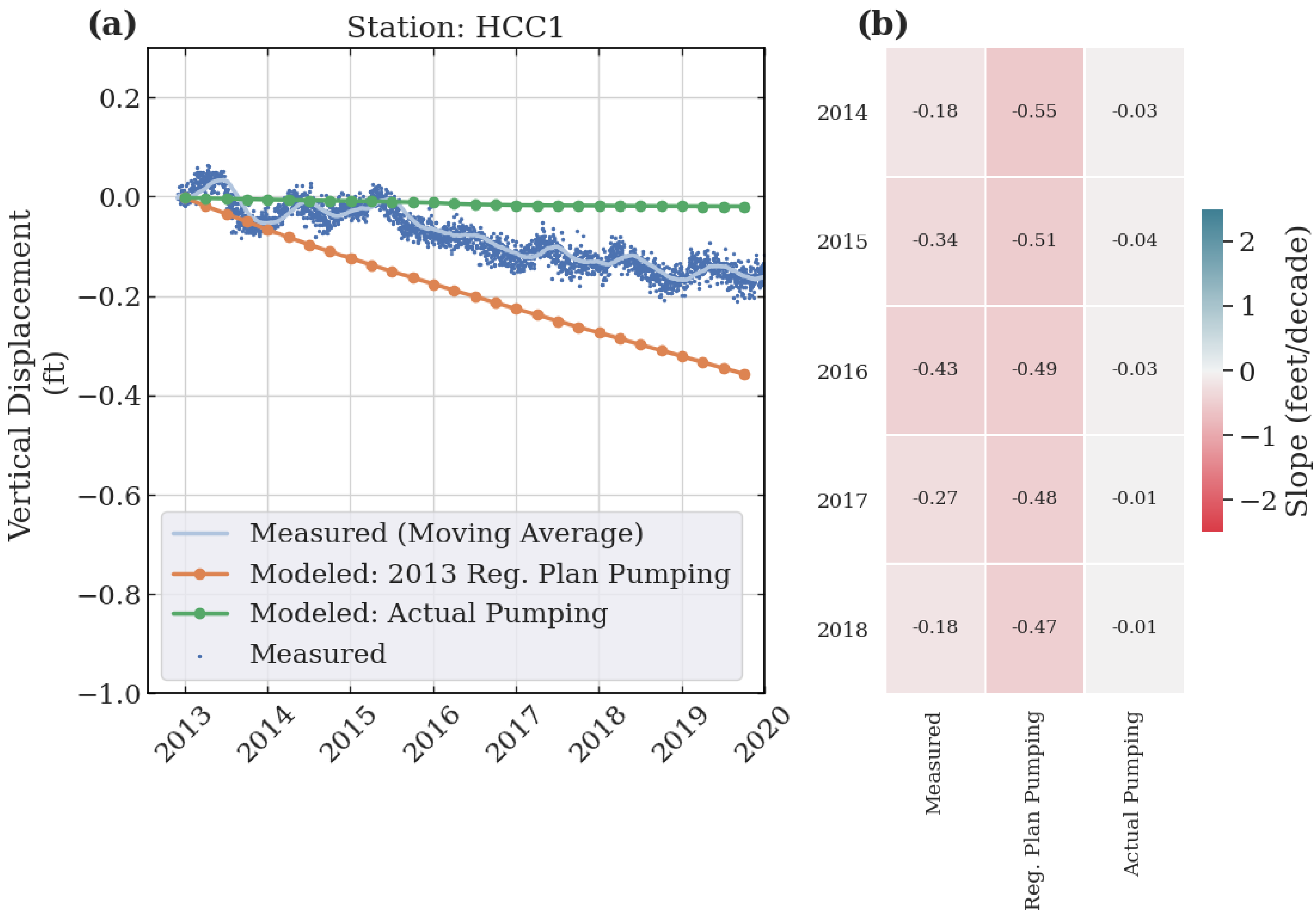

(a)
Station: CFHS
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2015
2016
2016
2017
2017
2018
2018
2019
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2017
2018
-0.53
-0.21
-0.00
-0.60
-0.44
-0.01
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2

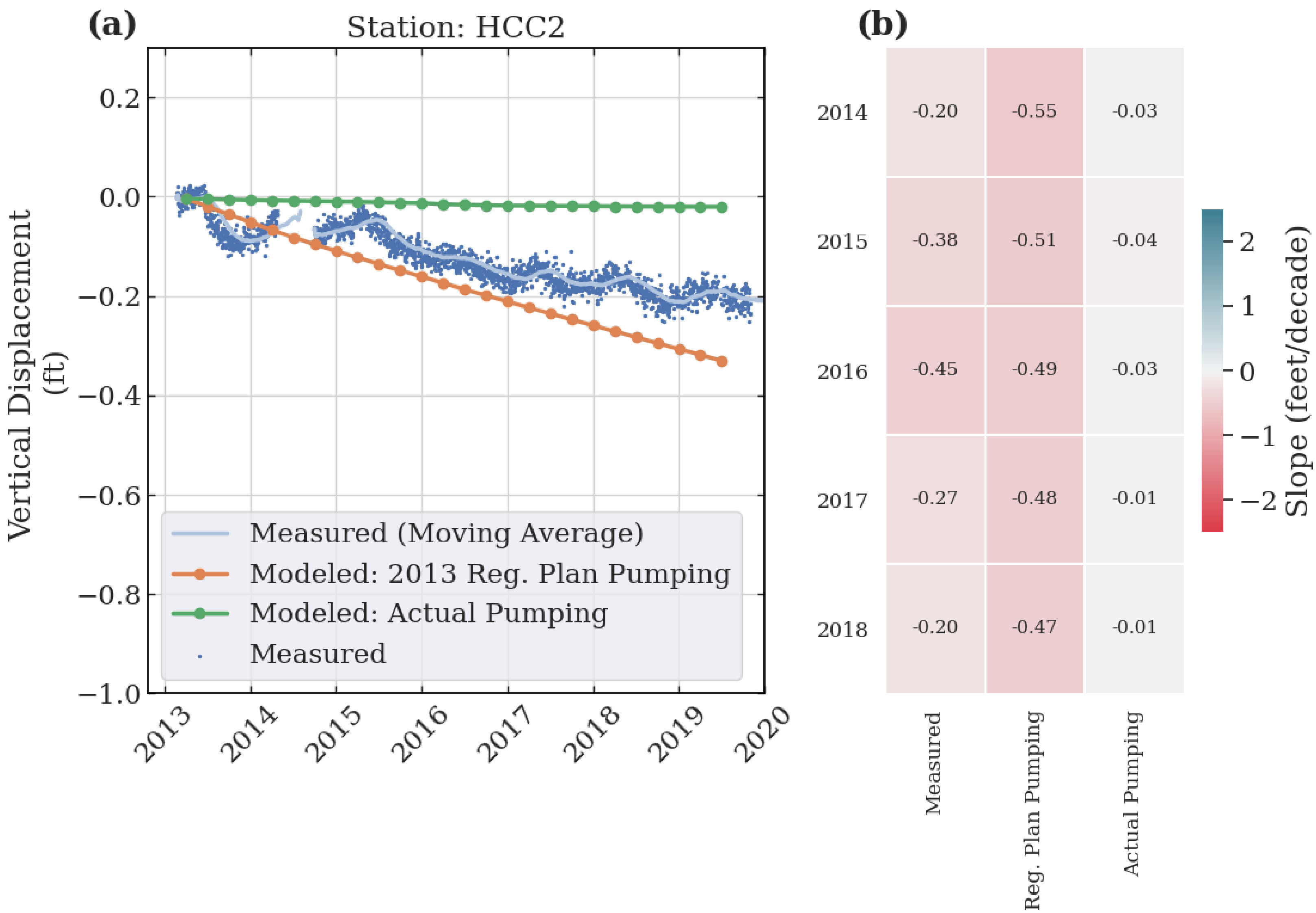

(a)
Station: CFJV
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2016
2016
2017
2017
2018
2018
2019
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2017
2018
-0.34
-0.90
0.00
-0.36
-0.91
-0.00
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2

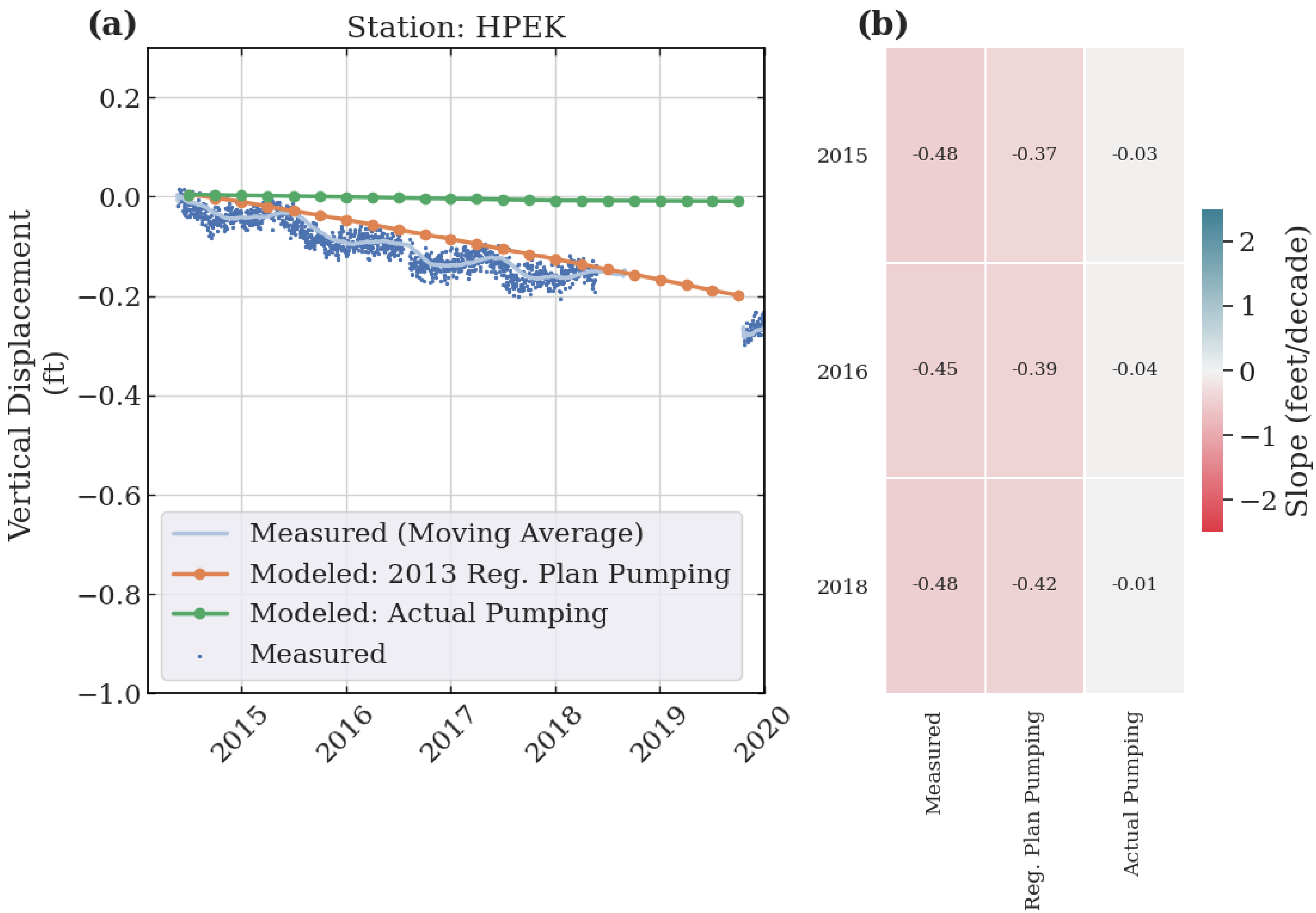

(a)
Station: COH1
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2010
2012
2014
2016
2018
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2010 -0.07 -0.02 0.01
2011 -0.18 -0.01 0.00
2012 -0.19 -0.01 0.02
2013 0.07 -0.02 0.00
2014 0.09 -0.04 -0.03
2015 -0.19 -0.05 -0.05
2016 -0.34 -0.05 -0.04
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2

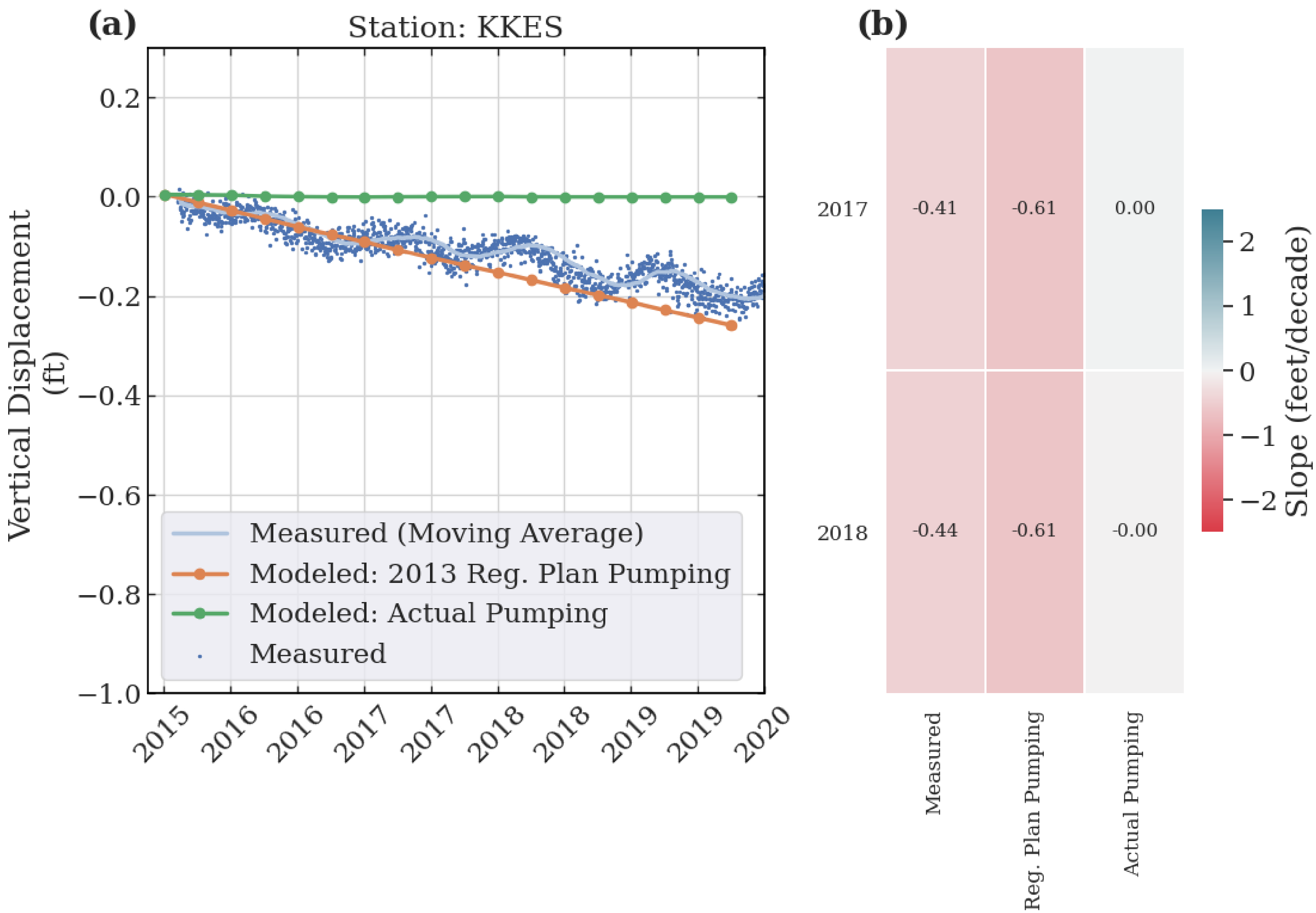


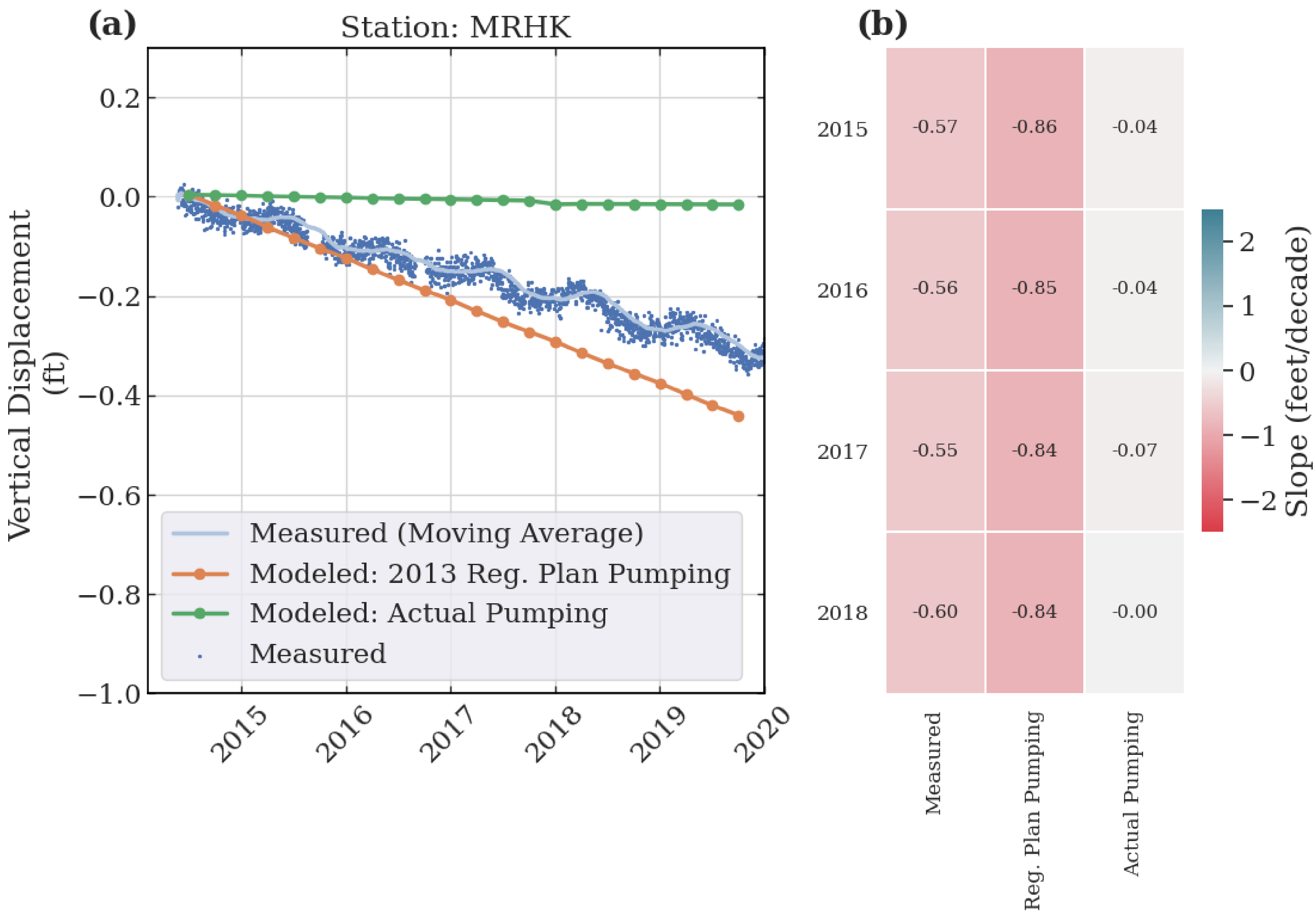
(a)
Station: COH6
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2010
2012
2014
2016
2018
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2010
2011
2012
2013
2014
-0.23
-0.46
-1.30
-0.23
-0.80
-1.53
-0.26
-0.87
-0.52
-0.17
-0.90
-0.22
-0.11
-0.91
-0.00
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2

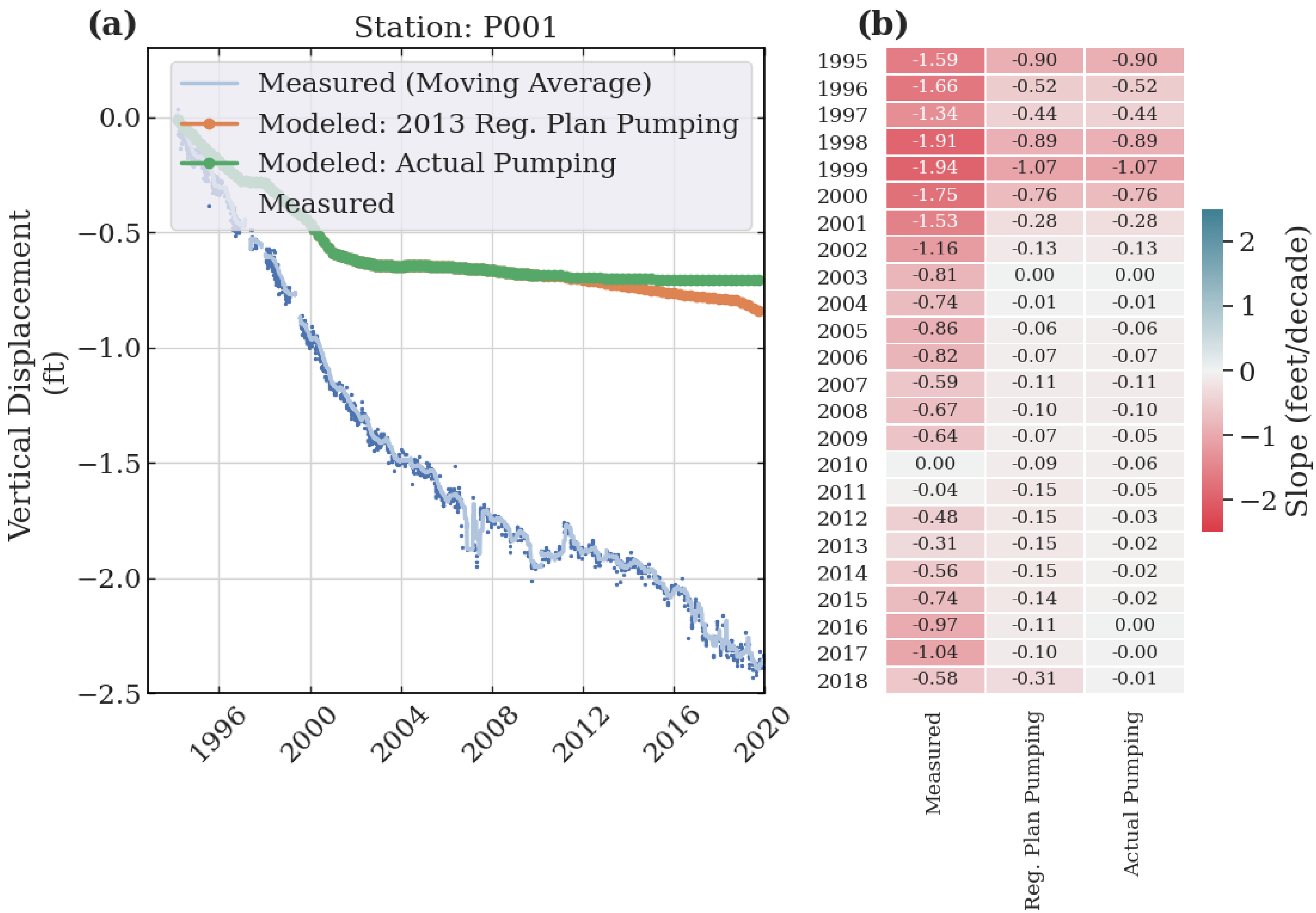

(a)
Station: HCC1
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2013
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2014
-0.18
-0.55
-0.03
2015
-0.34
-0.51
-0.04
2016
-0.43
-0.49
-0.03
2017
-0.27
-0.48
-0.01
2018
-0.18
-0.47
-0.01
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

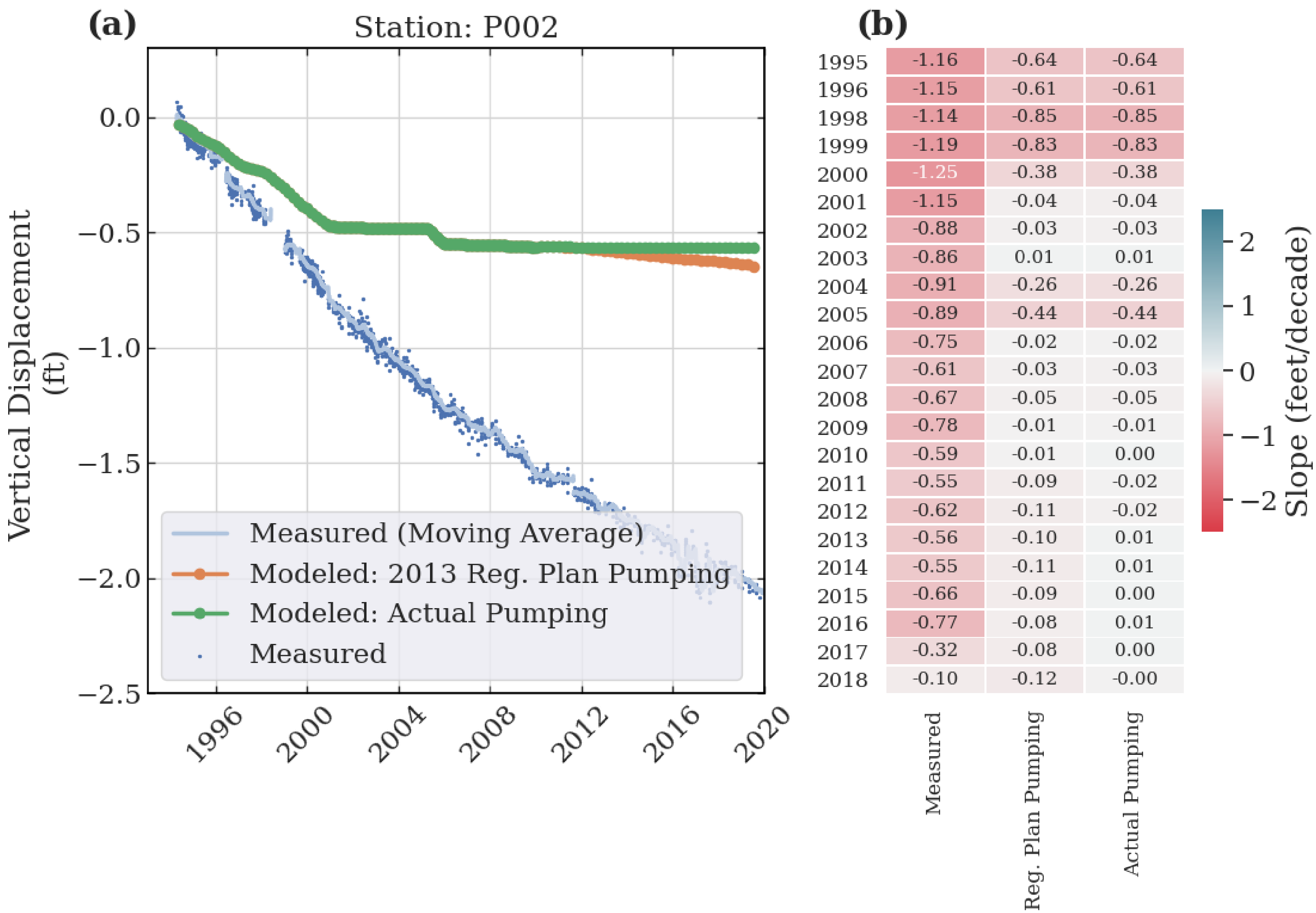

(a)
Station: HCC2
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2013
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2014
2015
2016
2017
2018
-0.20
-0.55
-0.03
-0.38
-0.51
-0.04
-0.45
-0.49
-0.03
-0.27
-0.48
-0.01
-0.20
-0.47
-0.01
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)


(a)
Station: HPEK
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2015
2016
2018
-0.48
-0.37
-0.03
-0.45
-0.39
-0.04
-0.48
-0.42
-0.01
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2

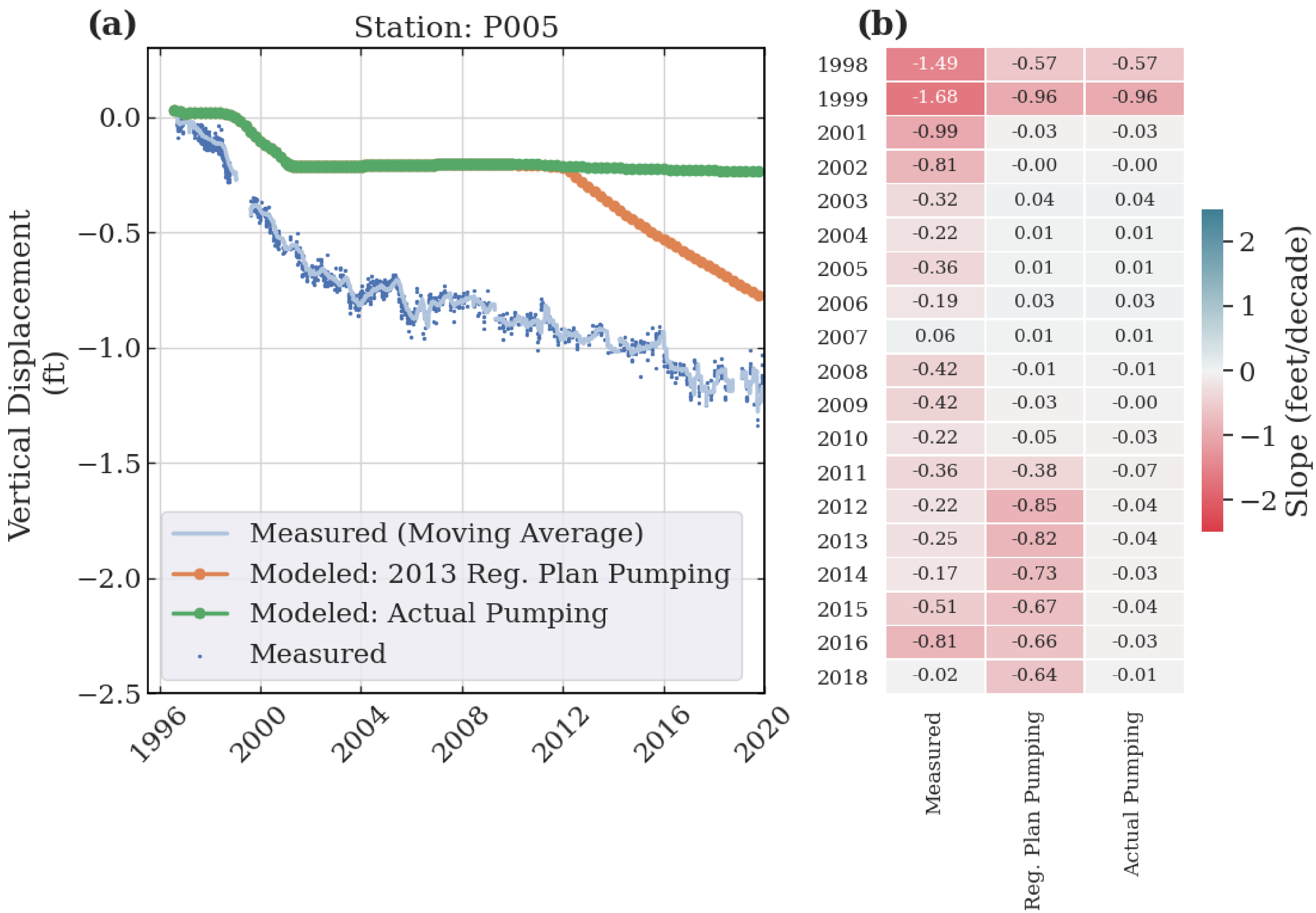

(a)
Station: KKES
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2015
2016
2016
2017
2017
2018
2018
2019
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2017
2018
-0.41
-0.61
0.00
-0.44
-0.61
-0.00
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

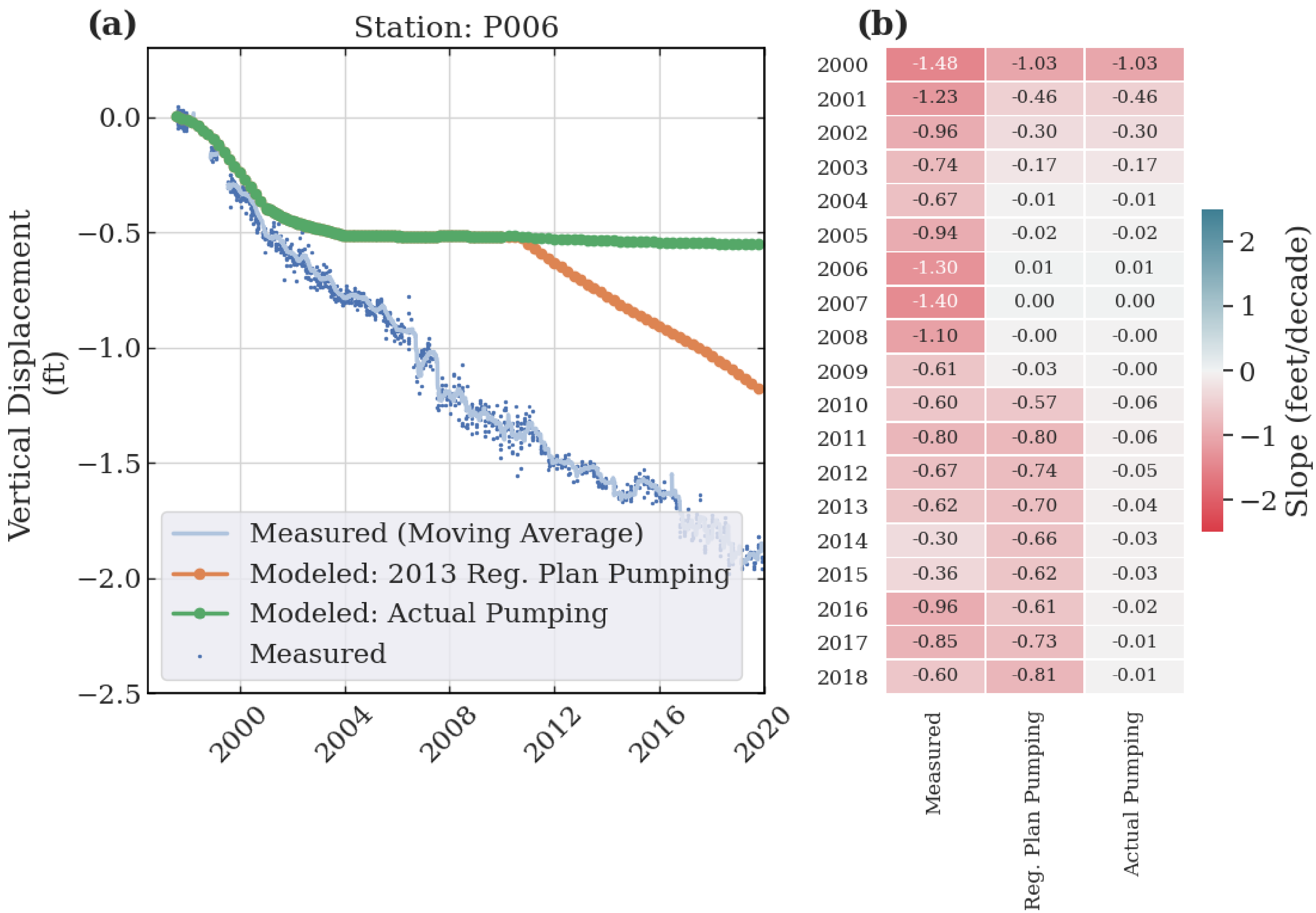

(a)
Station: MRHK
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2015
2016
2017
2018
-0.57
-0.86
-0.04
-0.56
-0.85
-0.04
-0.55
-0.84
-0.07
-0.60
-0.84
-0.00
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2

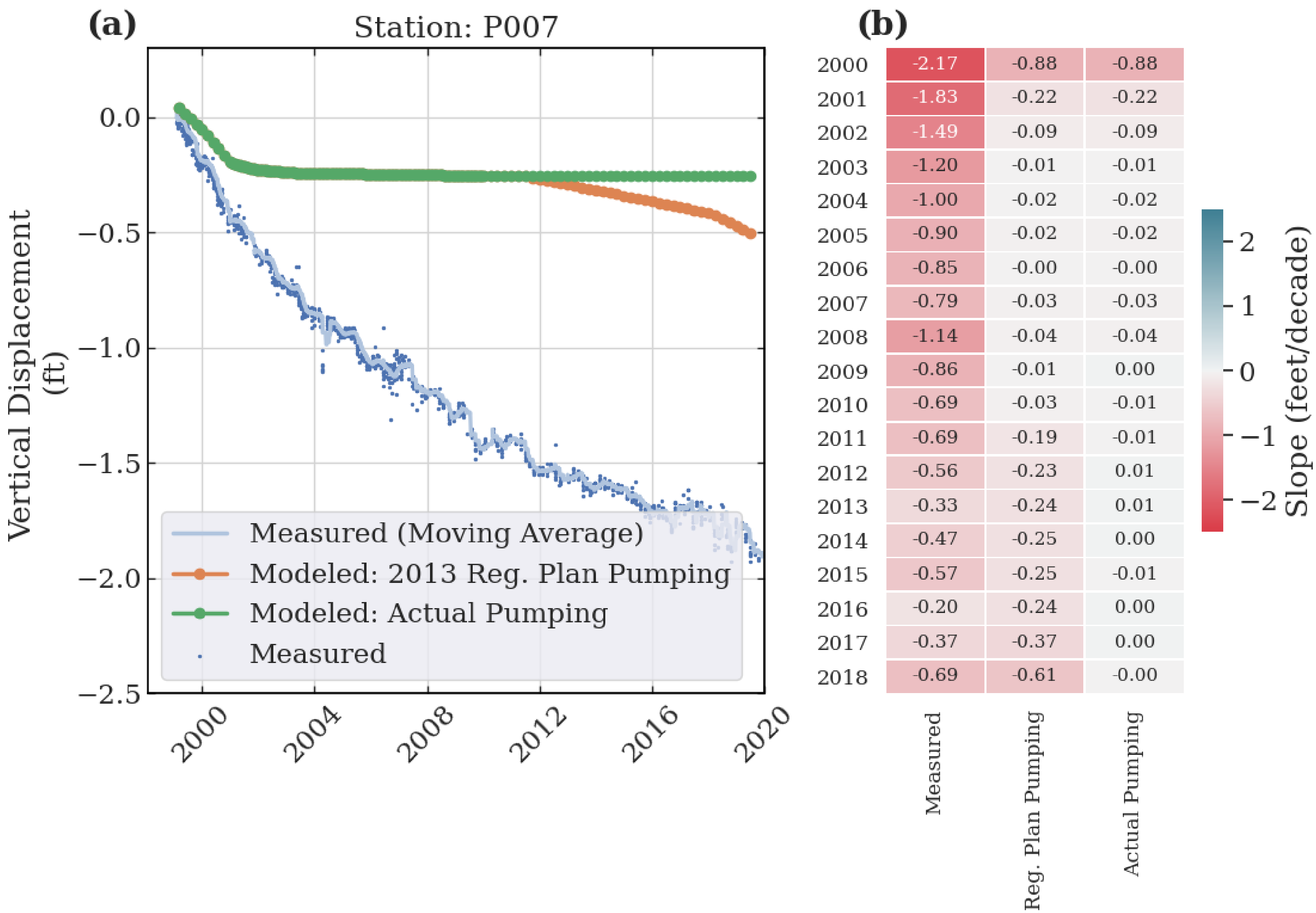

(a)
Station: P001
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
Vertical Displacement (ft)
0.0
−0.5
−1.0
−1.5
−2.0
−2.5
1996
2000
2004
2008
2012
2016
2020
(b)
1995 -1.59 -0.90 -0.90
1996 -1.66 -0.52 -0.52
1997 -1.34 -0.44 -0.44
1998 -1.91 -0.89 -0.89
1999 -1.94 -1.07 -1.07
2000 -1.75 -0.76 -0.76
2001 -1.53 -0.28 -0.28
2002 -1.16 -0.13 -0.13
2003 -0.81 0.00 0.00
2004 -0.74 -0.01 -0.01
2005 -0.86 -0.06 -0.06
2006 -0.82 -0.07 -0.07
2007 -0.59 -0.11 -0.11
2008 -0.67 -0.10 -0.10
2009 -0.64 -0.07 -0.05
2010 0.00 -0.09 -0.06
2011 -0.04 -0.15 -0.05
2012 -0.48 -0.15 -0.03
2013 -0.31 -0.15 -0.02
2014 -0.56 -0.15 -0.02
2015 -0.74 -0.14 -0.02
2016 -0.97 -0.11 0.00
2017 -1.04 -0.10 -0.00
2018 -0.58 -0.31 -0.01
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

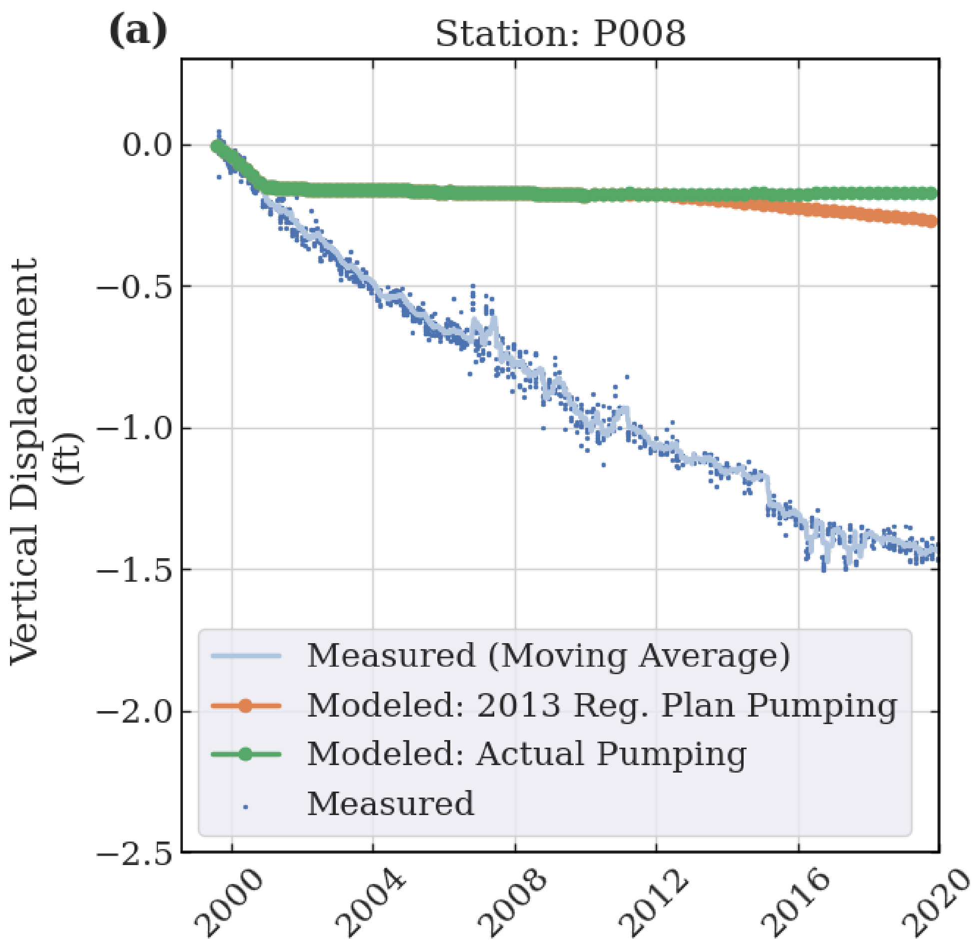


	Measured	Reg. Plan Pumping	Actual Pumping
1995	-1.16	-0.64	-0.64
1996	-1.15	-0.61	-0.61
1998	-1.14	-0.85	-0.85
1999	-1.19	-0.83	-0.83
2000	-1.25	-0.38	-0.38
2001	-1.15	-0.04	-0.04
2002	-0.88	-0.03	-0.03
2003	-0.86	0.01	0.01
2004	-0.91	-0.26	-0.26
2005	-0.89	-0.44	-0.44
2006	-0.75	-0.02	-0.02
2007	-0.61	-0.03	-0.03
2008	-0.67	-0.05	-0.05
2009	-0.78	-0.01	-0.01
2010	-0.59	-0.01	0.00
2011	-0.55	-0.09	-0.02
2012	-0.62	-0.11	-0.02
2013	-0.56	-0.10	0.01
2014	-0.55	-0.11	0.01
2015	-0.66	-0.09	0.00
2016	-0.77	-0.08	0.01
2017	-0.32	-0.08	0.00
2018	-0.10	-0.12	-0.00


(a)
Station: P005
Vertical Displacement
(ft)
0.0
−0.5
−1.0
−1.5
−2.0
−2.5
1996
2000
2004
2008
2012
2016
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
1998 -1.49 -0.57 -0.57
1999 -1.68 -0.96 -0.96
2001 -0.99 -0.03 -0.03
2002 -0.81 -0.00 -0.00
2003 -0.32 0.04 0.04
2004 -0.22 0.01 0.01
2005 -0.36 0.01 0.01
2006 -0.19 0.03 0.03
2007 0.06 0.01 0.01
2008 -0.42 -0.01 -0.01
2009 -0.42 -0.03 -0.00
2010 -0.22 -0.05 -0.03
2011 -0.36 -0.38 -0.07
2012 -0.22 -0.85 -0.04
2013 -0.25 -0.82 -0.04
2014 -0.17 -0.73 -0.03
2015 -0.51 -0.67 -0.04
2016 -0.81 -0.66 -0.03
2018 -0.02 -0.64 -0.01
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)


(a)
Station: P006
Vertical Displacement (ft)
0.0
−0.5
−1.0
−1.5
−2.0
−2.5
2000
2004
2008
2012
2016
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2000 -1.48 -1.03 -1.03
2001 -1.23 -0.46 -0.46
2002 -0.96 -0.30 -0.30
2003 -0.74 -0.17 -0.17
2004 -0.67 -0.01 -0.01
2005 -0.94 -0.02 -0.02
2006 -1.30 0.01 0.01
2007 -1.40 0.00 0.00
2008 -1.10 -0.00 -0.00
2009 -0.61 -0.03 -0.00
2010 -0.60 -0.57 -0.06
2011 -0.80 -0.80 -0.06
2012 -0.67 -0.74 -0.05
2013 -0.62 -0.70 -0.04
2014 -0.30 -0.66 -0.03
2015 -0.36 -0.62 -0.03
2016 -0.96 -0.61 -0.02
2017 -0.85 -0.73 -0.01
2018 -0.60 -0.81 -0.01
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

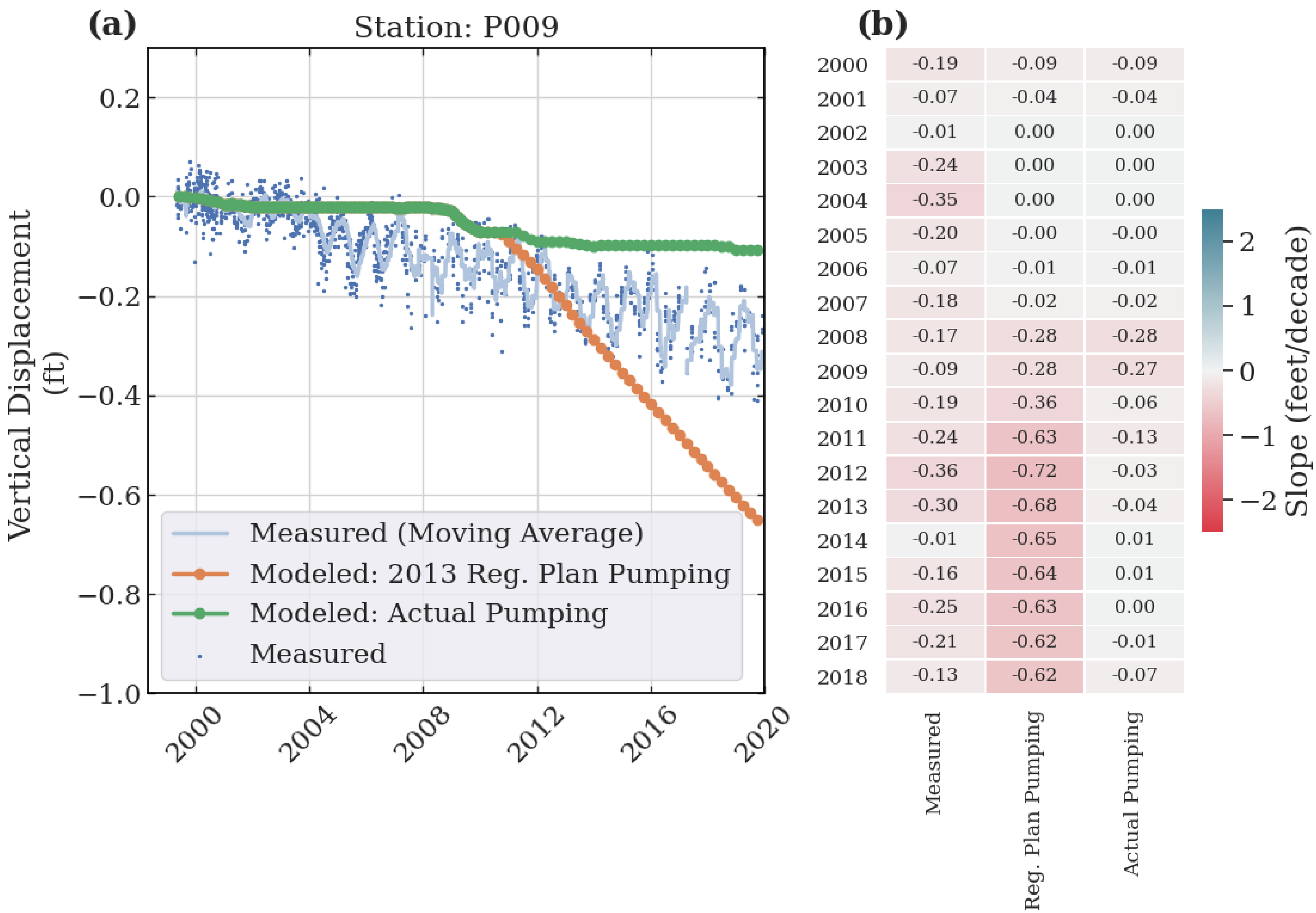

(a)
Station: P007
Vertical Displacement (ft)
0.0
−0.5
−1.0
−1.5
−2.0
−2.5
2000
2004
2008
2012
2016
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2000 -2.17 -0.88 -0.88
2001 -1.83 -0.22 -0.22
2002 -1.49 -0.09 -0.09
2003 -1.20 -0.01 -0.01
2004 -1.00 -0.02 -0.02
2005 -0.90 -0.02 -0.02
2006 -0.85 -0.00 -0.00
2007 -0.79 -0.03 -0.03
2008 -1.14 -0.04 -0.04
2009 -0.86 -0.01 0.00
2010 -0.69 -0.03 -0.01
2011 -0.69 -0.19 -0.01
2012 -0.56 -0.23 0.01
2013 -0.33 -0.24 0.01
2014 -0.47 -0.25 0.00
2015 -0.57 -0.25 -0.01
2016 -0.20 -0.24 0.00
2017 -0.37 -0.37 0.00
2018 -0.69 -0.61 -0.00
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)



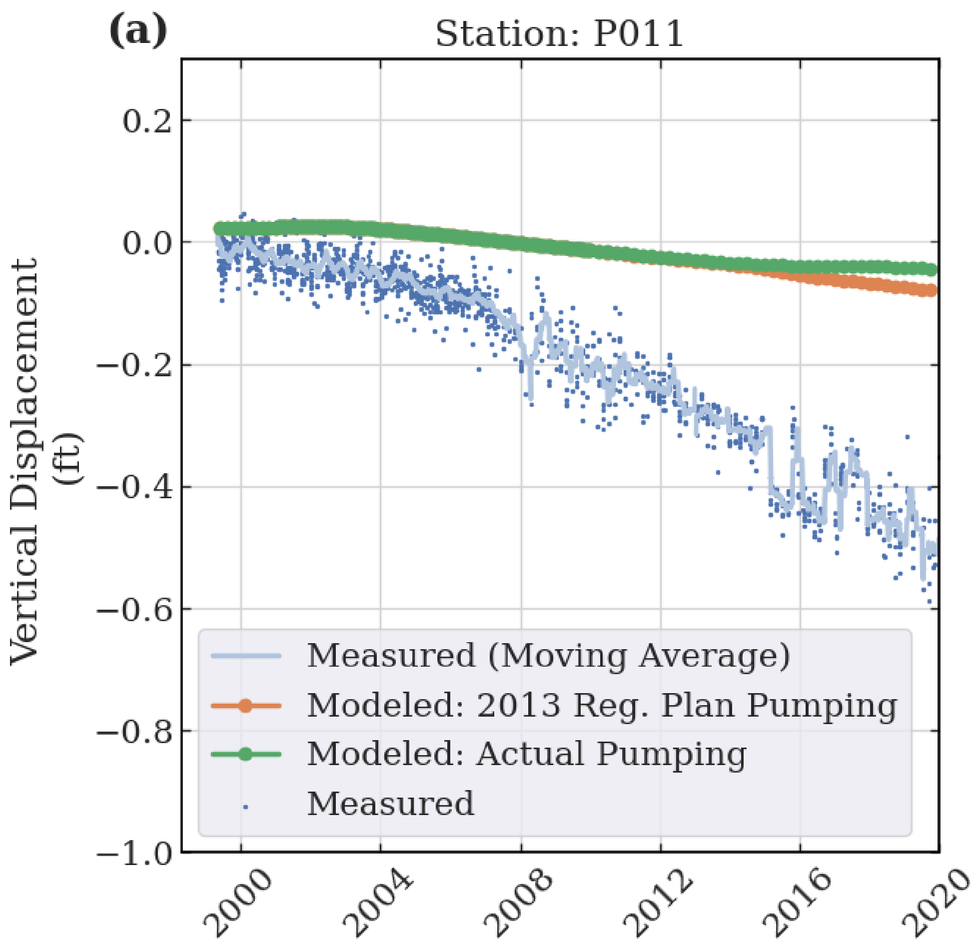
(b)

	Measured	Reg. Plan Pumping	Actual Pumping
2001	-1.16	-0.06	-0.06
2002	-1.01	-0.02	-0.02
2003	-0.91	0.00	0.00
2004	-0.84	-0.04	-0.04
2005	-0.59	-0.03	-0.03
2006	-0.46	-0.00	-0.00
2007	-0.75	-0.03	-0.03
2008	-1.01	-0.04	-0.04
2009	-0.77	-0.00	0.01
2010	-0.59	0.01	0.02
2011	-0.47	-0.04	-0.01
2012	-0.53	-0.11	0.00
2013	-0.41	-0.12	0.01
2014	-0.81	-0.13	0.01
2015	-1.01	-0.12	0.00
2016	-0.51	-0.11	0.01
2017	-0.10	-0.11	0.00
2018	-0.16	-0.12	-0.00

Slope (feet/decade): 2, 1, 0, −1, −2

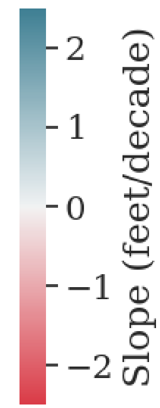

(a)
Station: P009
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2000
2004
2008
2012
2016
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2000 -0.19 -0.09 -0.09
2001 -0.07 -0.04 -0.04
2002 -0.01 0.00 0.00
2003 -0.24 0.00 0.00
2004 -0.35 0.00 0.00
2005 -0.20 -0.00 -0.00
2006 -0.07 -0.01 -0.01
2007 -0.18 -0.02 -0.02
2008 -0.17 -0.28 -0.28
2009 -0.09 -0.28 -0.27
2010 -0.19 -0.36 -0.06
2011 -0.24 -0.63 -0.13
2012 -0.36 -0.72 -0.03
2013 -0.30 -0.68 -0.04
2014 -0.01 -0.65 0.01
2015 -0.16 -0.64 0.01
2016 -0.25 -0.63 0.00
2017 -0.21 -0.62 -0.01
2018 -0.13 -0.62 -0.07
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

(a)

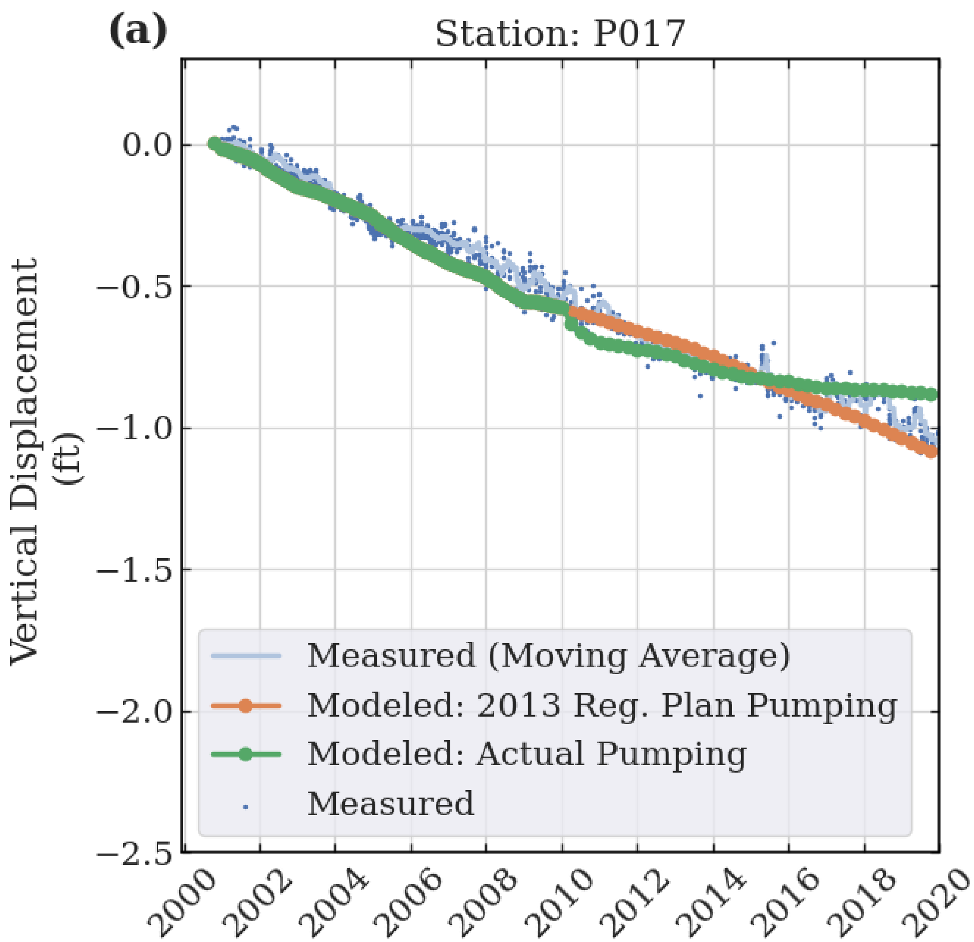


(b)

	Measured	Reg. Plan Pumping	Actual Pumping
2000	-0.10	0.00	0.00
2001	-0.11	-0.00	-0.00
2002	-0.08	-0.01	-0.01
2003	-0.10	-0.04	-0.04
2004	-0.15	-0.05	-0.05
2005	-0.15	-0.06	-0.06
2006	-0.19	-0.06	-0.06
2007	-0.34	-0.06	-0.06
2008	-0.33	-0.06	-0.06
2009	-0.22	-0.06	-0.06
2010	-0.19	-0.06	-0.06
2011	-0.19	-0.06	-0.05
2012	-0.31	-0.06	-0.05
2013	-0.31	-0.06	-0.04
2014	-0.48	-0.08	-0.03
2015	-0.40	-0.09	-0.02
2016	0.06	-0.07	-0.01
2017	-0.19	-0.06	-0.00
2018	-0.37	-0.06	-0.02

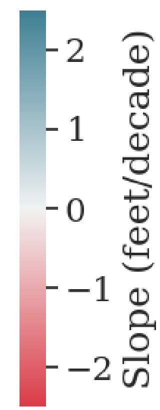


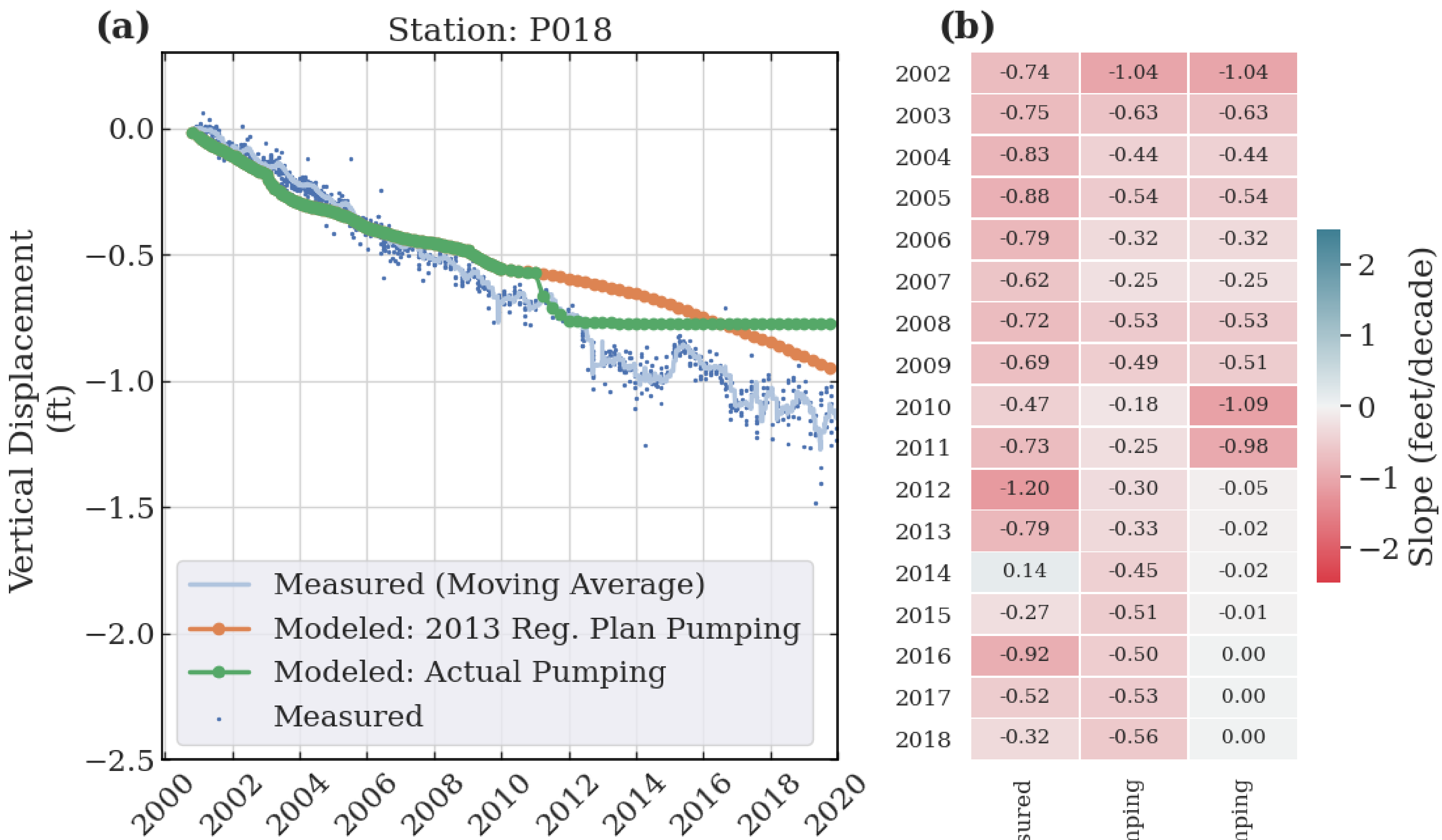
INTERA
GEOSCIENCE & ENGINEERING SOLUTIONS



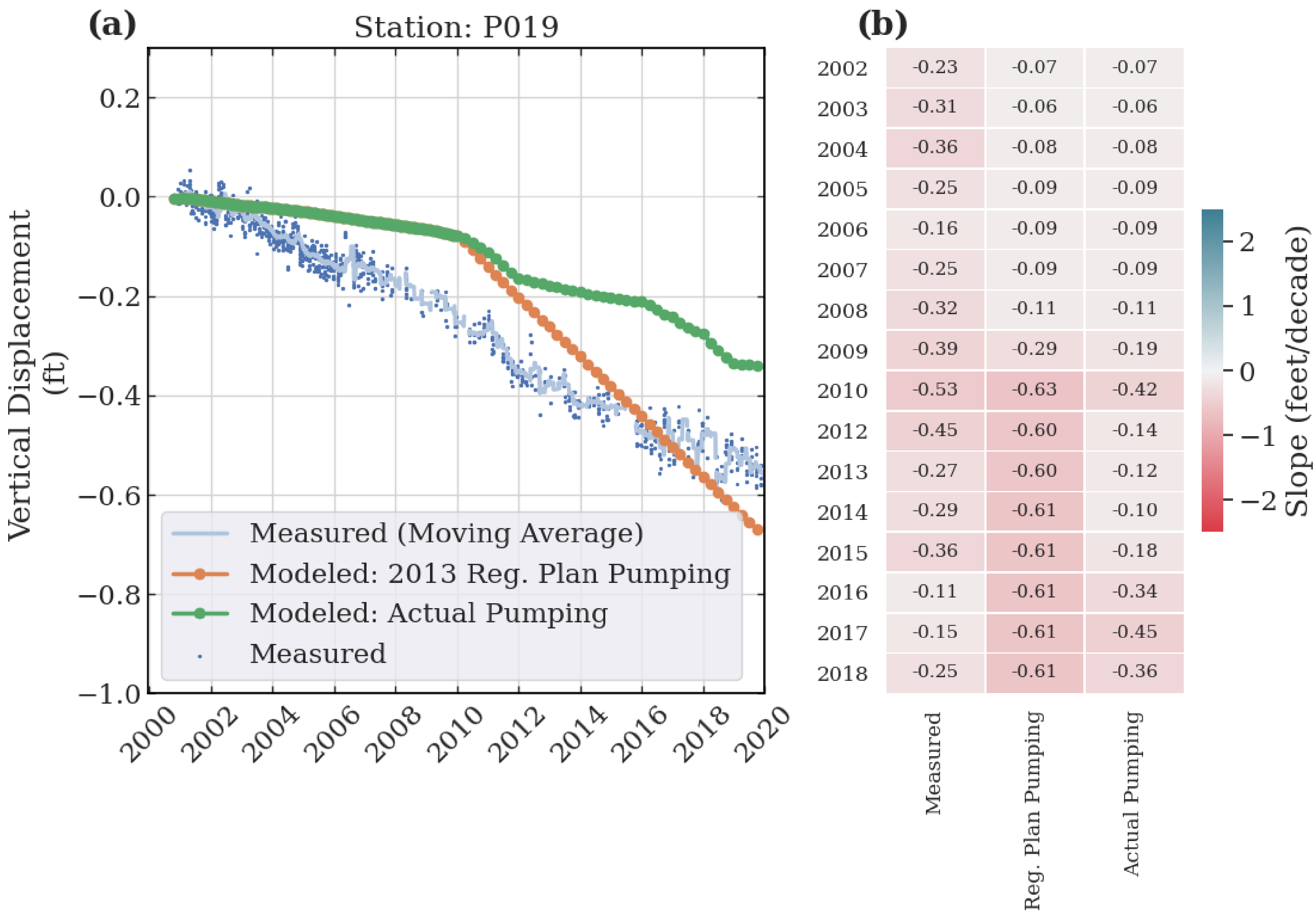
(b)

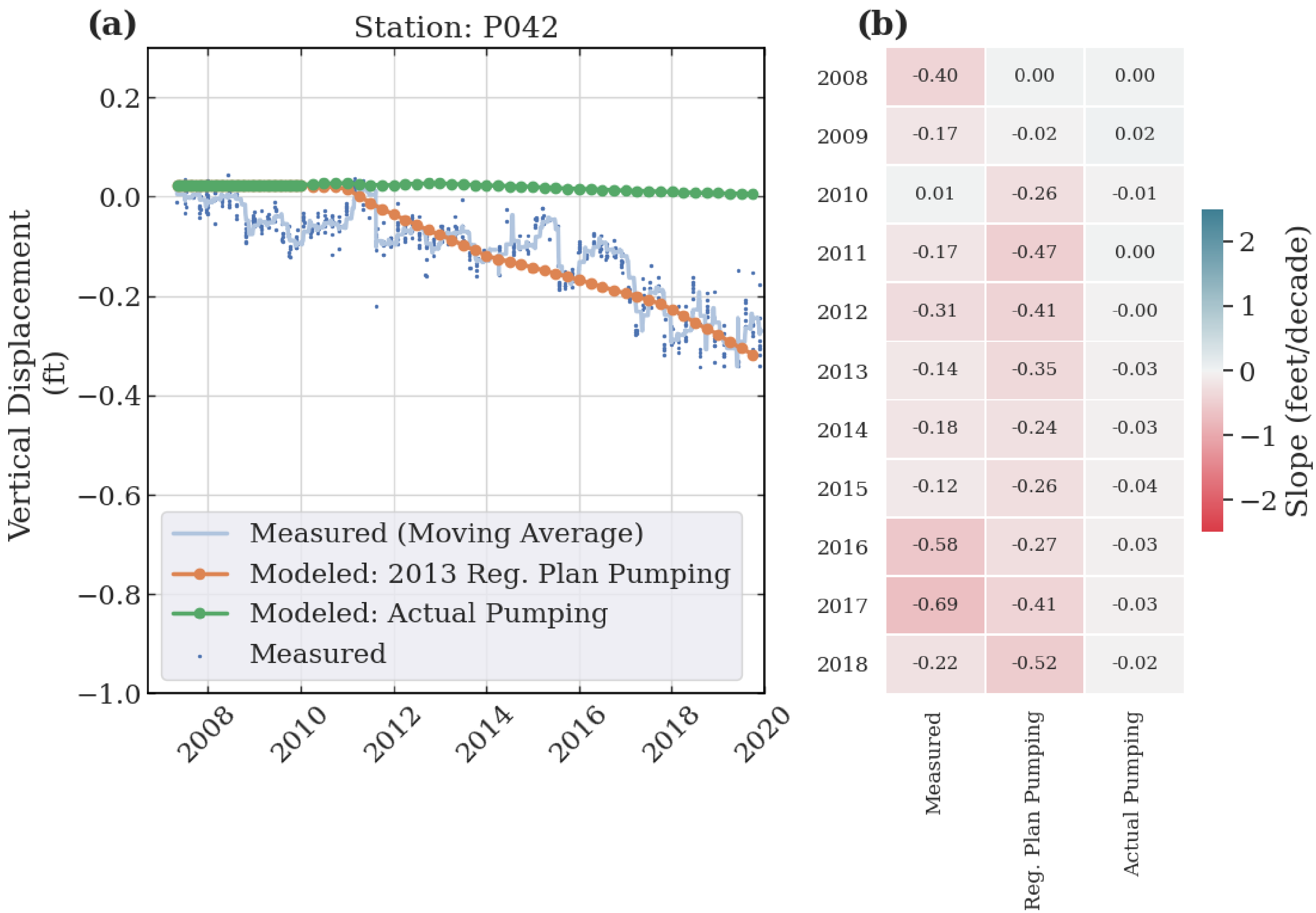
	Measured	Reg. Plan Pumping	Actual Pumping
2002	-0.63	-0.61	-0.61
2003	-0.80	-0.53	-0.53
2004	-0.76	-0.78	-0.78
2005	-0.42	-0.80	-0.80
2006	-0.37	-0.61	-0.61
2007	-0.67	-0.69	-0.69
2008	-0.71	-0.51	-0.51
2009	-0.62	-0.33	-0.71
2010	-0.68	-0.39	-0.71
2011	-0.74	-0.41	-0.23
2012	-0.62	-0.45	-0.35
2013	-0.36	-0.54	-0.40
2014	-0.38	-0.59	-0.21
2015	-0.64	-0.58	-0.19
2016	-0.34	-0.53	-0.15
2017	-0.17	-0.58	-0.06
2018	-0.63	-0.61	-0.09

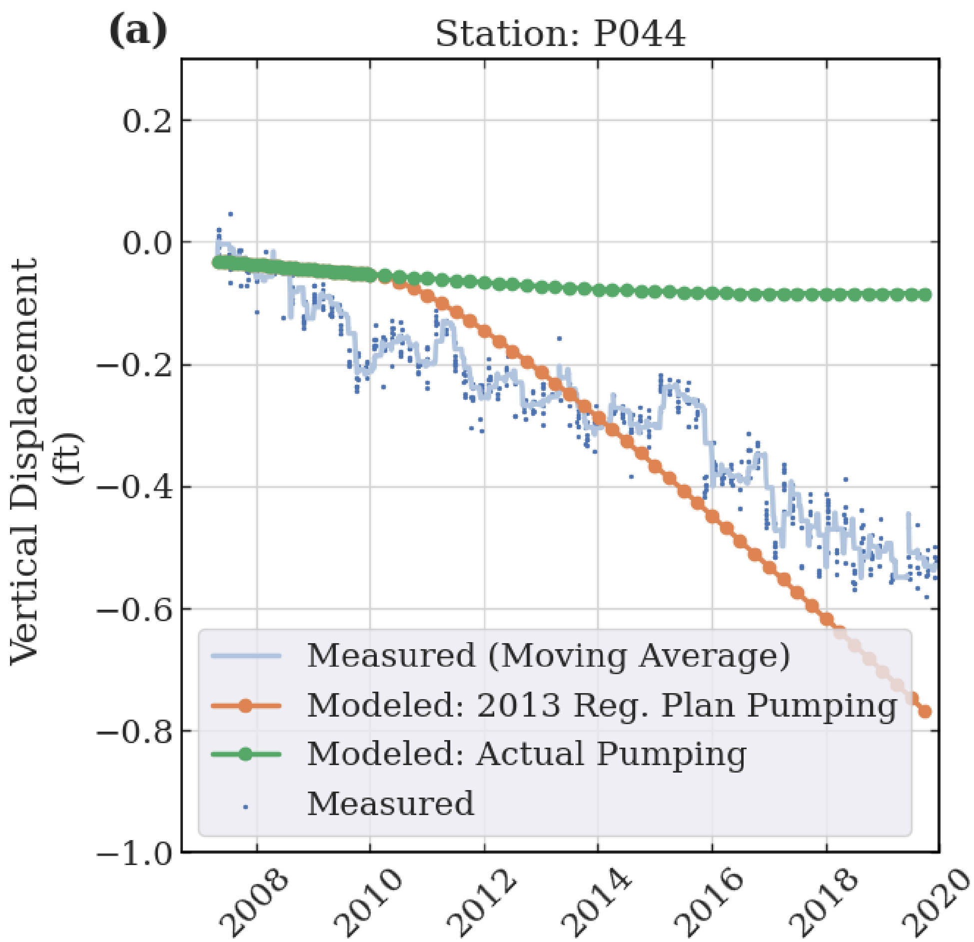




	Measured	Reg. Plan Pumping	Actual Pumping
2002	-0.74	-1.04	-1.04
2003	-0.75	-0.63	-0.63
2004	-0.83	-0.44	-0.44
2005	-0.88	-0.54	-0.54
2006	-0.79	-0.32	-0.32
2007	-0.62	-0.25	-0.25
2008	-0.72	-0.53	-0.53
2009	-0.69	-0.49	-0.51
2010	-0.47	-0.18	-1.09
2011	-0.73	-0.25	-0.98
2012	-1.20	-0.30	-0.05
2013	-0.79	-0.33	-0.02
2014	0.14	-0.45	-0.02
2015	-0.27	-0.51	-0.01
2016	-0.92	-0.50	0.00
2017	-0.52	-0.53	0.00
2018	-0.32	-0.56	0.00


(a)
Station: P019
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
Measured
Reg. Plan Pumping
Actual Pumping
2002 -0.23 -0.07 -0.07
2003 -0.31 -0.06 -0.06
2004 -0.36 -0.08 -0.08
2005 -0.25 -0.09 -0.09
2006 -0.16 -0.09 -0.09
2007 -0.25 -0.09 -0.09
2008 -0.32 -0.11 -0.11
2009 -0.39 -0.29 -0.19
2010 -0.53 -0.63 -0.42
2012 -0.45 -0.60 -0.14
2013 -0.27 -0.60 -0.12
2014 -0.29 -0.61 -0.10
2015 -0.36 -0.61 -0.18
2016 -0.11 -0.61 -0.34
2017 -0.15 -0.61 -0.45
2018 -0.25 -0.61 -0.36
Slope (feet/decade)
2
1
0
−1
−2

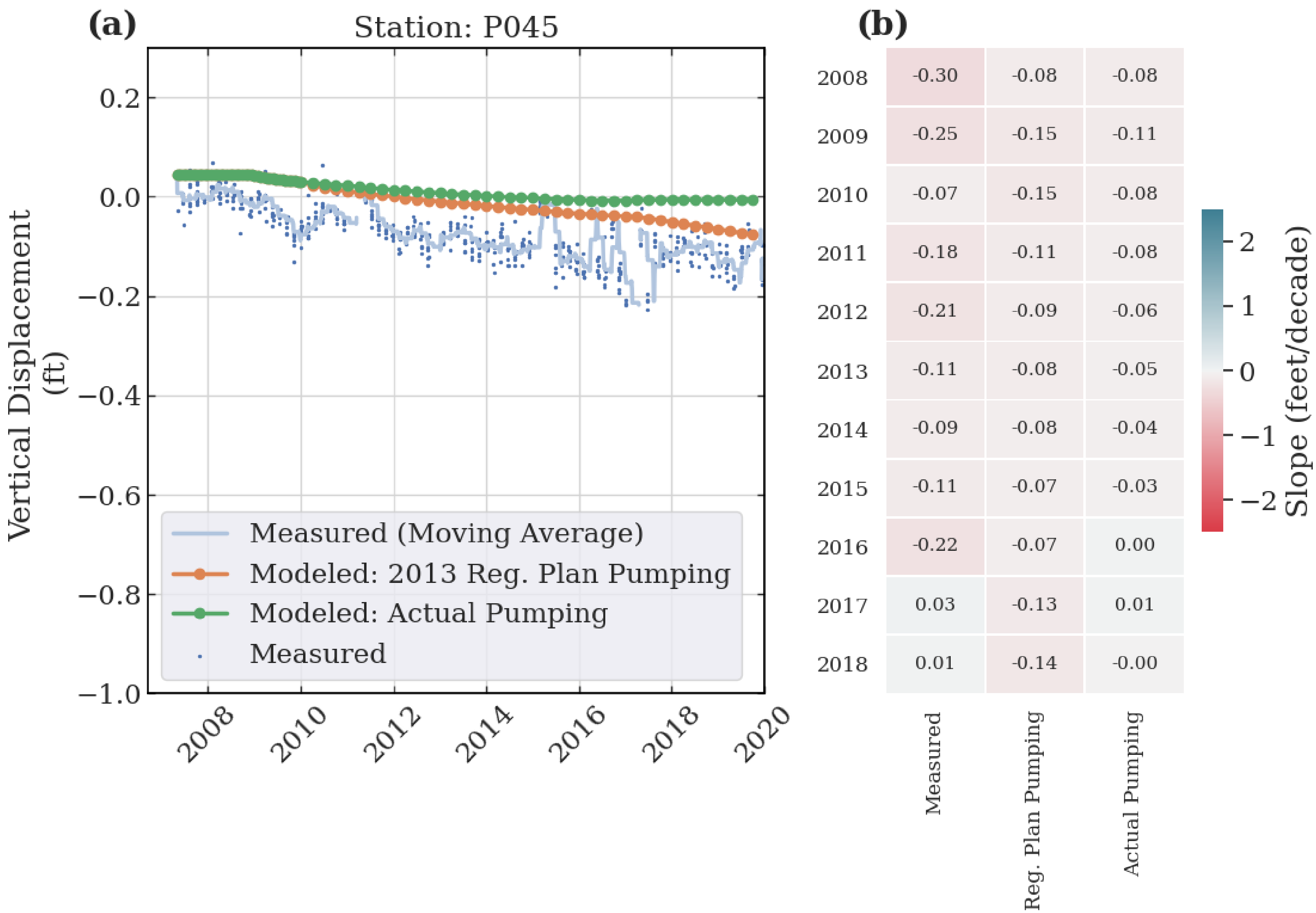

(a)
Station: P042
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2008
2010
2012
2014
2016
2018
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2008 -0.40 0.00 0.00
2009 -0.17 -0.02 0.02
2010 0.01 -0.26 -0.01
2011 -0.17 -0.47 0.00
2012 -0.31 -0.41 -0.00
2013 -0.14 -0.35 -0.03
2014 -0.18 -0.24 -0.03
2015 -0.12 -0.26 -0.04
2016 -0.58 -0.27 -0.03
2017 -0.69 -0.41 -0.03
2018 -0.22 -0.52 -0.02
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)



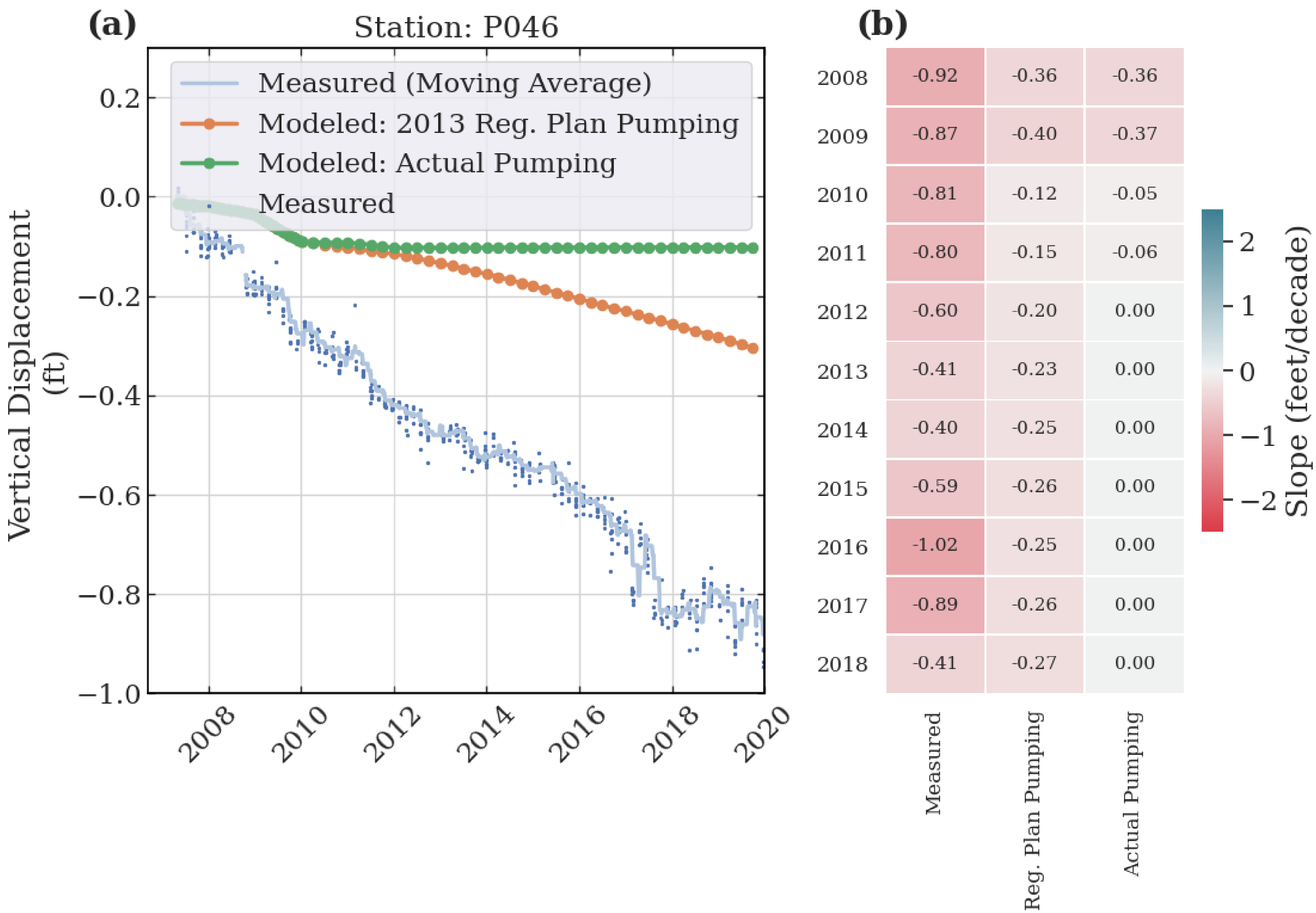
(b)

	Measured	Reg. Plan Pumping	Actual Pumping
2008	-0.71	-0.08	-0.08
2009	-0.53	-0.14	-0.07
2010	-0.38	-0.45	-0.06
2011	-0.40	-0.62	-0.06
2012	-0.41	-0.71	-0.06
2013	-0.29	-0.76	-0.04
2014	-0.10	-0.80	-0.03
2015	-0.55	-0.83	-0.02
2016	-0.91	-0.84	-0.01
2017	-0.54	-0.85	0.00
2018	-0.33	-0.87	0.00

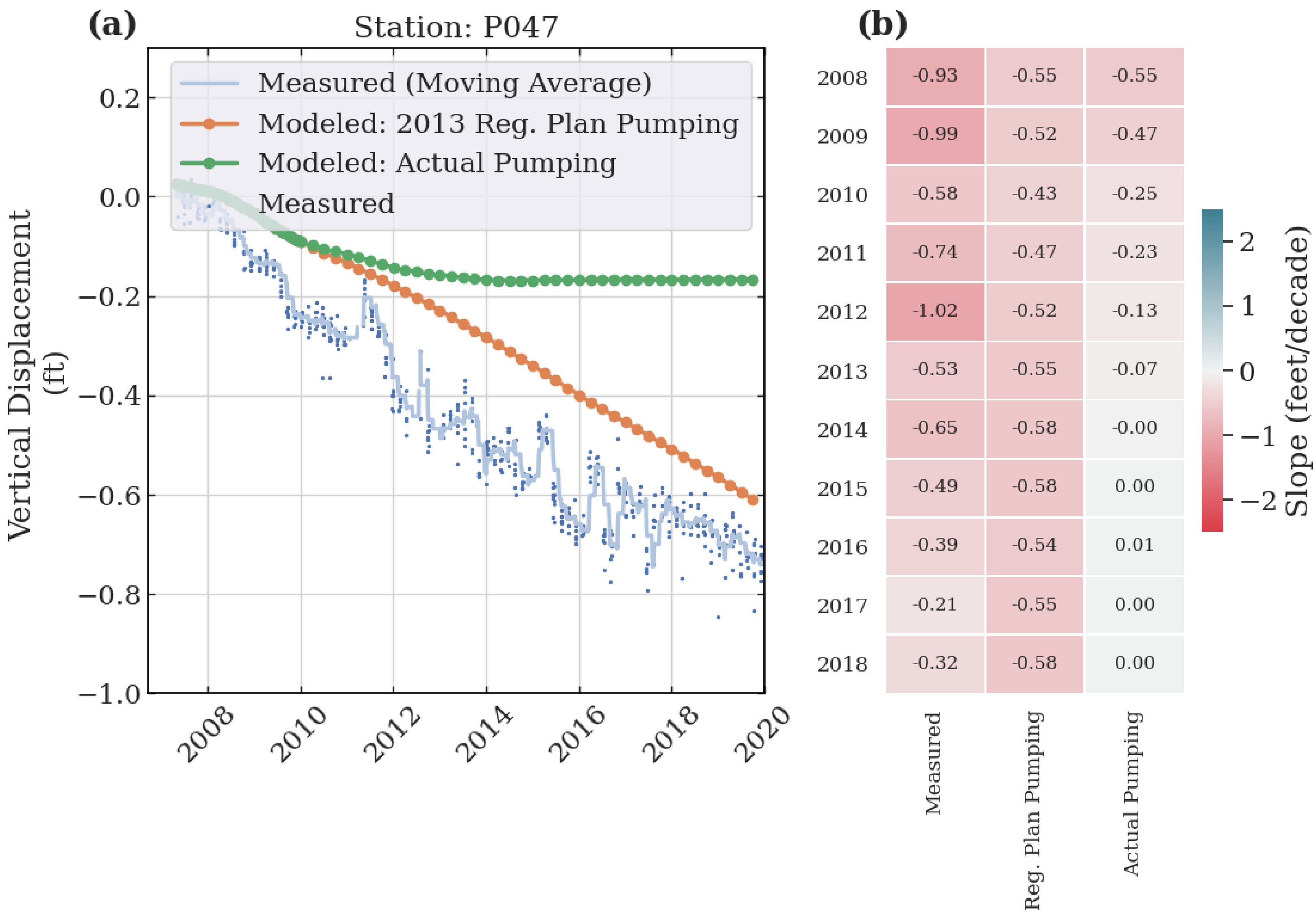
Slope (feet/decade): 2, 1, 0, −1, −2

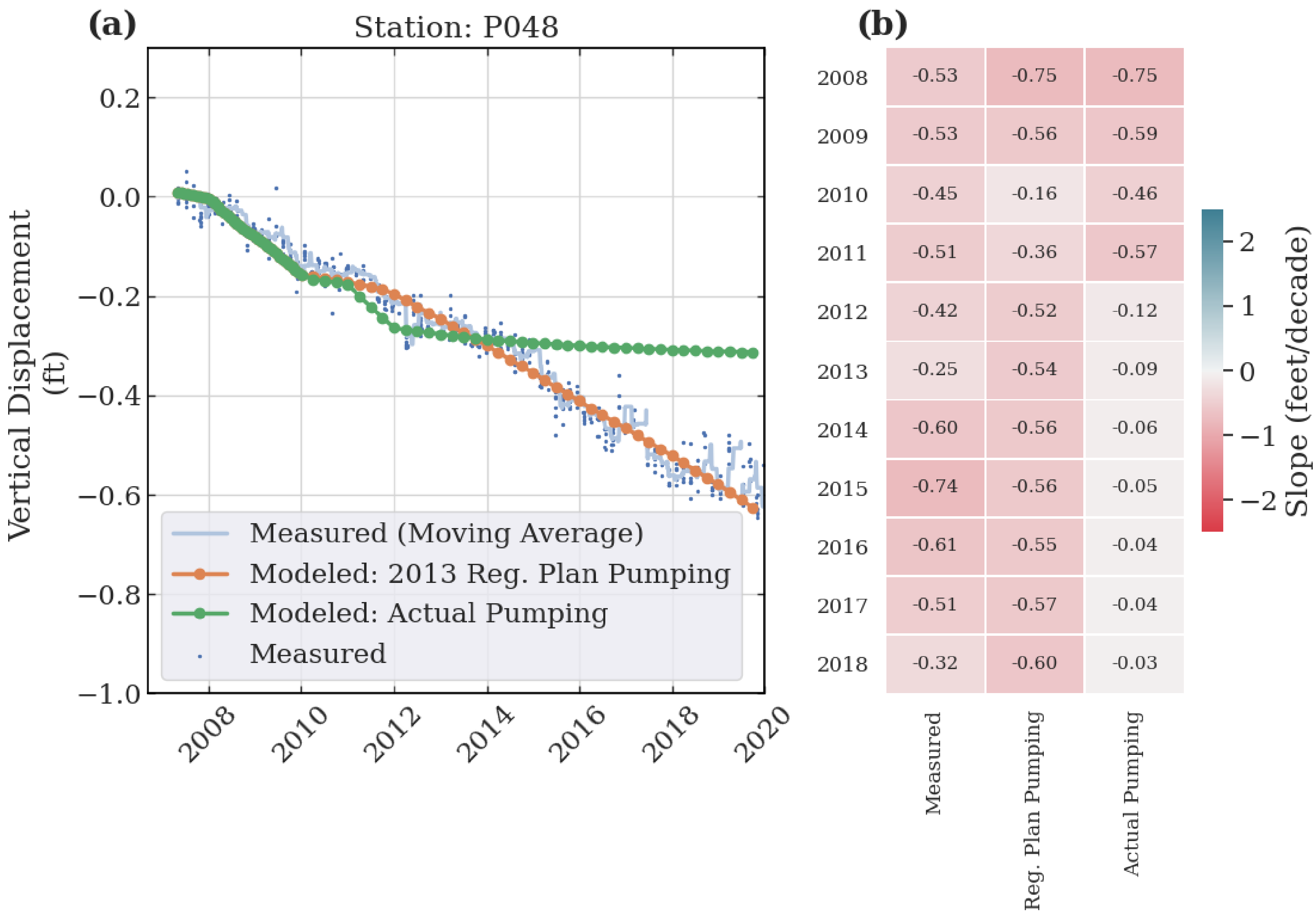


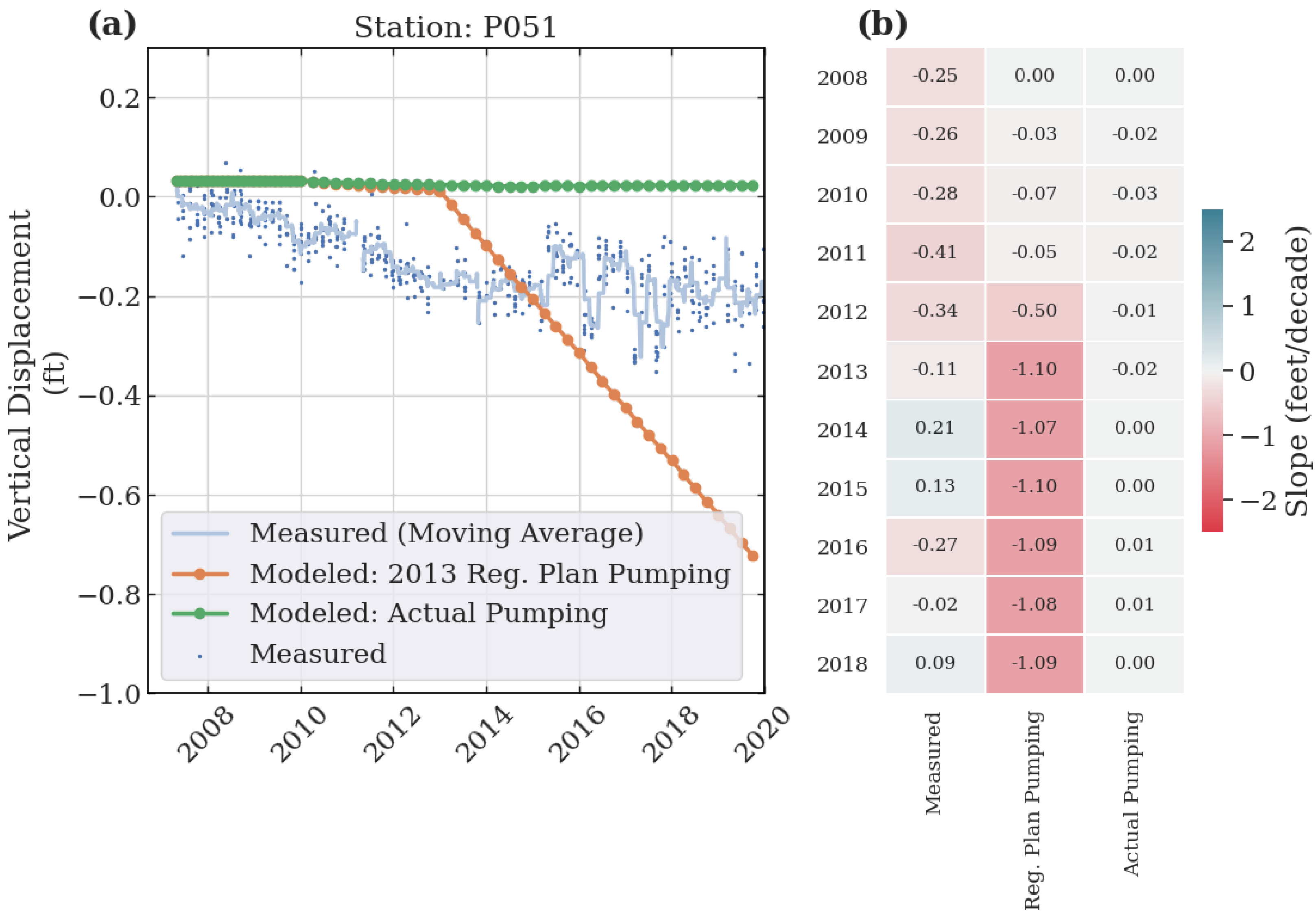
(a)
Station: P045
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2008
2010
2012
2014
2016
2018
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
Measured
Reg. Plan Pumping
Actual Pumping
2008 -0.30 -0.08 -0.08
2009 -0.25 -0.15 -0.11
2010 -0.07 -0.15 -0.08
2011 -0.18 -0.11 -0.08
2012 -0.21 -0.09 -0.06
2013 -0.11 -0.08 -0.05
2014 -0.09 -0.08 -0.04
2015 -0.11 -0.07 -0.03
2016 -0.22 -0.07 0.00
2017 0.03 -0.13 0.01
2018 0.01 -0.14 -0.00
Slope (feet/decade)
2
1
0
−1
−2

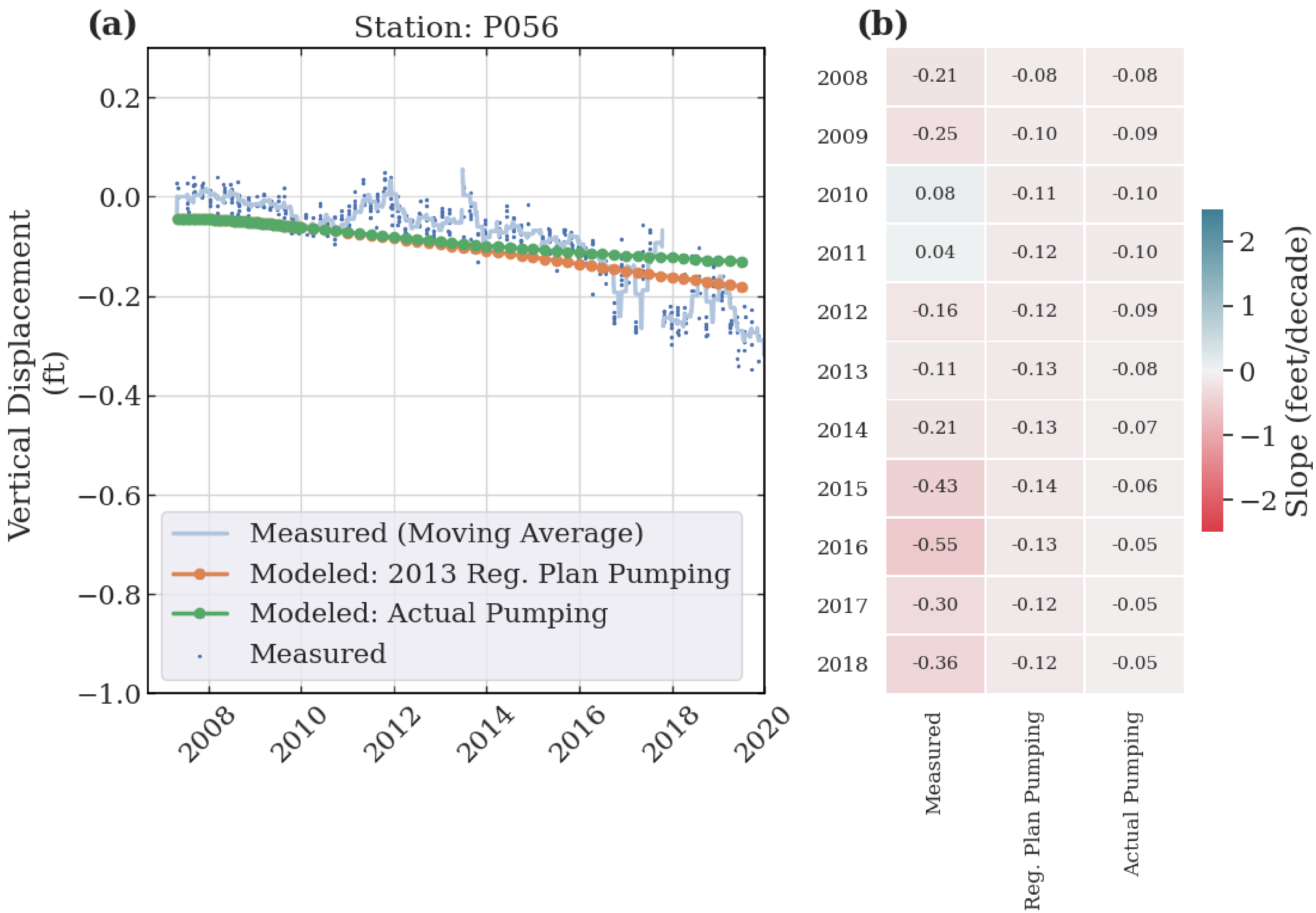


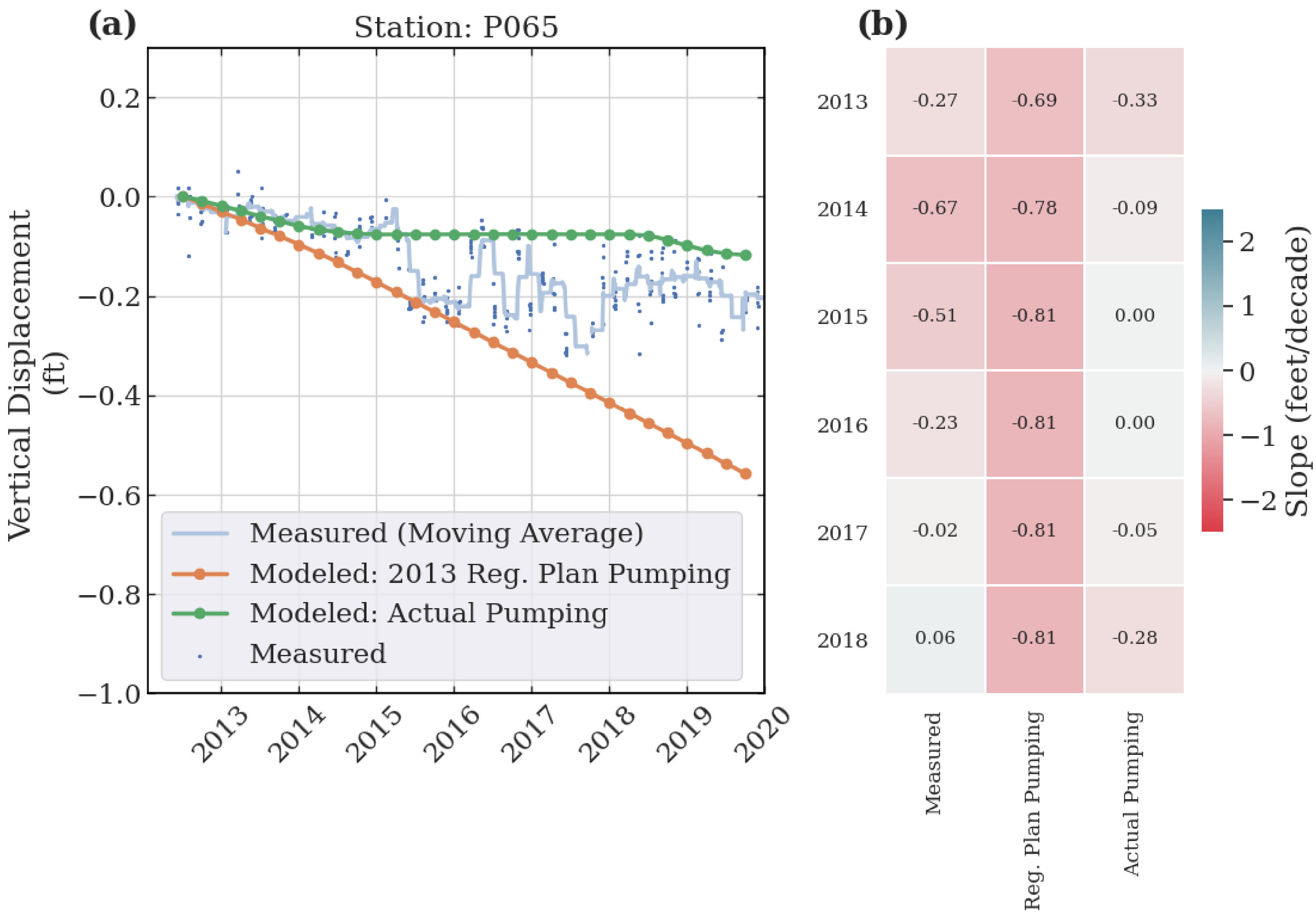
INTERA
GEOSCIENCE & ENGINEERING SOLUTIONS

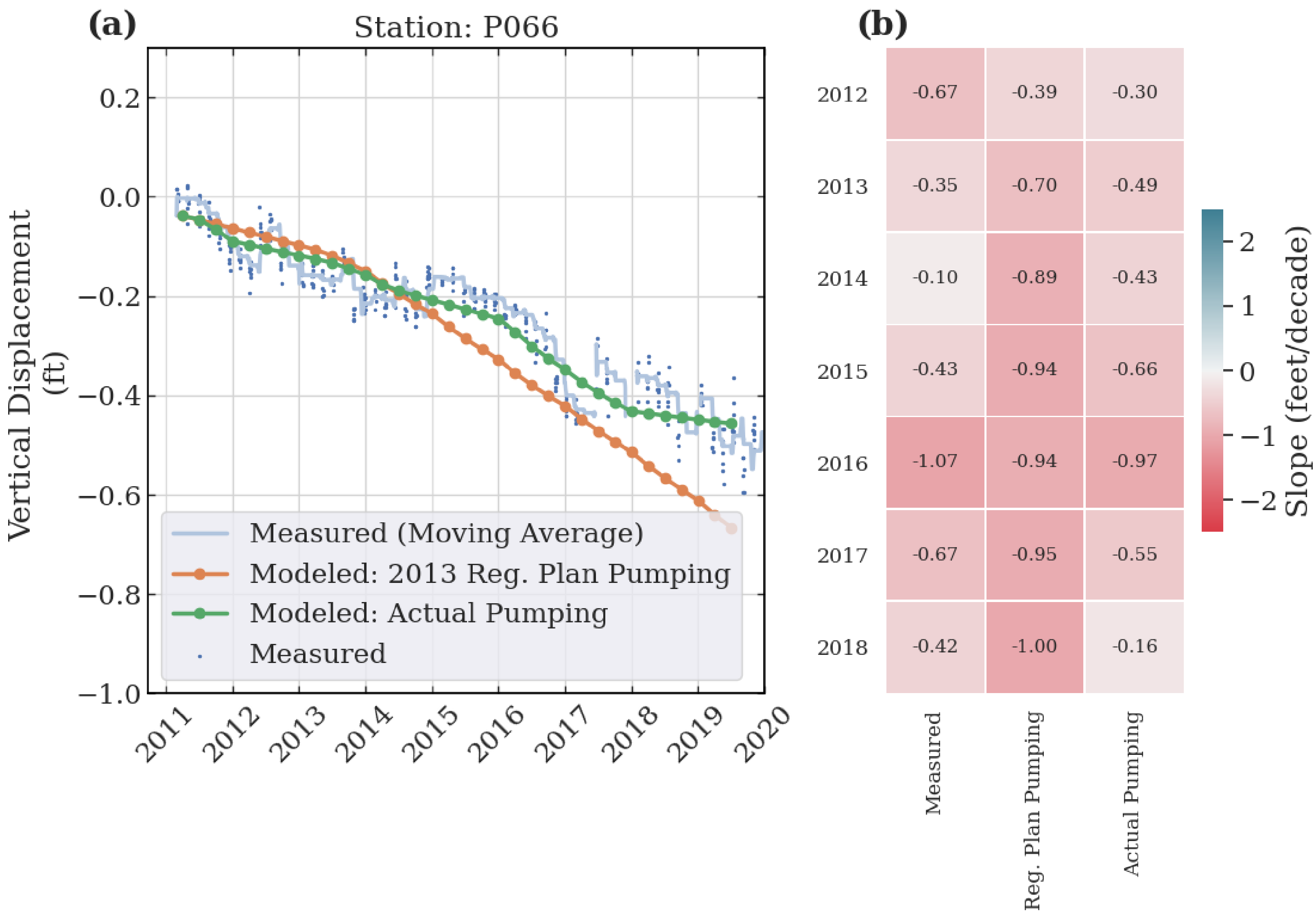

(a)
Station: P047
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2008
2010
2012
2014
2016
2018
2020
(b)
2008 -0.93 -0.55 -0.55
2009 -0.99 -0.52 -0.47
2010 -0.58 -0.43 -0.25
2011 -0.74 -0.47 -0.23
2012 -1.02 -0.52 -0.13
2013 -0.53 -0.55 -0.07
2014 -0.65 -0.58 -0.00
2015 -0.49 -0.58 0.00
2016 -0.39 -0.54 0.01
2017 -0.21 -0.55 0.00
2018 -0.32 -0.58 0.00
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

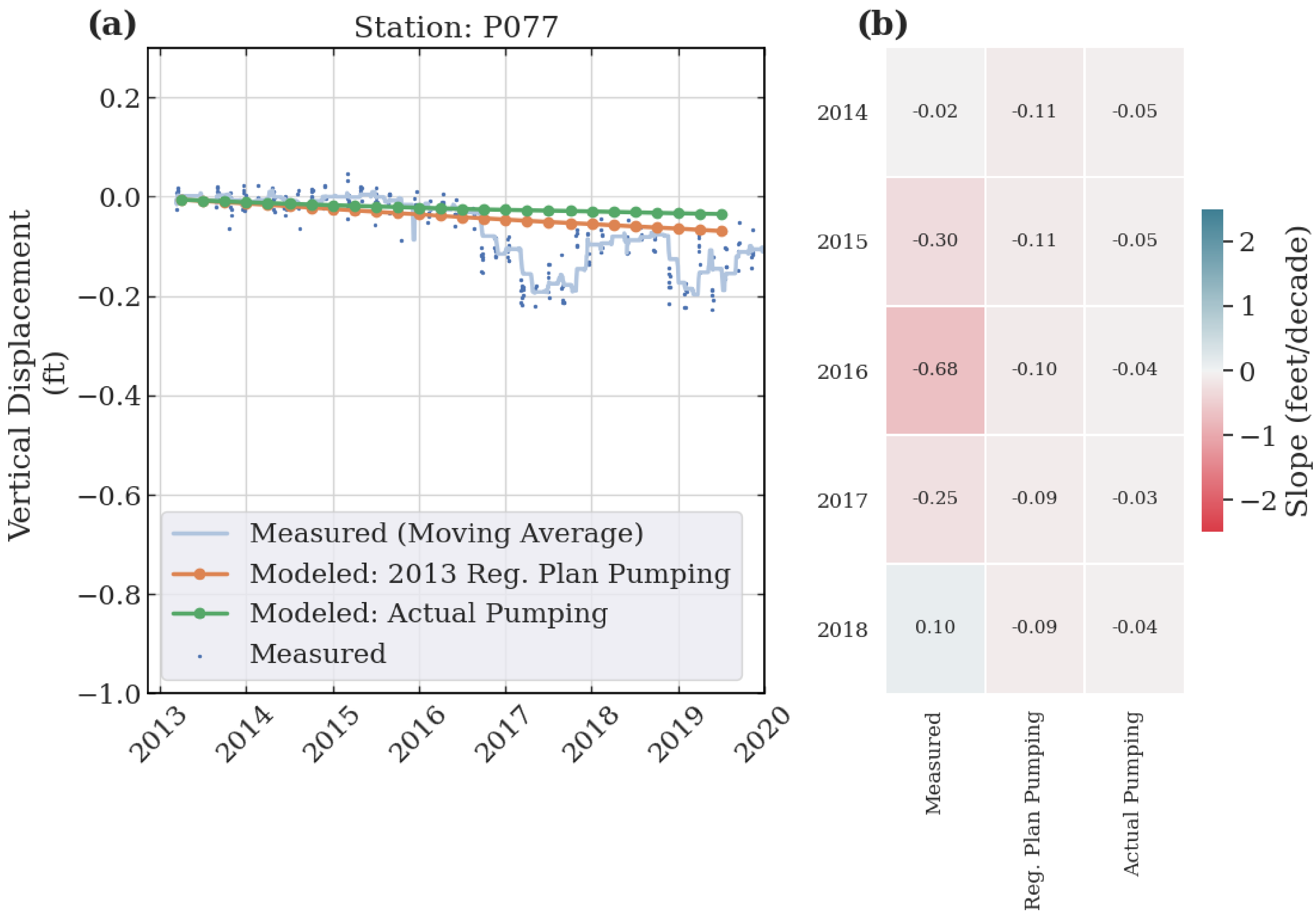

(a)
Station: P048
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2008
2010
2012
2014
2016
2018
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2008 -0.53 -0.75 -0.75
2009 -0.53 -0.56 -0.59
2010 -0.45 -0.16 -0.46
2011 -0.51 -0.36 -0.57
2012 -0.42 -0.52 -0.12
2013 -0.25 -0.54 -0.09
2014 -0.60 -0.56 -0.06
2015 -0.74 -0.56 -0.05
2016 -0.61 -0.55 -0.04
2017 -0.51 -0.57 -0.04
2018 -0.32 -0.60 -0.03
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

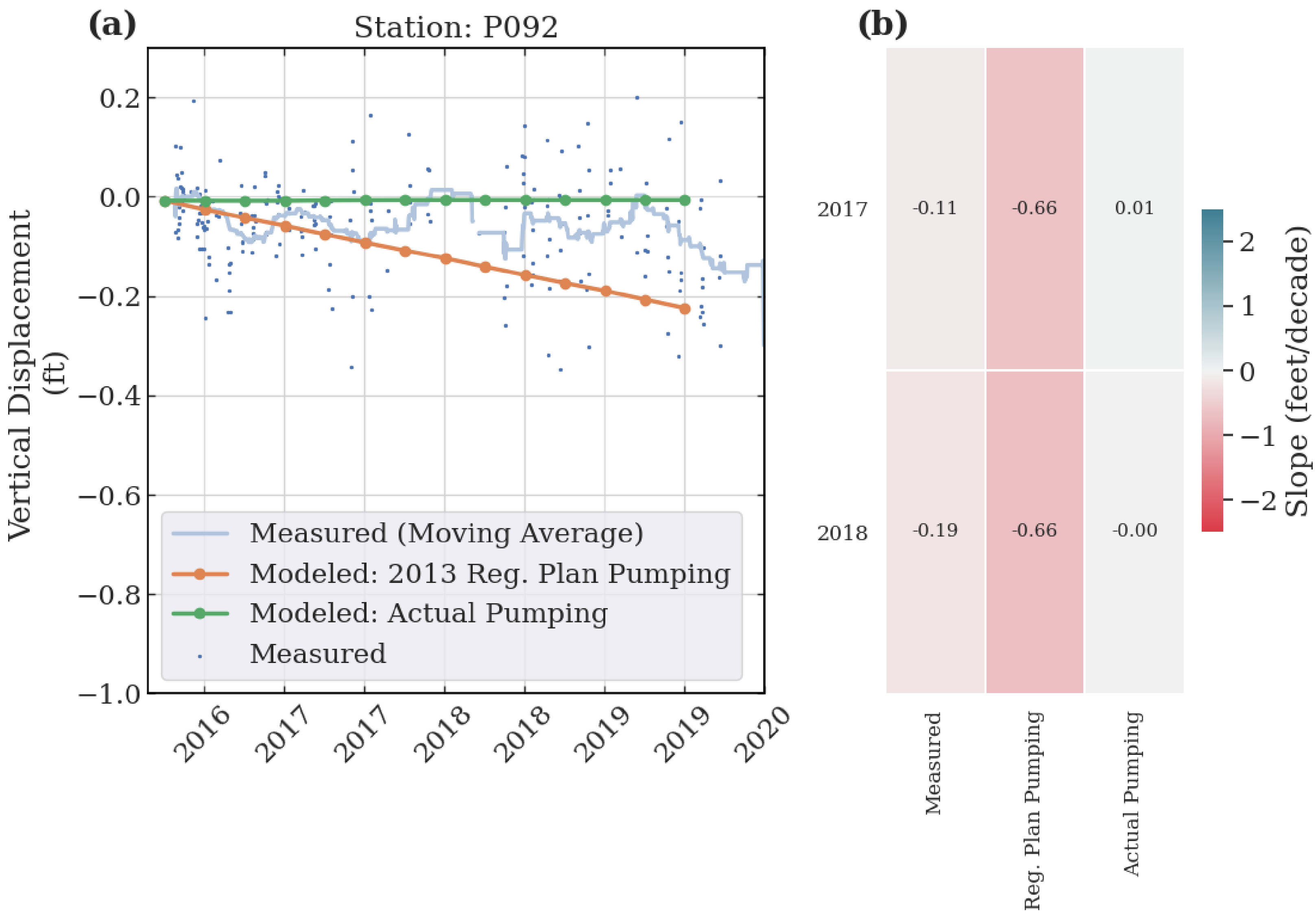

(a)
Station: P051
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2008
2010
2012
2014
2016
2018
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2008 -0.25 0.00 0.00
2009 -0.26 -0.03 -0.02
2010 -0.28 -0.07 -0.03
2011 -0.41 -0.05 -0.02
2012 -0.34 -0.50 -0.01
2013 -0.11 -1.10 -0.02
2014 0.21 -1.07 0.00
2015 0.13 -1.10 0.00
2016 -0.27 -1.09 0.01
2017 -0.02 -1.08 0.01
2018 0.09 -1.09 0.00
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

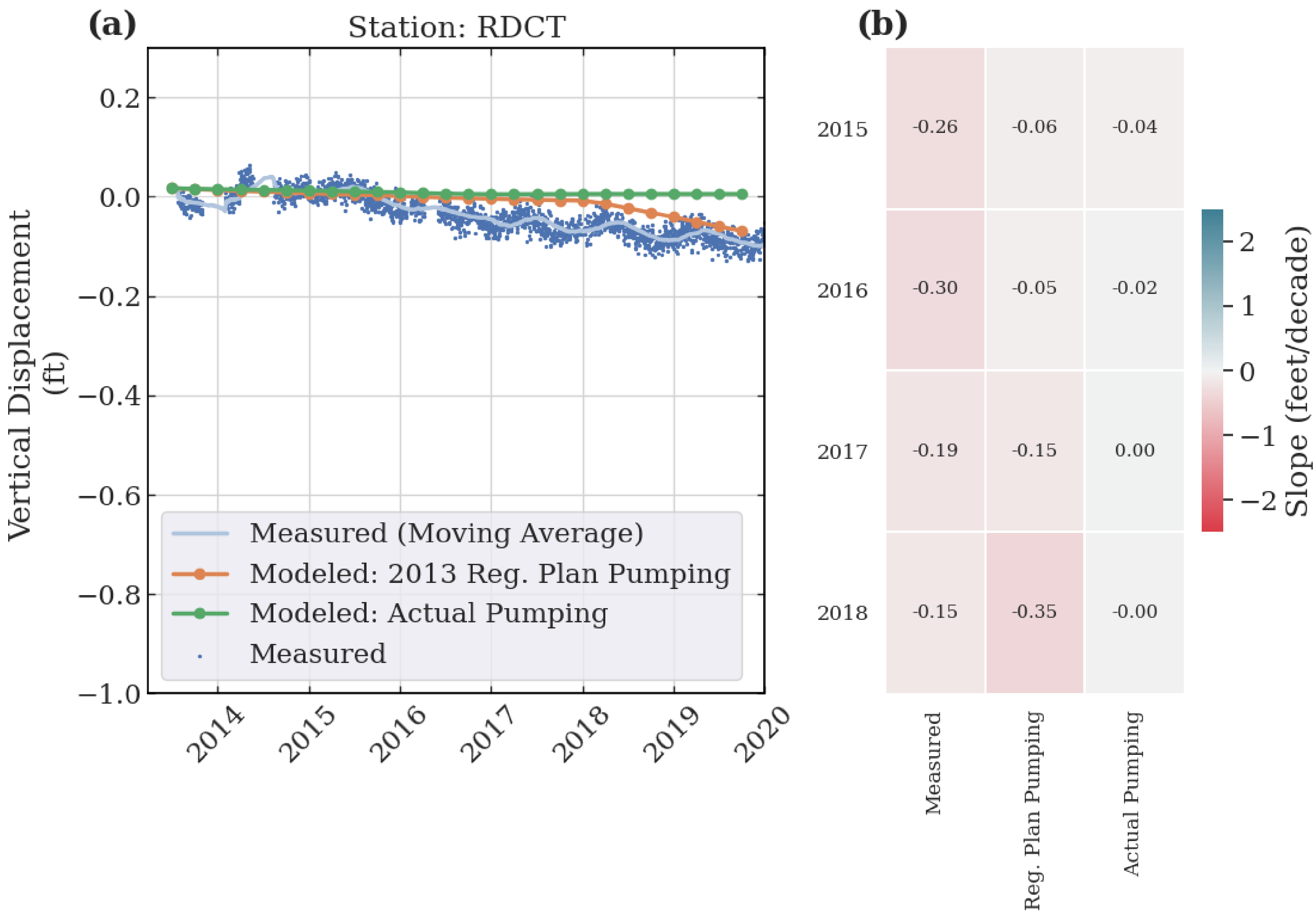

(a)
Station: P056
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2008
2010
2012
2014
2016
2018
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2008 -0.21 -0.08 -0.08
2009 -0.25 -0.10 -0.09
2010 0.08 -0.11 -0.10
2011 0.04 -0.12 -0.10
2012 -0.16 -0.12 -0.09
2013 -0.11 -0.13 -0.08
2014 -0.21 -0.13 -0.07
2015 -0.43 -0.14 -0.06
2016 -0.55 -0.13 -0.05
2017 -0.30 -0.12 -0.05
2018 -0.36 -0.12 -0.05
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

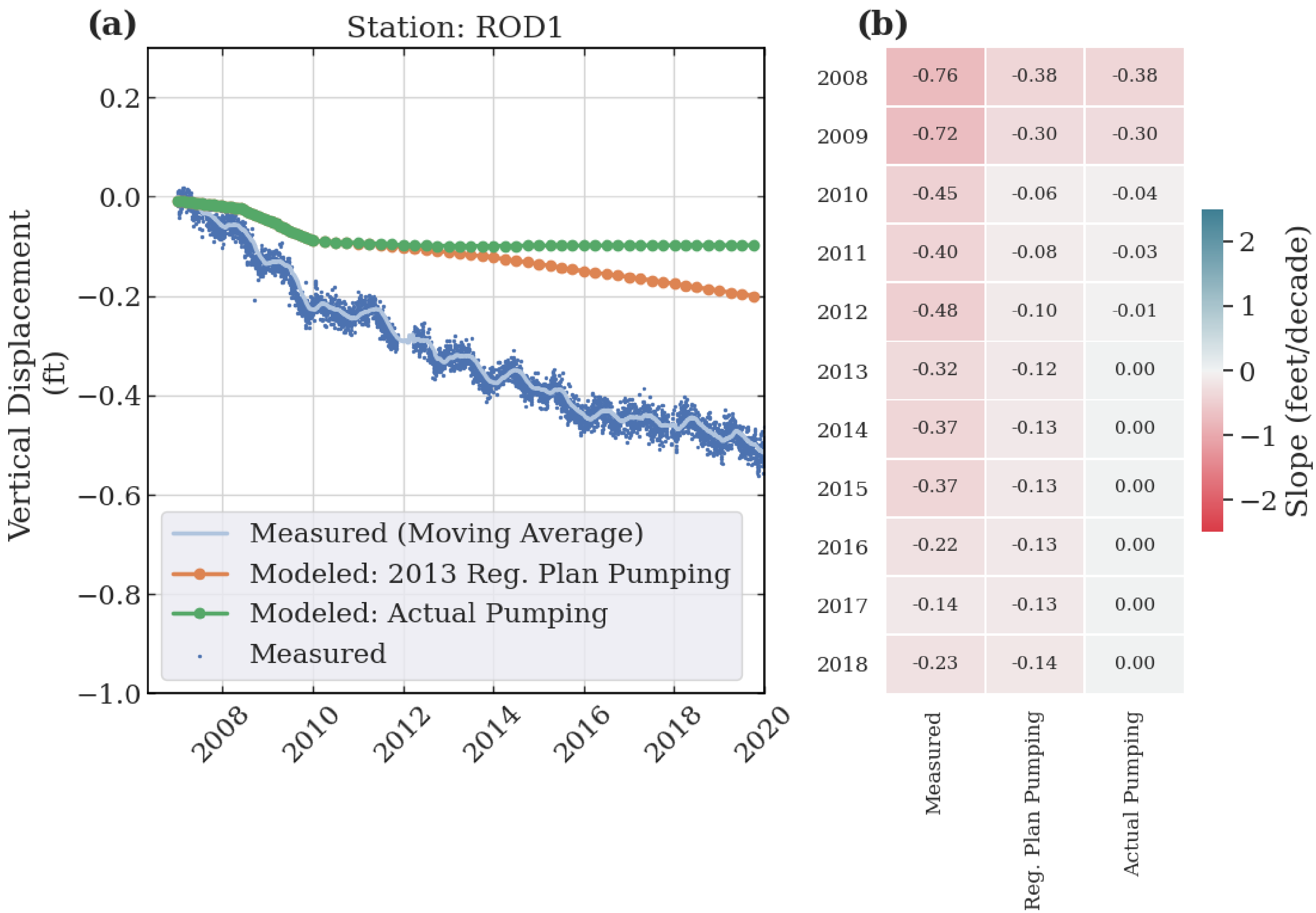

(a)
Station: P065
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2013
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2013 -0.27 -0.69 -0.33
2014 -0.67 -0.78 -0.09
2015 -0.51 -0.81 0.00
2016 -0.23 -0.81 0.00
2017 -0.02 -0.81 -0.05
2018 0.06 -0.81 -0.28
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

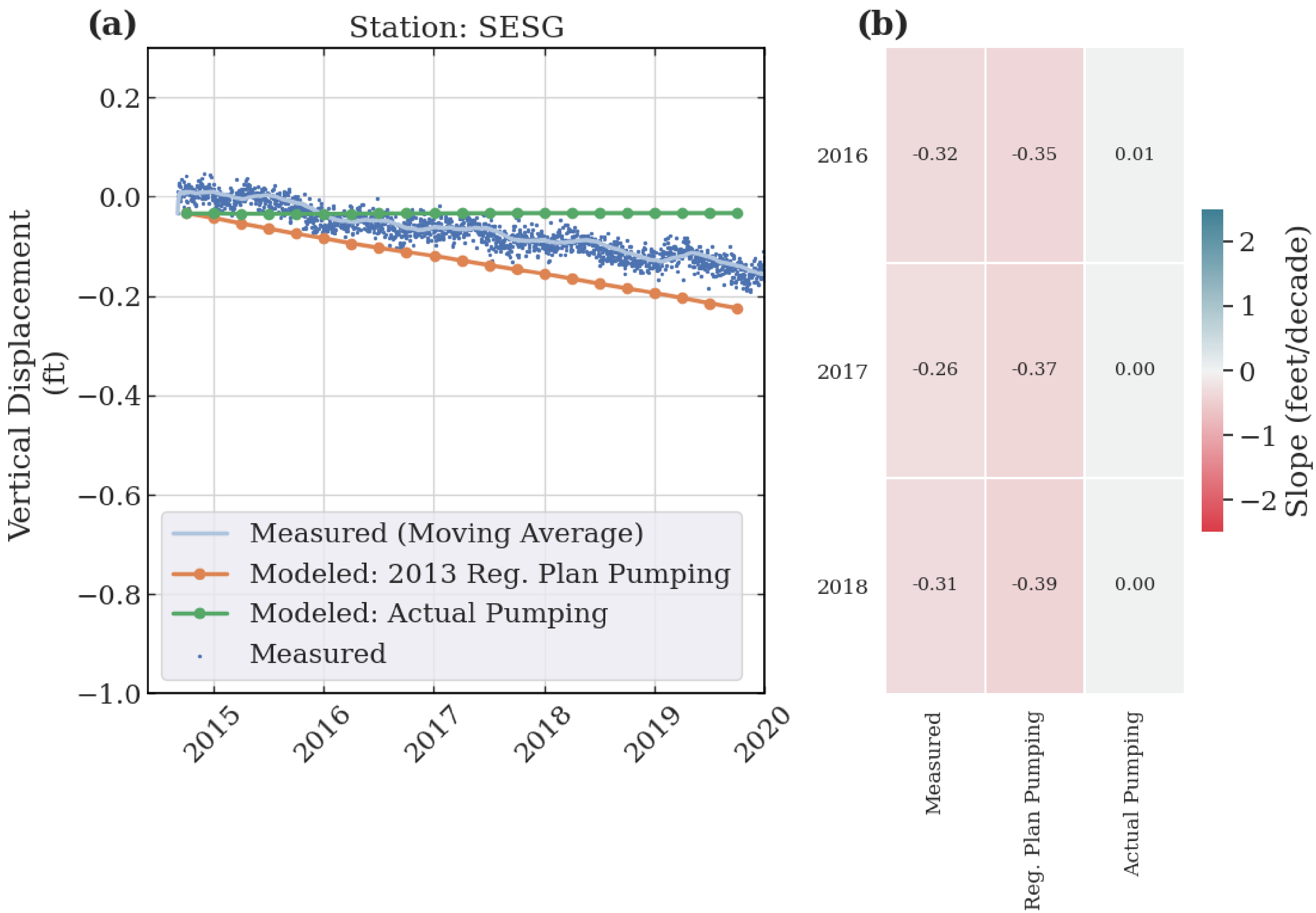

(a)
Station: P066
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2012
-0.67
-0.39
-0.30
2013
-0.35
-0.70
-0.49
2014
-0.10
-0.89
-0.43
2015
-0.43
-0.94
-0.66
2016
-1.07
-0.94
-0.97
2017
-0.67
-0.95
-0.55
2018
-0.42
-1.00
-0.16
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)


(a)
Station: P077
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2013
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2014
2015
2016
2017
2018
-0.02
-0.11
-0.05
-0.30
-0.11
-0.05
-0.68
-0.10
-0.04
-0.25
-0.09
-0.03
0.10
-0.09
-0.04
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

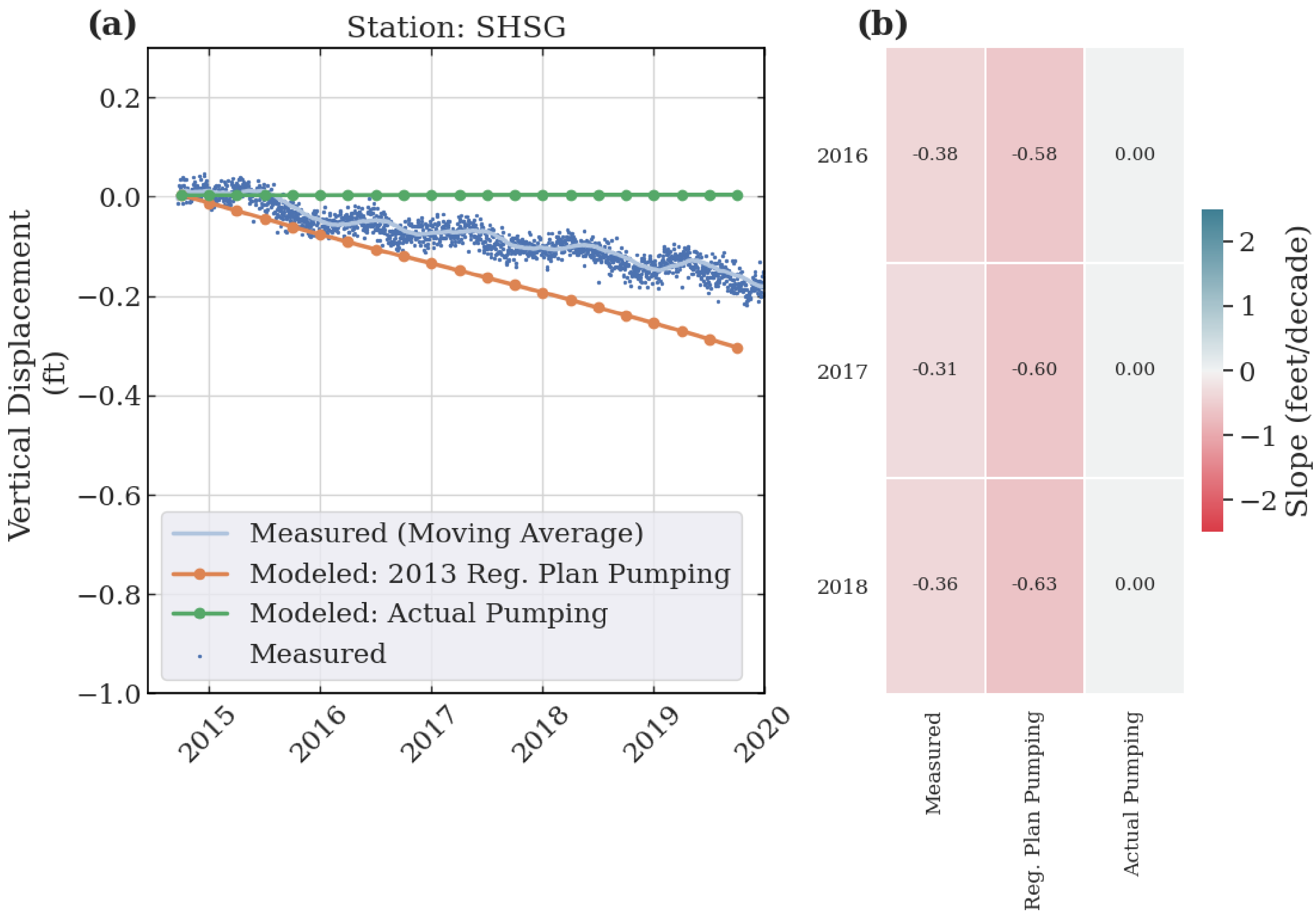

(a)
Station: P092
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
2016
2017
2017
2018
2018
2019
2019
2020
(b)
2017
2018
-0.11
-0.66
0.01
-0.19
-0.66
-0.00
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2

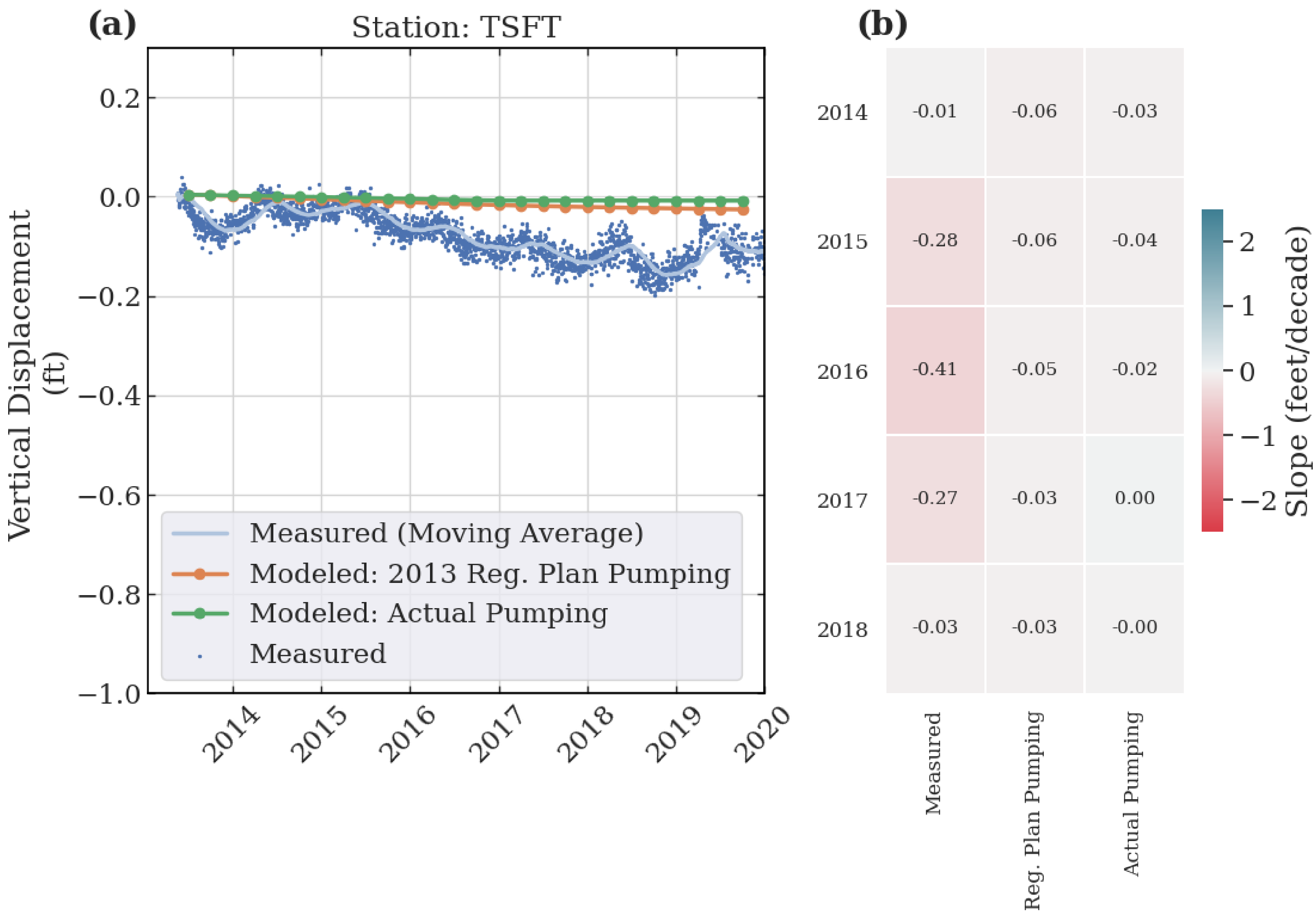

(a)
Station: RDCT
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2015
2016
2017
2018
-0.26
-0.06
-0.04
-0.30
-0.05
-0.02
-0.19
-0.15
0.00
-0.15
-0.35
-0.00
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2


(a)
Station: ROD1
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2008
2010
2012
2014
2016
2018
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2008 -0.76 -0.38 -0.38
2009 -0.72 -0.30 -0.30
2010 -0.45 -0.06 -0.04
2011 -0.40 -0.08 -0.03
2012 -0.48 -0.10 -0.01
2013 -0.32 -0.12 0.00
2014 -0.37 -0.13 0.00
2015 -0.37 -0.13 0.00
2016 -0.22 -0.13 0.00
2017 -0.14 -0.13 0.00
2018 -0.23 -0.14 0.00
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

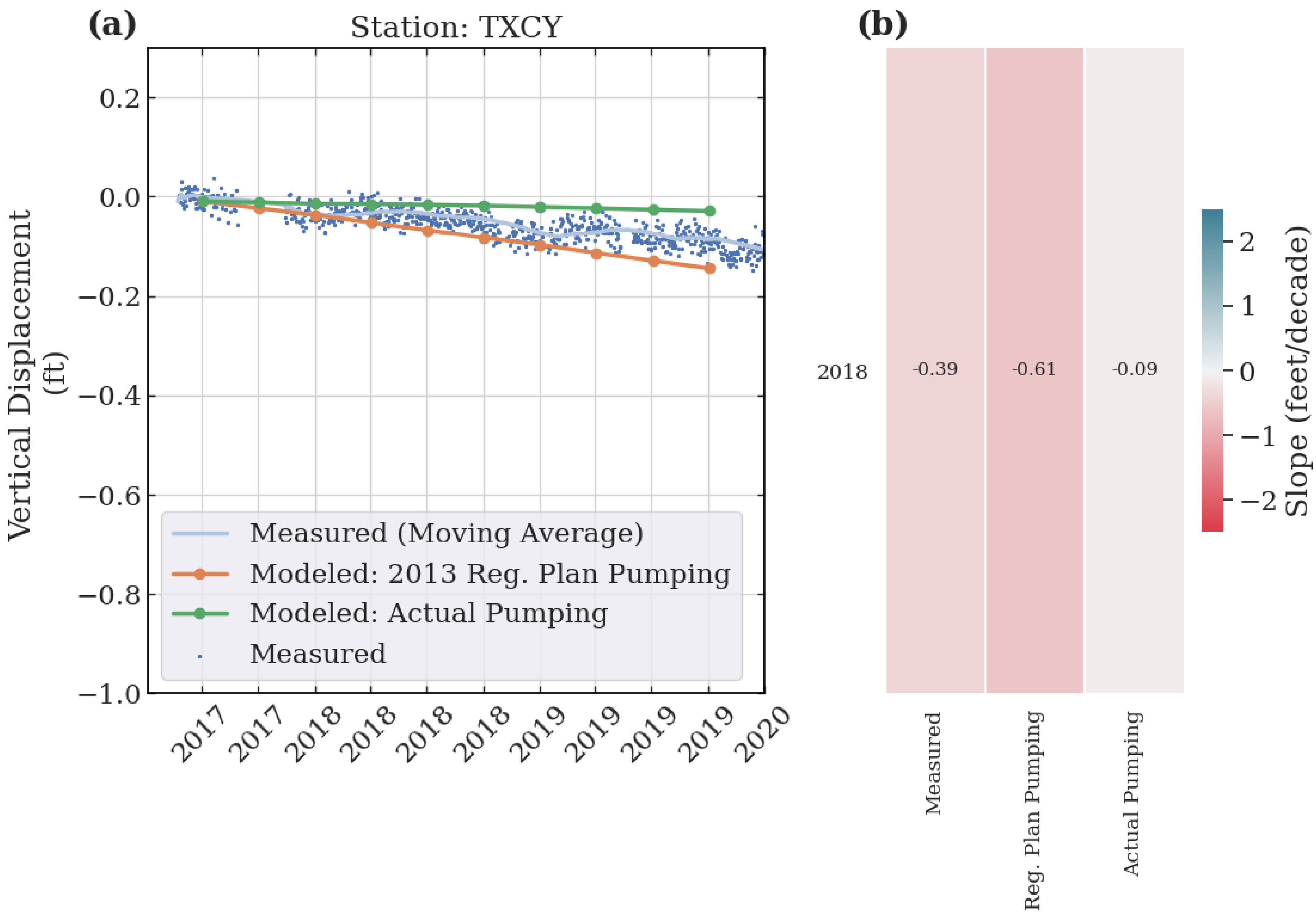


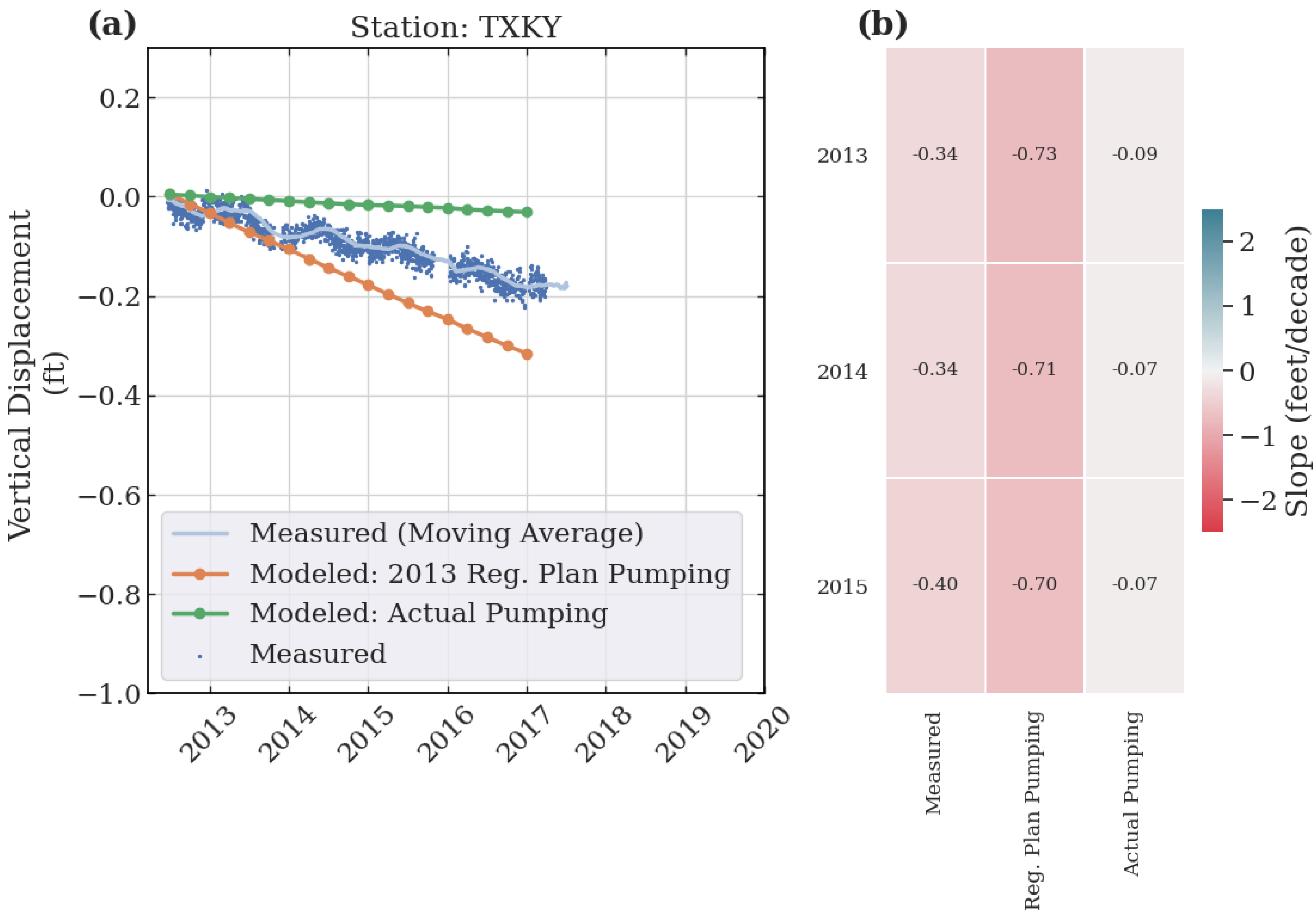
(a)
Station: SESG
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2016
2017
2018
-0.32
-0.35
0.01
-0.26
-0.37
0.00
-0.31
-0.39
0.00
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2


(a)
Station: SHSG
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2016
2017
2018
-0.38
-0.58
0.00
-0.31
-0.60
0.00
-0.36
-0.63
0.00
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2

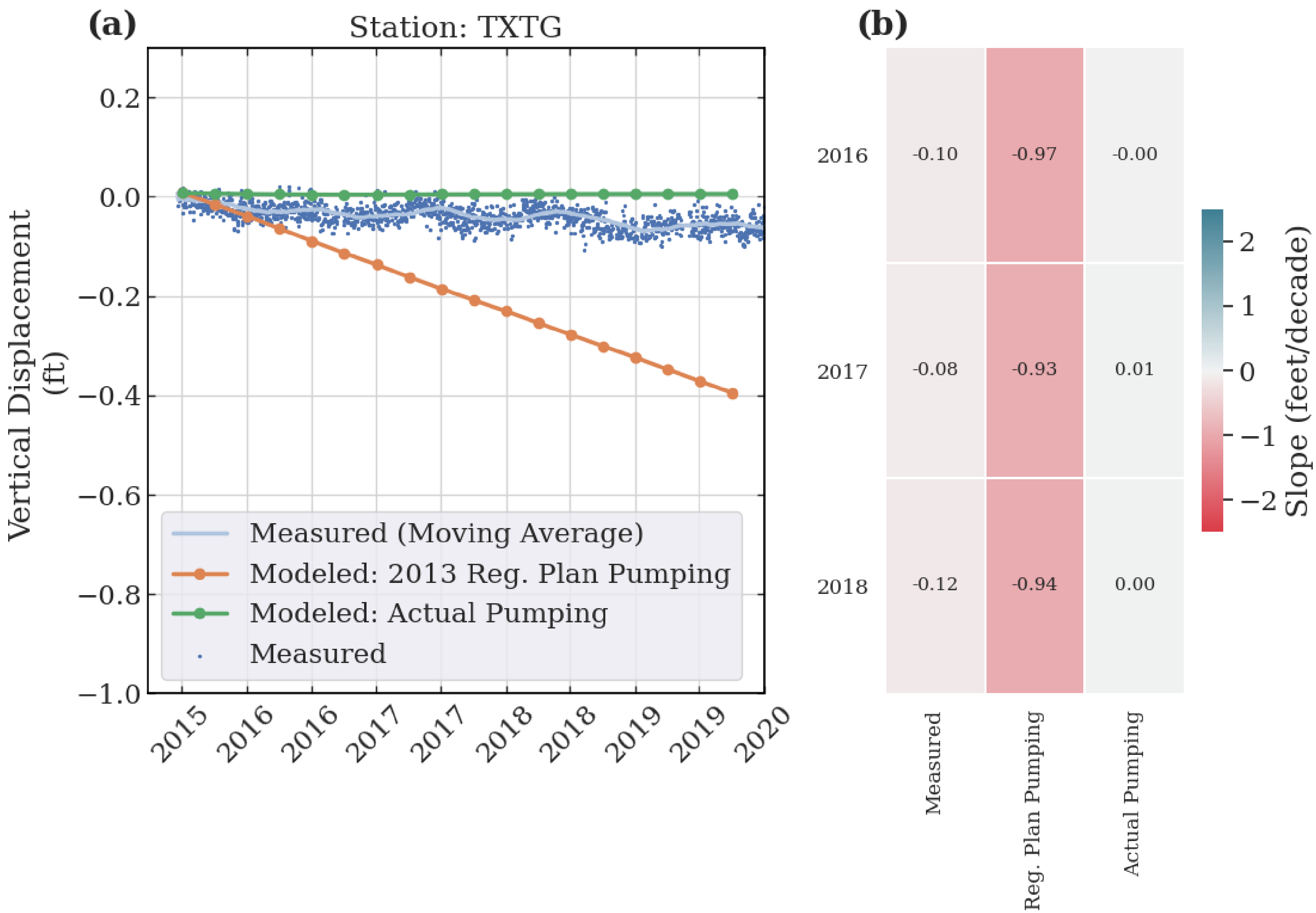


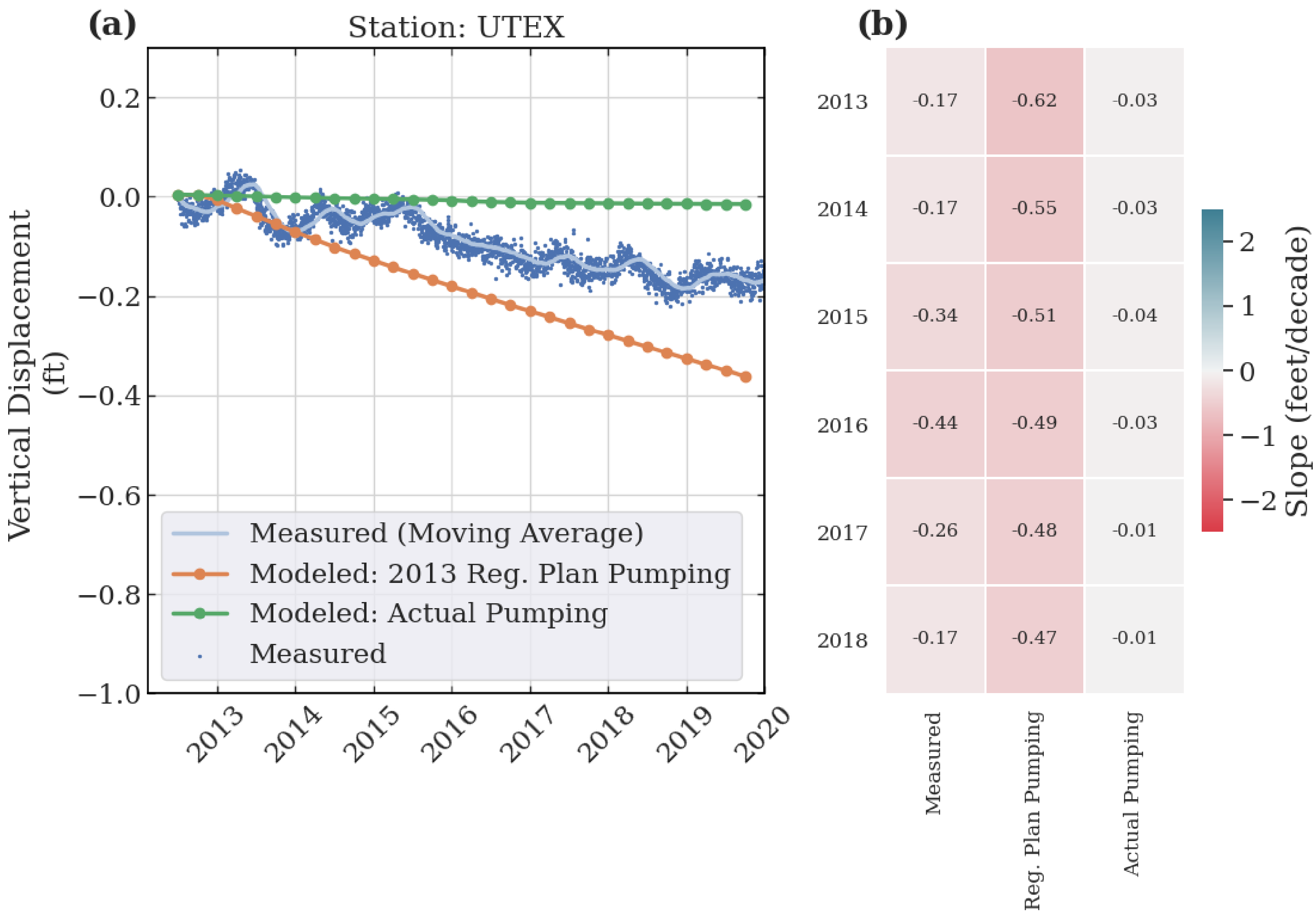
	Measured	Reg. Plan Pumping	Actual Pumping
2014	-0.01	-0.06	-0.03
2015	-0.28	-0.06	-0.04
2016	-0.41	-0.05	-0.02
2017	-0.27	-0.03	0.00
2018	-0.03	-0.03	-0.00

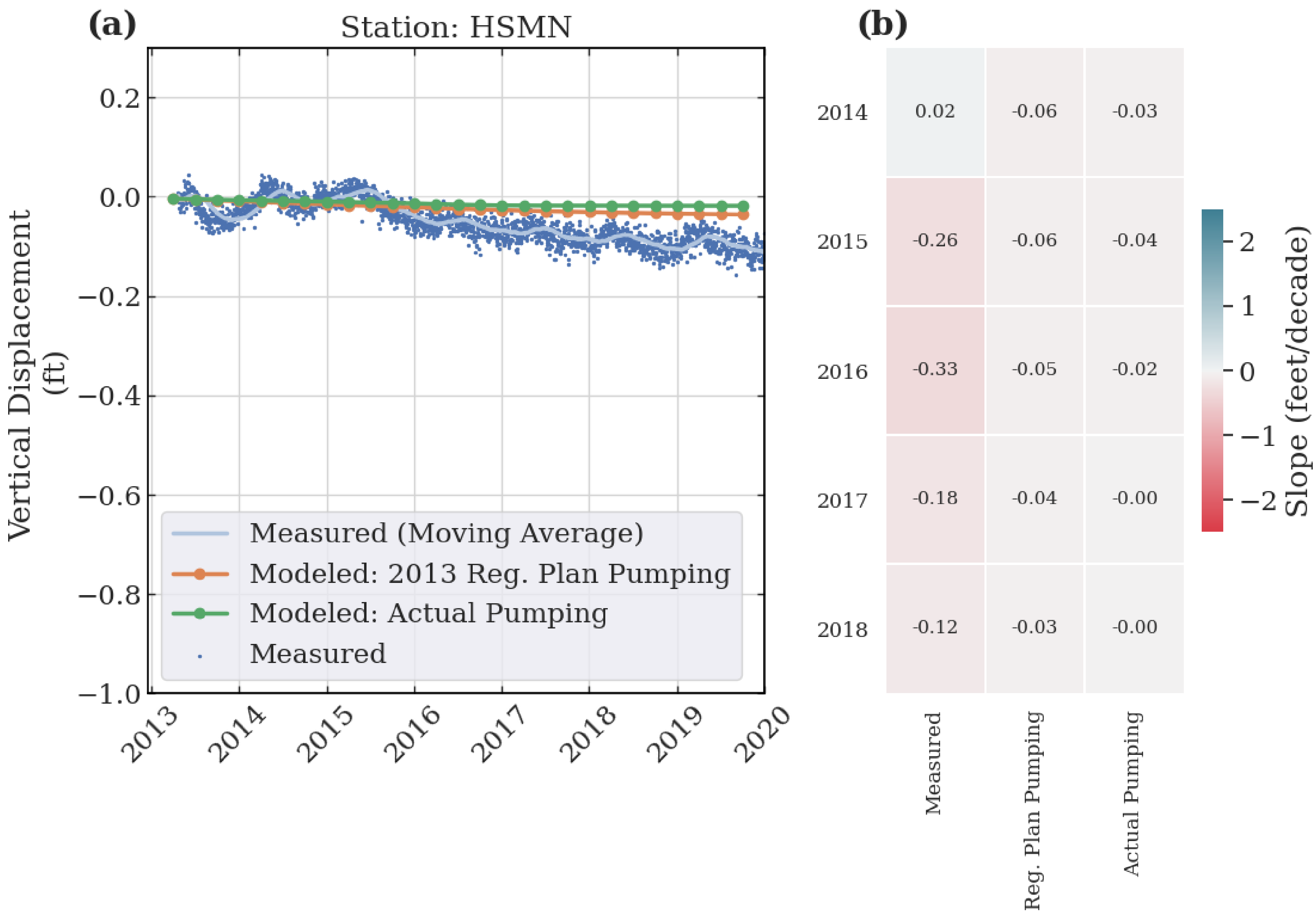

(a)
Station: TXCY
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
2017
2017
2018
2018
2018
2018
2019
2019
2019
2019
2020
(b)
2018
-0.39
-0.61
-0.09
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2

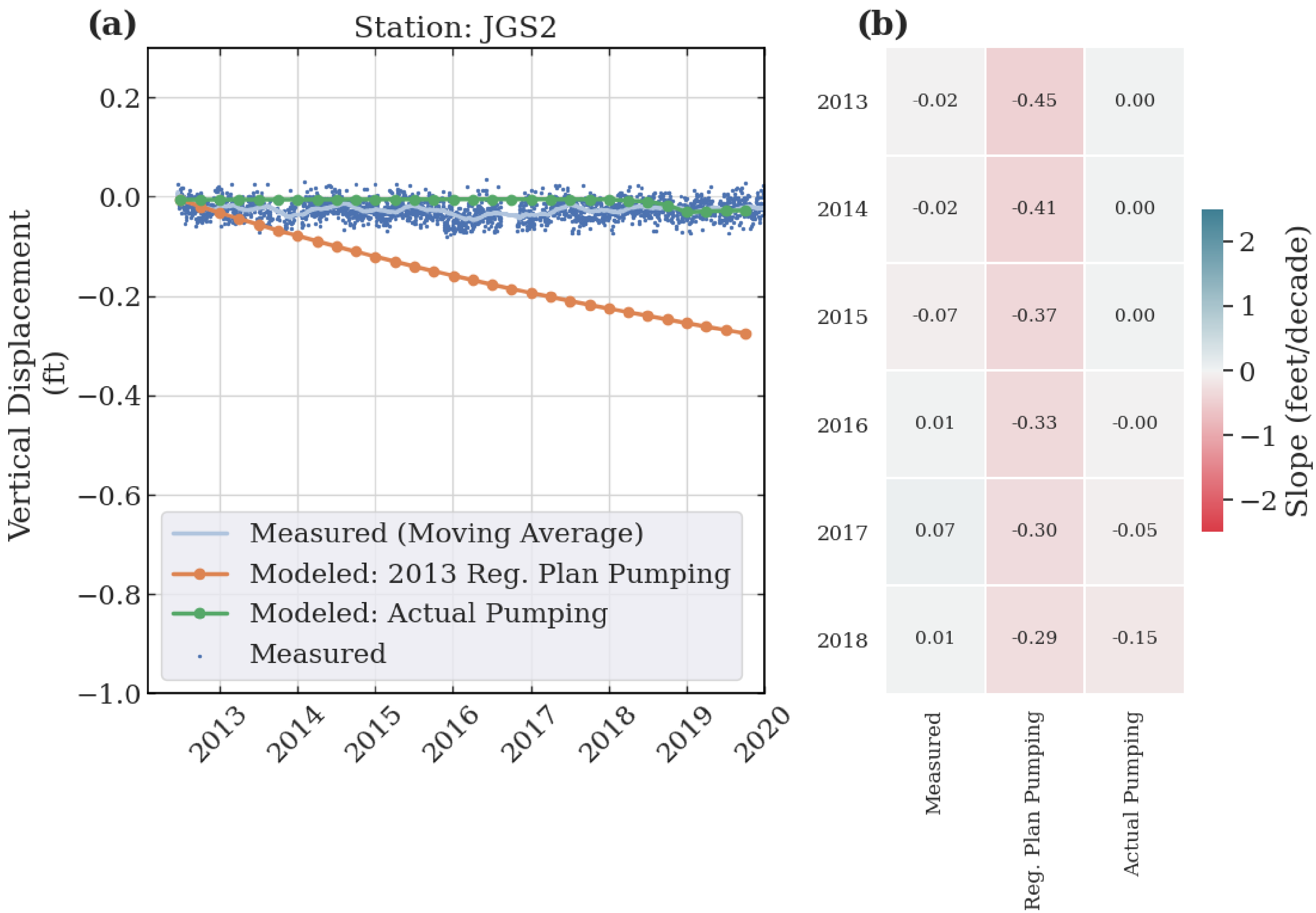


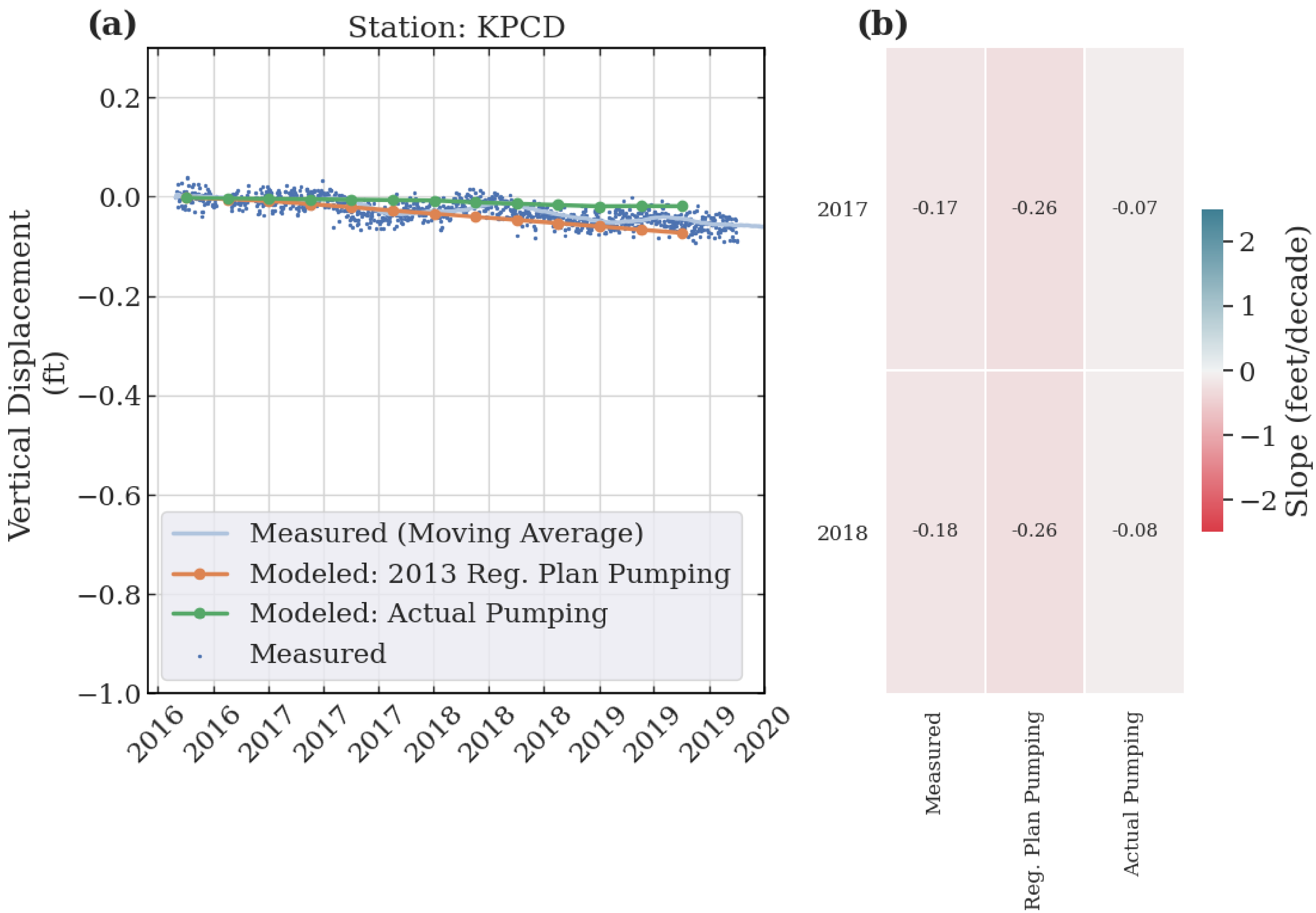
INTERA
GEOSCIENCE & ENGINEERING SOLUTIONS

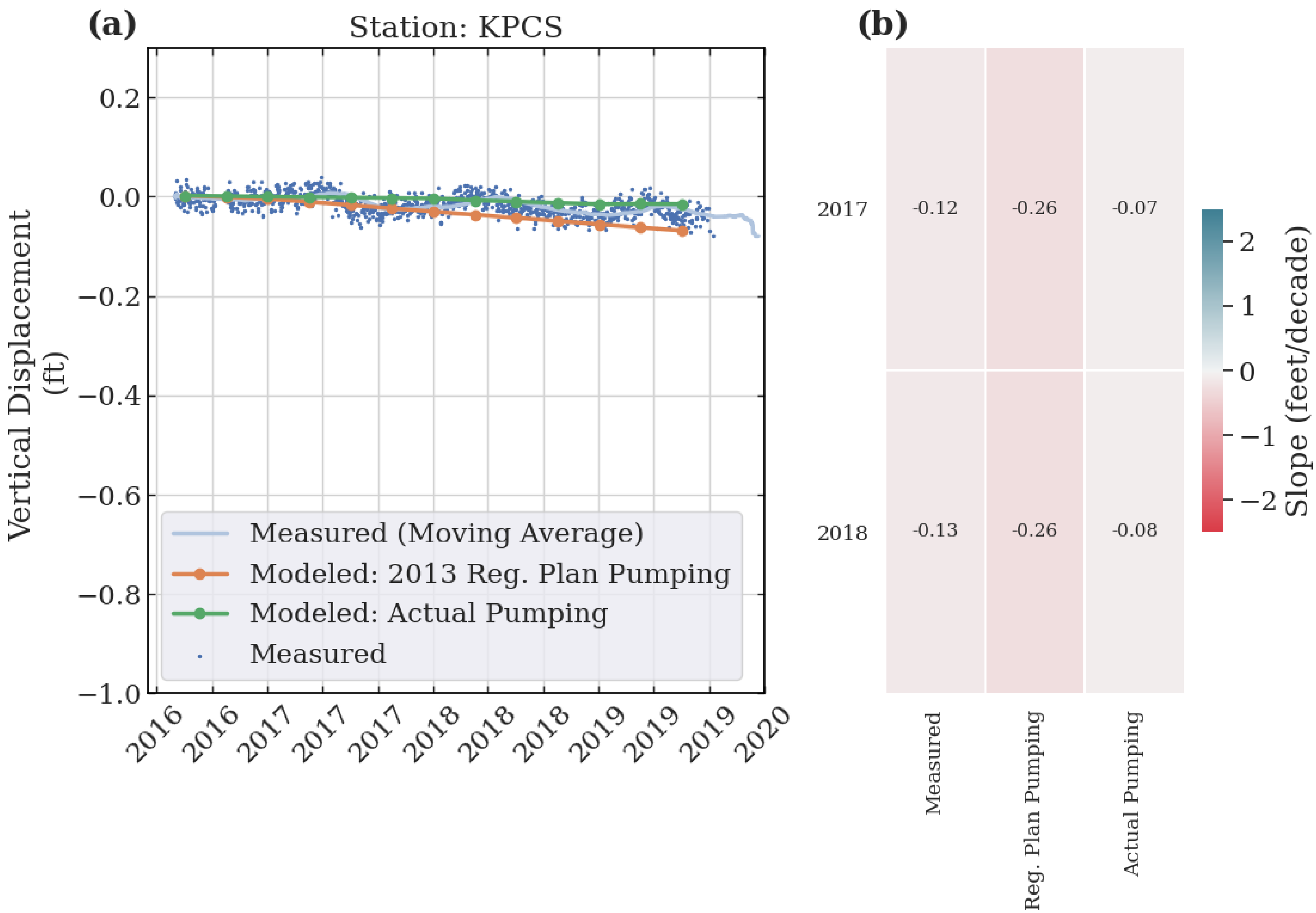

(a)
Station: TXTG
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2015
2016
2016
2017
2017
2018
2018
2019
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2016
-0.10
-0.97
-0.00
2017
-0.08
-0.93
0.01
2018
-0.12
-0.94
0.00
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)


(a)
Station: UTEX
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2013
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2013 -0.17 -0.62 -0.03
2014 -0.17 -0.55 -0.03
2015 -0.34 -0.51 -0.04
2016 -0.44 -0.49 -0.03
2017 -0.26 -0.48 -0.01
2018 -0.17 -0.47 -0.01
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2

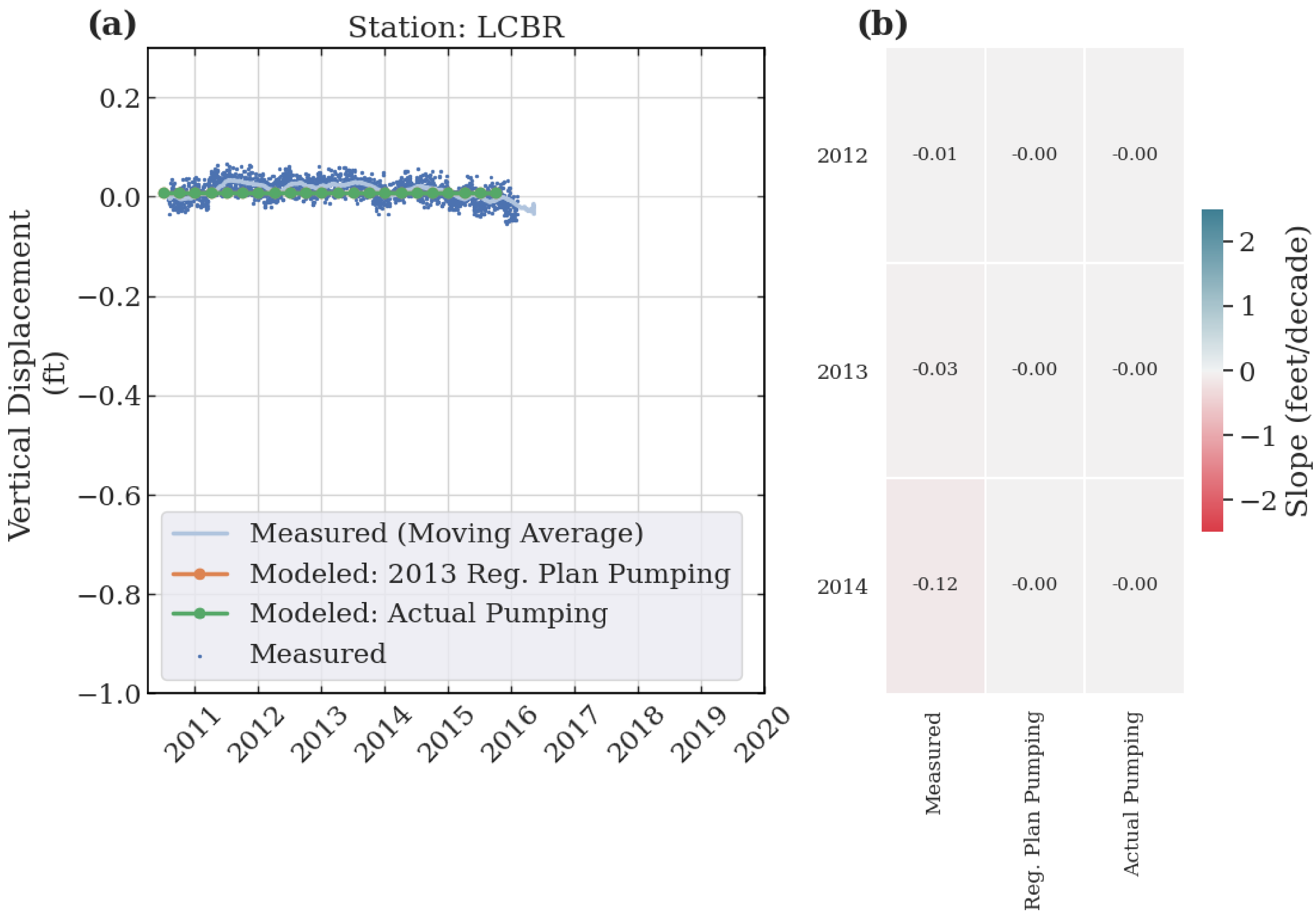

(a)
Station: HSMN
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2013
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2014
0.02
-0.06
-0.03
2015
-0.26
-0.06
-0.04
2016
-0.33
-0.05
-0.02
2017
-0.18
-0.04
-0.00
2018
-0.12
-0.03
-0.00
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

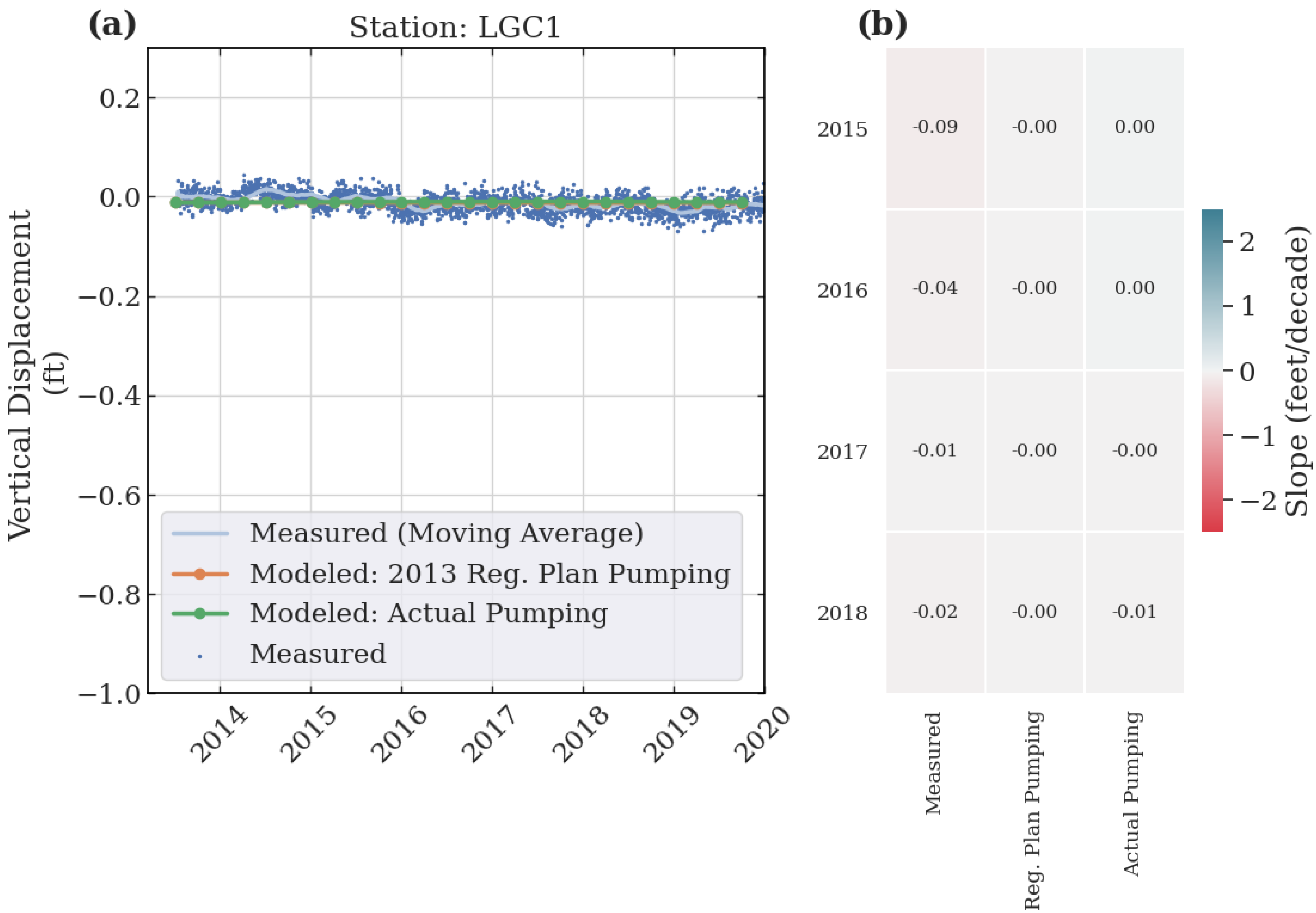

(a)
Station: JGS2
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
2013
2014
2015
2016
2017
2018
2019
2020
(b)
2013 -0.02 -0.45 0.00
2014 -0.02 -0.41 0.00
2015 -0.07 -0.37 0.00
2016 0.01 -0.33 -0.00
2017 0.07 -0.30 -0.05
2018 0.01 -0.29 -0.15
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2

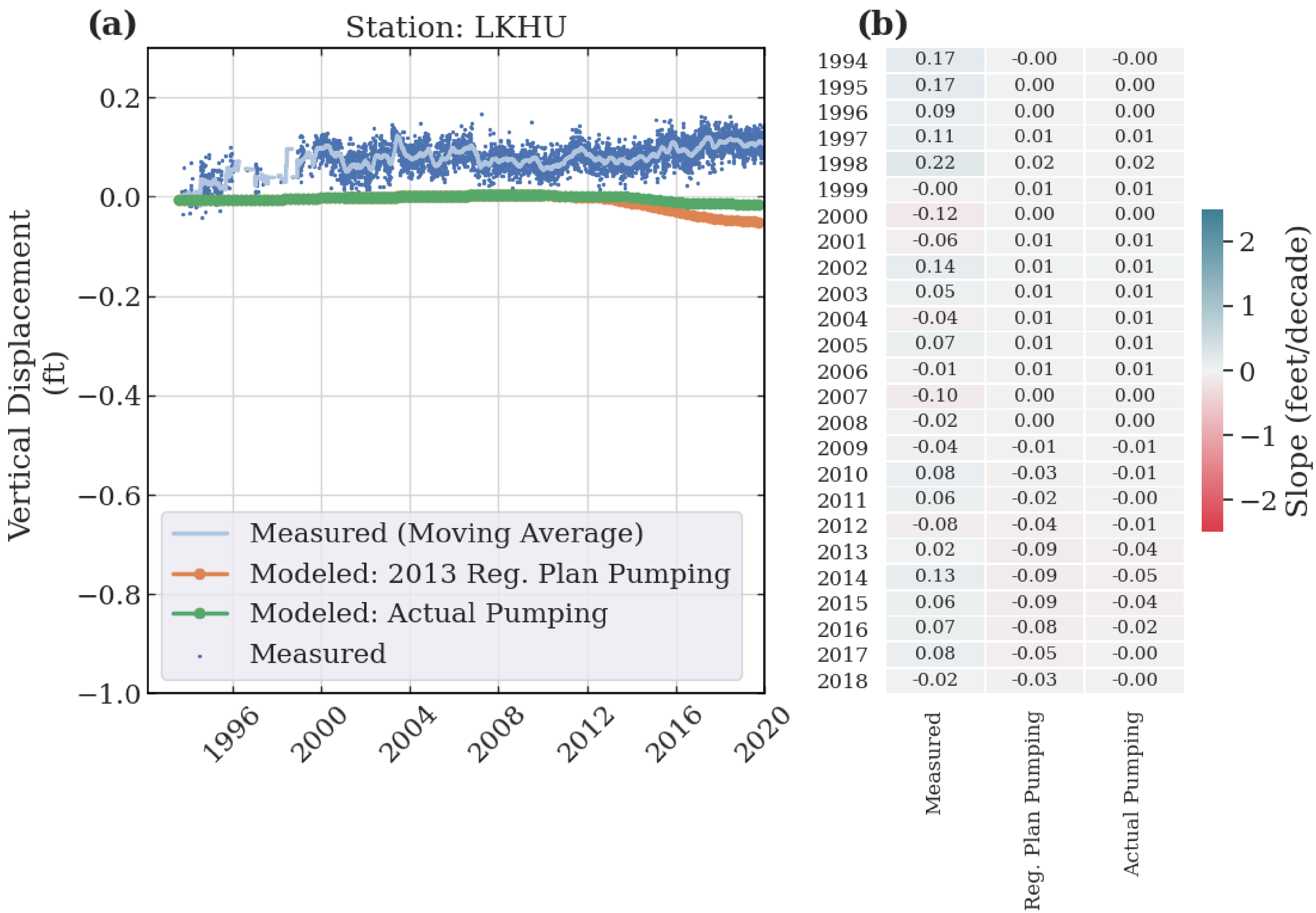

(a)
Station: KPCD
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2016
2016
2017
2017
2017
2018
2018
2018
2019
2019
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2017
-0.17
-0.26
-0.07
2018
-0.18
-0.26
-0.08
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

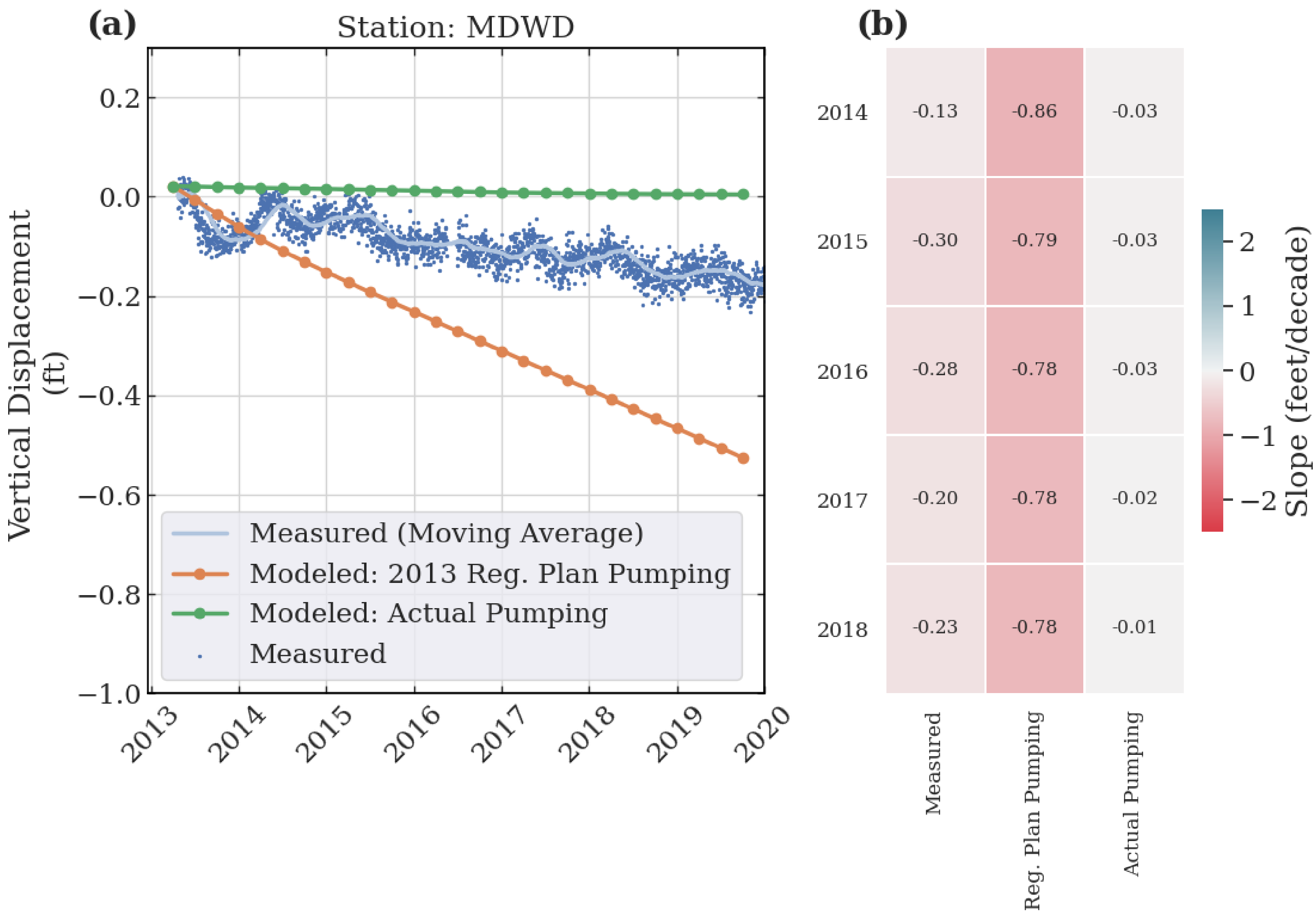


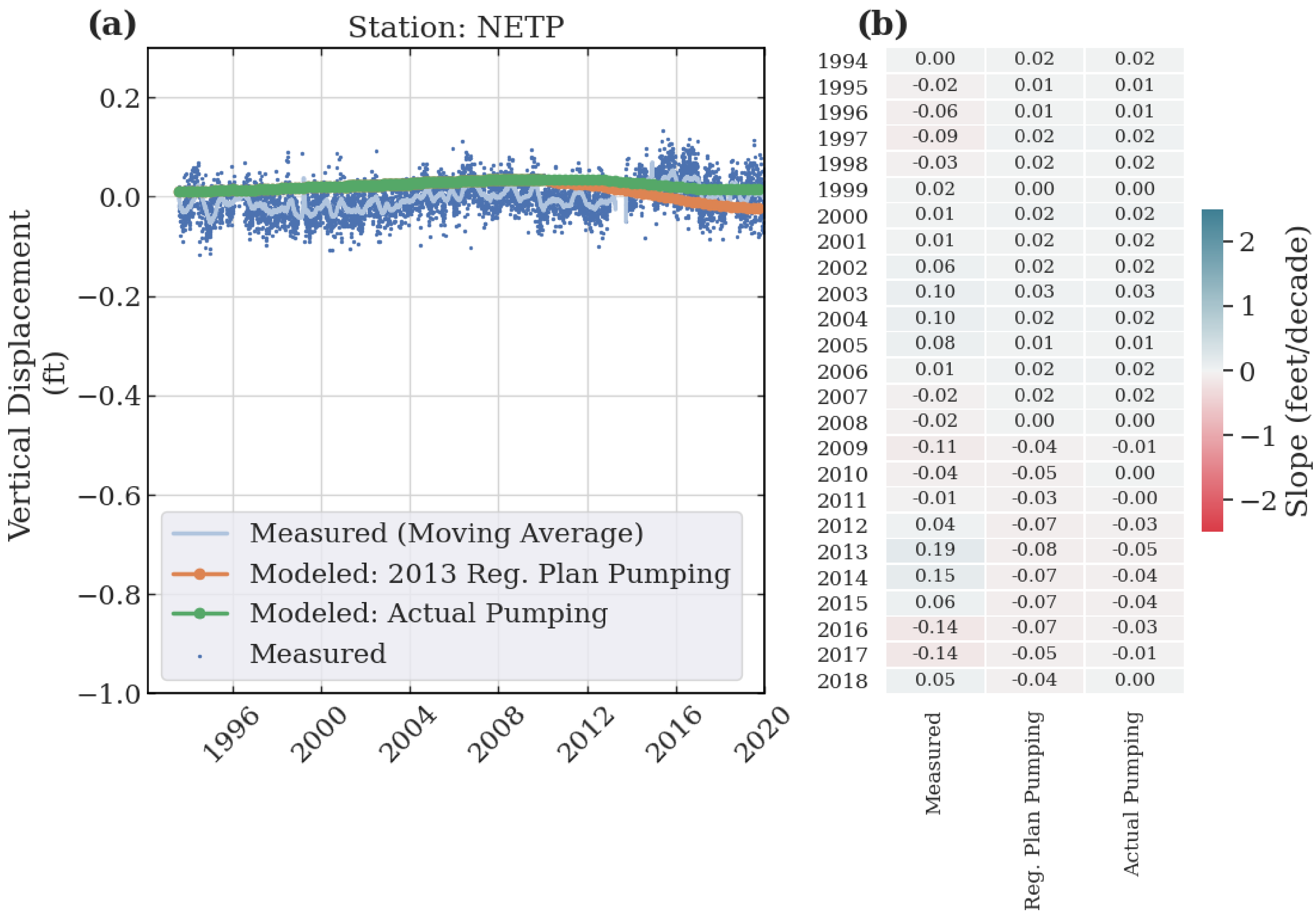
(a)
Station: KPCS
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2016
2016
2017
2017
2017
2018
2018
2018
2019
2019
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2017
2018
-0.12
-0.26
-0.07
-0.13
-0.26
-0.08
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2

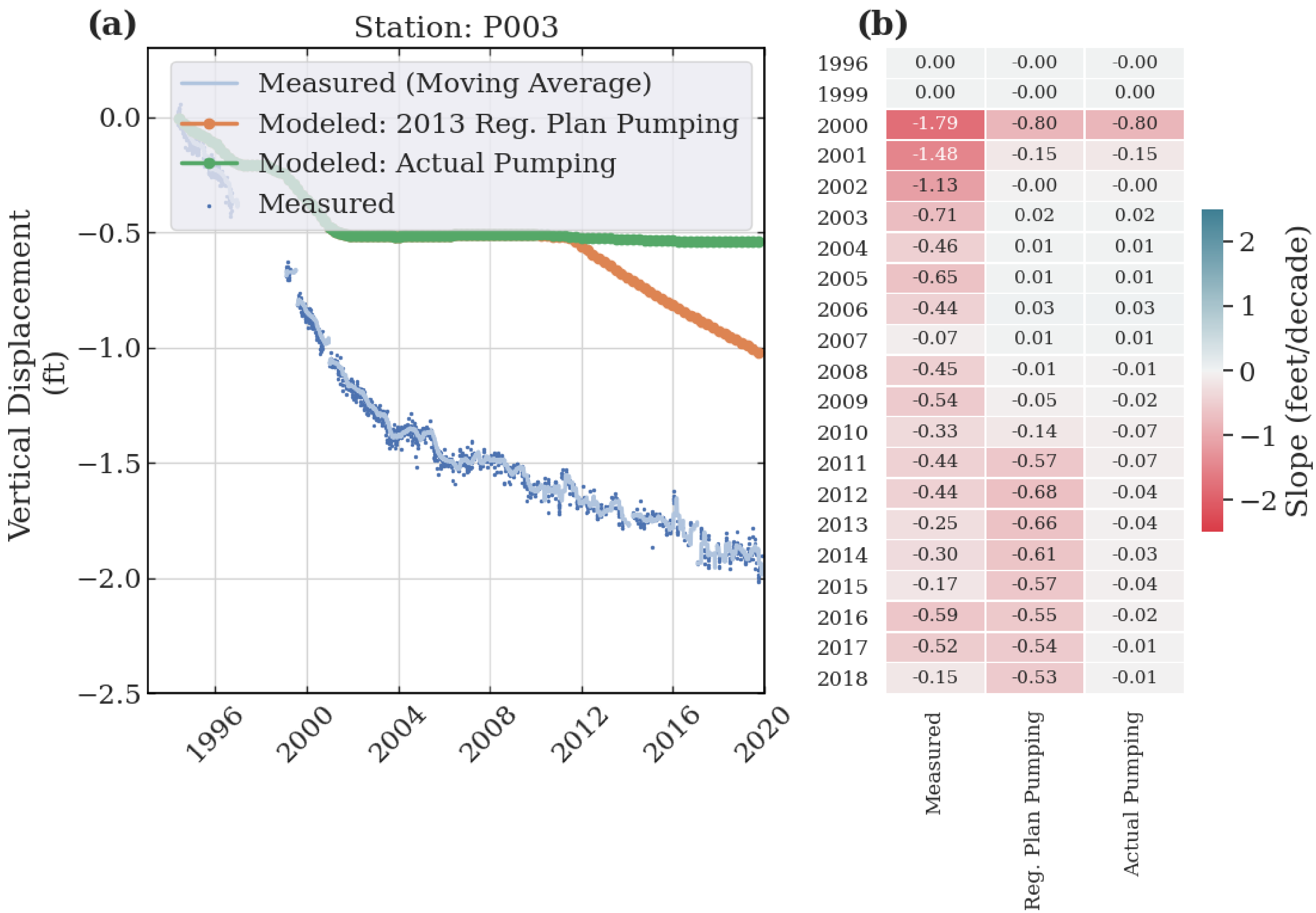

(a)
Station: LCBR
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2012
2013
2014
-0.01
-0.00
-0.00
-0.03
-0.00
-0.00
-0.12
-0.00
-0.00
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2

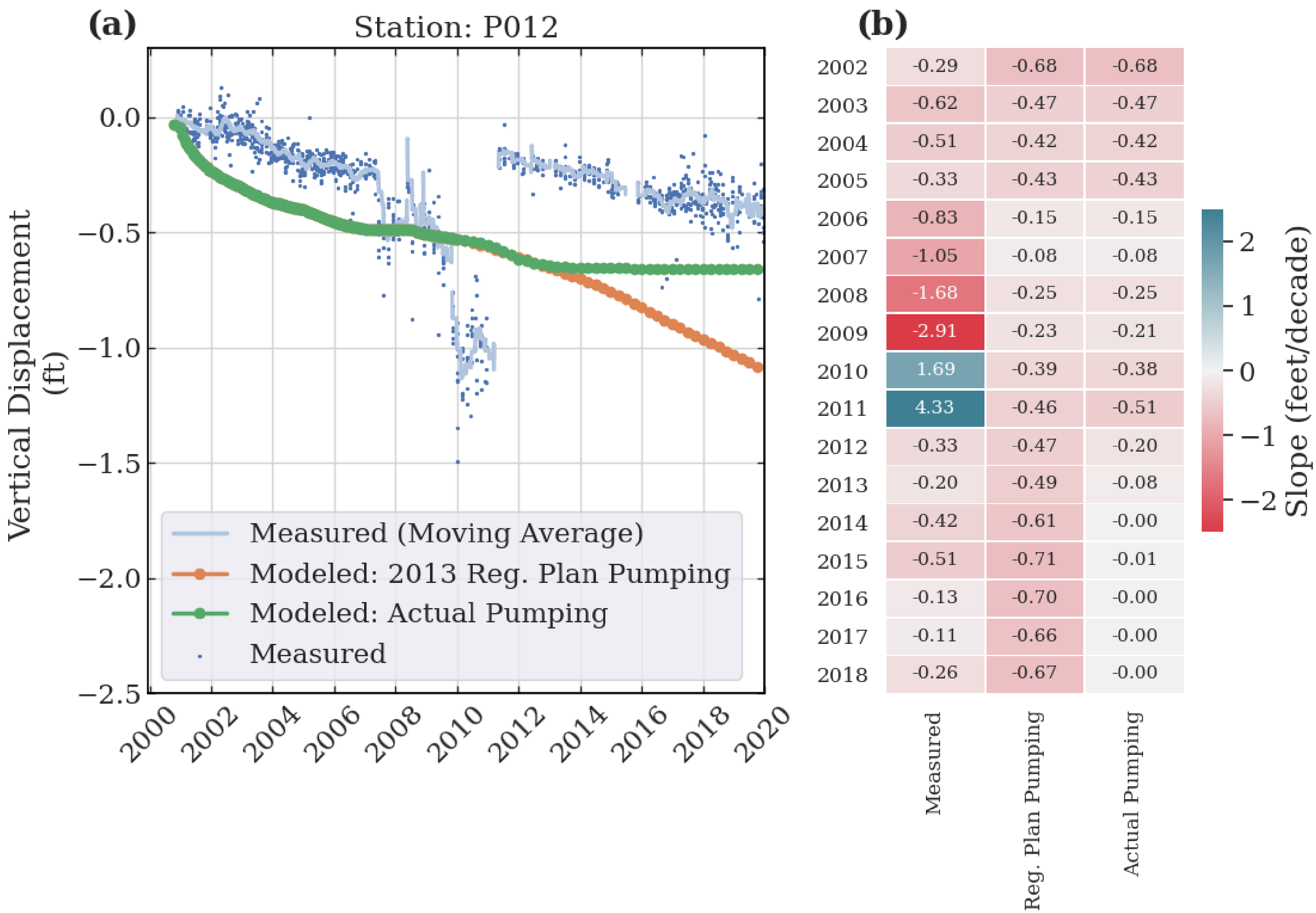

(a)
Station: LGC1
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2015
2016
2017
2018
-0.09
-0.00
0.00
-0.04
-0.00
0.00
-0.01
-0.00
-0.00
-0.02
-0.00
-0.01
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

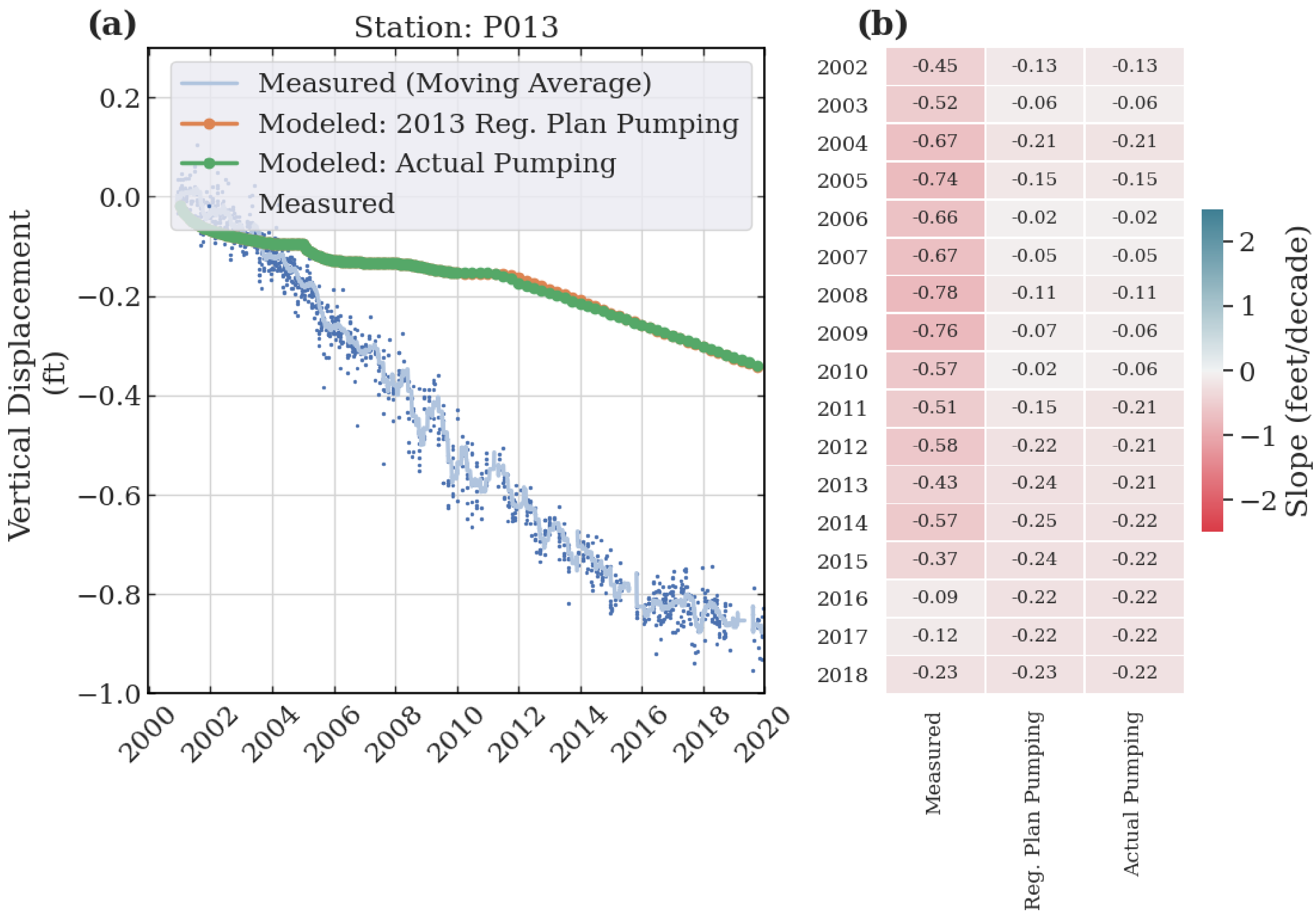

(a)
Station: LKHU
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
1996
2000
2004
2008
2012
2016
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
1994 0.17 -0.00 -0.00
1995 0.17 0.00 0.00
1996 0.09 0.00 0.00
1997 0.11 0.01 0.01
1998 0.22 0.02 0.02
1999 -0.00 0.01 0.01
2000 -0.12 0.00 0.00
2001 -0.06 0.01 0.01
2002 0.14 0.01 0.01
2003 0.05 0.01 0.01
2004 -0.04 0.01 0.01
2005 0.07 0.01 0.01
2006 -0.01 0.01 0.01
2007 -0.10 0.00 0.00
2008 -0.02 0.00 0.00
2009 -0.04 -0.01 -0.01
2010 0.08 -0.03 -0.01
2011 0.06 -0.02 -0.00
2012 -0.08 -0.04 -0.01
2013 0.02 -0.09 -0.04
2014 0.13 -0.09 -0.05
2015 0.06 -0.09 -0.04
2016 0.07 -0.08 -0.02
2017 0.08 -0.05 -0.00
2018 -0.02 -0.03 -0.00
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

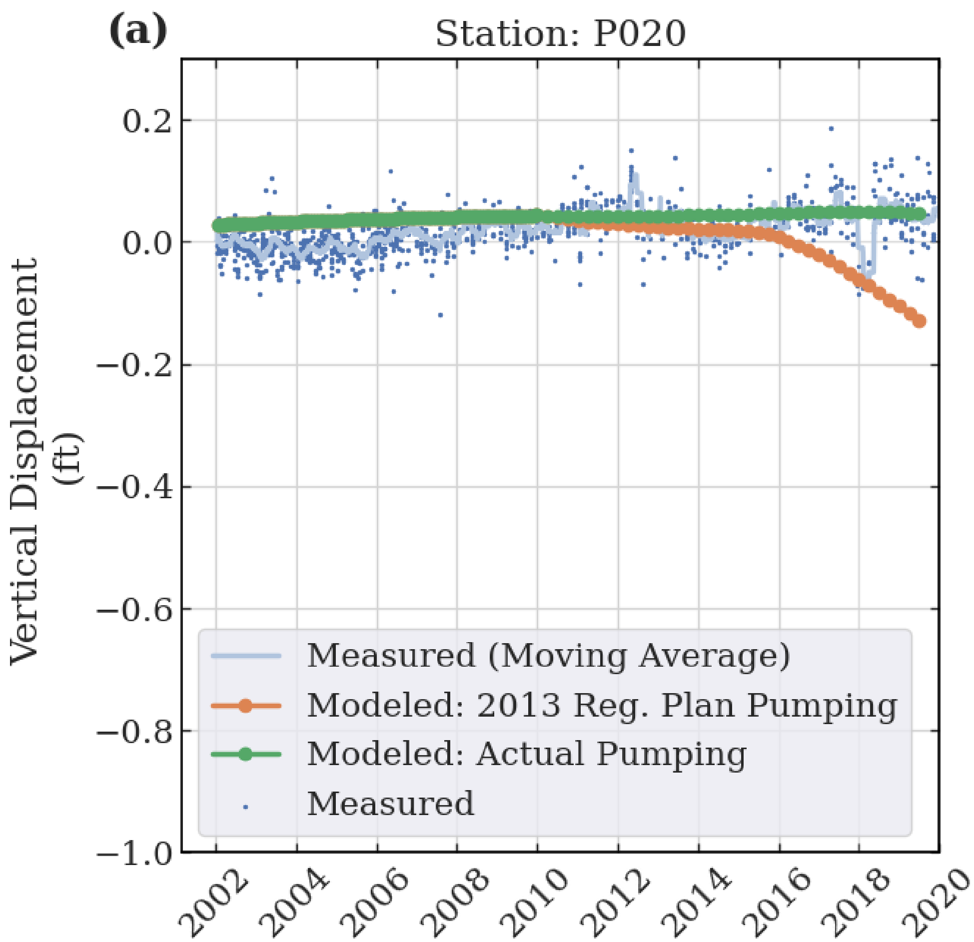

(a)
Station: MDWD
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2013
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2014
-0.13
-0.86
-0.03
2015
-0.30
-0.79
-0.03
2016
-0.28
-0.78
-0.03
2017
-0.20
-0.78
-0.02
2018
-0.23
-0.78
-0.01
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)


(a)
Station: NETP
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
1996
2000
2004
2008
2012
2016
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
1994 0.00 0.02 0.02
1995 -0.02 0.01 0.01
1996 -0.06 0.01 0.01
1997 -0.09 0.02 0.02
1998 -0.03 0.02 0.02
1999 0.02 0.00 0.00
2000 0.01 0.02 0.02
2001 0.01 0.02 0.02
2002 0.06 0.02 0.02
2003 0.10 0.03 0.03
2004 0.10 0.02 0.02
2005 0.08 0.01 0.01
2006 0.01 0.02 0.02
2007 -0.02 0.02 0.02
2008 -0.02 0.00 0.00
2009 -0.11 -0.04 -0.01
2010 -0.04 -0.05 0.00
2011 -0.01 -0.03 -0.00
2012 0.04 -0.07 -0.03
2013 0.19 -0.08 -0.05
2014 0.15 -0.07 -0.04
2015 0.06 -0.07 -0.04
2016 -0.14 -0.07 -0.03
2017 -0.14 -0.05 -0.01
2018 0.05 -0.04 0.00
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)


(a)
Station: P003
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
Vertical Displacement (ft)
0.0
−0.5
−1.0
−1.5
−2.0
−2.5
1996
2000
2004
2008
2012
2016
2020
(b)
Measured
Reg. Plan Pumping
Actual Pumping
1996 0.00 -0.00 -0.00
1999 0.00 -0.00 0.00
2000 -1.79 -0.80 -0.80
2001 -1.48 -0.15 -0.15
2002 -1.13 -0.00 -0.00
2003 -0.71 0.02 0.02
2004 -0.46 0.01 0.01
2005 -0.65 0.01 0.01
2006 -0.44 0.03 0.03
2007 -0.07 0.01 0.01
2008 -0.45 -0.01 -0.01
2009 -0.54 -0.05 -0.02
2010 -0.33 -0.14 -0.07
2011 -0.44 -0.57 -0.07
2012 -0.44 -0.68 -0.04
2013 -0.25 -0.66 -0.04
2014 -0.30 -0.61 -0.03
2015 -0.17 -0.57 -0.04
2016 -0.59 -0.55 -0.02
2017 -0.52 -0.54 -0.01
2018 -0.15 -0.53 -0.01
Slope (feet/decade)
2
1
0
−1
−2

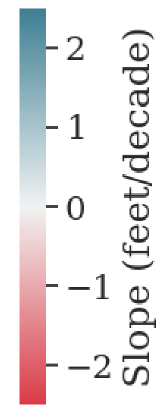

(a)
Station: P012
Vertical Displacement (ft)
0.0
−0.5
−1.0
−1.5
−2.0
−2.5
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2002 -0.29 -0.68 -0.68
2003 -0.62 -0.47 -0.47
2004 -0.51 -0.42 -0.42
2005 -0.33 -0.43 -0.43
2006 -0.83 -0.15 -0.15
2007 -1.05 -0.08 -0.08
2008 -1.68 -0.25 -0.25
2009 -2.91 -0.23 -0.21
2010 1.69 -0.39 -0.38
2011 4.33 -0.46 -0.51
2012 -0.33 -0.47 -0.20
2013 -0.20 -0.49 -0.08
2014 -0.42 -0.61 -0.00
2015 -0.51 -0.71 -0.01
2016 -0.13 -0.70 -0.00
2017 -0.11 -0.66 -0.00
2018 -0.26 -0.67 -0.00
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

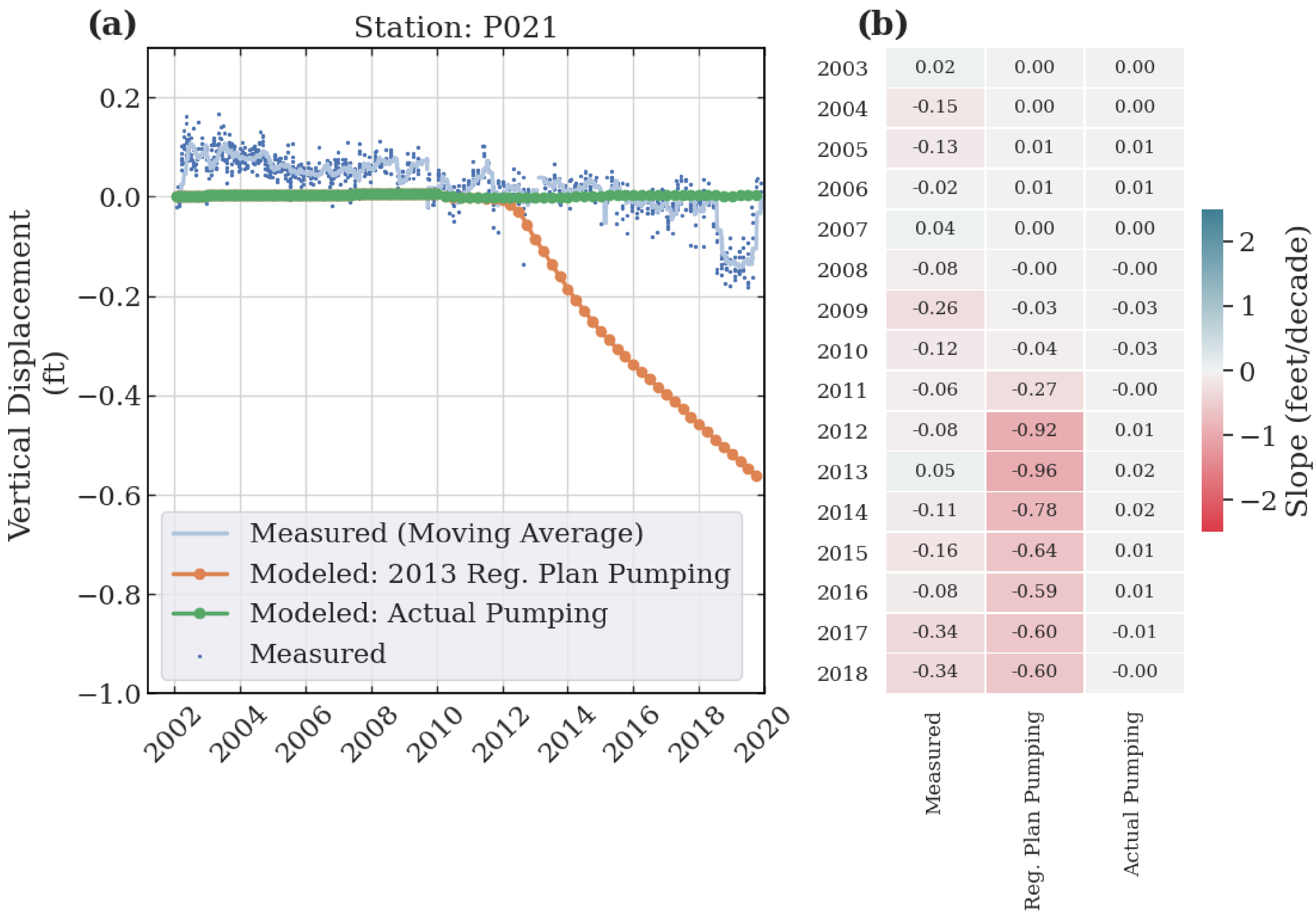

(a)
Station: P013
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
(b)
2002 -0.45 -0.13 -0.13
2003 -0.52 -0.06 -0.06
2004 -0.67 -0.21 -0.21
2005 -0.74 -0.15 -0.15
2006 -0.66 -0.02 -0.02
2007 -0.67 -0.05 -0.05
2008 -0.78 -0.11 -0.11
2009 -0.76 -0.07 -0.06
2010 -0.57 -0.02 -0.06
2011 -0.51 -0.15 -0.21
2012 -0.58 -0.22 -0.21
2013 -0.43 -0.24 -0.21
2014 -0.57 -0.25 -0.22
2015 -0.37 -0.24 -0.22
2016 -0.09 -0.22 -0.22
2017 -0.12 -0.22 -0.22
2018 -0.23 -0.23 -0.22
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

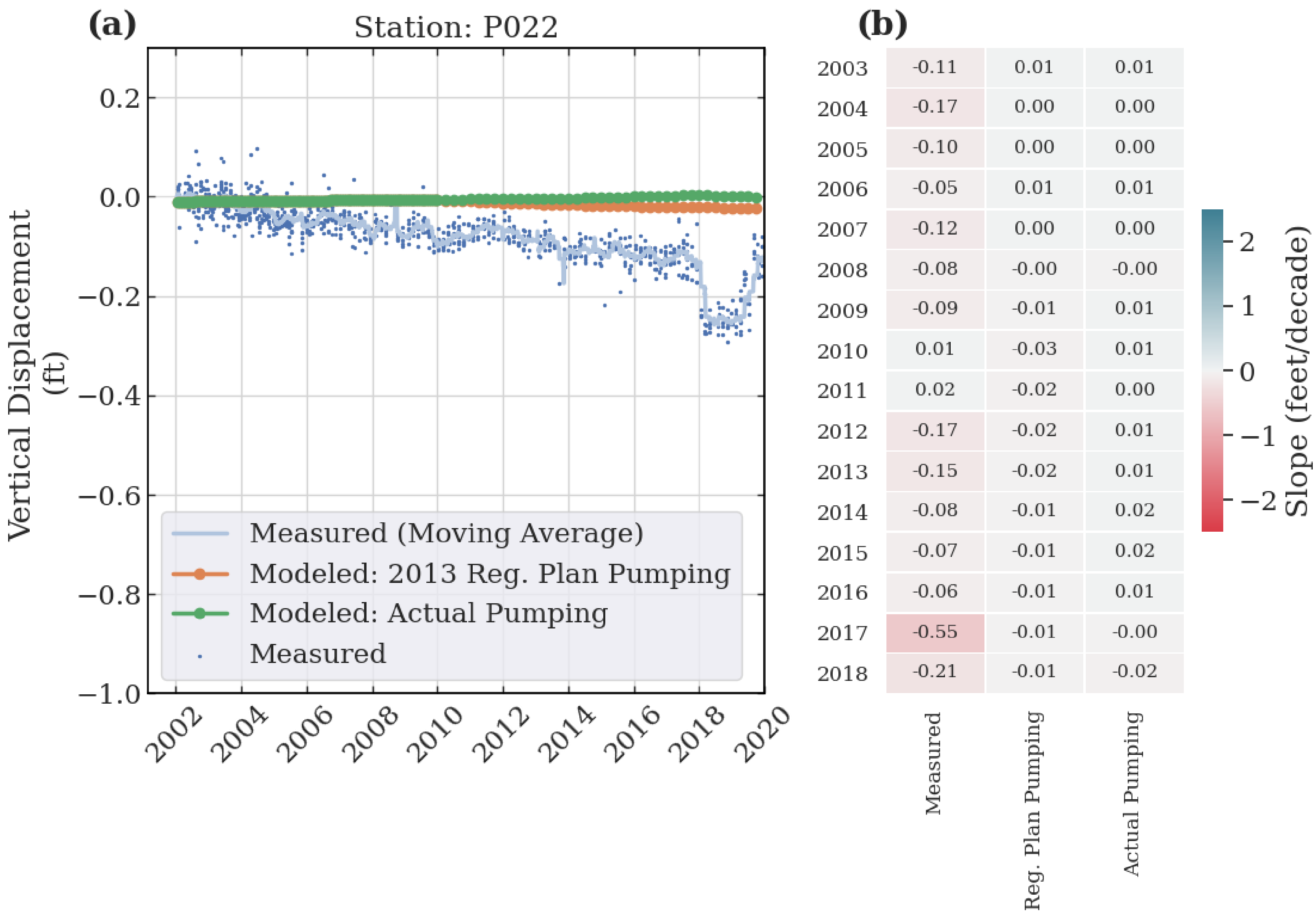


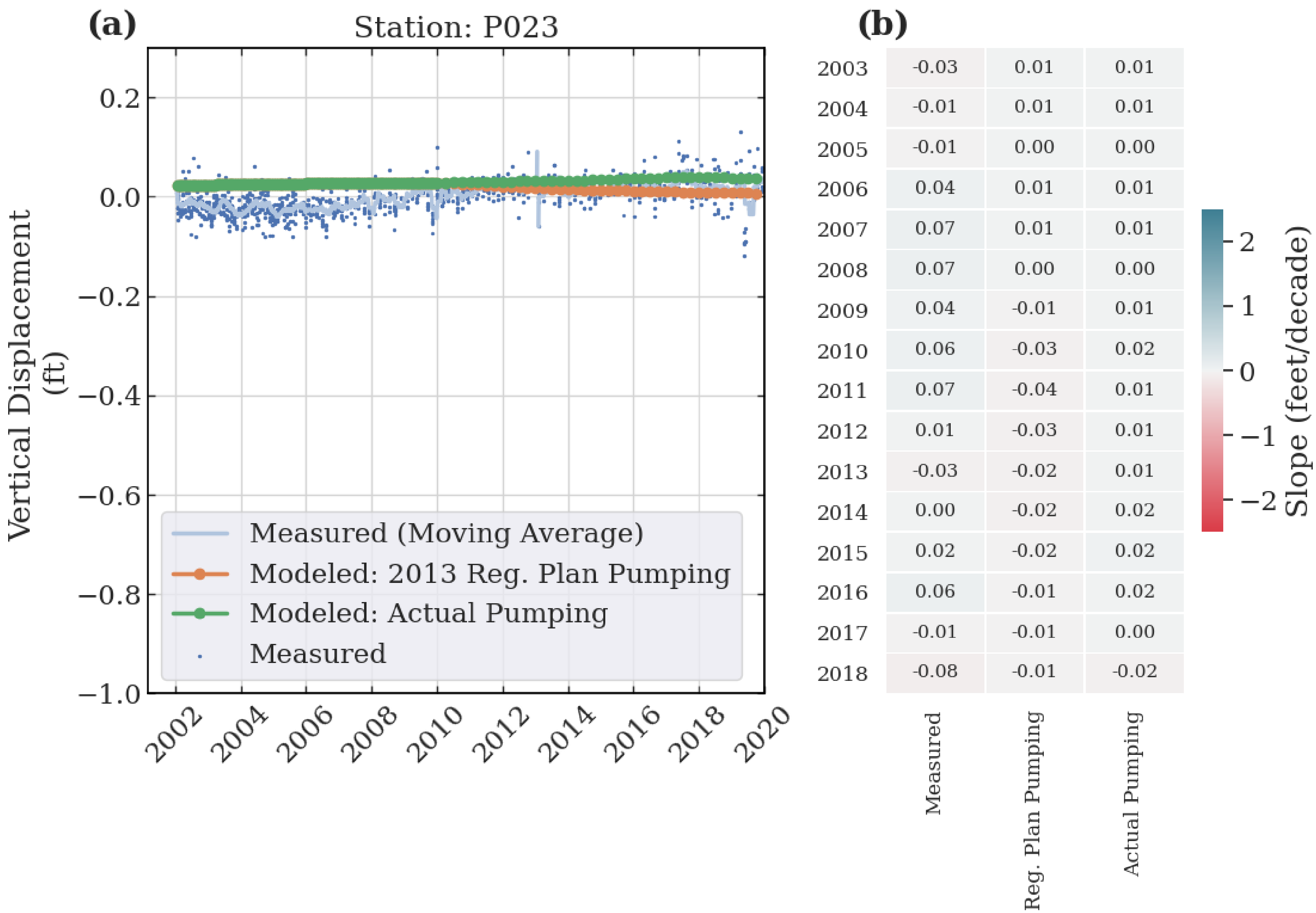
(b)

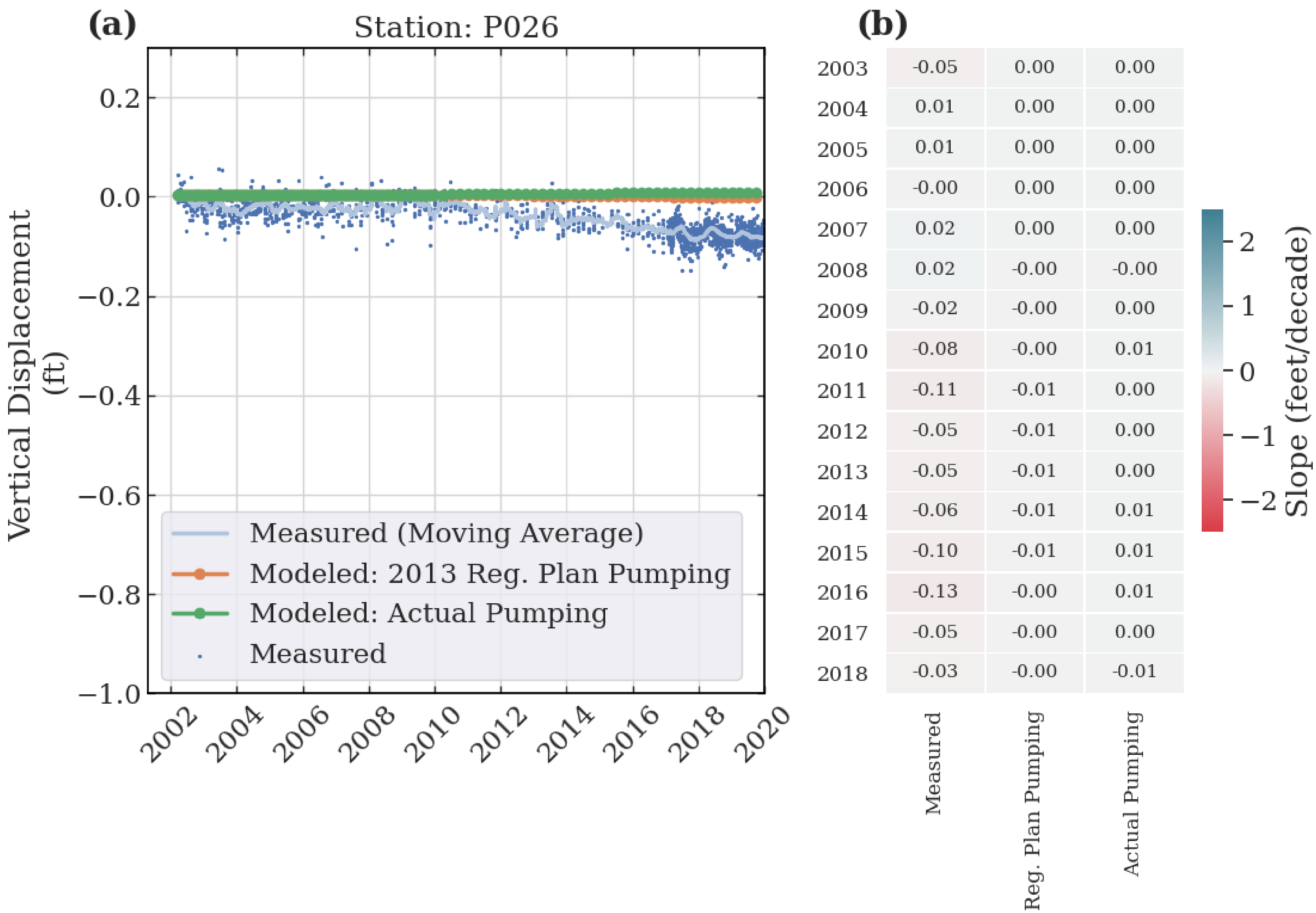
	Measured	Reg. Plan Pumping	Actual Pumping
2003	-0.03	0.02	0.02
2004	0.02	0.02	0.02
2005	0.13	0.02	0.02
2006	0.08	0.02	0.02
2007	0.05	0.02	0.02
2008	0.08	0.01	0.01
2009	0.04	-0.03	0.00
2010	0.11	-0.08	-0.01
2011	0.10	-0.05	-0.00
2012	-0.06	-0.04	0.01
2013	-0.21	-0.03	0.01
2014	-0.02	-0.04	0.02
2015	0.15	-0.18	0.02
2016	-0.06	-0.34	0.02
2017	-0.01	-0.42	0.00
2018	0.01	-0.45	-0.02

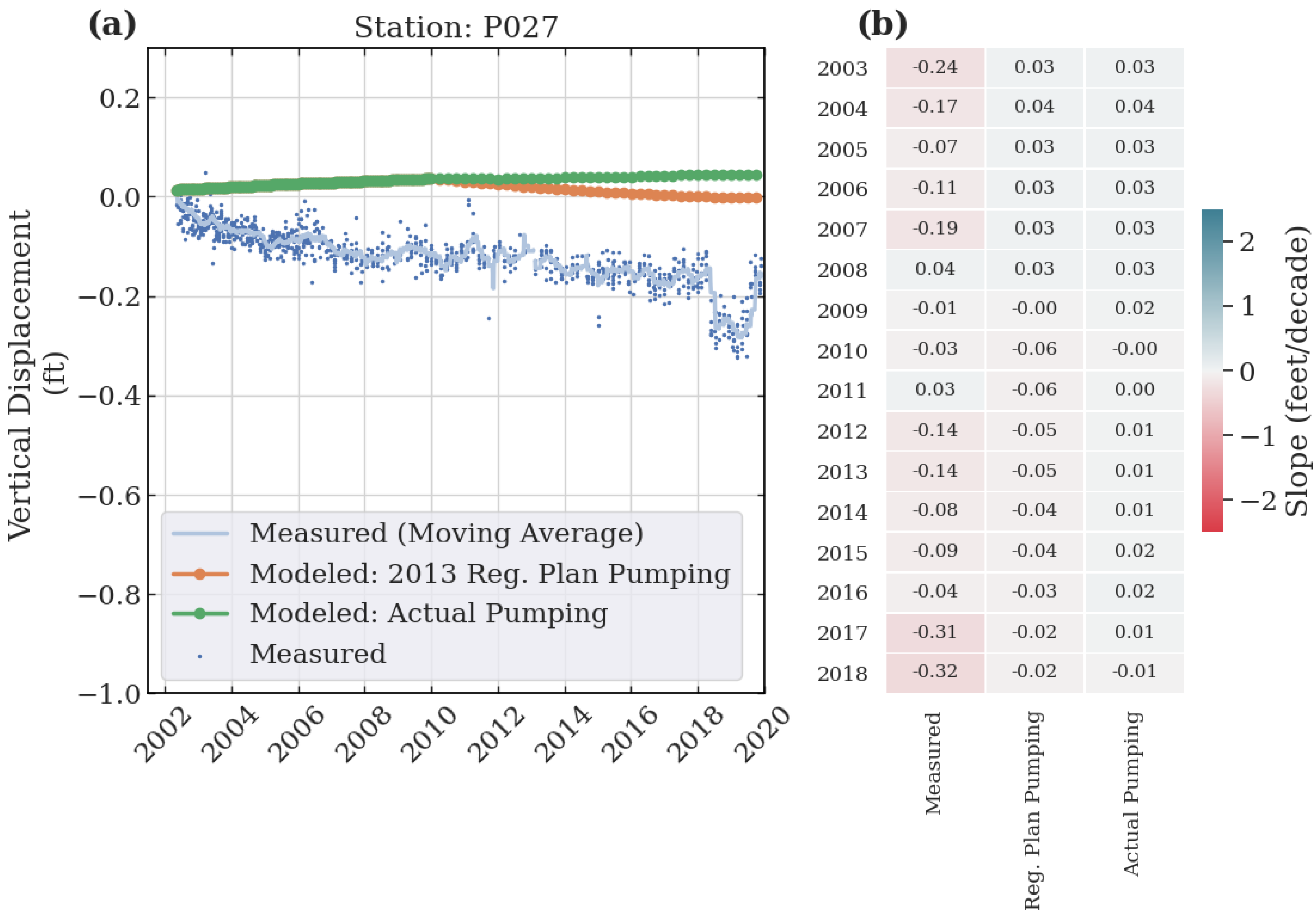


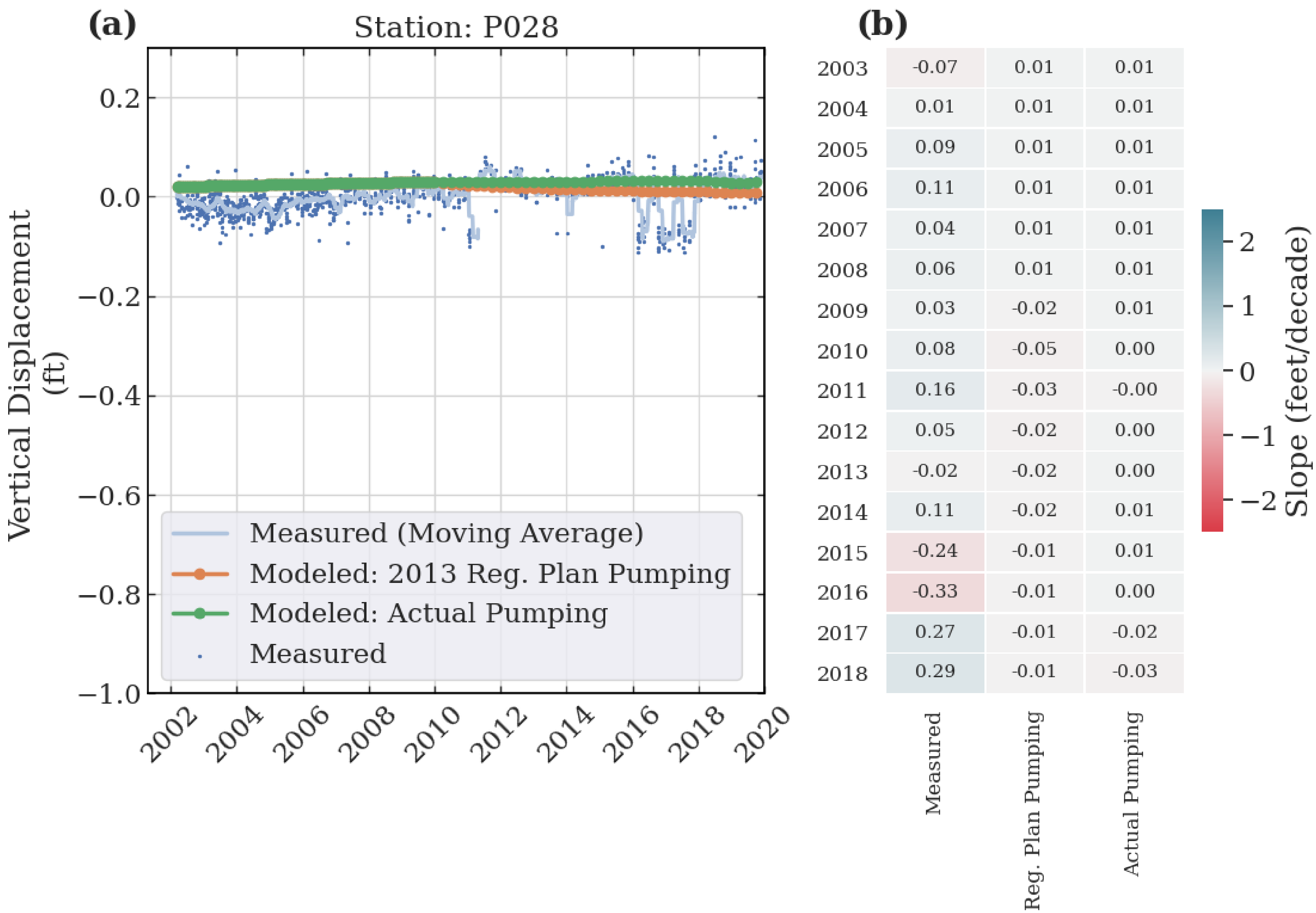

(a)
Station: P021
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2003 0.02 0.00 0.00
2004 -0.15 0.00 0.00
2005 -0.13 0.01 0.01
2006 -0.02 0.01 0.01
2007 0.04 0.00 0.00
2008 -0.08 -0.00 -0.00
2009 -0.26 -0.03 -0.03
2010 -0.12 -0.04 -0.03
2011 -0.06 -0.27 -0.00
2012 -0.08 -0.92 0.01
2013 0.05 -0.96 0.02
2014 -0.11 -0.78 0.02
2015 -0.16 -0.64 0.01
2016 -0.08 -0.59 0.01
2017 -0.34 -0.60 -0.01
2018 -0.34 -0.60 -0.00
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

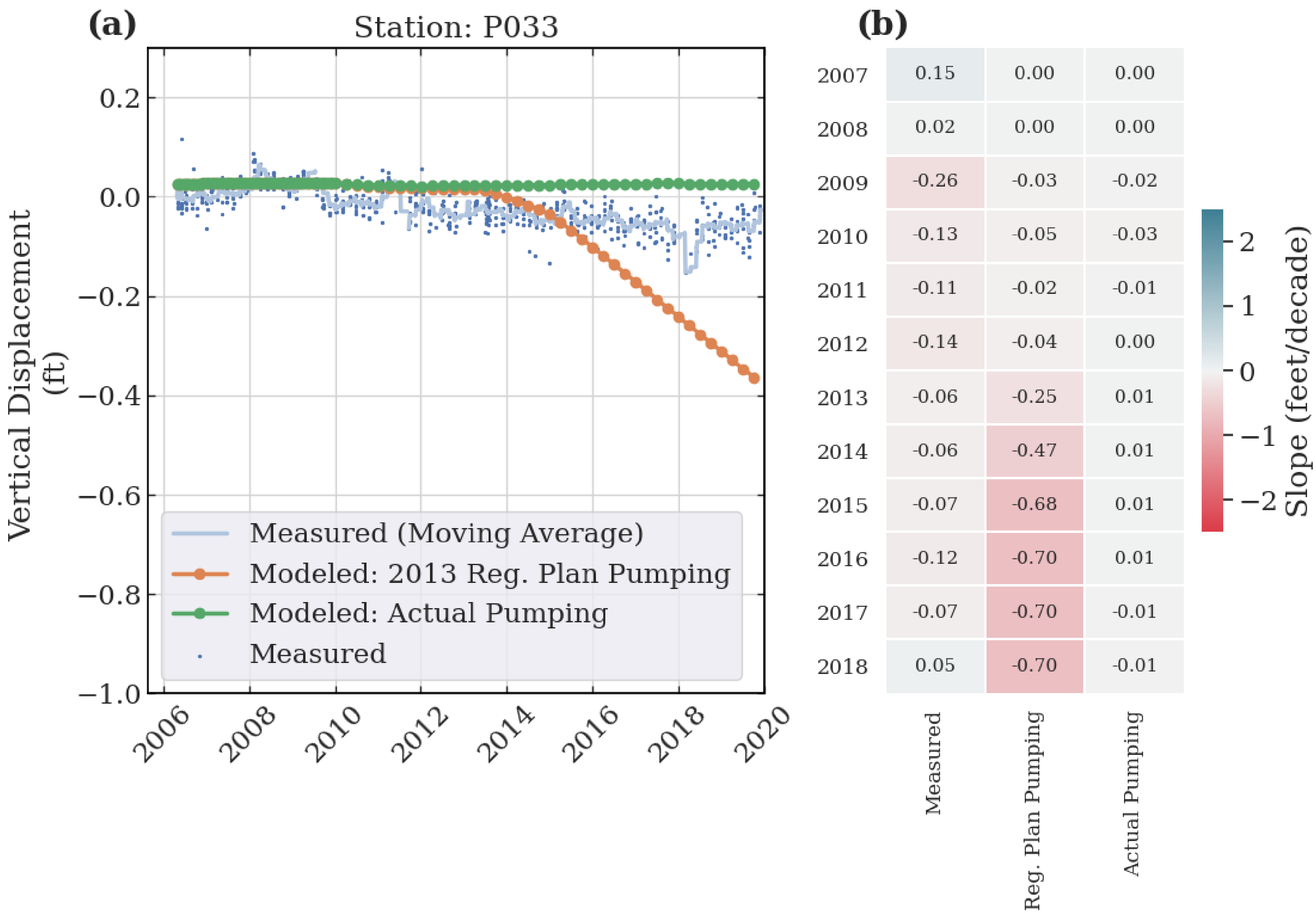

(a)
Station: P022
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2003 -0.11 0.01 0.01
2004 -0.17 0.00 0.00
2005 -0.10 0.00 0.00
2006 -0.05 0.01 0.01
2007 -0.12 0.00 0.00
2008 -0.08 -0.00 -0.00
2009 -0.09 -0.01 0.01
2010 0.01 -0.03 0.01
2011 0.02 -0.02 0.00
2012 -0.17 -0.02 0.01
2013 -0.15 -0.02 0.01
2014 -0.08 -0.01 0.02
2015 -0.07 -0.01 0.02
2016 -0.06 -0.01 0.01
2017 -0.55 -0.01 -0.00
2018 -0.21 -0.01 -0.02
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

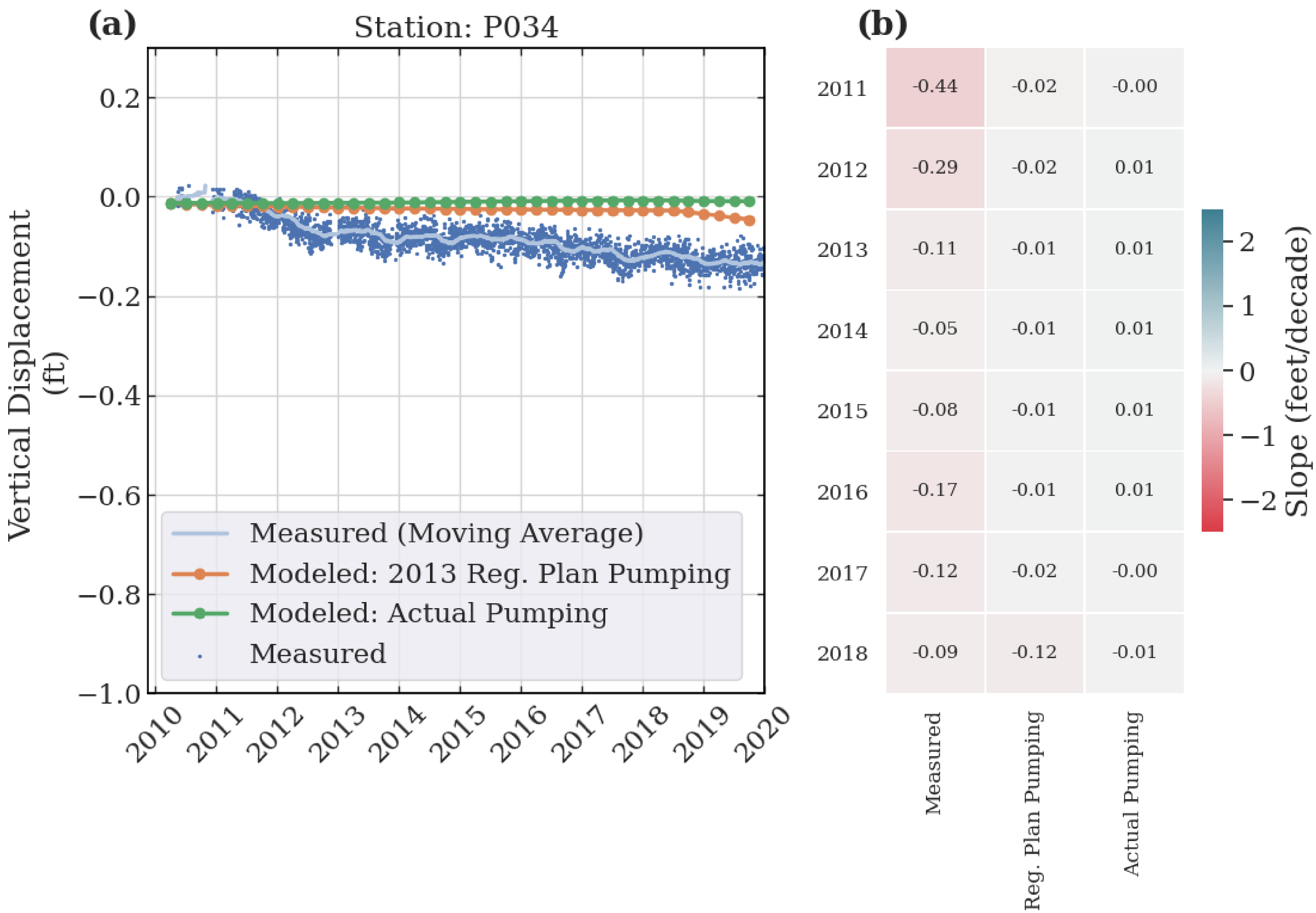

(a)
Station: P023
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2003 -0.03 0.01 0.01
2004 -0.01 0.01 0.01
2005 -0.01 0.00 0.00
2006 0.04 0.01 0.01
2007 0.07 0.01 0.01
2008 0.07 0.00 0.00
2009 0.04 -0.01 0.01
2010 0.06 -0.03 0.02
2011 0.07 -0.04 0.01
2012 0.01 -0.03 0.01
2013 -0.03 -0.02 0.01
2014 0.00 -0.02 0.02
2015 0.02 -0.02 0.02
2016 0.06 -0.01 0.02
2017 -0.01 -0.01 0.00
2018 -0.08 -0.01 -0.02
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

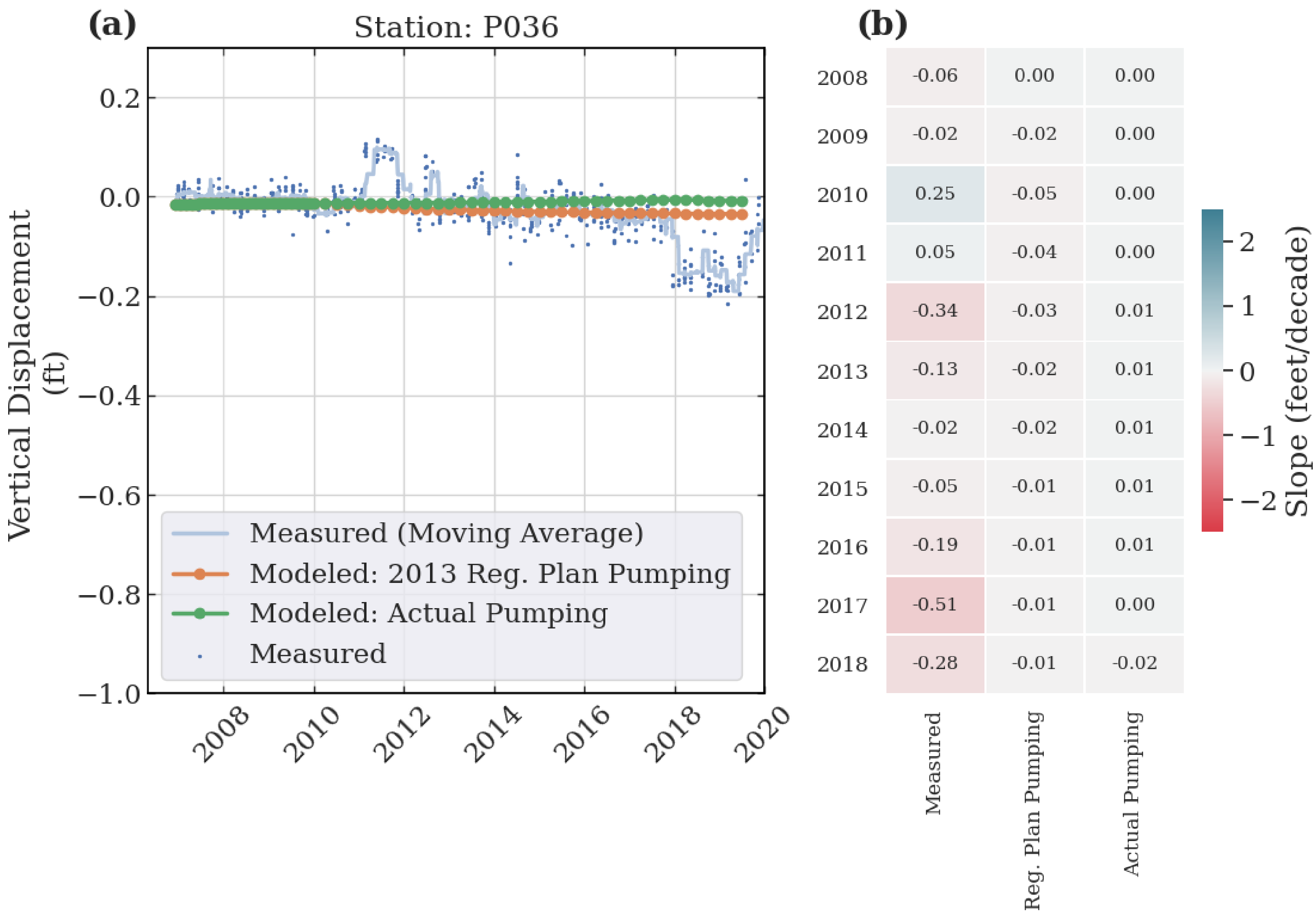

(a)
Station: P026
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2003 -0.05 0.00 0.00
2004 0.01 0.00 0.00
2005 0.01 0.00 0.00
2006 -0.00 0.00 0.00
2007 0.02 0.00 0.00
2008 0.02 -0.00 -0.00
2009 -0.02 -0.00 0.00
2010 -0.08 -0.00 0.01
2011 -0.11 -0.01 0.00
2012 -0.05 -0.01 0.00
2013 -0.05 -0.01 0.00
2014 -0.06 -0.01 0.01
2015 -0.10 -0.01 0.01
2016 -0.13 -0.00 0.01
2017 -0.05 -0.00 0.00
2018 -0.03 -0.00 -0.01
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2

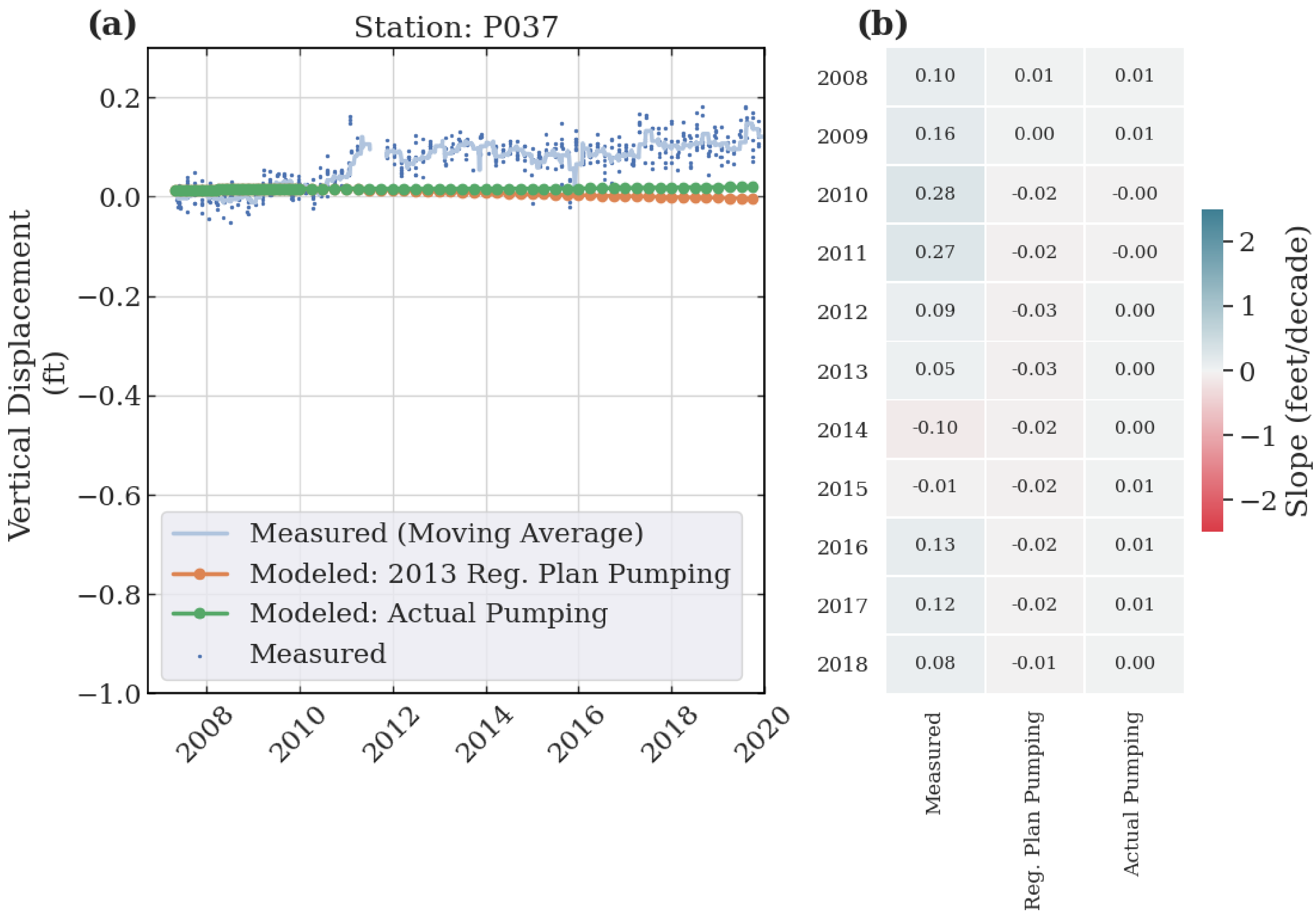

(a)
Station: P027
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2003 -0.24 0.03 0.03
2004 -0.17 0.04 0.04
2005 -0.07 0.03 0.03
2006 -0.11 0.03 0.03
2007 -0.19 0.03 0.03
2008 0.04 0.03 0.03
2009 -0.01 -0.00 0.02
2010 -0.03 -0.06 -0.00
2011 0.03 -0.06 0.00
2012 -0.14 -0.05 0.01
2013 -0.14 -0.05 0.01
2014 -0.08 -0.04 0.01
2015 -0.09 -0.04 0.02
2016 -0.04 -0.03 0.02
2017 -0.31 -0.02 0.01
2018 -0.32 -0.02 -0.01
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)


(a)
Station: P028
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2003 -0.07 0.01 0.01
2004 0.01 0.01 0.01
2005 0.09 0.01 0.01
2006 0.11 0.01 0.01
2007 0.04 0.01 0.01
2008 0.06 0.01 0.01
2009 0.03 -0.02 0.01
2010 0.08 -0.05 0.00
2011 0.16 -0.03 -0.00
2012 0.05 -0.02 0.00
2013 -0.02 -0.02 0.00
2014 0.11 -0.02 0.01
2015 -0.24 -0.01 0.01
2016 -0.33 -0.01 0.00
2017 0.27 -0.01 -0.02
2018 0.29 -0.01 -0.03
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

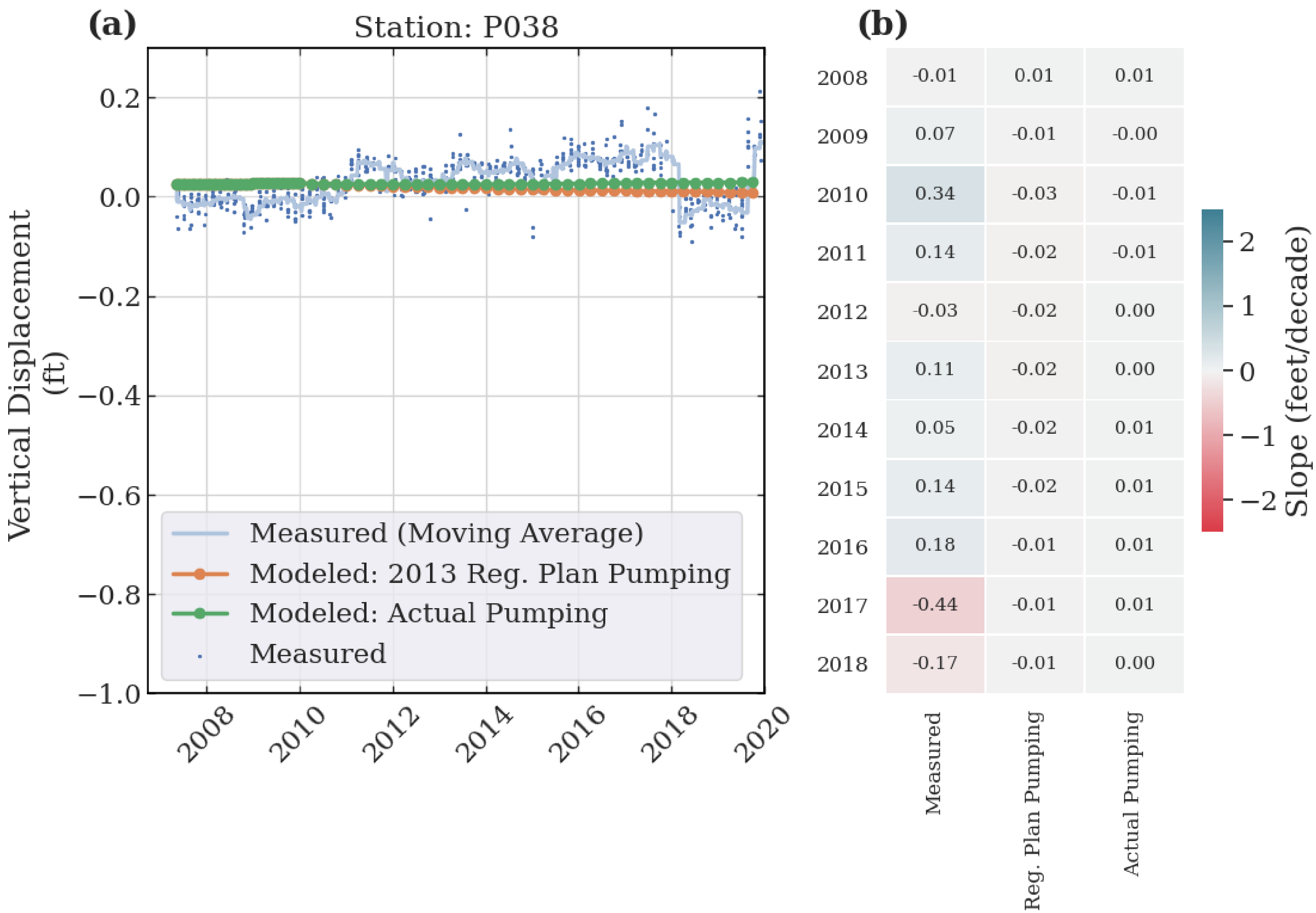

(a)
Station: P033
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2006
2008
2010
2012
2014
2016
2018
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2007 0.15 0.00 0.00
2008 0.02 0.00 0.00
2009 -0.26 -0.03 -0.02
2010 -0.13 -0.05 -0.03
2011 -0.11 -0.02 -0.01
2012 -0.14 -0.04 0.00
2013 -0.06 -0.25 0.01
2014 -0.06 -0.47 0.01
2015 -0.07 -0.68 0.01
2016 -0.12 -0.70 0.01
2017 -0.07 -0.70 -0.01
2018 0.05 -0.70 -0.01
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

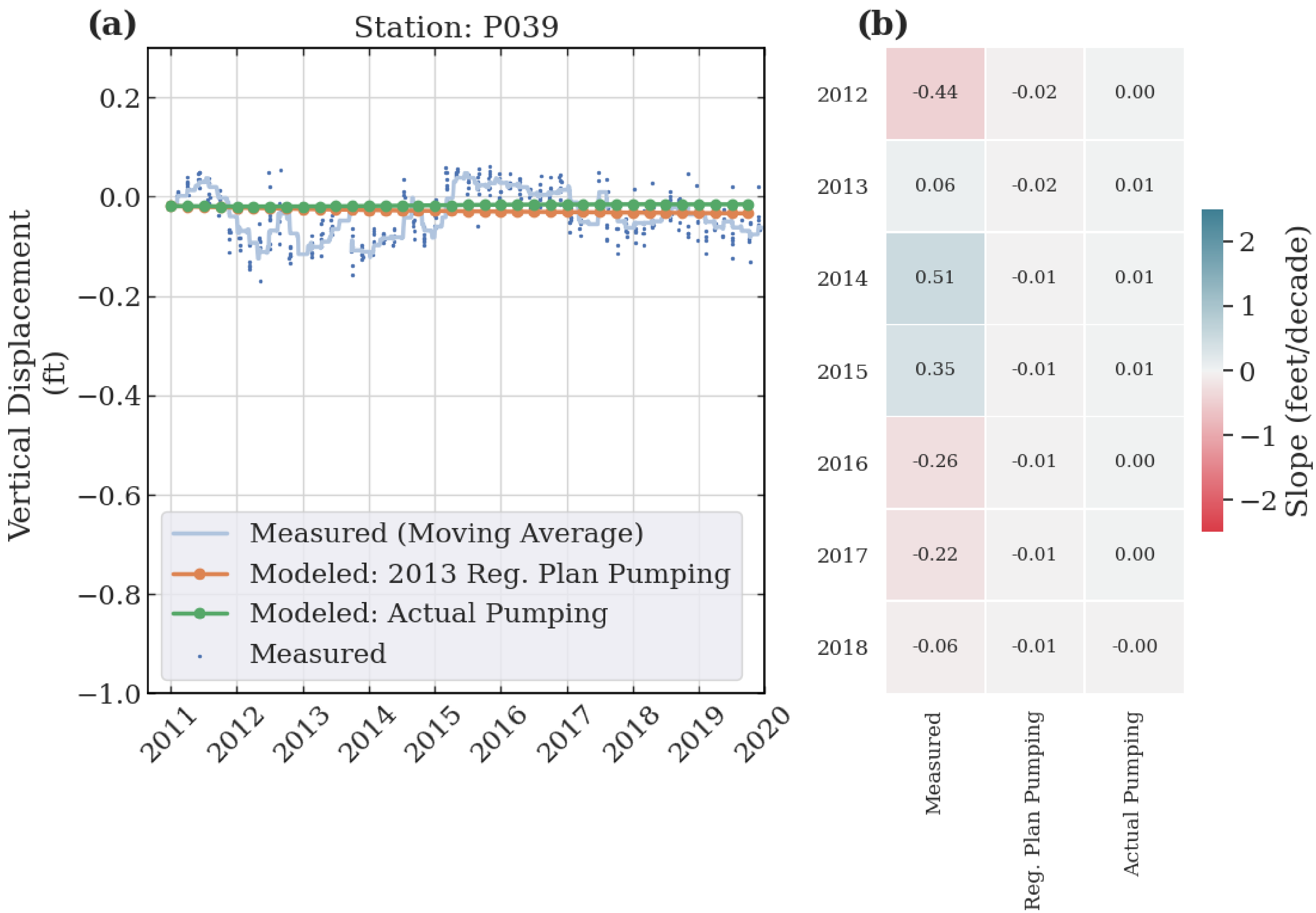

(a)
Station: P034
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
(b)
2011 -0.44 -0.02 -0.00
2012 -0.29 -0.02 0.01
2013 -0.11 -0.01 0.01
2014 -0.05 -0.01 0.01
2015 -0.08 -0.01 0.01
2016 -0.17 -0.01 0.01
2017 -0.12 -0.02 -0.00
2018 -0.09 -0.12 -0.01
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2

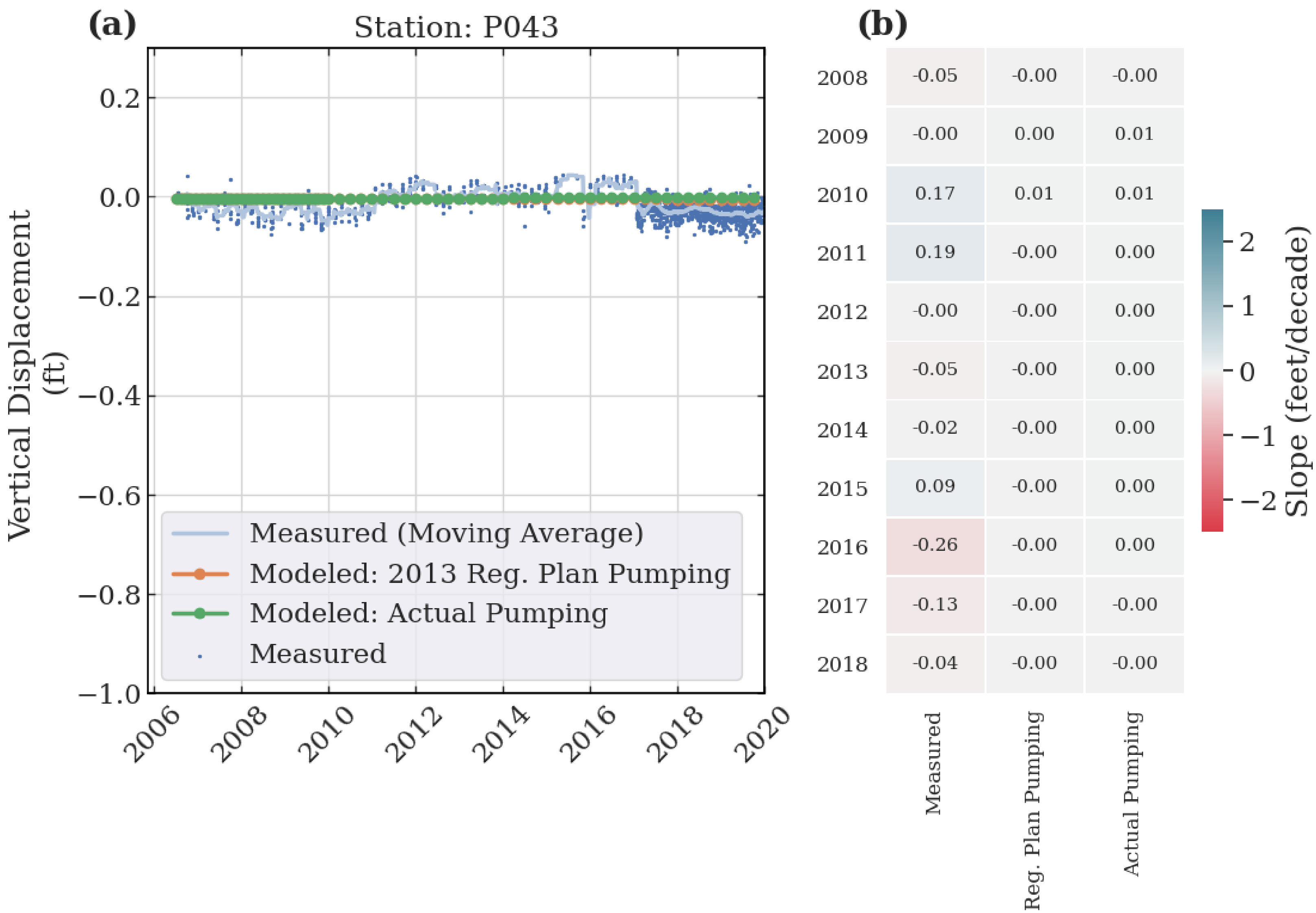

(a)
Station: P036
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2008
2010
2012
2014
2016
2018
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2008 -0.06 0.00 0.00
2009 -0.02 -0.02 0.00
2010 0.25 -0.05 0.00
2011 0.05 -0.04 0.00
2012 -0.34 -0.03 0.01
2013 -0.13 -0.02 0.01
2014 -0.02 -0.02 0.01
2015 -0.05 -0.01 0.01
2016 -0.19 -0.01 0.01
2017 -0.51 -0.01 0.00
2018 -0.28 -0.01 -0.02
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)



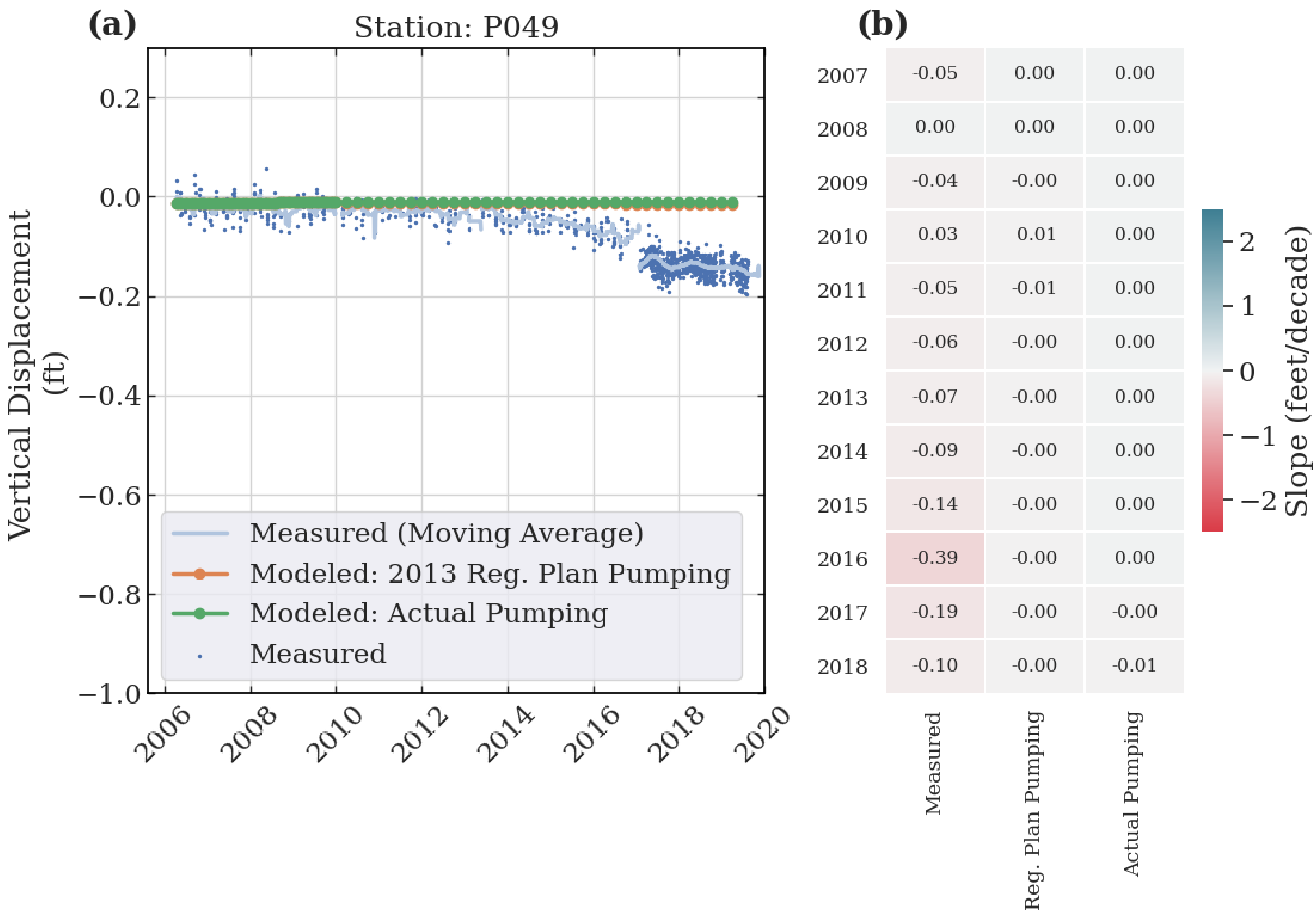
(a)
Station: P037
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2008
2010
2012
2014
2016
2018
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2008 0.10 0.01 0.01
2009 0.16 0.00 0.01
2010 0.28 -0.02 -0.00
2011 0.27 -0.02 -0.00
2012 0.09 -0.03 0.00
2013 0.05 -0.03 0.00
2014 -0.10 -0.02 0.00
2015 -0.01 -0.02 0.01
2016 0.13 -0.02 0.01
2017 0.12 -0.02 0.01
2018 0.08 -0.01 0.00
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

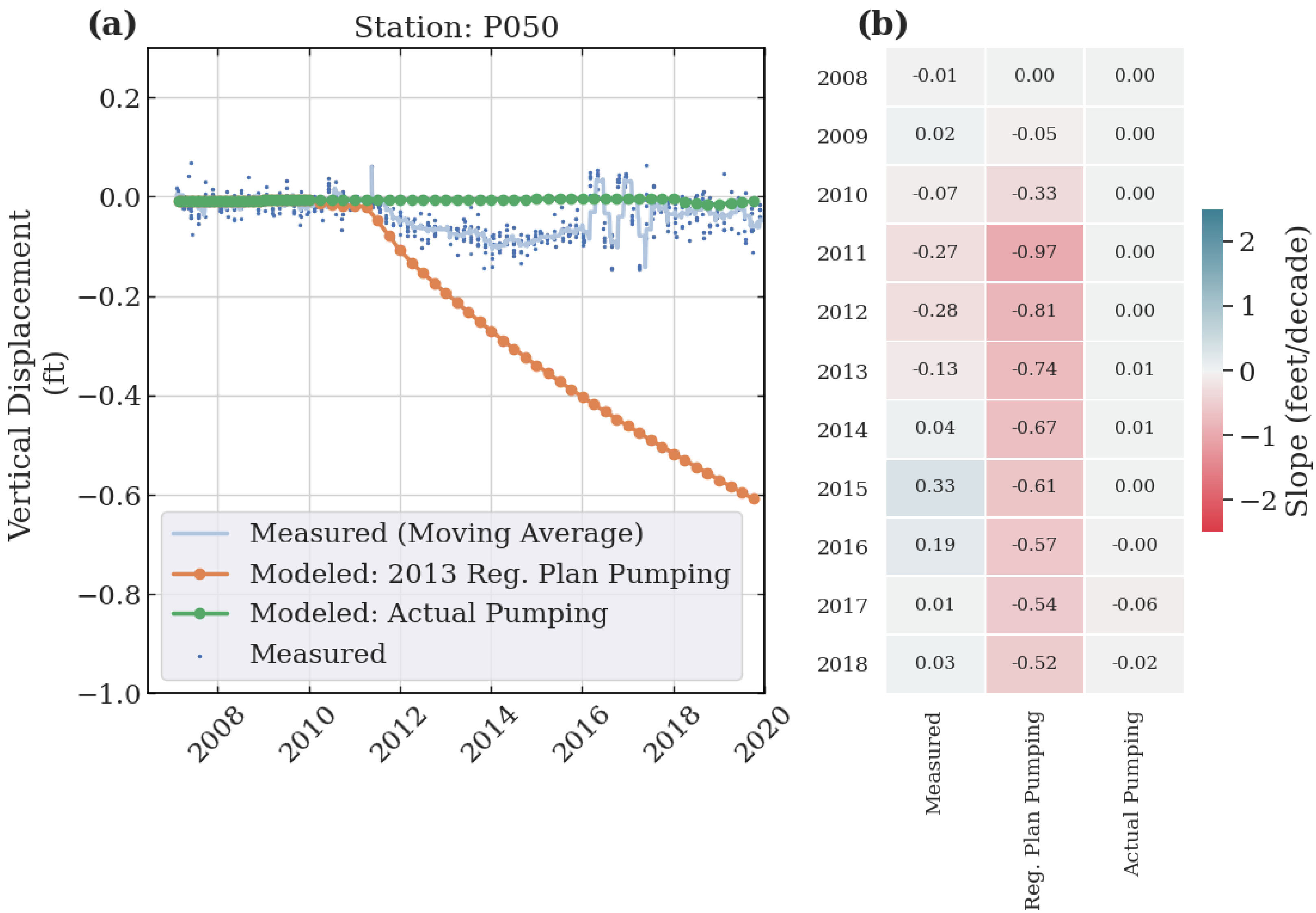

(a)
Station: P038
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2008
2010
2012
2014
2016
2018
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2008 -0.01 0.01 0.01
2009 0.07 -0.01 -0.00
2010 0.34 -0.03 -0.01
2011 0.14 -0.02 -0.01
2012 -0.03 -0.02 0.00
2013 0.11 -0.02 0.00
2014 0.05 -0.02 0.01
2015 0.14 -0.02 0.01
2016 0.18 -0.01 0.01
2017 -0.44 -0.01 0.01
2018 -0.17 -0.01 0.00
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

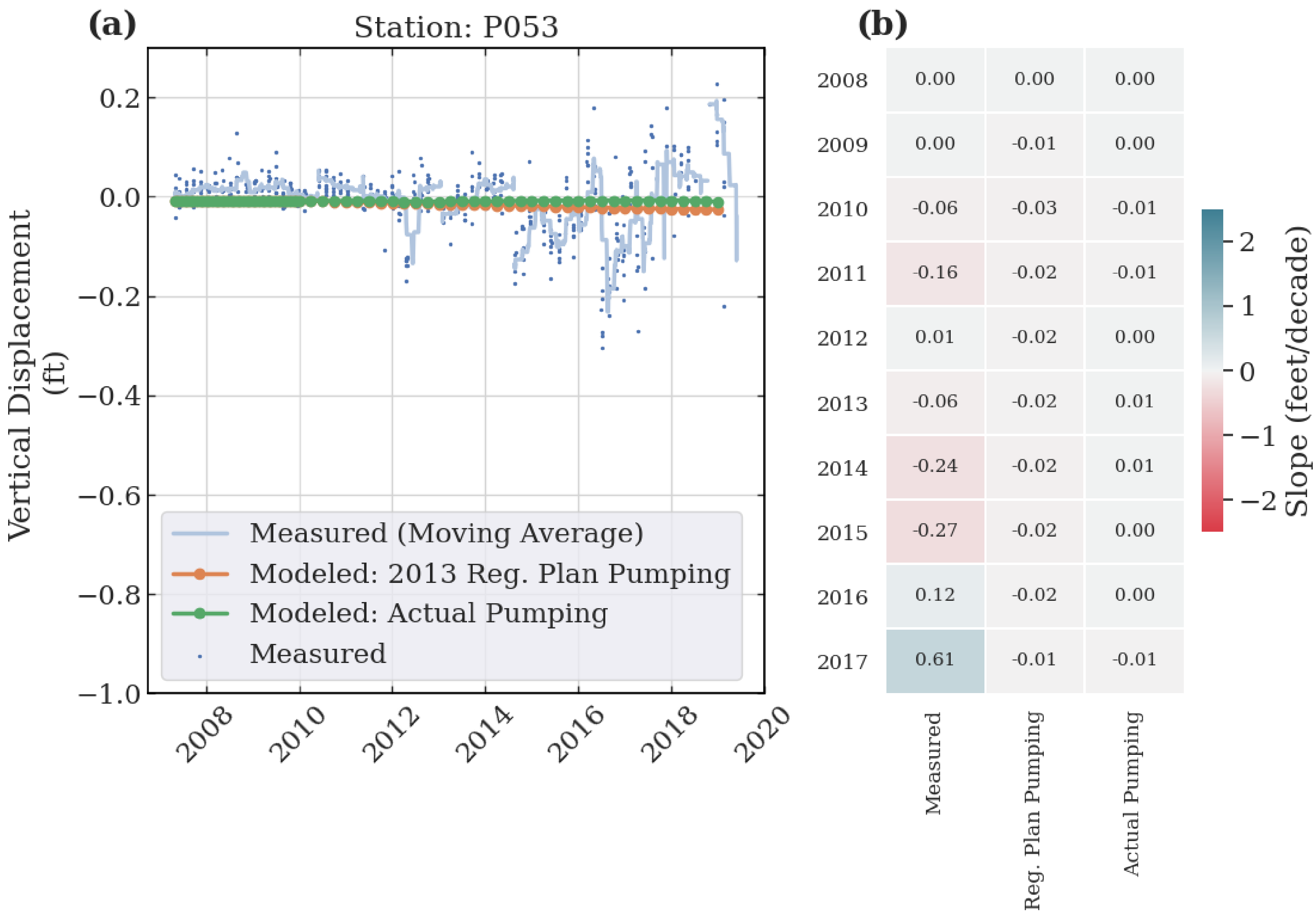

(a)
Station: P039
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2012 -0.44 -0.02 0.00
2013 0.06 -0.02 0.01
2014 0.51 -0.01 0.01
2015 0.35 -0.01 0.01
2016 -0.26 -0.01 0.00
2017 -0.22 -0.01 0.00
2018 -0.06 -0.01 -0.00
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)



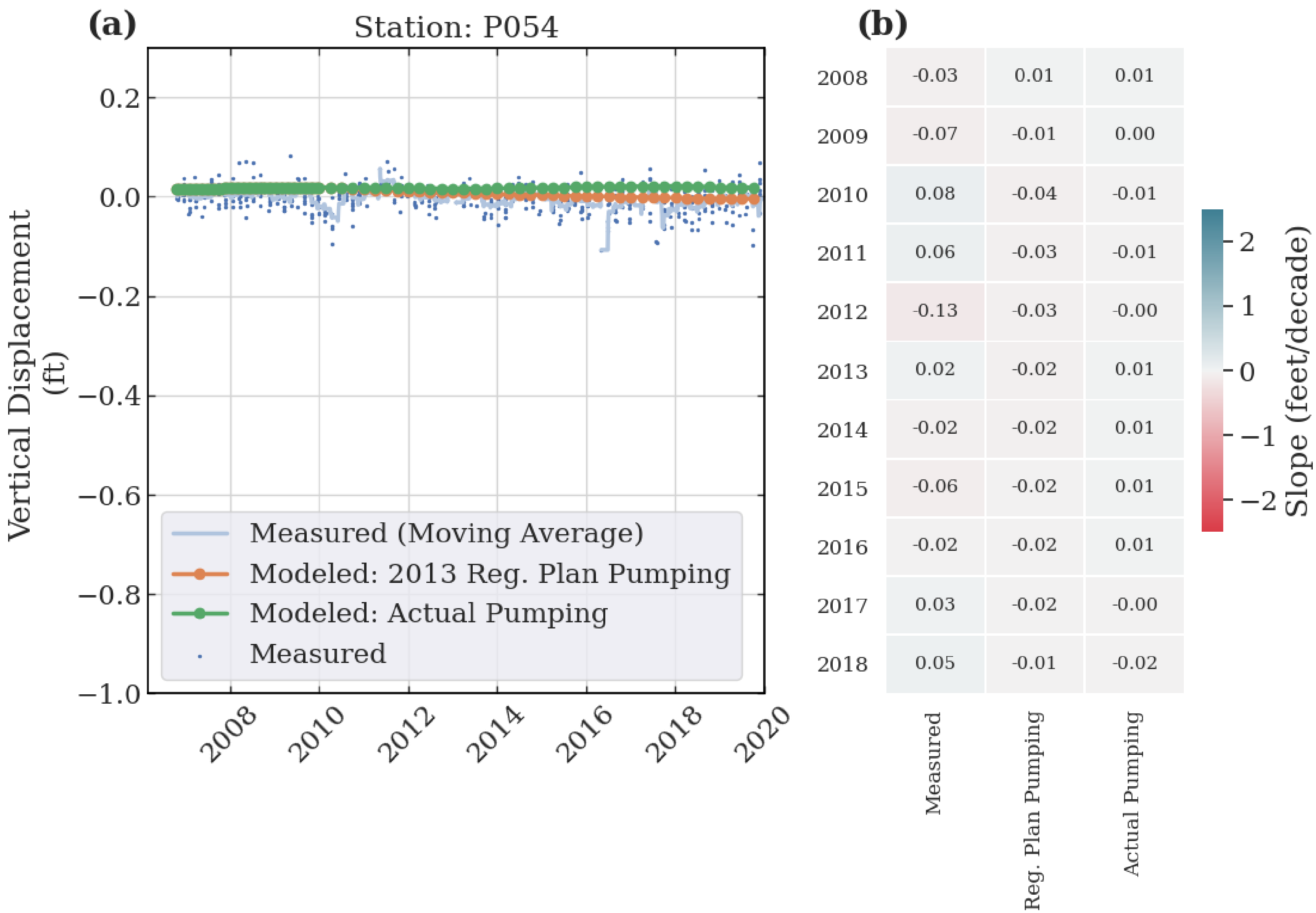
(a)
Station: P043
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2006
2008
2010
2012
2014
2016
2018
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2008 -0.05 -0.00 -0.00
2009 -0.00 0.00 0.01
2010 0.17 0.01 0.01
2011 0.19 -0.00 0.00
2012 -0.00 -0.00 0.00
2013 -0.05 -0.00 0.00
2014 -0.02 -0.00 0.00
2015 0.09 -0.00 0.00
2016 -0.26 -0.00 0.00
2017 -0.13 -0.00 -0.00
2018 -0.04 -0.00 -0.00
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

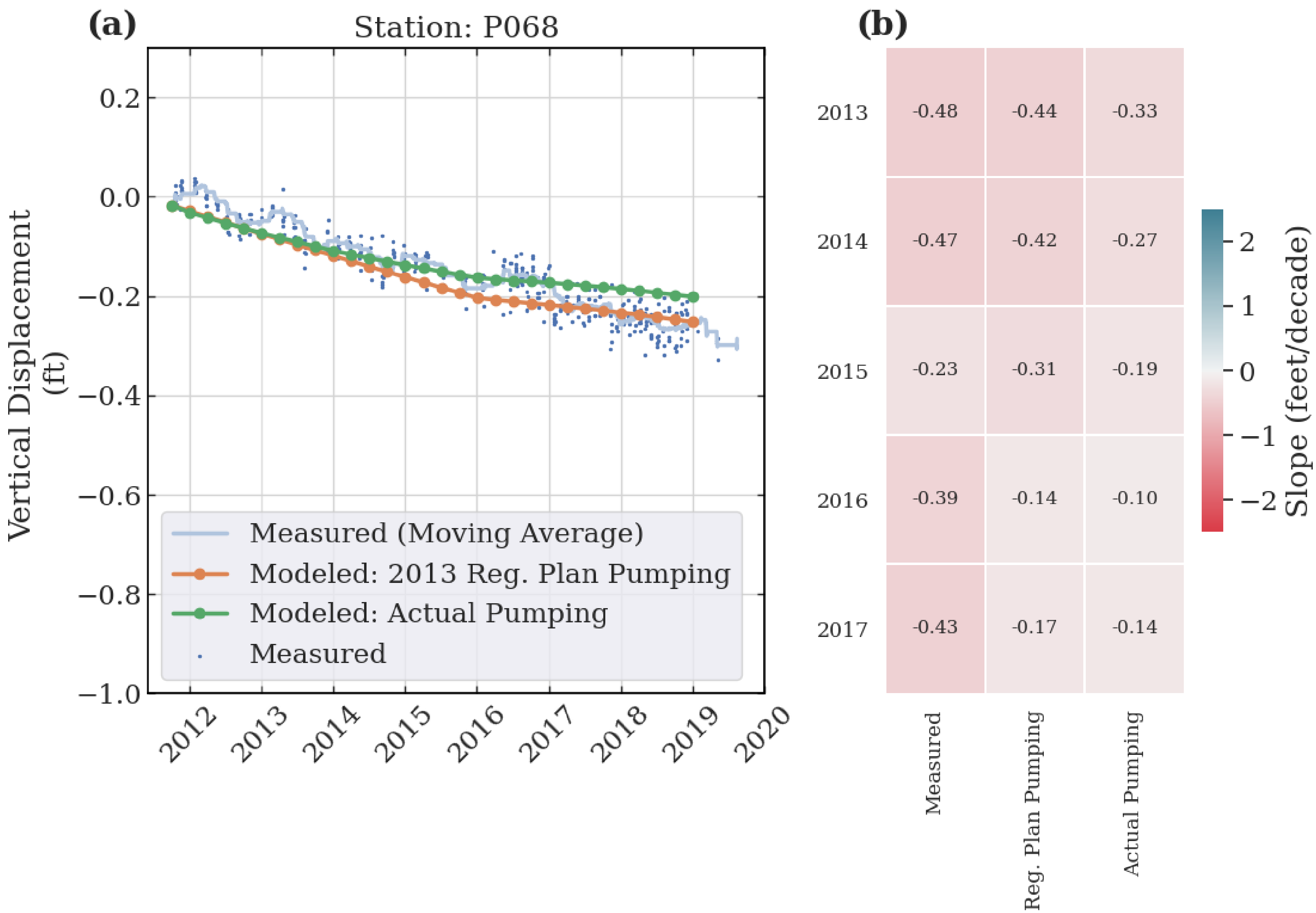

(a)
Station: P049
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2006
2008
2010
2012
2014
2016
2018
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2007 -0.05 0.00 0.00
2008 0.00 0.00 0.00
2009 -0.04 -0.00 0.00
2010 -0.03 -0.01 0.00
2011 -0.05 -0.01 0.00
2012 -0.06 -0.00 0.00
2013 -0.07 -0.00 0.00
2014 -0.09 -0.00 0.00
2015 -0.14 -0.00 0.00
2016 -0.39 -0.00 0.00
2017 -0.19 -0.00 -0.00
2018 -0.10 -0.00 -0.01
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

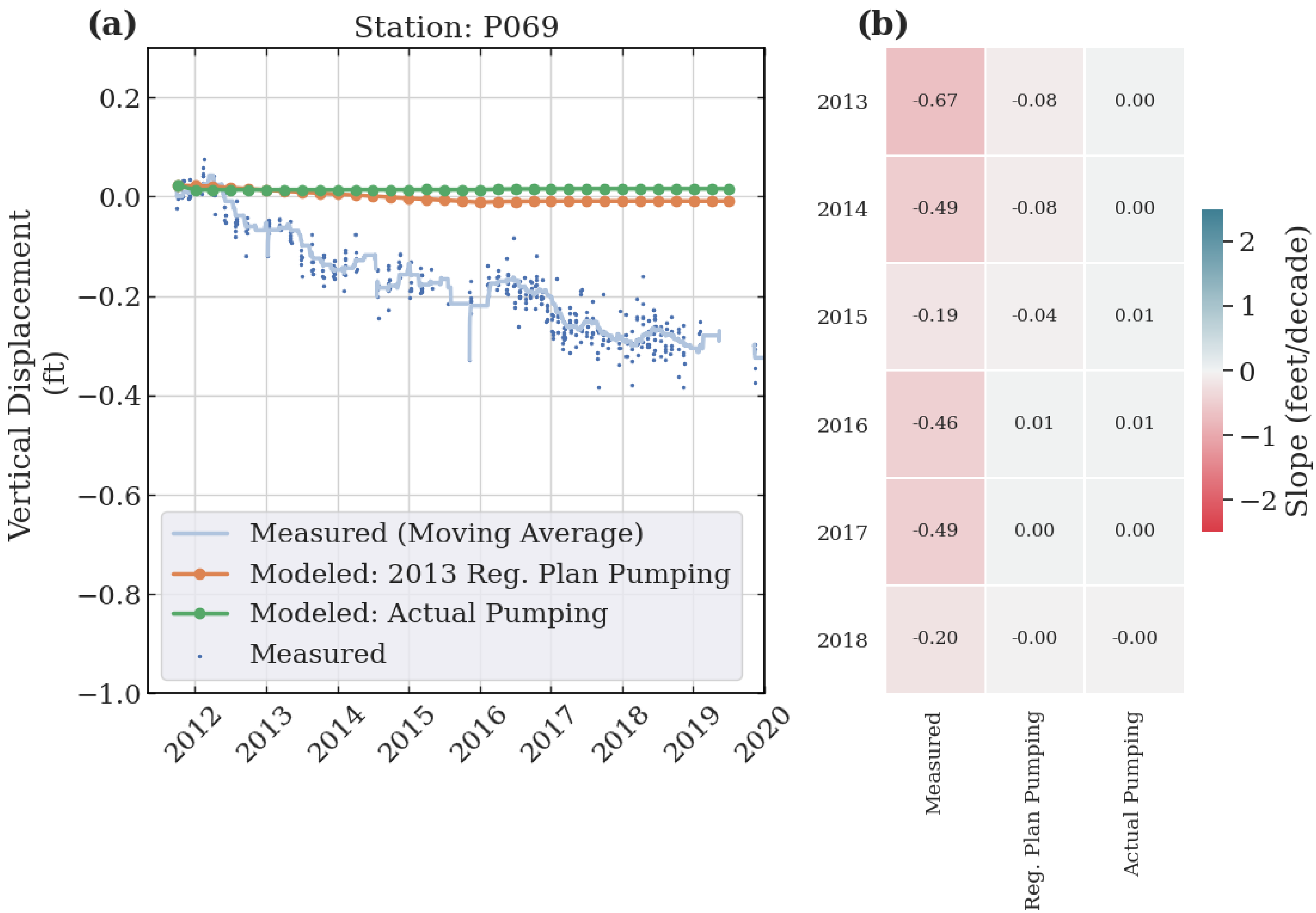

(a)
Station: P050
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2008
2010
2012
2014
2016
2018
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2008 -0.01 0.00 0.00
2009 0.02 -0.05 0.00
2010 -0.07 -0.33 0.00
2011 -0.27 -0.97 0.00
2012 -0.28 -0.81 0.00
2013 -0.13 -0.74 0.01
2014 0.04 -0.67 0.01
2015 0.33 -0.61 0.00
2016 0.19 -0.57 -0.00
2017 0.01 -0.54 -0.06
2018 0.03 -0.52 -0.02
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

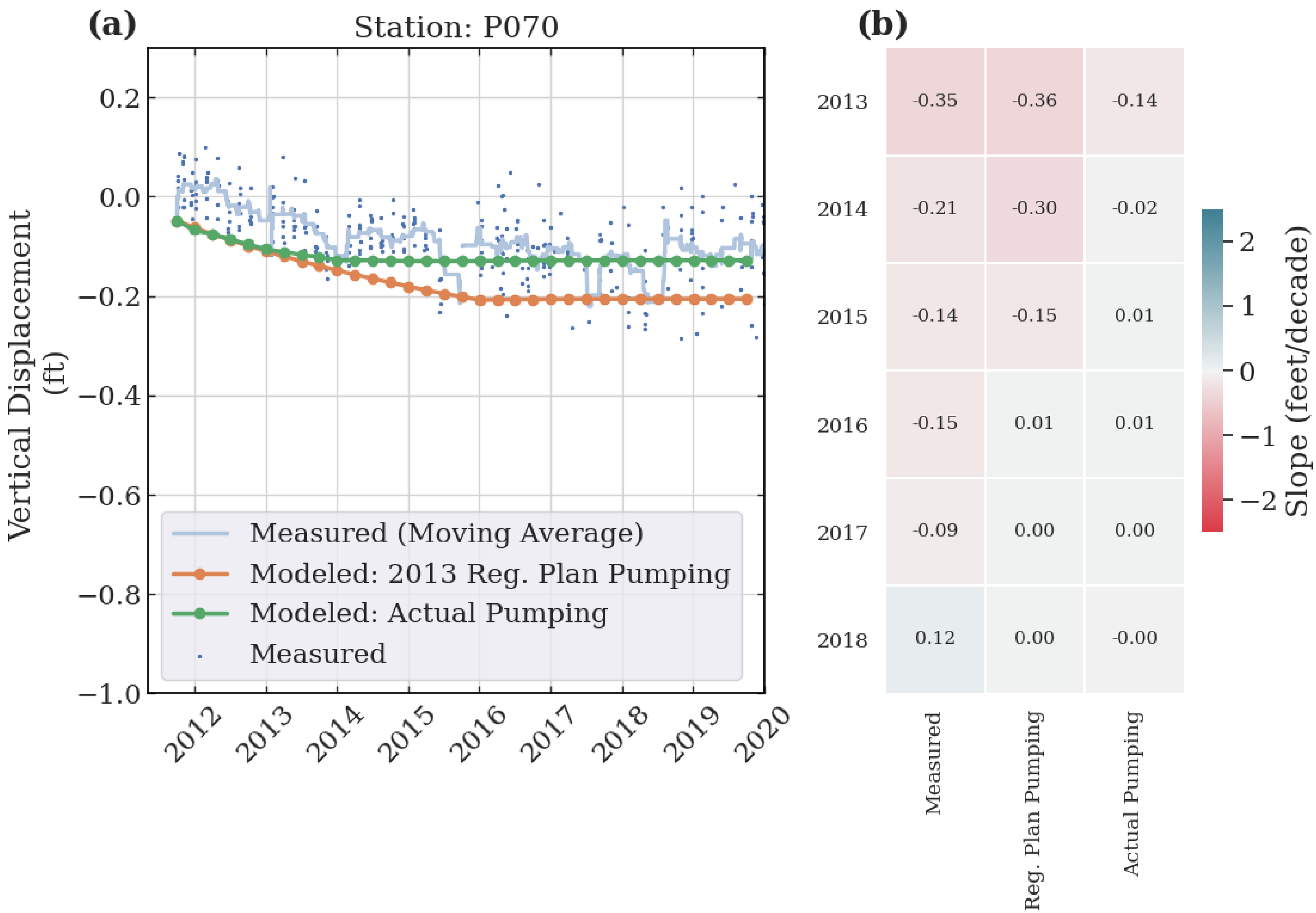


INTERA
GEOSCIENCE & ENGINEERING SOLUTIONS

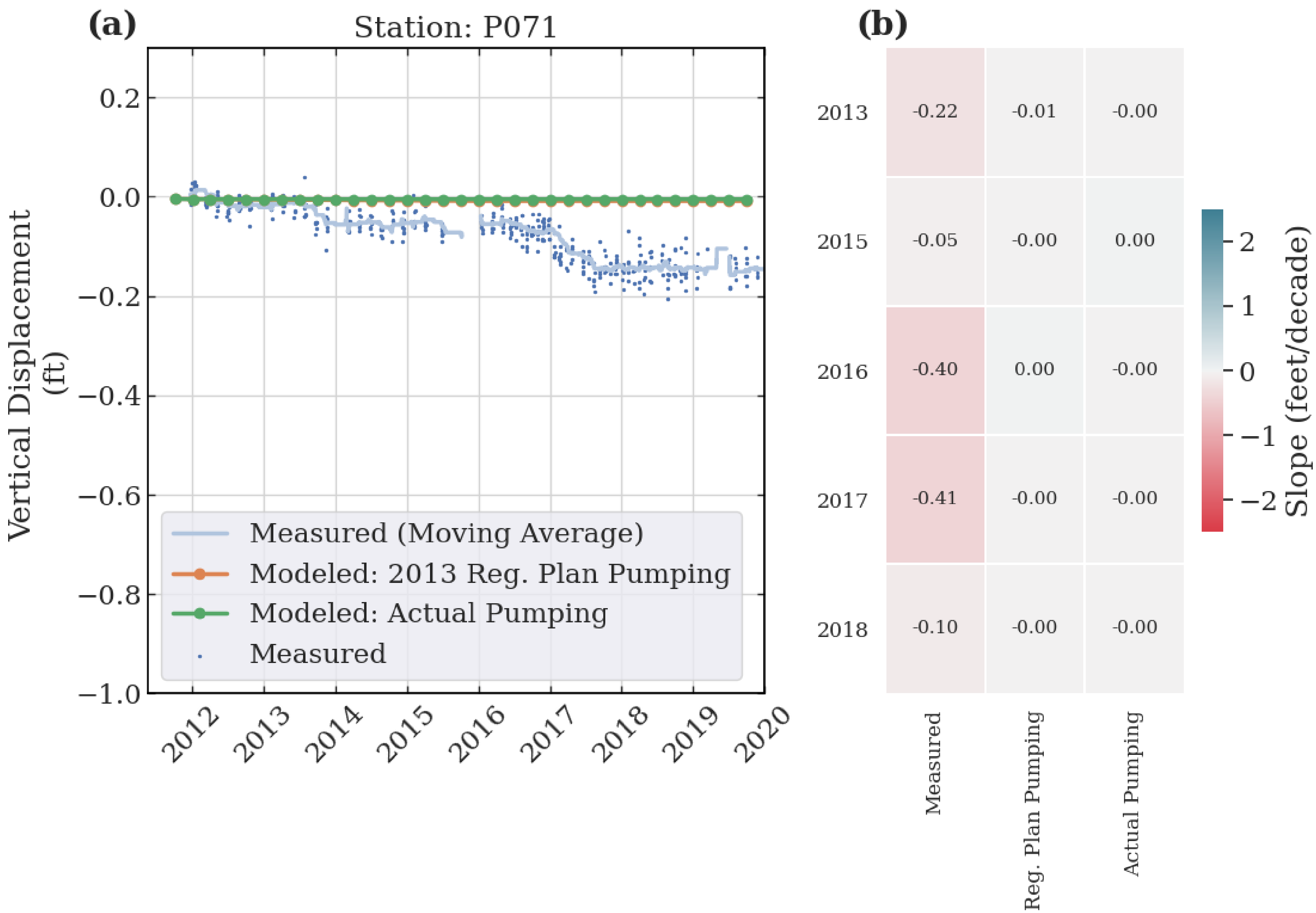

(a)
Station: P054
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2008
2010
2012
2014
2016
2018
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2008 -0.03 0.01 0.01
2009 -0.07 -0.01 0.00
2010 0.08 -0.04 -0.01
2011 0.06 -0.03 -0.01
2012 -0.13 -0.03 -0.00
2013 0.02 -0.02 0.01
2014 -0.02 -0.02 0.01
2015 -0.06 -0.02 0.01
2016 -0.02 -0.02 0.01
2017 0.03 -0.02 -0.00
2018 0.05 -0.01 -0.02
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

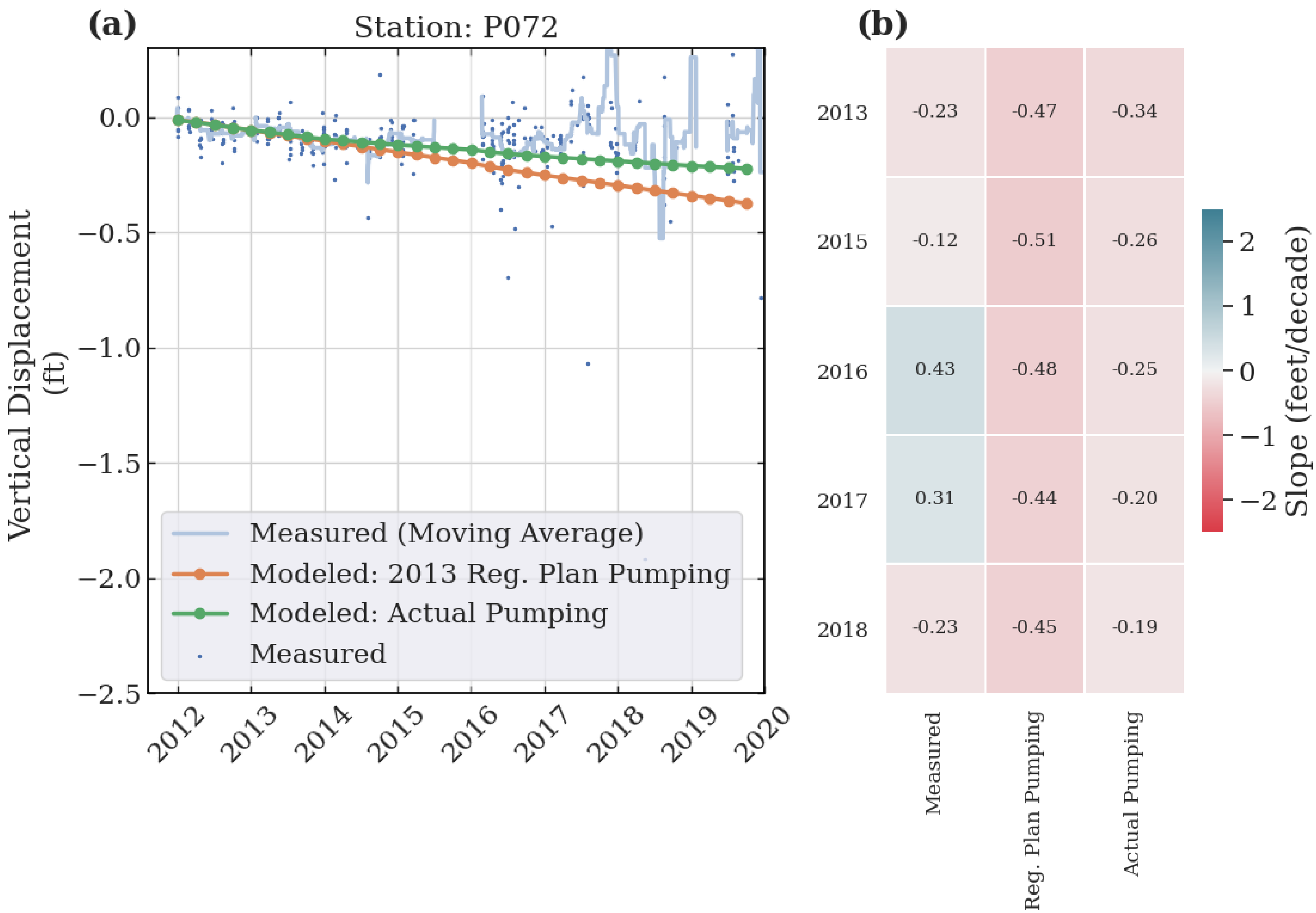

(a)
Station: P068
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2012
2013
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2013
2014
2015
2016
2017
-0.48
-0.44
-0.33
-0.47
-0.42
-0.27
-0.23
-0.31
-0.19
-0.39
-0.14
-0.10
-0.43
-0.17
-0.14
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2

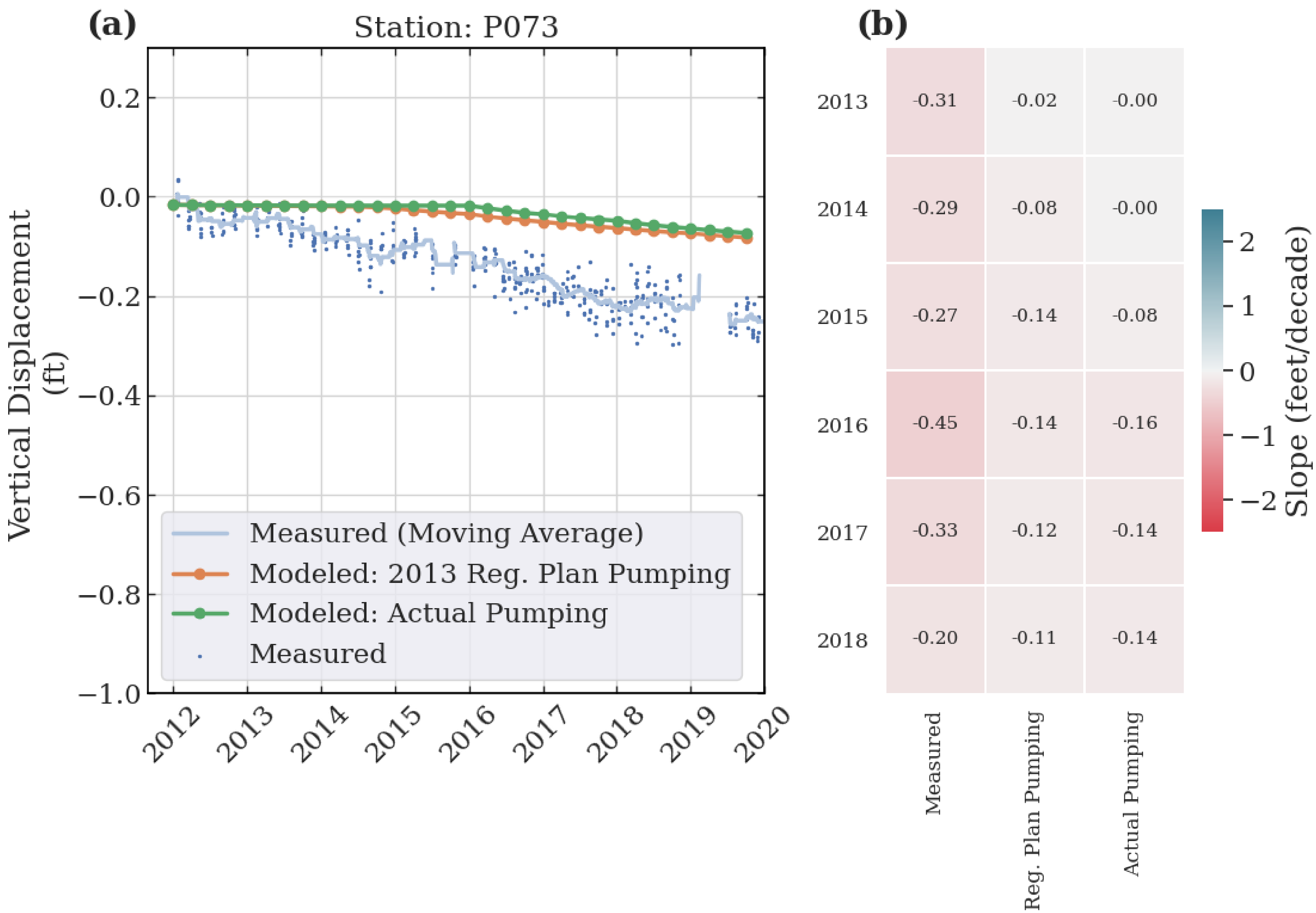

(a)
Station: P069
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2012
2013
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2013
-0.67
-0.08
0.00
2014
-0.49
-0.08
0.00
2015
-0.19
-0.04
0.01
2016
-0.46
0.01
0.01
2017
-0.49
0.00
0.00
2018
-0.20
-0.00
-0.00
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2

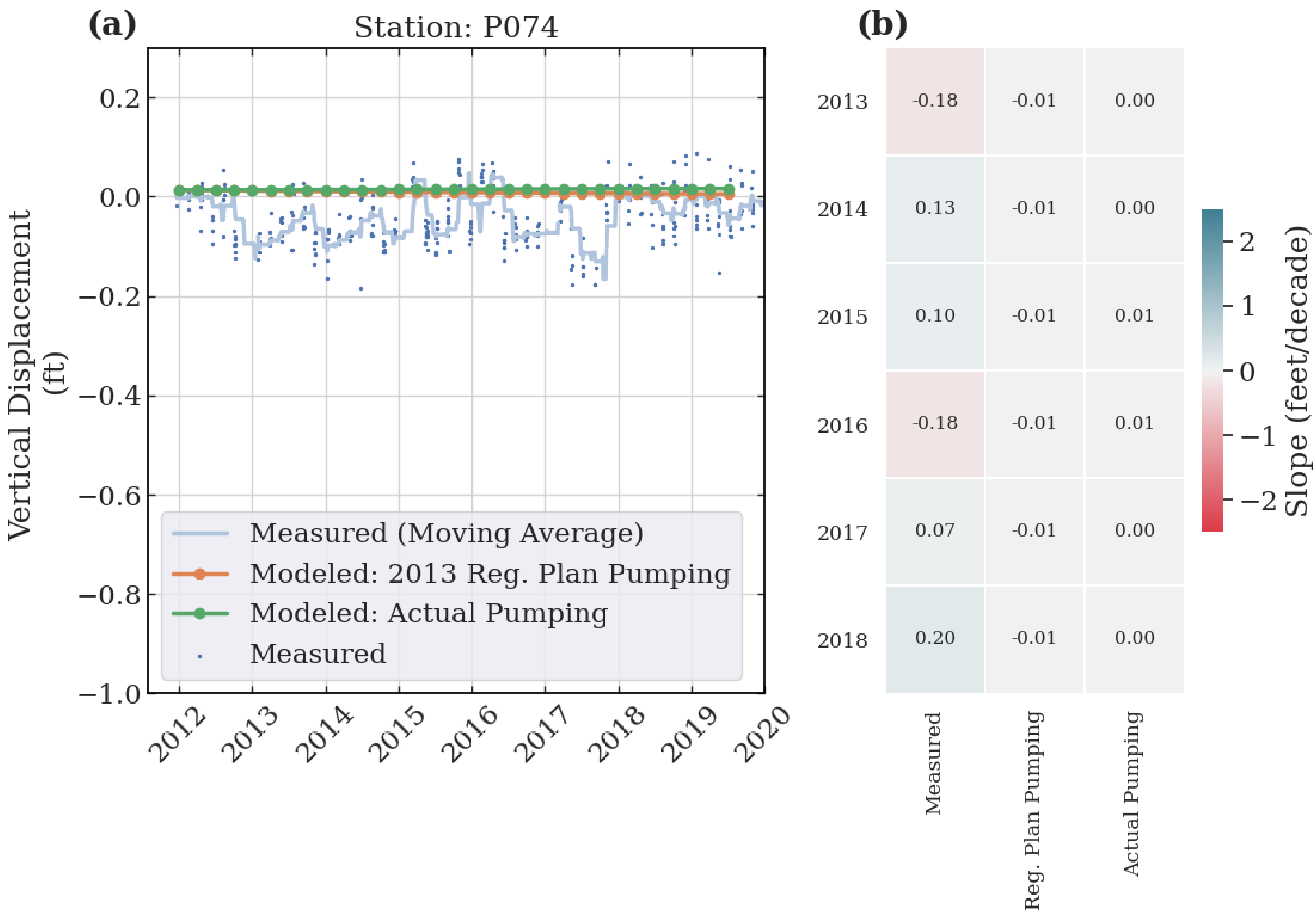


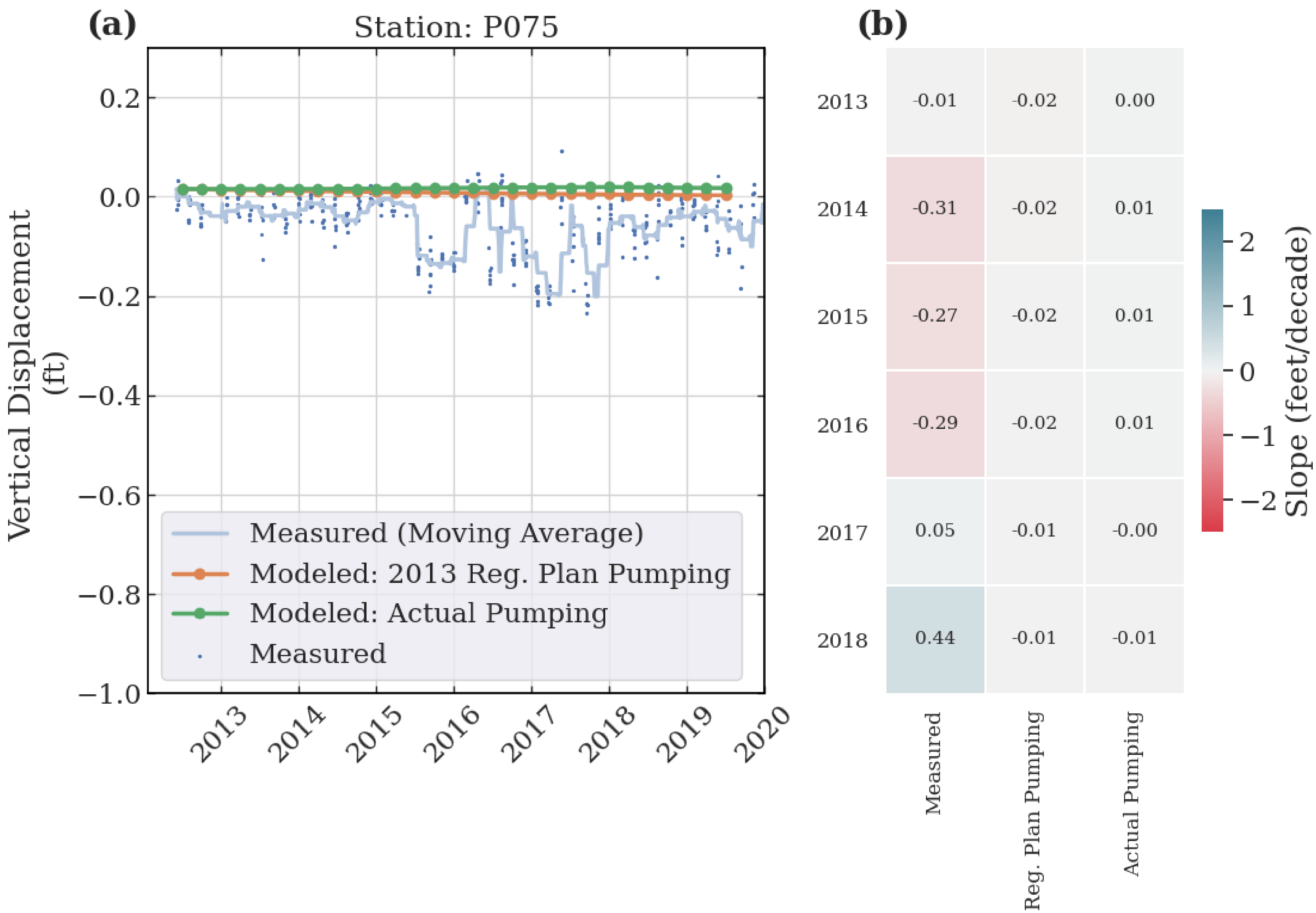
GEOSCIENCE & ENGINEERING SOLUTIONS


(a)
Station: P071
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2012
2013
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2013
2015
2016
2017
2018
-0.22
-0.01
-0.00
-0.05
-0.00
0.00
-0.40
0.00
-0.00
-0.41
-0.00
-0.00
-0.10
-0.00
-0.00
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

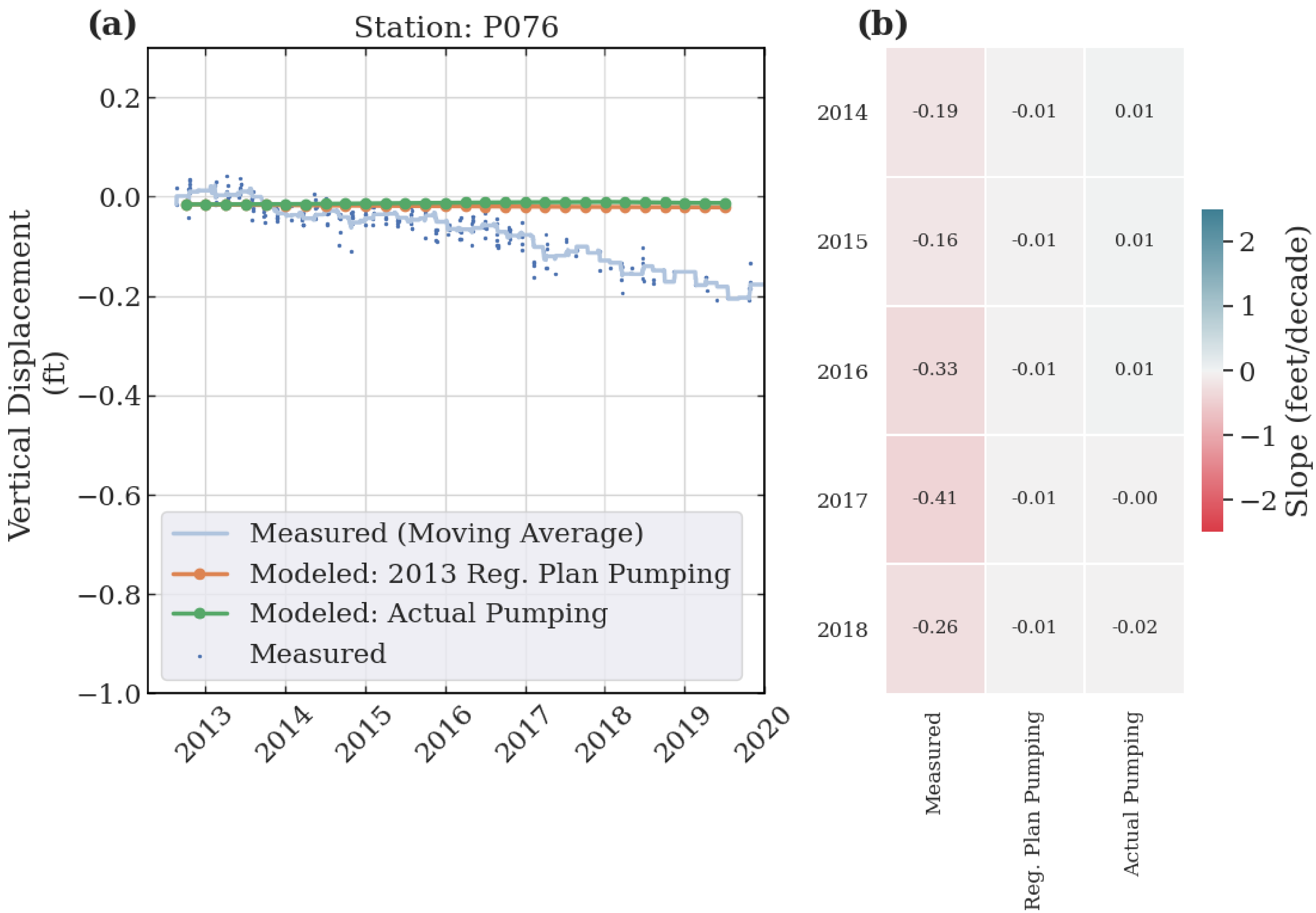

(a)
Station: P072
Vertical Displacement (ft)
0.0
−0.5
−1.0
−1.5
−2.0
−2.5
2012
2013
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2013
2015
2016
2017
2018
-0.23
-0.47
-0.34
-0.12
-0.51
-0.26
0.43
-0.48
-0.25
0.31
-0.44
-0.20
-0.23
-0.45
-0.19
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2

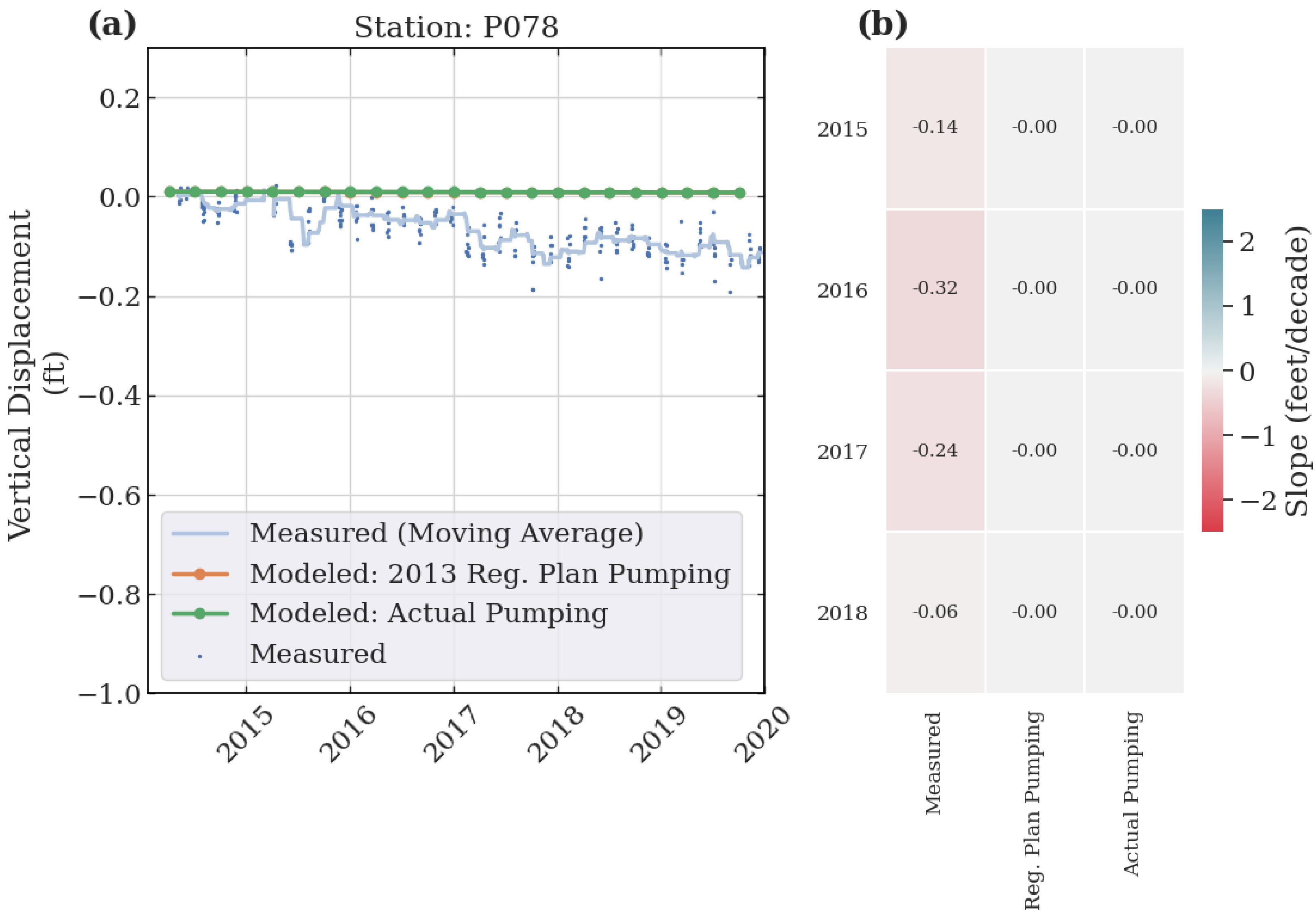

(a)
Station: P073
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2012
2013
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2013
-0.31
-0.02
-0.00
2014
-0.29
-0.08
-0.00
2015
-0.27
-0.14
-0.08
2016
-0.45
-0.14
-0.16
2017
-0.33
-0.12
-0.14
2018
-0.20
-0.11
-0.14
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

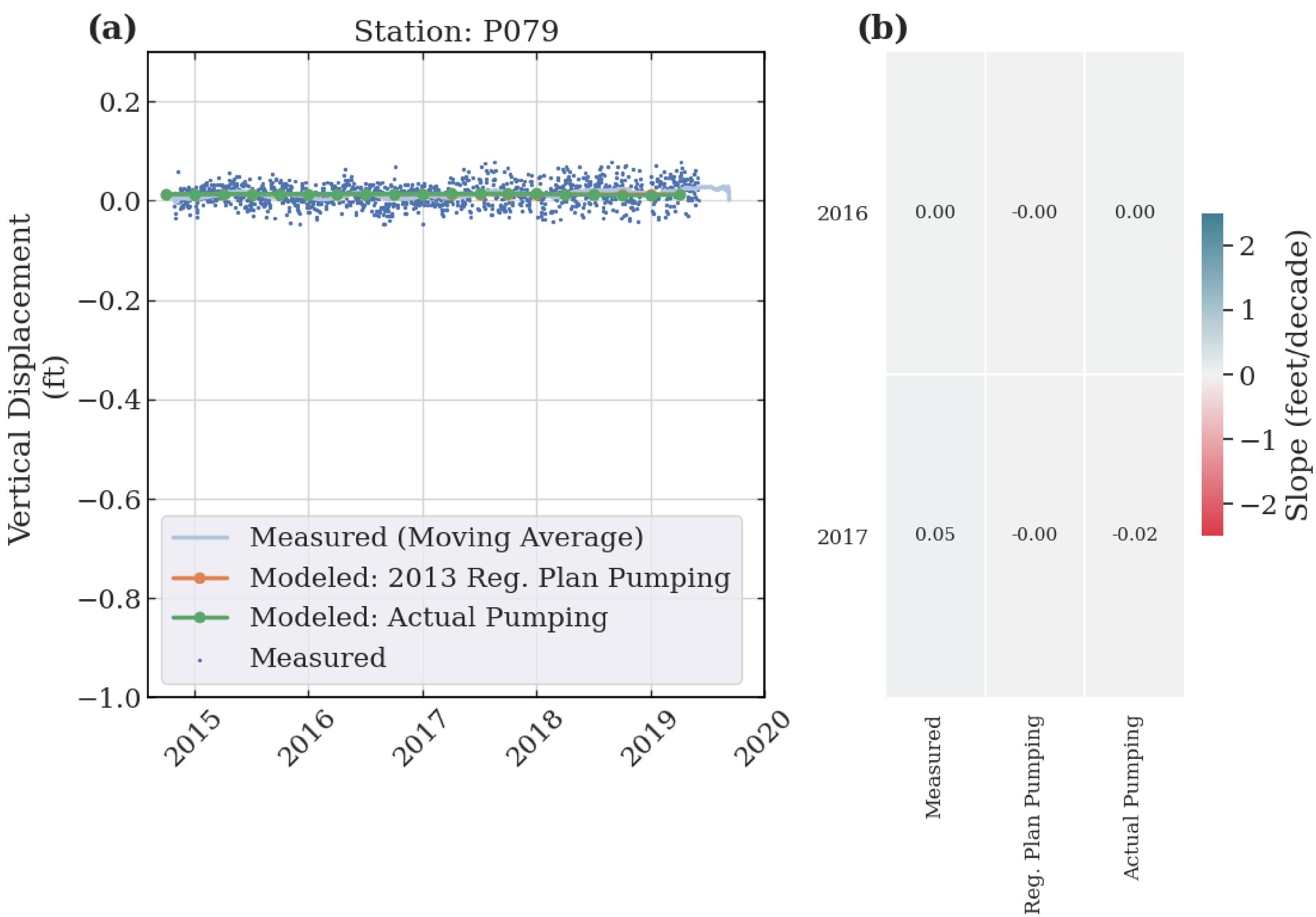

(a)
Station: P074
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2012
2013
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2013 -0.18 -0.01 0.00
2014 0.13 -0.01 0.00
2015 0.10 -0.01 0.01
2016 -0.18 -0.01 0.01
2017 0.07 -0.01 0.00
2018 0.20 -0.01 0.00
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

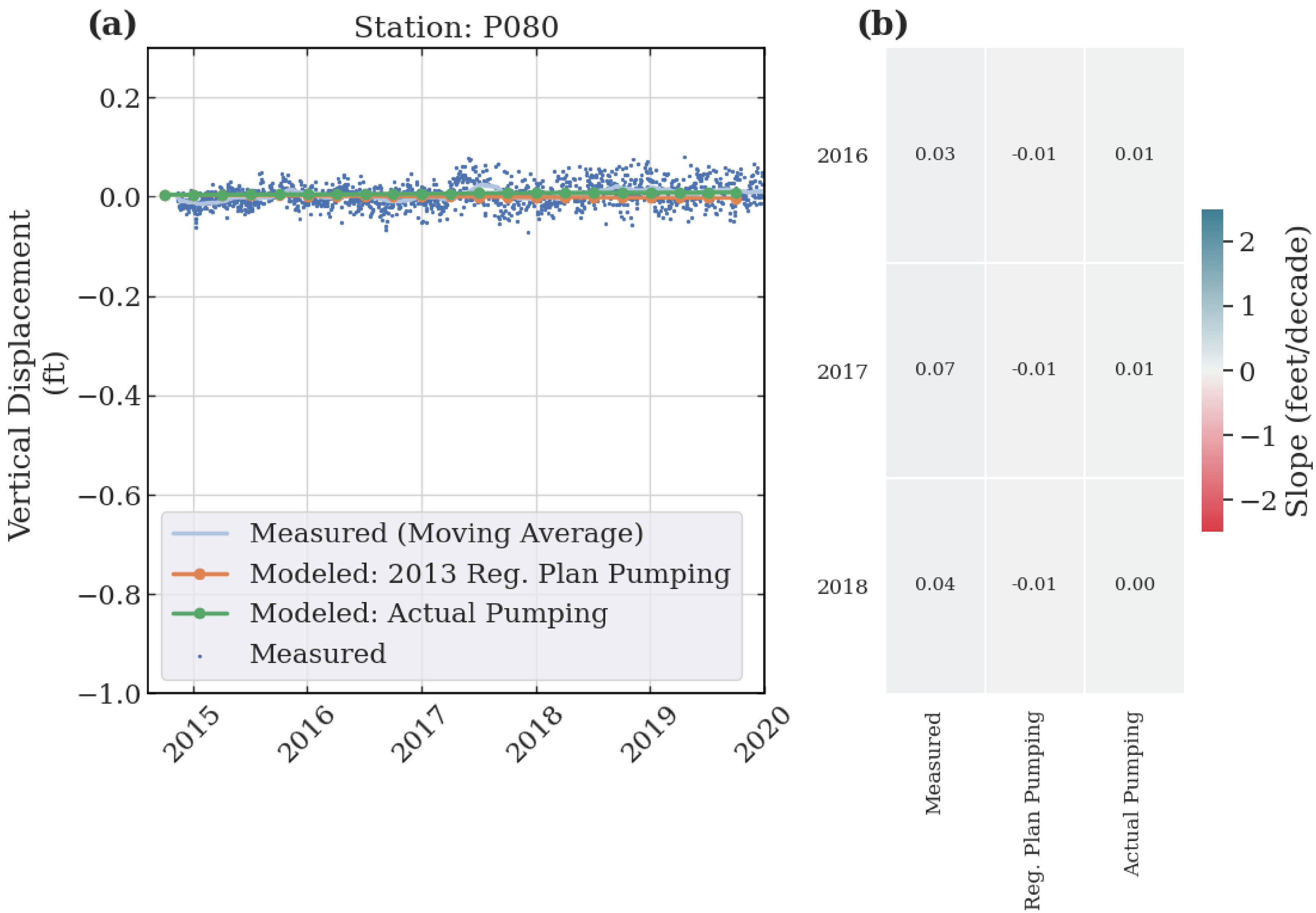


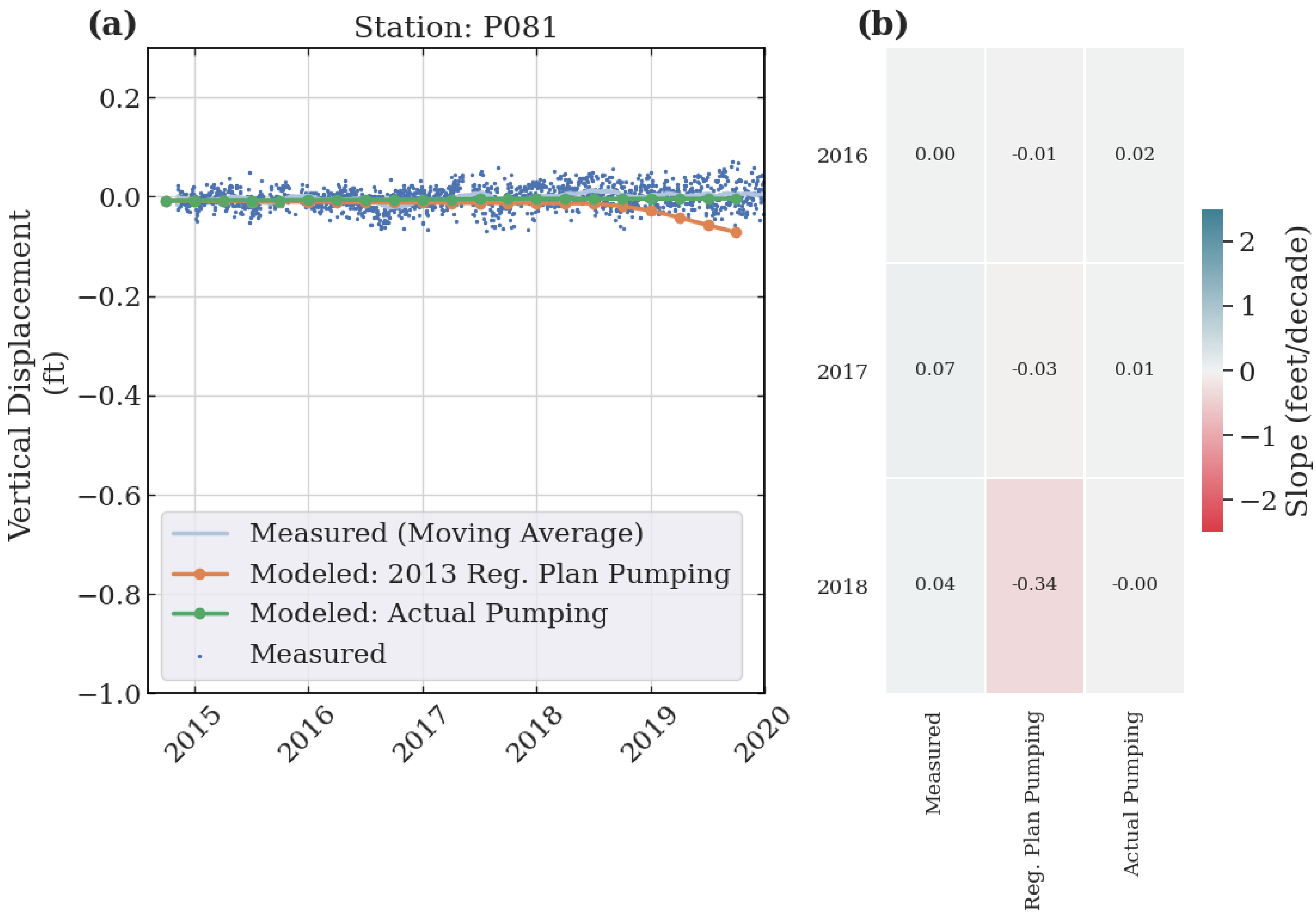
	Measured	Reg. Plan Pumping	Actual Pumping
2013	-0.01	-0.02	0.00
2014	-0.31	-0.02	0.01
2015	-0.27	-0.02	0.01
2016	-0.29	-0.02	0.01
2017	0.05	-0.01	-0.00
2018	0.44	-0.01	-0.01

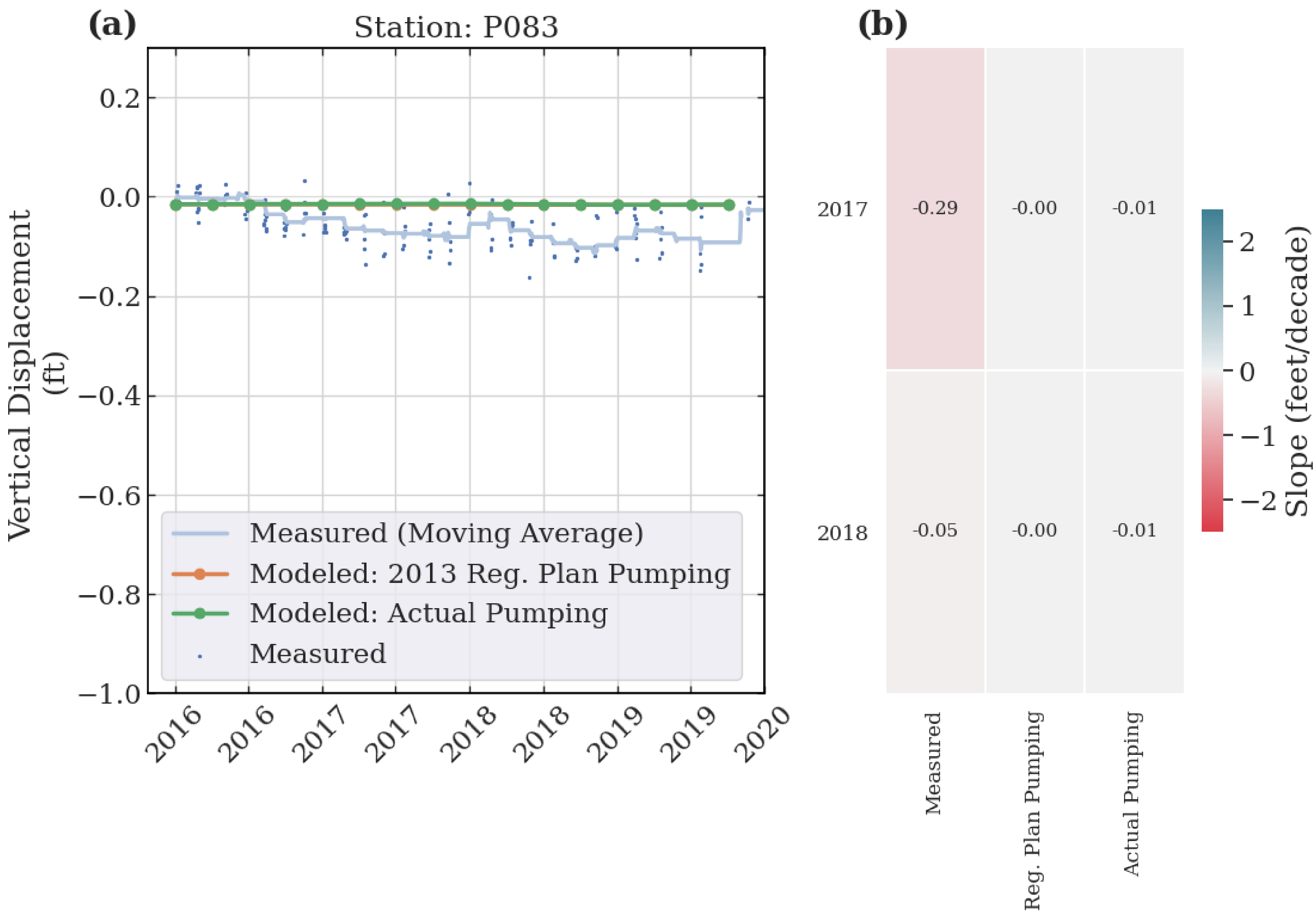

(a)
Station: P076
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2013
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2014
2015
2016
2017
2018
-0.19
-0.01
0.01
-0.16
-0.01
0.01
-0.33
-0.01
0.01
-0.41
-0.01
-0.00
-0.26
-0.01
-0.02
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

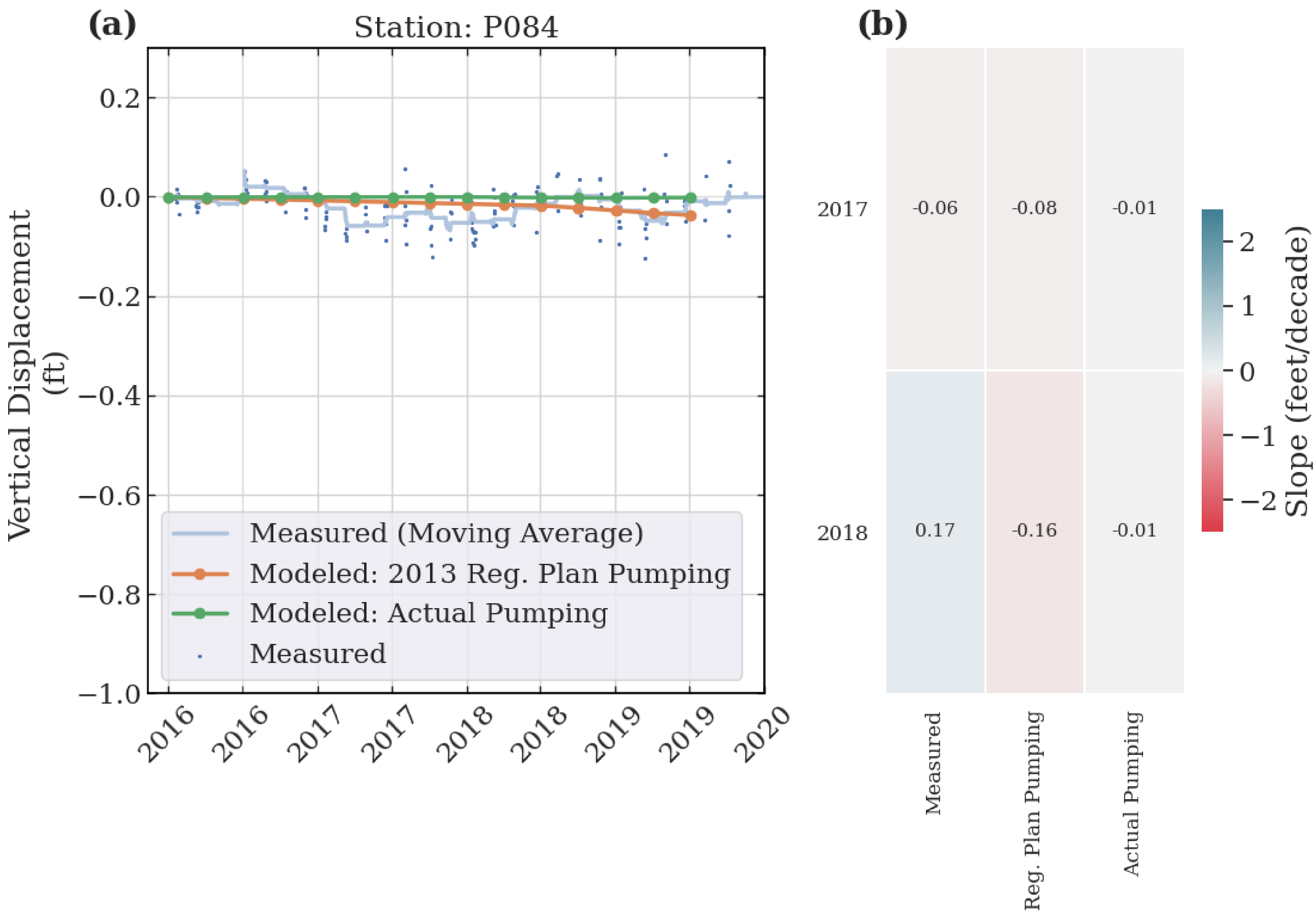

(a)
Station: P078
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2015
2016
2017
2018
-0.14
-0.00
-0.00
-0.32
-0.00
-0.00
-0.24
-0.00
-0.00
-0.06
-0.00
-0.00
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

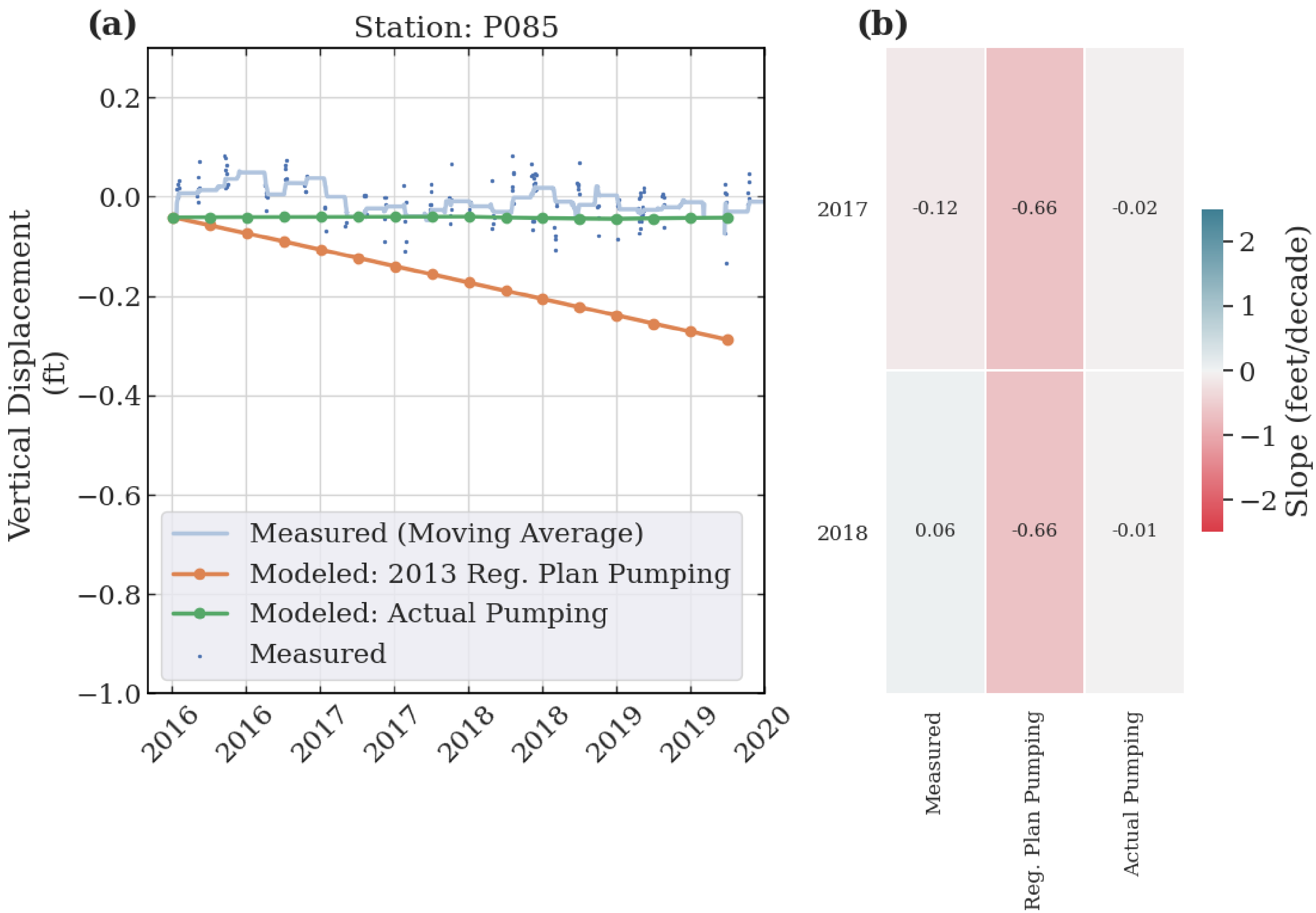

(a)
Station: P079
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2016
2017
0.00
-0.00
0.00
0.05
-0.00
-0.02
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2

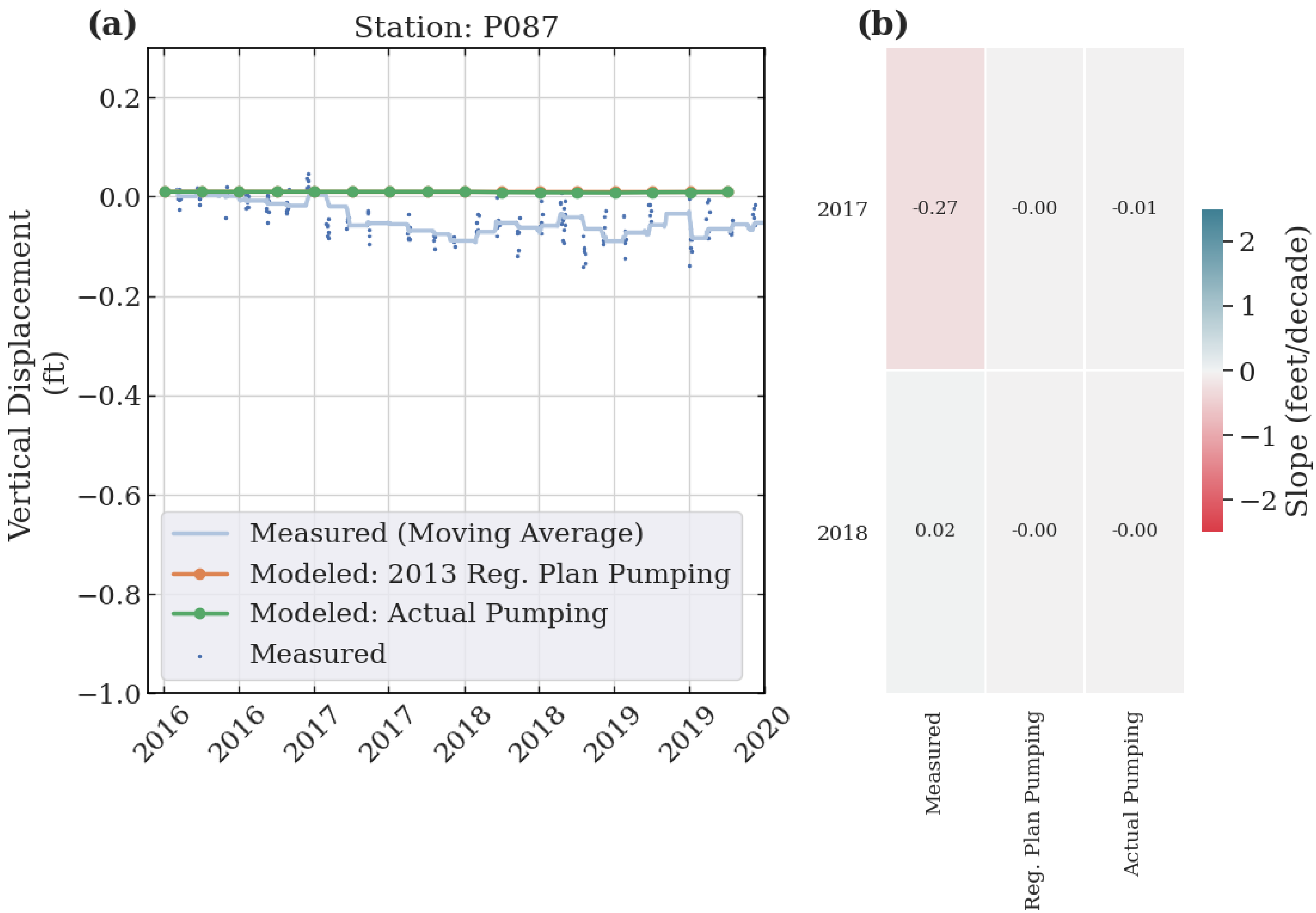

(a)
Station: P080
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2016
2017
2018
0.03
-0.01
0.01
0.07
-0.01
0.01
0.04
-0.01
0.00
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)


(a)
Station: P081
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2016
2017
2018
0.00
-0.01
0.02
0.07
-0.03
0.01
0.04
-0.34
-0.00
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

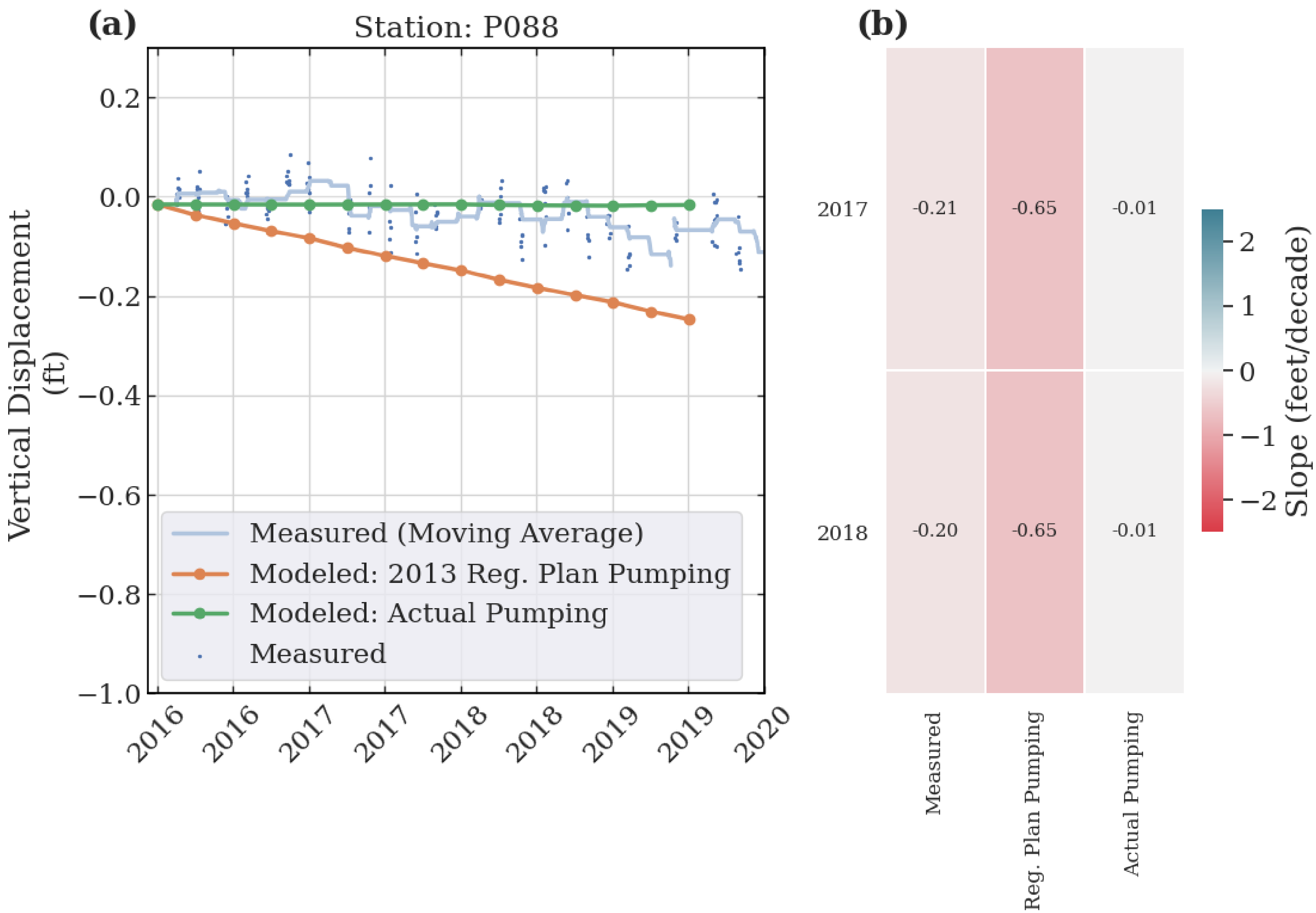

(a)
Station: P083
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2016
2016
2017
2017
2018
2018
2019
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2017
2018
-0.29
-0.00
-0.01
-0.05
-0.00
-0.01
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)


(a)
Station: P084
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2016
2016
2017
2017
2018
2018
2019
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2017
2018
-0.06
-0.08
-0.01
0.17
-0.16
-0.01
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2

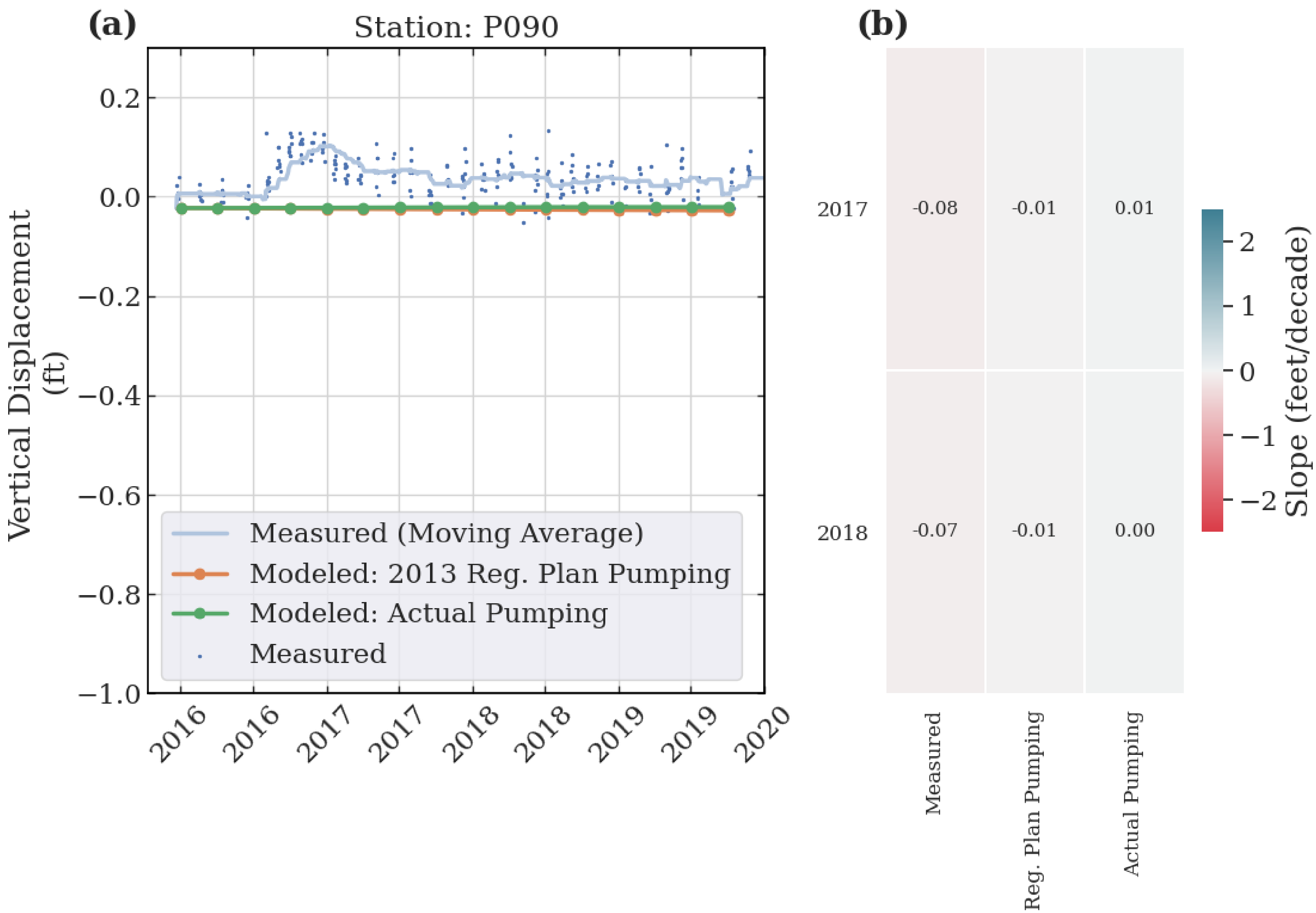

(a)
Station: P085
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2016
2016
2017
2017
2018
2018
2019
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2017
2018
-0.12
-0.66
-0.02
0.06
-0.66
-0.01
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)



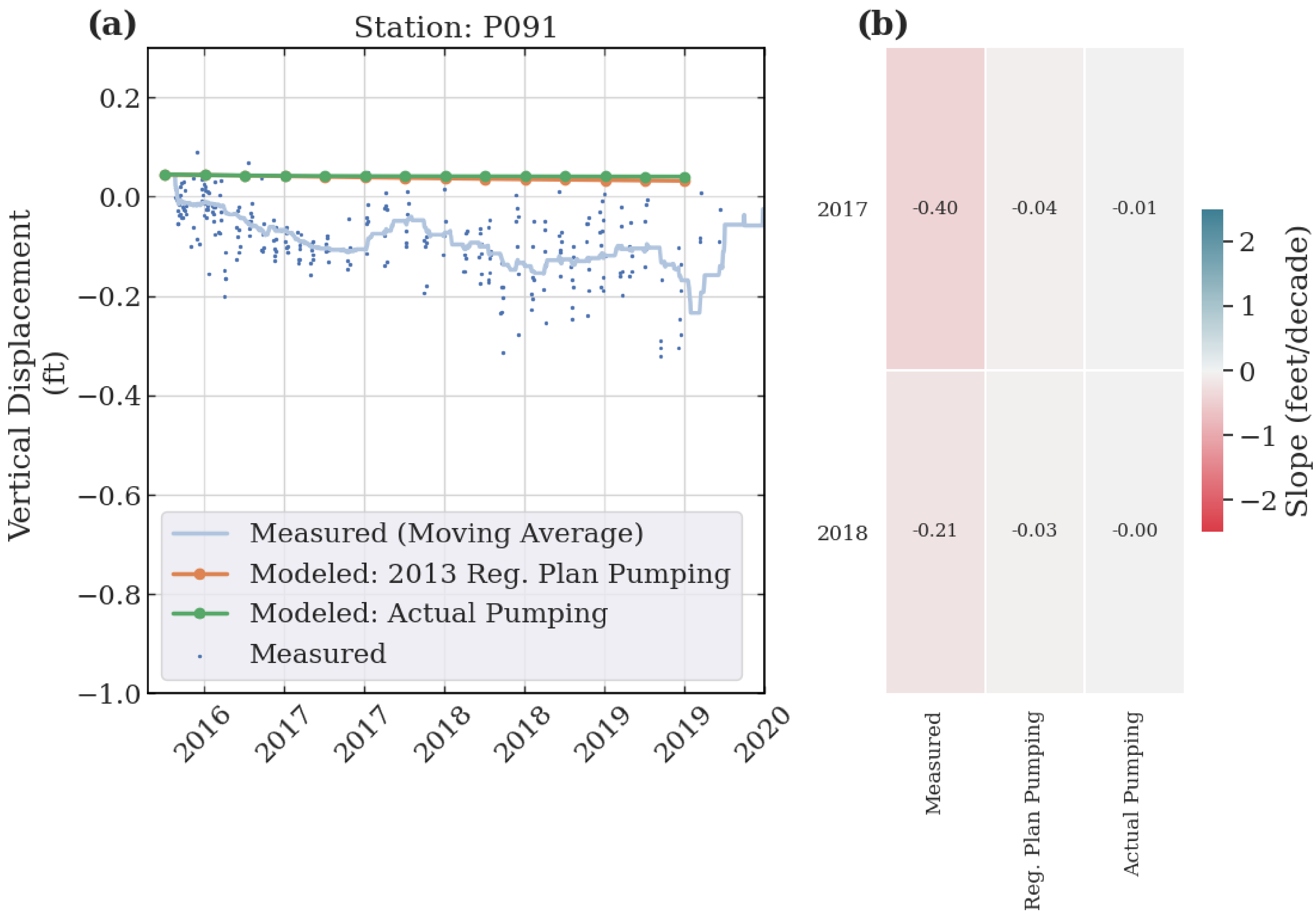
INTERA
GEOSCIENCE & ENGINEERING SOLUTIONS

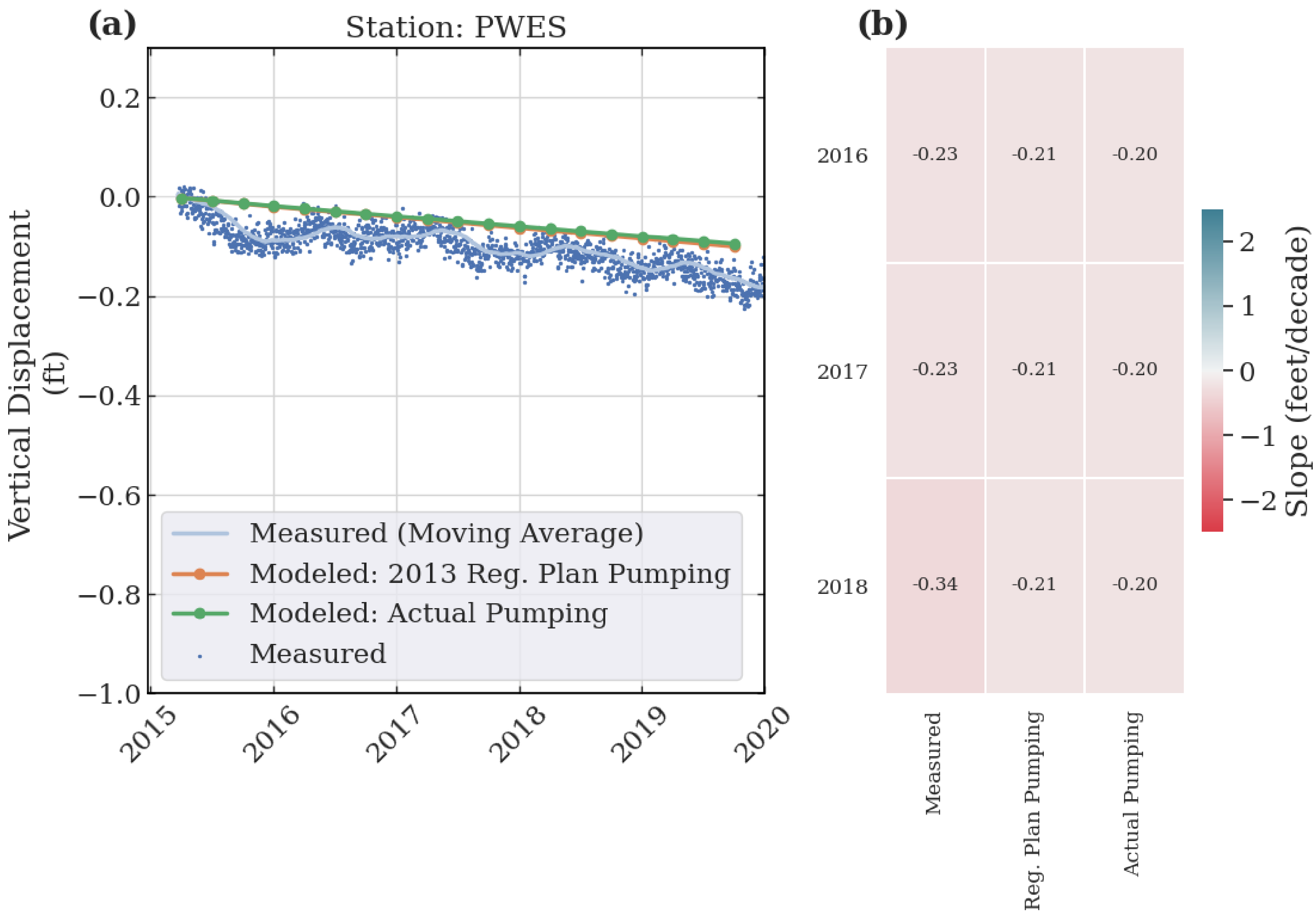


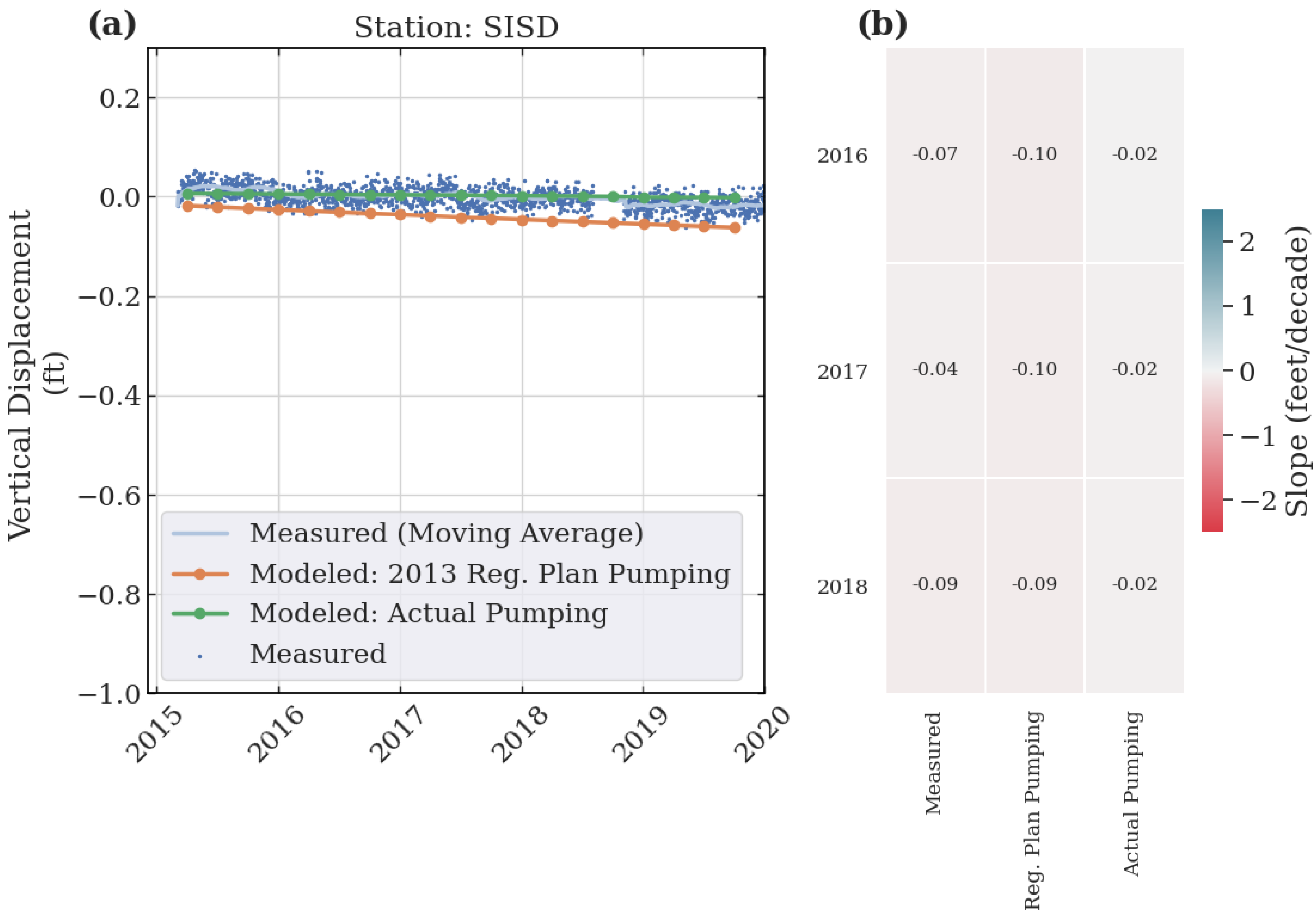
INTERA
GEOSCIENCE & ENGINEERING SOLUTIONS

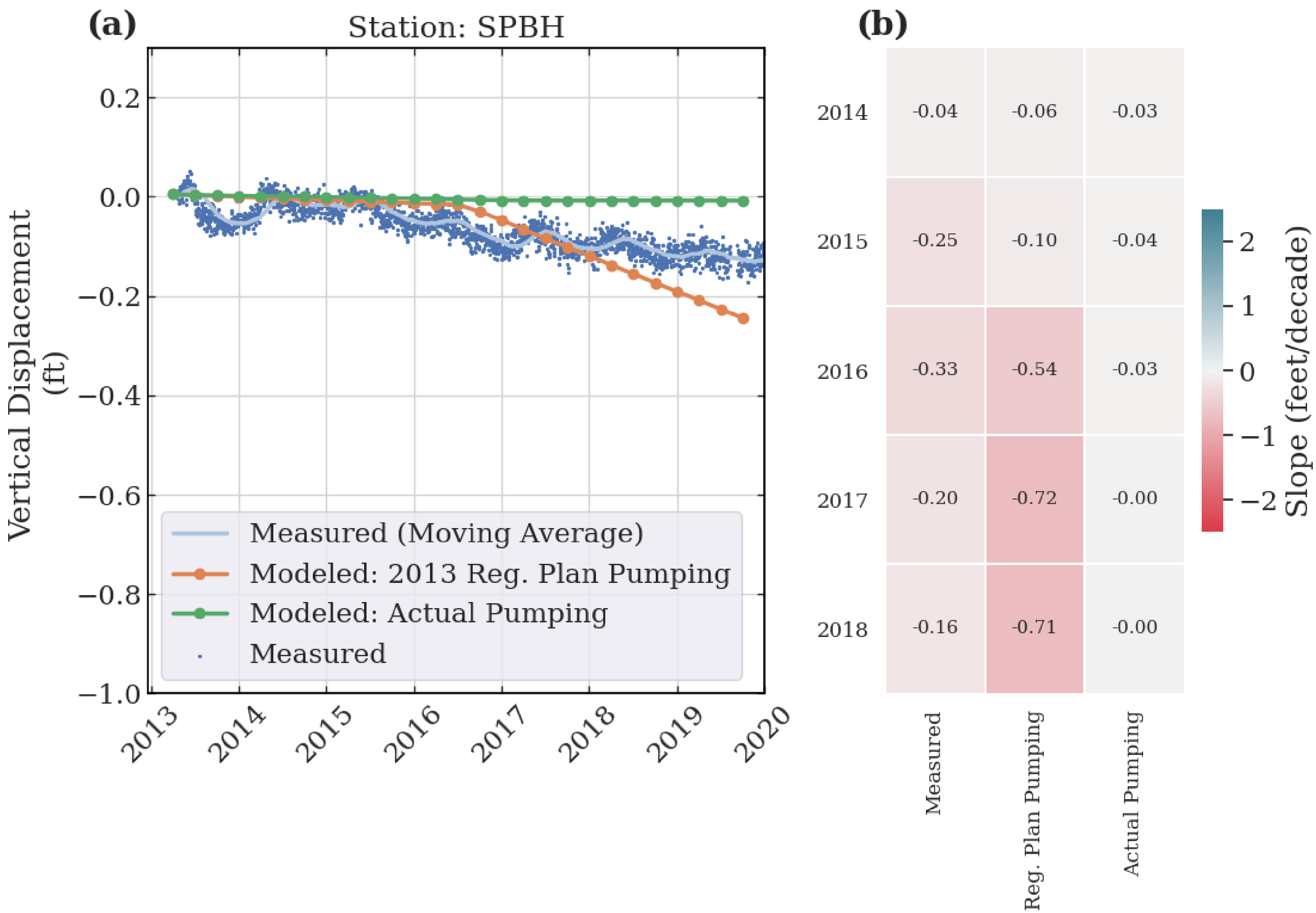


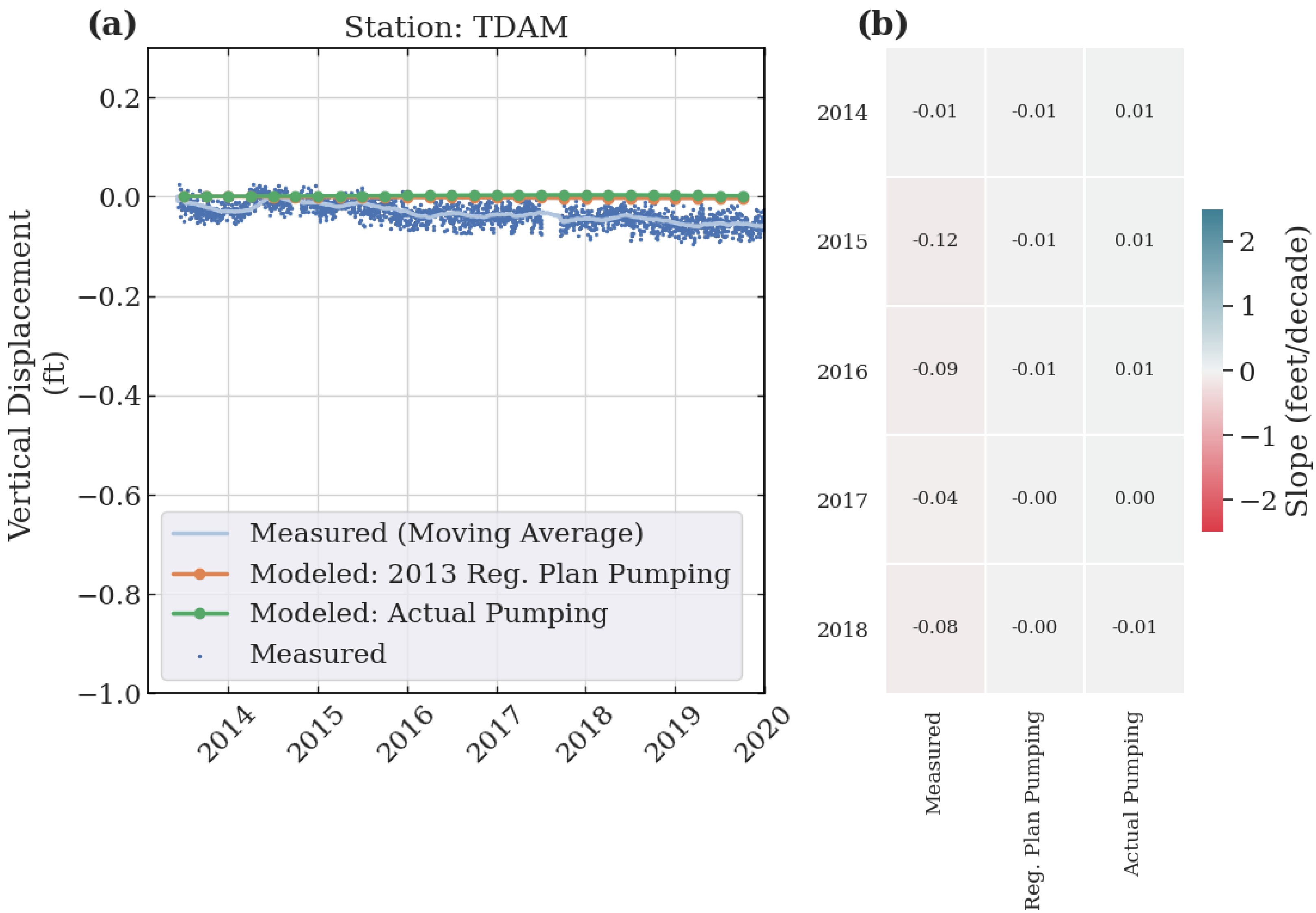
INTERA
GEOSCIENCE & ENGINEERING SOLUTIONS

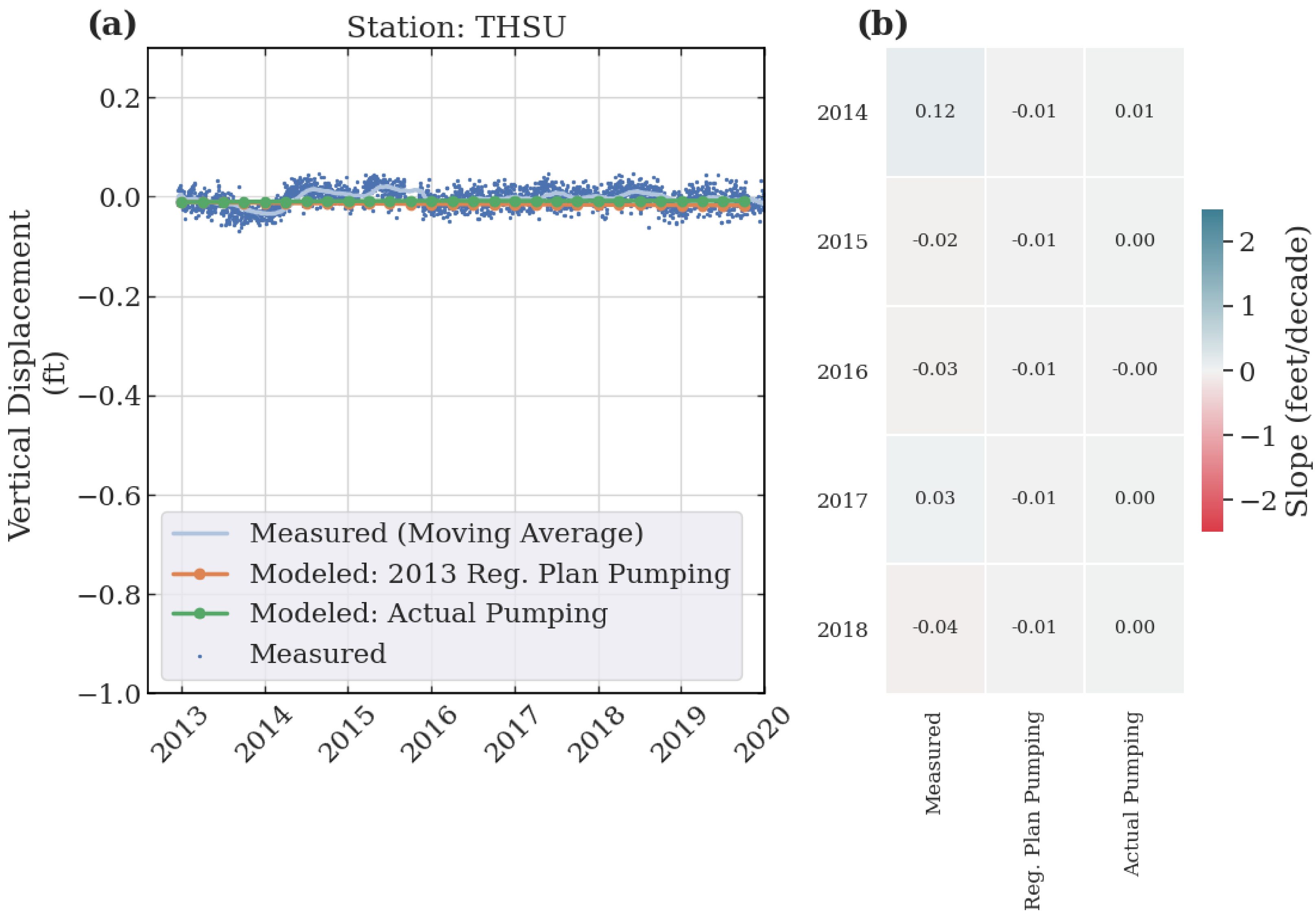

(a)
Station: P091
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
2016
2017
2017
2018
2018
2019
2019
2020
(b)
2017
2018
-0.40
-0.04
-0.01
-0.21
-0.03
-0.00
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2

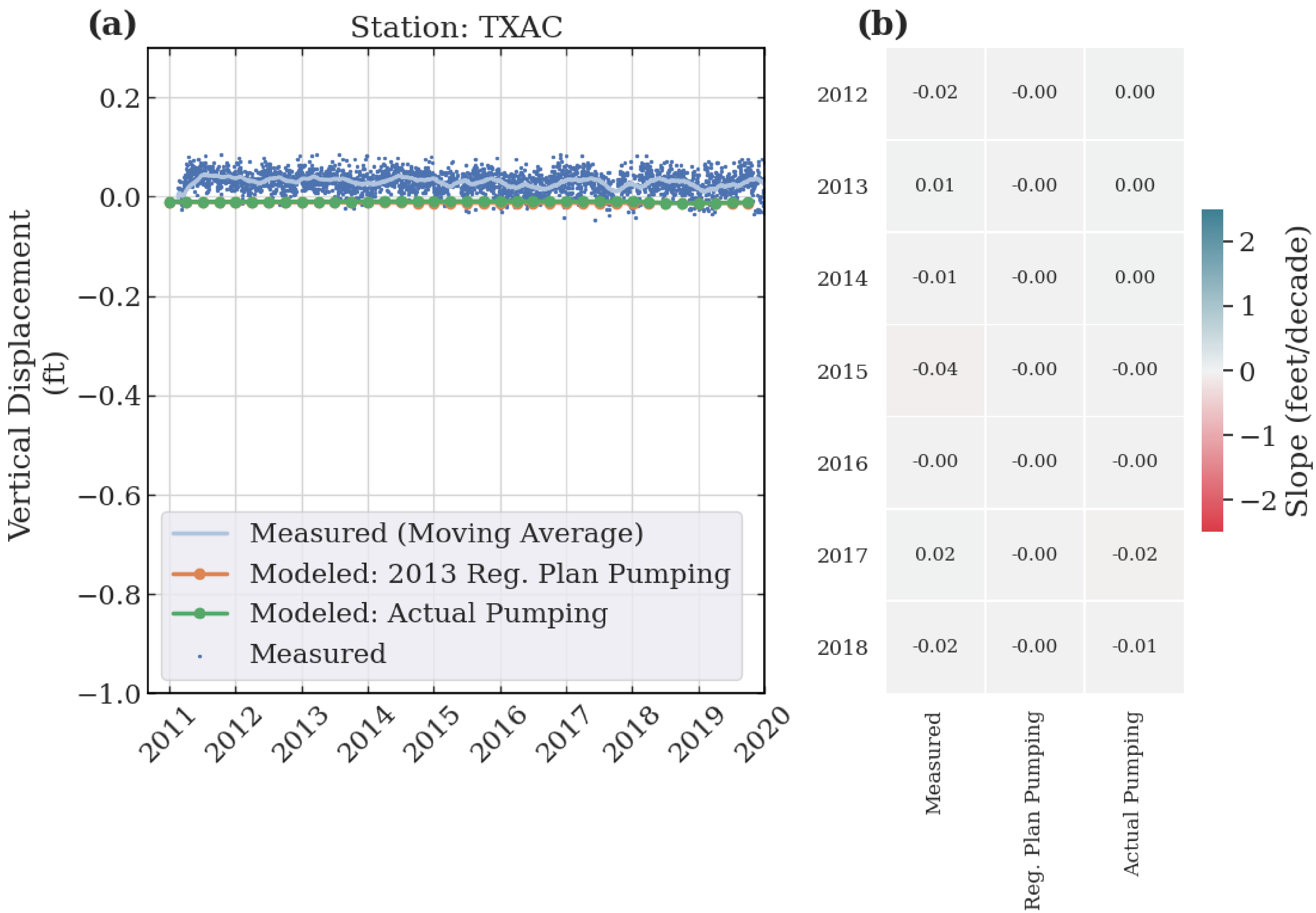

(a)
Station: PWES
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2016
2017
2018
-0.23
-0.21
-0.20
-0.23
-0.21
-0.20
-0.34
-0.21
-0.20
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2


(a)
Station: SISD
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2016
2017
2018
-0.07
-0.10
-0.02
-0.04
-0.10
-0.02
-0.09
-0.09
-0.02
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2

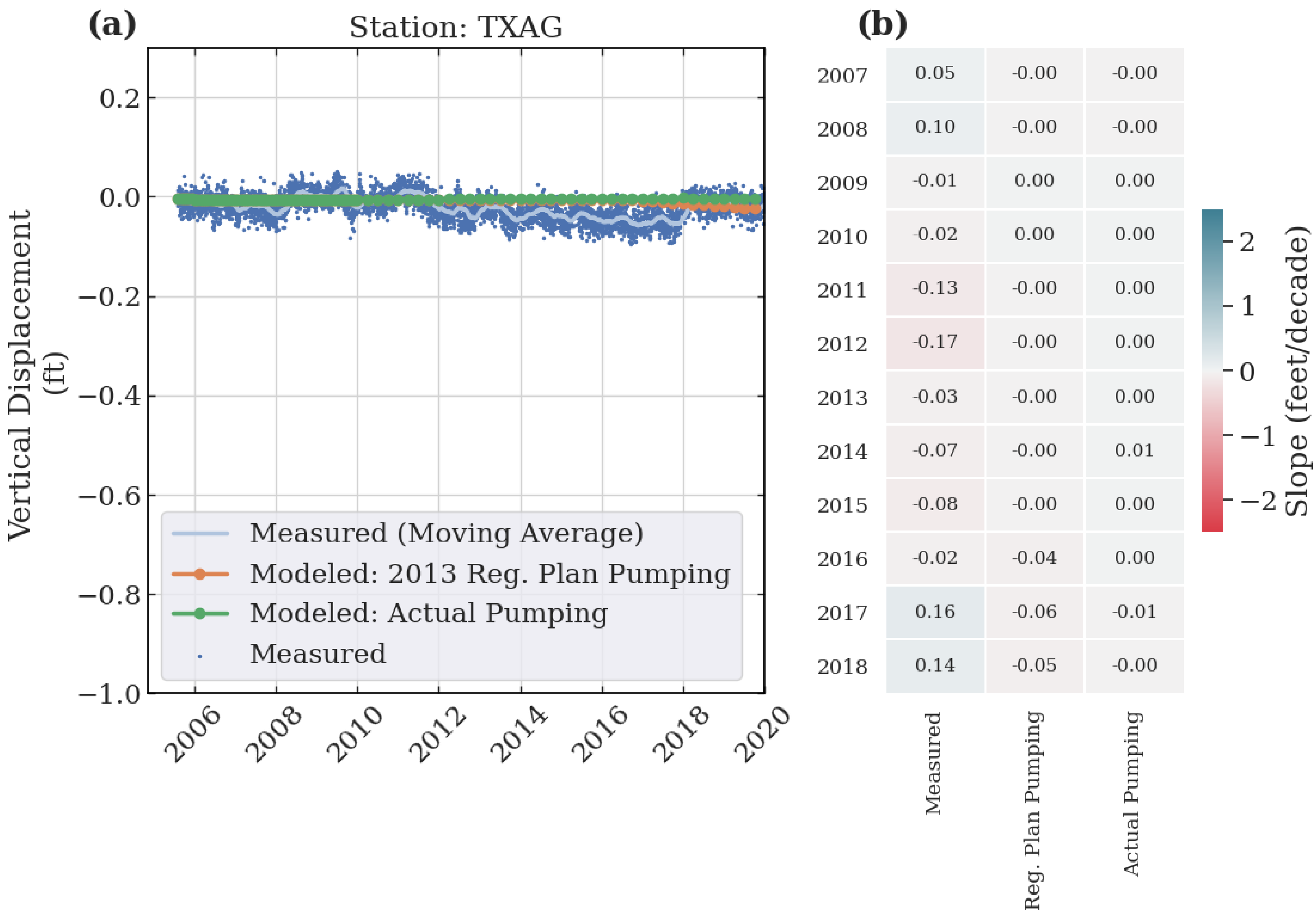

(a)
Station: SPBH
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2013
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2014
2015
2016
2017
2018
Measured
Reg. Plan Pumping
Actual Pumping
-0.04
-0.06
-0.03
-0.25
-0.10
-0.04
-0.33
-0.54
-0.03
-0.20
-0.72
-0.00
-0.16
-0.71
-0.00
Slope (feet/decade)
2
1
0
−1
−2

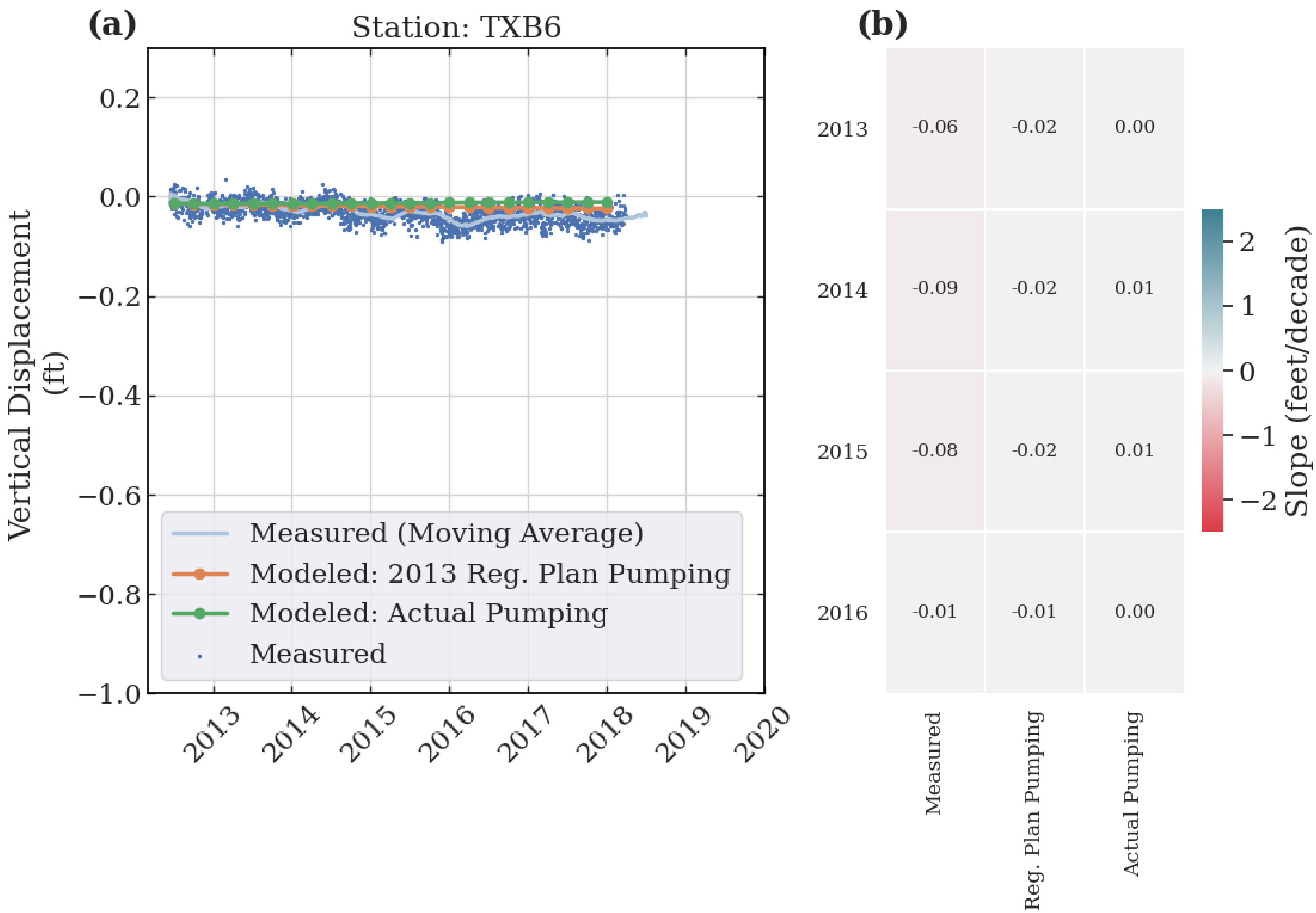

(a)
Station: TDAM
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2014
2015
2016
2017
2018
-0.01
-0.01
0.01
-0.12
-0.01
0.01
-0.09
-0.01
0.01
-0.04
-0.00
0.00
-0.08
-0.00
-0.01
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2

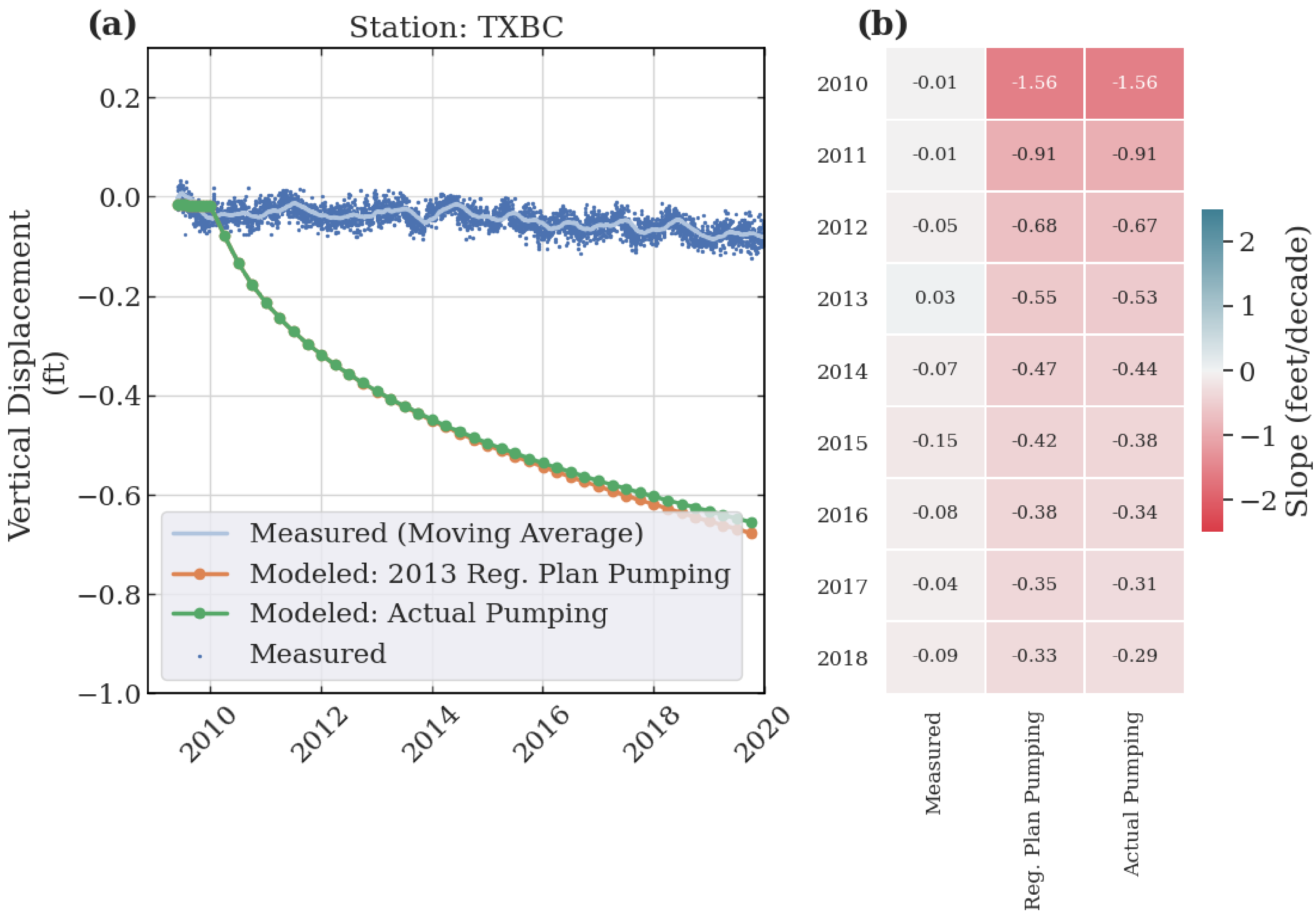

(a)
Station: THSU
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2013
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2014 0.12 -0.01 0.01
2015 -0.02 -0.01 0.00
2016 -0.03 -0.01 -0.00
2017 0.03 -0.01 0.00
2018 -0.04 -0.01 0.00
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2

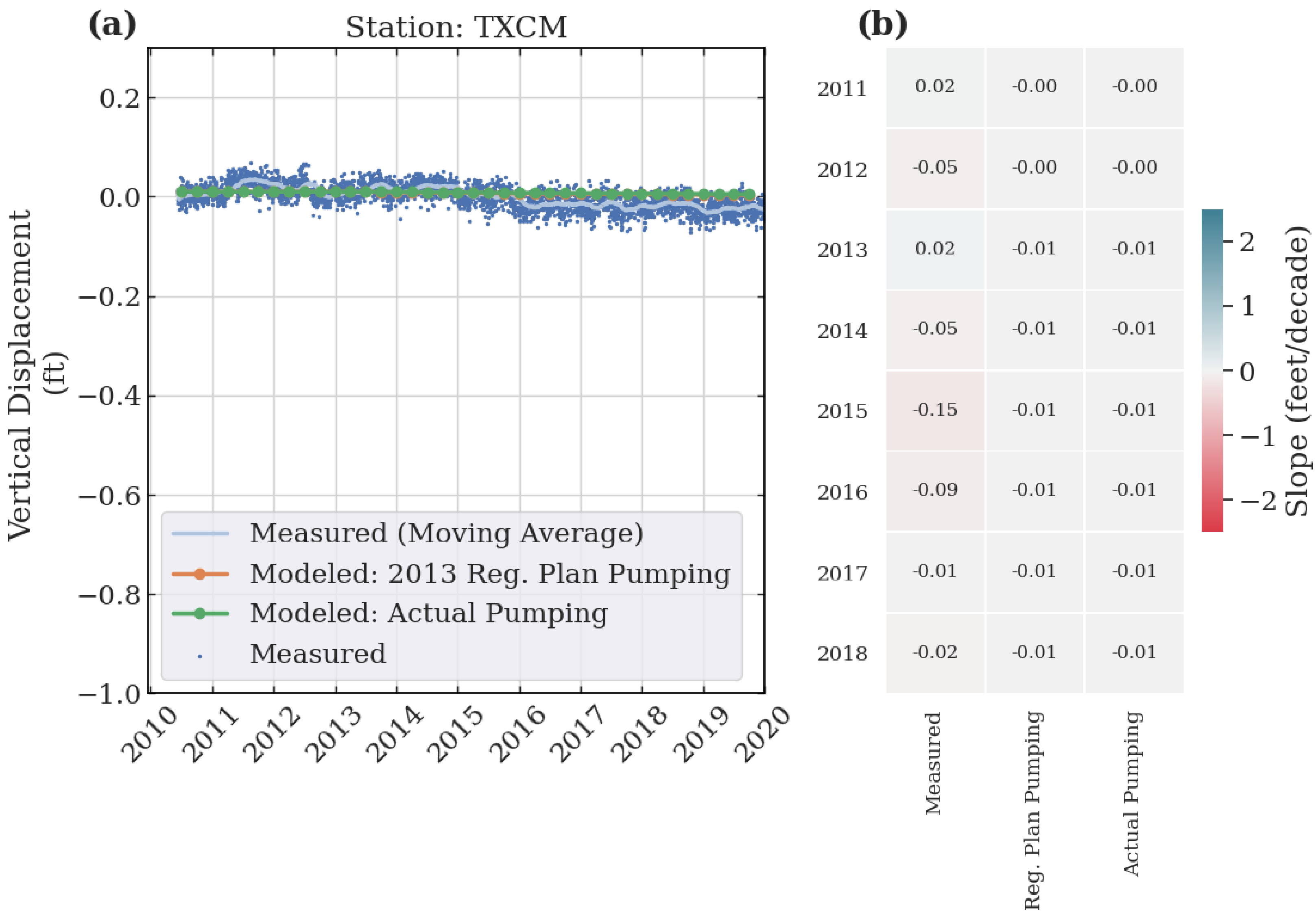


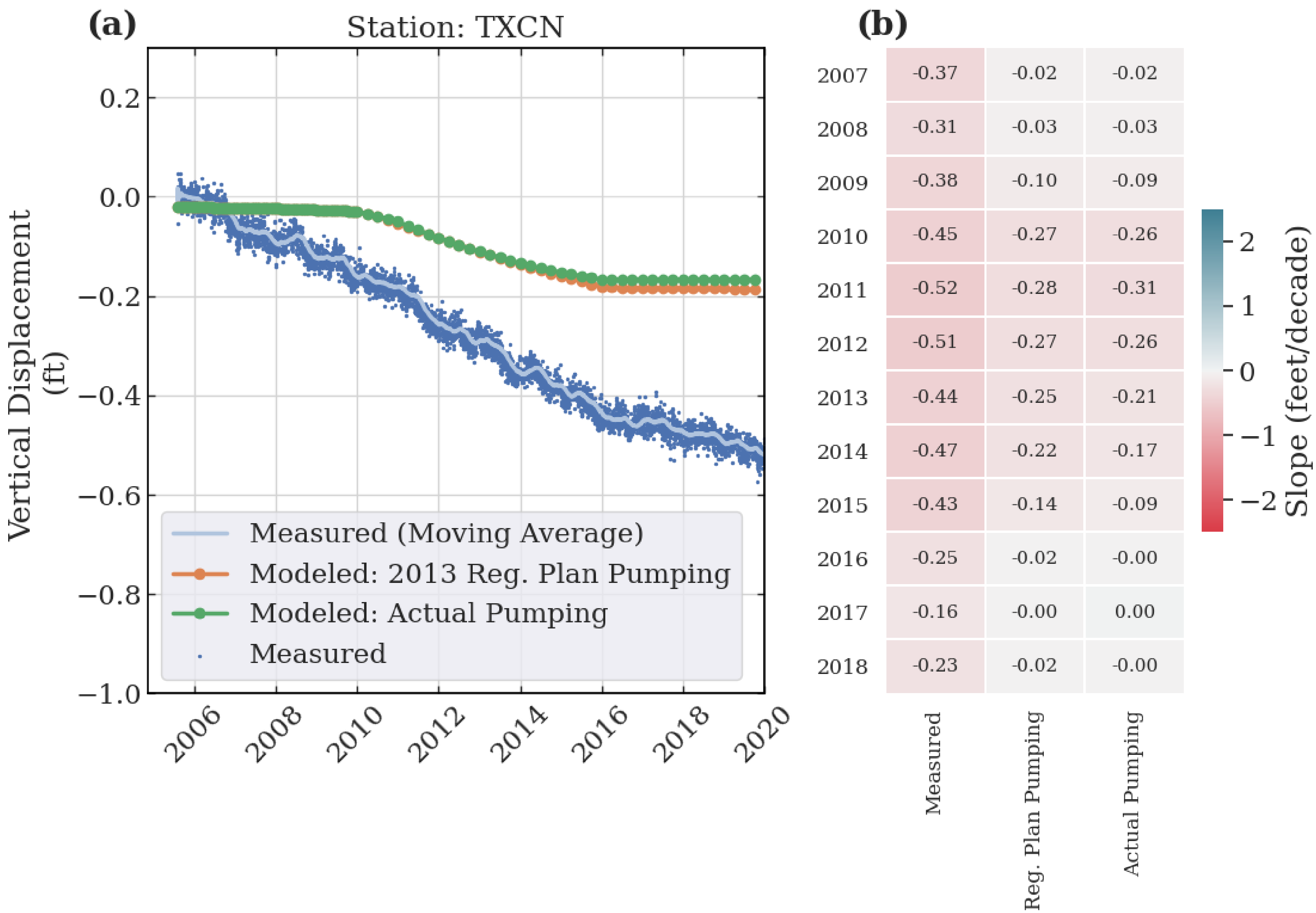
INTERA
GEOSCIENCE & ENGINEERING SOLUTIONS

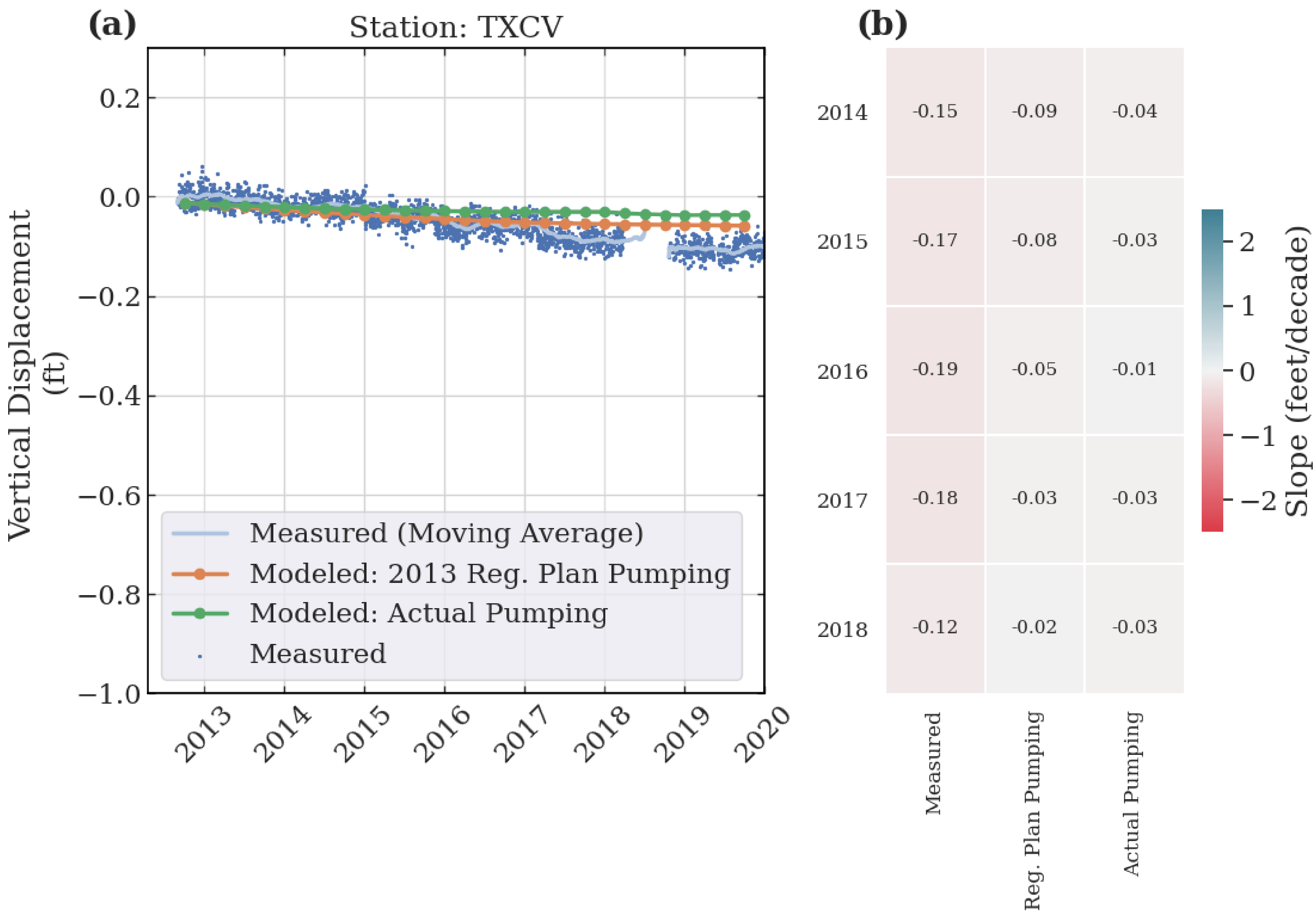

(a)
Station: TXAG
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2006
2008
2010
2012
2014
2016
2018
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2007 0.05 -0.00 -0.00
2008 0.10 -0.00 -0.00
2009 -0.01 0.00 0.00
2010 -0.02 0.00 0.00
2011 -0.13 -0.00 0.00
2012 -0.17 -0.00 0.00
2013 -0.03 -0.00 0.00
2014 -0.07 -0.00 0.01
2015 -0.08 -0.00 0.00
2016 -0.02 -0.04 0.00
2017 0.16 -0.06 -0.01
2018 0.14 -0.05 -0.00
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)


(a)
Station: TXB6
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2013
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2013 -0.06 -0.02 0.00
2014 -0.09 -0.02 0.01
2015 -0.08 -0.02 0.01
2016 -0.01 -0.01 0.00
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2

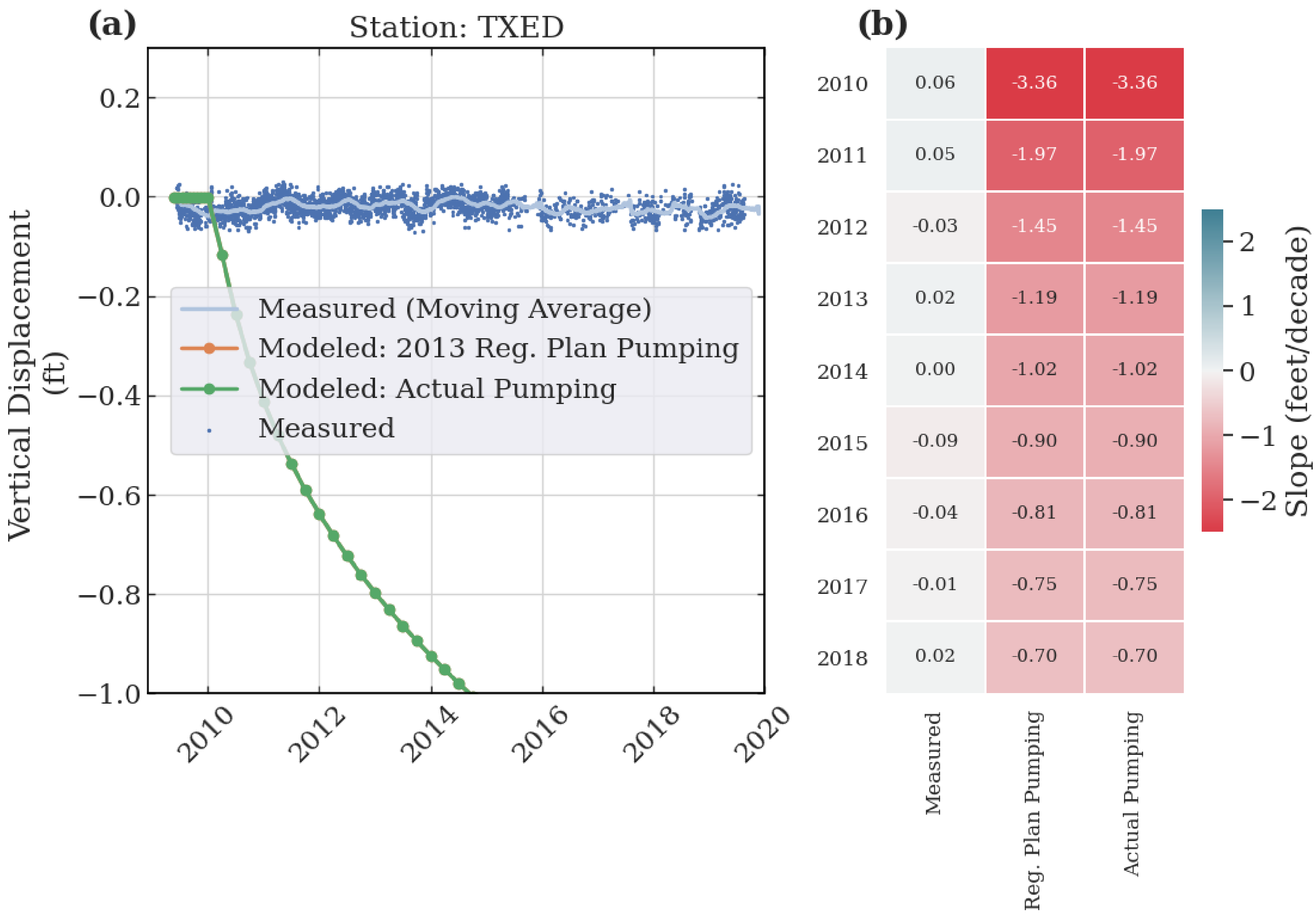

(a)
Station: TXBC
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2010
2012
2014
2016
2018
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2010 -0.01 -1.56 -1.56
2011 -0.01 -0.91 -0.91
2012 -0.05 -0.68 -0.67
2013 0.03 -0.55 -0.53
2014 -0.07 -0.47 -0.44
2015 -0.15 -0.42 -0.38
2016 -0.08 -0.38 -0.34
2017 -0.04 -0.35 -0.31
2018 -0.09 -0.33 -0.29
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2

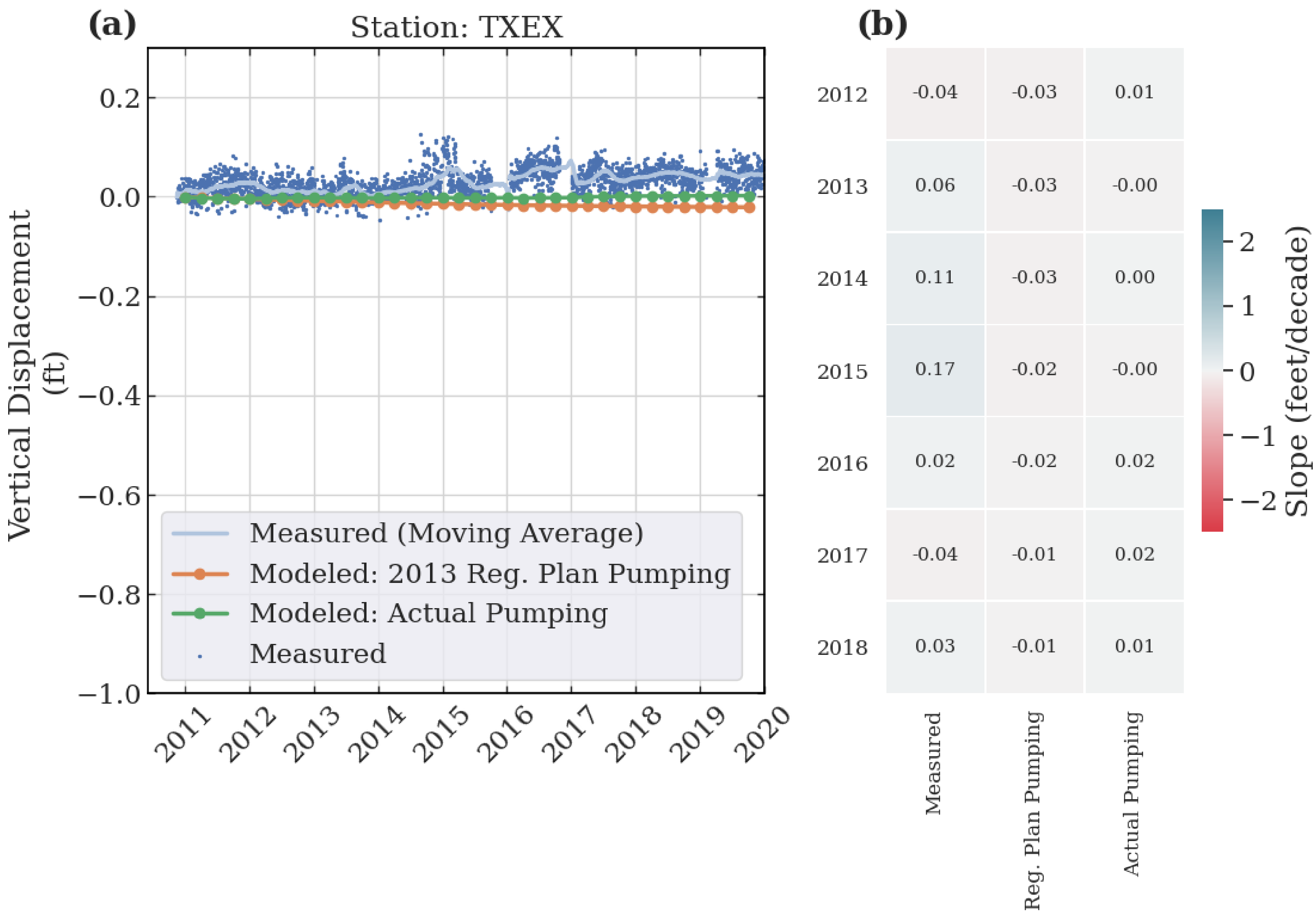

(a)
Station: TXCM
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2011 0.02 -0.00 -0.00
2012 -0.05 -0.00 -0.00
2013 0.02 -0.01 -0.01
2014 -0.05 -0.01 -0.01
2015 -0.15 -0.01 -0.01
2016 -0.09 -0.01 -0.01
2017 -0.01 -0.01 -0.01
2018 -0.02 -0.01 -0.01
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

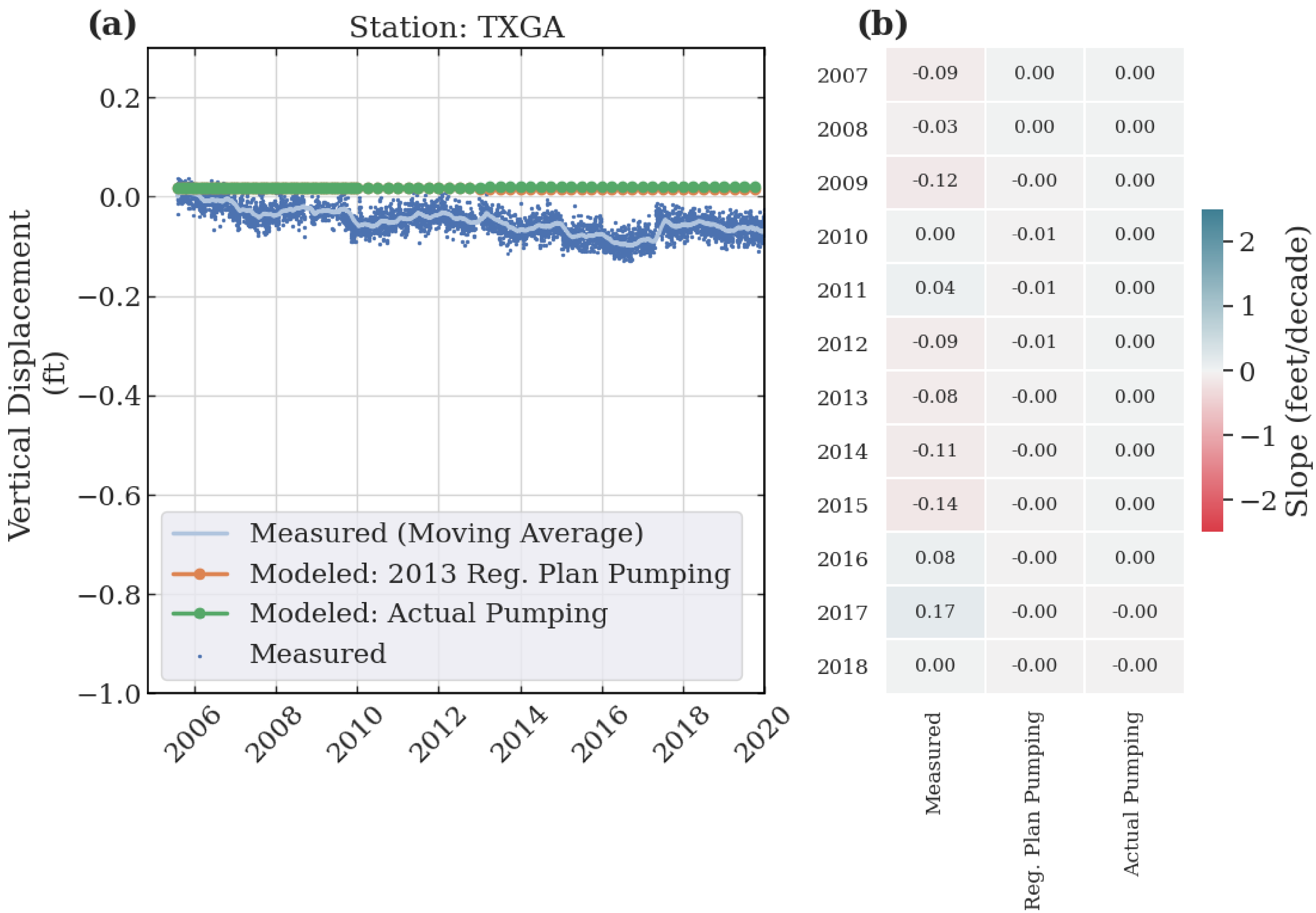

(a)
Station: TXCN
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2006
2008
2010
2012
2014
2016
2018
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2007 -0.37 -0.02 -0.02
2008 -0.31 -0.03 -0.03
2009 -0.38 -0.10 -0.09
2010 -0.45 -0.27 -0.26
2011 -0.52 -0.28 -0.31
2012 -0.51 -0.27 -0.26
2013 -0.44 -0.25 -0.21
2014 -0.47 -0.22 -0.17
2015 -0.43 -0.14 -0.09
2016 -0.25 -0.02 -0.00
2017 -0.16 -0.00 0.00
2018 -0.23 -0.02 -0.00
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

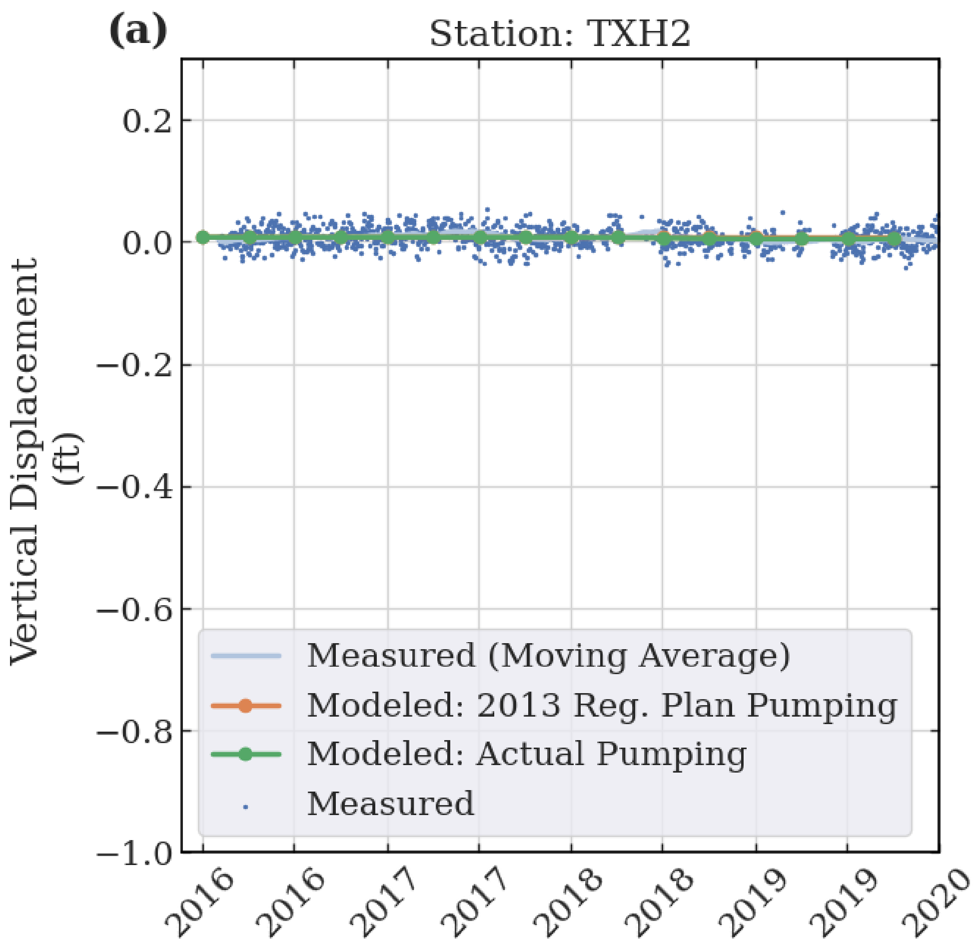


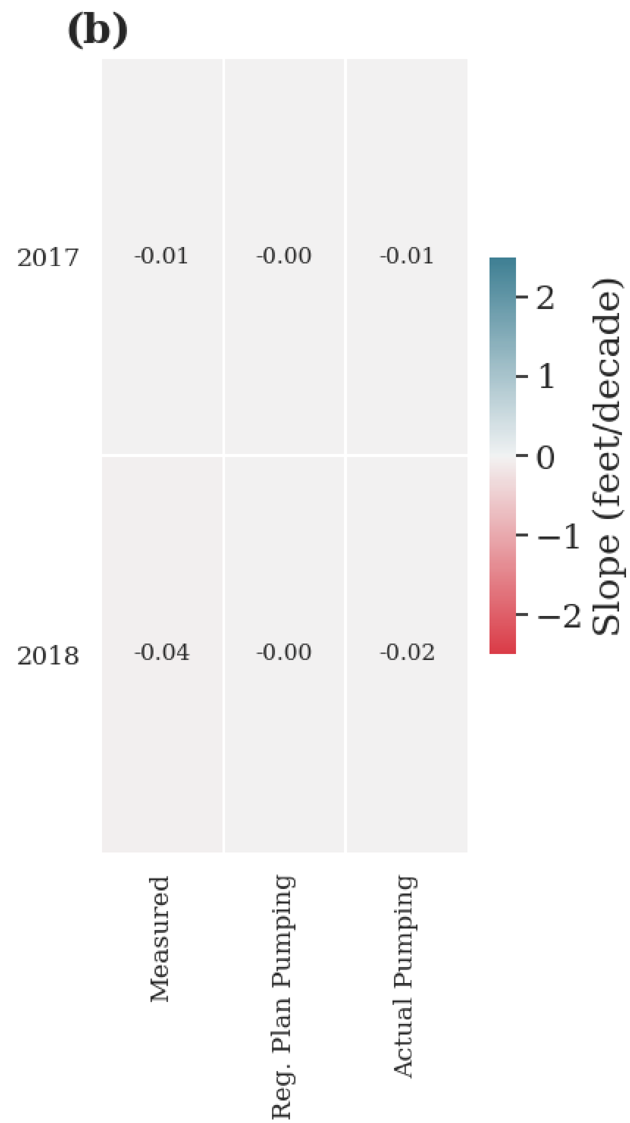
INTERA
GEOSCIENCE & ENGINEERING SOLUTIONS

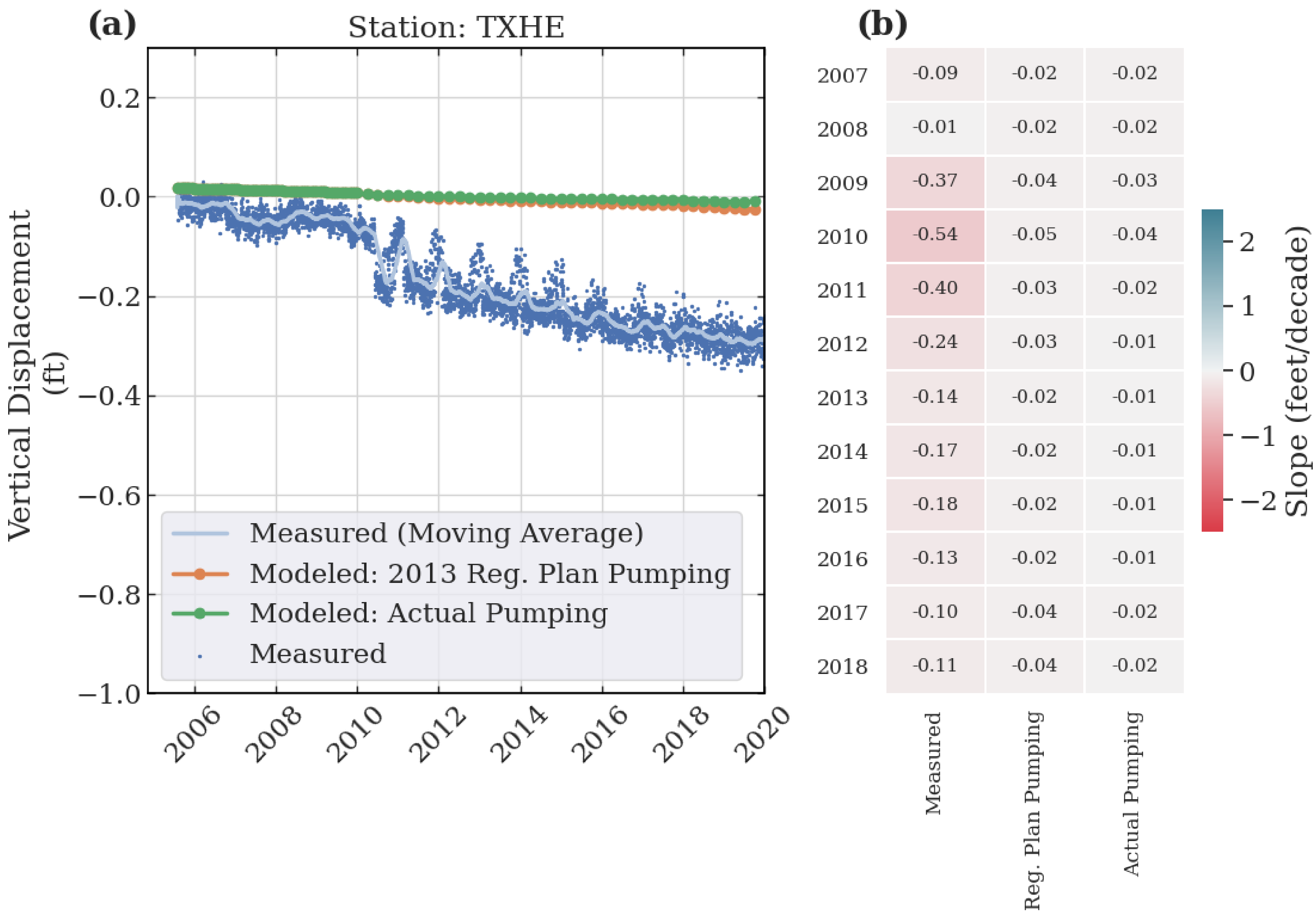

(a)
Station: TXED
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2010
2012
2014
2016
2018
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2010 0.06 -3.36 -3.36
2011 0.05 -1.97 -1.97
2012 -0.03 -1.45 -1.45
2013 0.02 -1.19 -1.19
2014 0.00 -1.02 -1.02
2015 -0.09 -0.90 -0.90
2016 -0.04 -0.81 -0.81
2017 -0.01 -0.75 -0.75
2018 0.02 -0.70 -0.70
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2


(a)
Station: TXEX
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2012
2013
2014
2015
2016
2017
2018
-0.04
-0.03
0.01
0.06
-0.03
-0.00
0.11
-0.03
0.00
0.17
-0.02
-0.00
0.02
-0.02
0.02
-0.04
-0.01
0.02
0.03
-0.01
0.01
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

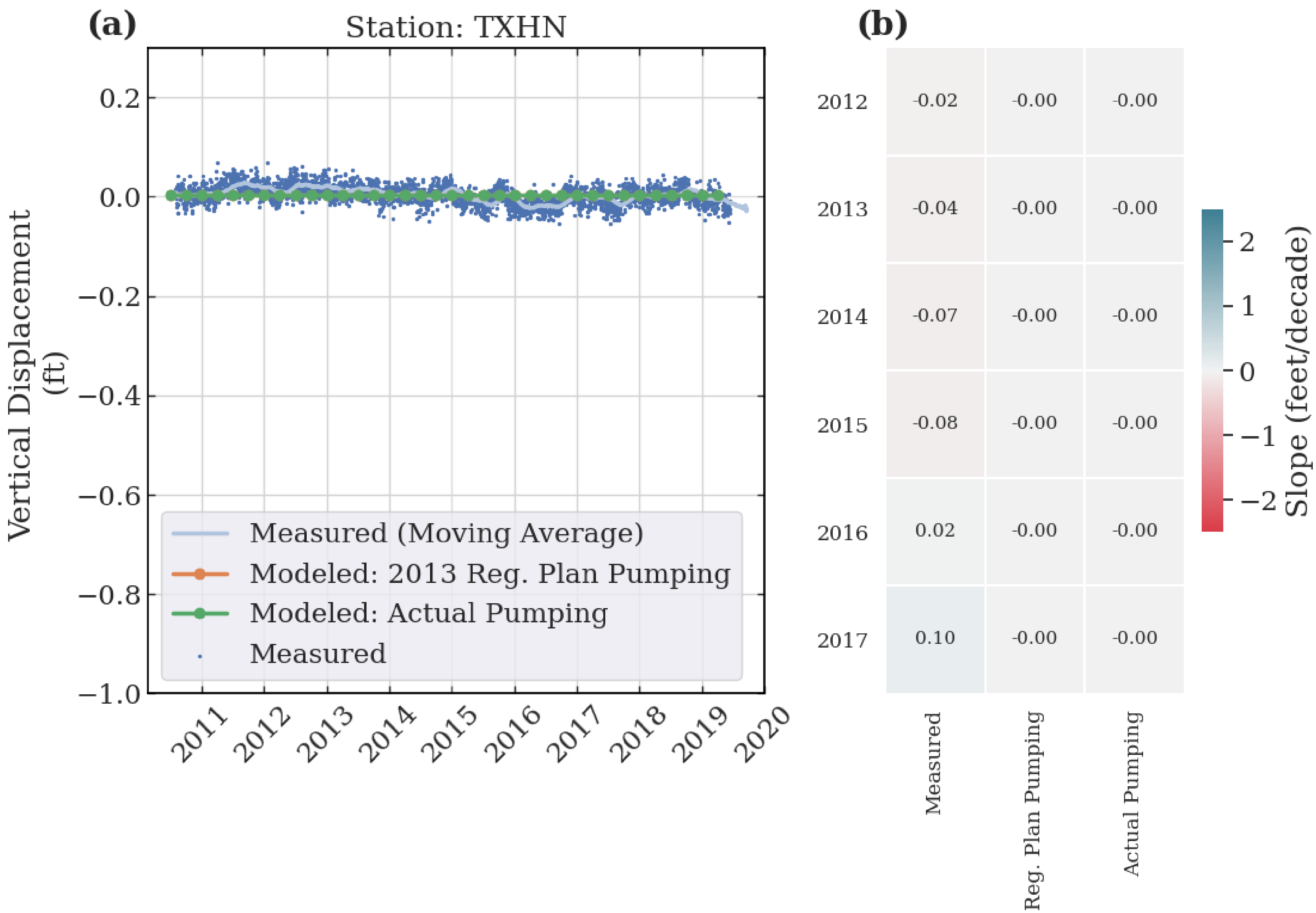

(a)
Station: TXGA
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2006
2008
2010
2012
2014
2016
2018
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2007 -0.09 0.00 0.00
2008 -0.03 0.00 0.00
2009 -0.12 -0.00 0.00
2010 0.00 -0.01 0.00
2011 0.04 -0.01 0.00
2012 -0.09 -0.01 0.00
2013 -0.08 -0.00 0.00
2014 -0.11 -0.00 0.00
2015 -0.14 -0.00 0.00
2016 0.08 -0.00 0.00
2017 0.17 -0.00 -0.00
2018 0.00 -0.00 -0.00
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2

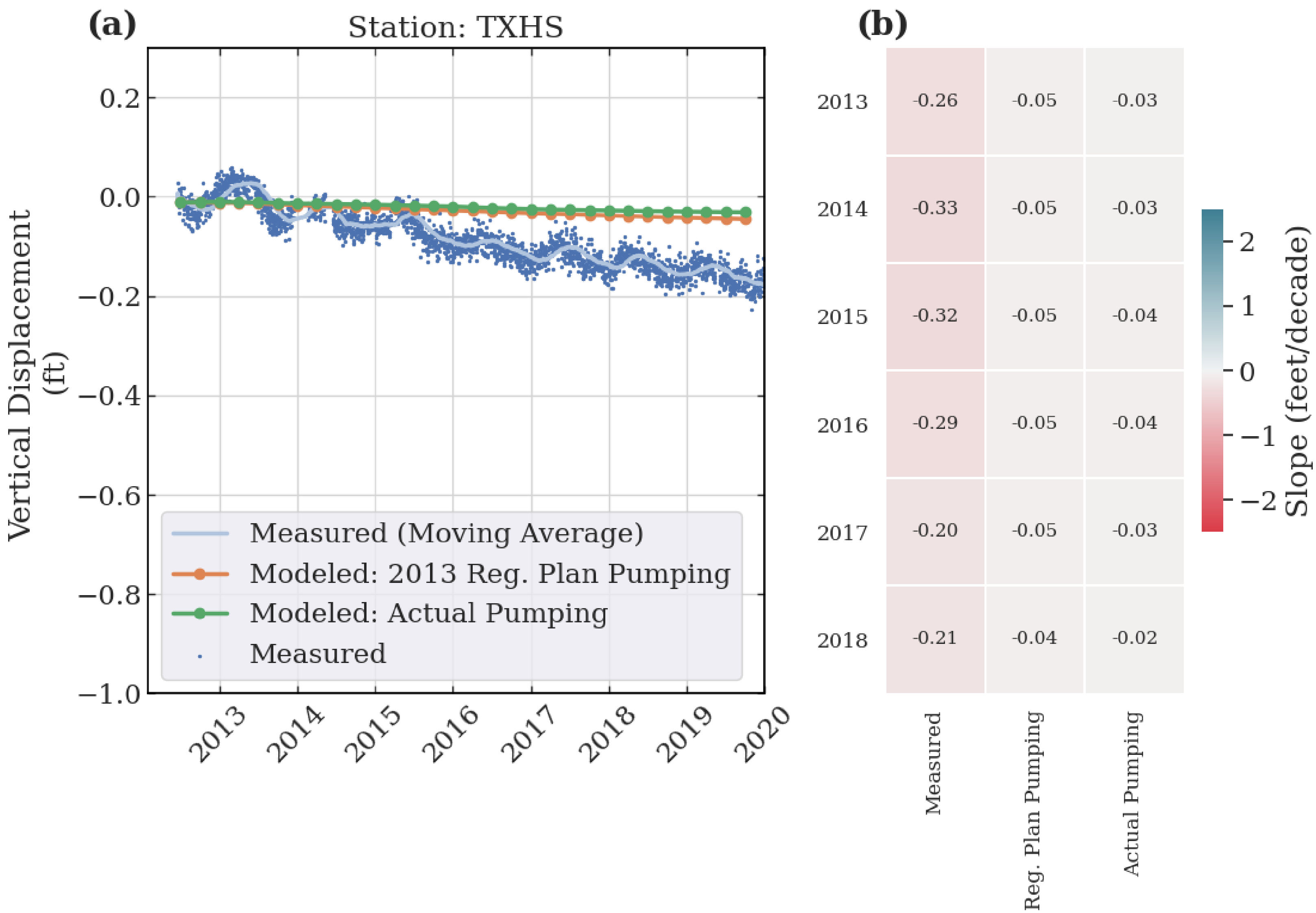

(a)
Station: TXH2
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
2016
2016
2017
2017
2018
2018
2019
2019
2020

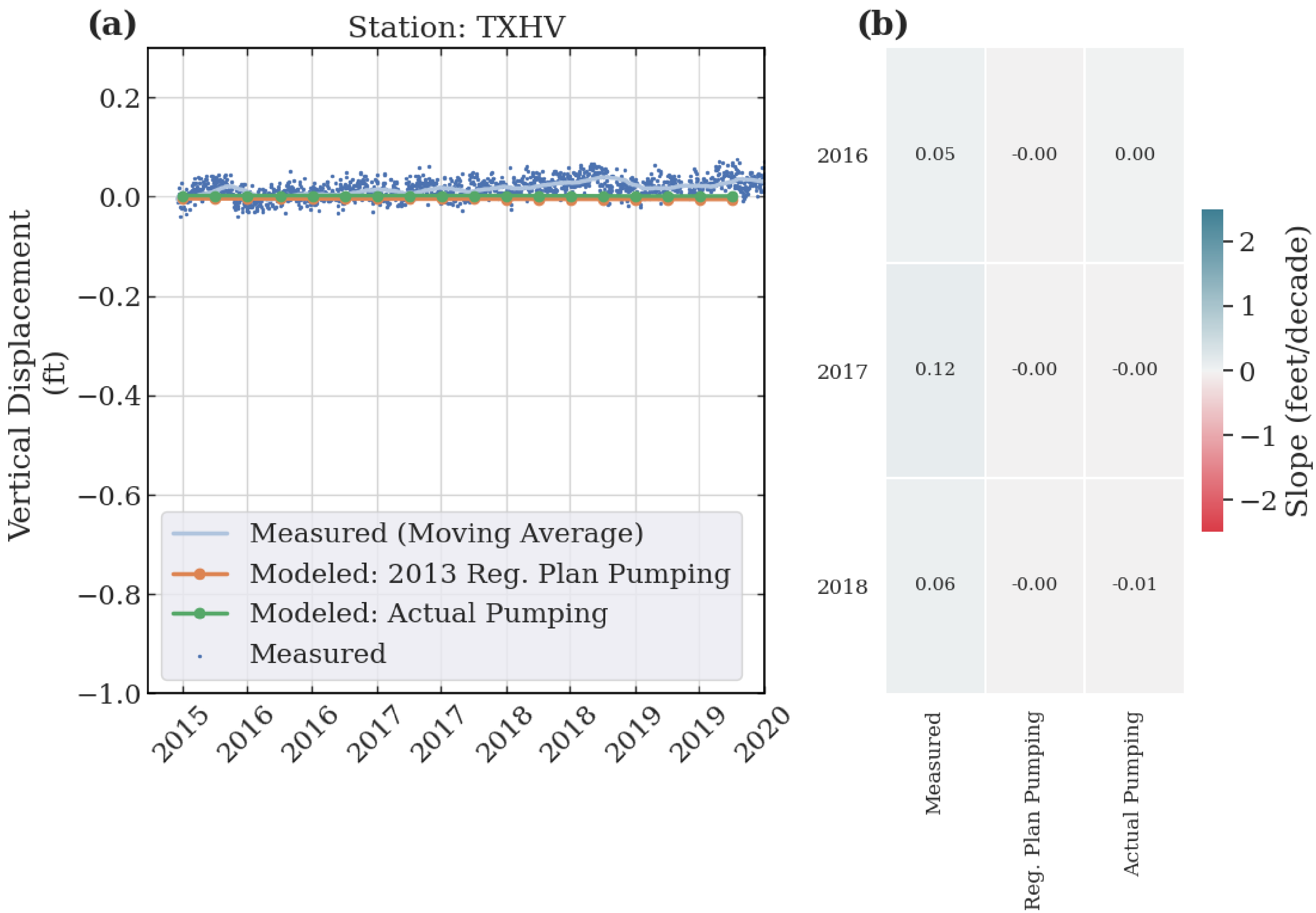

(b)
2017
-0.01
-0.00
-0.01
2018
-0.04
-0.00
-0.02
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

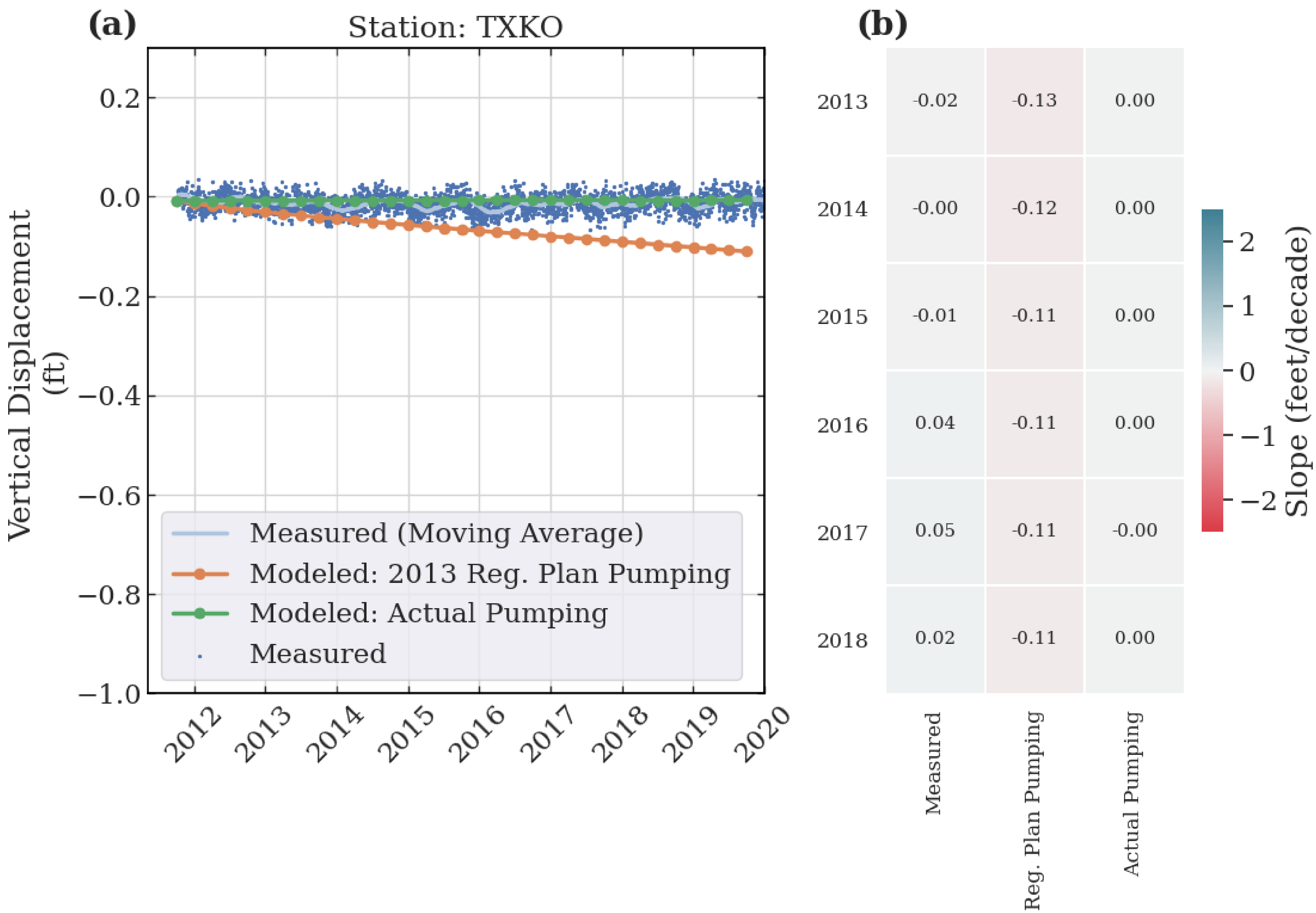


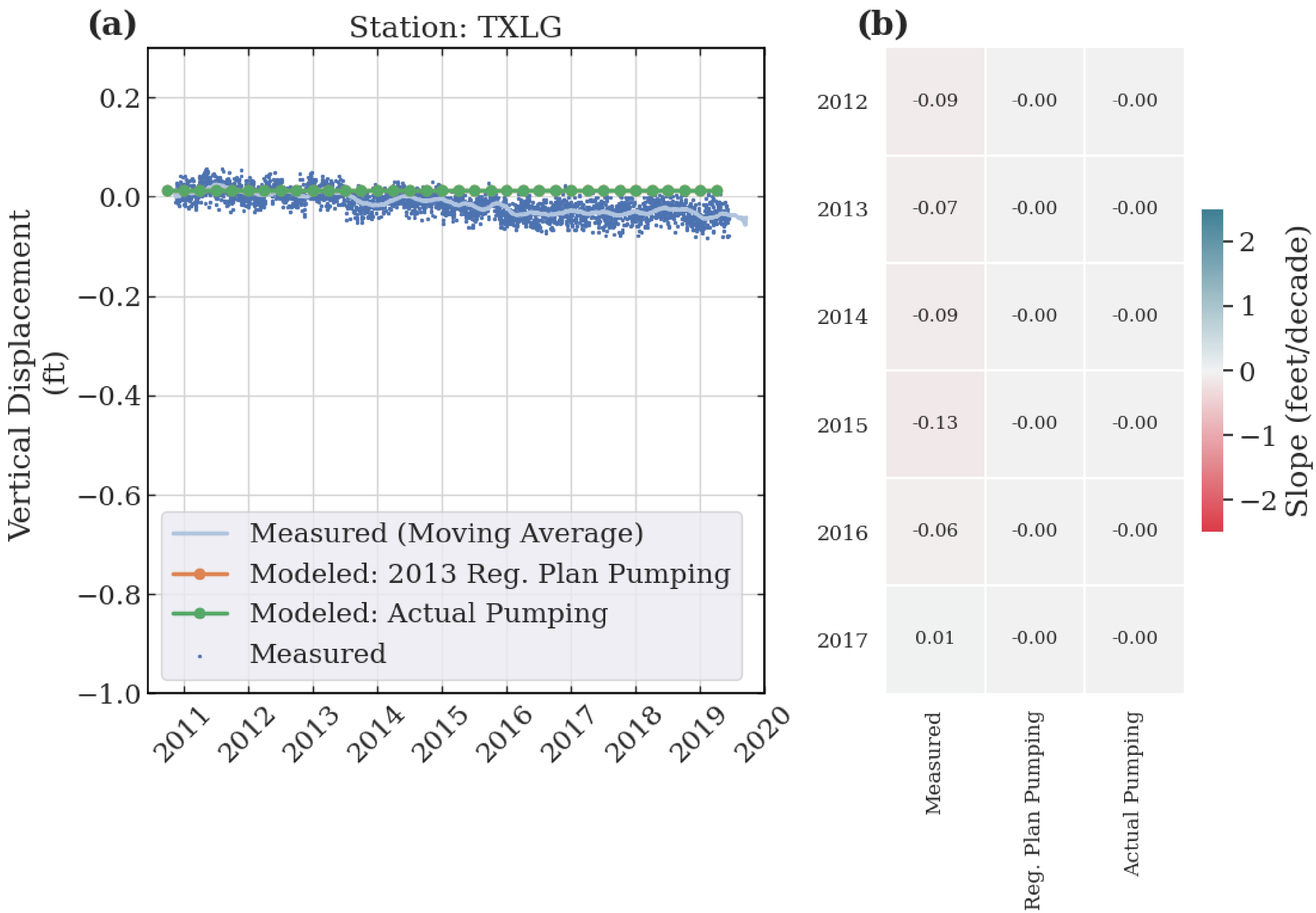
INTERA
GEOSCIENCE & ENGINEERING SOLUTIONS


(a)
Station: TXHN
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2012
-0.02
-0.00
-0.00
2013
-0.04
-0.00
-0.00
2014
-0.07
-0.00
-0.00
2015
-0.08
-0.00
-0.00
2016
0.02
-0.00
-0.00
2017
0.10
-0.00
-0.00
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

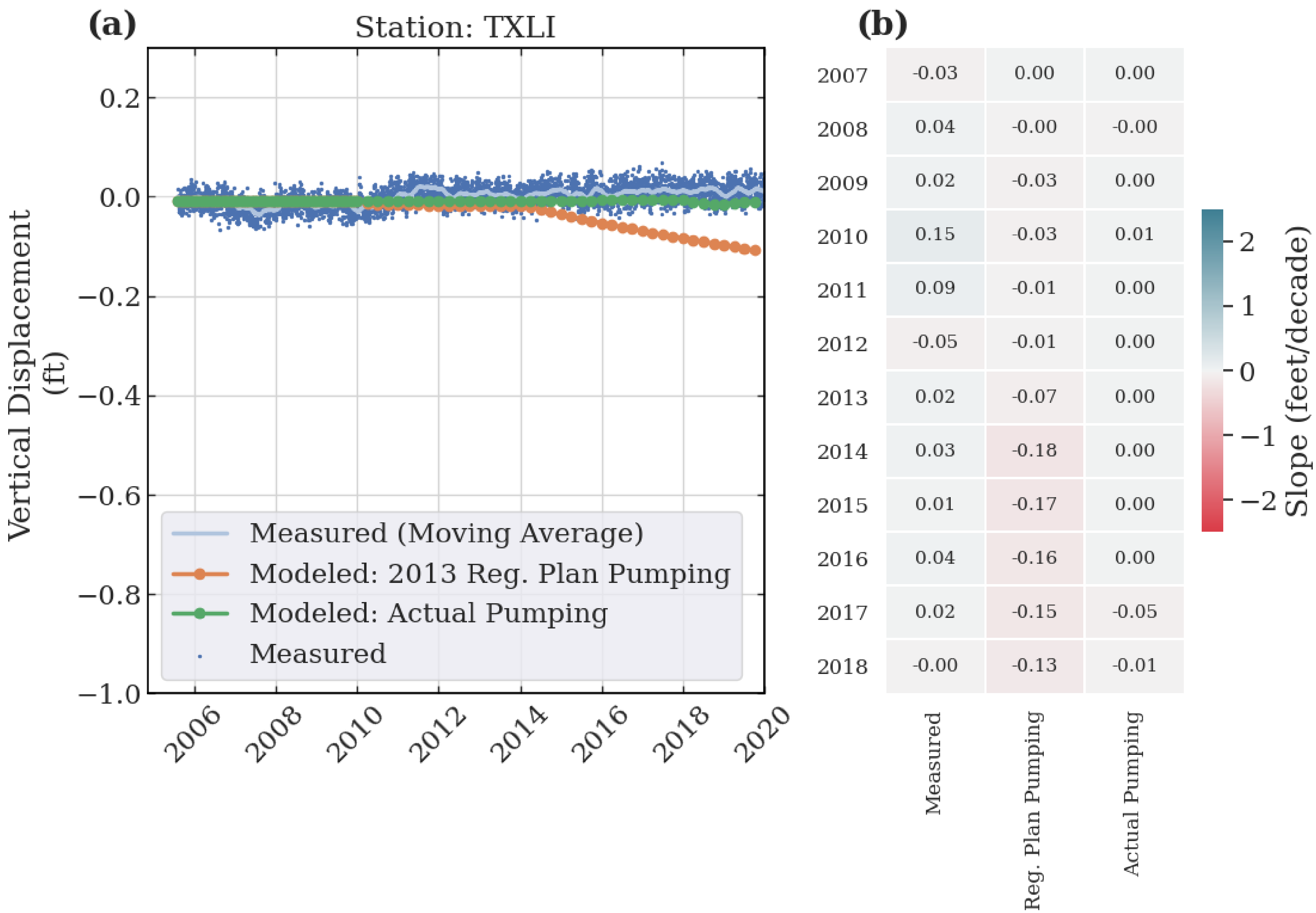

(a)
Station: TXHS
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2013
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2013 -0.26 -0.05 -0.03
2014 -0.33 -0.05 -0.03
2015 -0.32 -0.05 -0.04
2016 -0.29 -0.05 -0.04
2017 -0.20 -0.05 -0.03
2018 -0.21 -0.04 -0.02
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

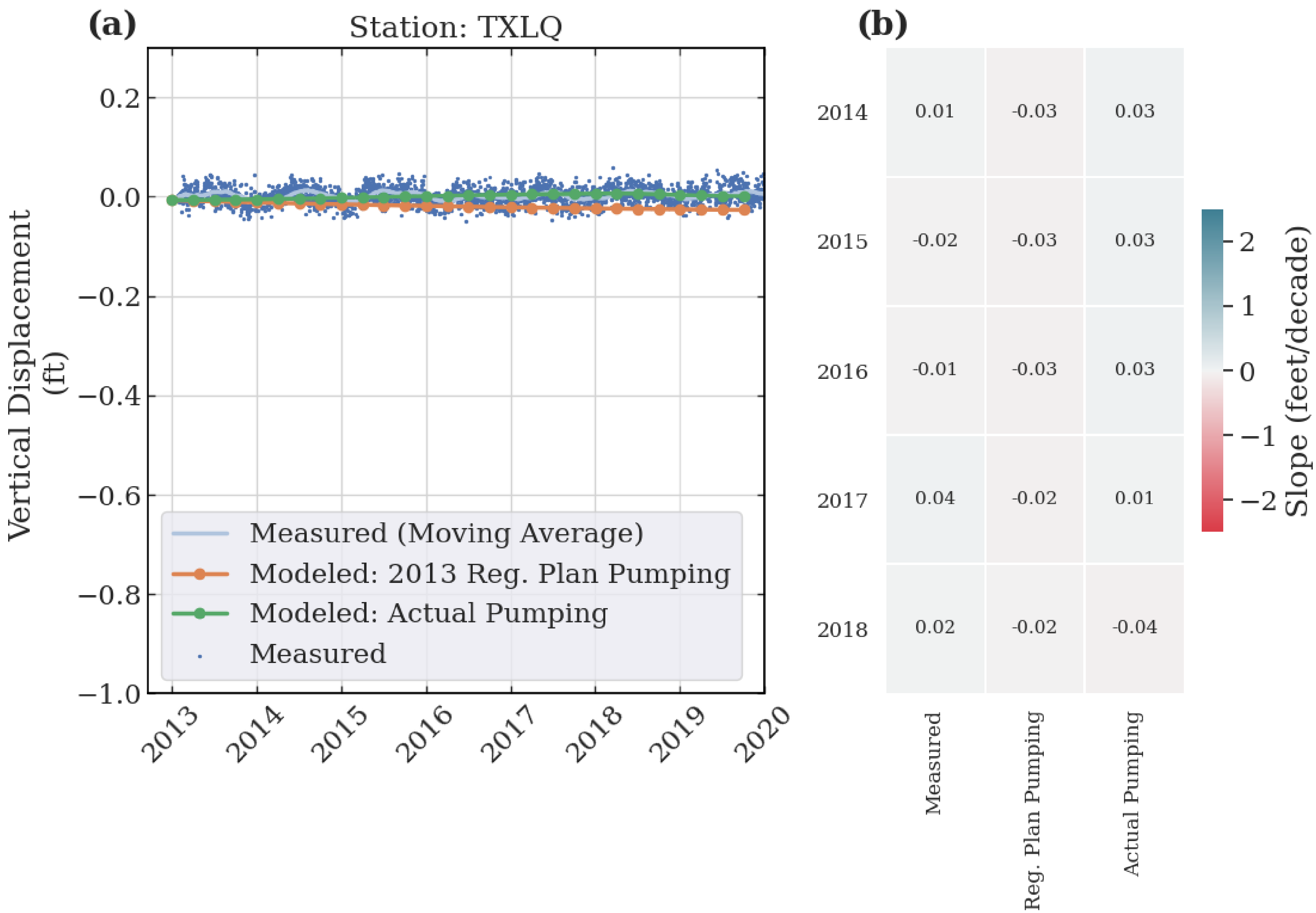

(a)
Station: TXHV
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2015
2016
2016
2017
2017
2018
2018
2019
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2016
2017
2018
0.05
-0.00
0.00
0.12
-0.00
-0.00
0.06
-0.00
-0.01
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2

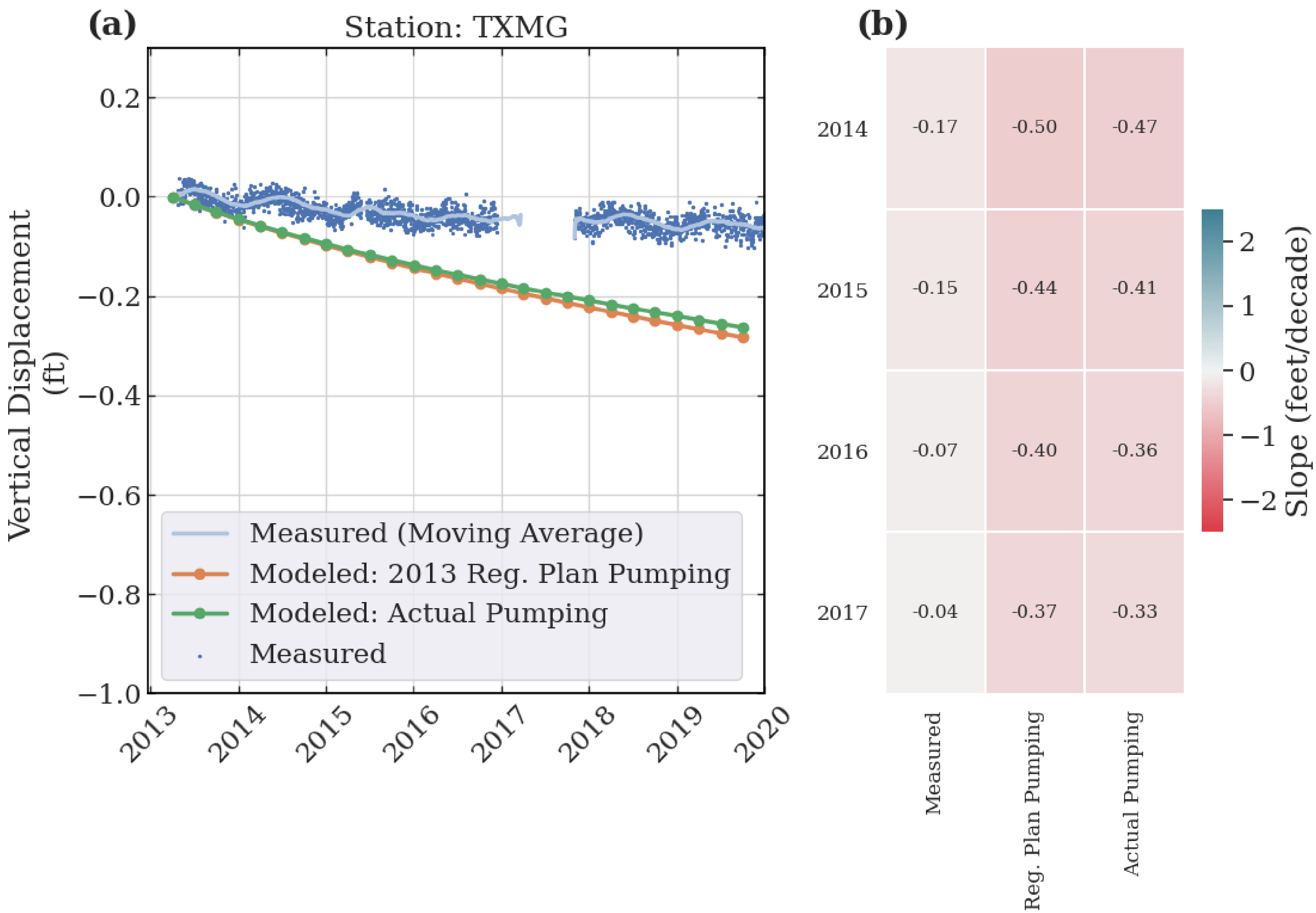

(a)
Station: TXKO
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2012
2013
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2013
2014
2015
2016
2017
2018
-0.02
-0.13
0.00
-0.00
-0.12
0.00
-0.01
-0.11
0.00
0.04
-0.11
0.00
0.05
-0.11
-0.00
0.02
-0.11
0.00
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

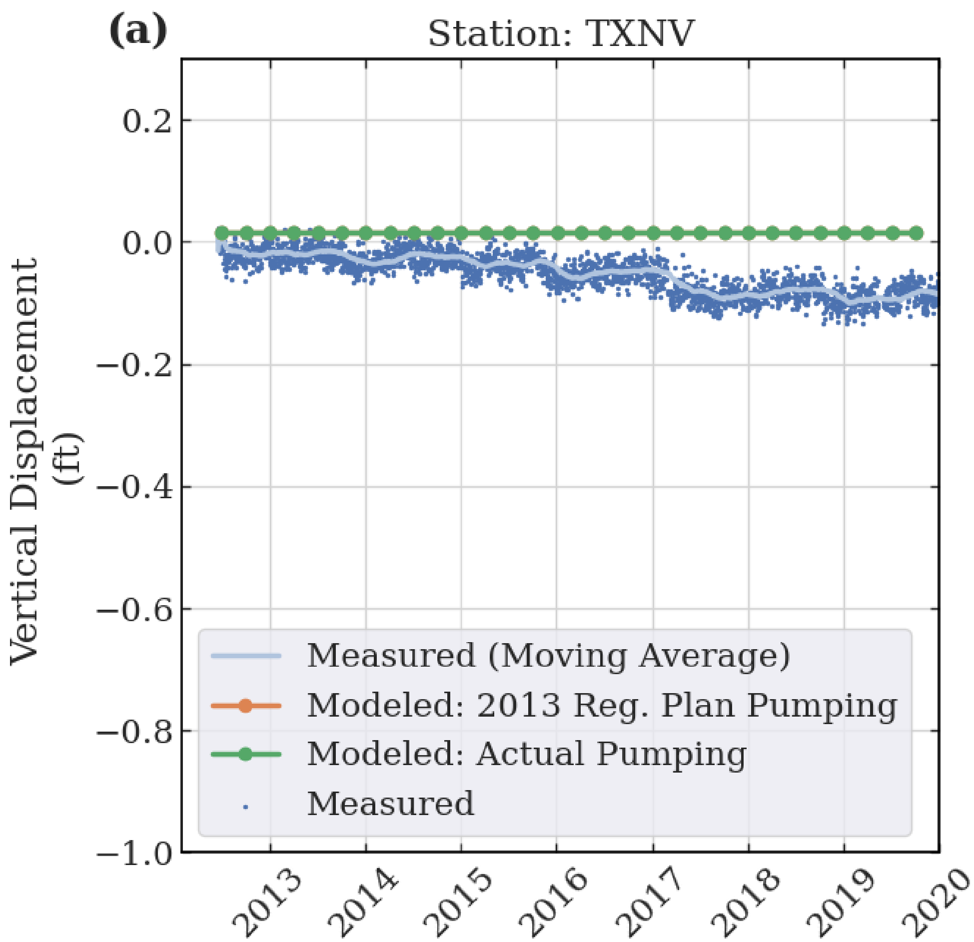


(a)
Station: TXLG
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2012 -0.09 -0.00 -0.00
2013 -0.07 -0.00 -0.00
2014 -0.09 -0.00 -0.00
2015 -0.13 -0.00 -0.00
2016 -0.06 -0.00 -0.00
2017 0.01 -0.00 -0.00
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

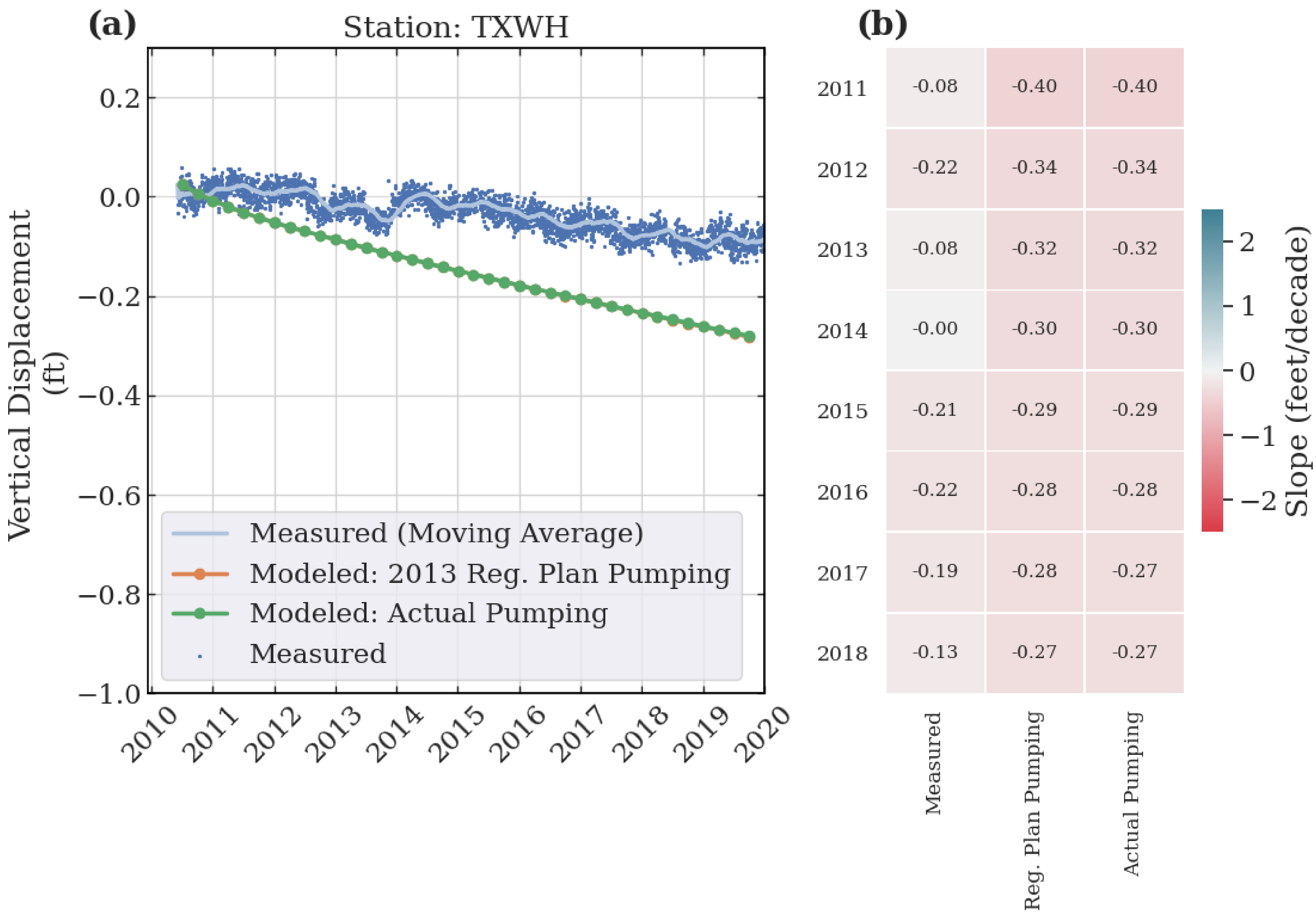

(a)
Station: TXLI
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
2006
2008
2010
2012
2014
2016
2018
2020
(b)
2007 -0.03 0.00 0.00
2008 0.04 -0.00 -0.00
2009 0.02 -0.03 0.00
2010 0.15 -0.03 0.01
2011 0.09 -0.01 0.00
2012 -0.05 -0.01 0.00
2013 0.02 -0.07 0.00
2014 0.03 -0.18 0.00
2015 0.01 -0.17 0.00
2016 0.04 -0.16 0.00
2017 0.02 -0.15 -0.05
2018 -0.00 -0.13 -0.01
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

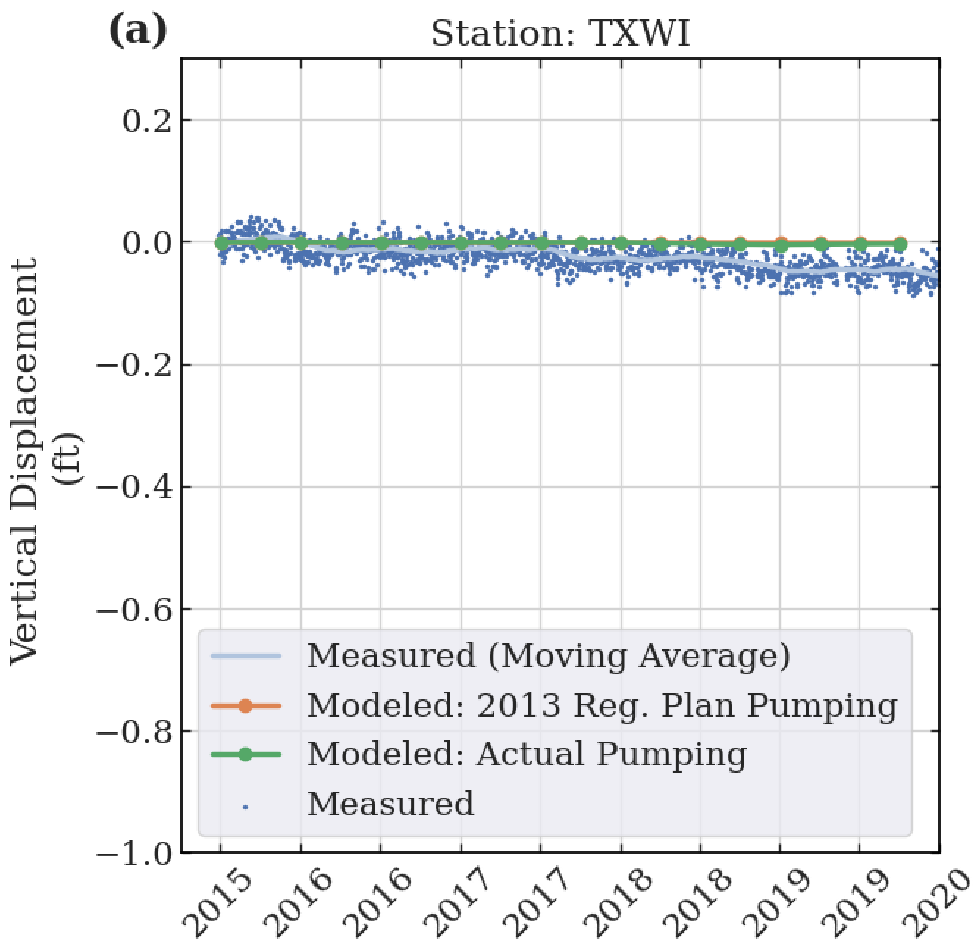

(a)
Station: TXLQ
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2013
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2014
2015
2016
2017
2018
0.01
-0.03
0.03
-0.02
-0.03
0.03
-0.01
-0.03
0.03
0.04
-0.02
0.01
0.02
-0.02
-0.04
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

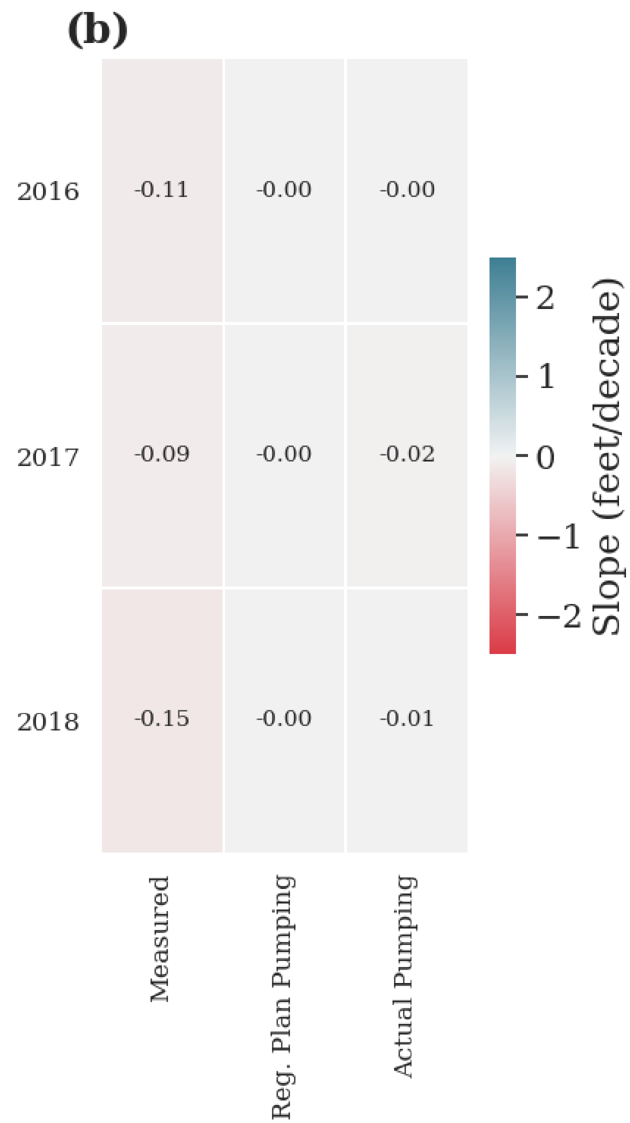

(a)
Station: TXMG
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2013
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2014
2015
2016
2017
-0.17
-0.50
-0.47
-0.15
-0.44
-0.41
-0.07
-0.40
-0.36
-0.04
-0.37
-0.33
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

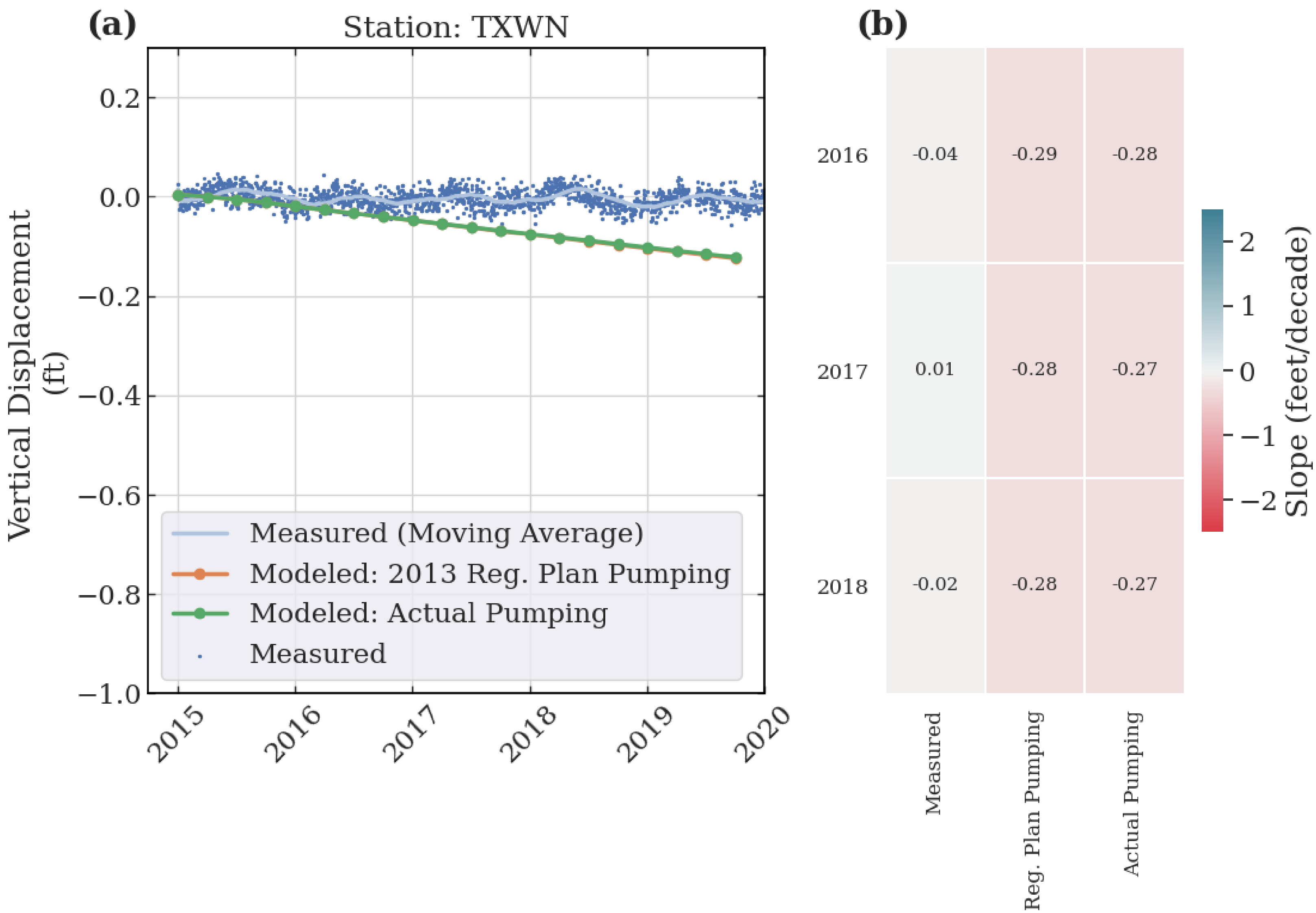


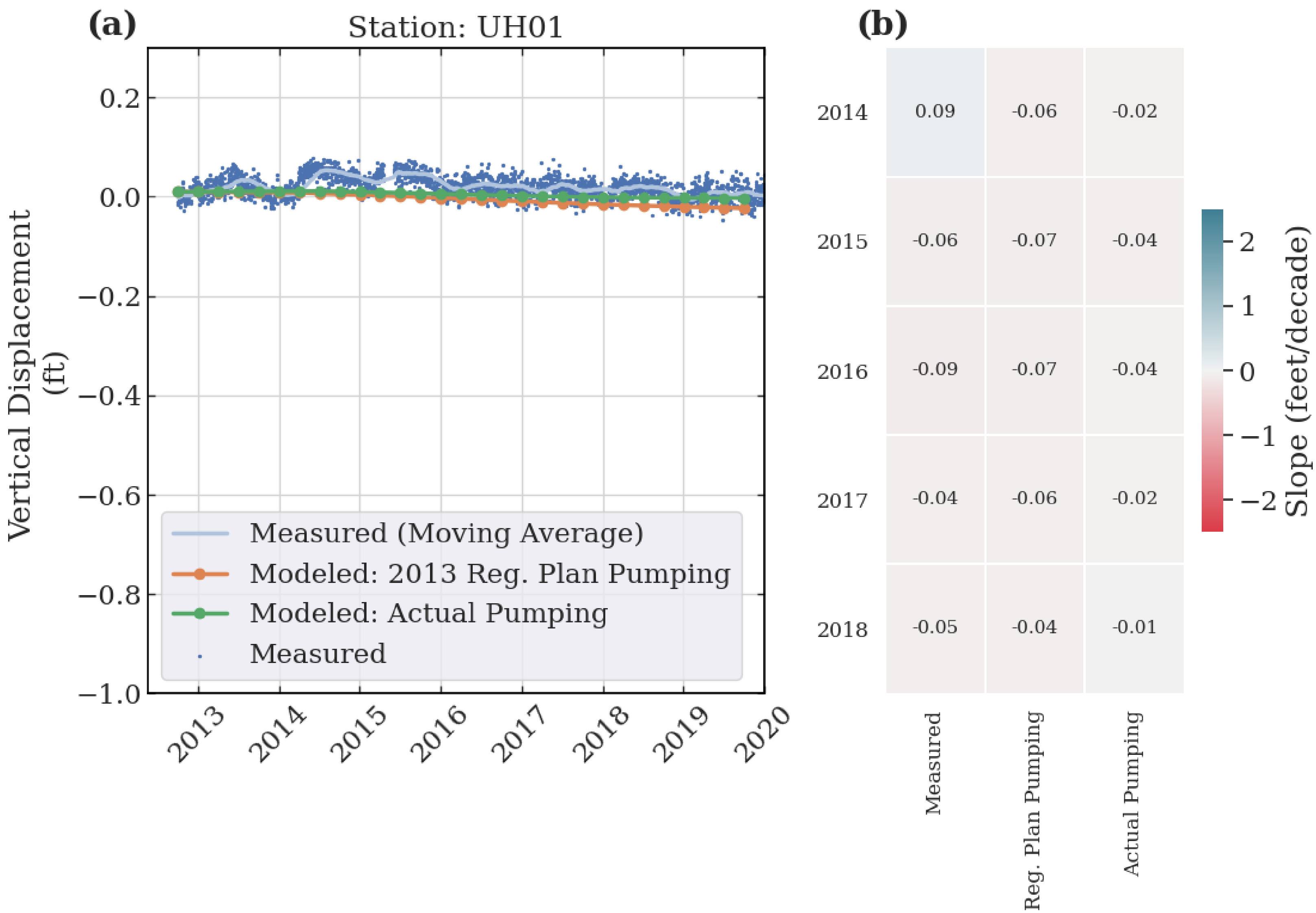
	Measured	Reg. Plan Pumping	Actual Pumping
2013	-0.04	-0.00	-0.00
2014	-0.07	-0.00	-0.00
2015	-0.11	-0.00	-0.00
2016	-0.20	-0.00	-0.00
2017	-0.15	-0.00	-0.00
2018	-0.05	-0.00	-0.00

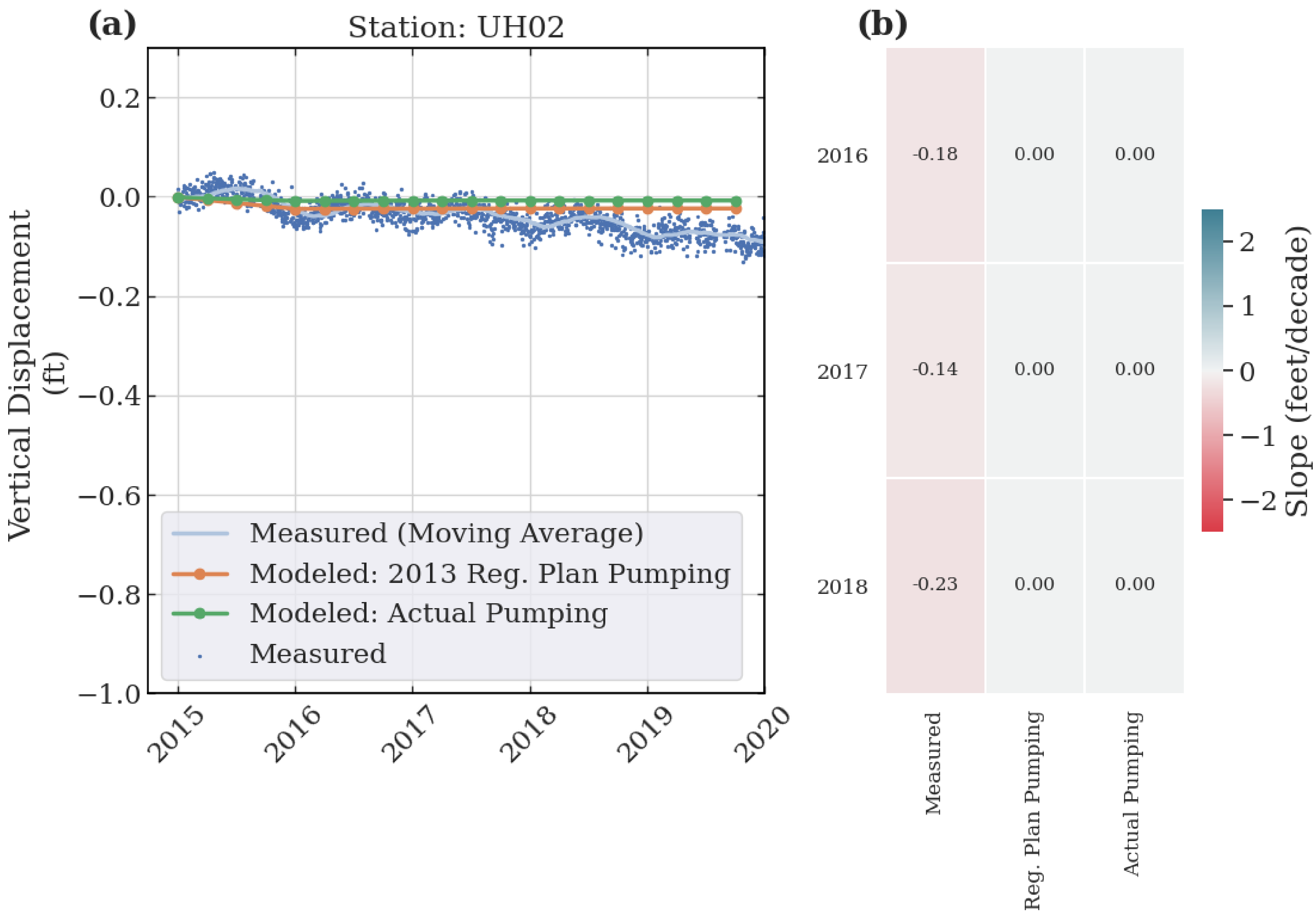

(a)
Station: TXWH
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2011 -0.08 -0.40 -0.40
2012 -0.22 -0.34 -0.34
2013 -0.08 -0.32 -0.32
2014 -0.00 -0.30 -0.30
2015 -0.21 -0.29 -0.29
2016 -0.22 -0.28 -0.28
2017 -0.19 -0.28 -0.27
2018 -0.13 -0.27 -0.27
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)


(a)
Station: TXWI
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2015
2016
2016
2017
2017
2018
2018
2019
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured

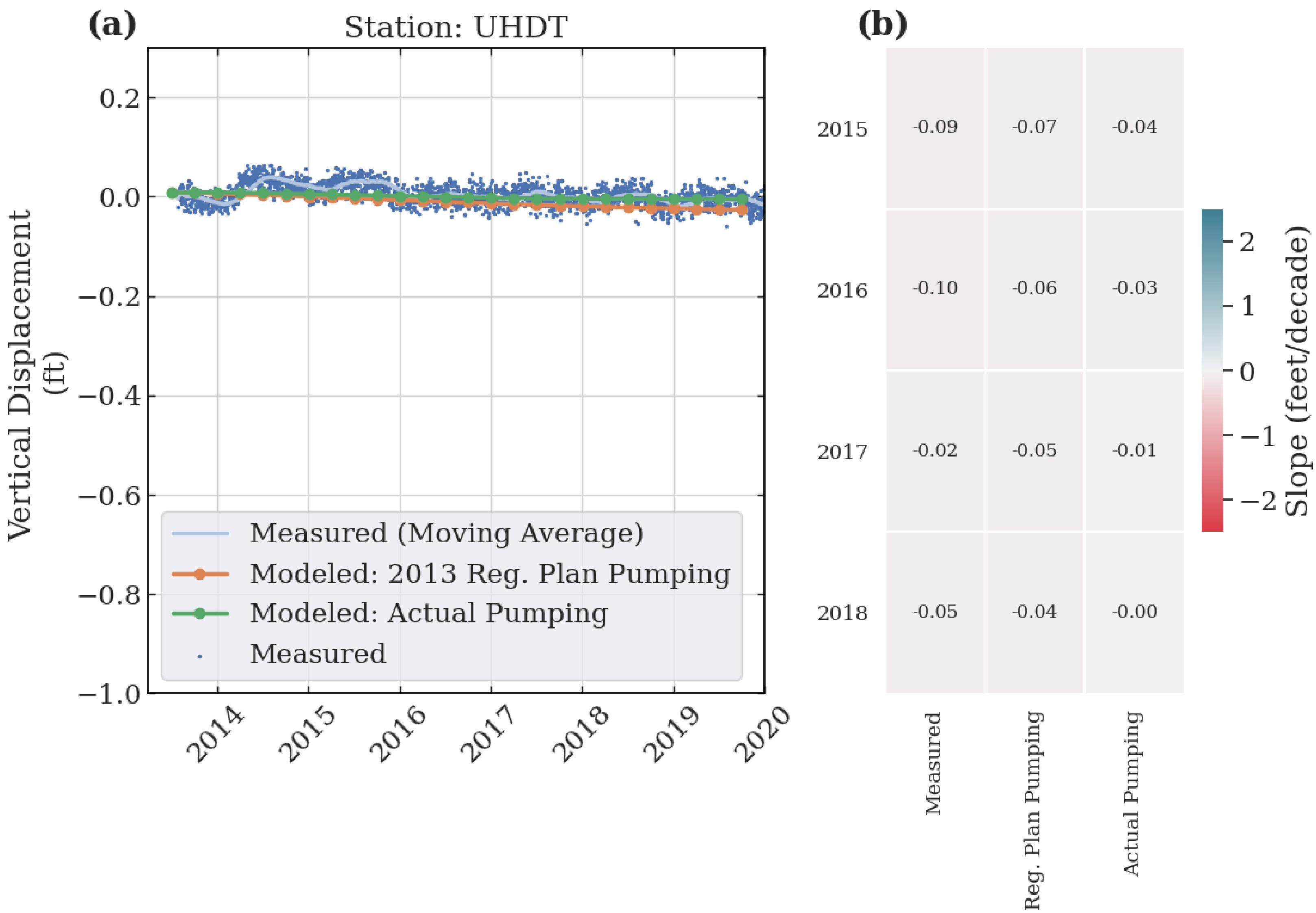

(b)
2016
-0.11
-0.00
-0.00
2017
-0.09
-0.00
-0.02
2018
-0.15
-0.00
-0.01
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

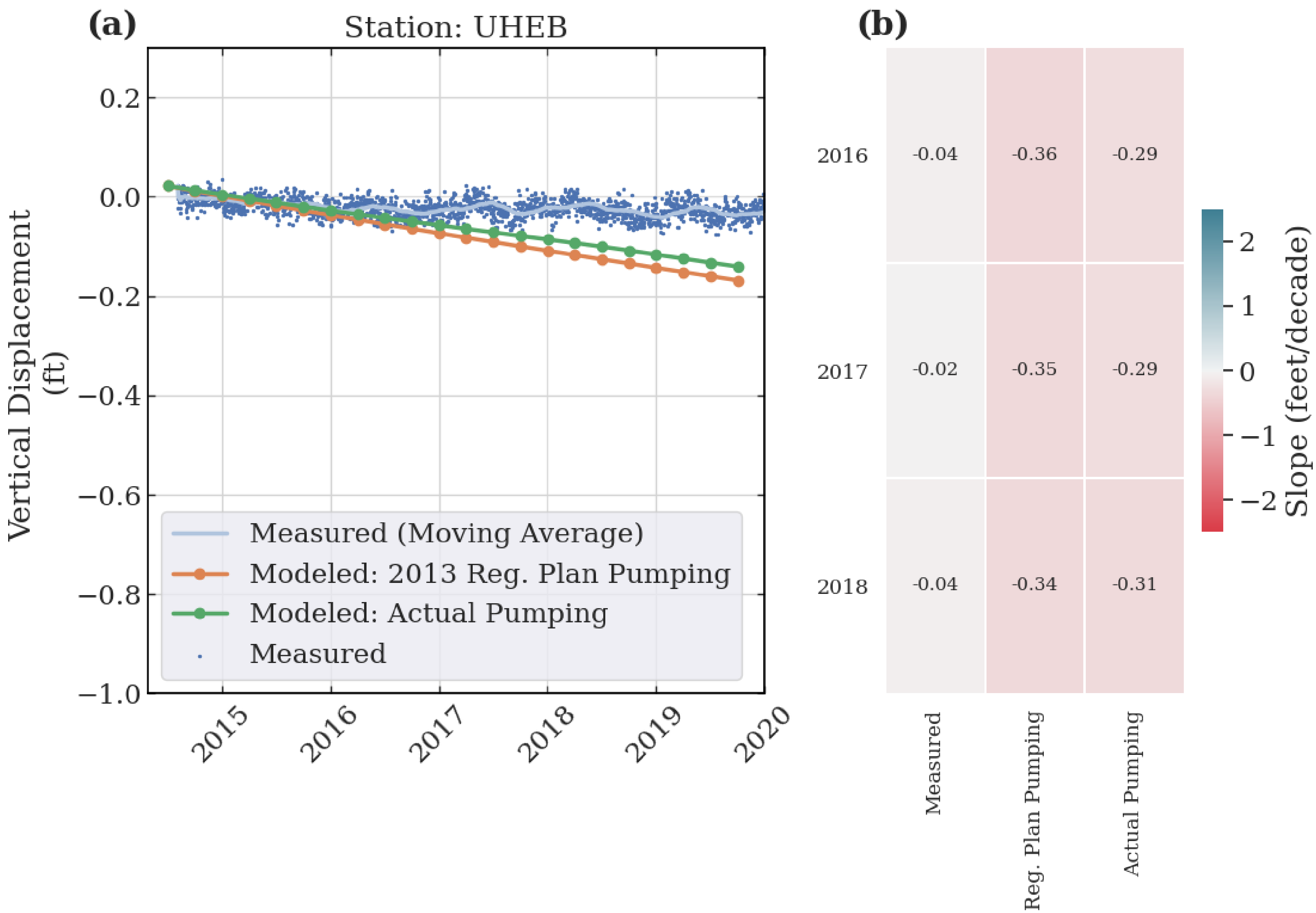

(a)
Station: TXWN
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2016
2017
2018
-0.04
-0.29
-0.28
0.01
-0.28
-0.27
-0.02
-0.28
-0.27
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2

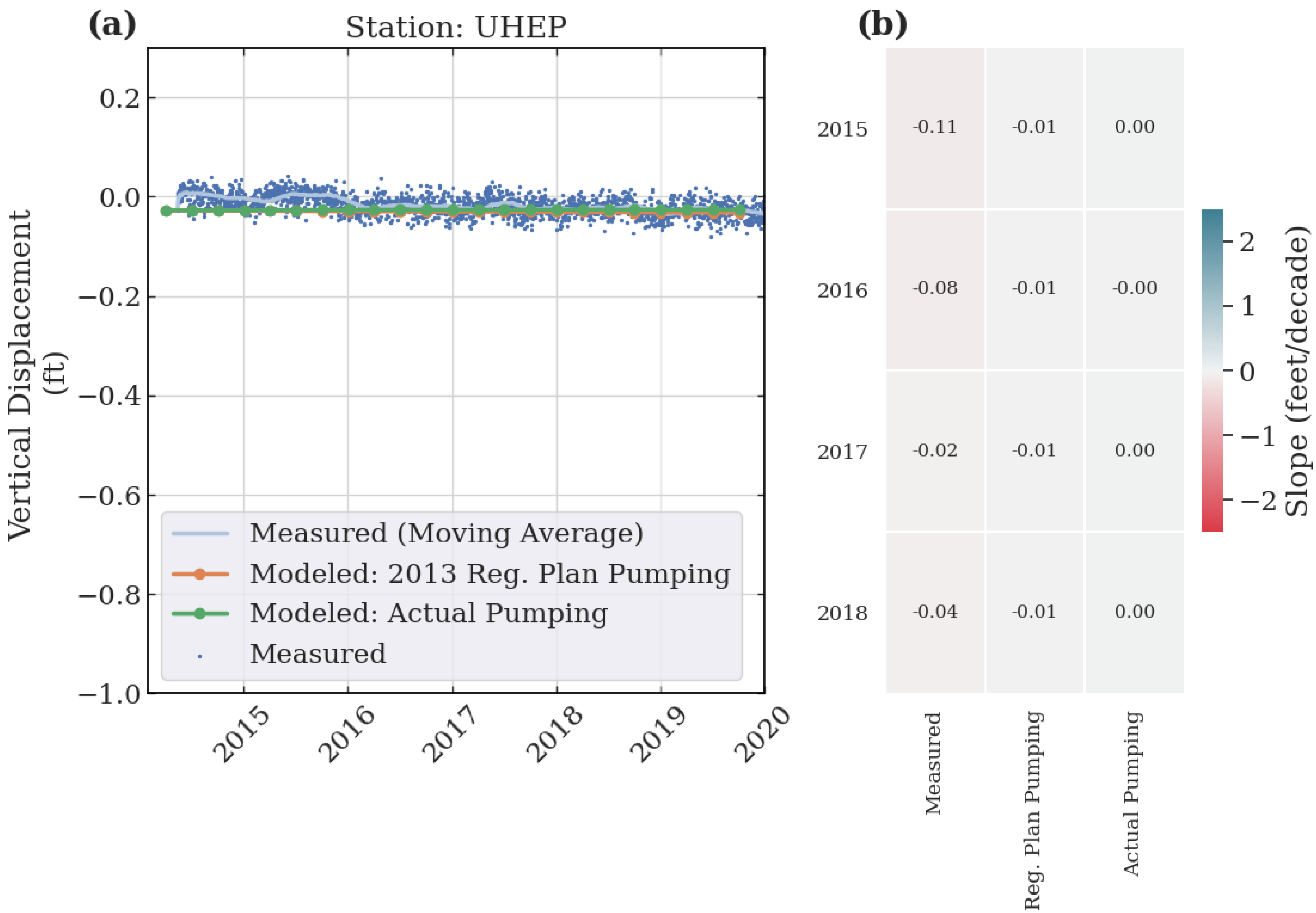

(a)
Station: UH01
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2013
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2014
2015
2016
2017
2018
0.09
-0.06
-0.02
-0.06
-0.07
-0.04
-0.09
-0.07
-0.04
-0.04
-0.06
-0.02
-0.05
-0.04
-0.01
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2

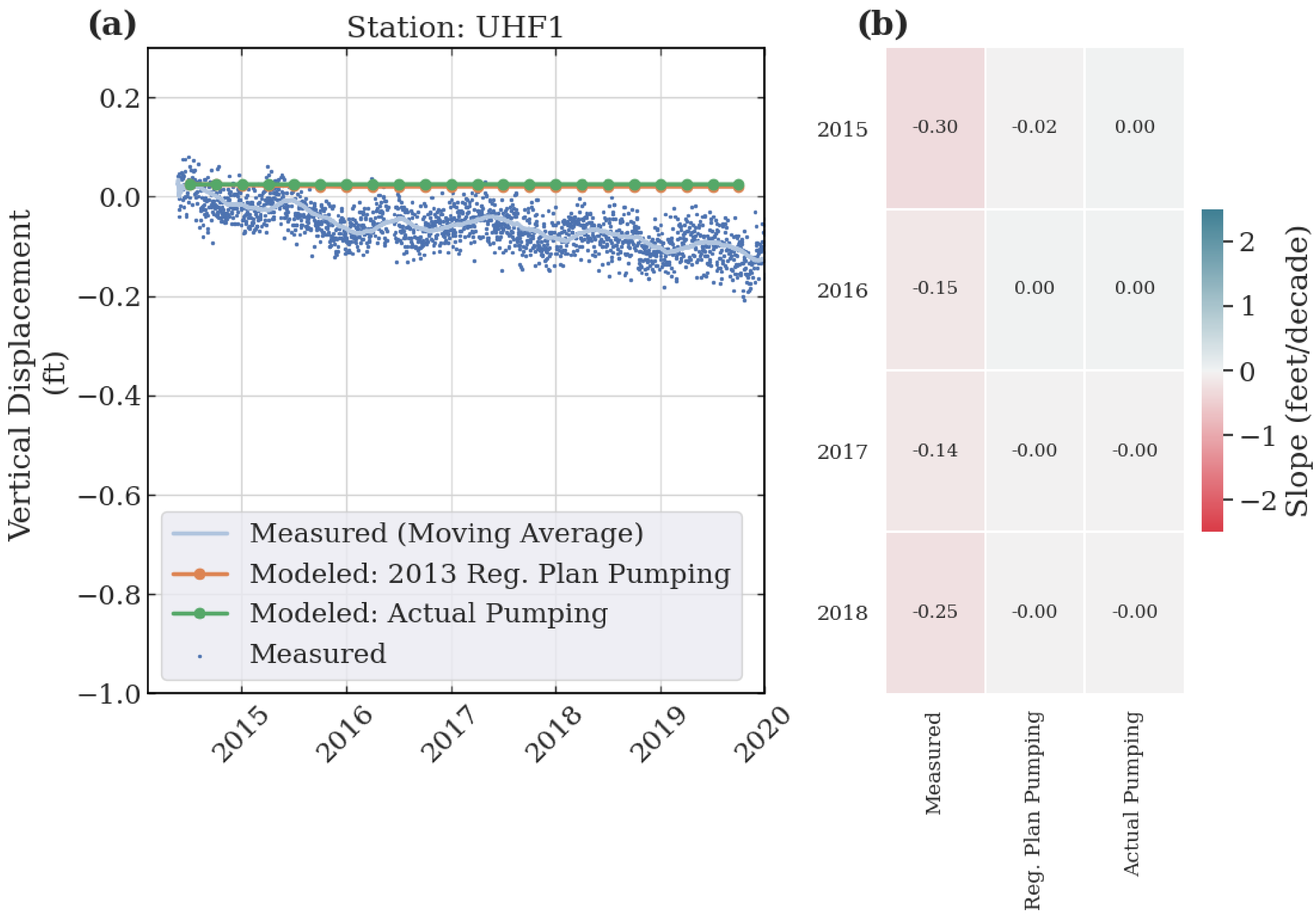


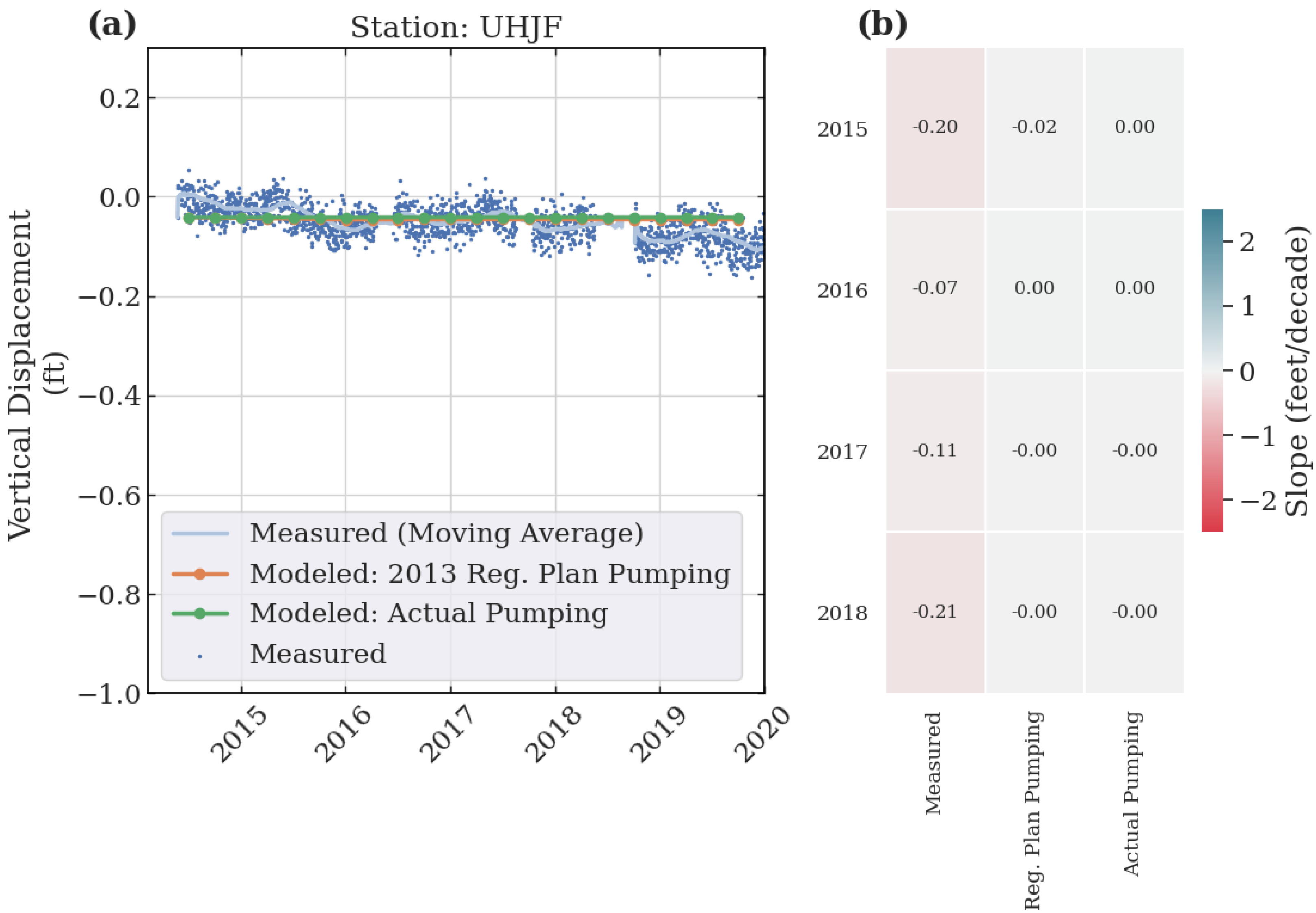
(a)
Station: UH02
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2016
2017
2018
-0.18
0.00
0.00
-0.14
0.00
0.00
-0.23
0.00
0.00
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

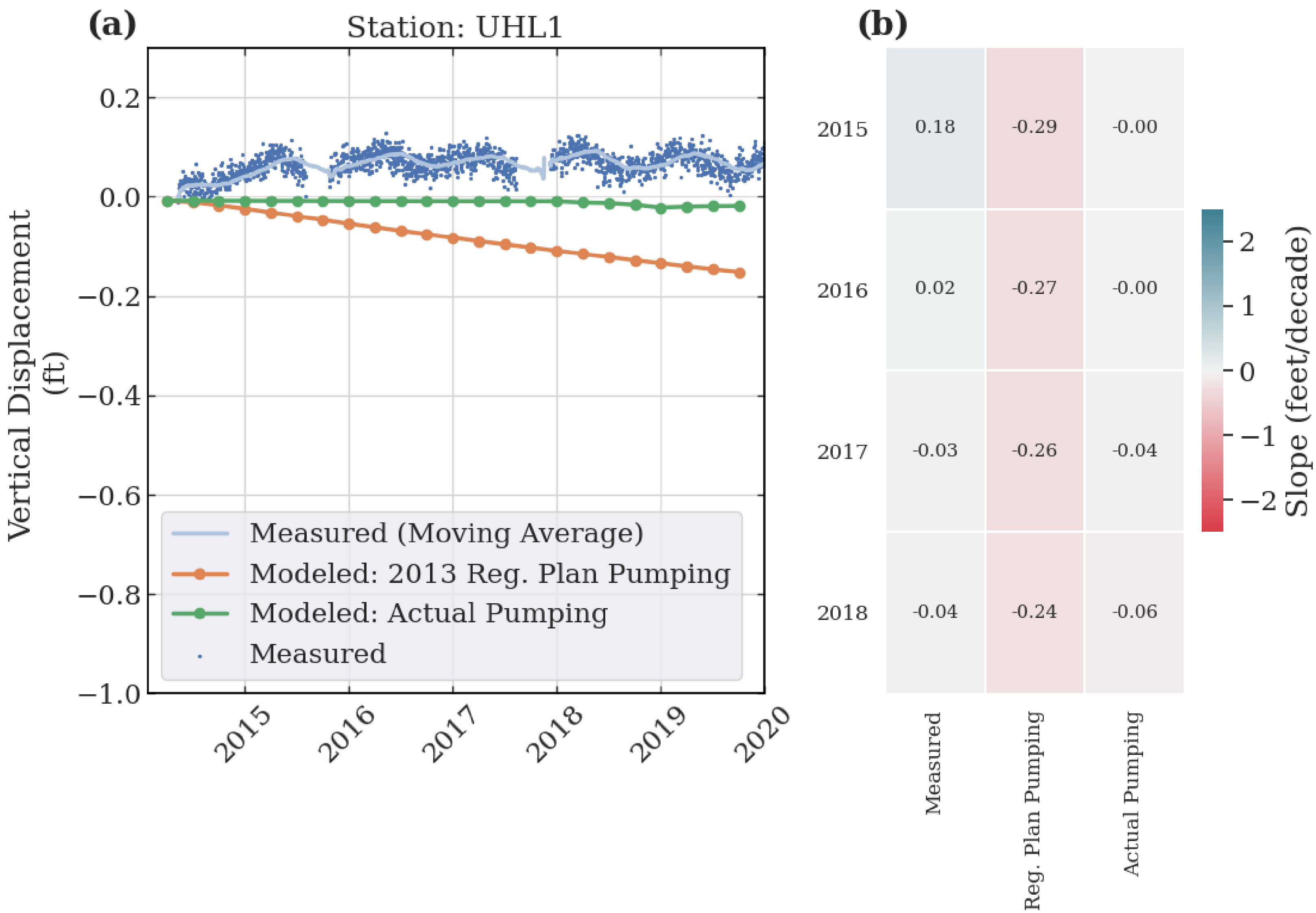

(a)
Station: UHDT
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
2014
2015
2016
2017
2018
2019
2020
(b)
2015
2016
2017
2018
-0.09
-0.07
-0.04
-0.10
-0.06
-0.03
-0.02
-0.05
-0.01
-0.05
-0.04
-0.00
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

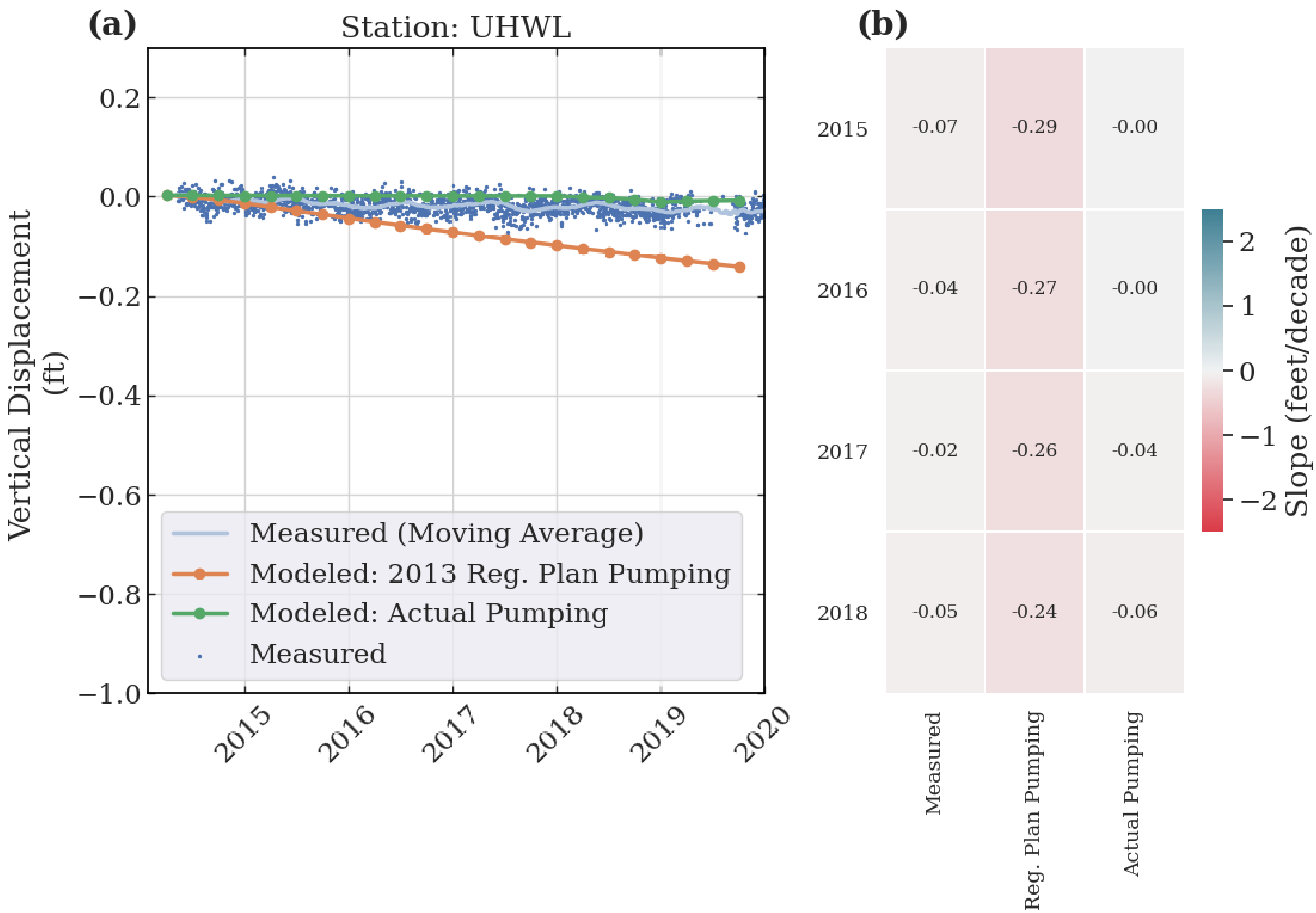

(a)
Station: UHEB
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2016
2017
2018
-0.04
-0.36
-0.29
-0.02
-0.35
-0.29
-0.04
-0.34
-0.31
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

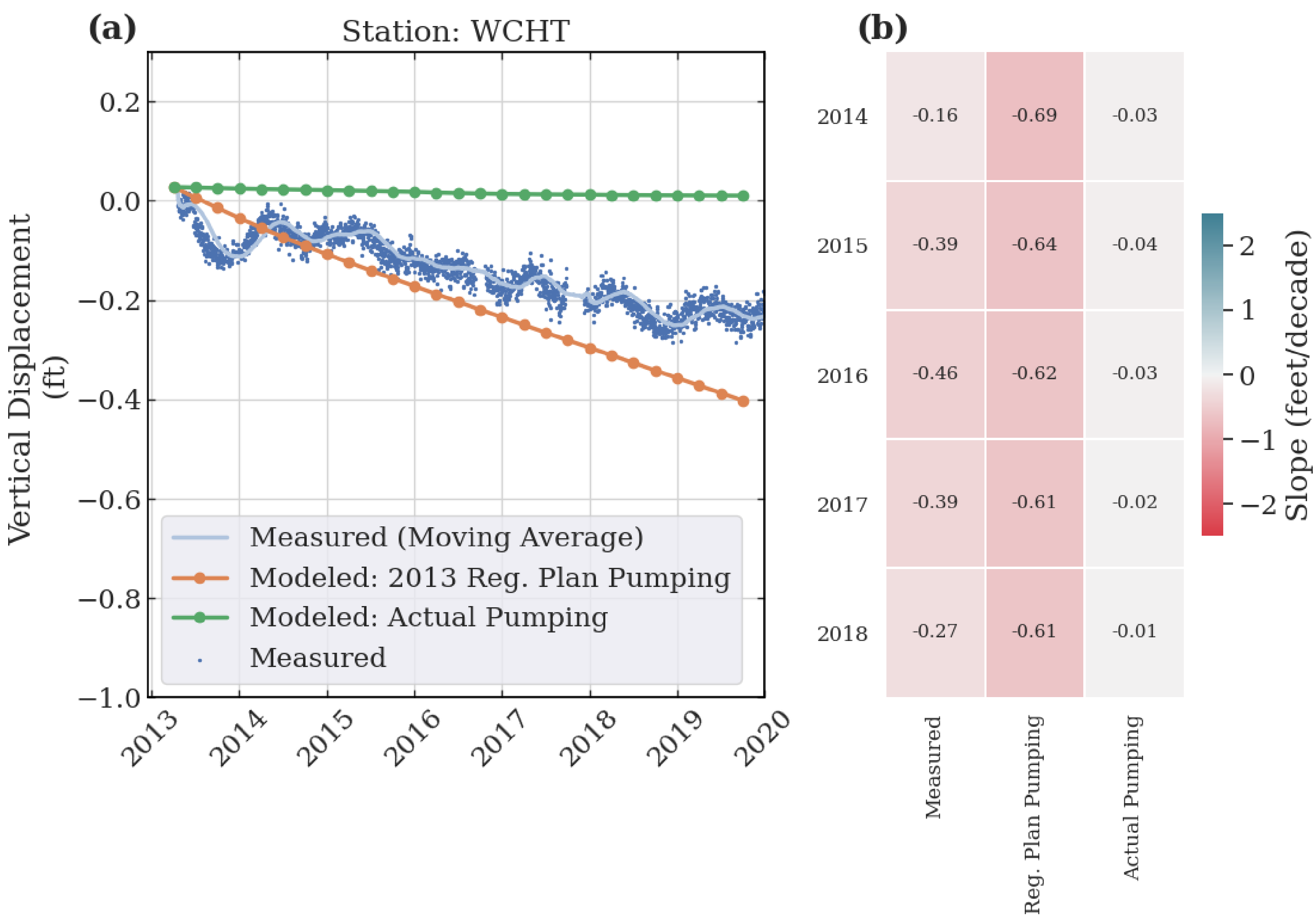

(a)
Station: UHEP
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2015
2016
2017
2018
-0.11
-0.01
0.00
-0.08
-0.01
-0.00
-0.02
-0.01
0.00
-0.04
-0.01
0.00
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

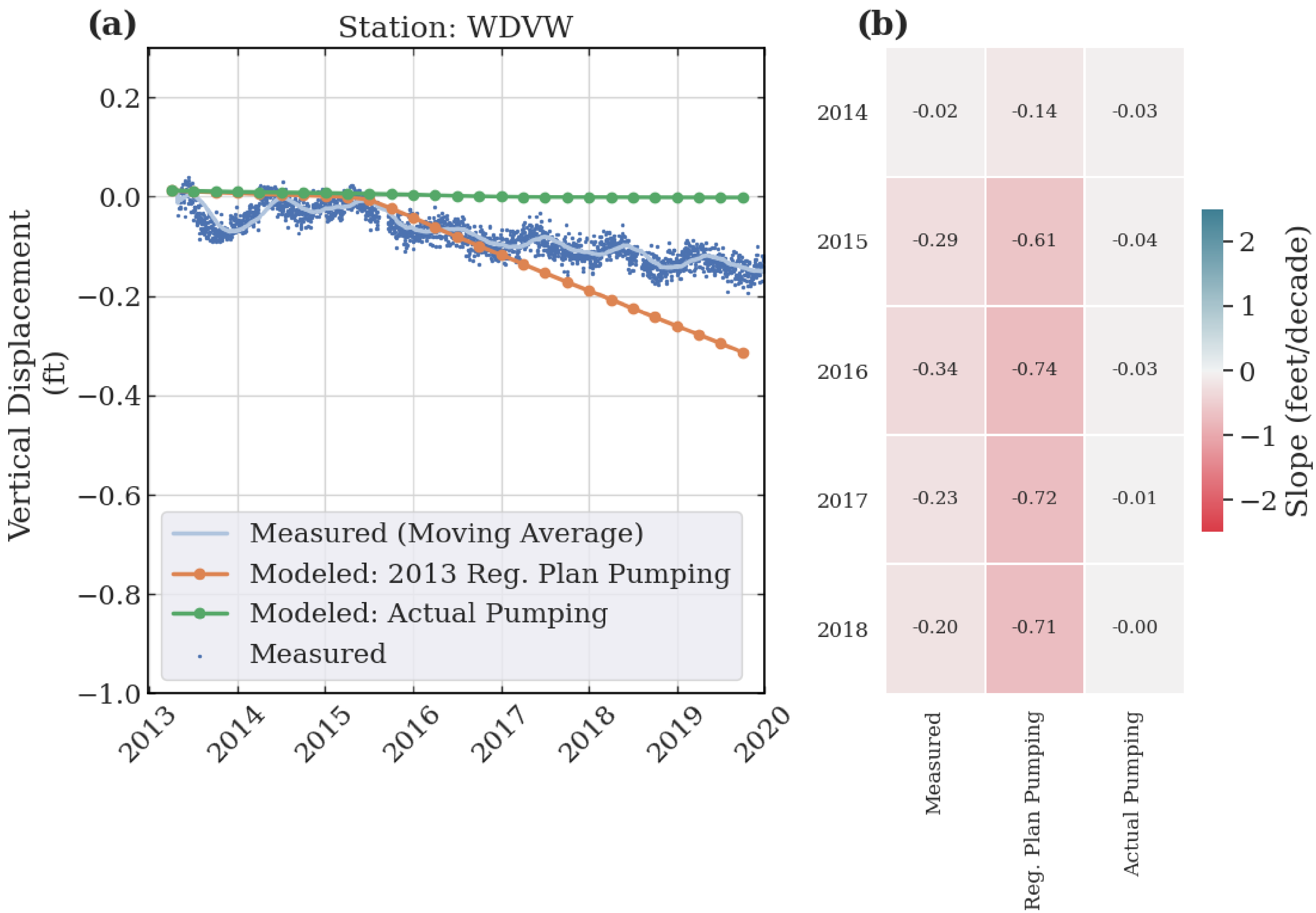

(a)
Station: UHF1
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2015
2016
2017
2018
-0.30
-0.02
0.00
-0.15
0.00
0.00
-0.14
-0.00
-0.00
-0.25
-0.00
-0.00
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

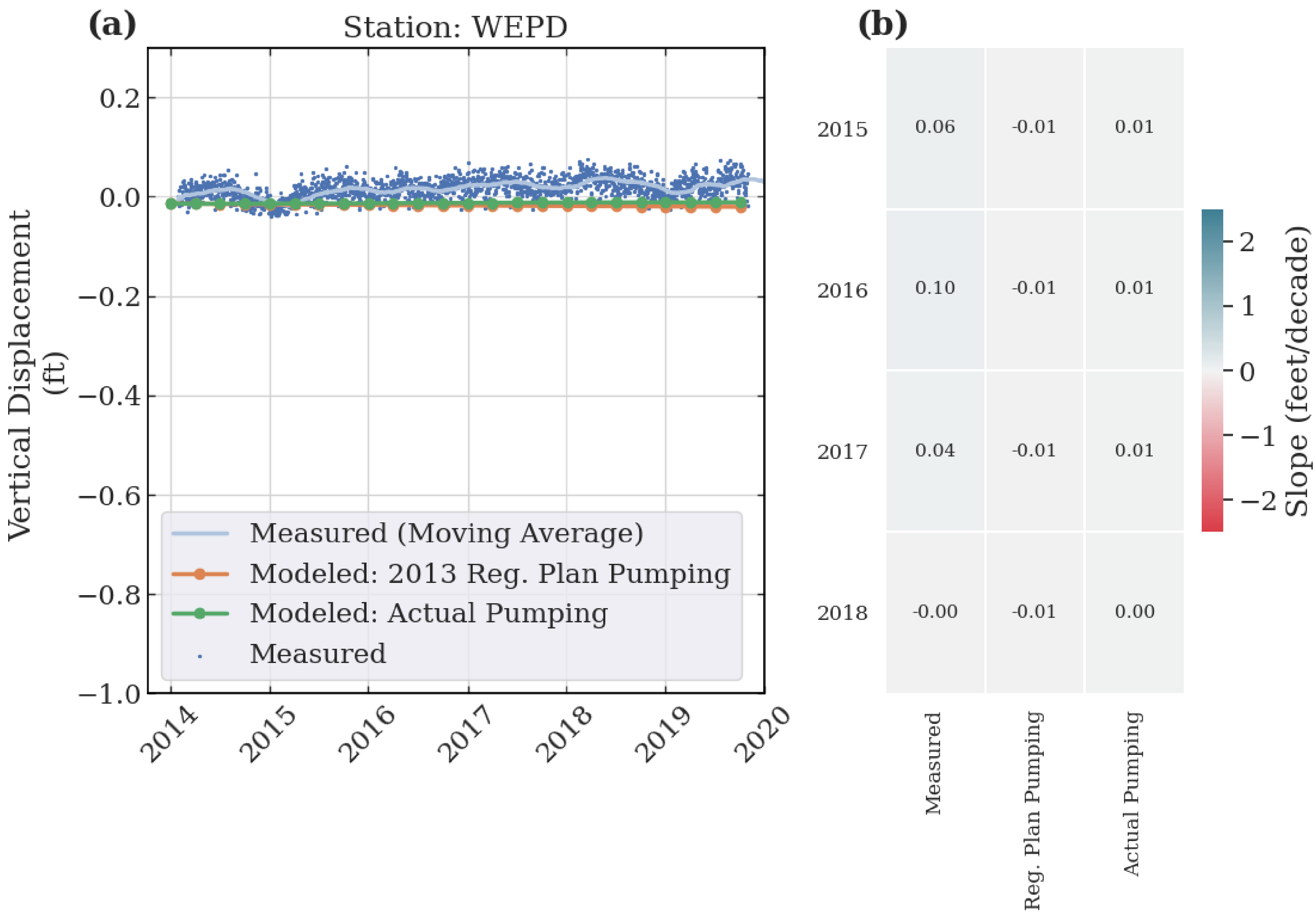

(a)
Station: UHJF
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2015
2016
2017
2018
-0.20
-0.02
0.00
-0.07
0.00
0.00
-0.11
-0.00
-0.00
-0.21
-0.00
-0.00
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

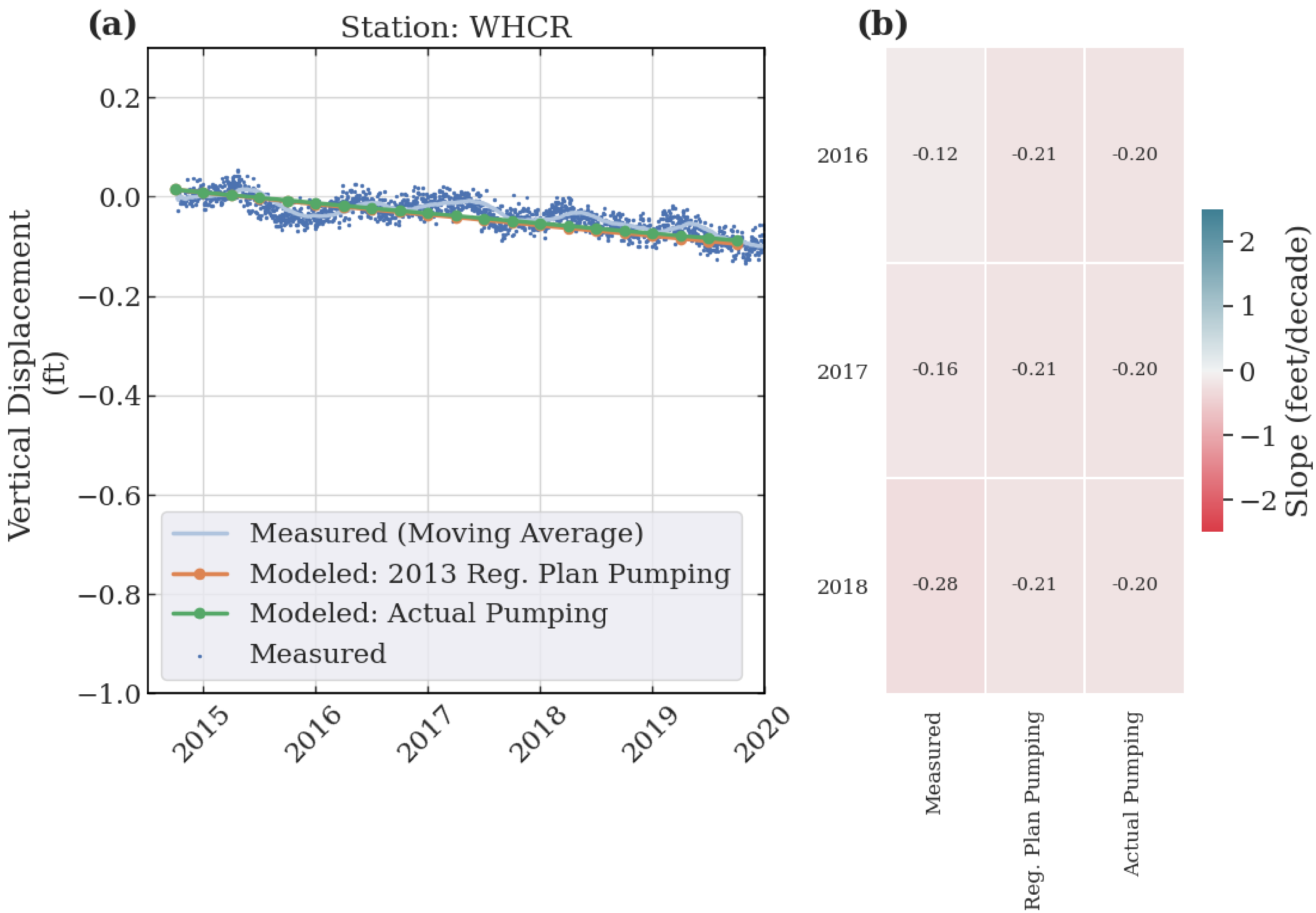

(a)
Station: UHL1
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2015
2016
2017
2018
0.18
-0.29
-0.00
0.02
-0.27
-0.00
-0.03
-0.26
-0.04
-0.04
-0.24
-0.06
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2

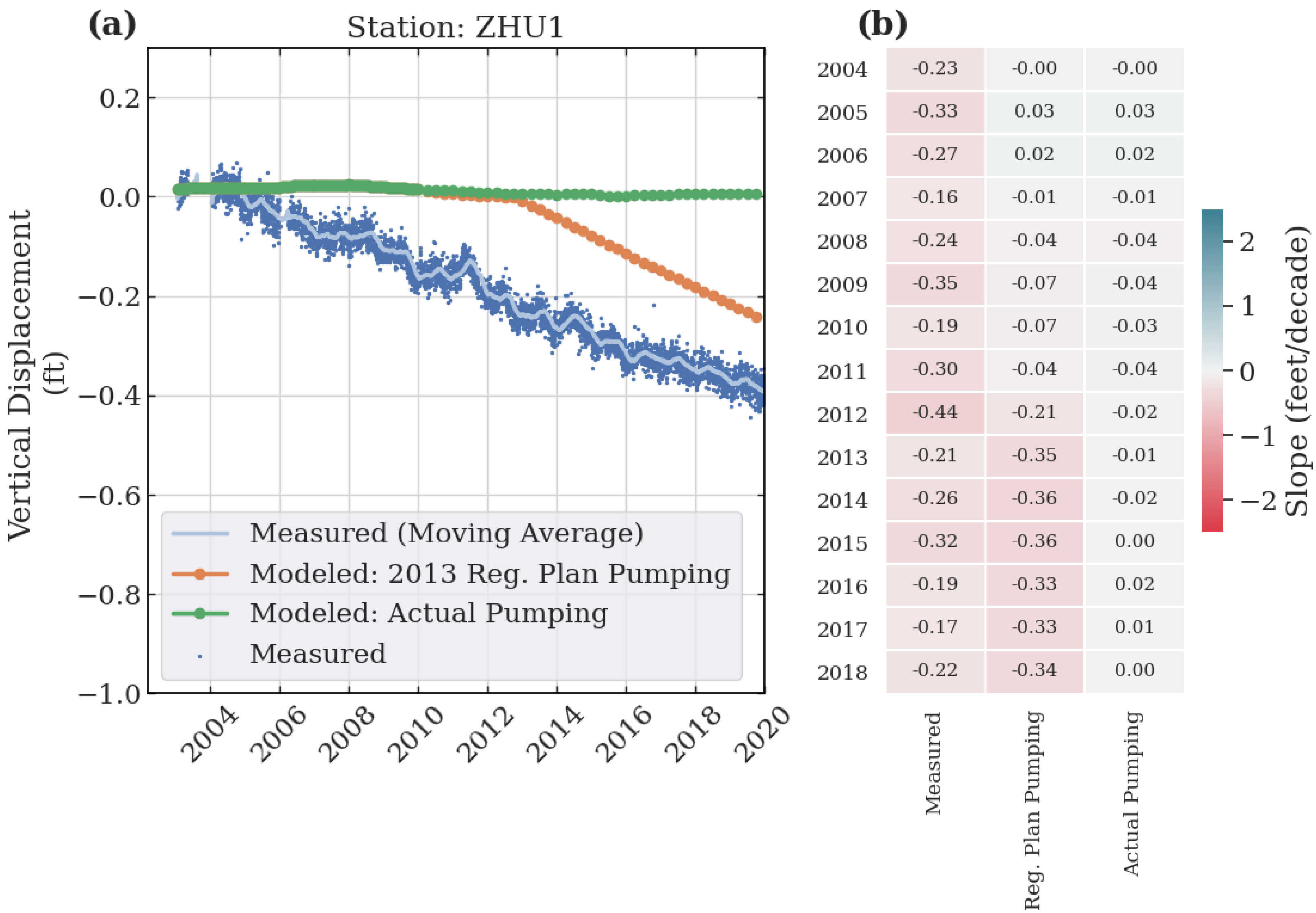

(a)
Station: UHWL
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2015
2016
2017
2018
-0.07
-0.29
-0.00
-0.04
-0.27
-0.00
-0.02
-0.26
-0.04
-0.05
-0.24
-0.06
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)


(a)
Station: WCHT
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2013
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2014
2015
2016
2017
2018
-0.16
-0.69
-0.03
-0.39
-0.64
-0.04
-0.46
-0.62
-0.03
-0.39
-0.61
-0.02
-0.27
-0.61
-0.01
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2

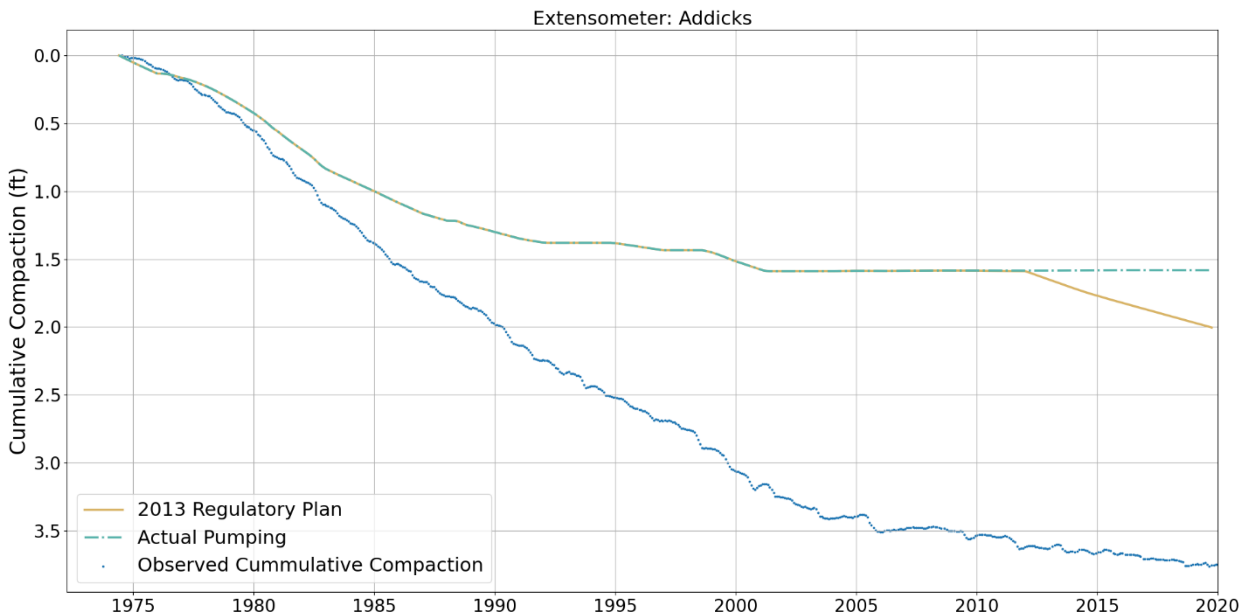

(a)
Station: WDVW
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2013
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2014
2015
2016
2017
2018
-0.02
-0.14
-0.03
-0.29
-0.61
-0.04
-0.34
-0.74
-0.03
-0.23
-0.72
-0.01
-0.20
-0.71
-0.00
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

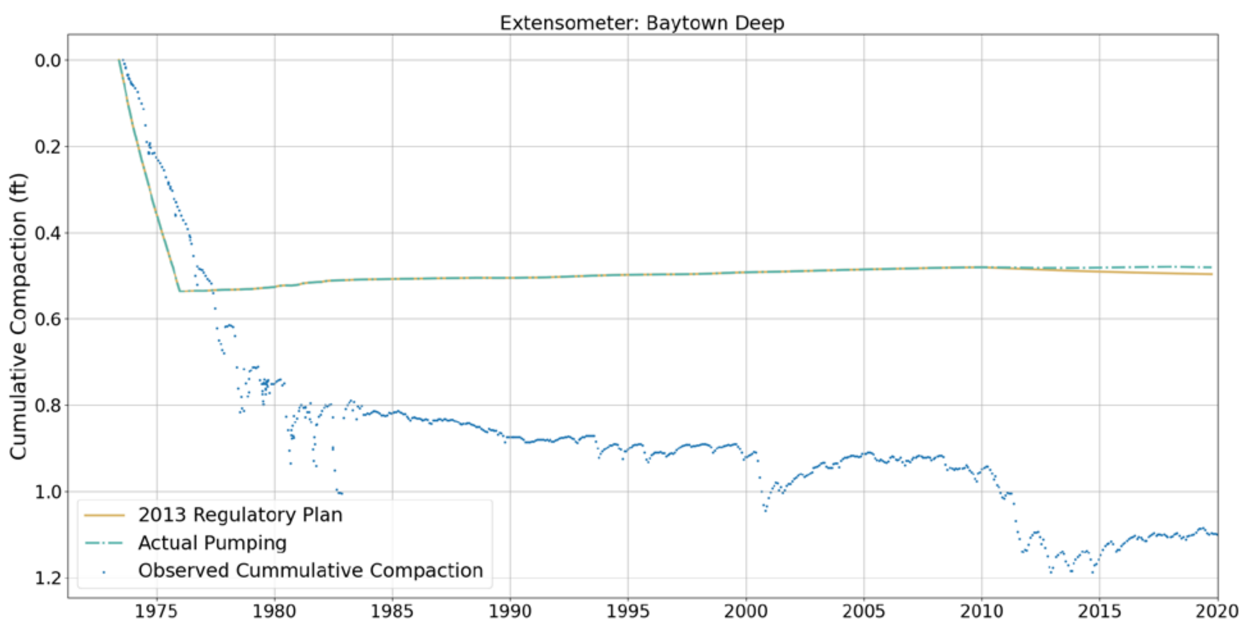

(a)
Station: WEPD
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2014
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2015
2016
2017
2018
0.06
-0.01
0.01
0.10
-0.01
0.01
0.04
-0.01
0.01
-0.00
-0.01
0.00
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2

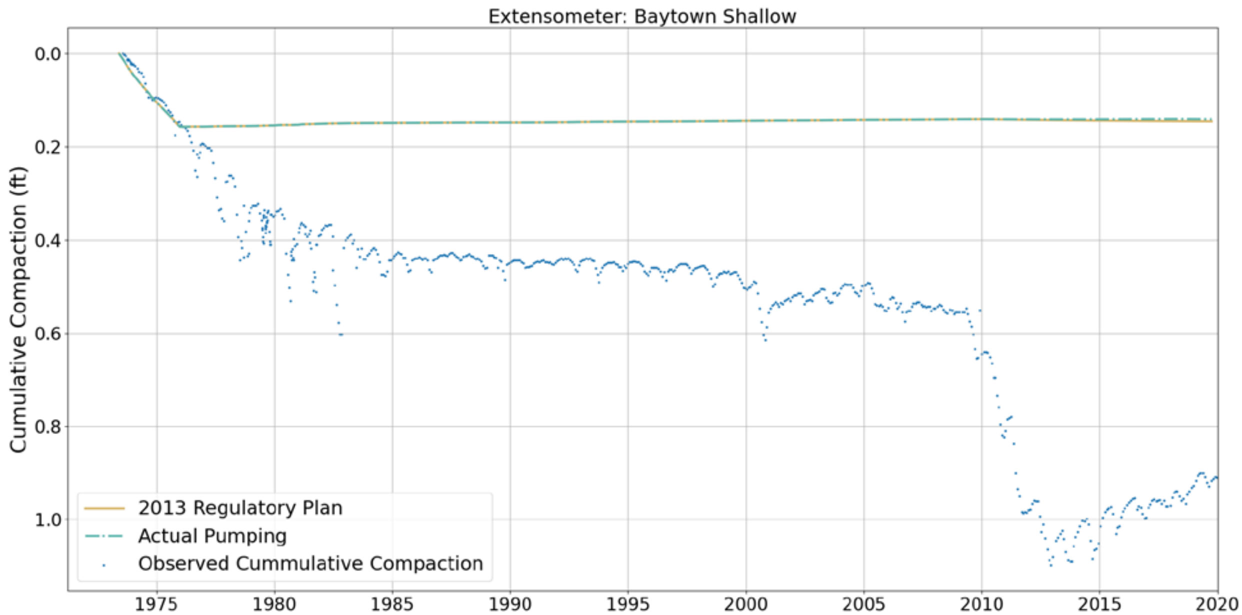

(a)
Station: WHCR
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2015
2016
2017
2018
2019
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2016
2017
2018
-0.12
-0.21
-0.20
-0.16
-0.21
-0.20
-0.28
-0.21
-0.20
Measured
Reg. Plan Pumping
Actual Pumping
Slope (feet/decade)
2
1
0
−1
−2

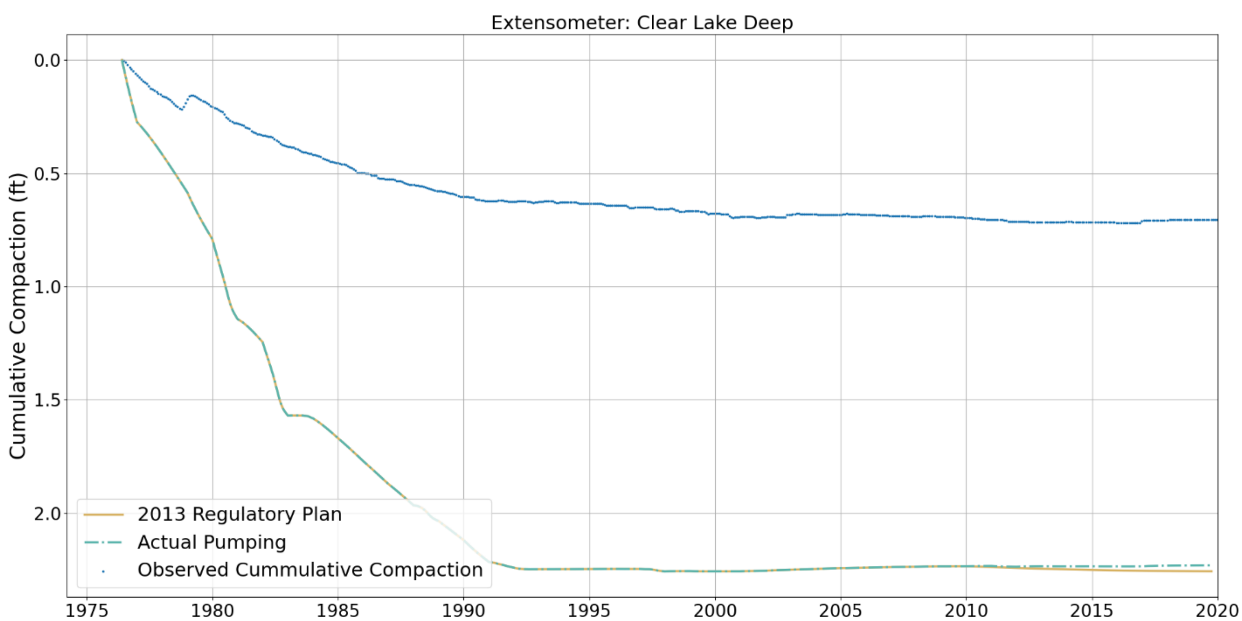

(a)
Station: ZHU1
Vertical Displacement (ft)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2004
2006
2008
2010
2012
2014
2016
2018
2020
Measured (Moving Average)
Modeled: 2013 Reg. Plan Pumping
Modeled: Actual Pumping
Measured
(b)
2004 -0.23 -0.00 -0.00
2005 -0.33 0.03 0.03
2006 -0.27 0.02 0.02
2007 -0.16 -0.01 -0.01
2008 -0.24 -0.04 -0.04
2009 -0.35 -0.07 -0.04
2010 -0.19 -0.07 -0.03
2011 -0.30 -0.04 -0.04
2012 -0.44 -0.21 -0.02
2013 -0.21 -0.35 -0.01
2014 -0.26 -0.36 -0.02
2015 -0.32 -0.36 0.00
2016 -0.19 -0.33 0.02
2017 -0.17 -0.33 0.01
2018 -0.22 -0.34 0.00
Measured
Reg. Plan Pumping
Actual Pumping
2
1
0
−1
−2
Slope (feet/decade)

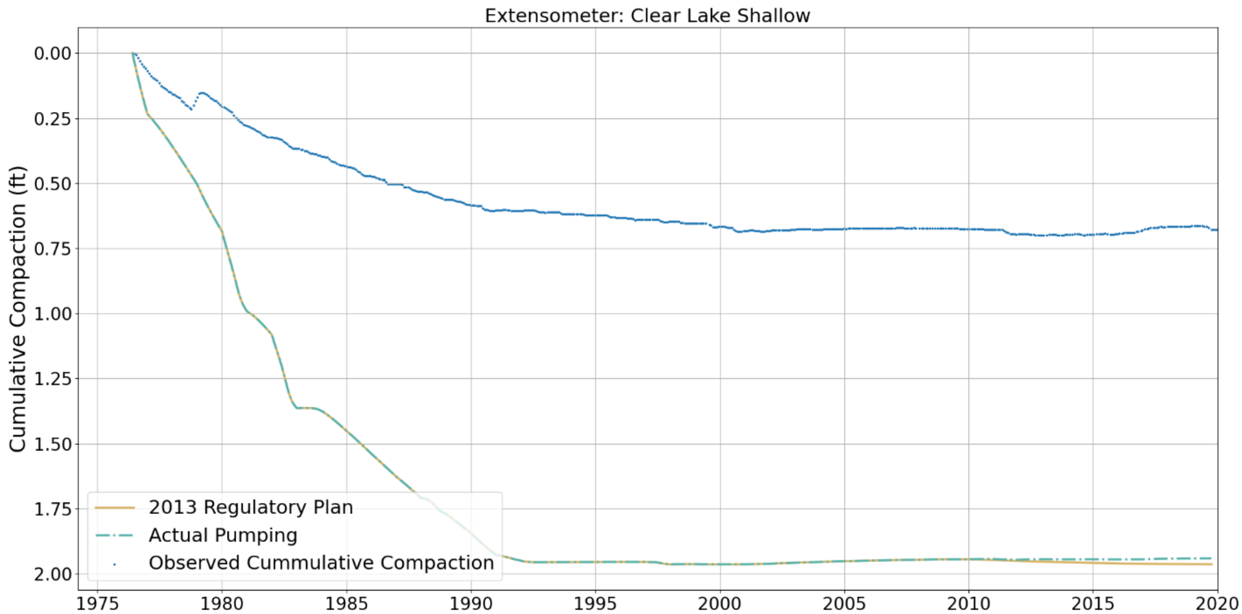
APPENDIX B:
EXTENSOMETER RESULTS

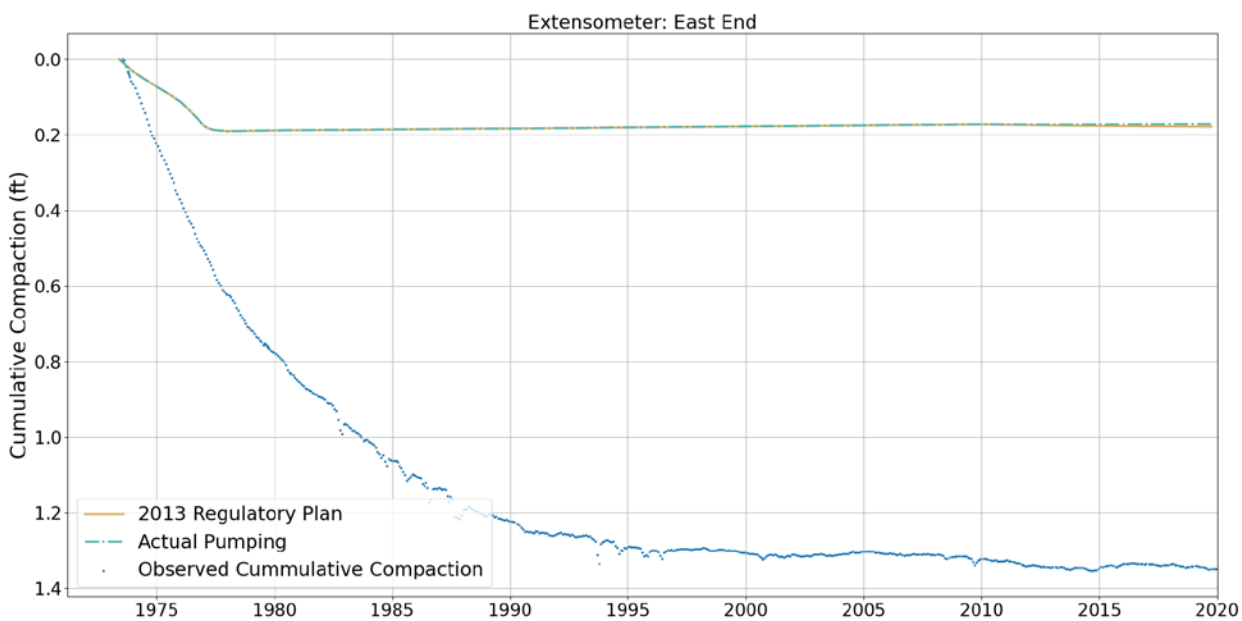

Extensometer: Addicks
Cumulative Compaction (ft)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2013 Regulatory Plan
Actual Pumping
Observed Cummulative Compaction

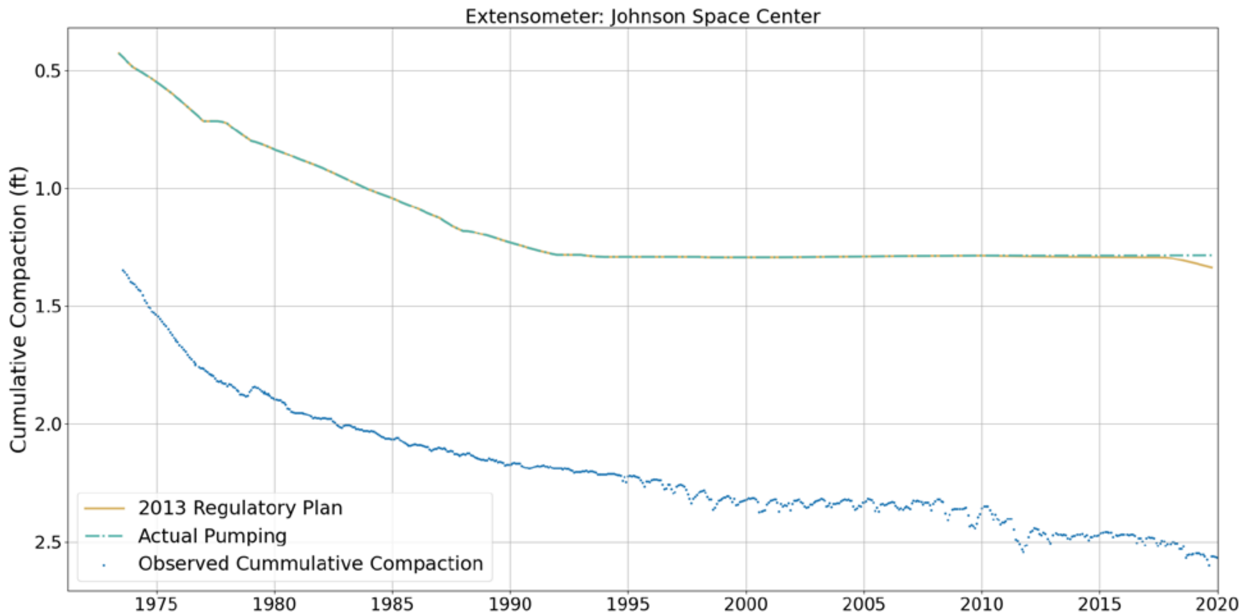

Extensometer: Baytown Deep
Cumulative Compaction (ft)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2013 Regulatory Plan
Actual Pumping
Observed Cummulative Compaction


Extensometer: Baytown Shallow
Cumulative Compaction (ft)
0.0
0.2
0.4
0.6
0.8
1.0
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2013 Regulatory Plan
Actual Pumping
Observed Cummulative Compaction

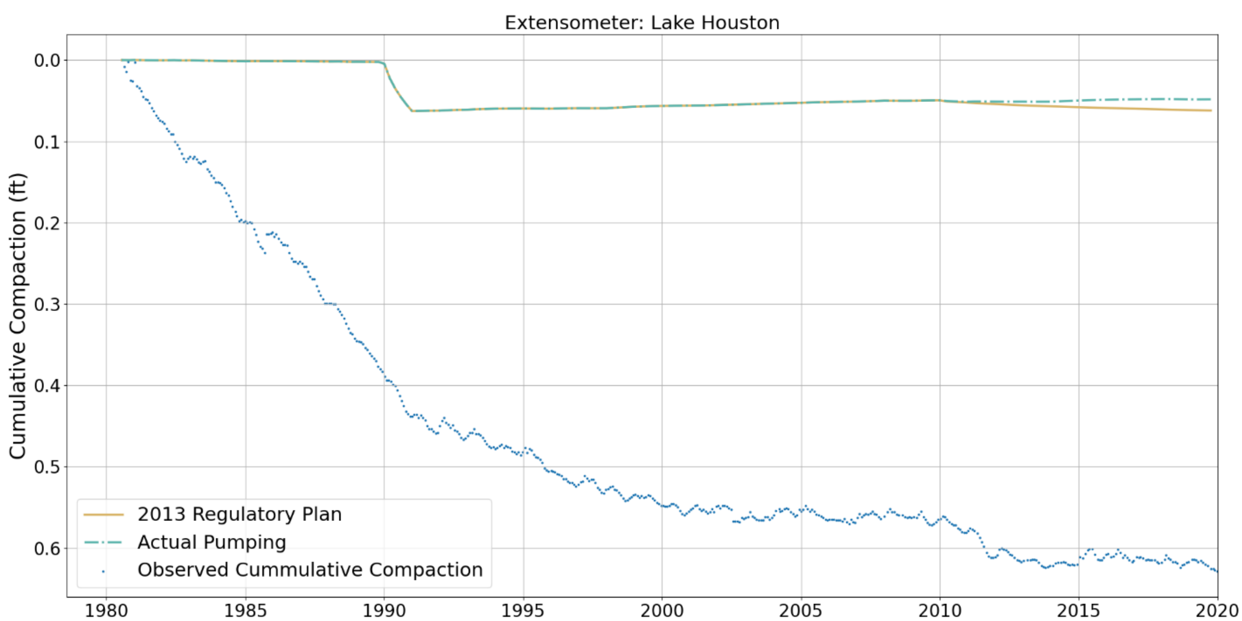

Extensometer: Clear Lake Deep
Cumulative Compaction (ft)
0.0
0.5
1.0
1.5
2.0
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2013 Regulatory Plan
Actual Pumping
Observed Cummulative Compaction


Extensometer: Clear Lake Shallow
Cumulative Compaction (ft)
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
2.00
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2013 Regulatory Plan
Actual Pumping
Observed Cummulative Compaction

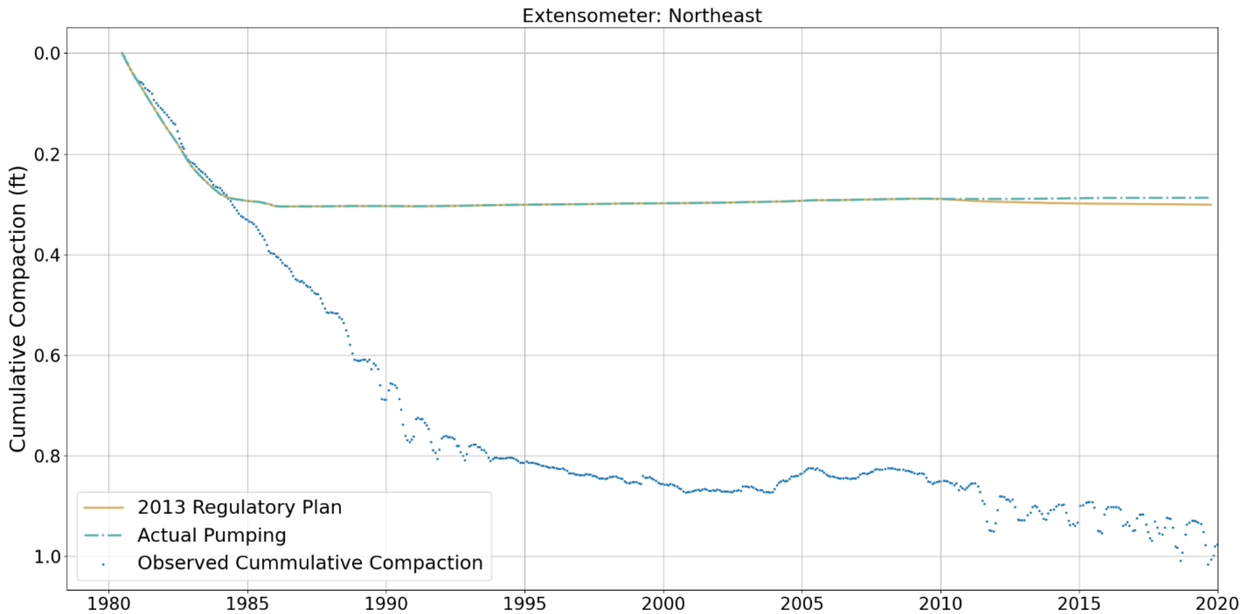

Extensometer: East End
Cumulative Compaction (ft)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2013 Regulatory Plan
Actual Pumping
Observed Cummulative Compaction

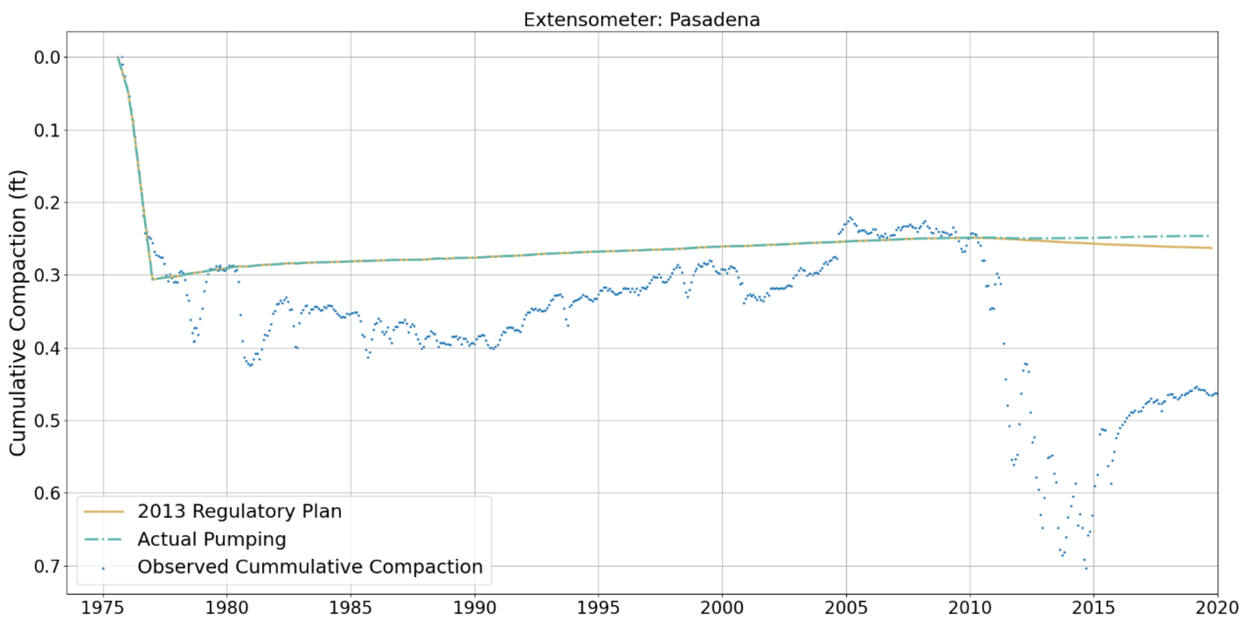


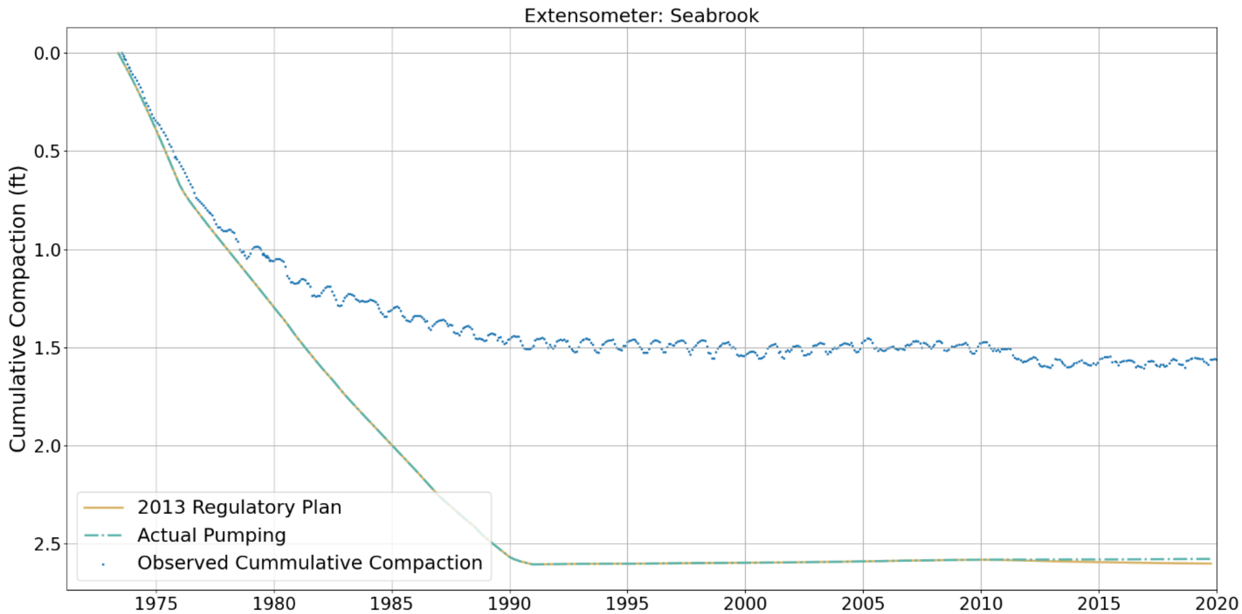
Extensometer: Johnson Space Center
Cumulative Compaction (ft)
0.5
1.0
1.5
2.0
2.5
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2013 Regulatory Plan
Actual Pumping
Observed Cummulative Compaction

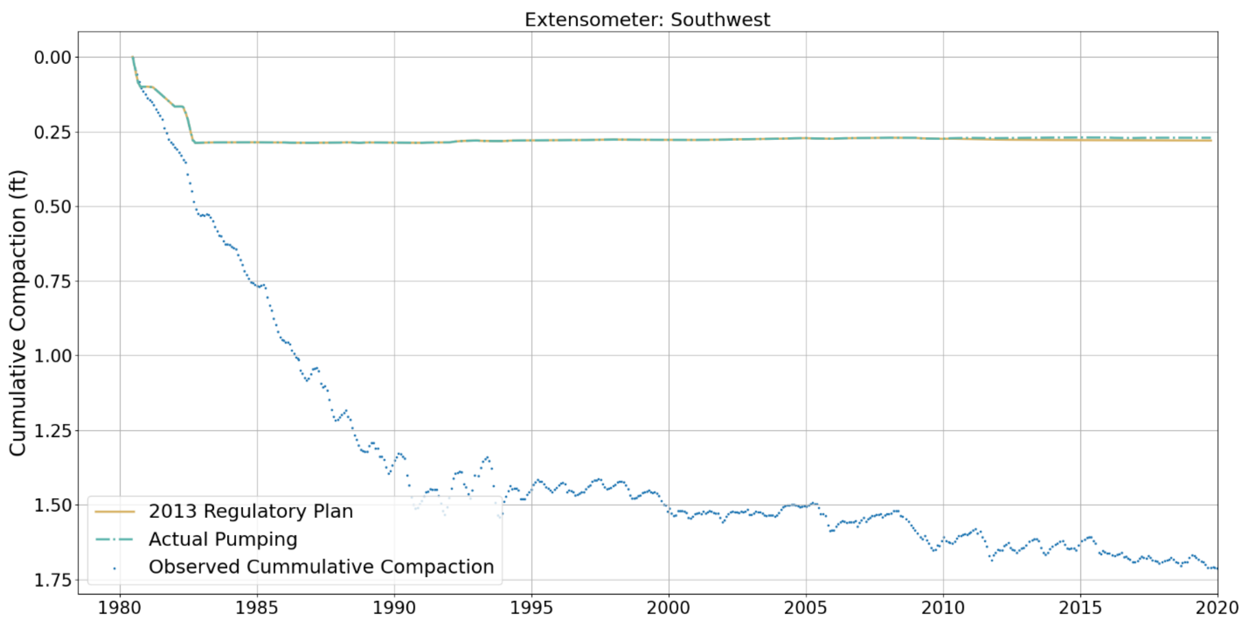


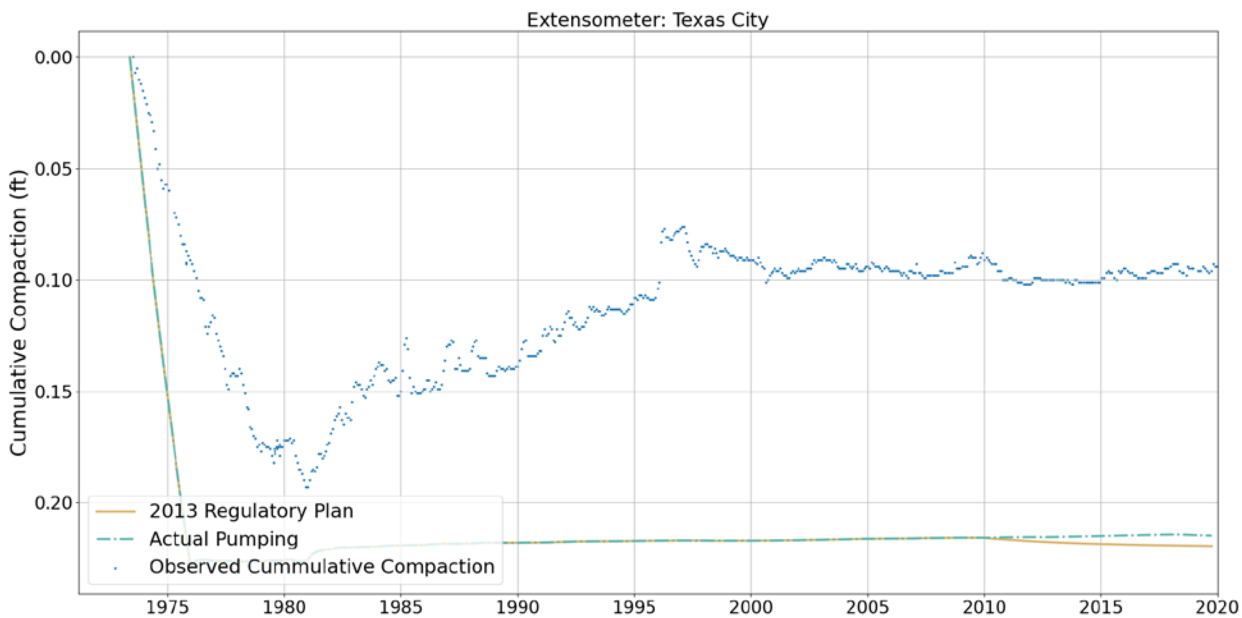
Extensometer: Lake Houston
Cumulative Compaction (ft)
0.0
0.1
0.2
0.3
0.4
0.5
0.6
1980
1985
1990
1995
2000
2005
2010
2015
2020
2013 Regulatory Plan
Actual Pumping
Observed Cummulative Compaction


Extensometer: Northeast
Cumulative Compaction (ft)
0.0
0.2
0.4
0.6
0.8
1.0
1980
1985
1990
1995
2000
2005
2010
2015
2020
2013 Regulatory Plan
Actual Pumping
Observed Cummulative Compaction


Extensometer: Pasadena
Cumulative Compaction (ft)
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2013 Regulatory Plan
Actual Pumping
Observed Cummulative Compaction


Extensometer: Seabrook
Cumulative Compaction (ft)
0.0
0.5
1.0
1.5
2.0
2.5
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2013 Regulatory Plan
Actual Pumping
Observed Cummulative Compaction


Extensometer: Southwest
Cumulative Compaction (ft)
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
1980
1985
1990
1995
2000
2005
2010
2015
2020
2013 Regulatory Plan
Actual Pumping
Observed Cummulative Compaction


Extensometer: Texas City
Cumulative Compaction (ft)
0.00
0.05
0.10
0.15
0.20
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2013 Regulatory Plan
Actual Pumping
Observed Cummulative Compaction